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Identify and Report Water Pollution: An Interpretive Guide to Surface Water Conditions of the New Hampshire Coastal Watershed, 2nd edition

New Hampshire Estuaries Project

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BE PART OF
THE SOLUTION

Identify and Report Water Pollution

An Interpretive Guide to Surface Water Conditions of the
New Hampshire Coastal Watershed
2nd edition

A photograph showing water flowing from a dark, rusted metal pipe into a stone structure. The water is splashing and creating white foam as it falls. The stone structure is made of large, irregular blocks of light-colored stone with dark mortar. The background shows more of the stone structure and some green foliage.

 **New Hampshire
Estuaries Project**



The NHEP is part of the U.S. Environmental Protection Agency's (EPA's) National Estuary Program, which is a collaborative local/state/federal program established under the Clean Water Act with the goal of promoting the protection and enhancement of nationally significant estuarine resources. The NHEP receives its funding from the EPA and is administered by the University of New Hampshire. The mission of the NHEP is to protect, enhance, and monitor the environmental quality of the state's estuaries.



The NHEP study area covers the entire coastal watershed of New Hampshire, including all the freshwater tributaries that flow into the estuaries in the state. Forty-two communities are within the NHEP's area of focus. About 10 percent of the state's land area is in the coastal watershed, where approximately one-third of the state's population and businesses are located. Although a portion of the watershed lies in Maine, currently the NHEP conducts its activities only in the New Hampshire portion.

Acknowledgements

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CICEET

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Table of Contents

Introduction	4
Who Are You Going To Call?	6
Water Color	
Brown	7
Gray	8
Green	9
Multi-color	10
Floating Material	
Foam	11
Trash	12
Oily (Rainbow) Sheen	13
Green Hair-like Strands	14
Green Flecks	14
Yellow, Brown, Black Film	15
Purple Slime	15
White Slime	15
Deposits	
Orange Slime, Fluff or Crust	16
Jelly-like Masses	17
Gray, Cottony Slime	17
Yard Waste	18
Shoreland Conditions	
Exposed Soil	20
Animal Waste	21
Trash Dumping	22
Odor	
Rotten Egg/Septic Smell	23
Chlorine	23
Sharp, Pungent Odor	24
Dry Weather Pipe Discharges	25
Resources	
NHDES Contact Information	27
Municipal Contact Information	28
NHEP Programs	29
Reducing Nitrogen Loading	30
“Be Part of the Solution”: Identify and Report Water Pollution Outreach Campaign	34
Citations/Additional Resources	35

Identify and Report Water Pollution: An Interpretive Guide to Surface Water Conditions of the New Hampshire Coastal Watershed

Introduction

As anyone who spends time along the banks of lakes, ponds, or streams knows, water is a dynamic environment. Its condition can change rapidly and sometimes in mysterious ways. For example, one day mounds of sudsy foam may appear in a stream's pool, only to disappear the next day. A pleasant pond in the spring can become a stinking, slimy green mess by August. And remote salt marshes may suddenly develop dark pools covered in iridescent purple scum and oily sheens. But are any, or all, of these conditions dangerous? Should you report what you see or are you simply witnessing natural processes?



Salmon Falls River in Milton, NH

These types of questions were the impetus for this field guide to surface water conditions. It was designed to help people who work or recreate outdoors to interpret surface water conditions so that they would recognize a pollution incident and know how to report it. The guide also suggests actions that communities can take to prevent water pollution and protect vital water resources. Finally, the guide includes helpful, relevant resources that will further explain particular surface water conditions.

This guide is not intended to be a definitive diagnostic tool. It describes only some of the unusual conditions in freshwater and estuarine environments of New Hampshire's coastal watershed. Marine (ocean) conditions are not included in this guide.



Sagamore Creek, Portsmouth, NH

The field guide is organized by observable conditions:

- Water Color
- Floating Material
- Deposits
- Shoreland Conditions
- Odors

For each of these conditions, identification clues are given as well as possible natural and human causes, environmental/social impacts, and in some cases, potentially extreme situations that should be considered emergency situations. These situations are highlighted.

The guide provides corrective actions, preventive actions, and resources to learn more about each of the surface water conditions.

The last section of the guide contains a variety of resources that will be useful for reporting and correcting pollution incidents. Included are multiple NH Department of Environmental Services programs and municipal contact information for fire departments, code enforcement/building inspector offices, public works/road agents, and health officers for each of the 42 coastal watershed communities.

Several of the New Hampshire Estuaries Project programs are highlighted, such as the Local Grants Program, the Community Technical Assistance Program, and the Coastal Illicit Discharge Elimination, Municipal Storm Sewer Mapping, & Illicit Discharge Detection Surveys Grant Program.

Stewardship of water resources is everyone's responsibility. Being observant while working or recreating in the environment is an important part of "Being Part of the Solution."



Storm drain stenciling in Durham, NH

Who Are You Going To Call?

When a pollution incident is encountered it is important to quickly contact the party responsible for dealing with the issue. For most pollution incidents, it is best to report them to local municipal officials who may need to contact the New Hampshire Department of Environmental Services (NHDES) to fix the problem. To address long-term issues, conservation commissions provide leadership and oversight in communities. Below is a table of likely pollution incidents and reporting recommendations. ***A list of municipal contacts for all 42 watershed communities appears on page 28.***

Pollution Incident	Recommended Action
Failed Septic System	Report to the municipal health inspector, code enforcement officer, or building inspector. If conditions persist, contact the NHDES Coastal Office at 603-559-1500.
Erosion	Report to the municipal code enforcement officer, building inspector, or Department of Public Works. Conservation commissions should be notified of erosion incidents. If no action is taken or if conditions persist, contact a NHDES Wetlands or Alteration of Terrain Compliance Investigator at 603-559-1500.
Oil or Hazardous Waste Spill	Call 911 or local fire department. Officials should report incidents to NHDES at 603-271-3899 during business hours or to the state police at 603-271-3636 or 800-346-4009 after business hours. Spills into surface waters and estuaries must be reported to the EPA's National Response Center at 800-424-8802.
Dry Weather Pipe Discharge	Report to municipal Department of Public Works. If no action is taken or if conditions persist, contact NHDES at 603-271-2358.
Excessive Algae	Report to conservation commission and NHDES Limnology Center at 603-271-3414.
Trash Dumping	Report to Department of Public Works, health inspector, or code enforcement officer. If no action is taken or if conditions persist, contact the NHDES Waste Management Division at 603-271-2900.
Cyanobacteria Bloom	Report suspected cyanobacteria blooms to NHDES Beach Program at 603-271-0698, NHDES Limnology Center 603-271-3414, or the Cyanobacteria Hotline at 603-419-9229.

Water Color

Brown Water

Description: Water ranging in color from light-tea to chocolate milk; it may have a rotten egg odor.

