

**AUDIT OF LAWS GOVERNING THE COASTAL REGION TO  
ENABLE AUTHORITIES TO TAKE APPROPRIATE ACTIONS TO  
PREPARE FOR COASTAL FLOOD RISKS**

**New Hampshire Department of Environmental Services  
FINAL REPORT – NOVEMBER 2018**

*Pursuant to Senate Bill 452 (Chapter 195, Laws of 2016)*

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## EXECUTIVE SUMMARY

Pursuant to Senate Bill 452 (Chapter 195, Laws of 2016), the New Hampshire Department of Environmental Services (NHDES) performed an audit of its statutory and regulatory authorities in order to determine any changes necessary to better prepare for projected coastal flood risks such as a storm surge, sea-level rise, and extreme precipitation. This report presents conceptual recommendations for changes to NHDES statutes and administrative rules to prepare for projected coastal flood risks, as well as cross-cutting recommendations to ensure coastal flood risks are consistently addressed across NHDES programs. In general, these recommendations call for amending minimum siting and design requirements for activities and facilities permitted by NHDES in areas subject to coastal flood risks, as well as the development of regularly updated uniform standards of guidance, the allowance of dynamic regulation to accommodate changing environmental conditions, and improved education and outreach to NHDES staff and local governments.

## INTRODUCTION

Senate Bill 452 (Chapter 195, Laws of 2016)<sup>1</sup> requires certain state agencies, including NHDES, the Department of Resources and Economic Development (DRED, formerly known as), the Department of Transportation (NHDT), and Fish and Game Department (NHFG), to conduct an audit of their existing state statutes, rules and agency policies governing state properties, projects, and actions in the coastal and Great Bay regions and determine any changes necessary to enable authorities to take appropriate actions to prepare for coastal flood risks such as storm surge, sea-level rise, and extreme precipitation. The law directs state agencies to use best-available projections of coastal flood risks such as those presented in the 2014 Coastal Risk and Hazards Commission Science and Technical Advisory Panel (STAP) report<sup>2</sup> (see summary in Appendix A) and to submit an interim and final report to the Governor and state legislature by November 1, 2017, and November 1, 2018, respectively.

The NHDES Coastal Program was awarded a grant from the National Oceanic and Atmospheric Administration to help coordinate agency implementation of Senate Bill 452 (Chapter 195, Laws of 2016). As part of this effort, NHDES resilience staff<sup>3</sup> developed a template approach for conducting agency audits (see Figure 1), provided support to other agencies upon request, and coordinated agency submission of interim reports to the New Hampshire General Court. In addition to this technical assistance, NHDES resilience staff completed an audit of NHDES statutes and administrative rules. The NHDES audit process and final recommendations are reported below.

## METHODS

Following the approach outlined in Figure 1 below, NHDES resilience staff reviewed NHDES statutes and administrative rules and drafted conceptual recommendations for changes to prepare for projected coastal flood risks, based on the findings of the 2014 STAP report (see Appendix A) and published best management practices. Feedback on the draft audit recommendations was then solicited from affected NHDES programs (see staff acknowledgements in Appendix B) and incorporated as part of this final report. Additional cross-cutting recommendations were also identified and are presented for the Department's consideration.

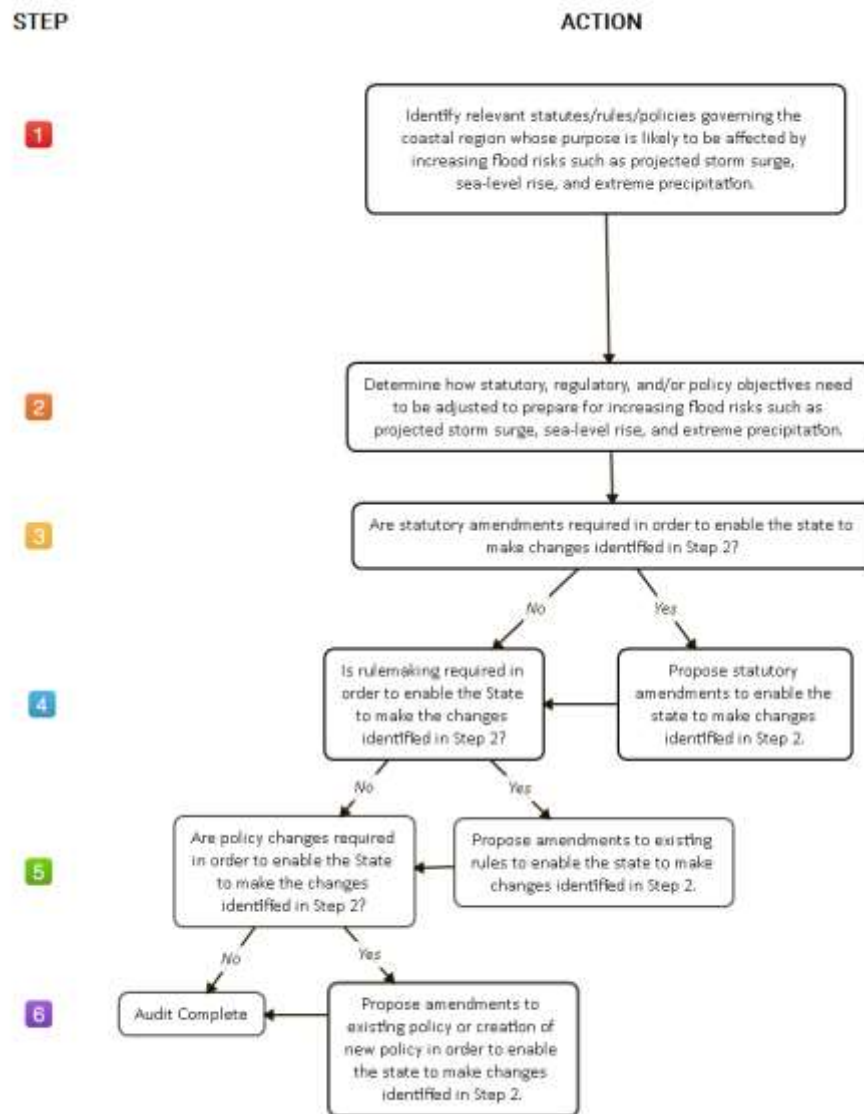
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<sup>1</sup> NH SB452 | 2016 | Regular Session. (2016, June 6). *LegiScan*. [https://legiscan.com/NH/text/SB452/id/1427001/New\\_Hampshire-2016-SB452-Chaptered.html](https://legiscan.com/NH/text/SB452/id/1427001/New_Hampshire-2016-SB452-Chaptered.html)

<sup>2</sup> New Hampshire Coastal Risk and Hazards Commission Science and Technical Advisory Panel (2014). *Sea-level Rise, Storm Surges, and Extreme Precipitation in Coastal New Hampshire: Analysis of Past and Projected Future Trends*. <http://www.nhcrhc.org/wp-content/uploads/2014-STAP-final-report.pdf>

<sup>3</sup> NHDES resilience staff involved in this effort include: Nathalie Morison (Coastal Resilience Specialist; New Hampshire Coastal Program, Water Division) and Sherry Godlewski (Adaptation and Resiliency Manager; Technical Services Bureau, Air Division)

Figure 1. Template Approach Developed by NHDES Staff for Conducting SB 452 Audits



## RECOMMENDATIONS

### *Recommended Changes to NHDES Statutes and Rules to Prepare for Projected Coastal Flood Risks*

Conceptual recommendations for changes to NHDES statutes and administrative rules to prepare for projected coastal flood risks are presented in Table 1 and Table 2 below. In general, these recommendations call for amending the minimum siting and design requirements for activities and facilities permitted by NHDES in areas subject to coastal flood risks such as storm surge, sea-level rise, and extreme precipitation. These recommendations are presented for consideration as part of future rulemaking efforts, recognizing that the proposed concepts will need to be further developed and vetted with stakeholders prior to initiating formal rulemaking processes to adopt any proposed amendments.

### *Cross-Cutting Department Recommendations*

In developing the conceptual recommendations to amend NHDES statutory and regulatory authorities, NHDES staff identified several cross-cutting issues and recommendations to ensure that coastal flood risks are consistently addressed across NHDES programs and incorporated into future amendments to NHDES statutes and administrative rules. In general, these cross-cutting recommendations call for the development of uniform standards of guidance, the allowance of dynamic regulation to accommodate changing environmental conditions, and continued education and outreach to NHDES staff and local governments. These cross-cutting recommendations were presented for consideration and potential adoption as policies and/or standard operation procedures.

- **Reference 2014 STAP report, as updated:** Any statutory, regulatory, and programmatic changes should comply with the requirement set forth in Senate Bill 452 (Chapter 195, Laws of 2016), Paragraph III, which stipulates that *“New Hampshire state agencies involved in planning, siting, and design of state-funded structures and facilities, public works projects, and transportation projects, as well as land acquisition and management and other environmental activities in the coastal and Great Bay regions of New Hampshire, shall reference the 2014 Coastal Risks and Hazards Commission report, “Sea-level Rise, Storm Surges, and Extreme Precipitation in Coastal New Hampshire: Analysis of Past and Projected Future Trends,” as updated, for guidance on all potentially affected activities. Agencies shall develop, as possible and appropriate, uniform standards of guidance, in conformity, as may be necessary due to federal actions.”*
- **Develop uniform standards of guidance:** Uniform standards of guidance should be developed in accordance with Senate Bill 452 (Chapter 195, Laws of 2016), Paragraph III, in order to help NHDES programs consistently incorporate projections of coastal flood risks in future statutory and regulatory amendments (see Appendix C for example guidance based on the findings in the 2014 STAP report). These uniform standards should be revised in conjunction with future updates to the 2014 STAP report, as required by RSA 483-B:22<sup>4</sup>, in order to account for best available science and emerging coastal flood risks (e.g., high tide flooding, groundwater rise, and changes in tidal hydrodynamics).
- **Allow for dynamic regulation:** Recognizing that environmental conditions are not static, and that NHDES is now required to supervise updates to the 2014 STAP report at least every five years pursuant to RSA 483-B:22<sup>5</sup>, NHDES programs have expressed a universal need for dynamic regulation in order incorporate best available science into their administrative rules. NHDES programs should be able to incorporate the 2014 STAP report, *as updated*, by reference into their respective administrative rules, however programs are currently limited from taking this dynamic approach due to JLCAR rule 201.01.
- **Enhance education of NHDES staff:** Throughout the audit process, NHDES programs expressed a lack of understanding of whether and how programs will be impacted by projected coastal flood risks and best management practices for addressing those impacts. Further explanation is needed to distinguish between the episodic flooding New Hampshire has experienced to date and the chronic, and in many cases permanent, nature of coastal flooding associated with sea-level rise. As a result, additional customized learning opportunities should be offered and required as part of the mandatory training for NHDES employees in order to enhance and normalize understanding of coastal flood risks, and other climate impacts, across NHDES staff.

