



2015-2018 Action Plan:

Introduction

Healthy estuaries and coasts are integral to the lifestyle of Long Islanders and draw visitors to the East End from all over the world. Unfortunately, nitrogen loading from human activities is causing widespread disruptions in Long Island's coastal ecosystems, including in the Peconic Estuary. From harmful and toxic algal blooms to low dissolved oxygen and degraded aquatic habitats, coastal waters are showing serious symptoms of nitrogen pollution that require action. The Peconic Estuary Program (PEP) and its partners have determined that addressing nitrogen is the strategic priority for the Program due to the far-reaching impacts of nitrogen on all aspects of the Estuary.

Nitrogen pollution is an extremely complex issue to manage, and requires actions by all levels of government, the public, and the agricultural and business community. Careful evaluation of the management options available can lead to more cost-effective ways of reducing nitrogen to levels required in the Peconic Estuary Total Maximum Daily Load (TMDL). This is the main goal of the Nitrogen Management portion of this Action Plan. While accelerating the implementation of the nitrogen TMDL is the top priority, PEP has also identified the protection and restoration of critical habitats, implementation of the pathogen TMDL, and reduction of harmful algal blooms as immediate priorities.

The PEP presents this prioritized action plan focused on short-term actions to help us collectively protect and improve the ecological health of the estuary. The actions below are intended to provide a menu of immediately implementable projects ("Actions Now") that will lead into follow-up actions in an approximately 5 year time frame ("Actions for the Future"). Beginning in 2016, PEP will launch an update to the Peconic Estuary Comprehensive Conservation and Management Plan. This updated plan is expected to build upon the short-term actions identified in this Action Plan and incorporate the future actions identified here, as well as additional actions identified by PEP committees and through a robust stakeholder engagement process. This action plan is meant to be a living document. Going forward, continuing discussion of strategic priorities is advisable to ensure that PEP is meeting the needs of local governments and other stakeholders and to identify additional funding opportunities.

There are many important and ongoing actions needed to restore the Estuary that are not explicitly included in this Action Plan. Ongoing tasks and partner activities such as implementation of the Critical Lands Protection Strategy, promotion of slow-release fertilizers, modeling of nitrogen loads, implementation of the nitrogen TMDL through effluent re-use at the Riverhead Wastewater Treatment Plant and installation of pilot alternative onsite septic systems, and rehabilitation of shellfish populations and natural habitats are critically important and need to continue in order to reduce nitrogen to acceptable levels. This document draws upon the successes and initiatives of PEP's many dedicated partners, but specifically focuses on activities that can be implemented by or supported by the Peconic Estuary Program itself.

While this action plan provides a path forward, PEP does not currently have all of the resources necessary to complete all of the actions outlined. There is a summary of resource needs at the end of each section and an overall summary at the end of the action plan. This plan will be used to prioritize pursuit of additional funds.

NITROGEN MANAGEMENT

Excess nitrogen loading is the most serious problem affecting water quality on Eastern Long Island.

Background:

Reducing nitrogen loading to the Peconic Estuary, especially via groundwater, has been identified as a top priority for the Peconic Estuary Program. A Strategic Planning session that took place in January 2013 specifically identified accelerating the implementation of the Peconic Estuary Nitrogen TMDL (Total Maximum Daily Load) (<http://www.peconicestuary.org/reports/362443d3f1856cfce9d283b88d3c9bd4188bfe56.pdf>), which requires reductions of 30-50% to restore the Estuary. To accomplish this, an increased strategic focus on nitrogen reductions will be necessary. The Strategic Planning session also identified the lack of information on the proportion in which various sources contribute nitrogen to groundwater as a road block to effective communication about - and therefore action on - reducing nitrogen loading. The following actions aim to reduce nitrogen loads by identifying sources of nitrogen on a subwatershed basis, and implementing management actions and projects to address these sources. While throughout the county wastewater inputs dominate, on the East End it is particularly important that agricultural and other fertilizer uses are evaluated as part of the solution. PEP places the highest priority on addressing the nitrogen loading to groundwater. But recognizing that it may take many years for contaminated groundwater to reach the Estuary, PEP also will help to investigate emerging technologies as interim solutions to address existing groundwater contamination.

The final enacted 2015-2016 New York State budget includes several items that support the Suffolk County Nitrogen Initiative and Long Island's two National Estuary Programs. The items include \$5,000,000 for services and expenses related to a Long Island Nitrogen Management and Mitigation Plan that will be administered by NYS DEC and the Long Island Regional Planning Council. Additionally, for the second year in a row, NY State appropriated \$3,000,000 for septic system research, development, and pilot programs to be facilitated by Suffolk County and Stony Brook University's new Clean Water Technology Center.

GOAL:

Reduce nitrogen loads to the Peconic Estuary to attain the Peconic Estuary TMDL and ensure a healthy and productive estuarine ecosystem.

OBJECTIVES:

- (1) Quantify nitrogen loads to groundwater entering the Peconic Estuary by sector, jurisdiction, and subwatershed.
- (2) Use this information to help determine cost-effective management actions to reduce nitrogen loads to the estuary.
- (3) Revise the TMDL Implementation Plan and work with local governments and other stakeholders to implement management actions.
- (4) Better understand the impacts of nitrogen on the estuarine ecosystem. To be addressed in the Habitat section, and in the Harmful Algal Bloom section.

