StormSmart Coasts

Who to Contact and What to Do Before Building or Rebuliding

The coast, with its beach access and beautiful views, can be an attractive place to build a home or cottage—but it is important to be prepared for coastal storms and flooding. To protect public safety, coastal development, and natural resources, Massachusetts has enacted regulations that set minimum construction standards for coastal areas. These regulations cover various projects, including new buildings, repair of storm-damaged properties, additions, substantial improvement to existing or damaged buildings, septic systems, piers, and shoreline stabilization structures such as seawalls and revetments. In addition, building—or rebuilding after a storm—provides an excellent opportunity to maximize storm damage protection for your property. Through thoughtful planning and design, you can go beyond the minimum regulatory standards and use the best available techniques to minimize future property damage, significantly reduce your flood insurance rates, and preserve the capacity of natural landforms to buffer storm waves and flooding to further protect your property.

To help property owners with the permitting process, this fact sheet provides information on who to contact about applicable regulations, an overview of the most common permits needed, and recommendations for StormSmart building techniques to protect your property.

Who to Contact Before Building or Rebuilding

Before beginning work of any kind, determine all potential regulations or restrictions that may apply to your project. The project planning stage is the best time to contact the following local and state officials for this information:

- The local Building Inspector if the work involves construction, demolition, renovation, or change of use of a building.
- The local Conservation Commission if the work is in or adjacent to a salt marsh, beach, dune, bank, floodplain, or other area subject to the Wetlands Protection Act.
- The local Board of Health for work involving septic systems and on-site wells.
- The local Planning Board or Building Inspector for land use and zoning issues.
- The Massachusetts Department of Environmental Protection (MassDEP) Waterways Program if the work is below the high tide line (or in a former tidal area that is now filled).
- The Massachusetts Natural Heritage and Endangered Species Program (NHESP) if any portion of the project is in or adjacent to Priority Habitat of Rare Species.

City and town telephone numbers are available at www.sec.state.ma.us/cis/cistel/telidx.htm. State agency contact information is provided on page 8.

Decks, stairs, siding, and other parts of these buildings were damaged by waves and flooding in a northeaster. Repairs to these houses will require permits under the State Building Code and Wetlands Protection Act regulations, and possibly the local wetlands bylaw.

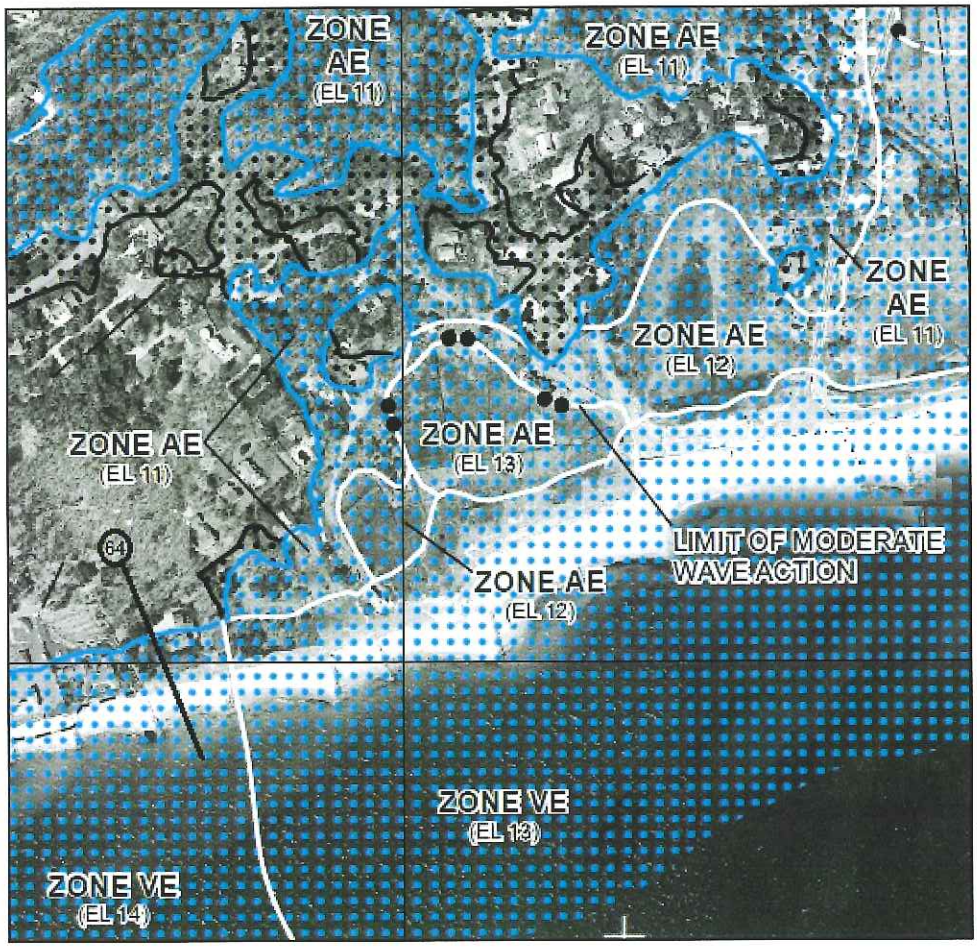
If a project involves work in rivers or below the highest high tide of the year, you may need a federal permit from the U.S. Army Corps of Engineers (USACE), Regulatory Division, under Section 10 of the Rivers and Harbor Act of 1899 or Section 404 of the Clean Water Act. Their contact information is listed on page 8.

