

2ND ANNUAL CAPE COASTAL CONFERENCE

JUNE 5-6, 2014

**STATE OF THE CAPE:
IMPLEMENTING STRATEGIES TO IMPROVE
WATER QUALITY & BUILD COASTAL
RESILIENCE**

BOOK OF ABSTRACTS

CONFERENCE PLANNING TEAM

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Waquoit Bay National Estuarine Research Reserve

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Provincetown Center for Coastal Studies

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Jo Ann Muramoto, Mass Bays Program Regional Coordinator
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Brian Dudley, Environmental Engineer
Massachusetts Department of Environmental Protection

Steve McKenna, Cape and Islands Regional Coordinator
Massachusetts Office of Coastal Zone Management

Judith Underwood, Renewable Energy Special Projects Coordinator, Environmental Technology Program
Cape Cod Community College

Day 1 - Thursday, June 5, 2014

Keynote Address

Getting to Clean Water – An Imperative for a Sustainable and Vibrant Economy

Dorothy A. Savarese, President & Chief Executive Officer, The Cape Cod Five Cents Savings Bank

Session 1: Wastewater and Watersheds: Shaping the Way Forward

The Cape Cod Approach: Solving Our Biggest Environmental Problem

Paul Niedzwiecki, Executive Director, Cape Cod Commission

The Cape Cod Commission was directed to complete an update to the 1978 Section 208 Plan under the Clean Water Act. This included both watershed-based technical review and stakeholder engagement around new and innovative solutions to meeting water quality goals. The outcomes of that process, as well as new tools and resources for communities to use in identifying appropriate local solutions, will be discussed.

An Integrated Nutrient Management Approach for Cape Cod - Applying Non-Traditional Technologies (Green Infrastructure)

Scott Horsley, Principal, Horsley Witten Group and Area Leader for the Cape Cod 208 Planning Process

Mr. Horsley will provide an overview of the non-traditional technologies being explored in the 1978 Section 208 Plan under the Clean Water Act update and discussion of the watershed planning approach and the proposed adaptive management framework.

Reaching Watershed Nitrogen Removal Targets: How Far Can Innovative and Alternative Onsite Septic Systems Get Us & Research on a New Non-Proprietary System That Could be a Game Changer

George Heufelder, Director, Barnstable County Department of Health and the Environment

Mr. Heufelder will discuss alternative onsite septic systems and how they might be applied in areas subject to nutrient load limitations. He will also discuss a new project investigating non-proprietary septic system designs from publically-funded projects in other parts of the country. The project is being funded by the Cape Cod Commission under the 208 Project and the Clean Water Act Section 319(b) Competitive Grant Program.

Session 2: Regulatory Considerations for Watershed Plans and Alternative Nitrogen Remediation Approaches

Streamlining Regulatory Review for Targeted Watershed Management Plans

Kristy Senatori, Deputy Director, Cape Cod Commission

The existing regulatory review process for wastewater management plans is imperfect and outdated. The proposed MEPA/CCC Special Review Procedure accommodates for expedited watershed planning and permitting across the region pursuant to the Section 208 Plan Update will be discussed.

Update on State Regulatory Guidance for Alternative Nitrogen Remediation Approaches

Vandana Rao, Assistant Director for Water Policy, Executive Office of Energy and Environmental Affairs

Ms. Rao will talk about a guidance document that is currently being developed by the state for proponents of non-traditional nitrogen attenuation strategies. This guidance is an interagency effort that includes EEA, DEP, and DFG. She will talk about the Commonwealth's approach to nitrogen removal, the steps that project proponents should take when developing these types of strategies, the pathway to permitting, and a brief discussion of a few of the strategies.

Session 3: Collaboration! A Big Part of the Solution : Models of Municipal Cooperation for Watershed-Based Management

Effecting Successful Inter-Municipal Collaboration

Kristy Senatori, Deputy Director, Cape Cod Commission

Models for intermunicipal collaboration in shared watersheds and their potential applicability to Cape Cod watersheds through the Section 208 Plan Update will be examined.

