

2017 marked the 30th anniversary of NHDES. Much has changed in the last 30 years to help sustain a high quality of life for all citizens by protecting and restoring public health and our beloved environment. While the work is not complete, NHDES took time this year to recognize 30 accomplishments and achievements that have impacted our environment and public health for the better over the past 30 years. Each of the six issues of our Environmental News newsletter in 2017 contained a description of five of these achievements, under a specific theme for each issue. In the January/February issue, it was:

Our Environment



Concord, NH, landfill before (left) and after (right) closing.

1. The End of the Unlined Landfill

Why it matters: The connection between our municipal unlined landfills and the water we drink and the air we breathe has been, and continues to be, an important focus for the environment and public health of New Hampshire's residents, particularly in light of recent efforts related to emerging contaminants.

Progress in 30 years: For decades prior to the creation of NHDES in 1987, most residents brought their trash to the "town dump," where it was burned in the open or in low-tech incinerators, or dumped on the land directly. "Burning day" at the dump filled the air with noxious odors and smoke containing hazardous chemicals and particulates that traveled far and wide, and were a significant contributor to air pollution in our state. By the mid-1980s, the practice of open burning had ceased, and waste at town dumps was generally covered with soil at the end of each day. By 1991, groundwater protection laws encouraged many New Hampshire towns to cease operating unlined landfills. To help towns, the New Hampshire Legislature enacted the Unlined Municipal Landfill Closure Grant Program in 1994. Under this program, administered by NHDES, towns that agreed to properly close their unlined landfills became eligible for a 20% state matching grant. The program was tremendously popular and successful, and provided over \$39 million to help 127 towns properly close 117 landfills. The program, in concert with responsible decisions and actions by our local governments, resulted in the investment of over \$190



million statewide to address this critical environmental challenge. The last unlined landfill was successfully closed and capped in 2012.

2. New Hampshire Rivers

Why it matters: Thirty years ago, one of New Hampshire's most significant environmental concerns was the pollution of the state's rivers. While rivers no longer were open sewers as they had been, residents wanted ways to protect recent gains. The New Hampshire Rivers Management and Protection Program initiated a unique partnership between state government, citizens and municipalities that gives locals a voice in the management of the rivers that flow through their communities.

Progress in 30 years: Today, 18 rivers have been designated into the program, encompassing over 1,000 miles of rivers that flow through more than half of the municipalities in the state, and over 200 local designees serve as river champions. In addition, the Volunteer Rivers Assessment Program (VRAP) consists of 28 groups, monitoring 250 stations on New Hampshire's rivers and streams to determine water quality conditions. As a result of NHDES' analyses of these monitoring data, we know that our rivers have generally excellent water quality. However, in the places where water quality is suffering, the culprit is polluted runoff.

3. Coastal Habitat Restoration

Why it matters: Healthy salt marshes and rivers are not only rich with life, they are also part of nature's basic strategy of protecting our towns and coastlines from a changing climate, including a greater frequency of severe rain storms and rise in sea level. New Hampshire's coastal habitats are affected by historic impacts such as fragmentation by roads and wetland fill, and by current uses such as encroachment by development, stormwater pollution, non-native invasive species, and the effects of a changing climate. While our coastal ecosystems are resilient to disturbance and change, important coastal resources, such as tidal rivers and salt marshes, are degraded or at risk.

Progress in 30 years: With leadership from NHDES, nearly 90 coastal habitat restoration projects have been completed, restoring 675 acres of salt marsh, 35 acres of oyster reef, and 5 acres of dune, and reconnecting 33.5 miles of fish habitat through the removal of three dams on tributaries to Great Bay. None of these successes are the work of only one entity; rather, they are the result of partnerships between state and federal agencies, municipalities and nonprofit organizations.

4. Protecting New Hampshire Aquifers

Why it matters: New Hampshire's population is heavily dependent on groundwater as its source of drinking water. It is estimated that 60% of New Hampshire citizens rely on groundwater for drinking water, with approximately 580,000 people in New Hampshire using private water supply wells. New Hampshire's aquifers are among the most vulnerable in the U.S. The shallow depth to the top of bedrock and to the water table increases the potential impact of contaminant releases.





Progress in 30 Years: New Hampshire has made significant progress toward protection and cleanup of our groundwater aquifers in the last 30 years. In 1991, New Hampshire created the Groundwater Protection Act (RSA 485) and eventually a variety of complimentary contamination cleanup statutes and regulations. Over the last 30 years, 620 hazardous waste, 6,550 petroleum sites and 33 solid waste sites have been cleaned up, and remaining contaminated sites are being managed. New Hampshire also has removed 19,909 underground storage tanks (USTs) and above ground storage tanks (ASTs). Many of these cleanups have been accomplished with state assistance through reimbursement funds, brownfields or methyl tertiary-butyl ether (MtBE) settlement funds.

The cleanup efforts have produced tangible improvements in New Hampshire aquifers in the last decade. For example, based on USGS randomized sampling conducted in 2005, over 20% of drinking water supplies in southern New Hampshire were contaminated with detectable levels of MtBE. The detections correlated with locations of USTs and the degree of development. After the removal of thousands of USTs and completion of hundreds of site cleanups, less than half of these water supply wells are still contaminated. Improvements in public water supply well detections of MtBE are even more dramatic.

5. Acid Rain

Why it matters: Acid rain, caused by air emissions of sulfur oxides and nitrogen oxides (largely from fossil fueled power plants), has long been known to negatively impact the state's forests, water, infrastructure and health.

Progress in 30 years: Title IV of the 1990 Clean Air Act (CAA) amendment addressed the growing acidity of rain falling in the Northeast in the 1970s and '80s by requiring large cuts in the emissions of sulfur oxides and nitrogen oxides "to reduce the adverse effects of acid deposition"—also known as acid rain. The benefits of the CAA's flexible market based approach are striking – since implementation, sulfur dioxide has decreased by more than 85% at a cost significantly lower than anticipated. To see if New Hampshire waterbodies were recovering, NHDES analyzed over 30 years of monitoring data for trends in pH (a measure of water acidity), alkalinity, sulfates and nitrates. Results showed the pH of rain has become significantly less acidic and sulfates and nitrates have significantly decreased. In our waterbodies, over 90% of the lakes and ponds analyzed also had lower levels of sulfates and nitrates. Alkalinity and pH either improved or remained stable in a majority of these waterbodies. These results are encouraging; however, New Hampshire's waters are still recovering from acid rain, a trend which is expected to continue for many years if not decades.

