Soil & Water

Purpose: To establish the current conditions of New Hampshire's land and water resources, both inland and coastal waterways, and prioritize the protection and restoration of soils and the promotion of water health in support of long-term food security and resilience.

What's at Stake?

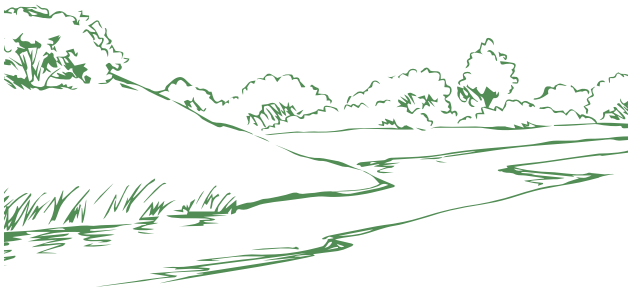
Soil health and water quality are fundamental to farm viability, food security, and public health. As New Hampshire's population grows, there is uncertainty in the availability and sustainability of healthy water and soils. This uncertainty is compounded by the increasing frequency of drought conditions and heavy precipitation events caused by climate change and the emerging understanding and impacts of per-and polyfluoroalkyl substances (PFAS) on public health. Both soil and water health need to be prioritized inside and out of food production to support a thriving agricultural community and mitigate the effects of a changing climate.

Current Conditions

Soil health and water quality are an acute concern in New Hampshire. Understanding the status of statewide soil health is difficult, as New Hampshire lacks a comprehensive soil monitoring program. We know that soil health is under threat due to high levels of soil disturbance, reduced soil cover, and increasingly adverse environmental conditions. Many New Hampshire farms are addressing these challenges by adopting best management practices, including cover cropping, no-till or reduced-till practices, prescribed grazing, and nutrient management plans to reduce soil compaction, build organic matter, increase infiltration, and reduce water runoff.

Water quality is threatened by both non-agricultural nutrient runoff from soils due to excess fertilizer applications to commercial, municipal, and residential lawns, and agricultural sources, such as excess fertilizer and manure applications. There are multiple source water locations in the state that are considered high priority areas by the USDA Natural Resource Conservation Service (NRCS). The NH Department of Environmental Services' (NHDES) 2020/2022 Clean Water Act 305(b) Report lists 67 assessed waterway units as impaired from total phosphorus and 21 impaired from total nitrogen.

Addressing these issues will take a collaborative stakeholder-engaged approach, as a large majority of New Hampshire's land is privately owned (80.2%), meaning that farmers, land managers, and policy-makers have an important role in soil health and water quality statewide.



Challenges and Opportunities

CHALLENGES

- A lack of public and political understanding for needed soil health support and its connections to farm viability and food security.
- Soil health is at risk due to increasingly frequent drought and heavy rainfall events caused by climate change.
- The state does not have a statewide, long-term soil monitoring program. Soil testing is offered by UNH Extension and NRCS.
- Water quality is impacted by numerous factors including: added pollutants, including PFAS; the fragmentation or removal of natural filtration and stability systems, such as wetlands and vegetated waterway buffers; and the increased frequency of large precipitation events caused by climate change.

OPPORTUNITIES

- There are multi-organizational bodies and networks that can promote collaboration between state, local, and federal agencies, universities and researchers, nonprofit organizations, and farmers to identify system needs and create solutions.
- State and federal governments have water quality management programs in place that encourage best management practices.
- Other Northeastern states have healthy soils partnerships, programs, and resources that could provide opportunities for collaboration (e.g., Vermont and Massachusetts).
- Approaches are available to better understand how the timing and size of storms, relative to agricultural activities, influences water quality reaching surface waters, but require investment.
- Practices that improve soil health and increase water retention, such as cover cropping, composting, no- and reduced-tillage, and creating nutrient management plans are supported by NRCS, both financially and through technical assistance.

