

The New Hampshire Drinking Water Program's Climate Change Resilience Plan

Overview

More frequent and intense weather events, flooding, and sea level rise are expected to pose significant climate related risks to New Hampshire's community water systems (CWSs) and their ability to provide safe drinking water. The New Hampshire Department of Environmental Services' (NHDES) Drinking Water and Groundwater Bureau (DWGB) developed a *Climate Change Resilience Plan* to guide activities that help CWSs build resilience against the impacts of climate change. The *Plan* outlines proactive short and long-term action items to be incorporated into the overall work of the Bureau, as well as recommendations specific to CWS operations.

Background

Climate change is already impacting the State of New Hampshire. Trends expected to specifically pressure State drinking water systems include: higher temperatures, more intense weather events, earlier snow melt, periods of low stream flows and groundwater levels, and sea level rise. Drinking water systems are already experiencing climate effects on system operations, water quality, and water availability. Forty-three percent of CWSs responding to a statewide Flood Impact Survey (2010) noticed increased impacts from storms in the preceding five years, while 11% of respondents reported impacts specifically from flooding. Almost half of the surface water systems responding to the Survey observed increased algae blooms and turbidity, both of which are associated with intense runoff events and higher temperatures.

In response to these challenges, NHDES' [2010-2015 Strategic Plan](#) outlined goals and actions to achieve its mission, including addressing "climate change through effective mitigation and adaptation strategies." NHDES launched a two year "Department Climate Initiative" to review all program activities and identify areas where programmatic changes could improve resiliency. In line with NHDES' initiative, DWGB created an organization-wide plan to guide its CWS assistance activities and help systems become more resilient to climate change.

Program Partners: New Hampshire Department of Environmental Services (NHDES) Drinking Water & Groundwater Bureau (DWGB)

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Steps to Ensure the Resilience of Water Systems against Climate Change Disruptions

DWGB's *Plan* includes several actions that will provide a strong foundation for expanding its resilience activities. Notable efforts include emergency planning and vulnerability assessment requirements for CWSs, a climate change vulnerability questionnaire in the drinking water sanitary surveys, and a statewide survey to define flooding impacts and costs to CWSs. The collective results and information gathered from these efforts have helped shape action items within the *Climate Change Resilience Plan*.

An initial step taken by the Bureau was to identify and communicate the main challenges that climate change presents for the State's drinking water systems. A Community Water Systems and Extreme Weather Events Survey was conducted in 2013 to gather information from CWS representatives on the climate related impacts they have already experienced, as well as gauge concern regarding future impacts. Aside from identifying current and potential climate threats to systems, the Survey captured over 200 respondents' needs for technical assistance, education, and outreach activities on climate change. A 2010 Flooding Impact Survey demonstrated that CWSs are highly vulnerable to flooding, as systems and their critical infrastructure are routinely located near surface waters. The Survey captured the facility components most commonly damaged from flooding and the main

costs incurred for repair. The results of both surveys provided a basis for DWGB to begin addressing climate concerns, proposing changes to existing programs, and identifying technical assistance needs for individual water systems.

Creating the Climate Change Resilience Plan for the Drinking Water Program

Drawing on input from surveys of CWSs, DWGB developed a [*Climate Change Resilience Plan*](#) (2014) that identifies the greatest risks to New Hampshire's CWSs from climate change and describes adaptation measures systems can take to improve resilience. The *Plan* also outlines priority changes to the Bureau's policies, operations, education and outreach efforts, and technical assistance activities.

Climate Change Challenges Identified by DWGB for Drinking Water Systems

- *Physical damage to system infrastructure* from flooding, intense storms, and water quality degradation.
- *Water quality concerns* due to increased loading of nutrients, sediments, and contaminants with more frequent storms and flooding.
- *Water availability concerns* as flows decline, temperatures rise, and water supply demand increases.
- *Outdated floodplain mapping*, including the need to update precipitation and system location data to evaluate infrastructure risks.

The *Plan* recommends both general and climate-impact specific actions that CWSs could take regarding planning operations and infrastructure improvements. General recommendations focus on staff and customer education about climate change, the use of forecasting tools and vulnerability assessments to identify system weaknesses, water conservation and reuse, and greater coordination among systems. Impact specific actions to address flooding events, severe storms, drought, lower water levels, and source water quality protection range from adopting low impact development practices, to culvert sizing and the implementation of buffer preservation measures. In addition to recommendations for CWSs, the DWGB identified short-term (1 month-1year), medium-term (1-3 years), and long-term (3+

years) actions to better incorporate climate considerations into its programs and help CWSs achieve water resiliency. Short-term items focus on DWGB staff education, identifying potential system vulnerabilities, updating flood and sea level rise mapping for CWS design requirements, and outreach on best practices. DWGB is currently implementing several short-term education and outreach efforts for water utilities through a series of articles in its newsletter, "[Supply Lines with the Source](#)." The articles capture climate change information, on the ground case studies, efficiency incentives and assistance offered by energy utilities, and best practices that could be adopted by water utilities to promote adaptation measures.

Medium and long-term actions focus on future initiatives to be taken by the Bureau's programs. Key medium-term actions involve incorporating climate change considerations into risk assessments for asset management, developing a list of systems impacted by natural disasters, integrating climate impacts and adaptation strategies in State emergency planning workshops, and instituting education requirements for certified system operators on climate change planning. The *Plan* also encourages the collection of surface water data by CWSs to monitor short and long-term trends, especially for algal bloom outbreaks. The Bureau will further enhance its conservation outreach and education efforts by working with regional planning commissions to encourage water system participation in climate change planning or projects. In the long-term, system siting, base elevation requirements, and design standards will be updated based on new information about predicted climate impacts, as well as recent flood and elevation mapping. The Bureau also intends to amend its rule-makings to require that emergency plans include responses to climate specific impacts.

The Bureau will perform a detailed review and update of the *Plan* every five years through a participatory process involving essential stakeholder groups. DWGB is also developing a new pilot program to evaluate the usefulness of climate change vulnerability assessments for water systems. The Bureau will work with a few interested systems to prepare vulnerability assessments that assess the risk of climate change impacts and their associated costs, which can guide CWSs in developing effective adaptation plans.