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<sup>4</sup> NH Rev Stat Ann § 483-B: 22 (eff. 2017, July 1). Coastal and Great Bay Region Reports. <http://www.gencourt.state.nh.us/rsa/html/L/483-B/483-B-22.htm>

<sup>5</sup> Ibid.

- **Improve outreach to local governments:** While this audit has revealed several opportunities to better manage coastal flood risks within NHDES statutory and regulatory authorities, it is important to note that coastal development is largely regulated by local land use decisions. As a result, NHDES should continue and work to improve its communication with local governments in order to ensure that New Hampshire’s communities understand their vulnerabilities and develop flexible planning and zoning approaches to preemptively mitigate coastal flood risks.
- **Revisit and revise recommendations:** Given that climate science is continually evolving and our understanding of coastal vulnerability is constantly improving, the recommendations presented herein are only initial steps aimed at creating a Department that is more capable of preparing for projected coastal flood risks. It is likely that statutes, rules, and policies will need to be further evaluated and adjusted in the future as our understanding about flood risks improves.

Table 1. Conceptual Recommendations for Amending NHDES Statutory Authorities (RSA)

NHDES Statutory Authorities (RSA)		
Chapter	Title	Considerations for Managing Coastal Flood Risks
RSA 21-O	Department of Environmental Services	<ul style="list-style-type: none"> <li>N/A – Flood control among general functions of the department</li> </ul>
RSA 125-C	Air Pollution Control	<ul style="list-style-type: none"> <li>Existing rulemaking authority allows NHDES to amend requirements for prevention, control, abatement, and limitation of air pollution; however, NHDES could consider adding explicit language for areas subject to coastal flooding if deemed necessary.</li> </ul>
RSA 125-D	Acid Rain Control Act	<ul style="list-style-type: none"> <li>N/A</li> </ul>
RSA 125-I	Air Toxic Control Act	<ul style="list-style-type: none"> <li>N/A</li> </ul>
RSA 125-J	Emissions Reduction Trading Programs	<ul style="list-style-type: none"> <li>N/A</li> </ul>
RSA 125-M	Mercury Emissions Reduction and Control Program	<ul style="list-style-type: none"> <li>N/A</li> </ul>
RSA 125-N	Dioxin Emissions Reduction and Control Program	<ul style="list-style-type: none"> <li>N/A</li> </ul>
RSA 125-O	Multiple Pollutant Reduction Program	<ul style="list-style-type: none"> <li>N/A</li> </ul>
RSA 125-R	Outdoor Wood-Fired Hydronic Heaters (OWHHs)	<ul style="list-style-type: none"> <li>N/A - Existing rulemaking authority allows NHDES to amend setback requirements for OWHHs in areas subject to coastal flooding [125-R:3]</li> </ul>
RSA 125-S	Motor Vehicle Air Pollution Abatement (MVAPA)	<ul style="list-style-type: none"> <li>Should MVAPA funds to support low emission transportation options (e.g., electric vehicle charging infrastructure), coastal flood risk should be factored into location criteria. This would not necessitate a change to RSA language, but would be specified in project/grant criteria. Currently, these funds are not used for this purpose, but could be in the future.</li> </ul>
RSA 141-E	Asbestos Management and Control	<ul style="list-style-type: none"> <li>N/A - Existing rulemaking authority allows NHDES to amend rules relative to management of asbestos containing materials. If impacted by severe coastal flooding, an emergency would likely be declared and rules may be waived due to a shortage of available licensed contractors.</li> </ul>
RSA 146-A	Oil Discharge or Spillage in Surface Water or Groundwater	<ul style="list-style-type: none"> <li>N/A – Existing authority to adopt rules relative to procedures and equipment to be used in the removal or containment of oil</li> </ul>
RSA 146-C	Underground Storage Facilities	<ul style="list-style-type: none"> <li>N/A – Existing authority to adopt rules relative information required for registration of USTs; criteria for issuing permits, including minimum standards for new or repaired USTs; procedures for closure; criteria for approving plans for new facility construction and installation; procedures and criteria for responding to discharge; procedures for conducting tank testing; etc. [146-C:9]</li> </ul>
RSA 146-D	Oil Discharge and Disposal Cleanup Fund	<ul style="list-style-type: none"> <li>N/A</li> </ul>

NHDES Statutory Authorities (RSA)		
Chapter	Title	Considerations for Managing Coastal Flood Risks
RSA 147-A	Hazardous Waste Management	<ul style="list-style-type: none"> <li>N/A – Existing authority to adopt rules relative to storage, treatment, containerization, transportation, and disposal of hazardous wastes; criteria for determining the suitability of proposed hazardous waste facility sites; tank standards and operating procedures, etc. [147-A:3 (IV), (IX-a), (XIII)]</li> </ul>
RSA 147-B	Hazardous Waste Cleanup Fund	<ul style="list-style-type: none"> <li>N/A – Existing authority to adopt rules relative to criteria under which cleanup projects shall be conducted, including, but not limited to, the financial, contractual, safety, and education requirements [147-B:7]</li> </ul>
RSA 147-C	Hazardous Waste Facility Review	<ul style="list-style-type: none"> <li>N/A</li> </ul>
RSA 147-D	Hazardous Waste Fee	<ul style="list-style-type: none"> <li>N/A</li> </ul>
RSA 147-F	Brownfields Program	<ul style="list-style-type: none"> <li>N/A – Existing authority to adopt rules relative to criteria for remediation and site stabilization, long term oversight and monitoring of properties with residual contamination, etc. [147-F:18]</li> </ul>
RSA 149-M	Solid Waste Management	<ul style="list-style-type: none"> <li>N/A – Existing authority to adopt rules relative to siting, design, construction, operation, and closure of solid waste facilities [149-M:7]</li> </ul>
RSA 332-E	WWTP Operators and Water Distribution System Personnel	<ul style="list-style-type: none"> <li>N/A</li> </ul>
RSA 481	State Dams, Reservoirs and Other Water Conservation Projects	<ul style="list-style-type: none"> <li>N/A</li> </ul>
RSA 482	Dams, Mills, and Flowage	<ul style="list-style-type: none"> <li>N/A – Existing authority to adopt reasonable rules [482:87]</li> </ul>
RSA 482-A	Fill and Dredge in Wetlands	<ul style="list-style-type: none"> <li>N/A – Existing authority to adopt reasonable rules [482-A:11, I]</li> </ul>
RSA 482-B	New Hampshire Water Well Board	<ul style="list-style-type: none"> <li>N/A</li> </ul>
RSA 483	New Hampshire Rivers Management and Protection Program	<ul style="list-style-type: none"> <li>Consider prohibiting construction of any new solid waste facilities along tidal portions of protected river corridors in 0.2% annual-chance floodplain (currently only in effect for new landfills) or areas subject to projected coastal flood risks [483:9 (VI), 483:9-a (VII), 483:9-aa (VII), 483:9-b (VII)]</li> </ul>
RSA 483-A	New Hampshire Lakes Management and Protection Program	<ul style="list-style-type: none"> <li>N/A</li> </ul>
RSA 483-B	Shoreland Water Quality Protection Act	<ul style="list-style-type: none"> <li>Consider changes to nonconforming uses and structures to account for projected coastal flood risks [RSA 483-B:11]</li> </ul>
RSA 483-D	Winnepesaukee River Watershed	<ul style="list-style-type: none"> <li>N/A</li> </ul>
RSA 485	New Hampshire Safe Drinking Water Act	<ul style="list-style-type: none"> <li>N/A – Existing authority to adopt rules relative to siting/design of new public water systems, privately owned redistribution systems, and alterations for existing systems; operation and maintenance requirements; required treatment [485:1, 485:3, 485:8]</li> </ul>
RSA 485-A	Water Pollution and Waste Disposal	<ul style="list-style-type: none"> <li>Consider changes as needed to authorize recommended amendments to administrative rules for individual sewage disposal systems (see Env-Wq 1000).</li> </ul>



NHDES Statutory Authorities (RSA)		
Chapter	Title	Considerations for Managing Coastal Flood Risks
RSA 485-C	Groundwater Protection Act	▪ N/A
RSA 485-E	Southeast Watershed Alliance	▪ N/A
RSA 485-F	Administration of the Drinking Water and Groundwater Trust Fund	▪ N/A
RSA 486	Aid to Municipalities for Water Pollution Control	▪ N/A
RSA 486-A	Aid to Public Water Systems	▪ N/A
RSA 487	Control of Marine Pollution and Aquatic Growth	▪ N/A
RSA 488	Water Management	▪ N/A
RSA 489	Integrated Land Development Permit	▪ N/A – Suspended for biennium ending June 30, 2019
RSA 489-C	Salt Applicator Certification Option	▪ N/A