Is Your Property in a Flood Zone?

To identify which requirements may apply to a building or rebuilding project, first determine whether your property is located within a flood zone by consulting the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), which can be found at your Town or City Hall or online at the FEMA Map Service Center (https://msc.fema.gov/portal). FIRMs are the official maps showing the areas that have been determined to be at high risk of flooding, known as Special Flood Hazard Areas (SFHAs). SFHAs are predicted to be flooded in a major flooding event—one that has a 1% probability of being equaled or exceeded in any given year (also referred to as the base flood, 1%-chance flood, 100-year flood, or 100-year storm). The flood elevation associated with the 1%-chance flood is called the Base Flood Elevation (BFE).

There are several resources available to help you understand the FIRMs and determine whether your property is within the floodplain (or determine the flood zone):

- The FEMA introductory fact sheet, *Using a Digital Flood Insurance Rate Map (DFIRM)* (www.fema.gov/media-library-data/20130726-1537-20490-8105/fema499_1_3.pdf).
- An animated FEMA tutorial on FIRMs (www.fema.gov/media/fhm/firm/ot_firm.htm).
- The FEMA Map Services Center (https://msc.fema.gov/portal), which includes information on obtaining FIRMs and related products.
- FEMA's FIRMette tutorial (www.fema.gov/media-library/assets/documents/34930), which provides instructions for determining the flood zone for an individual parcel by creating a "FIRMette" (a section of a FIRM for a specific address or location).



SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1%-CHANCE FLOOD

VE* zones - Areas subject to flooding where wave heights or wave runup are 3 feet or greater, or the entire extent of a primary frontal dune.

AE* zones - Areas subject to flooding with wave heights lower than 3 feet. Some A zones in coastal areas are subject to wave effects, quick-moving water, erosion, or a combination of these forces.

Limit of Moderate Wave Action - The landward limit of the 1.5-foot breaking wave.

X zones - Areas outside the limit of the 1%-chance floodplain that can expect moderate or minimal flooding or local drainage problems in storms greater than the 1%-chance flood.

*The "E" indicates that a predicted elevation of water has been determined and is designated on the FIRM.

An example of a DFIRM, a digital version of the FIRM from the FEMA Map Service Center.

- The Massachusetts Office of Coastal Zone Zone Management's (CZM) *Interpreting Federal Emergency Management Agency Flood Zone Maps and Studies in the Coastal Zone* (www.mass.gov/czm/interpreting-fema-maps).

State Laws and Regulations

The main state laws and regulations governing coastal construction are described below, along with their key requirements for building and rebuilding work. These descriptions are accurate as of the date of publication. For updates to the regulations, check each agency website (see page 8).

> **Important Note on Other Regulations:** Depending on the work being conducted and the location of the project, additional requirements may apply. For example, larger projects may require review under the Massachusetts Environmental Policy Act and CZM's Federal Consistency Review. See the Agency Contact Information on page 8 for links to state agency websites. Permits or approvals may also be required from other local departments (e.g., Planning Board for land use), and some local bylaws are more stringent than the state standards (e.g., wetlands bylaws and floodplain bylaws).