Natural Causes: Natural compounds like tannins and lignins stain water, especially if associated with peat bogs and wooded swamps. Algae, especially diatoms in high numbers, can stain water reddish brown. Rarely, a breached beaver dam will result in brown water.

Human Causes: Brown water that looks like chocolate milk is likely a result of eroded disturbed soils. Common sources of erosion are construction sites, animal enclosures, destabilized stream banks, and lakeshore erosion due to boat traffic.

Impacts: Sediments in brown water settle out when water velocity slows. The resulting siltation smothers benthic (bottom-dwelling) organisms and has been identified as a significant problem for oysters in Great Bay. Sediments also transport oils, nutrients, and other pollutants downstream and concentrate them in estuaries. Siltation increases stormwater system maintenance costs for municipalities and increases the likelihood of flooding.

Corrective Actions: Contact the municipal code enforcement officer, building inspector and/or conservation commission to report erosion incidents (page 28). Quickly stabilize disturbed soil using approved erosion control techniques. If no action is taken or if conditions persist, contact a NHDES Wetlands Bureau or Alteration of Terrain Compliance Investigator at 603-559-1500. If it is a lake condition, contact NHDES Limnology Center at 603-271-3414.

Preventive Actions: Municipalities should require building contractors to use erosion control practices, such as installing silt fencing. Promote the maintenance of wide vegetative buffers around surface waters (page 33). To stabilize stream banks, install approved and permitted erosion control structures or plant appropriate native plants.

Resources:

UNH Stormwater Center, <http://www.unh.edu/erg/cstev/>

Buffers, New Hampshire Estuaries Project,

<http://www.nhep.unh.edu/resources/buffers.htm>



Drainage with heavy sediment load

Erosion Control for Construction in the Protected Shoreland Buffer Zone, 1998, NHDES, <http://www.des.nh.gov/factsheets/sp/sp-1.htm>

Review of Bank and Shoreline Stabilization Applications by the DES Wetlands Bureau, 2003, NHDES, <http://www.des.nh.gov/factsheets/wetlands/wb-11.htm>

Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials, 2004, NHDES, http://www.des.nh.gov/WMB/Was/documents/2004_npsBMP.pdf

Gray Water

Description: Water appears milky and may have a rotten egg smell and/or soap odor.

Natural Causes: None

Human Causes: Illicit connections of domestic wastewater to storm drain systems will produce gray water. Untreated septic system discharge can be gray, especially if it is accompanied a chlorine or sewage odor (page 23). Illegal boat discharge may be grey or black. Stormwater runoff from parking lots may also appear cloudy.



U.S. Fish and Wildlife Service

Washing machine discharge

Impacts: Untreated wastewater adds potentially harmful bacteria, protozoa, and viruses to surface waters and excessive nutrients.

Corrective Actions: Contact the municipal code enforcement officer or Department of Public Works. If conditions persist, contact NHDES Coastal Office at 603-559-1500. Report illegal boat discharges to NHDES Limnology Center at 603-271-3414.

Preventive Actions: Route domestic wastewater to sanitary sewer systems. Route stormwater runoff to vegetated areas. Disable all boat toilets while in New Hampshire waters.

Resources:

Greywater: Keep It Out of Surface Waters, 2001, NHDES, <http://www.des.nh.gov/factsheets/wmb/wmb-7.htm>

Green Water

Description/Identification: Water may range from a blue-green to bright green color and may impart an odor. Conditions typically occur from May through October.

Natural Causes: None

Human Causes: Even though algae occur naturally, their intensity and frequency depend on human activity. Algae require certain nutrients in excessive amounts to initiate bloom conditions and activities such as over-fertilizing lawns, boat discharges, septic systems, agriculture operations, or discharging poorly treated wastewater add large amounts of nutrients to the water (page 30). Poor manure management of agricultural operations is another significant source of nutrients.



Algae bloom in small urban pond

Impacts: Frequent and intense algal blooms disrupt aquatic ecology. During a bloom, dissolved oxygen levels and pH rise in the surface layer. When algae cells die, bacteria decomposes them and substantially deplete oxygen levels. This may lead to the death of aquatic organisms, including fish.

Corrective Actions: Nutrient source control is the best long-term corrective measure for chronic algae blooms. Contact the NHDES Limnology Center at 603-271-3414 for information on the control of algae (page 27).

Preventive Actions: Managing sources of nutrients and preventing them from entering surface water is critical (page 30). Maintaining vegetative buffers will limit nutrients entering surface water. To prevent septic system failure, encourage yearly inspections of septic systems and pump out every three to five years. Test soils to determine fertilizer need and follow the requirements of the Shoreland Protection Act that calls for low phosphorus and slow release nitrogen fertilizers, with no applications within 25 feet of surface waters. Actively manage animal waste (page 20). Promote low impact development stormwater management technologies (page 31).

Potential Extreme Situations: Cynobacteria blooms are potentially toxic to animals and humans. Report suspected cyanobacteria blooms to the NHDES Beach Program, 603-271-0698 or NHDES Limnology Center, 603-271-3414.

Resources:

Landscaping at the Waters Edge: An Ecological Approach, 2007. UNH Cooperative Extension, <http://extension.unh.edu/pubs/>

Proper Lawn Care In the Protected Shoreland, 1997, NHDES,

<http://www.des.nh.gov/factsheets/sp/sp-2.htm>

Algae and Weed Control, UNH Cooperative Extension,

<http://extension.unh.edu/pubs/PubsSG/algaweed.pdf>

Recreational Exposure to Cyanobacteria (Blue-Green Algae): What You Should Know, <http://www.des.nh.gov/Beaches/cyanobacteria.htm>

Multi-color Water

Description: Water of various or uniform color, other than brown, green or gray.

Natural Causes: None

Human Causes: Paint and paint equipment rinsed into storm drains or into failing septic systems can color surface waters. Petroleum-based products produce a rainbow sheen on the top of the water (page 13).

Impacts: All paints contain toxins, such as heavy metals and solvents, that harm aquatic life.

Corrective Actions: Contact the municipal code enforcement officer or the building inspector to report improper paint disposal. Report chemical spills to the local fire department (page 28).

Preventive Actions: Encourage proper paint equipment cleaning procedures and never allow paint to enter storm drains. Use drop cloths to control spills outside. Promote the donation of left over paint to local theatre clubs, schools or churches. Small amounts of latex paint can be allowed to dry and then be thrown away in the garbage.

Resources:

"Green" Painting Tips - A Guide To The Environmentally Friendly Purchase, Use And Disposal Of Paint Products, NHDES, <http://www.des.nh.gov/hhw/PaintTipBrochure.pdf>

Pollution Prevention Tips for Paint, 1998, NHDES

<http://www.des.nh.gov/factsheets/hw/hw-14.htm>



Paint spill at construction site

Civahago Soil & Water Conservation District

Floating Material

Foam

Description: Foam is occasionally observed on the surface of lakes and streams, and more frequently observed on streams and rivers.

