STORMWATER SOLUTIONS FOR COASTAL COMMUNITIES

NROC Winter Meeting
Portsmouth, NH – March 15, 2016

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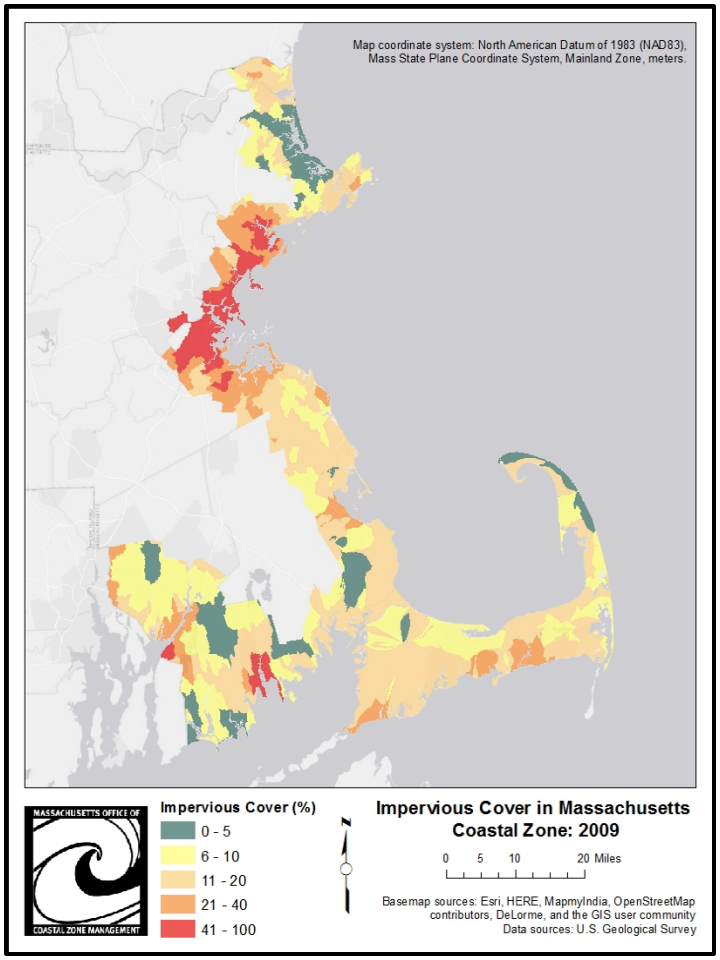
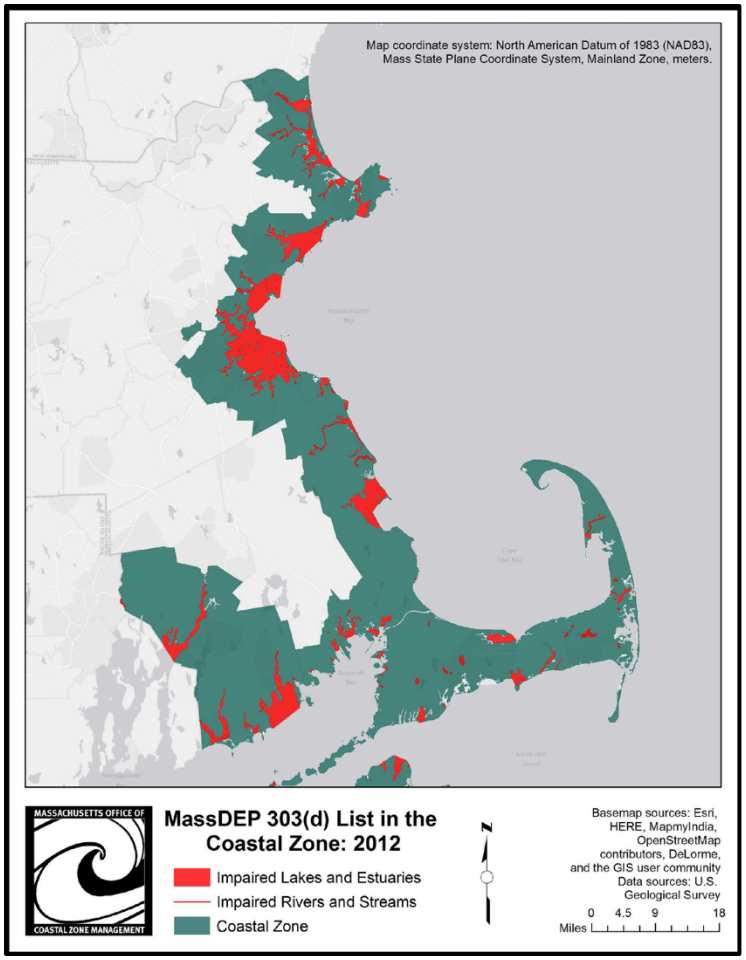
MA Office of Coastal Zone Management