A Legacy Inter-Municipal Agreement for Bourne and Wareham and Lessons Learned

Thomas Guerino, Town Administrator, Town of Bourne

The Town of Bourne has been involved with an IMA with the Town of Wareham since around 1991. This is as a result of the DEQU (at the time) and EPA requiring the Town to transport wastewater to the Wareham plant as opposed to constructing its own WW facility. The discussion will focus on the need to be vigilant on keeping dialogue open and adjusting the agreement as times and needs change for both communities. Local financial and political considerations need to be monitored to assure the letter and spirit of such agreements is adhered to during difficult times.

The Orleans Brewster Eastham Groundwater Protection District: A Local Case Study for Inter-Municipal Cooperation, Sims McGrath, Selectman, Town of Orleans

Mr. McGrath will discuss the tri-town Inter-Municipal Agreement (IMA) including its formation, administration, lessons learned about implementation of the IMA, and facility issues as they relate to the management of the district through the IMA.

Legal Considerations for Inter-Municipal Agreements

John Giorgio, Esq., Kopelman and Paige

The presentation will include: tips on the successful negotiation of intermunicipal agreements for wastewater treatment and disposal services from the perspective of both the sending and the receiving community, creating special purpose regional entities through existing legislation and special legislation to address regional wastewater needs, and available tools to conduct joint purchasing and procurement for planning, engineering, legal, and financial services.

Session 4: Protecting Ponds and Minimizing Fertilizer Impact

Preserving Local Control and Lower Cost Options for Nutrient Management: Cape Cod Fertilizer Management District of Critical Planning Concern

Jon Idman, Chief Regulatory Office, Cape Cod Commission

Discussion about the adoption of the County-wide Fertilizer Management DCPC designation; development of the Commission's model turf management regulations/ by-law pursuant to the DCPC; and the DCPC's relationship to existing state nutrient regulation and future local nutrient regulation.

Employing A Comprehensive Approach for Reducing Phosphorus Loads to Ponds and Meeting Water Quality Goals in Brewster

Mark Nelson, Principal, Horsley Witten Group

Brewster's efforts over the last year to develop watershed-based strategies to minimize phosphorus inputs to the Town's many ponds will be described, including proposed septic system design and stormwater management regulations. Recent outreach efforts to bring residents together to promote pond restoration will also be highlighted.

Pond Remediation Case Study: Using Alum Treatment to Restore Lovers Lane and Stillwater Pond, Chatham **Robert Duncanson, Director of Health and Environment, Town of Chatham**

This presentation will cover the assessment of the ecological status of Lovers Lake and Stillwater Pond, determination of the cause of eutrophication, evaluation of alternatives to mitigate the elevated phosphorus levels and implementation of alum treatment as the preferred alternative.

Session 5: It's Not All About Wastewater: Managing Stormwater with Green Infrastructure

Green Stormwater Infrastructure in New England – A Current Assessment

Rich Claytor, Principal Engineer, Horsley Witten Group

The presentation will cover the most recent advances in green stormwater infrastructure implementation in southeastern Massachusetts and beyond. Key features will include, designs to enhancement performance, components to ensure proper construction, and designs with long-term maintenance in mind.

Enhancing Nitrogen Removal in Stormwater BMPs: Latest Research Findings

James Houle, Program Manager, UNH Stormwater Center

This presentation highlights the results of over 10 years of Low Impact Development (LID) systems field testing and optimization, and the results of more recent laboratory column tests of various Bioretention soil mixes on the overall effectiveness for Phosphorus (P) and Nitrogen (N) removal.

Case Study - Shoestring Bay Stormwater Remediation Project, Mashpee

Catherine Laurent, DPW Director, Town of Mashpee

Shoestring Bay is a coastal water body in Mashpee that provides habitat for numerous shellfish including mussels, oysters, quahogs, and soft-shell clams. Water quality problems had resulted in permanent and seasonal shellfish harvesting closures in the bay. One of the pollution sources was direct discharge of stormwater from roads. The Town, with funding from the Cape Cod Water Resource Restoration Project, designed and installed a drainage system to collect and treat road runoff for the 10-year storm event.