NITROGEN: ACTIONS NOW			ESTIMATED ONE-TIME COSTS			ESTIMATED ANNUAL COSTS			
	TIMELINE	PARTNER	TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED	STAFF TIME (FTE)	TOTAL ANNUAL COSTS	IN PLACE	NEEDED

1N	Adopt an existing model to determine nitrogen loads by source, jurisdiction and subwatershed OR develop an appropriate model(s), including addressing data gaps and research/monitoring needed to validate model assumptions (e.g. attenuation rates). Compare the modeled loads to TMDL goals.	Adopt Model 2015, RFP if needed 2016	PEP Nitrogen Workgroup in consultation with SC & NYS DEC	\$1,000,000	\$155,000	\$845,000	0.10	\$12,500	\$12,500	\$0
2N	Assess the cost per pound of nitrogen reduction to groundwater for various BMPs to guide cost-effective management of nitrogen on a subwatershed basis.	2015-2016	PEP Nitrogen Workgroup and Contractor	\$100,000	\$0	\$100,000	0.10	\$12,500	\$12,500	\$0
3N	Work with Suffolk County on the development of its wastewater plan, and work with NYSDEC on its Long Island Nitrogen initiatives to integrate PEP's analyses considering East End specific solutions.	Immediately and ongoing over the next 5 years	PEP and PEPC	\$0	\$0	\$0	0.10	\$12,500	\$12,500	\$0
4N	Recommend revisions to strengthen Suffolk County's fertilizer law as appropriate.	2016	PEP working with SC	\$50,000	\$0	\$50,000	0.05	\$6,250	\$6,250	\$0
5N	Encourage implementation of nitrogen reduction actions by working with the Peconic Estuary Protection Committee. Develop proposals and seek funding for nitrogen management implementation projects.	Starting 2015	PEPC	\$50,000	\$0	\$50,000	0.05	\$6,250	\$6,250	\$0

6N	Inform the update of the Agricultural Stewardship plan by ensuring the implementation of full scale, verifiable management practices to reduce nitrogen loads to the Estuary to help achieve TMDL goals	2015	Ag Stewardship Committee	\$0	\$0	\$0	0.05	\$6,250	\$6,250	\$0
7N	Assess potential usefulness of nitrogen mitigation techniques through pilot projects that evaluate innovative technologies and practices to reduce the impact of existing contaminated groundwater on the Estuary, such as: a. Permeable Reactive Barriers b. Agricultural pilot projects to be identified by the Management Committee c. Bioharvesting (e.g. shellfish, algae aquaculture)	2016-2020	PEP, PEP TAC	\$0	\$0	\$0	0.05	\$81,250	\$6,250	\$75,000
TOTAL				\$1,200,000	\$155,000	\$1,045,000	0.50	\$137,500	\$62,500	\$75,000
*Future costs not intended to reflect funding for full remediation of the environment. Where feasible, we have included first order estimates of initial investments needed.										
NITROGEN: ACTIONS FOR THE FUTURE		ESTIMATED ONE-TIME COSTS*					ESTIMATED ANNUAL COSTS*			
		TIMELINE	PARTNER	TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED	STAFF TIME (FTE)	TOTAL ANNUAL COSTS	FUNDING IN PLACE NOW	FUNDING NEEDED

FN1	Use model and BMP cost information to refine TMDL implementation plan and develop more cost-effective subwatershed-specific strategies to achieve target reductions, including necessary regulatory actions.	2016-2017	PEP, PEPC, other stakeholders	\$200,000	\$0	\$200,000	0.20	\$25,000	0	\$25,000
FN2	Identify projects from the updated Ag Stewardship plan that support PEP objectives and seek funding to implement them	2015 – 2017	Ag Stewardship Committee ¹	\$3,000,000	\$300,000	\$2,700,000	0.05	\$6,250	0	\$6,250
FN3	Identify projects from the Suffolk County Wastewater Plan that support PEP objectives and seek funding to implement them	2015 – 2017	PEP, SC, PEPC, NYS DEC	\$100,000,000	\$1,000,000	\$99,000,000	0.10	\$12,500	0	\$12,500

HARMFUL ALGAL BLOOM (HAB) MANAGEMENT

Background: Harmful algal blooms (HABs) have plagued the Peconic Estuary since at least the mid 1980's, and the brown tide that occurred then was a main impetus for the creation of the Peconic Estuary Program. Although brown tides are no longer dominant, the Peconic Estuary experiences numerous other HABs annually. Because of the public health threat from HABs, the Suffolk County Department of Health Services is leading an effort to revisit the issue and develop a county-wide HAB research, monitoring and management plan. The PEP will be heavily involved in this process to review the state of the science on the issue and chart the course forward. This plan will form the basis for PEP's actions on HABs going forward. These might include things such as enhanced monitoring, research on climate impacts and shellfish interactions, and bio-physical models to quantify causal factors. In the short term, PEP is focused on implementing the nitrogen TMDL, since nitrogen is a known contributing factor to HAB prevalence. And through the TAC and support of the HAB Action Plan project, PEP hopes to foster the collection of information about other potential causes with the long-term goal of developing quantitative links that can form the basis for adaptive management of HABs.

GOAL: Eliminate harmful and nuisance algal blooms that limit water bodies' best uses.