Table 2. Conceptual Recommendations for Amending NHDES Regulatory Authorities

NHDES Administrative Rules				
Chapter	Subject	Eff. Date	Exp. Date	Considerations for Managing Coastal Flood Risks
<b>Air Program Rules (Env-A)</b>				
Env-A 100	Organizational rules	06-30-1995	N/A	▪ Consider updating definitions to include projected coastal flood risks as needed as per below
Env-A 200	Procedural rules	09-25-2012	09-25-2022	▪ N/A
Env-A 300	Ambient Air Quality Standards	09-01-2012	09-01-2022	▪ N/A
Env-A 400	Acid Deposition Control Program	03-19-2013	03-19-2023	▪ N/A
Env-A 500	Standards for New/Modified Facilities	09-22-2017	09-22-2027	▪ Consider amending requirements for certain new or modified facilities in areas subject to coastal flooding [Env 501.01, Env-A 503]
Env-A 600	Statewide Permit System	09-01-2012	09-01-2022	▪ Consider amending requirements for permitted facilities in areas subject to coastal flooding
Env-A 700	Permit Fee System	04-26-2011	04-26-2019	▪ N/A
Env-A 800	Testing and Monitoring Procedures	10-31-2010	10-31-2018	▪ Consider adding explicit language requiring testing and monitoring following a coastal flooding event
Env-A 900	Owner/Operator Recordkeeping	07-18-2015	07-18-2025	▪ N/A
Env-A 1000	Open Source Air Pollution	05-01-2011	05-01-2019	▪ Consider adding explicit language to manage emergency debris burning following coastal flooding events [Env-A 1001.05]
Env-A 1100	Mobile Source Air Pollution	05-22-2013	05-22-2023	▪ N/A
Env-A 1200	Volatile Organic Compounds RACT	06-01-2011	06-01-2019	▪ N/A
Env-A 1300	Nitrogen Oxides RACT	10-31-2010	10-31-2018	▪ N/A

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<b>NHDES Administrative Rules</b>				
<b>Chapter</b>	<b>Subject</b>	<b>Eff. Date</b>	<b>Exp. Date</b>	<b>Considerations for Managing Coastal Flood Risks</b>
Env-A 1400	Regulated Toxic Air Pollutants	01-05-2018	01-05-2028	<ul style="list-style-type: none"> <li>Consider whether and how to further regulate facilities that store chemicals that may release air toxics during coastal flooding events</li> </ul>
Env-A 1500	Transportation Conformity	10-01-2011	10-01-2019	<ul style="list-style-type: none"> <li>N/A – Amendments to the Clean Air Act would be necessary to change transportation conformity regulations [Env-A 1503.06]; however NHDES could consider taking advantage of the interagency consultation process required by 40 CFR §93.105 to ensure that projected coastal flood risks have been considered in transportation project design</li> </ul>
Env-A 1600	Fuel Specifications	09-24-2013	09-24-2023	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 1700	Permit Application Forms	10-01-2011	10-01-2019	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 1800	Asbestos Management and Control	05-05-2017	05-05-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 1900	Incinerators and Wood Waste Burners	04-23-2013	04-23-2023	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 2000	Fuel Burning Devices	09-24-2013	09-24-2023	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 2100	Particulates and Visible Emissions	04-23-2013	04-23-2023	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 2300	Mitigation of Regional Haze	01-08-2011	01-08-2019	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 2400	Ferrous/Non-Ferrous Operators	04-23-2013	04-23-2023	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 2700	Hot Mix Asphalt Plants	02-16-2013	02-16-2023	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 2800	Sand/Gravel, Cement/Concrete Sources	10-01-2010	10-01-2018	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 2900	SO <sub>2</sub> and NO <sub>x</sub> Budget Trading/Banking	10-01-2011	10-01-2019	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 3000	Emissions Reduction Credits Trading	01-21-1997	Exempt	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 3100	Discrete Emissions Trading Program	01-21-1997	Exempt	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 3200	NO <sub>x</sub> Budget Trading Program	01-01-2016	01-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 3300	Municipal Waste Combustion	07-18-2016	07-18-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 4100	VOC Content of Consumer Products	02-26-2014	02-26-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 4200	VOC Content of AIM Coatings	01-01-2015	01-01-2025	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 4300	Other Solid Waste Incineration	01-22-2015	01-22-2025	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 4600	CO <sub>2</sub> Budget Trading Program	01-01-2014	01-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 4700	CO <sub>2</sub> Offset Projects	01-01-2014	01-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-A 4800	CO <sub>2</sub> Allowance Auction Program	01-01-2014	01-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<b>Council and Board Rules</b>				
Env-AC 200	Air Resources Council Procedural Rules	01-25-2005	N/A	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-WMC 200	Waste Mgmt. Council Procedural Rules	01-24-2004	N/A	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-WC 100-200	Water Council Org. & Procedural Rules	09-14-2007	N/A	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-WtC 100-200	Wetlands Council Org. & Procedural Rules	12-30-2005	N/A	<ul style="list-style-type: none"> <li>N/A</li> </ul>
We 100-200	Water Well Board Org. & Procedural Rules	06-13-2008	N/A	<ul style="list-style-type: none"> <li>N/A</li> </ul>

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NHDES Administrative Rules				
Chapter	Subject	Eff. Date	Exp. Date	Considerations for Managing Coastal Flood Risks
We 300	License Requirements, Qualifications, Fees, and Application Procedures	03-01-2017	03-01-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
We 400	License Renewal	03-01-2017	03-01-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
We 500	Ethical Standards	03-01-2017	03-01-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
We 600	Standards for the Construction, Maintenance, Abandonment of Wells	03-01-2017	03-01-2027	<ul style="list-style-type: none"> <li>Consider updating standards for consistency if changes are made to public water system requirements [Env-Dw 300-400]</li> <li>Consider regulating coastal areas differently to account for projected coastal flood risks</li> </ul>
We 700	Standards for the Installation, Maintenance, Repair, Replacement of Pumps	03-01-2017	03-01-2027	<ul style="list-style-type: none"> <li>Consider updating these standards for consistency if changes are made to public water system requirements [Env-Dw 400]</li> <li>Consider regulating coastal areas differently to account for projected coastal flood risks</li> </ul>
We 800	Well Completion Report	03-01-2017	03-01-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
We 900	Administrative Fines	03-01-2017	03-01-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
We 1000	Registry of Complaints	03-01-2017	03-01-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Hazardous Waste Rules (Env-Hw)				
Env-Hw 100	Organizational Rules	08-14-2017	N/A	<ul style="list-style-type: none"> <li>Consider updating definitions to include projected coastal flood risks as needed as per below</li> </ul>
Env-Hw 200	Procedural Rules	08-14-2017	08-14-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Hw 300	Permits	08-14-2017	08-14-2027	<ul style="list-style-type: none"> <li>Consider amending siting requirements for existing [Env-Hw 304.08] and new facilities [Env-Hw 304.09] to account for projected coastal flood risks</li> <li>Consider requiring an assessment of coastal flood risks, including but not limited to potential sea-level rise induced groundwater rise, as part of the hydrogeological analysis required for standard and transfer facility permits [Env-Hw 304.11(8)]</li> <li>Consider amending transportation impact and safety analysis requirements to assess the vulnerability of coastal transportation routes to projected coastal flood risks [Env-Hw 304.18(d)]</li> </ul>
Env-Hw 400	Identification & Listing of Hazardous Wastes	08-14-2017	08-14-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Hw 500	Requirements for Generators	08-14-17	08-14-2027	<ul style="list-style-type: none"> <li>Consider amending storage requirements for generators located in areas subject to coastal flood risks [Env-Hw 507]</li> <li>Consider amending contingency plan requirements for generators located in areas subject to coastal flood risks [Env-Hw 509.02(a)(5)]</li> </ul>
Env-Hw 600	Requirements for Transporters	08-14-17	08-14-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>

NHDES Administrative Rules				
Chapter	Subject	Eff. Date	Exp. Date	Considerations for Managing Coastal Flood Risks
Env-Hw 700	Requirements for Facility Owners/Operators	08-14-17	08-14-2027	<ul style="list-style-type: none"> <li>Consider amending facility requirements to account for projected coastal flood risks [Env-Hw 702, 707-708]</li> </ul>
Env-Hw 800	Requirements for Recycling	08-14-17	08-14-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Hw 900	Inspections/Enforcement	08-14-17	08-14-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Hw 1000	Hazardous Waste Cleanup (HWC) Fund	08-14-17	08-14-2027	<ul style="list-style-type: none"> <li>Consider including language on Household Hazardous Waste (HHW) grant application to identify if the proposed HHW event is located in an area subject to coastal flooding and ensure that it is not held during coastal flooding events [Env-Hw 1003.05]</li> </ul>
Env-Hw 1100	Universal Waste	08-14-17	08-14-2027	<ul style="list-style-type: none"> <li>Consider amending contingency plan requirements for very large quantity handlers to account for projected coastal flood risks [Env-Hw 1105.05]</li> </ul>
Env-Hw 1200	Land Disposal Restrictions	08-14-17	08-14-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Oil & Remediation Program Rules (Env-Or)				
Env-Or 300	Aboveground Petroleum Storage Facilities	02-07-2014	02-07-2024	<ul style="list-style-type: none"> <li>Consider updating definitions to include projected coastal flood risks as needed per below</li> <li>Consider amending equipment standards [Env-Or 305]; operating, testing, and inspection requirements [Env-Or 306]; and installation requirements [Env-Or 307] for aboveground storage tanks (ASTs) located in areas subject to projected coastal flood risks</li> </ul>
Env-Or 400	Underground Storage Tank (UST) Facilities	09-01-2013	09-01-2023	<ul style="list-style-type: none"> <li>Consider updating definitions to include projected coastal flood risks as needed per below</li> <li>Consider amending equipment standards [Env-Or 405]; operation, maintenance, and testing requirements [Env-Or 406]; and installation requirements for USTs located in areas subject to coastal flood risks, including sea-level rise induced groundwater rise</li> </ul>
Env-Or 500	Recovery of Gasoline Vapors	11-17-2012	11-17-2022	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Or 600	Contaminated Site Management	06-01-2015	06-01-2025	<ul style="list-style-type: none"> <li>N/A – Remedial alternatives are evaluated and selected based on appropriateness in achieving cleanup standards. New information including any pertinent flood-related information would be considered in the selection of the remedial strategy for any site, if appropriate.</li> </ul>
Env-Or 700	Groundwater Release Detection Permits	06-01-2015	06-01-2025	<ul style="list-style-type: none"> <li>N/A</li> </ul>