Massachusetts State Building Code (www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/csl/building-codebbrs.html) - The Building Code protects public safety by ensuring that buildings are structurally sound, are constructed of appropriate materials, have adequate egress for fire safety, promote energy conservation, and have adequate sanitary facilities. The Building Code includes provisions for flooding and references the FIRMs for a determination of the V zones, A zones, and Base Flood Elevations. Local Building Inspectors implement the Massachusetts State Building Code.

Who is subject to the building code?
Anyone who proposes or undertakes new construction, renovation, or demolition of existing structures or changes the use or occupancy of an existing building must conform to the provisions of the Massachusetts State Building Code.

Key Building Code requirements:

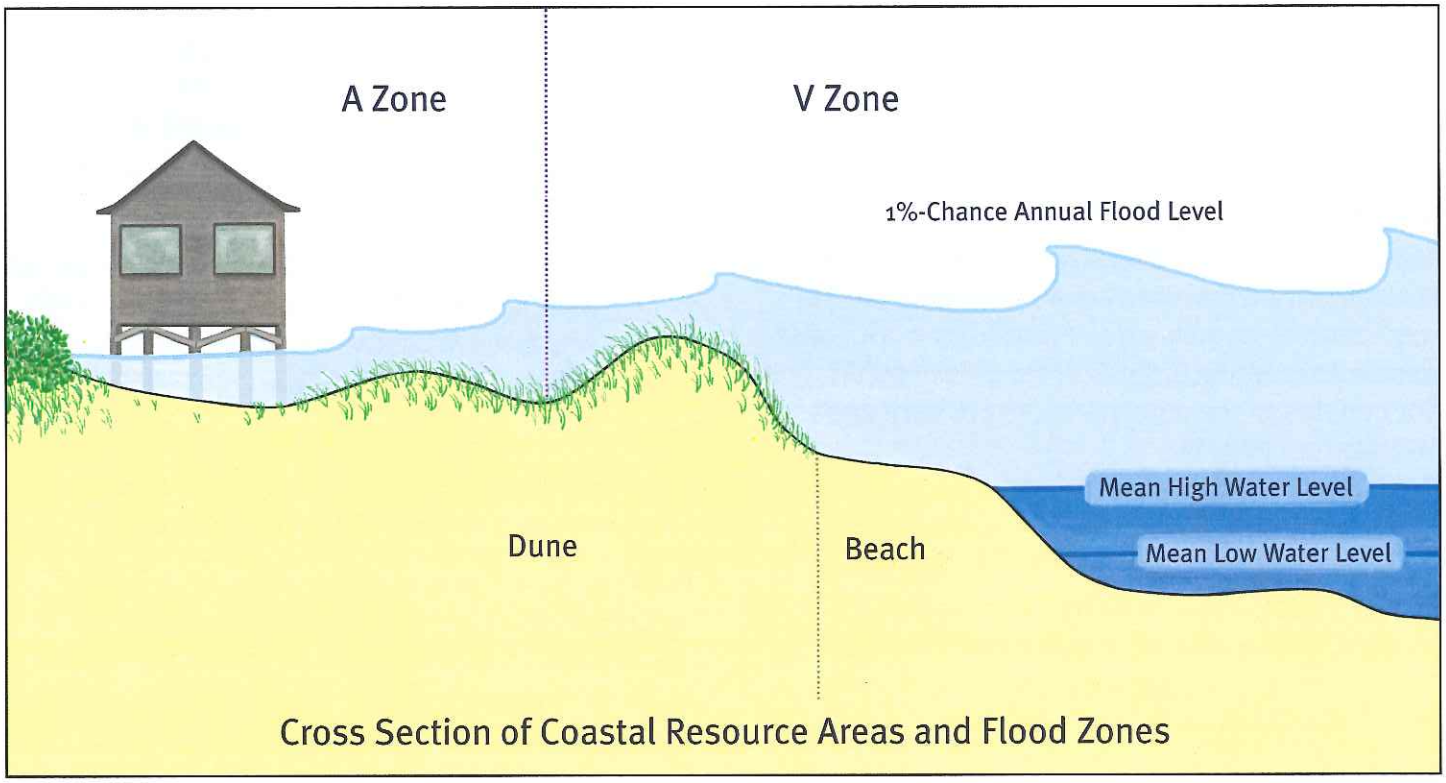
- Residential structures within A zones on FIRMs must be built with the lowest floors at or above the 1%-chance flood elevation and in accordance with the State Building Code [780 CMR R322].
- Structures in V zones should be elevated on piles or columns so that the lowest portion of the horizontal beams beneath the lowest floor is a minimum of two feet above the 1%-chance flood elevation [780 CMR R322; also see FEMA's *Coastal Construction Manual*].
- All structures within the floodplain affected by the 1%-chance flood must be certified by a Registered Professional Engineer for compliance with the State Building Code [780 CMR R322].
- New, expanded, or renovated structures in coastal dunes should be elevated on open pilings without footings [780 CMR R322].