OBJECTIVES:

- (1) Monitor HABs and potential causal factors for HABs
- (2) Use information correlating bloom frequency and magnitude with environmental factors to help focus implementation of actions and use information on quantitative links to develop management strategies to reduce or eliminate blooms; ;
- (3) Establish quantitative links between nitrogen and HABs to assist in modeling nitrogen impacts to contribute to the development of alternative endpoints for nitrogen.
- (4) Manage the impacts of HABs to protect public health and the environment

HARMFUL ALGAL BLOOMS (HABs): ACTIONS NOW		ESTIMATED ONE-TIME COSTS*					ESTIMATED ANNUAL COSTS			
		TIMELINE	PARTNER	TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED*	STAFF TIME (FTE)	TOTAL ANNUAL COSTS	FUNDING IN PLACE NOW	FUNDING NEEDED*
HAB1	Participate in HAB Action Plan project which will assess the state of knowledge & create HAB Monitoring, Research, and Management Plan. Ensure that the plan incorporates actions necessary to restore the Peconic Estuary	2015-2016	SC, NYSG, NYS DEC	\$100,000	\$100,000	\$0	0.05	\$6,250	\$6,250	\$0
TOTAL				\$100,000	\$100,000	\$0	0.05	\$6,250	\$6,250	\$0

HARMFUL ALGAL BLOOMS (HABs): ACTIONS FOR THE FUTURE		ESTIMATED ONE-TIME COSTS*				ESTIMATED ANNUAL COSTS*				
		TIMELINE	PARTNER	TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED	STAFF TIME (FTE)	TOTAL ANNUAL COSTS	FUNDING IN PLACE NOW	FUNDING NEEDED
FHAB1	The HAB action plan will dictate future actions	TBD	SC, NYSG, NYS DEC	TBD	TBD	TBD	TBD	TBD	TBD	TBD

***Future costs not intended to reflect funding for full remediation of the environment. Where feasible, we have included first order estimates of initial investments needed.**

PATHOGEN MANAGEMENT

Background: Contamination by bacteria and other pathogenic organisms may make shellfish unsafe to eat, and may result in closure of shellfish beds in the Peconic Estuary. High levels of pathogens may also make water unsafe for swimming, however, beach closures are not currently widespread throughout the Estuary. Shellfishing is a major economic and cultural activity on the East End, and tourism and recreation are dependent on having waters safe for bathing. Estuary-wide, stormwater runoff is likely the most important source of pathogen contamination, but other sources include wildlife and waterfowl, and nearshore onsite wastewater treatment. Recognizing impairments to water quality from pathogens, a TMDL (<http://www.peconicestuary.org/reports/9db5cfb5419c39240883f007c08997d02a886897.pdf>) for pathogens was approved in 2006 that addresses loads in 20 waterbodies. The pathogen load reduction required to attain water quality standards varies from 10%-90% among the 20 waterbodies addressed in the Peconic Estuary Pathogen TMDL. PEP has been working to establish subwatershed management plans to address the pathogen loads to pathogen impaired waterbodies, and to date has created 12 subwatershed management plans. Rigorous monitoring is required to assess whether shellfish are safe to eat, and thus whether shellfish beds can be reopened for harvesting.

GOAL:
Use improved pathogen loading information to implement the Peconic Estuary Pathogen TMDL to attain water quality standards and reopen waters seasonally certified or closed to shellfish harvesting.

- OBJECTIVES:**
- (1) Implement the 12 existing subwatershed management plans and develop a monitoring program to assess their effectiveness, with a focus on areas that may be able to be opened to shellfishing.
 - (2) Review pathogen load information on which the TMDL is based, and use new information to develop additional subwatershed management plans and revise existing plans as necessary.
 - (3) Develop a citizen monitoring QAPP and associated comprehensive pathogen monitoring plan to inform management activities including pathogen load reduction and shellfish bed certification

PATHOGENS: ACTIONS NOW		ESTIMATED ONE-TIME COSTS*				ESTIMATED ANNUAL COSTS			
		TIMELINE	PARTNER	TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED*	STAFF TIME (FTE)	TOTAL ANNUAL COSTS	FUNDING IN PLACE NOW

P1	Develop a workplan and QAPP for a pathogen monitoring program, focused on priority areas, to assess baseline water quality and evaluate the effectiveness of subwatershed management plan implementation, consistent with appropriate regulations.	2016	PEP, NYS DEC, SC, PEPC	\$50,000	\$50,000	\$0	0.05	\$6,250	\$6,250	\$0
P2	Use available monitoring and develop additional monitoring programs to further identify areas and focus management actions to reduce pathogen loads and to provide valuable information to the NYS DEC shellfish certification and 303(d) impaired waters programs.	2016 - 2017	PEP, NYS DEC, PEPC, SC	\$100,000	\$0	\$100,000	0.05	\$6,250	\$0	\$0
P3	Fully implement at least one subwatershed management plan, including and effectiveness monitoring.	2020	PEP, NYS DEC, PEPC, SC, local governments	\$250,000	\$120,000	\$130,000	0.05	\$6,250	\$6,250	\$0
P4	Review and report on implementation status of existing subwatershed management plans. Gather information from local governments.	2016	PEP in consultation with PEPC and municipalities	\$50,000	\$0	\$50,000	0.05	\$6,250	\$6,250	\$0