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Env-Or 800	Brownfields Program Under RSA 147-F	06-01-2015	06-01-2025	<ul style="list-style-type: none"> <li>N/A –U.S. Environmental Protection Agency currently requires brownfield grant recipients to evaluate potential climate change impacts to remedial options as part of an Analysis of Brownfield Cleanup Alternatives (ABCA)</li> </ul>
<b>Solid Waste Rules (Env-Sw)</b>				
Env-Sw 100	Purpose, Applicability, and Definitions	10-28-2005	N/A	<ul style="list-style-type: none"> <li>Consider updating definitions to include projected coastal flood risks as needed as per below</li> <li>Consider defining “facilities vulnerable to projected coastal flood risks,” referencing published vulnerability assessment if available</li> </ul>
Env-Sw 200	Procedures	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 300	Permits	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 400	CST Facility Requirements	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 500	Processing/Treatment Facility Requirements	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 600	Composting Facility Requirements	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 700	Incineration Facility Requirements	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 800	Landfill Requirements	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>In addition to suggested consideration for Env-Sw 1002.05 below, consider amending siting requirements for landfills to prohibit siting of landfills in areas vulnerable to projected coastal flood risks <i>[Env-Sw 804]</i></li> </ul>
Env-Sw 900	Management of Certain Wastes	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 1000	Universal Facility Requirements	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>Consider amending universal facility requirements, which apply to all facilities, to require that vulnerable facilities protect all waste storage, handling, and disposal areas from projected coastal flood risks <i>[Env-Sw 1002.05]</i></li> </ul>
Env-Sw 1100	Additional Facility Requirements	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 1200	Permit by Notification Facility Requirements	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 1300	Grants for Landfill and Incinerator Closure	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 1400	Financial Assurance	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 1500	Certification of Waste-Derived Products	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 1600	Facility Operator Training and Certification	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 1700	Land Application of Wood Ash	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 1800	Reduction of Toxics in Packaging	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 2000	Inspections	07-01-2014	07-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Sw 2100	Asbestos Disposal Sites Not Operated After July 1, 1981	09-01-2018	09-01-2028	<ul style="list-style-type: none"> <li>N/A</li> </ul>

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<b>Dam Program &amp; Related Rules (Env-Wr)</b>				
Env-Wr 100	Organizational Rules	01-22-2014	N/A	<ul style="list-style-type: none"> <li>Consider updating definitions to include projected coastal flood risks as needed per below</li> <li>Consider changing “100-Year Flood” to “1-percent annual chance flood” along with all subsequent references</li> </ul>
Env-Wr 200	Procedures	01-22-2014	N/A	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wr 300	Existing Dams	01-22-2014	01-22-2024	<ul style="list-style-type: none"> <li>Consider reevaluating all references to ensure that they remain appropriate for their purposes; include language, where appropriate, to stipulate that updated versions of the same references will apply</li> </ul>
Env-Wr 400	Constructing or Reconstructing a Dam	01-22-2014	01-22-2024	<ul style="list-style-type: none"> <li>Consider reevaluating all references to ensure that they remain appropriate for their purposes; include language, where appropriate, to stipulate that updated versions of the same references will apply</li> <li>Consider changing references for obtaining precipitation estimates to reflect best available data [Env-Wr 403.05]</li> <li>Consider reassessing current design requirements and determine whether changes are necessary to accommodate for projected increases in precipitation risks</li> </ul>
Env-Wr 500	Emergency Action Plans	01-22-2014	01-22-2024	<ul style="list-style-type: none"> <li>Consider reevaluating all references to ensure that they remain appropriate for their purposes; include language, where appropriate, to stipulate that updated versions of the same references will apply</li> </ul>
Env-Wr 600	Removal of Dams	01-22-2014	01-22-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wr 700	Lake Level Determinations	01-22-2014	01-22-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wr 900	Official List of Public Waters	09-24-2013	09-24-2023	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<b>Wetlands Rules (Env-Wt) Note: audit completed for public review draft available at: <a href="https://www.des.nh.gov/organization/divisions/water/wetlands/process-improvement.htm">https://www.des.nh.gov/organization/divisions/water/wetlands/process-improvement.htm</a></b>				
Env-Wt 100	Definitions; Access to Records	N/A	N/A	<ul style="list-style-type: none"> <li>Consider changing “100-year floodplain” to “1-percent annual chance floodplain” [Env-Wt 102.01]</li> </ul>
Env-Wt 200	Rules of Practice and Procedure	N/A	N/A	<ul style="list-style-type: none"> <li>N/A</li> </ul>

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Env-Wt 300	Permits and Other Authorizations; Conditions Applicable to All Work in Jurisdictional Areas	N/A	N/A	<ul style="list-style-type: none"> <li>▪ Consider adding cross-reference to sea-level rise and storm surge data required for standard permit projects in coastal areas under Env-Wt 603 [Env-Wt 311.01]</li> <li>▪ Consider adding reference to sea-level rise and storm surge data requirements in addition to existing references to sand dunes and areas within 100 feet of HOTL [Env-Wt 311.05 (a)(14)]</li> <li>▪ Consider making language consistent with Env-Wt 600 which references a “Coastal Functional Assessment” [Env-Wt 311.10]</li> <li>▪ Consider adding reference to flood protection that salt marshes and tidal wetland buffer provide [Env-Wt 314.04 (b)]</li> </ul>
Env-Wt 400	Delineation and Classification of Jurisdictional Areas; Classification of Projects	N/A	N/A	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>
Env-Wt 500	Project-Specific Requirements	N/A	N/A	<ul style="list-style-type: none"> <li>▪ Consider requiring sea-level rise and salt migration maps for public highway sites in addition to the salt marsh edge [Env-Wt 532.03 (f)]</li> <li>▪ Consider adding requirement for public highway designs to describe how sea-level rise projections are anticipated and accommodated for (if necessary) [Env-Wt 532.04]</li> <li>▪ Consider adding requirement for public highway designs to consider expected changes in precipitation; consider referencing NHCRHC STAP report (2014) as guidance [Env-Wt 532.04]</li> </ul>

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Env-Wt 600	Coastal Lands and Tidal Waters/Wetlands	N/A	N/A	<ul style="list-style-type: none"> <li>▪ Consider defining sea-level rise and storm surge [<i>Env-Wt 602</i>]</li> <li>▪ Consider requiring data screening to include sea-level rise and salt marsh migration pathways, as well as 1% annual chance floodplain locations [<i>Env-Wt 603.03</i>]</li> <li>▪ Consider requiring standard permit applications to conduct a vulnerability assessment, separate from the Coastal Functional Assessment, which involves identifying the appropriate sea-level rise scenario for the project and describing how the project will consider and address sea-level rise and associated changes to storm surge; reference the NHCRHC STAP report (2014) as guidance [<i>Env-Wt 603.05</i>]</li> <li>▪ Consider providing incentives for living shoreline approaches to shoreline stabilization, habitat restoration, and research that focuses on making shorelines and wetland resources more resilient to climate change impacts</li> </ul>
Env-Wt 700	Prime Wetlands	N/A	N/A	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>
Env-Wt 800	Compensatory Mitigation	N/A	N/A	<ul style="list-style-type: none"> <li>▪ Consider adding references to tidal resources throughout Chapter, with specific emphasis on the need for tidal wetlands projects to consider sea-level rise in proposals and show how conserved, restored, or created resource projects will account for projected future changes.</li> </ul>
Env-Wt 900	Stream Crossings; Certified Culvert Maintainer Program	N/A	N/A	<ul style="list-style-type: none"> <li>▪ Consider requiring consideration of potential changes in design storm flows based on projected changes in precipitation patterns.</li> <li>▪ Consider adding “tide gates” as regulated structures</li> <li>▪ Consider referencing the NHCRHC STAP Report (2014) as guidance.</li> </ul>
Drinking Water & Related Rules (Env-Dw)				
Env-Dw 100	Public Water Systems (PWS): Purpose and Applicability; Use of Federal Terms; Special Provisions for Political Subdivisions	06-01-2014	06-01-2024	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>
Env-Dw 200	Rule Waivers; Confidential Business Information; Hearing Procedures	06-01-2014	06-01-2024	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>
<u>Env-Dw 300</u>	<u>Sources of Water</u>			
Env-Dw 301	Definitions	04-01-2016	04-01-2026	<ul style="list-style-type: none"> <li>▪ Consider updating definitions to include projected coastal flood risks as needed per below</li> </ul>



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Env-Dw 302	Large Production Wells and Wells for Large Community Water Systems (CWS)	04-01-2016	04-01-2026	<ul style="list-style-type: none"> <li>Consider updating required flood information and maps (including 0.2% annual chance flood)</li> <li>Consider regulating coastal areas differently to account for projected coastal flood risks</li> </ul>
Env-Dw 303	Groundwater Sources of Bottled Water	04-01-2016	04-01-2026	<ul style="list-style-type: none"> <li>Consider updating required flood information and maps (including 0.2% annual chance flood)</li> <li>Consider regulating coastal areas differently to account for projected coastal flood risks</li> </ul>
Env-Dw 304	Emergency Bulk Water Supply for PWS	01-01-2018	01-01-2028	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Dw 305	Small Production Wells for Small CWS	04-01-2016	04-01-2026	<ul style="list-style-type: none"> <li>Consider updating required flood information and maps (including 0.2% annual chance flood)</li> <li>Consider regulating coastal areas differently to account for projected coastal flood risks</li> </ul>
<u>Env-Dw 400</u>	<u>Public Water Classification and Design</u>			
Env-Dw 401	PWS Classification; Well Siting Requirements; Hydrogeologic and Engineering Studies	06-01-2014	06-01-2024	<ul style="list-style-type: none"> <li>Consider updating required flood information and maps (including 0.2% annual chance flood)</li> <li>Consider regulating coastal areas differently to account for projected coastal flood risks</li> </ul>
Env-Dw 402	General Design Standards: Systems Serving 1,000 or More People	06-01-2014	06-01-2024	<ul style="list-style-type: none"> <li>Consider updating reference to "<a href="#">Recommended Standards for Water Works (2012)</a>" [Env-Dw 402.01 (a)]</li> </ul>
Env-Dw 403	Coatings, Additives, and Lead Prohibition	06-01-2014	06-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Dw 404	Design Standards for Large PWS	06-01-2014	06-01-2024	<ul style="list-style-type: none"> <li>Consider updating reference to "<a href="#">Recommended Standards for Water Works (2012)</a>" [Env-Dw 404.01 (a)]</li> <li>Consider regulating coastal areas differently to account for projected coastal flood risks</li> </ul>
Env-Dw 405	Design Standards for Small CWS	06-01-2014	06-01-2024	<ul style="list-style-type: none"> <li>Consider updating required flood information and maps (including 0.2% annual chance flood)</li> <li>Consider regulating coastal areas differently to account for projected coastal flood risks</li> </ul>
Env-Dw 406	Design Standards for Non-CWS	06-01-2014	06-01-2024	<ul style="list-style-type: none"> <li>Consider updating required flood information and maps (including 0.2% annual chance flood)</li> <li>Consider regulating coastal areas differently to account for projected coastal flood risks</li> </ul>