Current Conditions & Trends





53% of undeveloped land in the state is currently unprotected

Current SW obstacles for MA coastal zone:

- Physical and regulatory constraints
  - –High water table levels
  - –Flat terrain
  - –Unique soil types
  - –Highly altered drainage systems
  - –More stringent coastal regulations
- Extreme event stressors
  - –Hurricanes
  - –Storm surge
  - –Land subsidence
  - –Sea level rise

Floods in January 2015, Scituate MA

Nor'easter in February 2013, Hull MA

Floods in February 2013, Nantucket MA

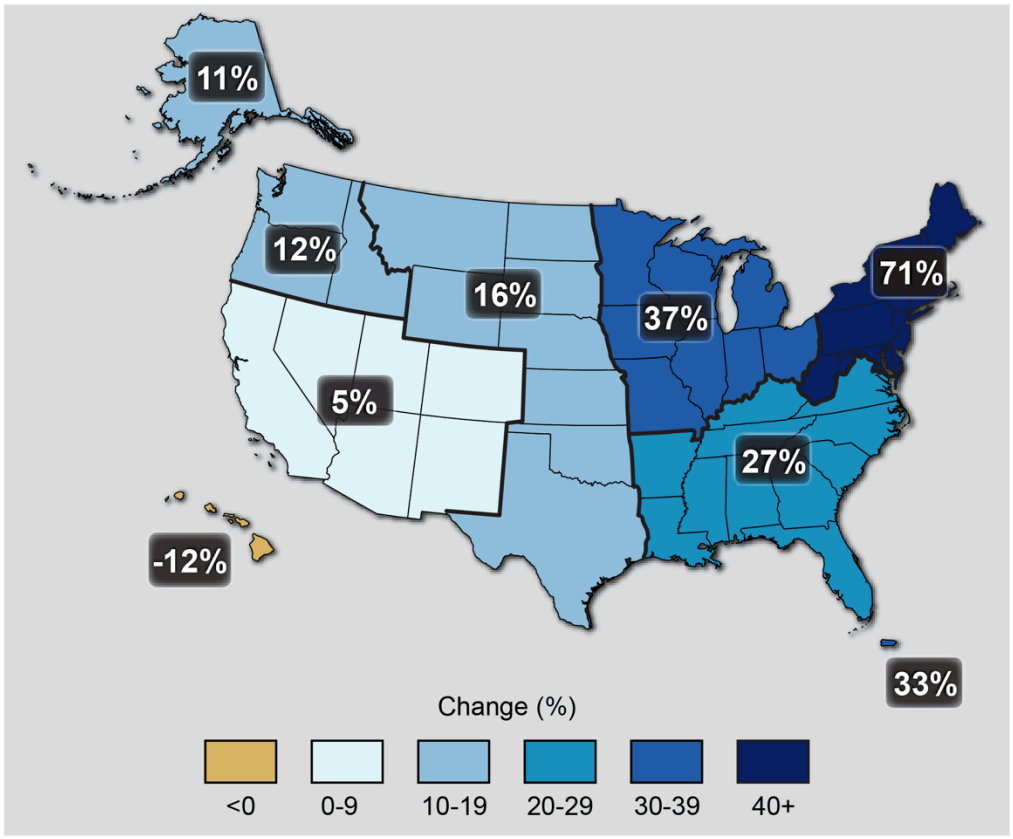


