

3:00PM - 3:15PM
Break

3:15PM - 4:10PM
Afternoon Plenary
Part One

4:10PM - 5:00PM
Afternoon Plenary
Part Two

5:00PM
Adjourn

USING NATURE BASED APPROACHES TO ENHANCE RESILIENCE - LESSONS FROM LOCAL PROJECTS
MODERATOR: STEVE MCKENNA, CAPE & ISLANDS REGIONAL COORDINATOR, MA OFFICE OF COASTAL ZONE MANAGEMENT

Demonstration of Living Shoreline Technology and Development of Ribbed Mussel Seed Production to Protect and Restore Salt Marsh in Coastal MA

This talk will present work being done by The Martha's Vineyard Shellfish Group and partners including the towns of Edgartown, Oak Bluffs and Tisbury, to conduct preliminary investigations into the hatchery production of ribbed mussels and test "living shoreline" techniques (using ribbed mussel, coir log and marsh grass for shoreline protection) at four pilot sites in embayments on Martha's Vineyard.

Rick Karney, Director and Shellfish Biologist, Martha's Vineyard Shellfish Group, Inc.

Shoreline Stabilization of North Barnstable Public Beaches Using Bioengineering Solutions

This presentation will highlight work being done to stabilize Blish Point-Millway Beach using sand-filled coir bags, native plantings, and sand fencing to protect substantial public access infrastructure and an engineered containment basin that has been used to store dredged sediments.

Christine Player, Senior Project Manager/Engineer, CLE Engineering

Lessons Learned From Green Infrastructure Projects in Massachusetts

This presentation will provide an overview of CZM's Green Infrastructure for Coastal Resilience Grant Program, including types of eligible projects and an overview of projects funded on the Cape and Islands. Tricia will discuss lessons learned and helpful tips to strengthen future project applications as well as other CZM funding opportunities.

Patricia Bowie, Coastal Resiliency Specialist, Massachusetts Office of Coastal Zone Management

Financing Resilience Planning - Places to Look for Funding

BEST PRACTICES FOR COMMUNICATING VULNERABILITY AND RISK & ENGAGING THE COMMUNITY
MODERATOR: TONNA-MARIE ROGERS, WAQUOIT BAY RESERVE

Evolution of the Public Process in Brewster: the Breakwater Beach Experience & Lessons Learned

Over the past two years Brewster worked on a coastal retreat/dune restoration project at Breakwater Beach, one of the Town's public landings and beach that has suffered from storm damage and chronic erosion. The project met with some public opposition. Public comment during the regulatory review process resulted in some modifications to the project, but the project remained controversial. Lessons learned from this experience are: Brewster's beaches are viewed as a vital part of the Town's character by residents and visitors alike and citizens want the Town to develop a comprehensive assessment of its beaches and coastal resources through an inclusive public engagement process. *Chris Miller, Natural Resources Director, Town of Brewster*

Enhancing Community Readiness to Adapt: Strategies for Education, Engagement, and Risk Management

How can we help our communities understand the risks they face? How can we create community buy-in for resilience-building measures? What education and engagement strategies can help? This session addresses these questions, discussing tools for communicating vulnerability and risk, community engagement, and collective risk management, and sharing lessons learned through the New England Climate Adaptation Project which involved four New England communities including the Town of Barnstable.

Dr. Danya Rumore, Associate Director, Environmental Dispute Resolution Program, University of Utah

RESILIENCE SPOTLIGHT - CAPE COMMUNITIES IN ACTION

Learn about different activities underway in Cape towns to enhance resilience.



AGENDA

MANAGING COASTAL RISK: ENHANCING COMMUNITY RESILIENCE IN A CHANGING CLIMATE

8:00AM- 8:45AM
Registration

9:00AM
Welcome & Opening
Remarks

9:15AM - 12:30PM
Morning Plenary

10:25AM - 10:45AM
Break

12:30PM-1:30PM
Lunch

WELCOME & OPENING REMARKS

*Tonna-Marie Rogers, Coastal Training Program Coordinator
Waquoit Bay National Estuarine Research Reserve*

KEYNOTE - PREPARING FOR EXTREME CLIMATE EVENTS

Dr. Radley Horton, Associate Research Scientist, Center for Climate Systems Research, Columbia University

