New Hampshire Estuaries Project
University of New Hampshire
Hewitt Annex, 54 College Rd
Durham, NH 03824-2601

Seacoast's 'Great' upland connection
By Eric Aldrich
Editor's note: The writer is director of communications for The Nature Conservancy of New Hampshire.

The next time you're standing on the shore and looking out across the beautiful Great Bay Estuary, take a moment to picture the well-known Seacoast waterbody from a loftier perspective: the clouds. The connection isn't so clear.

With a little imagination you can become a water droplet in the clouds, drifting over and looking down at the briny waters. And across the landscape, from your new perspective, you can clearly see Great Bay is more than just a bay. It's part of a system that funnels water from the land and merges it with the sea - forming a dynamic environment for a huge variety of life forms.

Before you know it, you're drawn into the system yourself. You can see how it all fits together - the estuary's upland connection.

As the air cools, you form into a rain drop that plummets to earth. Below you see woodlands. You see the shine of Great Bay below, and the low green hills around it. The houses and their little yards carved out of the woods. Cul de sacs, roads, highways, fields, marshes. Industries, plazas and parking lots. Your destiny depends on the type of surface you hit.

You could think about a single rain drop's destiny.

Does it hit in the woods or on a field. You might seep cleanly into the soil. Or does it strike an oily parking lot where you would gather pollutants as you slide toward a storm drain or gutter.

Clean or dirty, you're headed downhill and your journey will end in the sea.

Looking out at the horizon, you could imagine a bright red line running across the tops of the hills and ridges in a contorted circle all the way around Great Bay, encompassing 700 square miles. Rain that lands inside the circle heads toward Great Bay. Rain that lands outside the circle heads toward other watersheds.

That's the estuary's upland connection.

And that's just the watershed for the Great Bay Estuary. New Hampshire's other major estuary is Hampton-Seabrook Harbor, which holds the largest salt marsh in the state.

From land to sea

A watershed is the surface drainage area that contributes water to a lake, river, or other body of water. In the case of Great Bay, it is 700 square miles of land stretching north to Wakefield, west to Candia and south to Sandown. Compared to its watersheds, the estuaries themselves seem small. Great Bay seems small. Covering

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17 square miles, the Great Bay Estuary (which includes all tidally influenced sections) begins at New Castle and extends up to the bay which is surrounded by Durham, Newmarket, Newfields, Stratham, Greenland and Newington. The quality of the water in Great Bay and its estuary is largely determined by the structure of the watershed. A watershed that is largely forested will slowly filter rainwater as it enters rivers and will result in a cleaner estuary. A watershed that is largely paved will quickly flush rainwater, along with many residual pollutants, into rivers and thus result in a more polluted estuary.

Hampton-Seabrook Harbor's salt marshes cover nearly 8 square miles and the harbor itself another square mile.

In 2000, the New Hampshire Estuaries Project - a collaborative effort between local, state and federal agencies and organizations - launched a plan for restoring and managing the estuaries. Much of it is concerned with the land around the estuaries - the watershed.

"To improve the environmental health of our estuaries, we must look at land-based activities across the coastal watershed," said Jennifer Hunter, director of the New Hampshire Estuaries Project.

One land activity that dramatically impacts water quality is the application of hard materials such as pavement, concrete and buildings that prevent water from seeping into the soil. Collectively, these materials are called "impervious surfaces."

According to the N.H. Estuaries Project, an estimated 6.8 percent of New Hampshire's coastal watershed is covered by impervious surfaces. Studies show water quality deteriorates where impervious surface coverage exceeds 10 percent. The N.H. Estuaries Project works with many organizations to keep impervious surface cover below 10 percent in a variety of ways, including land protection, habitat restoration and wise planning.

To address problems involving water quality and living resources, the Estuaries Project's plan looks at things like:

- Improving stormwater management;
- Eliminating or reducing pollution from wastewater treatment facilities;
- Helping local planning boards, conservation commissions and regional planning commissions;
- Addressing land-use conversion issues;
- Limiting urban sprawl; and
- Protecting shorelands, wetlands and other ecologically sensitive places in the watershed.
- Protecting the land

The Seacoast region is one of the fastest growing areas of the state. If we want to safeguard the estuary's health, protecting land in the watershed is an important and lasting way to do it. That's the premise behind the Great Bay Resource Protection Partnership. Since 1994, this comprehensive and science-based approach has helped identify and protect critical lands in the watershed. So far, more than 5,000 acres have been permanently protected.

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With The Nature Conservancy as lead acquisition agent, the partners also include the Audubon Society of New Hampshire, Ducks Unlimited, Great Bay National Estuarine Research Reserve, Natural Resources Conservation Service, New Hampshire Fish and Game Department, Society for the Protection of New Hampshire Forests, U.S. Environmental Protection Agency and the U.S. Fish and Wildlife Service. Key funding has come from the National Oceanic and Atmospheric Administration and the North American Wetlands Conservation Act.

Many other organizations and towns in the watershed are protecting land, from the Seacoast Land Trust to Moose Mountains Regional Greenways, which conserves lands in the coastal watershed as far north as Wakefield.

Right now, 8.4 percent of the coastal watershed is protected. The New Hampshire Estuaries Project's goal is to protect 15 percent of the watershed land area by 2010.

"The New Hampshire Estuaries Project's management plan identifies land protection as a critical component of maintaining estuarine water quality," said Hunter, the New Hampshire Estuaries Project director. "The plan also recognizes that continued development will occur and thus promotes practices that limit impacts to valuable natural resources and water quality."

Restoring lands

Historically, New Hampshire uplands and wetlands were routinely cleared, filled or drained. Now, organizations - such as New Hampshire Estuaries Project, New Hampshire Coastal Program, Ducks Unlimited, N.H. Department of Transportation and others - are working to restore damaged uplands and wetlands to fully functioning habitats that do not deteriorate water quality. In fact, there are so many restoration projects in Great Bay's watershed alone that The Nature Conservancy is preparing to assemble a restoration compendium that will identify past restoration projects, highlight current projects, and prioritize future restoration needs. Restoration of uplands and wetlands far into the watershed is a key aspect of protecting the water quality of the Great Bay Estuary.

Wise planning

Wise planning is an important part of protecting Great Bay's water quality. Theresa Walker, a planning consultant with the Rockingham Planning Commission, believes the steady pace of residential development is one of the greatest threats facing Great Bay. She's working with towns in the Exeter River watershed and throughout Rockingham County to ensure developments are built in a way to minimize impervious surfaces and maximize natural areas that buffer rivers and streams.

"The volunteers here who serve on town boards are working diligently to amend their zoning laws and to educate themselves to see the wise protection of the resources," Walker said. "They're to be commended for doing a wonderful job. People realize there's a relationship between the health of Great Bay and what happens upstream, away from the bay."

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