Session 6: Using Shellfish Aquaculture for Nitrogen Remediation

Wellfleet Case Study

Curt Felix, Town of Wellfleet

Cape Cod and Massachusetts' coasts are highly exposed and have experienced increasingly severe storm events, hurricanes and coastal nor'easters which pound the sandy shorelines and harbors on a regular basis. Until the early to mid-1800's these shorelines featured extensive oyster reefs and salt marshes which provided living barrier protection and enormous food resources. Approximately 95% of oyster habitat and 65% of former saltmarsh have been lost. Massachusetts coastal regions have experienced a near catastrophic loss of historic fish stocks, according to NOAA, EPA, TNC and State DMF, DER and DEP.

Located in Duck Creek, Wellfleet, Ma, it has produced a population increase from a few thousand oysters to nearly 4.5 million within two years. In addition, wider cultch application in Wellfleet Harbor, outside the pilot site, has increased population by an estimated 40 million oysters, 5 times the current annual harvest. Extensive monitoring of nitrogen levels in the pilot area showed a surprising reduction of 70% due to the oyster population increase. The project was recently awarded the 2014 American Public Works Association's "Project of the Year" for Enhancing Estuary Water Quality.

Nitrogen Uptake in Shellfish: What We Are Learning From Local Research

Josh Reitsma, Cape Cod Cooperative Extension and Woods Hole Sea Grant

This presentation will explain recent results quantifying the amount of nitrogen contained in oysters and quahogs from water bodies around Cape Cod, and the factors that seem to affect the amount of nitrogen contained. These results will be presented as they relate to the potential for nitrogen extraction through shellfish propagation or aquaculture efforts. These results are also available as a technical report or a shorter extension bulletin through the Cooperative Extension or Sea Grant.

Impact of Ocean Acidification on Shellfish: Results from Local Research in Waquoit Bay

Daniel McCorkle, Chair, Geology and Geophysics Department, Woods Hole Oceanographic Institution

Mr. McCorkle will start with a brief overview of ocean acidification – the decrease in seawater pH caused by the build-up of fossil fuel carbon dioxide in the atmosphere. He will then discuss the range of processes that can lower the pH of coastal waters, using data from Waquoit Bay, MA. He will then briefly describe recent laboratory studies of ocean acidification impacts on the survival and growth of larval shellfish.

Day 2 – Friday, June 6, 2014

Keynote Addresses

Science Keynote: Our Changing Climate and National Climate Assessment Update

Scott Doney, Senior Scientist, Department of Marine Chemistry and Geochemistry and Director of the Ocean and Climate Change Institute, Woods Hole Oceanographic Institution

Policy and Management Keynote: Resilience - To What End?

Dr. Jeff Payne, Assistant Director, NOAA's Office of Coastal Resource Management

Building Resiliency to Storms, Sea Level Rise and Climate Change

Climate Trends In New England and Its Impact on Storm Behavior; Riverine and Coastal Flood Impacts

David Vallee, Hydrologist-in-Charge, NOAA/NWS/Northeast River Forecast Center

The Northeast United States has been more than its share of high impact flood events in recent years. Events have included intense flash floods, record river flooding, and devastating coastal inundation. For southeast New England, several of the most recent events have include the remarkable urban flash floods in Fall River & New Bedford, the catastrophic river flooding of March 2010, and of course Hurricane Sandy's "side-swipe" but no less impressive impacts along parts of the south coast.

A changing climate is without a doubt in progress throughout the Northeast. This presentation will discuss how the climate has changed across the region. We will examine the increase in temperatures and rainfall, the increased frequency of intense rain events, and how this has translated into changes in flood frequency. The presentation will also discuss how sea level rise and erosion along the coast have made the region more vulnerable than ever to a major hurricane strike on our shoreline.

Enhancing Disaster Preparedness and Emergency Response Systems: Getting Ready for All Hazards

Sean O'Brien, Coordinator, Barnstable County Emergency Management Committee

This discussion will cover the use of an "All Hazard-Multi Disciplined" approach for local and regional emergency planning on Cape Cod and how it can help with the 4 stages of an emergency. It will also describe the integration of public education and volunteerism into these efforts and how it can assist with community resiliency. Efforts to add small business into future planning efforts will be noted as well.