THE REALITIES OF NEW ENGLAND HURRICANES

David Vallee, Hydrologist-in-Charge, NOAA National Weather Service, Northeast River Forecast Center

ECONOMIC IMPACTS FROM FLOODS AND SOLUTIONS THAT WORK

Dr. Mahesh Ramachandran, Environmental Economist, Cape Cod Commission

What are the current flood loss statistics on the Cape? In aiming to enhance resiliency, what do we need to consider in estimating economic loss from floods? In designing effective solutions, what has proven to have worked? These are some of the questions, this presentation seeks to answer.

STATE OF OUR BEACHES: SHIFTING SHORELINES, SEDIMENT MANAGEMENT & COASTAL ACCESS

MODERATOR-PAT HUGHES, DIRECTOR, MARINE POLICY PROGRAM, CENTER FOR COASTAL STUDIES

Coastal Erosion Commission Findings; Shoreline Change Forecasting

This talk will cover the Massachusetts Coastal Erosion Commission just-published strategies and recommendations to mitigate impacts of coastal erosion. Rob will also describe a new USGS-CZM project to make statewide shoreline change forecasts which will be able to inform shoreline management decisions in the future. *Dr. Rob Thierer, Geologist, U.S. Geological Survey*

The Erosion Problem: Physical, Educational, and Regulatory Perspectives

This talk will cover erosion from different perspectives. Examples of physical erosion hotspots from across Cape Cod over the last year will be shown, and the coastal processes that control the erosion explained. The talk will also address how coastal science has informed the regulations that we have today and how regulations are currently being tested, as well as the increasing conflict between private property rights and public use of coastal resources.

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

Regional Approaches to Coastal Resource Management

This talk will summarize the work of the Center for Coastal Studies in characterizing sediment transport along the Cape Cod Bay shoreline, and how this work, together with other tools, will help identify and prioritize coastal resource management needs on Cape Cod. Coastal resources move without regard to property or municipal boundaries, and the talk will address the importance of regional approaches for resource management. *Heather McElroy, Natural Resources Specialist, Cape Cod Commission*

Dealing With Erosion at Sandy Neck Park: A Local Case Study

This talk will examine current erosion conditions at the Sandy Neck Park and the proactive approach that the Town of Barnstable is taking to address the issue via shoreline change modeling, an alternatives analysis of solutions, and public engagement. *Nina Coleman, Sandy Neck Park Manager, Town of Barnstable*



MINI-WORKSHOPS - CONCURRENT SESSIONS

1:30PM - 3:00PM

WORKSHOP 1 – OSTERVILLE A (Three 20 minute presentations followed by Q & A)

PLANNING BETTER AND SMARTER TO ENHANCE COMMUNITY PREPAREDNESS

MODERATOR: BRIAN DUDLEY, ENVIRONMENTAL ENGINEER, MA DEPT. OF ENVIRONMENTAL MANAGEMENT

Building Resiliency on Cape Cod Using Hazard Mitigation Planning (includes Town of Provincetown Case Study)

This presentation will focus on specific actions that build resiliency to natural hazards at the municipal level and identify funding sources for these actions. The Town of Provincetown will describe current projects that improve the resiliency of town-owned infrastructure.

Dr. Caroline Harper, Planner, Cape Cod Commission and Richard Waldo, DPW Director, Town of Provincetown

Using FEMA's Community Rating System Program to Enhance Floodplain Management and Save Money

This presentation will include a brief overview of the National Flood Insurance Program (NFIP) and recent changes, while focusing on using the NFIP's Community Rating System (CRS) to incentivize resilience planning and actions. Shannon will review the basics of the CRS, the status of the CRS for Cape Cod communities, and what attendees can do to help earn credit.

Shannon Jarbeau, CFM, Community Rating System and Floodplain Management Coordinator, Cape Cod Cooperative Extension

Bright Spots and Opportunities for the Transportation Network on Cape Cod

This presentation will describe public engagement tools created by the Cape Cod Commission to assess the vulnerability of critical transportation infrastructure to climate stressors.