Natural Causes: Foam is created when the surface tension of water is reduced, allowing bubbles to form. Naturally occurring dissolved organic material can reduce surface tension. Natural foam can be brown, black or yellowish and may smell fishy or musty. It breaks apart easily when disturbed.

Human Causes: Leaking sewer lines, boat discharges, or improper sewer connections to storm sewers are common sources of unnatural foam. Another common source of this type of foam is temporary car washing activities located near storm drains. Detergent foam often has a soapy, fragrant smell and does not break apart easily when stirred.

Impacts: Detergents and associated cleaning agents disrupt water surface tension and other micro-habitats. Disease-causing pathogens that the detergents removed from soiled items pose a public health risk.

Corrective Actions: Trace the source of foam and report it to the municipal health officer. If conditions persist, contact the NHDES Coastal Watershed Supervisor at 603-559-1500.

Preventive Actions: Instruct fundraising car washes to use phosphate free biodegradable detergents, wash cars on permeable surfaces (lawns), and prevent wash water from entering storm drains. To prevent septic system failure, encourage yearly inspections of septic systems and pump outs every three to five years.

Resources:

Lake Foam, 2001, NHDES, <http://www.des.nh.gov/factsheets/bb/bb-5.htm>

Community Car Washes and Water Quality, 2003, NHDES, <http://www.des.nh.gov/factsheets/wmb/wmb-14.htm>

Phosphorus Just A Little Is Too Much for Our Lakes, 1997, NHDES, <http://www.des.nh.gov/factsheets/bb/bb-20.htm>



NH Coastal Program

"Natural" foam from high water velocity on Brown's River in Seabrook, NH

Trash

Description: Waste paper, plastics, construction materials, and food.

Natural Causes: None

Human Causes: Improper management of trash containers and illegal dumping make solid waste vulnerable to dispersion by wind or scavenging by animals. Intentional littering also results in surface water trash.

Impacts: Trash in waterways can inhibit flow and increase the risk of flooding. Materials also carry the risk of introducing pathogens and pose a threat to wildlife.

Corrective Actions: Contact the code enforcement officer, Department of Public Works, and/or conservation commission. Organize community clean-ups of areas with chronic trash problems. Likely sources of labor for a clean-up are scouting troops, community service programs, and watershed associations.

Preventive Actions: Close dumpster covers, secure smaller trash containers, and cover construction roll-offs, especially near surface water.

Resources:

Managing Demolition/Construction Debris, 2000, NHDES,
<http://www.des.nh.gov/factsheets/sw/sw-6.htm>



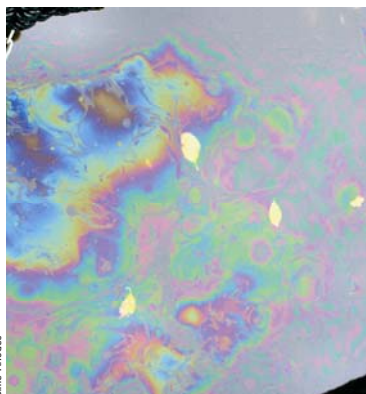
U.S. Fish and Wildlife Service

Trash in waterways increases flooding potential, degrades habitat, and introduces a variety of contaminants into aquatic environments.

Oily (Rainbow) Sheen

Description: Shiny multicolored film on water created by a thin layer of oil. May be associated with an odor.

Natural Causes: There are several sources of natural organic oils. The most common source is from bacteria that are decomposing plant and animal material. Areas with this type of oil will have an earthy or rotting smell. Events that may increase the amount of decomposing organic material include algal blooms, hot dry weather, insect emergence, the presence of iron bacteria, and fish kills. To confirm a naturally occurring sheen, disrupt it with a stick. Natural oil sheens break apart easily and do not flow back together.



Diesel fuel spilled from a boat

Human Causes: Any petroleum products, such as gasoline, heating oil, and solvents, will produce an oily sheen when mixed with water. Common sites of spills include marinas, gas stations, and stormwater runoff from parking lots. To confirm a petroleum sheen, disrupt it with a stick. Petroleum sheens don't easily break apart and quickly flow back together.

Impacts: Natural oils may pose little threat to public health but may harbor other organisms that could result in health related problems. Petroleum products in water have negative effects that include wildlife poisoning and drinking water contamination.

Extreme Situation: Oil spills must be reported immediately. Call 911 or the local fire department.

Corrective Actions: Municipal officials must report all oil and chemical spills to NHDES during business hours at 603-271-3899 or the state police at 603-271-3636 or 800-346-4009 after business hours. Incident report forms can be found at http://www.des.nh.gov/emergency_response.htm. Spills into surface waters must be reported to the EPA's National Response Center at 800-424-8802.

Preventive Actions: Promote proper disposal of waste oil, use no-spill nozzles for municipal and private gas tanks, maintain boat engines, and use oil and water separators in parking lot and roadway drainage systems.

Resources:

Household Disposal of Used Oil, 1999, NHDES,
<http://www.des.nh.gov/factsheets/oil/oil-2.htm>

Green Hair-like Strands

Description: Bright or dark green strands resembling cotton candy, often in floating mats.

Natural Causes: None

Human Causes: Even though filamentous algae occur naturally, the extent of growth depends on human activity. Excessive nutrients from fertilizers or on-shore septic systems promote thick filamentous algae growth.

Impacts: Filamentous algae may inhibit aquatic vegetation growth, reduce fish habitat, and support bacterial growth that depletes dissolved oxygen.

Corrective Actions: Filamentous algae can be removed with a rake to prevent it from decomposing in the water.

Preventive Actions: Limit nutrients entering surface water (page 30).

Resources:

Algae Fact Sheet, 1997, NHDES,

<http://www.des.nh.gov/factsheets/bb/bb-6.htm>



Houston Band of Maliseet Indians

Filamentous algae in pond

Green Flecks

Description: Resembles floating blue-green paint chips or grass clippings.

Natural Causes: None

Human Causes:

Excessive nutrients may trigger cyanobacteria blooms.



Tommi Finck

Cyanobacteria on pond

Impacts: Some cyanobacteria produce harmful toxins (page 9).

Extreme Situations: Cyanobacteria blooms are potentially toxic to animals and humans. Report suspected cyanobacteria blooms to the NHDES Beach Program, 603-271-0698 or NHDES Limnology Center, 603-271-3414 or the Cyanobacteria Hotline at 603-419-9229.

Corrective Actions: Contact NHDES Limnology Center at 603-271-3414 or NHDES Beach Program at 603-271-0698 for assistance.

Preventive Actions: Limit nutrients entering surface waters (page 30).

Resources:

Recreational Exposure to Cyanobacteria (Blue-Green Algae): What You Should Know, <http://www.des.nh.gov/Beaches/cyanobacteria.html>

Yellow, Brown, or Black Film

Description: A yellow, brown, or black coating on water surface, usually in June.