P5	Participate in NYSDEC "Long Island Embayment Study" to better define pathogen sources on a subwatershed basis.	2016-2018	NYS DEC	\$350,000	\$350,000	\$0	0.05	\$6,250	\$6,250	\$0
TOTAL				\$800,000	\$520,000	\$280,000	0.25	\$31,250	\$25,000	\$0
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PATHOGENS: ACTIONS FOR THE FUTURE				ESTIMATED ONE-TIME COSTS*			ESTIMATED ANNUAL COSTS*			
		TIMELINE	PARTNER	TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED	STAFF TIME (FTE)	TOTAL ANNUAL COSTS	FUNDING IN PLACE NOW	FUNDING NEEDED
FP1	Use results of NYSDEC Long Island Pathogen Embayment Study to determine if subwatershed management plans need to be revised, and create new plans.	2017-2020	PEPC	\$500,000	\$0	\$500,000	0.10	\$12,500	\$0	\$12,500
FP2	Use NYSDEC Long Island Pathogen Embayment study to prioritize & implement projects identified in existing subwatershed management plans.	2017-2020	PEP, PEPC	\$3,750,000	\$0	\$3,750,000	0.10	\$12,500	\$0	\$12,500
FP3	Work with DEC to develop revisions to Peconic Estuary Pathogen TMDL as necessary.	2020-2022	NYS DEC	\$0	\$0	\$0	0.20	\$25,000	\$0	\$25,000
FP4	Widely implement pathogen monitoring program developed above (P1).	2018 - 2023	PEP, PEPC, NYS DEC, SC	TBD	TBD	TBD	0.10	TBD	TBD	TBD

FP5	Provide guidance to local governments who are seeking to increase local laboratory capacity (including staffing) with appropriate certification for shellfish sanitation and staffing for decision making.	2018-2020	PEPC, NYS DEC	TBD	TBD	TBD	TBD	TBD	TBD	TBD
FP6	Audit efficacy of subwatershed management plan implementation in reducing pathogens.	2020	PEP Stormwater Workgroup, PEPC	\$50,000	\$0	\$50,000	0.05	\$6,250	\$0	\$6,250
FP7	Adapt pathogen reduction strategy based on results of the above actions, and implement it.	2018 - 2023	PEP Stormwater Workgroup,	\$3,750,000	\$0	TBD	TBD	TBD	TBD	TBD

HABITAT RESTORATION:

Background:

The Peconic Estuary watershed contains a large variety of natural communities, from upland pine barrens along the Peconic River to soft-bottom benthos in the main bays. Habitat loss, fragmentation and degradation are frequently the result of the alteration of the natural landscape from factors such as development, pollution and climate change. Though all living resources and habitats are of importance, current priorities for the Peconic Estuary Program include critical areas that support submerged aquatic vegetation, tidal wetlands and diadromous fish habitat within riverine ecosystems.

GOAL:

Protect and restore priority habitats, taking into account sea level rise and climate change.

OBJECTIVES:

- (1) Complete implementation of ongoing projects, such as wetland restoration and fish passage, in the PEP Habitat Restoration Plan (HRP);
- (2) Strategically update the HRP considering new information to provide guidance and action steps for implementation including monitoring;
- (3) Monitor the effectiveness of past PEP implementation projects and use to inform further plan updates;
- (4) Develop plans for management of seagrass working with the NY Seagrass Coordinator;
- (5) Support the development of water quality criteria for estuarine waters based on seagrass populations.

HABITAT RESTORATION: ACTIONS NOW				ESTIMATED ONE-TIME COSTS			ESTIMATED ANNUAL COSTS			
		TIMELINE	PARTNER	TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED	STAFF TIME (FTE)	TOTAL ANNUAL COSTS	IN PLACE	NEEDED
HR1	Issue 2015 updated Habitat Restoration Plan that includes strategic focus for restoration projects based on new municipal priorities, consideration of sea level rise, the 2015 Long Island Tidal Wetland Trends Analysis and the 2014 Long Island Sound Study Tidal Wetland Loss Workshop	2016	PEP State Coordinator, PEP Natural Resources Subcommittee, NYS DEC Seagrass Coordinator	\$0	\$0	\$0	0.15	\$18,750	\$18,750	\$0
HR2	Determine the causal factors of seagrass decline through development of bio-optical and temperature tolerance model.	2015-2016	PEP	\$80,000	\$80,000	\$0	0.05	\$6,250	\$6,250	\$0
HR3	Use aerial seagrass survey, long-term monitoring, and bio-optical modeling project results to determine current status and restoration potential of seagrass.	2015	Natural Resources Subcommittee, NYS DEC Seagrass Coordinator, SoMAS, CCE	\$0	\$0	\$0	0.05	\$6,250	\$6,250	\$0

HR4	Continue support for the development and construction of fish passage on the Peconic River (Woodhull, Upper Mills, Forge Road and Edwards Ave)	2015-onward	PEP, NYS DEC, Riverhead, Southampton, Brookhaven, LIPA/PSEGLI, and SC Parks	\$1,800,000	\$500,000	\$1,300,000	0.10	\$12,500	\$12,500	\$0
HR5	Work with NYSDEC to conduct feasibility study to identify potential living shorelines pilot projects for future construction and to develop monitoring protocols.	2015-2017	PEP and NYS DEC	\$150,000	\$0	\$150,000	0.05	\$6,250	\$0	\$6,250
HR6	Use information from the 2015 Tidal Wetland Trends Analysis to prioritize wetland restoration projects.	2015	PEP, NYS DEC, municipalities	\$0	\$0	\$0	0.05	\$6,250	\$0	\$6,250
HR7	Conduct feasibility, design, and construction of priority wetland restoration projects.	2016-2020	PEP, NYS DEC, municipalities	\$1,000,000	\$0	\$1,000,000	0.10	\$12,500	\$0	\$12,500
HR8	Update the Critical Lands Protection Strategy	2015 onward	PEP Climate Change Workgroup	\$30,000	\$30,000	\$30,000	0.10	\$12,500	\$12,500	\$0
HR9	Advocate for habitat protection and restoration within the Peconic Estuary; collaborate with partners who seek funding for such restoration	ongoing	NYS DEC Coordinator, PEP Director, NRSC	\$0	\$0	\$0	0.5	\$62,500	\$62,500	\$0

