

# Overview of National and State erosion management reviews & reports





- National Research Council: Managing Coastal Erosion 1990
- Heinz Center: Evaluation of Erosion Hazards 2000
- Maryland: Shore Erosion Task Force Report 2000
- North Carolina: Beach and Inlet Management Plan 2011
- Massachusetts Coastal Hazards Commission Report 2007
- Massachusetts Climate Change Adaptation Report 2011

# NRC: Managing Coastal Erosion

- National Research Council asked to provide advice on appropriate erosion management strategies, data needs, and applicable methodologies
- Primary focus: National Flood Insurance Program
- Review of state erosion management programs
- NRC report issued in 1990 contained 3 principle views:
  - Transfer economic costs of erosion losses from federal taxpayers to property owners via premiums that approximate the risks of loss. Program should eventually become actuarial.
  - Discourage inappropriate development in erosion zones as delineated by FEMA or the states
  - Promote better building practices in erosion-prone areas

# NRC: Managing Coastal Erosion

- Recommendations:
  - FEMA's coastal hazard mapping should incorporate methodologies and data for erosion hazard delineations (erosion or “E” zones: E-10, E-30, E-60)
  - Utilize historical shoreline change method to immediately begin mapping erosion hazard zones
  - No new development should be permitted seaward of the E-10 line, except water-dependent uses, such as piers and docks; and only readily-movable structures should be permitted seaward of the E-60 line
  - State or local regulations that meet these minimum standards should be pre-requisite for community NFIP participation

# NRC: Managing Coastal Erosion

- Recommendations (continued):
  - A national policy should be adopted that requires placement of good-quality sand, dredged from harbors and entrances, as beach nourishment
  - Develop guidance on proper procedures to mitigate negative effects of existing and planned structures that cause adverse effects on the adjacent property owners
  - FEMA should inform the general public of risks associated with development in the coastal zone
  - FEMA should provide regular notice to all land owners in E-zones as to the existence and magnitude of erosion (through notations on annual flood insurance premium notices, or deeds / title)

# NRC: Managing Coastal Erosion

- Review of state programs:
  - Coastal states have gained considerable experience in the implementation and administration of regulatory erosion programs
  - Most states have general regulations to mitigate coastal hazards, including erosion, flooding, and storm surge
  - About 1/3 states have erosion hazard area management programs that specifically include the establishment of erosion setbacks for new construction
  - Program elements vary, but most states with regulatory programs have established a threshold erosion standard of 1 ft/year to define a high hazard area
  - Many state programs employ data averaging or "grouping" procedures for unit of shoreline

# Heinz: Evaluation of Erosion Hazards

- National Flood Insurance Reform Act of 1994 required an analysis of possible policy changes to address erosion hazards within federal programs
- Heinz Center for Science, Economics and the Environment led independent study for FEMA
- Goal – To improve understanding of the impacts of erosion and erosion-related flooding on the NFIP, other federal programs, and coastal communities
- 2000 report contains series of findings, explores policy options, and makes 2 overarching recommendations
- Report also contains some economic analysis of the impacts of erosion (limited scope, extrapolated)

# Heinz: Evaluation of Erosion Hazards

- Recommendation #1: Congress should instruct FEMA to develop erosion hazard maps that display the location and extent of coastal areas subject to erosion.
  - FIRMs do not inform current and prospective coastal property owners of erosion risks
  - The omission is substantial: Averaged over the highest hazard flood zone, the risk of erosion-related damage to structures is roughly equal to the risk of flood damage
  - Without accurate information on erosion, state and local decision makers and the general public will not be fully aware of the coastal hazards they face, nor will they be able to make use of this information for land-use planning and erosion hazard mitigation

# Heinz: Evaluation of Erosion Hazards

- Recommendation #2: Congress should require FEMA to include the cost of expected erosion losses when setting flood insurance rates along the coast
  - Despite facing higher risk, homeowners in erosion-prone areas currently are paying the same amount for flood insurance as are policyholders in non-eroding areas
  - FEMA should incorporate the additional risk from erosion into the determination of actuarial rates in high-hazard coastal regions.
  - This will eliminate the need for subsidies from other NFIP policyholders or taxpayers to cover expected erosion losses