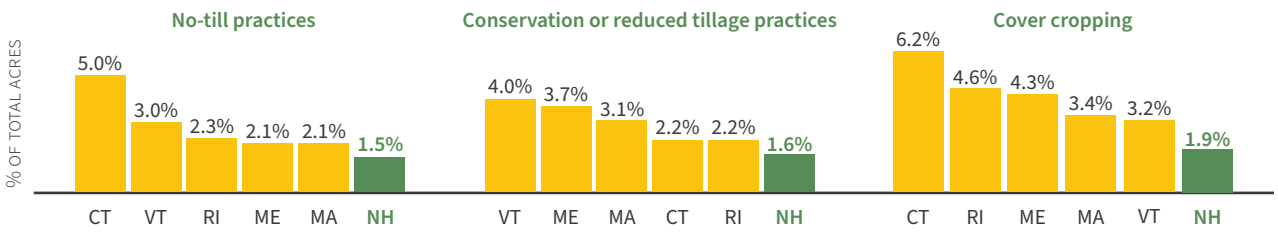
Measurement and Monitoring

SOIL HEALTH MONITORING

In the absence of a statewide soil health monitoring program, preliminary soil health indicators should be synthesized from the number of farmers (and total acreage) who adopt best management practices, including reduced-till or no-till practices, prescribed grazing, cover cropping, and nutrient management plans. The best place to track these metrics would be through the USDA Census of Agriculture, Land Use Practices section, which relies on voluntary reporting, or through NRCS reporting.

NEW ENGLAND LAND USE PRACTICES, 2022

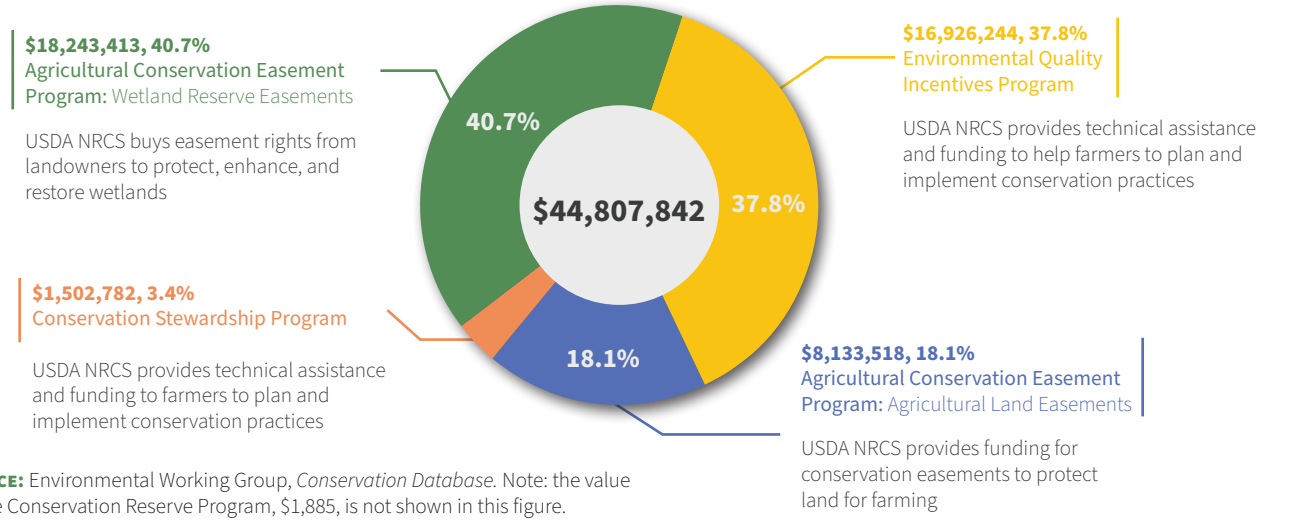
Responses from the 2022 Census of Agriculture indicate that New Hampshire farms had the lowest adoption of conservation practices among New England states.