TOTAL				\$3,060,000	\$610,000	\$2,480,000	1.15	\$143,750	\$118,750	\$25,000
*Future costs not intended to reflect funding for full remediation of the environment. Where feasible, we have included first order estimates of initial investments needed.										
HABITAT RESTORATION: ACTIONS FOR THE FUTURE		ESTIMATED ONE-TIME COSTS*					ESTIMATED ANNUAL COSTS*			
		TIMELINE	PARTNER	TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED	STAFF TIME (FTE)	TOTAL ANNUAL COSTS	FUNDING IN PLACE NOW	FUNDING NEEDED
FHR1	Construct Ecosystem-based model (e.g. ecoHAB or EcoSim) of Peconic Estuary to facilitate better understanding of system-wide dynamics and impacts of pollution and other stressors on the entire ecosystem	2017-2020	NRSC, Researchers	\$100,000.00	\$0.00	\$100,000.00	0.05	\$6,250.00	\$0.00	\$6,250.00
FHR2	Review Critical Natural Resource Areas and significant habitats identified in the CCMP and update priorities based on new information and partnerships	2015-2020	NRSC, NYS DEC	\$0.00	\$0.00	\$0.00	0.05	\$6,250.00	\$0.00	\$6,250.00

CLIMATE CHANGE ADAPTATION

Background:

Climate change has the potential to impact implementation of the Peconic Estuary CCMP. Conservative projections for the Long Island region include air temperature increases ranging from 3°F to 5°F by 2050, along with greater temperature variability, increased seasonality, and higher frequency of extreme temperature events. While increases in annual precipitation are expected to be relatively minor, the amount of precipitation falling as part of an “extreme” precipitation event and the frequency of such events is expected to increase, as is the frequency of drought. Ocean temperatures in our region are expected to rise between 4°F and 8°F over the next century. Locally, sea level is expected to increase from 2 to 5 inches by the 2020s, and 7 to 12 inches by the 2050s. As sea level increases, the PEP expects an increase in demand for hardened shorelines. Construction of living shorelines is an environmentally beneficial alternative that may also have positive impacts on habitat. PEP must consider the impacts of climate change in all aspects of CCMP implementation. The actions below provide the information and framework necessary to do that.

GOAL:

Ensure Climate Change is considered in all PEP decision making, including the prioritization of projects and selection of sites for restoration, construction, and acquisition.

OBJECTIVES:

- (1) Provide tools to local governments and other stakeholders to mitigate and adapt to the impacts of climate change on the Peconic Estuary
- (2) Ensure climate change is considered in PEP projects
- (3) Contribute to educate of stakeholders about the impacts of climate change on estuary resources

CLIMATE CHANGE ADAPTATION: ACTIONS NOW				ESTIMATED ONE-TIME COSTS			ESTIMATED ANNUAL COSTS			
		TIMELINE	PARTNER	TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED	STAFF TIME (FTE)	TOTAL ANNUAL COSTS	IN PLACE	NEEDED
CC1	Complete Climate Vulnerability Assessment	2015-2016	PEP Climate Change Workgroup	\$35,000	\$35,000	\$0	0.1	\$12,500	\$12,500	\$0

CC2	Develop a climate change adaptation and implementation plan that includes considerations for vulnerable communities and emphasizes solutions that are environmentally sustainable and protective of estuarine resources. Hold public meetings to involve stakeholders in the development of the plan.	by 2018	PEP Climate Change Workgroup, PEP Education and Outreach contractor	\$200,000	\$0	\$200,000	0.1	\$12,500	\$0	\$12,500
CC3	Work with local governments & NYS DEC to propose new policies to protect and promote living shorelines	by 2017	PEP, NYS DEC, municipalities	\$0	\$0	\$0	0.05	\$6,250	\$0	\$6,250
TOTAL				\$235,000	\$35,000	\$200,000	0.25	\$31,250	\$12,500	\$18,750
*Future costs not intended to reflect funding for full remediation of the environment. Where feasible, we have included first order estimates of initial investments needed.										
CLIMATE CHANGE ADAPTATION: ACTIONS FOR THE FUTURE				ESTIMATED ONE-TIME COSTS*			ESTIMATED ANNUAL COSTS*			
		TIMELINE	PARTNER	TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED	STAFF TIME (FTE)	TOTAL ANNUAL COSTS	FUNDING IN PLACE NOW	FUNDING NEEDED
FCC1	Provide technical assistance and funds to implement living shoreline projects identified in the NYSDEC living shorelines assessment (HR5).	starting 2016	PEP	\$150,000	\$0	\$150,000	0.05	\$6,250	\$0	\$6,250

FCC2	Implement actions identified in the Climate Change Adaptation Plan	starting 2018	PEP, NYS DEC, municipalities	TBD	TBD	TBD	TBD	TBD	TBD	TBD
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EDUCATION & OUTREACH

Background:

Citizen involvement has been a critical component of the PEP since its inception. The Program formed a Citizens Advisory Committee (CAC) to ensure broad-based public participation in the development of the CCMP. Educating and involving the public and obtaining public support is vital to the success of the PEP. Effective public participation provides the broad-based public support needed to ensure that actions are implemented. The ultimate goal of public participation in the PEP is to establish a public consensus that will ensure long-term support for the implementation of the CCMP. While developing this consensus among individuals and key segments of the public, an understanding of individual and collective roles in watershed protection can be established, making that constituency dedicated to caring for the Peconic Estuary System. The Public Participation Strategy outlined in the CCMP stresses the need to continue to bring together the stakeholders in the watershed, participate in decision-making affecting the estuary, encourage participation in programs to protect, enhance and restore the estuary and its watershed, and conduct education and outreach efforts on priority topics. PEP will be revising its CCMP in 2016-2018 and a strong stakeholder outreach process is integral to this effort.

