

# **NORTHEAST STATES' WATER RESOURCE RESEARCH PRIORITIES**



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**Prepared by:  
The New England Interstate Water Pollution Control Commission**

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## **Introduction**

Advancing necessary research and “good science” concerning water resources in the Northeast is critical to NEIWPCC’s mission to assist our member states’ efforts to protect water quality and safeguard public health. As water resource issues become increasingly challenging, research can advance our understanding and promote innovative solutions in the region.

NEIWPCC is working to enhance our member states’ understanding of critical water resource issues; advance research that will have a broad impact on and benefit to the protection, management, and preservation of NEIWPCC member states’ water resources and public health; and promote coordination and cooperation between NEIWPCC member states’ water resource and public health agencies and research stakeholders, including federal agencies, academia, and industry. A principal goal of this effort is to develop, maintain and advance a Northeast water research priorities agenda, which reflects states’ individual and collective needs, addresses both short and long term priorities, and is flexible as priorities shift.

This research priorities document is the result of a state research needs survey conducted in 2004, and refined through discussions with NEIWPCC Program Directors and additional surveys of state staff through our program specific workgroups during 2005. Additions to this list and shifts in priorities are anticipated and will be reflected in future version of this document. Equipped with this priorities list, NEIWPCC hopes to engage the larger water resource research community in the Northeast region in discussing and pursuing the identified research needs.

## **NEIWPCC Overview**

Since 1947, the New England Interstate Water Pollution Control Commission has been a leader in the fight for clean water. As a not-for-profit interstate agency, NEIWPCC serves and assists its member states—Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont—in many ways: by coordinating activities and forums that encourage cooperation among the states, educating the public about key water quality issues, supporting research projects, training environmental professionals, and providing overall leadership in water management and protection. NEIWPCC's initial emphasis was on surface water protection, but that role has grown over the years to include such matters as wetlands restoration, nonpoint source pollution, drinking water, and underground storage tanks.

NEIWPCC is overseen by 35 Commissioners--five from each member state--who are appointed by their state governors or, in some cases, assume the post due to their position. The Commissioners are a diverse group, representing state water pollution control agencies, environmental protection agencies, health departments, industry, municipalities, and the general public. The chairmanship of the Commission rotates between states every two years.

Under the leadership of Executive Director Ronald Poltak and Deputy Director Susan Sullivan, NEIWPCC's staff develops and carries out programs endorsed by the Commissioners. Further coordination of the work comes from the directors of our three main divisions: Water Quality, Wastewater and Onsite Systems, and Drinking Water. NEIWPCC's headquarters are in Lowell, Mass., but we also employ people in other locations as a means of more directly supporting projects in our member states.

Over the years, NEIWPCC has found that the best way to get the states to share information and insight is through workgroups. On a regular basis, we bring together state and federal agency personnel with expertise in a certain area to discuss problems, share needs, and develop recommendations. The workgroup meetings provide a structured forum for the exchange of ideas. They help set our agenda for the important work that remains to be done.

## **Northeast States' Water Resource Research Priorities**

***TIER 1** – Research needs that are a high priority for a state(s). Research needs are not listed in any specific order.*

### Mercury Research

- Research on mercury in wastewater.
- Mercury deposition monitoring/modeling (e.g. MERGANSER).
- Develop fish consumption advisory database.
- Research to track environmental responses to decreased emissions (NEG-ECP).

### Biological Research on Freshwater and Marine Systems

- Biological monitoring (freshwater, marine, wetlands).
- Research to support numeric biological criteria for freshwater and marine systems.
- Research to develop biological assessment protocols for low gradient streams.
- Aquatic life considerations—research to assess the stresses caused by low flows, withdrawals, and discharges.

### Nutrient Research

- Research into the fate and transport of nutrients (e.g. nitrogen) from septic systems to surface waters and groundwaters (a shared research priority with wastewater).
- Research into nitrogen impacts on wetlands.
- Research to evaluate nitrogen and phosphorus attenuation.
- Research to support nutrient criteria development (connections between algae blooms and chlorophyll a concentrations in New England freshwater bodies).

### Dissolved Oxygen Research

- Data collection for screening level DO models (marine waters in NH and Maine).

### Stormwater Research

- Research on the effectiveness of BMPs (structural and non-structural) for reducing stormwater/nonpoint source pollution.
- Research to support the development and application of new technologies and methods to reduce nutrients, bacteria, sediment loads from urban and suburban areas to rivers and estuaries.
- Research to control bacteria in a larger watershed, particularly in high priority resource areas (e.g. shellfish area and water supplies).