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Env-Dw 407	Standards Adopted by Reference	06-01-2014	06-01-2024	▪ Consider updating all references to latest available versions
<u>Env-Dw 500</u>	<u>Operation and Maintenance</u>			
Env-Dw 501	Permit to Operate	06-20-2017	06-20-2027	▪ N/A
Env-Dw 502	Certification of Water Works Operators	08-19-2017	08-19-2027	▪ N/A
Env-Dw 503	PWS General Operational Requirements	12-03-2013	12-03-2023	▪ Consider requiring that emergency plans for CWS located in coastal areas address how systems will respond to projected coastal flood risks [ <i>Env-Dw 503.21</i> ]
Env-Dw 504	PWS Maintenance Requirements	12-03-2013	12-03-2023	▪ N/A
Env-Dw 505	Backflow Prevention	06-01-2014	06-01-2024	▪ N/A
Env-Dw 506	Seasonal Public Water Systems	02-01-2015	02-01-2025	▪ N/A
Env-Dw 600	Capacity Assurance	07-26-2016	07-26-2026	▪ N/A
<u>Env-Dw 700</u>	<u>Water Quality: Standards, Monitoring, Treatment, Compliance, and Reporting</u>			
Env-Dw 701	Purpose and Applicability; Units of Measure; Definitions	05-01-2010	05-01-2018	▪ N/A
Env-Dw 702	Microbiological MCSs and MCLGs	05-01-2010	05-01-2018	▪ N/A
Env-Dw 703	Radionuclide Contaminant MCLs and MCLGs	05-01-2010	05-01-2018	▪ N/A
Env-Dw 704	Regulated Inorganic Chemical Contaminant MCLs and MCLGs	05-01-2010	05-01-2018	▪ N/A
Env-Dw 705	Regulated Organic Chemical Contaminant MCLs and MCLGs	05-01-2010	05-01-2018	▪ N/A
Env-Dw 706	Regulated Secondary MCLs (SMCLs)	05-01-2010	05-01-2018	▪ N/A
Env-Dw 707	General Monitoring Requirements; Laboratory Analytical Methods	05-01-2010	05-01-2018	▪ N/A
Env-Dw 708	Sampling Schedules	05-01-2010	05-01-2018	▪ N/A
Env-Dw 709	Monitoring for Microbiological Contaminants	02-01-2015	02-01-2025	▪ N/A
Env-Dw 710	Monitoring for Radionuclides	05-01-2010	05-01-2018	▪ N/A
Env-Dw 711	Monitoring for Inorganic Chemicals	05-01-2010	05-01-2018	▪ N/A
Env-Dw 712	Monitoring for Organics	05-01-2010	05-01-2018	▪ N/A
Env-Dw 713	Monitoring for Secondaries	05-01-2010	05-01-2018	▪ N/A
Env-Dw 714	Control of Lead and Copper	05-23-2017	05-23-2027	▪ N/A

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Env-Dw 715	Disinfection Residuals, Byproducts, and Byproduct Precursors	01-01-2010	01-01-2018*	<i>Note: Audit completed for Initial Proposal – Fixed Text dated 11-29-17</i> ▪ N/A
Env-Dw 716	Filtration, Disinfection, and Waste Recycling	01-01-2010	01-01-2018*	<i>Note: Audit completed for Initial Proposal – Fixed Text dated 11-29-17</i> ▪ N/A
Env-Dw 717	Groundwater Monitoring and Treatment	11-21-2009	11-21-2017*	<i>Note: Audit completed for Final Proposal – Fixed Text dated 03-05-18</i> ▪ N/A
Env-Dw 718	Recordkeeping Requirements	06-01-2014	06-01-2024	▪ N/A
Env-Dw 719	Reporting Monitoring Data	05-01-2010	05-01-2018	▪ N/A
Env-Dw 720	Inspections; Significant Deficiencies; Assessments	02-01-2015	02-01-2025	▪ N/A
Env-Dw 721	Exemptions	06-01-2014	06-01-2024	▪ N/A
Env-Dw 722	BAT and Treatment Techniques	06-01-2014	06-01-2024	▪ N/A
Env-Dw 723	Non-Central Treatment	06-01-2014	06-01-2024	▪ N/A
Env-Dw 800	Public Notification by PWS	06-30-2010	06-30-2018	▪ N/A
<u>Env-Dw 900</u>	<u>Protection of Water Sources</u>			
Env-Dw 901	Groundwater Reclassification	12-19-2014	12-19-2024	▪ N/A
Env-Dw 902	Protecting the Purity of Surface Water Sources of Drinking Water	05-20-2014	05-20-2024	▪ N/A
<u>Env-Dw 1000</u>	<u>Grants for Public Water Systems</u>			
Env-Dw 1001	Grants for Surface Water Treatment, Regional Water Systems, and Groundwater Investigations	06-01-2014	06-01-2024	▪ N/A
Env-Dw 1002	Water Supply Land Protection Grant Program	01-01-2018	01-01-2028	▪ N/A
<u>Env-Dw 1100</u>	<u>Drinking Water State Revolving Loan Fund</u>			
Env-Dw 1101	Purpose; Applicability; Use of Standard Terms	01-24-2015	01-24-2025	▪ N/A
Env-Dw 1102	Chapter Specific Definitions	01-24-2015	01-24-2025	▪ N/A
Env-Dw 1103	Establishment of DWSRF	01-24-2015	01-24-2025	▪ N/A
Env-Dw 1104	Eligibility and Application Requirements	01-24-2015	01-24-2025	▪ N/A
Env-Dw 1105	Project Prioritization; Intended Use Plans	01-24-2015	01-24-2025	▪ N/A
Env-Dw 1106	Financial Assistance; Payments; Accounting	01-24-2015	01-24-2025	▪ N/A
Env-Dw 1107	Environmental Review	01-24-2015	01-24-2025	▪ N/A

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Env-Dw 1108	Design, Construction, Implementation Phases	01-24-2015	01-24-2025	▪ N/A
Env-Dw 1109	Waivers	01-24-2015	01-24-2025	▪ N/A
Env-Dw 1200	Privately Owned Redistribution Systems	02-24-2010	02-24-2018*	<i>Note: Audit completed for Initial Proposal – Fixed Text dated 01-09-18</i> ▪ N/A
<i>Env-Dw 1300</i>	<i>Drinking Water &amp; GW Trustfund (on hold)</i>			
Water Quality / Quantity Rules (Env-Wq)				
<u>Env-Wq 300</u>	<u>Surface Water Protection</u>			
Env-Wq 301	State Surface Water Discharge Permits	05-22-2013	05-22-2023	▪ N/A
<i>Env-Wq 302</i>	<i>Water Quality Certification (in progress)</i>			▪ N/A
<i>Env-Wq 303</i>	<i>Reserved</i>			▪ N/A
Env-Wq 304	Certification of WWTP Operators	08-01-2013	08-01-2023	▪ N/A
Env-Wq 305	Pretreatment of Industrial Wastewater	08-01-2013	08-01-2023	▪ N/A
Env-Wq 306	Management of Mercury Amalgam	08-01-2013	08-01-2023	▪ N/A
<u>Env-Wq 400</u>	<u>Groundwater Protection</u>			
Env-Wq 401	BMPs for GW Protection	05-19-2015	05-19-2025	▪ N/A
Env-Wq 402	GW Discharge Permits and Registrations	03-01-2016	03-01-2026	▪ Consider updating vulnerability assessment requirement for new or expanded facilities to include assessment of projected coastal flood risks <i>[Env-Wq 402.15 (n)(4)]</i>
Env-Wq 403	Large Groundwater Withdrawals	03-21-2018	03-21-2028	▪ N/A
Env-Wq 404	Underground Injection	12-23-2010	12-23-2018	▪ N/A
<i>Env-Wq 405</i>	<i>Geothermal Systems (in progress)</i>			
<u>Env-Wq 500</u>	<u>Clean Water State Revolving Fund</u>			
Env-Wq 501	Purpose and Applicability	12-01-2015	12-01-2025	▪ N/A
Env-Wq 502	Definitions	12-01-2015	12-01-2025	▪ Consider updating definitions to include projected coastal flood risks as needed per below
Env-Wq 503	Establishment of CWSRF	12-01-2015	12-01-2025	▪ N/A
Env-Wq 504	Use of CSWRF; Eligible Projects and Costs	12-01-2015	12-01-2025	▪ Consider continuing to promote resilient wastewater infrastructure projects as eligible project type <i>[Env-Wq 504.02]</i>
Env-Wq 505	Establishing Priority for Funding	12-01-2015	12-01-2025	▪ Consider continuing to prioritize projects that reduce projected coastal flood risks / enhance coastal resilience <i>[Env-Wq 505.02 (a)]</i>
Env-Wq 506	Procedures for Receipt of CWSRF Funds	12-01-2015	12-01-2025	▪ N/A