Dr. Caroline Harper, Planner, Cape Cod Commission

WORKSHOP 2 – OSTERVILLE B (Three 20 minute presentations followed by Q & A)

PREPARING FOR STORMS AND SEA LEVEL RISE-TOOLS TO AID PLANNING & FLOOD RESPONSE

MODERATOR: ERIN PERRY, SPECIAL PROJECTS COORDINATOR, CAPE COD COMMISSION

Our Rising Seas: An Introduction to the Cape Cod Sea Level Rise Viewer Tool

This presentation will cover the development of the Commission's Sea Level Rise tool, highlight its functionality and discuss its use in local and regional planning efforts. The Commission incorporated local data into the national "bath tub" model developed by NOAA's Coastal Services Center. The result is the only locally-specific Sea Level Rise model currently available to planners, public works directors and citizens to make better long-term planning decisions. Ms Reynolds will also discuss how the Commission has responded to user feedback as well as the tool's continuing evolution. To review the tool, log on to capecodcommission.org/sealevelrise

Anne Reynolds, GIS Director, Cape Cod Commission

Where Will The Flood Waters Go? Mapping Flood Pathways to Protect Valuable Coastal Infrastructure

The responsibility of preparing for, and responding to, inundation events, typically falls upon local entities. They need to plan and mitigate for storm events and increasing 'nuisance' flooding. The storm-tide pathway project, ongoing in two Massachusetts communities, aims to provide high-resolution on the ground data of precise locations through which low-lying areas will flood during high water events now and in the future. Potential pathways are located using data visualization software, LIDAR elevation data and extensive field surveys using GPS data. The location and elevation of these pathways are then mapped and tied to a local tidal datum and tide gauge in an accessible location, (e.g. harbor master's office, town dock). Local entities can then mitigate or respond in real-time during a flood event based on the maps of storm-tide pathways thereby increasing a town's response capabilities and resiliency.

Dr. Mark Borelli, Director, Sea Floor Mapping Program, Center for Coastal Studies

Responding to a Rising Tide

National Weather Service Mapping Tools and Resources to Support Flood Response

Cape Cod can be impacted by both hurricanes and extratropical storms (e.g. nor'easters). Although coastal flooding is coastal flooding, the two types of storms are sufficiently diverse to result in different lines of products and services. We will take a brief look at key terminology and products when a hurricane threatens and a longer look at information associated with nor'easter threats, since nor'easters pose a more frequent threat to Cape Cod and the rest of the Massachusetts east coast. National Weather Service information that can aid coastal storm response includes watch/warning terminology, web page for tide forecasts and coastal flood warning products, and inundation mapping tools. The focus is responding to storms that can impact us **now** as well as future storms which are projected to be more intense.

Robert Thompson, Meteorologist-in-Charge, National Weather Service, Taunton

WORKSHOP 3 – GRAND BALLROOM (PLENARY) (Three 20 minute presentations followed by Q & A)

PROTECTING KEY NATURAL RESOURCES IN A CHANGING CLIMATE

MODERATOR: JO ANN MURAMOTO, REGIONAL COORDINATOR, MASS BAYS PROGRAM AND DIRECTOR OF SCIENCE PROGRAMS, ASSOCIATION TO PRESERVE CAPE COD

Responding to Inundation from Below: Planning for the Effects of Sea Level Rise on Groundwater

This presentation will begin with a viewing of the APCC's video describing the problem: rising sea level will affect the Cape's groundwater system, causing the water table to rise and changes in stream discharge. The video was produced in cooperation with the U.S. Geological Survey which is completing a study of the effect of sea level rise on the mid-Cape's groundwater system, in collaboration with the Cape Cod Commission and other partners. Following the video we will discuss the impacts that we need to plan for, including high groundwater impacting septic systems, infrastructure, natural resources and streamflow. APCC and our partners will be developing recommendations for adaptation measures to build resilience against the effects of inundation from below.

Ed DeWitt, Executive Director, Association to Preserve Cape Cod

Marsh Sustainability in the Face of Sea Level Rise

Coastal wetlands such as salt marshes which are a key part of the Massachusetts and New England coastline, provide many benefits such as serving as habitat, offering flood protection, filtering pollutants, and storing carbon which may contribute to climate change. Despite their value, these ecosystems are under threat from many factors and climate change presents new and intensified risks. What can long-term monitoring data tell us about salt marsh sustainability around the nation? How can this data be used to inform restoration and management of our local salt marshes to ensure that these natural systems and the services they provide are preserved?