# MD: Shore Erosion Task Force

- Established by state statute in 1999 to:
  - Identify shore erosion needs by county
  - Clarify local, State, and federal roles
  - Establish five and ten year shore erosion control plans
  - Review contributing factors to shore erosion
- 2000 report, Task Force concluded:
  - Shore erosion is one of the most significant problems facing Maryland's diverse coastal environment
  - Despite interest and involvement by numerous local, state, federal, and private parties, Maryland lacks the institutional, organizational, and fiscal resources to adequately respond to shore erosion
- Task Force issued series of recommendations

# MD: Shore Erosion Task Force

- Recommendations, included:
  - Establish technical and other capacity to conduct comprehensive shore erosion planning
  - Identify and analyze areas subject to shore erosion, sea level rise, and environmental sensitivity to prioritize and target shore protection activities and establishment of regional shore erosion control strategies
  - Develop project review and selection criteria to guide implementation of erosion control strategies
  - Conduct technical evaluations of new shore protection products and methods, evaluate the need for minimum engineering standards, and review industry practices
  - Encourage the beneficial use of dredged materials in both individual and regional scale projects

# NC: Beach and Inlet Management Plan

- North Carolina legislation in 2000 required the development of a multi-year Beach Management and Restoration Strategy and Plan
- Statutory findings included:
  - NC beaches are vital to tourism industry and provide significant recreational and economic benefits
  - Beach erosion threatens economic viability of coastal communities and can significantly affect revenues
  - Beach nourishment as an erosion control method provides flood protection, enhances recreational quality, restores habitat, and provides additional public access
  - Relocation or acquisition is sometimes the best available remedy for the property owner and is in the public interest

# NC: Beach and Inlet Management Plan

- 2011 NC Beach and Inlet Management Plan, included:
  - In-depth characterization four main regions and five localized sub-regions
  - Development of management strategies:
    - NC policies allow only “soft” solutions (e.g., beach nourishment, inlet dredging/bypassing/management, setbacks, and structure relocation)
    - Exceptions for limited number of “grandfathered” pre-existing hardened structures
    - Policy is to avoid downdrift impacts, such as increased erosion, that are associated with these structures
    - Management strategies also include oceanfront building setbacks based on long-term erosion rates

# NC: Beach and Inlet Management Plan

- 2011 NC Beach and Inlet Management Plan (cont.):
  - Comprehensive analysis of socio-economic values
    - Beaches and inlets generate \$3 billion in revenue and directly support 39,000 jobs in coastal communities
  - Contains detailed beach nourishment and dredging needs with corresponding funding requirements
  - Makes recommendations deemed essential for a sustainable long-term management plan, including:
    - Planning projects regionally allows for an “efficiency of scale,” combine environmental, geotechnical, and monitoring studies
    - State should establish a dedicated Beach and Inlet Management Fund
    - Fill data gaps and standardize data collection formats

# MA Coastal Hazards Commission

- Launched in Feb. 2006; report issued May 2007
  - Characterize vulnerability to coastal hazards such as erosion, flooding, and sea-level rise
  - Evaluate adequacy of data, tools, regulations and management approaches, including (1) repair or removal existing structures; (2) beach nourishment; (3) coastal retreat, infrastructure relocation, and property acquisition; (4) market-based incentives (e.g. insurance); and (5) hazard mitigation planning
  - Develop recommendations
  - Conduct pilot infrastructure assessment (e.g., seawalls and revetments) and estimate costs for maintenance and improvements with overall objective to develop a 20-year coastal infrastructure and protection plan

# MA Coastal Hazards Commission

- 29 recommendations in 4 categories
  - Hazards Information
  - Policy
  - Planning and Regulations
  - Protection
- For each recommendation, the report:
  - Provides context and rationale
  - Identifies lead agency (including non-EEA and non-state entities)
  - Whether new funds are needed
  - Next steps for action
  - Duration of project
- Report summarizes results of pilot coastal infrastructure inventory for South Shore