### Wetlands Research

- Research and development of biological condition monitoring protocols.
- Research to support/refine wetland mitigation policies - impacts of buffers of varying sizes on water quality and wildlife; performance of created mitigation wetlands; assessing wetland functions and values; stream mitigation (how to compensate for stream impacts); mitigating impacts to wildlife habitat (e.g., highway/road passage effectiveness).
- Research on the impacts of development/fill (direct, indirect, cumulative).
- Research on pollution impacts on wetlands (groundwater and surface water).
- Research to support the restoration of impaired wetlands.
- Research on wetlands laws/regulations enforcement and compliance.

### Wastewater Research

- Research into failing onsite wastewater treatment systems and their impact on surface and groundwater water quality (e.g. impacts of nutrient enrichment).
- Research on the effects of pharmaceuticals and personal care products (PPCPs) on wastewater treatment systems.
- Research to identify in-region wastewater treatment operator staffing needs for the future.

### Drinking Water Research

- Research into disposal of contaminated treatment media and wastewater (i.e., arsenic, radionuclides).
- Review existing studies and, if necessary, conduct research on the effects of drinking water treatment residuals discharges to Title 5 systems (look at both the impacts on Title 5 system effectiveness and potential drinking water quality impacts).
- Research into emerging drinking water contaminants: NDMA (including formation via treatment).

### Residuals Research

- Research that explores the approaches being used to address phosphorus in biosolids and the positive and negative aspects of each with a goal towards developing a more regional or perhaps national approach.

### Contaminant Research

- Research into the fate, transport and toxicity of existing and emerging chemicals of concern (for example, surfactants, pharmaceuticals, personal care products, flame retardants).

***Tier 2 – Research needs that are a general priority for a state(s). Research needs are not listed in any specific order.***

### Drinking Water

- Source Water Protection – Research into the multiple uses of surface water drinking water supplies, especially boat launches built next to or near water intakes, boat traffic and their impacts, human impacts from swimming, and ice fishing. Research to quantify economic impacts from a contamination event.
- Research into the viability and utility of UV in small and very small systems for meeting disinfection needs economically: capital costs; O&M costs including power; need for backup if UV sources/power fail; special training needed for operators.
- Research into pharmaceuticals in source waters.
- Research to identify the distribution of naturally occurring drinking water contaminants in New England.
- Research to find out if it is possible to isolate in wells where naturally occurring contaminants (Ar, Fl, radionuclides) are coming from and then block off this area or even move the pump location (high priority for Arsenic due to regulatory deadline).
- Research into the distribution and nature of endocrine-disrupting chemicals in New England waters as of a certain date (e.g., a “baseline” study).
- Evaluate or at least gather data from diverse arsenic treatment systems to provide data showing which media gives the most adsorption per \$.

- Private home radon aerators. In the typical installation, condensation from the exhaust vent pipe is drained back into the treated water aerator tank. Does this create bacterial risk? Evaluate typical devices of many brand names for leakage potential of radon inside the home.
- Research into groundwater quality impacts from manganese treatment.

#### Stormwater Research

- Research on simple but accurate tools for performing loading estimates for stormwater (pre and post development) and how to use them for anti-degradation reviews for developments that require 401 water quality certifications.
- Research on tools for including current and future (watershed 20 year or build out conditions) stormwater loadings to streams having TMDL's performed on them would be helpful.
- Research into stormwater impacts and risks from swimming and other contact recreation.

#### Wetlands Research

- Research to refine wetland delineation.
- Research on special/rare/significant wetlands.
- Research on vernal pools.

#### Residuals Research

- Research on better indicators for pathogens: evaluate the possibility of using E. coli or other indicator organisms in place of or in addition to fecal coliform in the 503 regulation.
- Characterization of pathogens in sludge and variations in treatment (what is in Class A v. Class B) and their fate in the field (and under different conditions such as surface application v. incorporation and potential for regrowth).
- Research to evaluate the effectiveness of current 503 management practices versus more stringent state requirements under various conditions in minimizing pollutant transport (including pathogens), and effectiveness in dealing with nuisance issues.
- Research on the fate and transport of radionuclides in drinking water treatment residual sludge's (and applicable to wastewater treatment sludges).

#### Water Allocation and Sustainable Use Research

- Research to help determine allocation of water to competing uses.

***Tier 3** – Research needs that are not a priority for the states at this time, but are of general interest for the future. Research needs are not listed in any specific order.*

#### Mercury Research

- Research to assist in the development of an interstate mercury TMDL.

#### Wastewater Research

- Research to evaluate the feasibility of wastewater treatment plant operator certification across the region.

#### Drinking Water Research

- Research into the low level occurrence of chloroform in coastal aquifers.
- Research into regional contaminants not covered by SDWA: pesticides (forestry, cranberries, blueberries, potatoes, etc.).