Natural Causes: Tree pollens form surface film on still water.

Human Causes: None

Impacts: None

Corrective Actions: None

Preventive Actions: None



NHEP

Pool of pollen in a stream

Purple Slime

Description: In salt marshes, thick mats of purple floating slime, with a rotten egg smell.

Natural Causes: Purple sulfur bacteria causes this condition.

Human Causes: None

Impacts: None

Corrective Actions: None

Preventive Actions: None



Dave Burdick

Purple bacteria in a salt marsh in Stratham, NH

Floating Material

White Slime

Description: In salt marshes, globs of white slime with sulfur odor.

Natural Causes: White sulfur bacteria causes this condition.

Human Causes: None

Impacts: None

Corrective Actions: None

Preventive Actions: None



Dave Burdick

White sulfur bacteria in a salt marsh in Rye, NH

Deposits

Orange Slime, Fluff or Crust

Description: Coating of orange or orange-red materials that covers underwater structures. Often this material is associated with a surface oily sheen that breaks apart when touched with an object (page 13).

Natural Causes: Some types of bacteria feed on iron and excrete a clear jelly-like substance that turns orange when exposed to oxygen. This natural phenomenon is generally caused by groundwater with low dissolved oxygen and high iron concentrations entering an oxygenated stream, lake, river, or estuary. The state's geologic formations have a great supply of iron that dissolves into groundwater and surface waters.



Orange deposits in Exeter, NH

Human Causes: Since this condition is associated with anoxic (without oxygen) soil, it may indicate water leaching from a landfill or stump dump. This condition can also occur when land has been excavated or filled for construction.

Impacts: Although it looks alarming, this condition does not pose a direct environmental threat, however, it is a possible indication of buried contaminants leaching to surface water.

Corrective Actions: Investigate the source of the low dissolved oxygen water and contact the conservation commission. If conditions persist, contact a NHDES Wetlands Bureau Compliance Investigator at 603-559-1500.

Preventive Actions: Ensure proper containment of landfills.

Resources:

Iron Bacteria in Drinking Water, 2002, NHDES,
<http://www.des.nh.gov/factsheets/ws/ws-3-21.htm>

Jelly-like Masses

Description: Globbs or strings of gelatinous materials.

Natural Causes: Colonial animals called bryozoans form basketball-sized masses on structures in freshwater habitats. Many aquatic creatures deposit gelatinous egg masses. Some aquatic plants like *Brasenia* produce gelatinous masses to defend against aquatic invertebrates. Iron bacteria produces clear jelly that turns orange when exposed to oxygen (page 16). In the lower portions of the Piscataqua River, jelly-like tunicates, commonly called sea squirts, colonize underwater structures.



NHDES Limnology Center

Colonies of bryozoans

Human Causes: None

Impacts: Some tunicates are invasive species. These may displace native organisms and foul underwater structures in estuaries, such as moorings.

Corrective Actions: Suspected invasive tunicates should be reported to NH Sea Grant, 603-749-1565.

Preventive Actions: Inspect and remove organisms from boats and fishing gear entering NH waters.

Resources:

Bryozoans in New Hampshire Lakes, 2006, NHDES,

<http://www.des.nh.gov/factsheets/bb/bb-59.htm>

Gray, Cottony Slime

Description: Called sewer fungus, it is actually feathery colonies of bacteria, often associated with a chlorine smell (page 23).

Natural Causes: None

Human Causes: Sewer fungus grows in the presence of untreated sewage or domestic wastewater.

Impacts: Presence of sewer fungus likely indicates the presence of disease-causing pathogens that pose a public health risk and excessive nutrients that lower water quality.



NHDES

Gray bacteria in stream

Corrective Actions: Identify wastewater sources and report to municipal health inspector, Department of Public Works, or the code enforcement officer. If no action is taken or if condition persists, contact the NHDES Coastal Field Office at 603-559-1500 for assistance.

Preventive Actions: Maintain and monitor sanitary sewer systems.

Resources:

Bacteria in Surface Waters, 2001, NHDES,
<http://www.des.nh.gov/factsheets/bb/bb-14.htm>

Yard Waste

Description: Solid waste composed of grass clippings, leaves, twigs, branches, and other garden refuse.

Natural Causes: Ravines in wooded areas will naturally collect leaves and branches. Wrack deposits of dead grass and algae are driven onto estuary shorelines by the wind.

Human Causes: Dumping grass clippings and other yard waste into surface water.

Impacts: Disposal of yard waste into surface waters can increase the impacts of flooding by creating blockages in waterways and increasing sedimentation. Yard waste dumping can kill underlying vegetation and result in exposed soils that lead to excessive erosion (page 20), especially on shorelines. Yard waste may also spread invasive species, such as purple loosestrife (*Lythrum salicaria*) and Asiatic bittersweet (*Celastrus orbiculatus*), which can disrupt native ecology. Yard waste accumulation in shallow fresh waters can encourage the growth of leeches.

Decomposing yard waste adds excessive nutrients to the water and depletes dissolved oxygen, creating conditions that can kill fish and other aquatic life.



NHDES

Yard waste smothering vegetation

Corrective Actions: Yard waste dumping into surface water is illegal. Contact the local building inspector, code enforcement officer, and/or conservation commission to report yard waste dumping. If no action is taken or if condition persists, contact the NHDES Wetlands Bureau, Coastal Field Office at 603-559-1500.

Preventive Actions: Establish a municipal composting program and/or encourage onsite composting. To reduce the risk of spreading invasive species, landscape with only native plants.

Resources:

Backyard Composting: Nature's Way of Recycling, NHDES,
<http://www.des.nh.gov/SWTAS/pdf/compostFlier.pdf>

Municipal Composting of Yard Waste, 2007, NHDES,
<http://www.des.nh.gov/factsheets/sw/sw-3.htm>



Manchester Urban Ponds Restoration Program

Deposits

Volunteer clean-ups can significantly improve the function of some aquatic habitats by removing concentrations of yard waste and litter. These events also are effective outreach tools that raise public awareness about pollution prevention programs.

Shoreland Conditions

Exposed Soils

Description:

Unvegetated soil that erodes into waterways.

Natural Causes:

Flooding can damage stream banks and wash away anchoring vegetation. Wind and fire can also destroy vegetation.



Construction site erosion near storm drain

Human Causes: Construction activities, animal enclosures and farming are commonly associated with exposed soil. Yard waste, especially on shorelines, kills underlying vegetation and exposes soils to erosion.

Impacts: Exposed soil adds sediments to surface water that reduces light penetration and smothers aquatic organisms. Called siltation, it has been identified as a significant problem for eelgrass beds and oysters in Great Bay. Sediments also transport nutrients and pollutants downstream that are concentrated in estuaries. Additionally, unabated siltation will increase stormwater system maintenance costs for municipalities and increase flooding.