GOAL:

Build public understanding and support for estuary protection and restoration to achieve results.

OBJECTIVES:

- (1) Improve understanding of human impacts on estuary and value of estuary to humans;
- (2) Promote action-oriented stewardship of estuary resources;
- (3) Increase awareness of estuary as important resource;
- (4) Enhance cooperation among stakeholders, including common messaging on water quality;
- (5) Engender support for CCMP revision and implementation.

EDUCATION & OUTREACH: ACTIONS NOW	TIMELINE	PARTNER	ESTIMATED ONE-TIME COSTS			ESTIMATED ANNUAL COSTS			
			TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED	STAFF TIME (FTE)	TOTAL ANNUAL COSTS	IN PLACE	NEEDED

EO1	Annually support a public education and outreach workplan to achieve PEP's strategic priorities and support CCMP revision	ongoing	PEP, NEIWPC, Education and Outreach contractor	\$0	\$0	\$0	0.20	\$25,000 PEP staff	\$125,000	\$0
								\$100,000 Contract		
EO2	Bring together the CAC and other NGOs in a communications workgroup to develop common strategic messaging and a plan to disseminate it	2016	CAC, PEP Education and Outreach contractor, Marketing consultant	\$0.00	\$0.00	\$0.00	0.10	\$12,500	\$0.00	\$12,500.00
								Part of EO1		
EO3	Rebuild CAC membership and recruit a broad range of stakeholders	2015-2016	CAC, PEP Education and Outreach contractor	\$0.00	\$0.00	\$0.00	0.05	\$6,250	\$0.00	\$6,250.00
EO4	Advocate and raise awareness about the estuarine ecosystem and its restoration	ongoing	PEP Director and State Coordinator	\$0.00	\$0.00	\$0.00	0.50	\$62,500	\$62,500.00	\$0.00
EO5	Build and maintain partnerships with citizens organizations and stakeholder groups	ongoing	PEP Director and State Coordinator	\$0.00	\$0.00	\$0.00	0.15	\$18,750	\$18,750.00	\$0.00
TOTAL				\$0	\$0	\$0	1.00	\$225,000	\$206,250	\$18,750
*Future costs not intended to reflect funding for full remediation of the environment. Where feasible, we have included first order estimates of initial investments needed.										
EDUCATION & OUTREACH: ACTIONS FOR THE FUTURE			ESTIMATED ONE-TIME COSTS*				ESTIMATED ANNUAL COSTS*			
			TIMELINE	PARTNER	TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED	STAFF TIME (FTE)	TOTAL ANNUAL COSTS	FUNDING IN PLACE NOW

FEO1	Implement portion of communications plan, through a variety of media, on water quality with a focus on nitrogen	2017-2020	CAC, communications workgroup	\$50,000	\$0	\$50,000	0.10	\$12,500	\$0	\$12,500
TOTAL				\$50,000	\$0	\$50,000	0.10	\$12,500	\$0	\$12,500

MONITORING

Background:

The Peconic Estuary Program has a robust monitoring program that assesses a range of critical indicators throughout the Estuary. Monitoring is currently conducted for water quality parameters, seagrass health and extent, and atmospheric deposition. Monitoring and data collection are also conducted through various projects occurring in the estuary. The goal of the PEP's monitoring program is to both determine the status of the estuary in order to inform management decisions, but also to assess the response of the estuary to management actions and identify emerging threats. Monitoring information must be regularly analyzed and synthesized into reports that inform critical resource management decisions, not simply chronicle status of estuarine resources.

GOAL:

Use information about the status of and trends in health of the estuary to adjust implementation strategies to reduce pollution and manage estuary resources based on adaptive management principles.

OBJECTIVES:

- (1) Evaluate and recommend appropriate indicators of estuarine health to assess the impact of management actions to restore the estuary.
- (2) Use available data on the indicators to regularly report on the state of the estuary.
- (3) Recommend where additional or alternative indicators and monitoring may be required to comprehensively assess the state of the estuary and progress of CCMP implementation.
- (4) Develop methods and mechanisms to share data among academia, nonprofit organizations and government.