James Rassman, Acting Manager, Waquoit Bay National Estuarine Research Reserve

Planning for the Effects of Climate Change on Shellfishing in Wellfleet Harbor Using a Community-Based Approach

Shellfish play a vital role in the ecology of Wellfleet Harbor and the economy of Wellfleet. However, shellfish are particularly vulnerable to climate change. The National Marine Fisheries Service ranks shellfish as among the most vulnerable of fish stocks in the northeastern US. In this presentation we will share the process and outcomes of the Working Group on Climate Change impacts on shellfishing in Wellfleet Harbor. The Working Group is a community-based group with broad representation from the shellfish industry and the Town, whose purpose was to identify: threats to shellfishing in Wellfleet Harbor from climate change, the role of shellfish in mitigating impacts from climate change and other environmental hazards in Wellfleet Harbor, as well as strategies to increase the resilience of Wellfleet and its shellfishery. The Working Group produced reports to characterize the risks and vulnerabilities for the shellfish fishery and local community due to a changing climate – both today and into the future. The next step is to integrate this information into future planning and decision making.

Seth Tuler, Associate Teaching Professor, Worcester Polytechnic Institute & Research Fellow, Social and Environmental Research Institute

WORKSHOP 4 – CENTERVILLE (Four 15 minute presentations followed by Q & A)

PROTECTING PUBLIC HEALTH IN A CHANGING CLIMATE

MODERATOR: TONNA-MARIE ROGERS, COASTAL TRAINING PROGRAM COORDINATOR, WAQUOIT BAY RESEARCH RESERVE

Potential Health Impacts of Climate Change

This presentation will set the stage for the session by presenting an overview of the types of public health threats that climate change presents globally and nationally as well as risks that might be of particular concern in New England/Massachusetts region.

Dr. Shubhayu Saha, Health Scientist and Senior Research Fellow, Centers for Disease Control and Prevention (CDC)

Statewide and Regional Capacity of Local Health Departments to Prepare for Health Impacts of Climate Change

The presentation will highlight the major findings of a survey of local health departments in Massachusetts regarding their capacity to address public health impacts associated with climate change at the local level. We will also describe our work in implementing the CDC's Building Resilience Against Climate Effects (BRACE) framework to assist communities in their adaptation planning efforts.

Margaret M. Round, Chief of Air Toxics, Environmental Toxicology Program, Bureau of Environmental Health, MA DPH

In Hot Pursuit: What Are We Learning About Mosquito and Tick Abundance and Distribution on Cape Cod

The Cape Cod Mosquito Control Project was organized in 1928 and manages mosquito populations in Barnstable County below the level where they create a nuisance and/or transmit disease. The Project conducts surveillance throughout the 15 member towns and controls mosquitoes using an Integrated Pest Management plan that employs the most effective and least environmental invasive mosquito control techniques. Analysis of collection data over the past 23 years has shown changes in species and disease prevalence causing Project methodology to evolve with those changes. Deer ticks are a well-established vector of four significant diseases found on the Cape. Lone Star ticks have recently become established on the Cape and may transmit three additional diseases and a significant allergic response to red meat consumption. Ecological factors that may influence human health risk will be discussed.

Gabrielle Sakolsky, Staff Entomologist and Assistant Superintendent, Cape Cod Mosquito Control Project & Larry Dapsis, Deer Tick Project Coordinator and Entomologist, Barnstable County Cooperative Extension

Fighting the Rising Tide: Diminished Septic System Performance Due to Climate Change

This presentation will cover results of research conducted to investigate projected climate change impacts of elevated water tables due to sea level rise and higher temperatures on the contaminant removal capabilities of conventional and innovative septic system soil treatment areas. Results will highlight how the capacity of both types of septic systems to remove pathogenic bacteria, phosphorus, nitrogen, biochemical oxygen demand and viruses were affected. This research is relevant for Cape Cod given that the region currently has a high number of septic systems in the landscape.

Jennifer Cooper, Ph.D. Candidate, University of Rhode Island