Corrective Actions: Contact the municipal code enforcement officer, building inspector, and/or conservation commission to report erosion incidents. If no action is taken or if conditions persist, contact a NHDES Wetlands Bureau or Alteration of Terrain Compliance Investigator at 603-559-1500.

Preventive Actions: Require building contractors to conduct erosion control practices, such as spreading mulch and installing silt fencing. Promote the maintenance of wide vegetative buffers around surface waters (page 33). To stabilize shorelands seek assistance and permitting from the NHDES Wetlands Bureau at 603-559-1500.

Resources:

Erosion Control for Construction in the Protected Shoreland Buffer Zone, 1998, NHDES, <http://www.des.nh.gov/factsheets/sp/sp-1.htm>

Review of Bank & Shoreline Stabilization Applications by the DES Wetlands Bureau, 2003, NHDES, <http://www.des.nh.gov/factsheets/wetlands/wb-11.htm>

Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials, 2004, NHDES, http://www.des.nh.gov/WMB/Was/documents/2004_npsBMP.pdf

Animal Waste

Description: Animal droppings ranging in size, shape and dispersal patterns.

Natural Causes:

Concentrated populations of wildlife will create significant waste. Geese and ducks, which produce high nutrient waste, can defecate up to 28 times per day.

Human Causes: Horse barns, dog kennels, and hobby farms are common sources of concentrated animal waste. Dog waste in neighborhoods adjacent to surface waters is a significant threat to water quality.

Impacts: Pathogens associated with animal waste pose human health risks. Bacteria from animal waste can close shellfish areas to harvesting and cause advisories to be issued at Designated Public Beaches. Excessive nutrients from animal waste will impact water quality (page 30).

Corrective Actions: Contact the municipal health inspector, the code enforcement office, and/or conservation commission. If conditions persist contact the NHDES Coastal Field Office at 603-559-1500.

Preventive Actions: Owners of large animals should follow manure management procedures. In neighborhoods with large numbers of dogs, implement a pet waste outreach campaign and enforce animal waste disposal ordinances. Do not feed any wildlife that congregate around public waters and especially at public beaches.

Resources:

The Inside Scoop: How to Conduct a Pet Waste Outreach Campaign, 2007, NHDES,

http://www.des.nh.gov/coastal/documents/scoop_manual.pdf

Identifying Animal Droppings and Feces, University of Nebraska,

<http://icwdm.org/Inspection/droppingfeces.asp>

Good Neighbor Guide for Horse-Keeping: Manure Management, 1995, UNH Cooperative Extension,

<http://extension.unh.edu/Pubs/AgPubs/aahr1050.pdf>

Canada Geese Facts and Management Options, 2004, NHDES,

<http://www.des.nh.gov/factsheets/bb/bb-53.htm>



Outreach campaigns can prevent pet waste from entering surface water

Trash Dumping

Description: Abandoned appliances, tires, car batteries, furniture, automobiles, and other large refuse items.

Natural Causes: Flooding can drag trash great distances.

Human Causes: Due to price of disposal, large household items may be dumped in remote areas, often adjacent to wetlands.

Impacts: Oil, coolant, mercury, and other contaminants contained in large household appliances can leak into the environment and either directly kill flora and fauna or introduce contaminants that will degrade the environment. Trash often collects standing water and provides mosquito breeding areas that are vectors for human disease. Refrigerators can trap small children if the doors are not removed.

Corrective Actions: Contact land owner, the code enforcement officer, Department of Public Works, and/or conservation commission. Organize community clean-ups of areas with chronic trash problems. Likely sources of labor for a clean-up are scouting troops, community service groups, and watershed associations.

Preventive Actions: Encourage local code and law enforcement to monitor likely dumping locations. Limit access to remote areas that are vulnerable to dumping.

Resources:

Identification Of Hazardous Waste, 2000, NHDES,
<http://www.des.nh.gov/factsheets/hw/hw-11.htm>



U.S. Fish and Wildlife Service

Trash dumped near lake

Odors

Rotten Eggs

Description: Some sulfide gases, such as hydrogen sulfide, have a “rotten egg” smell.

Natural Causes:

Decomposing organic material in wetlands, especially salt marshes, will produce sulfide gases and methane gases.



A salt marsh pool that produces sulfide gases

Human Causes: Discharge from a failed septic system or a damaged sewer line will produce similar odors to natural sulfide gas.

Potential Extreme Situations: Natural gas smells somewhat like rotten eggs. Northern Utilities is the only gas utility in New Hampshire’s coastal watershed. If a gas leak is suspected, the company recommends that people leave the area immediately and call the 24-Hour Gas Leak Emergency line at 1-800-842-6847.

Impacts: Strong sulfide gas smell is unpleasant, but a common occurrence, especially in tidal areas. Sulfide gas odors detected away from tidal wetlands or any sewer-like odors warrant further investigation.

Corrective Actions: Contact the municipal health officer or Department of Public Works to investigate source of odor. If conditions persist, contact the NHDES Coastal Field Office at 603-559-1500.

Preventive Actions: To prevent septic system failure, encourage yearly inspections of septic systems, pump outs every three to five years, and protection of leach fields.

Resources:

What You Should Know About Your Septic System to Prevent Costly Repairs, 2006, NHDES, <http://www.des.nh.gov/gw/gw0405.htm>

Chlorine

Description: A familiar smell associated with swimming pools and laundry bleaches. May be associated with greywater or foam.

Natural Causes: None

Human Causes: Improper wastewater and/or swimming pool discharges.

Impacts: Chlorine is toxic to aquatic organisms.

Corrective Actions: Call 911 or local fire department (page 28). Municipal officials should report incidents to NHDES at 603-271-3899.

Preventive Actions: Maintain systems that contain chlorine and never discharge into surface waters.

Resources:

Chemicals in the Environment: Chlorine, 1994, U.S. EPA,
http://www.epa.gov/chemfact/f_chlori.txt

Sharp, Pungent Odor

Description: Odors that irritate nose, eyes, throat and/or lungs.

Natural Causes: Several animals, such as skunks, mink, muskrats, and foxes, produce distinctive pungent odors. Typically they do not produce a stinging sensation.

Human Causes: Many volatile chemicals, including pesticides and fertilizers, emit powerful odors that may produce irritation or stinging sensations.



Cinnamon McNeil

A gasoline spill is usually first detected by its strong, familiar odor

Potential Extreme Situations: If odors cause irritation, leave the area immediately and call 911 or the local fire department (page 28).

Impacts: Many volatile chemicals have severe environmental impacts on flora and fauna and pose a human health risk.

Corrective Actions: Municipal officials must report all oil and chemical spills to NHDES during business hours at 603-271-3899 or the state police at 603-271-3636 or 800-346-4009 after business hours. Incident report forms can be found at http://www.des.nh.gov/emergency_response.htm. Spills into surface waters must be reported to the EPA's National Response Center at 800-424-8802.