MONITORING: ACTIONS NOW	TIMELINE	PARTNER	ESTIMATED ONE-TIME COSTS			ESTIMATED ANNUAL COSTS				
			TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED	STAFF TIME (FTE)	TOTAL ANNUAL COSTS	IN PLACE	NEEDED	
M1	Publish a technical report – the “Environmental Indicators Report”-, including indicators for which currently available data are sufficient.	2015	Environmental Indicators Workgroup	\$12,500	\$12,500	\$0	0.1	\$12,500	\$12,500	\$0

M2	Publish State of the Estuary Report based on Environmental Indicators Report	2016	Environmental Indicators Workgroup, CAC	\$30,000	\$5,000	\$25,000	0.1	\$12,500	\$0	\$12,500
M3	Reach out to partners participating in data collection activities, and hold a workshop to discuss cooperative monitoring and data sharing for the estuary.	2016	PEP, NYS DEC, researcher, non-profits, USGS	\$30,000	\$0	\$30,000	0.1	\$12,500	\$0	\$12,500
M4	Create deliverables for monitoring products that summarize and present data for key PEP indicators on an annual basis.	2015 onward	PEP, SCDHS, USGS	\$0	\$0	\$0	0.05	\$6,250	\$0	\$6,250
M5	Conduct Seagrass Long-Term Monitoring Program in 2015 and develop recommendations for future seagrass monitoring.	2015	PEP TAC, CCE	\$30,000	\$30,000	\$0	0.05	\$6,250	\$0	\$6,250
M6	Develop a comprehensive monitoring program for HABs and related environmental factors in waters of the Peconic Estuary with a focus on Alexandrium, Dinophysis, Cochlodinium, and Ulva in marine waters and cyanobacteria in freshwaters.	2016-2017	PEP TAC	\$25,000	\$0	\$25,000	0.05	\$6,250	\$0	\$6,250
M7	Support Suffolk County's Water Quality Monitoring Program to provide data on the health of the estuary	2016-2017	PEP TAC, SCDHS	\$0	\$0	\$0	0.05	\$6,250 PEP staff	\$201,250	\$0
								\$195,000 SC staff		

M8	Support USGS Continuous Monitoring Program to provide data on the health of the estuary	2016-2017	PEP TAC, NYS DEC, USGS	\$0	\$0	\$0	0.05	\$6,250 PEP staff	\$141,250	\$0
								\$135,000 USGS		
M9	Supplement Pathogen monitoring QAPP (action P1) to include other water quality parameters of interest to local partners	2016	PEPC, NYS DEC	\$25,000	\$25,000	\$0	0.05	\$6,250	\$6,250	\$0
TOTAL				\$152,500	\$72,500	\$80,000	0.60	\$405,000	\$361,250	\$43,750
*Future costs not intended to reflect funding for full remediation of the environment. Where feasible, we have included first order estimates of initial investments needed.										
MONITORING: ACTIONS FOR THE FUTURE				ESTIMATED ONE-TIME COSTS*			ESTIMATED ANNUAL COSTS*			
		TIMELINE	PARTNER	TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED	STAFF TIME (FTE)	TOTAL ANNUAL COSTS	FUNDING IN PLACE NOW	FUNDING NEEDED
FM1	Revise PEP monitoring strategy: 1. Evaluate existing environmental indicators. 2. Consider adding indicators 3. Develop endpoints and goals or targets for all indicators.	2017 and 2018	Environmental Indicators Workgroup	\$50,000	\$0	\$50,000	TBD	TBD	TBD	TBD
FM2	Adjust monitoring programs to reflect new monitoring strategy and ensure adequate data is being collected and analyzed.	2016	PEP staff & Environmental Indicators workgroup	TBD	TBD	TBD	TBD	TBD	TBD	TBD

FM3	Establish agreement(s) for sharing environmental data, in particular HABs, and make it available publically in an analyzed format	2017-2020	University Researchers, NYS DEC, USGS, SC, others	TBD	TBD	TBD	TBD	TBD	TBD	TBD
FM4	Report again in 2020 on Environmental Indicators. Publish State of the Estuary report in 2021	2020 – 2021	Environmental Indicators Workgroup, CAC	\$40,000	\$0	\$40,000	TBD	TBD	TBD	TBD
FM5	Conduct seagrass surveys per recommendations in M5 above.	2016 on	PEP TAC	TBD	TBD	TBD	TBD	TBD	TBD	TBD
FM6	SC monitoring	2018 onward	SCDHS	0	0	0	0.05	\$6,250 PEP staff	\$76,250.00	\$125,000.00
								\$195,000 SC staff		
FM7	USGS	2018 onward	USGS, NYS DEC	0	0	0	0.05	\$6,250 PEP staff	\$6,250.00	\$135,000.00
								\$135,000 USGS		

PROGRAM MANAGEMENT AND FINANCING

Background:

PEP has recognized the need for stable, long-term, dedicated financing to implement restoration of the Estuary. In the short term PEP has also recognized the need to augment its capacity to complete the actions defined in this plan. The current financing section is geared toward short-term actions to develop longer-term strategies and financing plans that will be incorporated into the updated CCMP. Throughout this plan, we have identified where we must apply our existing resources, which include roughly 4 FTE at an average of \$125,000 each. Contributions by Suffolk County and New York State are essential to the maintenance of base program functions. The shaded area below computes the financial and staff resources required to implement the short term actions listed in this plan, which far surpass the current available resources.

GOALS:

Develop stable, long-term funding for CCMP implementation and program operations.

OBJECTIVES:

- (1) Identify sustainable source of funding for wastewater treatment upgrades.
- (2) Promote PEP as source of information and stakeholder involvement in regional decision-making
- (3) Report on updated management strategies every five years hence using the best available data and information.