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Env-Wq 507	Financial Assistance; Payments; Accounting	12-01-2015	12-01-2025	<ul style="list-style-type: none"> <li>▪ Provided sufficient subsidy is available, consider continuing to offer principal forgiveness for planning and asset management projects, including but not limited to, efforts to build coastal resilience</li> </ul>
Env-Wq 508	Environmental Review	12-01-2015	12-01-2025	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>
Env-Wq 509	Procurement of Engineering Services	12-01-2015	12-01-2025	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>
Env-Wq 510	Design, Construction, Implementation Phases	12-01-2015	12-01-2025	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>
Env-Wq 511	Waivers	12-01-2015	12-01-2025	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>
<u>Env-Wq 700</u>	<u>Standards of Design and Construction for Sewerage and Wastewater Treatment Facilities</u>			
Env-Wq 701	Purpose and Applicability	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>
Env-Wq 702	Definitions	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ Consider updating definitions to include projected coastal flood risks as needed per below</li> </ul>
Env-Wq 703	Engineering Design Documents	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ At minimum and where appropriate, consider incorporating latest relevant updates to NEIWPC TR-16 Guides for the Design of Wastewater Treatment Works, including but not limited to the 2011 edition as revised in 2016, which accounts for flood risks</li> </ul>
Env-Wq 704	Design of Sewerage	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ See proposed consideration for Env-Wq 703</li> </ul>
Env-Wq 705	Sewage Pump Stations	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ See proposed consideration for Env-Wq 703</li> </ul>
Env-Wq 706	Siting of WWTPs	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ See proposed consideration for Env-Wq 703</li> </ul>
Env-Wq 707	Basis of Design Reports for WWTPs	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ See proposed consideration for Env-Wq 703</li> </ul>
Env-Wq 708	Additional WWTP Requirements	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ See proposed consideration for Env-Wq 703</li> </ul>
Env-Wq 709	Influent Headworks	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ See proposed consideration for Env-Wq 703</li> </ul>
Env-Wq 710	Flow and Waste Strength Equalization	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ See proposed consideration for Env-Wq 703</li> </ul>
Env-Wq 711	Settling	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ See proposed consideration for Env-Wq 703</li> </ul>
Env-Wq 712	Chemical Coagulation for Primary and Secondary Settling	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ See proposed consideration for Env-Wq 703</li> </ul>
Env-Wq 713	Suspended Growth Biological Treatment	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ See proposed consideration for Env-Wq 703</li> </ul>
Env-Wq 714	Fixed Film Biological Treatment	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ See proposed consideration for Env-Wq 703</li> </ul>
Env-Wq 715	Disinfection	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ See proposed consideration for Env-Wq 703</li> </ul>
Env-Wq 716	Sludge Handling and Disposal	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ See proposed consideration for Env-Wq 703</li> </ul>
Env-Wq 717	Innovative and Alternative Technologies	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ See proposed consideration for Env-Wq 703</li> </ul>
Env-Wq 718	Ownership of WWTPs	10-15-2014	10-15-2024	<ul style="list-style-type: none"> <li>▪ See proposed consideration for Env-Wq 703</li> </ul>

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NHDES Administrative Rules				
Chapter	Subject	Eff. Date	Exp. Date	Considerations for Managing Coastal Flood Risks
Env-Wq 719	Waivers	10-15-2014	10-15-2024	▪ See proposed consideration for Env-Wq 703
<u>Env-Wq 800</u>	<u>Sludge Management</u>			
Env-Wq 801	Purpose and Applicability	01-01-2016	01-01-2026	▪ N/A
Env-Wq 802	Definitions	01-01-2016	01-01-2026	▪ Consider updating definitions to include projected coastal flood risks as needed per below
Env-Wq 803	Notification Requirements	01-01-2016	01-01-2026	▪ N/A
Env-Wq 804	Required Permits and Certifications; Process	01-01-2016	01-01-2026	▪ N/A
Env-Wq 805	Sludge Hauler Permit Requirements	01-01-2016	01-01-2026	▪ N/A
Env-Wq 806	Site Permit Requirements	01-01-2016	01-01-2026	▪ N/A
Env-Wq 807	Facility Permit Requirements	01-01-2016	01-01-2026	▪ Update reference to TR-16, 2011 edition as revised in 2016 or later [Env-Wq 807.08 (a)]
Env-Wq 808	Groundwater Monitoring	01-01-2016	01-01-2026	▪ N/A
Env-Wq 809	Sludge Quality Certification Requirements	01-01-2016	01-01-2026	▪ N/A
Env-Wq 810	Land Application and Management Restrictions	01-01-2016	01-01-2026	▪ N/A
Env-Wq 811	Waivers and Equivalency Determinations	01-01-2016	01-01-2026	▪ N/A
Env-Wq 900	Youth Camps	09-01-2017	09-01-2027	▪ N/A
<u>Env-Wq 1000</u>	<u>Subdivisions; Individual Sewage Disposal Systems (ISDS)</u>			
Env-Wq 1001	Purpose; Applicability; Waivers; Statutory Definitions	10-01-2016	10-01-2026	▪ N/A
Env-Wq 1002	Definitions	10-01-2016	10-01-2026	▪ Consider updating definitions to include projected coastal flood risks as needed per below
Env-Wq 1003	Applications for Subdivision or ISDS Approval	10-01-2016	10-01-2026	▪ In addition to SFHA, consider requiring that plans for subdivision and ISDS applications show location of the subject property that lies within the 0.2% annual chance floodplain and/or in areas subject to projected coastal flood risks, including sea-level rise induced groundwater rise [Env-Wq 1003.07(f), Env-Wq 1003.13(w)]
Env-Wq 1004	Approvals; Installation; Replacement of ISDS Components; Expansions	10-01-2016	10-01-2026	▪ N/A
Env-Wq 1005	Subdivisions	10-01-2016	10-01-2026	▪ N/A

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NHDES Administrative Rules				
Chapter	Subject	Eff. Date	Exp. Date	Considerations for Managing Coastal Flood Risks
Env-Wq 1006	Test Pits	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>Consider whether and how to require that existing conditions (e.g., depth to groundwater) be verified for all subdivision and ISDS applications located in areas subject to projected coastal flood risks, including sea-level rise induced groundwater rise</li> </ul>
Env-Wq 1007	Percolation Test	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1008	Design Requirements for All Systems	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>Consider amending minimum design requirements for all ISDS applications located in areas subject to projected coastal flood risks, including sea-level rise induced groundwater rise</li> </ul>
Env-Wq 1009	Sewer Lines	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1010	Septic Tanks	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>Consider requiring inspection for water-tightness and replacement of leaking septic tanks located in areas subject to projected coastal flood risks, including sea-level rise induced groundwater rise</li> </ul>
Env-Wq 1011	Aeration Tanks	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1012	Gravity Grease Interceptors and Floor Drains	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1013	Sewage Pumps and Siphons	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1014	Effluent Disposal Areas: Soils, Set-Backs	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1015	Distribution Boxes	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1016	Construction Requirements for all EDA	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1017	Effluent Conduits	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1018	Beds and Trenches	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1019	Pressure Distribution	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1020	Dry Wells	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1021	Raised Effluent Disposal Areas	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1022	Alternate Systems	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1023	Operating Requirements	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1024	Innovative/Alternative Technology	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1025	Waterfront Property Site Assessment Study	10-01-2016	10-01-2026	<ul style="list-style-type: none"> <li>In addition to, or in lieu of, proposed consideration for Env-Wq 1003, consider requiring permitted designers to show whether any portion of the property is subject to projected coastal flood risks, including sea-level rise induced groundwater rise, on the site assessment form/sketch [Env-Wq 1205.04, Env-Wq 1205.06]</li> </ul>
Env-Wq 1100	Public Bathing Places	05-01-2014	05-01-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>

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NHDES Administrative Rules				
Chapter	Subject	Eff. Date	Exp. Date	Considerations for Managing Coastal Flood Risks
Env-Wq 1200	Winnepesaukee River Basin Program	10-09-2010	10-09-2018	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1300	Clean Lakes Program	10-18-2014	10-18-2024	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1400	Shoreland Protection	12-17-2016	12-17-2026	<ul style="list-style-type: none"> <li>Consider updating definitions to include projected coastal flood risks as needed per below [<i>Env-Wq 1402</i>]</li> <li>Consider requiring that stormwater management project designs incorporate projected changes in extreme precipitation (see also proposed consideration for Env-Wq 1504)</li> </ul>
<u>Env-Wq 1500</u>	<u>Alteration of Terrain</u>			
Env-Wq 1501	Purpose; Applicability; Calculation of Time	08-15-2017	08-15-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1502	Definitions	08-15-2017	08-15-2027	<ul style="list-style-type: none"> <li>Consider updating definitions to include projected coastal flood risks as needed per below</li> <li>Change “100-year floodplain” to “1-percent annual chance floodplain” along with all subsequent references [<i>Env-Wq 1502.01</i>]</li> </ul>
Env-Wq 1503	Permit Requirements	08-15-2017	08-15-2027	<ul style="list-style-type: none"> <li>Add whether the project is located within a Coastal/Great Bay Region Community to application checklist for consistency with Alteration of Terrain Permit Application Form – revised 01/2018 [<i>Env-Wq 1503.07(f)</i>]</li> <li>Provide more detailed description of what additional information is required for projects within the coastal or great bay region (e.g., selection of projected sea-level rise scenario based on project design life; narrative description of how project design addresses projected sea-level rise, storm surge, and 15% increase in precipitation) [<i>Env-Wq 1503.08 (l)</i>]</li> </ul>
Env-Wq 1504	Plans and Calculations	08-15-2017	08-15-2027	<ul style="list-style-type: none"> <li>For coastal/Great Bay region projects require plans to include limits of sea-level rise and storm surge scenario selected based on project design life [<i>Env-Wq 1504.06 (e)</i>]</li> <li>Require depth of precipitation to be determined using references provided + 15% (note: this should apply to all projects, not just coastal/great bay projects) [<i>Env-Wq 1504.09 (b)(1)</i>]</li> </ul>
Env-Wq 1505	Requirements to Protect Water Quality During Terrain Alteration Activities	08-15-2017	08-15-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1506	Methods for Erosion and Sediment Control During Terrain Alteration Activities	08-15-2017	08-15-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>



