

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 May/June issue, it was:

Our Enjoyment



(Photo: Presidential Range of the White Mountains, New Hampshire)

1. Regional Haze

Why it matters: The great thing about living in and visiting New Hampshire is enjoying the views of our beautiful mountains and lakes. Of course, it is best when they can be seen clearly. This has not always been the case, however, as plumes of pollutants have been blown into the state, reducing visibility and erasing many of the pristine views we have come to love. These regional haze events occur when small particles in the atmosphere scatter and absorb light. It not only reduces our quality of life, but it impacts tourism and causes health problems. Much of this haze consists of very small particles of pollutants, which can cause respiratory irritation as well as cardiac complications when inhaled. Regional haze events often occur when weather patterns transport pollutants from high-emitting states.



Progress in 30 years: Regional haze events in New Hampshire have been reduced significantly in frequency and intensity over the past 30 years. Regulations to reduce acid rain, ozone, particle pollution and sulfur dioxide have benefited us by reducing haze formation by about 65% over the past 30 years. While we have already made a lot of progress improving visibility, the federal regional haze rule requires that this progress continue until the manmade portion of the haze is virtually eliminated by 2064. We are well on our way to this goal thanks to cleaner electrical generation, industrial processes, cars and fuels. Emissions of sulfur dioxide, nitrogen oxides, ammonia, particles and organic gases are all major ingredients of regional haze. They will need to be reduced further in the years and decades ahead. Progress won't be easy, and the rate of improvement won't necessarily be uniform, since economics and weather patterns will cause variation. But thanks to a number of air quality programs, haze will continue to diminish and even better views of those beautiful lakes and mountains will come shining through.

2. Aquatic Invasive Species

Why it matters: Aquatic Invasive Species (AIS) like milfoil, fanwort and water chestnut can have long-lasting impacts on the biology, ecology and recreational values of lakes, ponds and rivers. In fact, invasive species are recognized as the second largest threat to biodiversity. AIS can force out native species and alter the natural look and characteristics of our freshwater resources. There are currently 85 infested waterbodies in New Hampshire, some supporting as many as six different invasive species at one time. What's more, there are always new AIS threats that are literally just a boat ride away, which can bring in new plants and animals to the state's waterbodies.

Progress in 30 years: Today, New Hampshire has a multi-tiered approach in addressing invasive species issues, including prevention, early detection, rapid response and long-term management initiatives. The overall rate of infestation has slowed from more than six waterbodies a year to less than one or two new waterbodies a year. Infestations are detected earlier than ever, where chances for eradication are more feasible. The variety of control practices has been expanded, and each has been made more effective at targeting the invasive species and leaving native species behind. Long-term management is aimed at reducing the overall density and distribution of larger and more complex infestations, so that measured reductions in AIS infestations are realized. As a result, New Hampshire's waterbodies are better protected from new infestations, and those that are infested have a better long-term prognosis in terms of the ecological health and recreational values of those waterbodies.

3. Protecting and Enjoying New Hampshire's Aquatic Resources



Why it matters: New Hampshire was among the first states in the nation to pass its own legislation to protect wetlands. The statute has been revised over the years, but the principal goals and focus still remain: to protect these very vulnerable and important features of the landscape that “quietly” provide numerous benefits to people, such as flood attenuation, water quantity and quality functions, areas of important wildlife habitat, and recreation.



Progress in 30 years: New Hampshire's climate is changing, and will continue to change in the future. The protection of aquatic resources and the upland buffer surrounding them is widely recognized as one facet in adapting to a changing climate. One mechanism that has been adopted by NHDES in the last 30 years is considering the protection of habitats of high ecological value as compensation for impacts to aquatic resource areas of lower value, if impacts are unavoidable. This protection of sensitive aquatic ecosystems and wildlife habitats requires coordination among many partners and has become a role of the Aquatic Resource Mitigation (ARM) Program.

The ARM Fund was established to provide wetland permit applicants the opportunity to offset wetland impacts by providing funds into a watershed account. These funds are then disbursed to significant land conservation or restoration projects. The ARM Program recognizes the potential for long-term environmental results from mitigation that considers watershed goals, assists conservation efforts important to a community, and has the ability to target important and vulnerable wetlands in a region. To date, the program has protected 16,000 acres of land and restored over 100 acres with a focus on wetlands and streams, tidal resources, and areas important to endangered species. The 83 funded projects provide opportunities for passive recreation, important breeding areas for species of special concern, and key locations on the landscape to assist in ameliorating more frequent intense storm events.

Enabling mitigation to be coordinated through a comprehensive program has achieved great success for communities across the state concerned with retaining these special aquatic features.

4. Shellfish Harvest

Why it matters: Thirty years ago, none of New Hampshire's tidal waters were open for commercial or recreational harvest of clams, oysters or mussels. The State had no ongoing program to evaluate these waters for public health risks associated with contamination from human or animal waste, chemical contamination, or risks from naturally occurring biotoxins and pathogens. Residents could not harvest these shellfish recreationally, nor could the state's shellfish farmers participate in the region's growing commercial shellfish aquaculture industry.

Progress in 30 years: Today, nearly all of the state's tidal waters have been evaluated and are continually monitored for public health risks. The NHDES Shellfish Program maintains a regular water sampling schedule at over 70 stations, tracks over 800 potential pollution sources across more than 250 miles of tidal shoreline, and monitors shellfish harvest areas for the presence of dangerous biotoxins such as "Red Tide." Over 5,000 acres of estuarine waters (43%) and nearly 52,000 acres of ocean waters (94%) are now open for recreational harvest, and the state's commercial oyster aquaculture industry has grown from four farms in 2011 to 18 farms in 2016.

The industry continues to grow, with 2-3 new farms added each year. The NHDES Shellfish Program continues to address new and emerging public health threats such as *Vibrio* bacteria, as well as new species of marine algae that produce potentially fatal biotoxins.



5. Great Bay Oil Spill Response

Why it matters: Great Bay is New Hampshire's largest and most complex estuary and is a habitat integral to the health of numerous species in the Gulf of Maine. A large oil spill impacting the Great Bay Estuary could be catastrophic. A significant amount of petroleum is delivered by oil tankers into the Port of Portsmouth and is transported up the Piscataqua River to oil storage terminals. The river is known for strong tidal currents and difficult navigational hazards. Preventing spilled oil from moving in these



conditions in an area where the river can be nearly three quarters of a mile wide is a daunting and dangerous mission. The environmental and economic consequences of a large spill would likely be significant.

Progress in 30 Years: The NHDES Spill Response and Complaint Investigation Section (SRCIS) staff has been working with contractors since 1992 to develop methods and strategies to minimize the amount of

oil that could reach Great Bay from a large spill event. NHDES worked with the University of New Hampshire and the local oil spill cooperative (funded by the local oil terminals) from the late 1990s to early 2003 to design, test and improve an initial response strategy that placed 6,000 linear feet of oil containment boom in a "v" configuration across the river to minimize the movement of oil into Great Bay.

In 2003, after numerous trials, NHDES determined that this previously developed strategy could not be successfully deployed. Therefore, NHDES began redesigning the response strategy. A new strategy was developed that included innovative methods of deploying long lengths of boom in fast current. NHDES has managed the testing and modifications of this strategy annually since 2008. As a result of these efforts, a workable strategy has been developed that uses 5,600 linear feet of oil boom to cross Upper Little Bay and direct oil to a single collection point.

NHDES trains oil spill response contract workers annually on deployment of the strategy and continues to improve its response capabilities. NHDES staff is well respected by the US Coast Guard for their efforts in the development and continuous improvement of this particular strategy and our spill preparedness.