Wetlands Protection Act (WPA) (www.mass.gov/dep/water/resources/wetlands.htm) - This law and its regulations (310 CMR 10.00) protect natural resource areas—including salt marshes, banks (also known as bluffs), dunes, beaches, and the coastal floodplain (also known as Land Subject to Coastal Storm Flowage in the regulations). These resource areas function to protect particular public interests, including helping to buffer and safeguard property from storm damage and flooding. Local Conservation Commissions implement the WPA and its regulations. MassDEP oversees WPA administration, develops regulations and policies, provides technical training to commissions, and hears appeals of decisions.

Who is subject to the WPA?
Anyone who proposes or undertakes an activity that will remove, fill, dredge, or alter (change the condition of) a bank, beach, dune, wetland, river, or floodplain; the area within 100 feet of banks, beaches, dunes, and wetlands; or the area within 200 feet of a river.

Key WPA requirements:

- New shoreline protection structures (e.g., revetments, seawalls, and bulkheads) are typically prohibited on all beaches and dunes. On coastal banks, hard structures are only allowed when necessary to protect buildings constructed before August 10, 1978, and only if no other alternative is feasible. When allowed, these structures must not: reduce the supply of sand and other sediment to down-current areas, increase sediment levels in channels and wetlands, negatively impact adjacent or nearby coastal beaches due to changes in



Cross Section of Coastal Resource Areas and Flood Zones

wave action, or otherwise increase adverse effects to neighbors. Where feasible, the use of non-structural measures, such as beach nourishment, is often more readily permitted by state and local authorities [310 CMR 10.25(5) & 10.27(3)&(4)].

- Any project on a coastal bank or within the area 100 feet landward of a bank shall not interfere with the bank's supply of sediment to down-drift locations and shall not adversely affect the stability of the bank itself [310 CMR 10.30(4)&(6)].
- Any project on a coastal dune or within the area 100 feet landward of a dune shall not affect the capacity of the dune to protect against storm or flood damage [310 CMR 10.28(3)].

Massachusetts Endangered Species Act (MESA) (www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/mass-endangered-species-act-mesa) - This law and its regulations [321 CMR 10.00] protect rare species and their habitats by prohibiting "take" of any plant or animal species listed as endangered, threatened, or of special concern by the Massachusetts Division of Fisheries & Wildlife. "Take" is defined as: "in reference to animals to harass, harm, pursue, hunt, shoot, hound, kill, trap, capture, collect, process, disrupt the nesting, breeding, feeding or migratory activity or attempt to engage in any such conduct, or to assist such conduct, and in reference to plants, means to collect, pick, kill, transplant, cut or process or attempt to engage or to assist in any such conduct. Disruption of nesting, breeding, feeding or migratory activity may result from, but is not limited to, the modification, degradation or destruction of Habitat."

Who is subject to MESA?
Unless otherwise exempt (see 321 CMR 10.14), anyone who proposes or undertakes an activity located within a Priority Habitat of Rare Species must file with the Division of Fisheries & Wildlife, Natural Heritage & Endangered Species Program for review and approval. This may include, but is not limited to, soil or vegetation alteration, grading, excavation, construction of buildings or structures, dock installation, dredging, beach nourishment, and bank stabilization. To determine if a project site is located within a designated Priority Habitat, see the Massachusetts Natural Heritage Atlas (www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/regulatory-maps-priority-and-estimated-habitats).

Key MESA requirements:

- NHESP is charged with reviewing any project or activity located within Priority Habitat to determine if it will result in Take of endangered, threatened, or special concern species. While some projects will not negatively impact state-listed species or their habitats, others must be

This concrete seawall was undermined by erosion and has failed. Repairs or reconstruction of this wall would likely require state permits under the Wetlands Protection Act and Chapter 91 Waterways regulations, federal U.S. Army Corps of Engineers permits, and possibly a permit under the local wetlands bylaw.

conditioned to avoid Take (e.g., timing restrictions, surveys, and project modifications). Those projects that do result in Take may only be permitted if they qualify for a Conservation & Management Permit [321 CMR 10.23].