Preventive Actions: Use all chemicals in accordance with label instructions. Never dump these chemicals in storm drains or surface waters.

Resources:

New Hampshire's Air Toxics Control Program: Protecting Public Health and the Environment from Toxic Air Pollutants, 2006, NHDES,
<http://www.des.nh.gov/factsheets/ard/ard-1.htm>

Dry Weather Pipe Discharges

Description: If it has not rained for two or three days and there is water flowing from a stormwater outfall pipe, it is very likely that the water is not stormwater discharge. Discharges during dry weather conditions suggest improper connections to the stormwater drainage system, cracked and leaking pipes, or other illegal discharges to storm sewer systems. These types of non-stormwater discharges into storm drain systems, known as “illicit discharges,” are major pollution sources that negatively impact water quality.

Characteristics of storm drainage pipe discharges that signify a problem and warrant further investigation include odors such as sewage, gasoline, or chemical smells; colored water; floating materials such as soap suds or oil sheens; and excessive vegetation around outfall pipes.

Natural Causes: Some drainage pipes are used to direct springs or seeps that flow during dry weather. Tidal culverts or drainage pipes may discharge during the tidal cycle. Water runoff from melting snow can enter storm sewer systems and cause discharges during dry weather.

Human Causes: Pipes discharging during dry weather periods typically suggest that an illegal connection to the stormwater drainage system exists. Common examples of illicit discharges include sewage lines from homes and business incorrectly connected to storm system; cross-connections between sewer lines and a storm drainage system; laundry discharges and/or basement floor drains connected to storm sewer systems; and improper disposal of household and automotive wastes. Car washing, pavement washing, swimming pool draining, and other one-time or intermittent activities that cause water to wash into a stormwater conveyance system are other causes of dry weather discharges. Cracks to old storm drain pipes or breaks in pipes allow groundwater to infiltrate, which can be particularly problematic if the pipes are located near septic systems or leaking sanitary system pipes.



Kern Kiser

Pipe discharging water during dry weather

Impacts: Illicit discharges pose a human health risk especially when the problem is caused by wastewater entering the stormwater drainage system. High bacteria levels found in wastewater that is discharged without treatment result in harvest closures for shellfish beds and swimming beach closures. Other pollutants and toxins found in illicit discharges also can pose human health risks and threaten aquatic habitats.

Corrective Actions: A number of diagnostic tests (smoke tests, dye tests, video surveillance in pipes, etc.) can help identify the source of pollution. Communities can then work with the building or home owner to correct the problem and connect sanitary discharges to a wastewater treatment system. One-time or intermittent discharges to storm drains may be harder to identify and correct. Opportunities for citizens to report illegal dumping to town officials may help identify problems over time.

Preventative Actions: Development and implementation of a solid stormwater management program involves many aspects that can limit illicit discharges. Town ordinances should restrict discharges to the storm drain system, and education programs should encourage homeowners to properly dispose of household hazardous wastes and maintain septic systems through inspections and pump-outs.

Resources:

Guidelines and Standard Operating Procedures: Illicit Discharge Detection and Elimination and Pollution Prevention/Good Housekeeping for Stormwater Phase II Communities in NH, 2006, Seacoast Stormwater Coalition,
www.nhep.unh.edu/resources/pdf/guidelines_and_standard-cop-06.pdf

NHDES Watershed Management Bureau: Watershed Assistance Section,
<http://www.des.nh.gov/WMB/was/investigations.htm>



NHEP

Permitted discharge into Great Bay in Durham, NH

NHDES Contact Information



Beach Program	603-271-0698	Alicia.Carlson@des.nh.gov
Coastal Field Office	603-559-1500	Mary.Power@des.nh.gov
Coastal Watershed Supervisor	603-559-0032	Sally.Soule@des.nh.gov
Drinking Water Program	603-271-2513	dwgbInfo@des.nh.gov
Hazardous Waste Hotline	603-271-2942 866-429-9278	hwcomp@des.nh.gov
Household Hazardous Waste	603-271-2927	hhw@des.nh.gov
Limnology Center	603-271-3414	Jody.Connor@des.nh.gov
Non-Point Source Pollution	603-271-2963	watershed@des.nh.gov
Oil/Hazardous Waste Spill Response	603-271-3899	Robert.Berry@des.nh.gov
Petroleum Remediation	603-271-2900	remed@des.nh.gov
Pollution Prevention Program Hotline	800-273-9469	nhppp@des.nh.gov
Solid Waste Compliance	603-271-6467	Mike.Guilfoy@des.nh.gov
Solid Waste Permitting	603-271-5185	Wayne.Wheeler@des.nh.gov
Solid Waste Program	603-271-2456	swcomp@des.nh.gov
Solid Waste Technical Assistance	603-271-2900	
Spill Response & Complaint Investigations	603-271-3000	Carroll.Brown@des.nh.gov
Subsurface Systems Bureau	603-559-1500	Mary.Power@des.nh.gov
Used Oil Hotline	888-825-3645	

New Hampshire Pollution Prevention Program

The New Hampshire Pollution Prevention Program (NHPPP) is a free, confidential, non-enforcement, pollution prevention and compliance assistance program available to all NH businesses, institutions, municipalities and agencies. Without the risk of enforcement, you can have the NHPPP evaluate your facility for compliance issues and ways to economically reduce wastes. Contact NHPPP at 603-271-6460, 800-273-9469, nhppp@des.nh.gov, or <http://www.des.nh.gov/nhppp>.

