ENVIRONMENTAL
Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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Climate Change in New Hampshire: Is Your Wastewater Treatment Facility Climate Ready?

What is climate change?

Climate change, also known as global warming, describes the changes in average weather that have been observed across the globe over the past several decades. These weather changes are due to a buildup of carbon dioxide (CO_2) in the atmosphere. CO_2 in the atmosphere normally acts as a "blanket" that retains heat from the Sun and protects us from the cold of space. The extra CO_2, however, is causing this blanket to grow thicker and trap additional heat. This causes warming in Earth's air and oceans, resulting in rising sea levels and changes in the pattern and distribution of precipitation, as well as the intensity and frequency of extreme storms.

How do I know climate change is happening in New Hampshire?

Because of changes in Earth's average air and ocean temperature, the very character of New Hampshire has been changing over the past several decades. On average, from the 1970s to today, the state has experienced more precipitation each year, with more rain and less snow. More of this precipitation has fallen in extreme events. The average temperatures have also risen. The most pronounced change has occurred in winter, with fewer days with snow on the ground and with spring coming earlier.

New Hampshire has also experienced some very unusual and extreme weather over the past 16 years. From 2003 through 2018, the State had 15 presidentially declared, storm-related disasters, including one hurricane, one tropical storm, a landslide, a tornado and numerous severe storms with flooding event and winter storms. An additional 10 emergency storm-related declarations were made during this 16-year time period. In contrast are the 50 years prior, from 1953 through 2002, during which New Hampshire experienced only 15 presidentially declared, storm-related disasters and three emergency storm-related declarations.

In addition to all the extreme precipitation events, New Hampshire has experienced periods of drought. The most recent drought was in 2016.

Why should wastewater treatment facilities (WWTFs) be concerned about climate change?

Recovery from these extreme storm events costs New Hampshire communities and the State a lot of money and this can affect the State's overall economy. Following these extreme storm events, people may be without electricity for long periods, roads and bridges may be washed out, and critical infrastructure such as pump stations and WWTFs may be flooded from both surface water flooding and from excessive infiltration and inflow.

From the drought perspective, many WWTF operators experienced higher than average wastewater concentrations with lower infiltration and inflow during 2016. This combination resulted in difficulty successfully operating WWTFs that were designed with higher minimum flows in mind. Energy use for WWTFs around the State significantly increased during the 2016 drought.

What considerations should WWTFs consider in light of climate change?

When severe flooding events occur, a WWTF's capacity to manage floodwaters can diminish and water quality may deteriorate. After severe storms, WWTFs may have no electricity for a number of days, other than the critical elements connected to generator power. Critical questions to consider include:

1. What critical elements at your WWTF will be without power during this time?
2. How long can your WWTF operate on generator power during high flow conditions and maintain adequate treatment to protect public health and the environment?
3. How will you continue to operate your WWTF and collection system if critical infrastructure (e.g., pump stations, outfalls, process equipment and tankage, pipes, and buildings) is flooded?

For the opposite extreme, WWTFs also need to be prepared to continue to treat wastewater under drought conditions. Critical questions to consider include:

1. Can you maintain in-stream water quality criteria with lower dilution available?
2. Do you have flexibility in your aeration blower design to treat under low flow conditions in an energy efficient way?

Installing more, smaller pumps and blowers can help with both ends of the flow/concentration spectrum during both flood conditions as well and during drought conditions.

What can WWTFs do about climate change?

WWTFs and communities can integrate climate change into asset management, effective utility management, capacity building, security and emergency preparedness. There are six basic elements of becoming Climate Ready:

1. **Climate Impact Awareness –** learn and educate yourself, your staff and your management. Understand how climate change impacts your WWTF and collection system. Ask questions and practice emergency response protocols for both flood and drought conditions.
2. **Adaptation Strategies –** evaluate your system and find your weak points. Develop plans to strengthen your weaknesses. Adaptation is an iterative process, be flexible. Include adaptation (operational flexibility) in all your upgrade projects.
3. **Mitigation Strategies –** reduce your energy consumption to reduce your carbon footprint and your contribution to climate change. Start with conservation and energy efficiency, and then add alternative green power generation, using the savings from efficiency projects to pay for renewable energy projects. Mitigation can save money while you are also positively impacting climate change! (Refer to Fact Sheet WEB-25 for more information on mitigation.)
4. **Federal and State Policies and Programs –** be aware of regulations and policies that must be met and maintained as the climate changes. Communicate regularly with regulators relative to issues or concerns relative to climate change impacts at your WWTF or collection system. Ask for assistance.
5. **Community Interest and Support –** educate your community and your users. Develop an outreach strategy with tools appropriate to the audience. NHDES can assist in this effort and with outreach efforts. Please ask for assistance you need your community's support.
6. **Partnerships Outside of the Utility –** critical to the long-term success of your Climate Readiness. Forge partnerships with key stakeholders such as: watershed and environmental organizations, land use planners, regional planning commissions, electric utilities and gas, other utilities and water associations.

For additional information on Climate Ready Water Utilities and adaption strategies, refer to EPA's Creating Resilient Water Utilities page. You may also contact Sharon Nall, P.E., NHDES WWEB at (603) 271-2508 or sharon.nall@des.nh.gov with questions regarding climate change adaptation for WWTFs.