- Each MESA review is specific to both the site and the proposed project. Thus, a project approval does not approve any or all projects at the site. A MESA Project Review Checklist Form is available under the "Regulatory Review" tab at www.mass.gov/nhesp.
- If a Notice of Intent is required under the Wetlands Protection Act regulations, the applicant has the option to streamline the WPA and MESA review. Search for "Notice of Intent Form" on MassDEP's website at www.mass.gov/dep.

Because these access structures are adjacent to rare species habitat, reconstruction may require a permit under the Massachusetts Endangered Species Act.

"Chapter 91" Waterways (www.mass.gov/dep/water/resources/waterway.htm) - The Massachusetts Chapter 91: Public Waterfront Act and its Waterways Regulations, [310 CMR 9.00] promote public access to private tidelands (i.e., the area between high and low tide), Commonwealth Tidelands (i.e., the area below mean low water), and filled former tidelands for uses that require direct access to the water and ensure that areas are maintained for public use and enjoyment when privately developed. The regulations require new or unlicensed structures on the waterfront (including piers, seawalls, marinas, and even some homes built on land areas which were previously "filled") to meet certain standards. Chapter 91 Waterways Regulations are implemented by MassDEP.

Who is subject to Chapter 91?
Anyone who dredges, fills, or builds, replaces, maintains, or changes the use of a structure that is in, on, over, or under tidal waters up to the mean high water line; anyone doing work on a structure located on man-made fill near tidal waters may also be subject to Chapter 91 requirements.

Key Chapter 91 requirements:

- Structures built on flowed or filled tidelands must be structurally sound and not pose an unreasonable threat to navigation, public health or safety, or adjacent structures if damaged or destroyed in a storm [310 CMR 9.37(1)].
- New buildings for human occupancy (except for marinas, ferry terminals, and other "water-dependent" uses) must be able to withstand a 1%-chance flood and should incorporate projected sea level rise over their design life. The documented relative sea level rise rate in Massachusetts is approximately one

foot rise for every 100 years. Therefore, elevating a building at least one foot above the required elevation can help account for this relative rise in sea levels.

- New or expanded residential structures in V zones may not be built seaward of mean high water [310 CMR 9.37(2)].
- Structures should not interfere with the public's right to fish, fowl, and navigate.

State Environmental Code Title 5: Septic Systems
(www.mass.gov/eea/agencies/massdep/water/wastewater/septic-systems-title-5.html) - Title 5, [310 CMR 15.000] provides for the protection of public health, safety, welfare, and the environment by requiring the proper siting, construction, upgrade, and maintenance of on-site sewage disposal systems and appropriate means for the transport and disposal of septage. Local Boards of Health implement Title 5 regulations. MassDEP oversees Title 5 administration, provides training and technical assistance, and hears certain appeals.

Who is subject to Title 5?
Anyone installing, replacing, reconstructing, repairing, expanding, or upgrading an on-site sewage treatment and disposal system.

Key Title 5 requirements:

- New septic tanks are generally not allowed in V zones of beaches, dunes, or barrier beaches or in a regulatory floodway. Replacement of septic tanks that existed prior to March 31, 1995, may be permitted in some cases when it is not feasible to move them out of the V zone or above the 1%-chance flood elevation [310 CMR 15.213(1)].
- Septic fields are generally not allowed in V zones of beaches, dunes, barrier beaches, or in a regulatory floodway. Exceptions exist for particular pre-existing buildings [310 CMR 15.213(2)].

Additional StormSmart Building Recommendations

- Use the best available information regarding the predicted extent and elevation of flooding, including draft revised Flood Insurance Rate Maps issued by FEMA, which are typically available at your Town Hall or on FEMA's Preliminary Flood Hazard Data webpage (http://floodmaps.fema.gov/prelim/index.htm).
- Elevate buildings above the height required by the Building Code to account for uncertainties inherent in flood mapping. See CZM's *StormSmart Coasts Fact Sheet #5 - Raise Your Home, Lower Your Monthly Payments: Protect Buildings and Reduce Monthly Expenses with Freeboard* (www.mass.gov/eea/docs/czm/stormsmart/ssc/ssc5-freeboard.pdf).
- Be aware of all available information regarding the vulnerability of your coastal property. See the StormSmart Coasts Assessing Vulnerability of Coastal Areas and Properties web page (www.mass.gov/eea/agencies/czm/program-areas/stormsmart-coasts/vulnerability).
- Choose erosion and shoreline management techniques that can effectively reduce erosion and storm damage while minimizing impacts to shoreline systems. See CZM's StormSmart Properties Fact Sheets for more information (www.mass.gov/czm/stormsmart-properties).
- Landscape coastal properties in and adjacent to the 1%-chance floodplain shown on the FIRMs to improve natural protection from storm damage and erosion. See CZM's Coastal Landscaping website and fact sheets (www.mass.gov/eea/agencies/czm/program-areas/stormsmart-coasts/coastal-landscaping).