# MA Coastal Hazards Commission

- Recommendations, included:
  - Establish a storm-resilient coastal communities program to provide case studies for effective planning and implementation
  - Compile coastal hazards characterization atlases
  - Develop process to capture coastal conditions after major storm events
  - Develop, update, and implement hazard mitigation plans for coastal communities
  - Evaluate feasibility of guidance or revisions to Wetland Protection Act regulations for LSCSF
  - Update State Building Code requirements for coastal construction
  - Map and model sea-level rise data

# MA Coastal Hazards Commission

- Recommendations (continued):
  - Develop a risk and vulnerability assessment map for each coastal community
  - Implement a program of regional sand management through policies, regulations, and activities that promotes nourishment as the preferred alternative for coastal hazard protection
  - Provide incentives, such as reduced insurance premiums, for retrofitting homes in coastal areas to lessen the potential risk due to storms
  - Establish a Technical Advisory Committee to develop construction and monitoring guidance, and recommend appropriate approval conditions for new and innovative protection approaches

# MA Climate Change Adaptation Report

- Global Warming Solutions Act of 2008
  - Reduce GHG emissions (1990 levels)
    - 10-25% by 2020,
    - 80% by 2050
  - Directed EEA to convene Advisory Committee to and develop report analyzing strategies for adapting to the predicted impacts of climate change
- Advisory Committee: members from many different sectors, interests
- 5 technical subcommittees: coastal zone & ocean, infrastructure, human health & welfare, local economy, natural resources & habitat

# MA Climate Change Adaptation Report

- Report issued in September 2011:
  - Review of climate predictions and impacts
  - Cross-cutting strategies
    - Current, accurate information improves decision-making
    - Advance risk and vulnerability assessments
    - Build adaptation into current plans and actions
    - Support local communities
    - Encourage ecosystem-based adaptation
    - Continue to seek expert advice and stakeholder input
    - Ensure agency and regional coordination
  - Chapters for each 5 subcommittee topics
  - Intended as a starting point for discussions, analyses, and adoption of various adaptation strategies

# MA Climate Change Adaptation Report

- Coastal Zone and Oceans (CZO) chapter
- CZO findings, included:
  - MA coastal cities and towns account for 1/3 and coastal counties have more than 3/4 of the state's population
  - Coastal and marine tourism and recreation: annual output of \$8.7 billion (2004)
- CZO strategies, included:
  - Hazard mapping to incorporate projected sea level rise
  - Limit/condition/prohibit development in vulnerable areas
  - Further revisions to the State Building Code, with strengthened requirements for hazard areas
  - Reduce number of vulnerable coastal properties through land acquisition from willing sellers in fee, or by conservation restrictions; explore other options

# MA Climate Change Adaptation Report

- CZO strategies (continued):
  - Incentives: grants for communities, technical and planning assistance
  - Advance use of “soft” engineering approaches and green infrastructure to promote healthy beaches and dunes
  - Prioritize placement of sediment on public beaches over offshore disposal
  - Acquire and update shoreline change information every 5-10 years
  - Increase natural resiliency and reduce anthropogenic stressors through improvements in water quality
  - Target land protection to account for changing landscape, natural communities, valuable ecological resources, and provide zones for migration

## Other sources

- Connecticut - Shoreline Preservation Task Force 2013
- Virginia Institute of Marine Science - Living Shoreline Guidance - 2013
- NOAA - Protecting the Public Interest: How Coastal States and Territories Use No-Build Areas along Ocean and Great Lake Shorefronts - 2012
- USGS - National Assessment of Shoreline Change: Historical Shoreline Change along the New England and Mid-Atlantic Coasts - 2010
- National Research Council - Mitigating Erosion on Sheltered Coasts - 2007
- Delaware - Striking A Balance - 2005
- New York - Governor's Coastal Erosion Task Force - 1994