Figure source: Karl et al. 2009; Walsh and Wuebbles 2014

Floods in May of 2006, Peabody MA, Photo by Bryan Snyder/Reuters

Future (and current) risks

Sea level rise

Storm surge

Annual precipitation

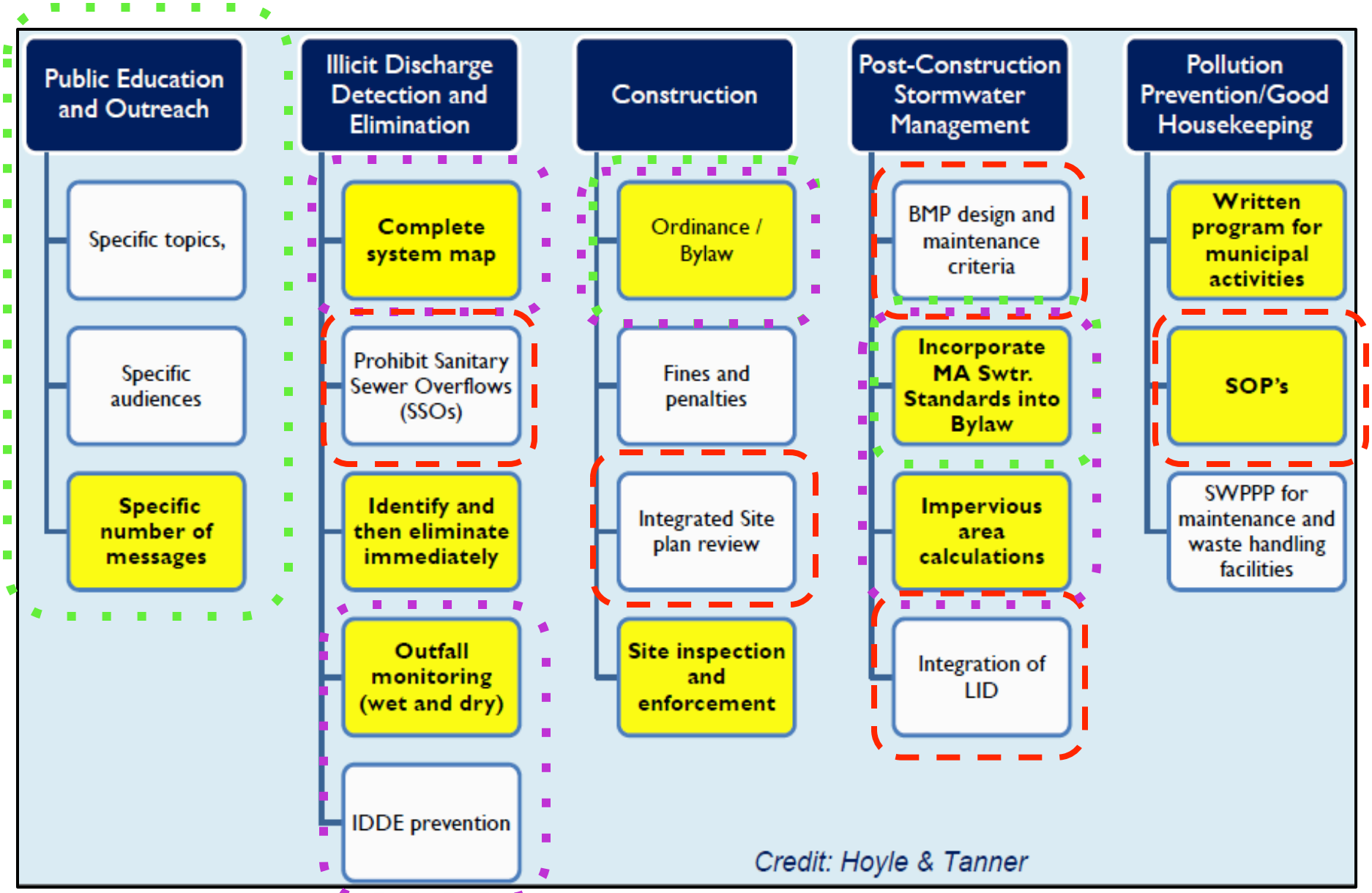
Coastal-influenced groundwater elevation

Precipitation extremes (design storm event precipitation depths)

ORIGINAL OBJECTIVES

Engaging with municipalities to provide **technical assistance** on stormwater management in the coastal zone with a focus on, **effective and resilient technologies**, available **funding mechanisms**, and **permit requirements**.