The addition being constructed on this house is elevated above the flood elevation. Approvals under the State Building Code, Wetlands Protection Act regulations, Planning Board, and local wetlands bylaw were required for this project.

Additional Resources

- CZM's *Environmental Permitting in Massachusetts* (www.mass.gov/eea/agencies/czm/program-areas/federal-consistency-review/environmental-permitting-in-massachusetts.html).
- Massachusetts Division of Fisheries & Wildlife, Natural Heritage & Endangered Species Program data viewer for Priority/Estimated Habitat (www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/regulatory-maps-priority-and-estimated-habitats).
- CZM's StormSmart Coasts program (www.mass.gov/czm/stormsmart) - Specific references for coastal property owners include:
  - StormSmart Properties fact sheets, which provide strategies for property owners to reduce coastal erosion and storm damage while minimizing impacts to the shoreline and neighboring properties.
  - Assessing Vulnerability of Coastal Areas and Properties web page, which includes resources to identify areas of the Massachusetts coast most vulnerable to erosion and flooding, including shoreline change data, Flood Insurance Rate Maps, hurricane surge inundation maps, and maps depicting coastal inundation with sea level rise.
  - *Sea Level Rise: Understanding and Applying Trends and Future Scenarios for Analysis and Planning.*
  - *Massachusetts Homeowner's Handbook to Prepare for Coastal Hazards.*
- CZM's Massachusetts Ocean Resources Information System (MORIS) (www.mass.gov/czm/moris).
- FEMA's website at www.fema.gov includes the following publications:
  - *Coastal Construction Manual*, FEMA P-55.
  - Home Builder's Guide to Coastal Construction Technical Fact Sheet Series, FEMA P-499.
- FEMA Technical Bulletins, which provide guidance on meeting the building performance standards of the National Flood Insurance Program (www.fema.gov/plan/prevent/floodplain/techbul.shtm), including these two recommended bulletins:
  - *Openings in Foundation Walls and Walls of Enclosures*, Technical Bulletin-1 (www.fema.gov/media-library-data/20130726-1502-20490-9949/fema_tb_1__1_.pdf).
  - *Free-of-Obstruction Requirements*, Technical Bulletin 5 (www.fema.gov/media-library-data/20130726-1511-20490-9526/fema_tb_5.pdf).
- Association of State Floodplain Managers website (www.floods.org), which includes the following publications:
  - *No Adverse Impact Floodplain Management* (www.floods.org/index.asp?menuID=349&firstlevelmenuID=187&siteID=1).
  - *Coastal No Adverse Impact Handbook* (www.floods.org/index.asp?menuid=340&firstlevelmenuid=187&siteid=1).
  - *NAI in the Coastal Zone: Case Studies* (www.floods.org/index.asp?menuid=432&firstlevelmenuid=187&siteid=1).

Agency Contact Information

Board of Building Regulations and Standards (BBRS) -
www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/csl/building-codebbrs.html

Massachusetts Department of Environmental Protection (MassDEP) - www.mass.gov/eea/agencies/massdep

MassWildlife Natural Heritage & Endangered Species Program (NHESP) -
www.mass.gov/eea/agencies/dfg/dfw/natural-heritage

Massachusetts Office of Coastal Zone Management (CZM) - www.mass.gov/czm

Massachusetts Department of Conservation and Recreation (DCR), Flood Hazard Management Program - www.mass.gov/eea/agencies/dcr/water-res-protection/hazard-mitigation

Massachusetts Environmental Policy Act Unit (MEPA) - www.mass.gov/eea/agencies/mepa

Federal Emergency Management Agency (FEMA), Mitigation Division, Region I -
www.fema.gov/region-i-mitigation-risk-reduction-activities-methods

United States Army Corps of Engineers (USACE), New England District, Regulatory Division -
www.nae.usace.army.mil/Missions/Regulatory.aspx

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