SOURCE: USDA 2022 Census of Agriculture, *Table 47: Land Use Practices.*

From 2017 to 2022, USDA Conservation Program funding in New Hampshire equaled nearly $45 million, mostly for the Agricultural Conservation Easement Program and Environmental Quality Incentives Program.

USDA CONSERVATION PROGRAM FUNDING IN NEW HAMPSHIRE, 2017-2022

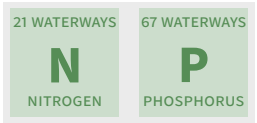


SOURCE: Environmental Working Group, *Conservation Database.* Note: the value for the Conservation Reserve Program, $1,885, is not shown in this figure.

SURFACE WATER QUALITY

Surface water quality is well tracked by NHDES, who monitor stream chemical characteristics, identify impaired waters, and develop Total Daily Maximum Loads reports. Statewide assessments are published every two years. The department's Clean Water Act Section 305(b) Report provides important statewide assessments of water quality. Specific attention should be paid to nitrogen and phosphorus levels and which impaired waterways drain into primarily agricultural versus suburban or more developed watersheds. Water quality improvement efforts should target a reduction in surface waterways assessed as impaired for total nitrogen and phosphorus. More specific details on impaired waterways, and those being listed and delisted, can be found in Section 303(d) of the NHDES report.

IMPAIRED WATERWAYS



Recommendations

- **Establish a voluntary statewide soil monitoring program.** A voluntary statewide soil monitoring program would provide data on soil health conditions. This program could be run as a partnership between UNH Extension, the NH Department of Agriculture, Markets, and Food (NHDAMF), the State Conservation Committee (SCC), conservation districts, NRCS, and other interested partners.
- **Encourage farmers to adopt soil health-focused practices.** Soil-health focused practices include no- or reduced-tillage, cover cropping, composting, on-site composting, and others. Farmers who adopt these practices need to be supported through sustained annual funding administered by the NHDAMF and/or the SCC. The adoption of these practices can be supported by the development of the conservation districts' low-cost equipment rental programs.
- **Support NRCS's efforts to increase farmer access to grants.** Farm Bill-funded grant programs, like the Environmental Quality Incentives Program, Conservation Stewardship Program, and ACT Now, often present barriers to farmers interested in applying. Emphasis should be put on efforts to increase access for historically underserved farmers.

- **Create and maintain on-farm water resources.** Support farmers' ability and resources to create and maintain on farm water resources. These man-made and natural resources, including water retention ponds, basins, and natural wetlands hold excess precipitation, reduce run-off, and increase filtration.

- **Utilize networks to address causes of nonpoint source water pollution.** Networks, like the Lakes Management Advisory Committee and Rivers Management Advisory Committee, help address causes of nonpoint source water pollution, such as fertilizer runoff at residential and commercial sites.

- **Continue state funded support for source water research, protection, and restoration.** Funding would continue supporting research, like the storm sampling of streams draining into agricultural areas, as well as protection grants and restoration projects.

- **Address PFAS issues as public health priorities.** Prioritizing PFAS as a public health issue includes developing PFAS testing, research, standards, and remediation of soil and water contamination. Potential legislation could address the need to remove PFAS from biosolid amendments on farms. Funding for remediation programs should be increased to enhance ongoing work by NHDES and to meet the Environmental Protection Agency's new federal standards.

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New Hampshire
Department of Agriculture, Markets, and Food

NH FOOD ALLIANCE

This brief was developed through a participatory process led by the NH Food Alliance, a program of the University of New Hampshire. The brief content is comprised of the opinions, perspectives, and information gathered by the authors and participants, and does not necessarily represent those of the NH Department of Agriculture, Markets, and Food or the NH Food Alliance.

For more information, including references and opportunities to get involved, visit the 2025 NH Food and Agriculture Strategic Plan web page on nhfoodalliance.org or scan the QR code on the inside front cover of the print version.