NHDES Administrative Rules				
Chapter	Subject	Eff. Date	Exp. Date	Considerations for Managing Coastal Flood Risks
Env-Wq 1507	Requirements to for Permanent Methods for Protecting Water Quality	08-15-2017	08-15-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1508	Permanent Methods for Protecting Water Quality	08-15-2017	08-15-2027	<ul style="list-style-type: none"> <li>Incorporate design modification requirements for stormwater treatment practices in coastal areas to address BMP vulnerabilities sea-level rise, storm surge, extreme precipitation (e.g., submerged outfalls, reduced separation to groundwater, storm surge inundation, chronic exposure to wind, sand, salt, etc.) (see <a href="#">Assessment of Climate Change Impacts on Stormwater BMPs and Recommended BMP Design Considerations in Coastal Communities (2015)</a>) [<i>Env-Wq 1508.03-1508.20</i>]</li> </ul>
Env-Wq 1509	Waivers and Deadline Extensions	08-15-2017	08-15-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1510	Best Management Practices for Blasting	08-15-2017	08-15-2027	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<u>Env-Wq 1600</u>	<u>Septage Management</u>			
Env-Wq 1601	Purpose and Applicabilty	11-26-2013	11-26-2023	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1602	Definitions	11-26-2013	11-26-2023	<ul style="list-style-type: none"> <li>Consider updating definitions to include projected coastal flood risks if needed per below</li> </ul>
Env-Wq 1603	Permit, Certification, Permit-by-Notification Requirements; Application Processing	11-26-2013	11-26-2023	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1604	Notification Requirements	11-26-2013	11-26-2023	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1605	Septage Hauler Permit Requirements	11-26-2013	11-26-2023	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1606	Septage Tanks	11-26-2013	11-26-2023	<ul style="list-style-type: none"> <li>Consider prohibiting the siting of septage tanks in 1% annual chance floodplain, or require that septage tanks be protected against the 1% annual chance flood elevation/safeguarded to prevent buoyancy and lateral movement during flood conditions [<i>Env-Wq 1606.16</i>]</li> </ul>
Env-Wq 1607	Portable Toilet and Marine Sanitation Device Waste Requirements	11-26-2013	11-26-2023	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Env-Wq 1608	Site Permit Requirements	11-26-2013	11-26-2023	<ul style="list-style-type: none"> <li>Consider requiring that site plans show location of 1% annual chance floodplain [<i>Env-Wq 1608.07</i>]</li> </ul>
Env-Wq 1609	Facility Permit Requirements	11-26-2013	11-26-2023	<ul style="list-style-type: none"> <li>Consider requiring that facility plans show location of 1% annual chance floodplain [<i>Env-Wq 1609.07</i>]</li> <li>Consider prohibiting the siting of permanent septage facilities within 1% annual chance floodplain [<i>Env-Wq 1609.09</i>]</li> </ul>
Env-Wq 1610	<i>Reserved</i>			

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<b>NHDES Administrative Rules</b>				
<b>Chapter</b>	<b>Subject</b>	<b>Eff. Date</b>	<b>Exp. Date</b>	<b>Considerations for Managing Coastal Flood Risks</b>
Env-Wq 1611	Innovative/Alternative Septage Treatment Requirements	11-26-2013	11-26-2023	<ul style="list-style-type: none"> <li>▪ Consider requiring that I/A facility plans show location of 1% annual chance floodplain [<i>Env-Wq 1611.08</i>]</li> <li>▪ Consider prohibiting the siting of permanent I/A facilities within 1% annual chance floodplain [<i>Env-Wq 1611.10</i>]</li> </ul>
Env-Wq 1612	Research and Development Permit Requirements	11-26-2013	11-26-2023	▪ N/A
Env-Wq 1613	EQ Certification Requirements	11-26-2013	11-26-2023	▪ N/A
Env-Wq 1614	EQ Solids and EQ Filtrate Requirements	11-26-2013	11-26-2023	▪ N/A
Env-Wq 1615	Groundwater Protection Requirements	11-26-2013	11-26-2023	▪ N/A
Env-Wq 1617	Waivers	11-26-2013	11-26-2023	▪ N/A
Env-Wq 1700	Surface Water Quality Standards	12-01-2016	12-01-2026	▪ N/A
Env-Wq 1800	Rivers Management & Protection Program	05-25-2017	05-25-2027	▪ N/A
Env-Wq 1900	Rules for the Protection of Instream Flow on Designated Rivers	05-28-2011	05-28-2019	▪ N/A
<u>Env-Wq 2100</u>	<u>Water Conservation; Use Registration and Reporting</u>			
Env-Wq 2101	Water Conservation	12-03-2013	12-03-2023	▪ N/A
Env-Wq 2102	Water Use Registration and Reporting	03-21-2017	03-21-2027	▪ N/A
Env-Wq 2200	Voluntary Certified Salt Applicator	10-18-2014	10-18-2024	▪ N/A
<b>Cross-Program Rules (Env-C)</b>				
Env-C 200	Rules of Practice and Procedure	03-25-2007	N/A	▪ N/A
Env-C 300	Laboratory Accreditation	01-01-2017	01-02-2027	▪ N/A
Env-C 500	Engineer Prequalification	07-22-2014	07-22-2024	▪ N/A
Env-C 601-605	Administrative Fine Procedures	12-29-2014	12-29-2024	▪ N/A

## APPENDIX A – 2014 STAP REPORT SUMMARY

### 2014 SCIENCE AND TECHNICAL ADVISORY PANEL REPORT SUMMARY

## Sea-level Rise, Storm Surges, and Extreme Precipitation in Coastal New Hampshire: Analysis of Past and Projected Future Trends

Climate change is expected to have significant impacts on critical infrastructure and natural and cultural resources in coastal New Hampshire over the next century and beyond.

This report is intended to help municipal and state decision-makers prepare for projected sea-level rise and other coastal hazards and minimize the risks those hazards pose to municipalities and state assets.



#### SEA-LEVEL RISE

Global sea levels have been rising and are expected to continue rising well beyond the end of the 21st century. Rising seas pose significant risks to our communities and ecosystems, cultural resources and other coastal property and infrastructure.

#### PROJECTIONS

Forecasting rates of global greenhouse gas emissions is challenging, but research shows that current greenhouse gas concentrations and current or accelerated emissions will continue to influence sea levels in the future.

#### PRECIPITATION

Mean annual precipitation in the northeastern United States increased by approximately 5 inches (more than 10%) between 1895 and 2011.

#### PROJECTIONS

Annual precipitation is expected to increase by as much as 20% between 2071 and 2099 compared to the late 20th century. Most of the precipitation increases will be in winter and spring in the form of rain or snow. Fall and summer will experience less of an increase.

#### EXTREME PRECIPITATION

The Northeast experienced a 50% increase in total annual precipitation from storms classified as extreme events between 1901 and 2012. Here, "extreme" is defined as the number of times each year that the 24-hour rainfall amount exceeds the largest 1% of precipitation events in that year.

#### PROJECTIONS

Extreme precipitation events are projected to increase in frequency and in the amount of precipitation produced. In particular, the rainfall amount produced by hurricanes is projected to increase. However, current climate models and analyses are not as good at projecting future changes in the frequency or magnitude of extreme precipitation events.

#### SEA-LEVEL RISE SCENARIOS AT 2050 AND 2100

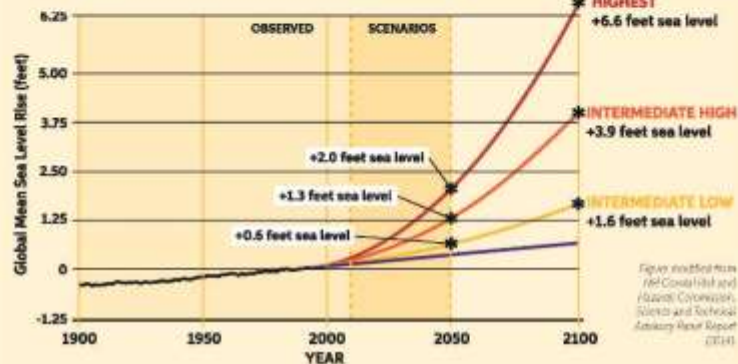


Figure modified from NH Coastal and Inland Waters Assessment, Science and Technical Advisory Panel Report (2014).

#### PROCESSES CAUSING SEA LEVELS TO RISE



- 40%** Ocean warming or thermal expansion
- 30%** Melting of land-based glaciers
- 20%** Melting of Antarctic and Greenland ice sheets
- 10%** Vertical land movements, shifts in Earth's gravity field and ocean dynamics

#### STORM SURGE

The New Hampshire coast is significantly impacted by both Nor'easters and hurricanes. Winds from these storms drive ocean water towards the land, resulting in the short-term rise in water levels called storm surge. The actual height of a flood is determined by factors such as storm intensity, forward speed, storm area size, coastline characteristics, and angle of approach to the coast, in addition to tide height. Nor'easters can impact the region for several days and produce a storm surge with or without the addition of inland runoff from heavy precipitation. Over the past ten years the largest storm surges observed in New Hampshire occurred during Nor'easters.



#### PROJECTIONS

Considering changes in water levels due to sea-level rise alone, today's extreme storm surge events (i.e. 100-year flood) will have a greater inundation extent and occur more frequently over time. Due to increased coastal development, there has been a significant increase in impacts from hurricanes nationwide over the 20th century. However, there is some uncertainty in the projection of trends in hurricane frequency and intensity in any given region, and no research consistently finds a trend in the frequency and intensity of Nor'easters.



## USING THIS REPORT:

# How to Prepare for the Changing Climatic Conditions in Coastal New Hampshire

### PREPARING FOR SEA-LEVEL RISE

For coastal locations where the need to protect existing coastal development, infrastructure or ecosystems is high, sea level estimates should be applied as follows:

1. **Determine the time period** over which the system is designed to serve (either in the range 2014–2050, or 2051–2100).
2. **If the design time period is 2014–2050**, commit to manage to 1.3 feet of sea-level rise, but be prepared to manage and adapt to 2 feet if necessary.
3. **If the design time period is 2051–2100**, commit to manage to 3.9 feet of sea-level rise, but be prepared to manage and adapt to 6.6 feet if necessary.
4. **Be aware that the projected sea-level rise ranges may change** and prepare to adjust design considerations if necessary. The choice of management strategies can include strategies to protect, accommodate, or retreat from the flood risk.

### EXAMPLES OF PREPARING FOR SEA-LEVEL RISE

A building or facility with an anticipated lifespan beyond 2050 could be constructed today:

- For the highest sea-level rise scenario of 6.6 feet (the most protective approach).
- OR
- For 2 feet of future sea-level rise —but designed to allow modifications sometime in the future to protect against 3.9 or 6.6 feet of sea-level rise.