The Economic Imperative for Adaptation Planning

Dr. Rob Johnston, Director, George Perkins Marsh Institute and Professor of Economics, Clark University

New England states and communities are facing impending choices regarding the management and protection of coastal resources. Among the most challenging are those that balance the demand for waterfront development with effective protection of coastal ecosystem services and adaptation to coastal storms and flooding. Related management decisions can have important impacts on economic benefits and costs realized by the public. This presentation discusses approaches used to quantify the economic benefits, costs and tradeoffs of coastal adaptation. It also presents some common misperceptions concerning these effects. Examples from past and ongoing research across New England are used to illustrate methods, results and implications for adaptation choices.

What the State is Doing To Support More Resilient Communities

Julia Knisel, Coastal Shoreline and Floodplain Manager, MA Office of Coastal Zone Management

Julia will provide an overview of two new CZM administered grant programs that support innovative local efforts to increase awareness of climate impacts, identify vulnerabilities, and implement measures to mitigate coastal erosion and flooding problems and increase community resilience.

Dealing With Erosion: The Spectrum of Coastal Erosion Control Methods

Greg Berman, Coastal Processes Specialist, Woods Hole Sea Grant and Cape Cod Cooperative Extension

Coastal managers and property owners have wide range of options available to them when attempting to deal with erosion. Most of these methods are designed to protect the upland property, however they can cause degradation to the adjacent coastal resource areas. The rapid development of the coastline and existing coastal hazard risks, over the past several decades, have lead to a substantial amount of shoreline stabilization projects on Cape Cod. The desire to use these techniques to protect upland property is not going away any time soon. Our changing climate, combined with a projected acceleration of sea level rise, will be (and is being) used as justification for increases in the quantity and robustness of shoreline protection. This talk will present erosion control methods as a spectrum, with regard to varying degrees of potential environmental impacts.

Adaptation Case Study: How Brewster is Using Managed Retreat to Address Coastal Erosion

Chris Miller, Director, Brewster Department of Natural Resources

Brewster has been experiencing one to two feet of annual erosion, and many of the town landings are in peril. Paines Creek Landing was recently relocated landward, with the former parking area restored to coastal dune. Brewster is currently assessing all of its landings and may be proposing additional retreat at Breakwater Landing, another parking lot in eroding dunes.

Implementation of an Innovative Tool for Cape and Island Towns - Falmouth's Black Beach-Sippewissett Marsh District of Critical Planning Concern

Elizabeth Gladfelter, Conservation Commission Chair, Town of Falmouth

Falmouth's DCPC, protecting the wetlands complex of Black Beach and Great Sippewissett Marsh, was the first established DCPC on Cape Cod. A DCPC, a regulatory tool of the Cape Cod Commission, enables town(s) to "adopt special rules and regulations that will protect natural, coastal, scientific, cultural, architectural, archaeological, historic, economic, or recreational resources or values of regional, statewide, or national significance." We will explore the resource areas and resource area values protected by the establishment of this DCPC (and how the value of these were documented), the process by which this DCPC was established, and how DCPC wetlands regulations were developed and incorporated into the Falmouth Wetlands Regulations. Lastly, we will discuss lessons learned, e.g., what has been protected and how we might strengthen the resiliency of this important coastal complex as we anticipate future changes.

Surging Seas Risk Finder for Massachusetts: A New Sea Level Risk Web Tool

Dan Rizza, Manager and Research Associate, Climate Central

In this presentation, Dan will give an overview of Climate Central's new Surging Seas Risk Finder for Massachusetts, a public web tool that provides local projections, maps and assessments of exposure to sea level rise and coastal flooding tabulated by zip code, municipality, planning, and legislative districts.

Preparing for Sea Level Rise and Climate Change at a Community and Individual Asset Scale

Kirk Bosma, Woods Hole Group

Climate change is redefining risk for cities, infrastructure, and local communities. Historic events are no longer reliable proxies for future conditions. As such, numerous coastal communities have developed, or started to develop, Coastal Climate Adaptation Plans that integrate projected climate change and sea-level rise influences into their planning process. For local communities and individual building and structural systems, appropriate planning, and subsequently adaptation, depend on accurate and precise identification of the risk of flooding due to future storm surge and sea level rise. These present and future risk levels help decision makers identify where and when to focus planning efforts and implement adaptations. This presentation will provide examples and insight on how communities can cost-effectively integrate the most recent high resolution risk information to develop climate change preparedness and adaptations at a local scale.

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