Municipal Contact Information

Community	Fire Department	Code Enforcement Building Inspector	Public Works/Road Agent	Health Officer
Barrington	664-7394	664-9007 ext. 5	664-9007 ext. 0166	664-5798
Brentwood	642-8132	642-6400 ext. 18	775-7654	642-6400
Brookfield	522-8336	651-3055	651-3055	522-3688
Candia	483-2202	483-1015	483-5525	483-8101
Chester	483-2202	887-5552	396-5083	887-4979
Danville	382-5133	382-8253 ext. 1	382-0703	382-3005
Deerfield	463-8811	463-8811 ext. 110	463-7736	463-8811
Dover	516-6150	516-6008	516-6450	743-6038
Durham	868-5531	868-8064	868-5578	868-8064
East Kingston	642-3141	502-9293	642-5246	642-5326
Epping	679-5446	679-1092	679-5441, ext. 113	679-5441
Exeter	773-6131	773-6112	773-6157	773-6131
Farmington	755-2131	755-2774	755-4884	755-2208
Fremont	895-6719	895-3200 ext. 18	300-7429	895-3200 ext. 18
Greenland	547-3501	431-3070, cell 502-4623	431-3070, cell 502-4623	431-3070
Hampton	926-3316	929-5826	926-4402	929-5826
Hampton Falls	926-5752	926-5269	770-6771	926-5269
Kensington	772-5751	867-9527	772-5423	867-9527
Kingston	642-3626	642-3342	642-8042	642-3342
Lee	659-5411	659-6783	659-6515	659-6783
Madbury	742-1164	742-5131	742-5131	742-5131
Middleton	473-2750	755-1083	473-8390	755-3631
Milton	652-4201	652-4501 ext. 207	652-9891	652-4501
New Castle	436-1132	431-6710 ext. 1311	431-6710	431-6710
New Durham	859-3473	859-0516 or 859-4081	859-8000	859-5500
Newfields	772-5070	772-5070	772-5070	772-5070
Newington	436-9441	436-7640 ext. 13	436-7640,	436-7640
Newmarket	659-3334	659-3617 ext. 1311	659-3617 ext. 1801	659-8501
N. Hampton	964-5500	964-8650	964-6442	964-8650
Northwood	942-9103	942-5586 ext. 203	942-9108	942-5586 ext. 211
Nottingham	679-5666	679-9597	679-5022	679-5022
Portsmouth	427-1515	610-7243	427-1530	610-7273
Raymond	895-4353	895-4735 ext. 116	895-4735 ext. 108	895-4735 ext. 116
Rochester	335-7545	335-7524	335-7529	332-3508
Rollinsford	742-2803	742-2510	742-2510	742-2510
Rye	964-6411	964-9800	964-5300	964-5523
Sandown	887-4806	867-6085	887-3484	887-3646
Seabrook	474-2611	474-3871	474-9771	474-3871
Somersworth	692-3457	692-9522	692-4266	692-9503
Strafford	269-4121	765-4799	332-0349	664-2192 ext. 13
Stratham	772-8215	772-7391	772-5550	778-7391
Wakefield	522-8336	522-6205 ext. 308	522-8266	522-6205

NHEP Programs

The New Hampshire Estuaries Project (NHEP) offers a variety of programs that assist communities in protecting and improving water quality.

Local Grants Program

Communities, watershed groups, and conservation organizations can apply for funding to support projects that implement actions from the NHEP Management Plan to improve water quality. A request for proposals for this annual grant program is released late summer each year. Typically, up to \$10,000 is awarded per project.



NHEP offices are located in Nesmith Hall, on the University of New Hampshire campus in Durham, NH

Community Technical Assistance Program

The NHEP's Community Technical Assistance Program (CTAP) assists communities with a number of regulatory and nonregulatory approaches to natural resources protection. The program provides consultants to work with communities on stormwater management, buffer protection, and land conservation. Many projects have resulted in improved ordinances to better protect water quality and other natural resources. The NHEP pays for the assistance and manages the contract agreement with the consultants. Applications for CTAP can be submitted by town planning boards or conservation commissions.

Coastal Illicit Discharge Elimination, Municipal Storm Sewer Mapping, & Illicit Discharge Detection Surveys Grant Program

The NHEP provides funds through a grant program administered by NHDES to which coastal watershed communities can submit project proposals for the elimination of illicit discharges into the storm drainage system, mapping municipal storm sewer systems, and surveying storm sewer systems for illicit discharges. To date over 25 community projects have been funded through this grant program.

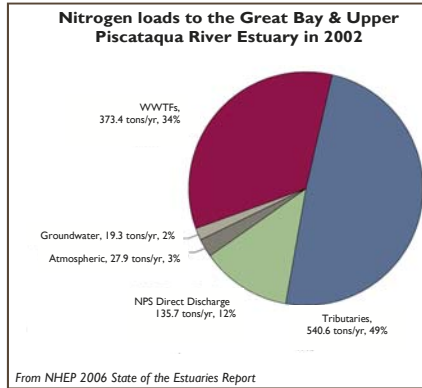


Contact: NHEP@unh.edu
www.nhep.unh.edu

Reducing Nitrogen Loading

Dissolved inorganic nitrogen (DIN) is common and is essential for most aquatic life. However, excessive DIN is a problem when it overfeeds algae, creating a population explosion called an algae bloom. Blooms alter aquatic habitats by affecting dissolved oxygen levels, light penetration, and pH.

Data presented in the *2006 State of the Estuaries Report* document a 59 percent increase in DIN concentrations in Great Bay in the past 25 years. Negative effects of excessive nitrogen are beginning to be observed in some parts of the estuary. Nuisance algal blooms can be found in some embayments and tributaries.



Nonpoint source pollution directly discharged to Great Bay or to its tributaries is the largest source of nitrogen to the bay, accounting for over 60 percent of the total. Nitrogen sources include septic systems, lawn fertilizers, and atmospheric deposition to the land. Stormwater runoff washes land-based sources into the bay. Increasing development and associated impervious surfaces increase the amount of stormwater runoff.

There are several ways to reduce nitrogen loading into surface waters:

I. Maintain Septic Systems

Poorly maintained and failing septic systems can contribute nitrogen to surface waters. Homeowners should maintain their septic system by inspecting it yearly, ordering pump outs every three years, protecting the leach field, limiting water use, and adding only biodegradable materials to the system.

The NHEP offers outreach materials, including a maintenance folder for septic system owners and an informational video to assist municipalities and other groups with outreach campaigns. To receive copies of septic system educational materials, email a request to Contact.NHEP@unh.edu or call 603-862-3403.



Septic System Maintenance Folder

2. Manage Stormwater Effectively: Implement Municipal Stormwater Management Plans and Use LID Technologies

Low impact development (LID) stormwater management methods allow runoff to seep into the ground and often use vegetation to filter water and remove nitrogen, phosphorus, and other pollutants. LID approaches can decrease the frequency and magnitude of floods.



LID device treating stormwater from a parking lot

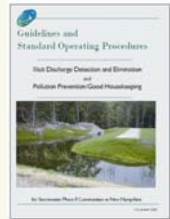
LID stormwater management technologies that remove nitrogen include bioretention areas, rain gardens, grassy swales, infiltration trenches, basins or ponds, native plantings, and green roofs. Many of these treatments can be installed around existing development.

For more information on LID, contact the NHDES Watershed Division's Biology Section at 603-271-2963 or watershed@des.nh.gov or the UNH Stormwater Center (page 32).

Low-Impact Development: Taking Steps to Protect New Hampshire's Surface Waters, 2005, NHDES, <http://www.des.nh.gov/factsheets/wmb/wmb-17.htm>

Outstanding Resource

Guidelines and Standard Operating Procedures: Illicit Discharge Detection and Elimination and Pollution Prevention/Good Housekeeping for Stormwater Phase II Communities in NH



Designed specifically for New Hampshire communities, this manual addresses illicit discharge detection and elimination (IDDE) programs and pollution prevention/good housekeeping for municipal activities. It is written for program managers with responsibility for developing town stormwater programs and for municipal employees who will implement programs. The manual offers six steps to develop a customized IDDE program and commonly accepted technical standards and guidance on stormwater management measures. It is a resource for improving stormwater management and employee training programs.