### HISTORIC SEA LEVELS

Based on local tide gauge data, sea levels in New Hampshire have been rising by an average of **0.7 inches per decade since 1900**. The rate of sea-level rise has increased to approximately **1.3 inches per decade since 1993**.

### FUTURE SEA LEVELS

Using 1992 sea levels as a baseline, New Hampshire sea levels are expected to rise **0.6 – 2.0 feet by 2050** and **1.6 – 6.6 feet by 2100**.



### PREPARING FOR CHANGES IN PRECIPITATION

Consideration of historical increases in precipitation and projected future precipitation should be applied as follows:

- **If the design time period is 2014–2050**, buildings and infrastructure should be designed to withstand extreme precipitation intensities based on the most current precipitation data.
- **If the design time period is 2051–2100**, buildings and infrastructure should be designed to manage a 15 percent increase in the amount of precipitation produced during extreme precipitation events after 2050.



### PREPARING FOR CHANGES IN STORM SURGES

Coastal projects should be designed to consider future flood risks by adding projected sea-level rise heights to current storm surge heights, as measured by the 100-year and 500-year floods.



## ABOUT THIS REPORT AND THE NEW HAMPSHIRE COASTAL RISK AND HAZARDS COMMISSION

This Science and Technical Advisory Panel report is intended to guide the New Hampshire Coastal Risk and Hazards Commission in its development of recommendations to assist in planning and preparation for the changing climatic conditions in coastal areas of the state.

The New Hampshire Coastal Risk and Hazards Commission was established by the New Hampshire Legislature on July 2, 2013 by RSA 483E. The Commission is required to consider key scientific research on current and future coastal risks and hazards and is charged with recommending legislation, rules and other actions.

The Commission created a Science and Technical Advisory Panel to review available scientific information about coastal hazards and flood risks in New Hampshire.

The Panel analyzed the latest published data on historic trends and projections for the years 2050 and 2100 for sea-level rise, coastal storms, and extreme precipitation.

These findings were summarized in a peer-reviewed report, which the Commission unanimously adopted in July 2014 and used to develop its final report and recommendations released in November 2016. The Panel suggests this assessment and report be updated at least every two years as new research and data become available.

To learn more about the New Hampshire Coastal Risk and Hazards Commission, go to [www.nhcrhc.org](http://www.nhcrhc.org).

For information or questions about the Commission, contact Cliff Sinnott, Commission Chair at 603-778-0885 or [csinnott@rpc-nh.org](mailto:csinnott@rpc-nh.org).

To download the complete Science and Technical Advisory Panel report, go to [www.nhcrhc.org](http://www.nhcrhc.org).

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REVISED NOVEMBER 2016

## APPENDIX B – NHDES STAFF ACKNOWLEDGEMENTS

### AIR RESOURCES DIVISION

<i>Compliance</i>	<i>Permitting &amp; Environmental Health</i>	<i>Technical Services</i>
<b>Evan Mullholland</b> Administrator	<b>Gary Milbury</b> Administrator	<b>Kendall Perkins</b> Air Monitoring Program Manager
<b>Karla McManus</b> Rules Coordinator	<b>Cathy Beahm</b> Air Permit Programs Manager	<b>Joseph Fontaine</b> Technical Programs Manager

### WASTE MANAGEMENT DIVISION

<i>Hazardous Waste Remediation</i>	<i>Oil Remediation &amp; Compliance</i>	<i>Solid Waste Management</i>	<i>Hazardous Waste Management</i>
<b>Karlee Kenison</b> Administrator	<b>Sarah Yuhas-Kirn</b> Administrator	<b>Pamela Hoyt-Denison</b> Waste Programs Administrator	<b>John Duclos</b> Administrator
<b>Amy Doherty</b> State Sites Section Supervisor	<b>Michael Juranty</b> Oil Compliance Section Supervisor	<b>Paul Gildersleeve</b> Permitting & Design Review	<b>Zachary Lorch</b> Waste Management Engineer
<b>Michael McCluskey</b> Brownfields Coordinator	<b>Charles Corliss</b> Technical Standards & Design Review Chief		
	<b>Peg Bastien</b> Petroleum Remediation Section Supervisor		

### WATER DIVISION

<i>Dam</i>	<i>Drinking Water &amp; Groundwater</i>	<i>Subsurface Systems</i>
<b>James Gallagher</b> Administrator	<b>Sarah Pillsbury</b> Administrator	<b>Rob Tardif</b> Administrator
<b>Kent Finemore</b> Asst. Chief Engineer	<b>Harrison “Chip” Mackey</b> Monitoring Section Supervisor	<b>Dawn Buker</b> Design Review Section Supervisor
<b>Steve Doyon</b> Safety & Inspection Administrator	<b>Cynthia Klevens</b> Water Treatment & Small Systems Manger	<b>Kevin Kaveny</b> Subsurface Compliance Supervisor
	<b>Shelley Frost</b> Small Systems Engineering & Technical Assistance	
	<b>Brandon Kernen</b> Hydrology & Conservation Supervisor	
	<b>Stephen Roy</b> Groundwater Permitting Technical Group Manager	
	<b>Emily Jones</b> Enforcement & Rulemaking Supervisor	

**WATER DIVISION (continued)**

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*Wastewater  
Engineering*

**Tracy Wood**  
Administrator

**Sharon Nall**  
Planning,  
Protection  
& Assistance  
Section Supervisor

*Watershed  
Management*

**Ted Diers**  
Administrator

**Steve Couture**  
Coastal Program  
Administrator

**Kirsten Howard**  
Coastal Resilience  
Coordinator

*Wetlands*

**Mary Ann Tilton**  
Asst. Administrator

**David Price**  
East Region Supervisor

**Eben Lewis**  
Southeast Region  
Supervisor

**Darlene Forst**  
Shoreland Supervisor

**Stephanie Giallongo**  
Wetlands Specialist

**Neil Bilodeau**  
Wetlands Specialist

*Terrain Alteration*

**Ridge Mauck**  
Program Supervisor

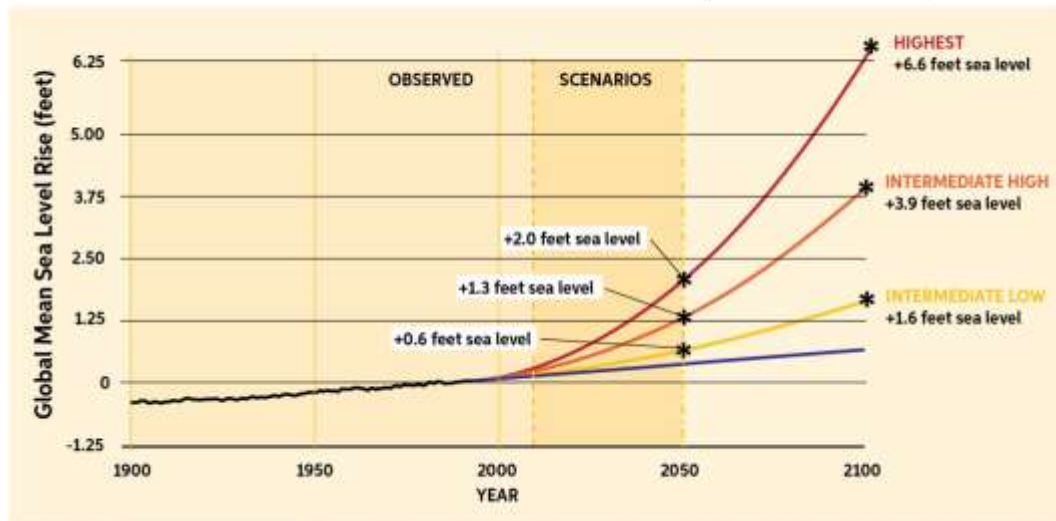
## APPENDIX C – EXAMPLE GUIDANCE FOR INCORPORATING COASTAL FLOOD RISKS IN PROJECT DESIGN

### *Guidance for incorporating risk tolerance to sea-level rise flooding into project design*

The acceptable loss or damage to an asset should be considered in determining the most appropriate design standards for protection, with more critical, expensive, and long-lasting structures and facilities having low risk tolerance and lower value, easily replaced structures and facilities having higher risk tolerance. This guidance is intended to help NHDES staff and permit applicants understand how to use the concept of risk tolerance to select an appropriate sea-level rise scenario.

Tolerance for risk	Need to protect	Suggested scenario
Low	High	Manage to Intermediate High scenario and be prepared to adapt to Highest scenario. (STAP 2014)
Medium	Medium	Manage to Intermediate Low scenario and be prepared to adapt to Intermediate High scenario.
High	Low	Either manage or be prepared to adapt to Intermediate Low scenario.

Sea-level rise scenarios under different emission levels in 2050 and 2100. Source: Adapted from NHCRHC STAP (2014).



### *Examples:*

A project with low risk tolerance to flooding might be a large public facility (e.g., wastewater treatment plant, fire station, or tidal culvert on an emergency route). If the tidal culvert is expected to last until 2075 and the risk tolerance is low, the project should be designed to accommodate approximately 2.5 feet of sea-level rise and be prepared to adapt to approximately 4 feet of sea-level rise.

A project with high risk tolerance to flooding might be a deck, dock, or driveway. If the driveway is expected to last until 2050 and risk tolerance is high, the project should either be designed for today's water levels and be prepared to adapt to 0.6 feet of sea-level rise, or be designed to accommodate 0.6 feet of sea-level rise.

*Guidance for incorporating storm surge into project design*

Projects should utilize probabilities of storm frequency and magnitude embodied in updated FEMA Federal Insurance Rate Maps (FIRMs) for coastal New Hampshire. In other words, projects add the sea-level rise scenario selected above to the Base Flood Elevation to determine the final Design Flood Elevation for the project.

*Guidance for incorporating extreme precipitation into project design*

If the design time period is 2014–2050, projects should be designed to withstand extreme precipitation intensities based on the most current precipitation data, with the assumption that a gradual increase in frequency of extreme precipitation events will occur over time. If the design period is 2051–2100, buildings and infrastructure should be designed to manage a 15% increase in the amount of precipitation produced during extreme precipitation events after 2050.