Developing the coastal communities component of the Stormwater Solutions **website** and **associated materials** to serve as a model program to support effective stormwater management at the local level.


Public Education and Outreach
Specific topics,
Specific audiences
Specific number of messages
Illicit Discharge Detection and Elimination
Complete system map
Prohibit Sanitary Sewer Overflows (SSOs)
Identify and then eliminate immediately
Outfall monitoring (wet and dry)
IDDE prevention
Construction
Ordinance / Bylaw
Fines and penalties
Integrated Site plan review
Site inspection and enforcement
Post-Construction Stormwater Management
BMP design and maintenance criteria
Incorporate MA Swtr. Standards into Bylaw
Impervious area calculations
Integration of LID
Pollution Prevention/Good Housekeeping
Written program for municipal activities
SOP's
SWPPP for maintenance and waste handling facilities
Credit: Hoyle & Tanner

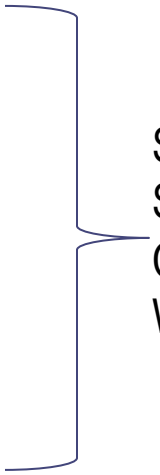
RESULTS OF NEEDS ASSESSMENT:

Increased Awareness, Effectiveness, Efficiency

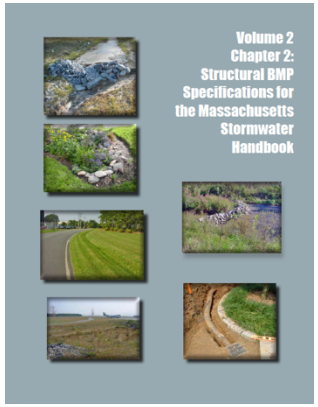
- Provide strategies for more bang for your buck
- Provide database of funding mechanisms and sources
- Provide standardized materials, resources and guidance for DPW, boards, and governing officials focused on stormwater impacts and solutions
- Provide low-cost, high-benefit structural and non-structural BMP recommendations and include local, on-the-ground examples
- **Audience:** municipal/utility staff; mayor/city council/select board; local boards; consultants
- **Format:** technical tools/training; case studies; factsheets; website; presentations

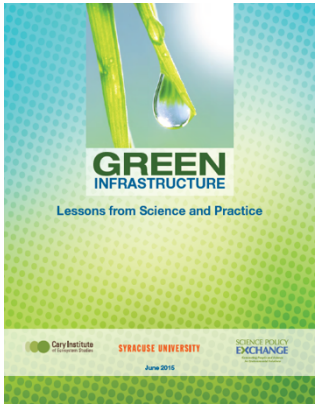
PRODUCTS:

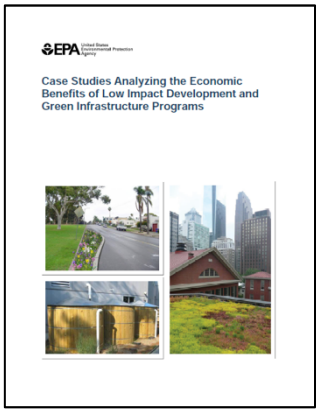
FORMAT	PRODUCT
StoryMaps	Introduction to stormwater in MA coastal zone (incl. climate change impacts, coastal constraints, and stormwater management solutions)
Factsheets	Low-cost, high-benefit strategies (incl. benefits of investing now, innovative funding strategies, integrated planning)
	Suitable available resources for local officials (incl. education and outreach materials)
Databases	Available funding sources
Technical Tools	Stormwater BMP selection tool
	Process and policy guidance document for local officials