Read the guide online at www.nhep.unh.edu/resources/pdf/guidelines_and_standard-cop-06.pdf

UNH Stormwater Center

The UNH Stormwater Center studies stormwater-related water quality and quantity issues and operates a field facility to evaluate and verify performance of stormwater management devices and technologies. Fifteen different management systems are currently undergoing side-by-side comparison testing under strictly controlled conditions.



UNH Stormwater Center's Treatment Units

The Center hosts workshops for municipal officials, town administrators, engineers, land planners, landscape architects, and natural resource managers. The sessions cover the performance, cost, suitability, operation, and maintenance issues associated with different stormwater management devices. The NHEP covers workshop costs for town staff, conservation commissioners, and planning boards members from the 42 coastal watershed towns. For more information, contact the UNH Stormwater Center Site Manager at 603-767-7091.

3. Promote Proper Lawn Care in Shoreland Areas

Fertilizers used on lawns can contaminate surface and groundwater. The New Hampshire Comprehensive Shoreland Protection Act prohibits the use of all fertilizers except limestone within 25 feet of the reference line of public waters (see RSA 483-B:4 (XVII)). Twenty-five feet beyond the reference line, low phosphate, slow release nitrogen fertilizer or limestone may be used.

Lawn care techniques that will further protect water quality include soil aeration, mulching with grass clippings, prudent water and fertilizer use, maintenance of 2 inch grass height, and use of alternate ground cover instead of lawns. Reducing the size of managed lawns and landscaping with native plants can minimize the need for fertilizers and watering.



Ivan Melencion

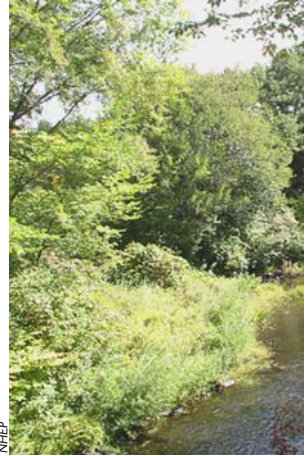
Maintaining a 2 inch grass height is a practice that protects water quality.

For more information see *Landscaping at the Waters Edge: An Ecological Approach*, 2007, UNH Cooperative Extension, <http://extension.unh.edu/pubs/>

4. Maintain Vegetated Buffers

Vegetated buffers around water bodies can greatly decrease the amount of nitrogen entering surface waters. Buffers filter stormwater runoff and remove nitrogen, as well as many other pollutants. In addition, buffers slow the velocity of stormwater runoff thereby minimizing erosion and promoting groundwater recharge. They also physically protect and separate a stream, lake, or wetland from future encroachment.

Municipalities should maintain and protect buffers in their towns by developing and enforcing buffer ordinances to improve water quality, maintaining buffers on town-owned lands, and conducting outreach to land owners to encourage proper stewardship of buffer areas.



Lamprey River in Lee, NH

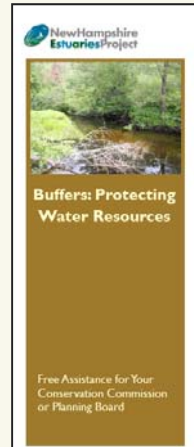
Outstanding Resource

Customized Community Assistance to Improve Buffer Protections

Protecting buffers around water resources is a priority of the NHEP, which offers many ways to assist communities with buffer protections. A NHEP consultant can meet with town boards, community officials, and watershed groups to provide information, workshops, or assistance in developing ordinances or outreach campaigns to improve buffer protections.

Some communities may be eligible for assistance through the NHEP's Community Technical Assistance Program.

For more information or to schedule assistance contact the NHEP at 603-862-2641 or [Contact.NHEP@unh.edu](mailto>Contact.NHEP@unh.edu).



Citations/Additional Resources

- Bacteria In Surface Waters, 2001, NHDES, <http://www.des.nh.gov/factsheets/bb/bb-14.htm>
- Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials, 2004, NHDES, http://www.des.nh.gov/WMB/Was/documents/2004_npsBMP.pdf
- Bryozoans in New Hampshire Lakes, 2006, NHDES, <http://www.des.nh.gov/factsheets/bb/bb-59.htm>
- Canada Geese Facts and Management Options, 2004, NHDES, <http://www.des.nh.gov/factsheets/bb/bb-53.htm>
- Erosion Control for Construction in the Protected Shoreland Buffer Zone, 1998, NHDES, <http://www.des.nh.gov/factsheets/sp/sp-1.htm>
- A Field Guide to Aquatic Phenomena, <http://www.umaine.edu/waterresearch/FieldGuide/color.htm#gray>
- "Green" Painting Tips - A Guide To The Environmentally Friendly Purchase, Use And Disposal Of Paint Products , NHDES
- Brochure, <http://www.des.nh.gov/hhw/PaintTipBrochure.pdf>
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- Household Disposal of Used Oil, 1999, NHDES, <http://www.des.nh.gov/factsheets/oil/oil-2.htm>
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- Managing Demolition/Construction Debris, 2000, NHDES, <http://www.des.nh.gov/factsheets/sw/sw-6.htm>
- NPS Maine: <http://www.maine.gov/dep/blwq/training/gallery/algae.htm>
- Phosphorus Just A Little Is Too Much for Our Lakes, 1997, NHDES, <http://www.des.nh.gov/factsheets/bb/bb-20.htm>
- Pollution Prevention Tips for Paint, 1998, NHDES <http://www.des.nh.gov/factsheets/hw/hw-14.htm>
- Recreational Exposure to Cyanobacteria (Blue-Green Algae): What You Should Know, <http://www.des.nh.gov/Beaches/cyanobacteria.html>
- Review of Bank and Shoreline Stabilization Applications by the DES Wetlands Bureau, 2003, NHDES, <http://www.des.nh.gov/factsheets/wetlands/wb-11.htm>
- Snohomish County, Washington, Public Works: Surface Water Management, http://www1.co.snohomish.wa.us/Departments/Public_Works/Divisions/SWM/Work_Areas/Water_Quality/Investigations/default.htm
- State of the Estuaries Report, 2006, NHEP, http://www.nhep.unh.edu/resources/pdf/2006_state_of_the-nhep-06.pdf
- Surface Water Quality Data Interpretation Workbook, <http://www.texaswatch.geo.txstate.edu/resources/Curriculum/Data%20Analysis%20Curriculum/Section%20One.pdf>
- UNH Stormwater Center, <http://www.unh.edu/erg/cstev>

Immediately Report Chemical or Oil Spills

Call 911

Or Local Fire Department

Additionally, notify NHDES at

603-271-3899

during business hours

or the

New Hampshire State Police at

603-271-3636

or

1-800-346-4009

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