MANAGEMENT AND FINANCING: ACTIONS NOW		TIMELINE		ESTIMATED ONE-TIME COSTS			ESTIMATED ANNUAL COSTS			
				TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED	STAFF TIME (FTE)	TOTAL ANNUAL COSTS	IN PLACE	NEEDED
PMF1	Support 1 FTE for existing Program Director	ongoing	PEP, SC	\$0	\$0	\$0	^^	\$135,000^^	\$135,000^^	\$0
PMF2	Support 1 FTE for State Coordinator	ongoing	PEP, NEIWPCC & NYS DEC	\$0	\$0	\$0	^^	\$115,000^^	\$115,000^^	\$0
PMF3	Support 1 FTE for existing Program Coordinator	ongoing	PEP, NEIWPCC, & SC	\$130,000	\$130,000	\$0	^^	\$100,000^^	\$100,000^^	\$0

PMF4	USEPA Program Coordinator (1FTE provided by US EPA)	ongoing	EPA	\$0	\$0	\$0	^^	\$135,000^^	\$135,000^^	\$0
PMF5	Support 0.1 FT NEIWPCC Program Coordinator	ongoing	NEIWPCC	\$0	\$0	\$0	^^	\$10,000^^	\$10,000^^	\$0
PMF6	Provide additional resources to assist PEP in implementing the Action Plan.	2016 - 2017	SC	\$0	\$0	\$0	^^	\$125,000^^	\$125,000^^	\$0
PMF7	Provide additional resources to assist PEP in implementing the Action Plan.	2016-2017	NYS DEC	\$0	\$0	\$0	^^	\$125,000^^	\$125,000^^	\$0
PMF8	Revise CCMP to reflect new information and current priorities~	2016-2018	All	\$200,000	\$200,000~	\$0	2.00	\$250,000	\$0	\$250,000
PMF9	Foster a continuing conversation with local governments to understand mutual priorities and needs, and ensure appropriate mechanisms are in place for their involvement in PEP	2015	PEP	\$0	\$0	\$0	0.10	\$12,500	\$12,500	\$0
PMF10	Work with partners to develop long term funding mechanisms as appropriate.	2015	PEP, SC, NYS DEC, PEPC	\$0	\$0	\$0	0.10	\$12,500	\$12,500	\$0
PMF11	Administer PEP (e.g. grants admin, contracts management, applying for funding, participate in NEP), reporting	ongoing	EPA, PEP, SC, NEIWPCC	\$0	\$0	\$0	0.75	\$93,750	\$93,750	\$0

PMF12	Implement PEP Goals and CCMP actions within Federal, State and County Government	ongoing	US EPA, NYS DEC, SC	\$0	\$0	\$0	0.15	\$18,750	\$18,750	\$0
PMF13	Seek outside grant funding	ongoing	PEP	0	\$0	\$0	0.50	\$62,500	\$6,250	\$56,250
TOTAL				\$330,000.00	\$330,000.00	\$0.00	3.60	\$450,000.00	\$143,750.00	\$306,250.00
~ PEP recommendation for use of 2015-2016 NYS Budget Line Item for protection of the Peconic Estuary										

RESOURCE NEEDS SUMMARY									
The short term actions listed in the plan above require a total of \$5.7M in one-time costs plus an additional \$1.4M annually, including 7.35 FTE staff support. Of these total amounts, only \$1.7M in one time funding and \$930,000 annually is available, including 4 FTE staff support. Approximately \$5.5M additional dollars would be needed to implement this short term action plan during the next three years.									
SHORT TERM ACTION TOTAL			ESTIMATED ONE-TIME COSTS			ESTIMATED ANNUAL COSTS			
	TIMELINE	PARTNER	TOTAL ONE-TIME COST	FUNDING IN PLACE NOW	FUNDING NEEDED	STAFF TIME (FTE)^	TOTAL ANNUAL COSTS	IN PLACE	NEEDED
			\$5,777,500	\$1,722,500	\$4,085,000	7.35	\$1,423,750	\$930,000	\$487,500
^^Note: total staff time calculated from actions, not existing staff resources									

¹Acronyms:

Agricultural (Ag) Stewardship Plan Writing Committee consists of: NYS DEC; SCDEDP; SCDHS; PEP; CCE; SWCD; NRCS; Long Island Farm Bureau; SCWA; Individual Agricultural Producers

BMP- Best Management Practice

CAC- Citizens Advisory Council

CCE - Cornell Cooperative Extension of Suffolk County

CCMP- Comprehensive Conservation and Management Plan

FTE- Full-time Equivalent

HAB- Harmful Algal Bloom

LIPA/ PSEG LI- Long Island Power Authority/ Public Service Enterprise Group Long Island

LISS- Long Island Sound Study

NEIWPC- New England Interstate Water Pollution Control Commission

NRCS - Natural Resources Conservation Service

NYS DEC - New York State Department of Environmental Conservation

NYSG- New York Sea Grant

PEPC - Peconic Estuary Protection Committee - the entity created by the Inter-municipal Agreement (IMA)

PEP - Peconic Estuary Program

PEP TAC- Peconic Estuary Program Technical Advisory Committee

QAPP- Quality Assurance Project Plan

RFP- Request for Proposals

SC - Suffolk County

SCDEDP - Suffolk County Departments of Economic Development and Planning

SCDHS – Suffolk County Department of Health Services

SCWA - Suffolk County Water Authority and other water suppliers

SoMAS- School of Marine and Atmospheric Sciences (Stony Brook University)

SSER- South Shore Estuary Reserve

SWCD - Suffolk County Soil and Water Conservation District

TMDL- Total Maximum Daily Load

USEPA- United States Environmental Protection Agency

USGS- United States Geological Survey