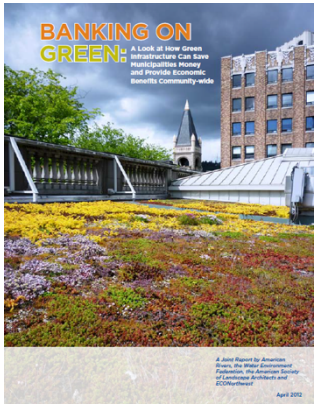


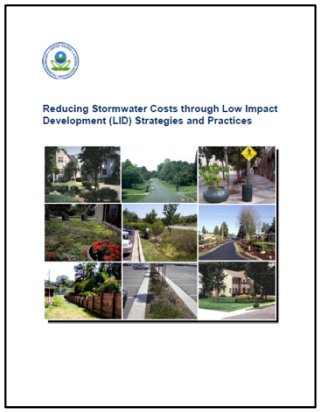
Stormwater Solutions: Coastal Communities Website

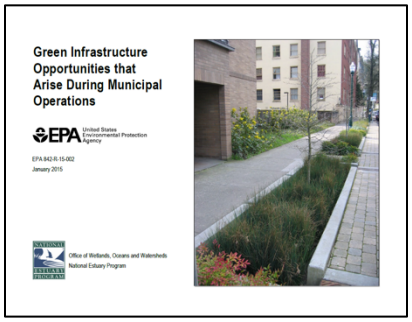


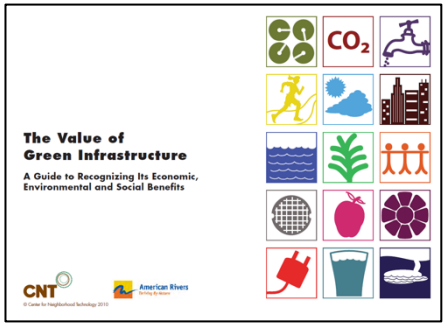




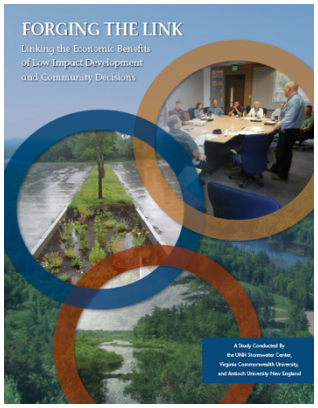


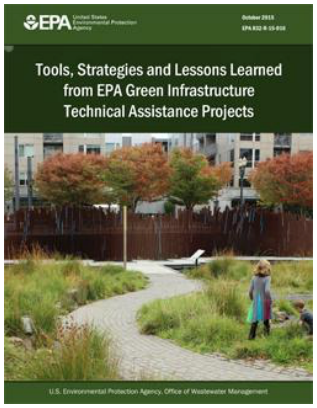


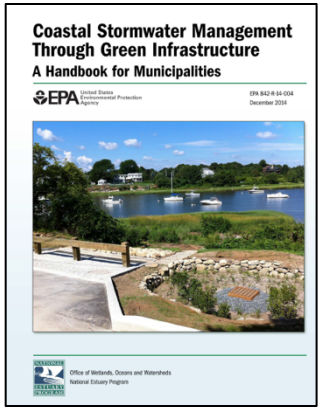


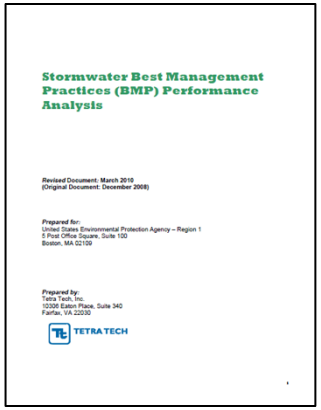


STORMWATER BMP SELECTION TOOL









STORMWATER BMP SELECTION TOOL: VARIABLES

- **Costs** (e.g. land, construction, and maintenance)
- **Site Design** (e.g. local feasibility; appropriate land use)
- **Receiving Water Characteristics** (e.g. drains to sensitive water body, wetland, or endangered species habitat)
- **Treatment Suitability** (e.g. removes nutrients, bacteria; provides groundwater recharge)
- **Physical Feasibility** (e.g. soils infiltration rate; depth to high water table; maximum slope)
- **Community and Environmental Factors** (e.g. ease of maintenance; community acceptance; habitat quality)
- **Site Restrictions and Setbacks** (e.g. 100-year floodplain; water wells; septic systems)
- **Climate and Terrain Factors** (e.g. vulnerable to salt water intrusion, flooding and inundation, or rising sea levels)

THANK YOU

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