

Stormwater Currents



A Publication
of the Town of
Narragansett

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Cutting Edge Clean-Up for the Narrow River

The Town of Narragansett is truly a leader when it comes to keeping water clean. This year, the Town constructed a unique stormwater treatment system at Mettatuxet Beach that is designed to remove sediment, bacteria and fertilizers before allowing the stormwater to flow into the Pettaquamscutt (Narrow) River.

Why Bother Cleaning Up Rain Water? Isn't the Narrow River Clean?

The Narrow River is a favorite locale for swimming and boating, however, according to the Rhode Island Department of Environmental Management, it does not meet the standards for the harvesting of shellfish because the bacteria counts in the river are too high. The Coastal Resources Management Council's Special Area Management Plan says that excessive nitrogen (found in lawn and plant fertilizers) enters the river and can cause it to become overgrown with plants and phytoplankton which deplete the water of oxygen when they decay - robbing fish and other marine organisms of the oxygen they need to thrive.

Stormwater, as it flows off our roofs, lawns and streets, picks up whatever is in its path. Much of the bacteria comes from pet waste and droppings from waterfowl and wildlife, nutrients come from fertilizers applied to lawns and detergents used to wash cars, and sediment can come from just about anything including wearing parts on cars, road sand, soil and leaves.

Under the Rhode Island Pollution Discharge Elimination System (RIPDES) Phase II regulations, the Town of Nar-

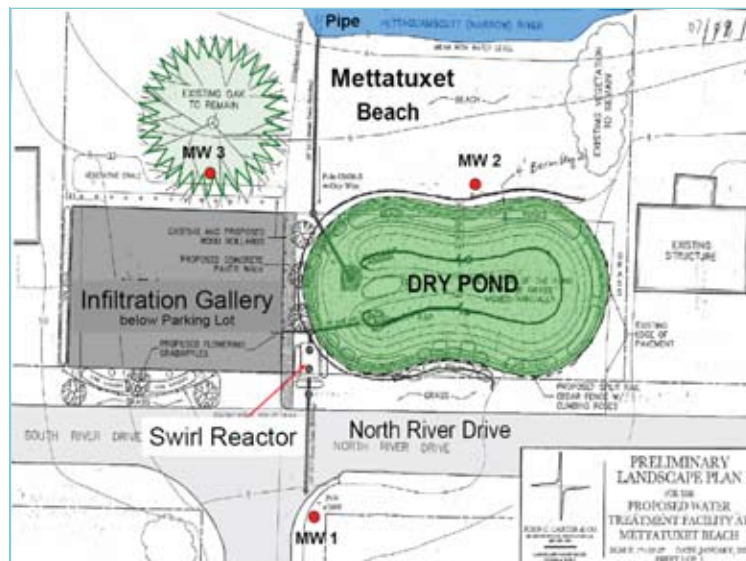
continued on page 2

WHAT'S INSIDE

FAMILY FUN -
What is your
Watershed Address?
page 2

Watershed Course for
Teachers Sponsored by the
Narrow River Preservation
Association
page 3

Looking Ahead
page 3-4



Top Illustration: The Mettatuxet Beach system consists of three components: (1) a swirl reactor to remove solids from stormwater, (2) an underground infiltration gallery below a paved parking lot to remove bacteria, and (3) a dry pond to remove bacteria and fertilizers. Note the location of monitoring wells (MW) to measure water quality before and after treatment
Left Photo: The completed parking lot hides the infiltration system that removes bacteria from stormwater before it enters the Narrow River.
Right Photo: The completed dry pond contains plants that remove nutrients (fertilizers) from stormwater before it enters the Narrow River.

FAMILY FUN

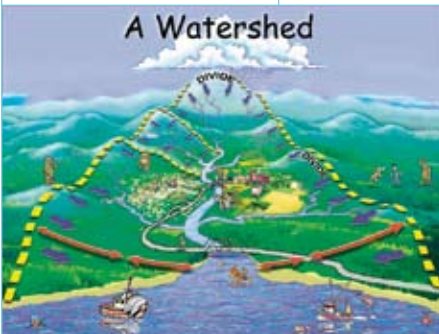
What is Your Watershed Address?

A watershed is the area of land that drains to a particular water body. The key word in defining this term is land. A watershed boundary is defined by the highest elevation surrounding a water body. Water drains to one water body on one side of a ridge and another on the other.

Try This

Now that you know your watershed address, why not take a family outing to visit your watershed? Try to find:

- ✓ The watershed divide: The highest point that separates your watershed from the next one. (Hint – Boston Neck and Point Judith Roads may be places to look).
- ✓ The water body for which your watershed is named by traveling as directly downhill from your home as possible.
- ✓ Potential sources of pollution like pet waste, oil and grease or other debris on the street, or excess landscape fertilizer.



Watershed diagram from www.recycleworks.org

Your watershed address is the watershed in which you live. When it rains at your house, the stormwater runs downhill from your home, driveway and grounds, and eventually reaches the water body after which your watershed was named. For example, if you live in the Block Island Sound Watershed, stormwater that runs off from your home ends up in Block Island Sound.

What we do on the land can make a big difference in the quality of our precious water resources. If we add too much fertilizer to our lawns or allow pet waste to remain on the streets, those pollutants will end up in our rivers, ponds and bays.

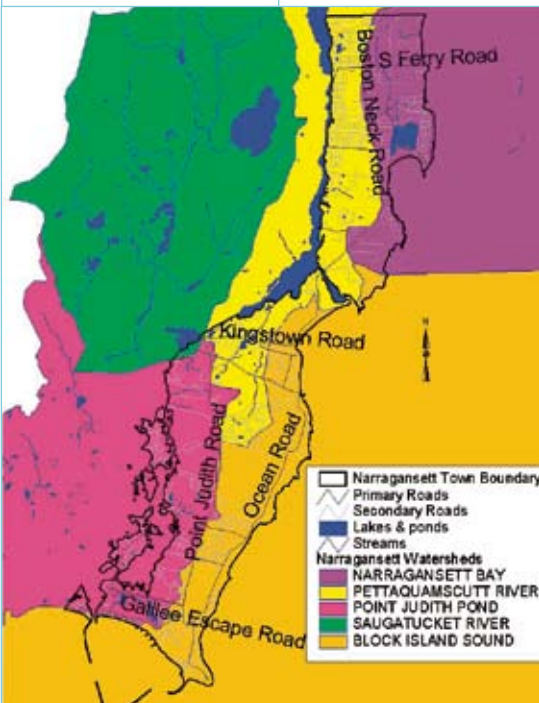
Want to Get More Involved?

Check out your local watershed associations and find out how you can help protect Narragansett's water resources::

If Your Watershed Address Is	Check Out
Block Island Sound or Narragansett Bay Watershed	Save the Bay, www.savebay.org
Pettaquamscutt (Narrow) River Watershed	The Narrow River Preservation Association, www.narrowriver.org
Saugatucket River Watershed	The Saugatucket River Heritage Corridor Coalition www.saugatucket.org
Point Judith Pond Watershed	The Salt Ponds Coalition www.saltpondscoalition.org

Find Your Watershed Address

Use the map to the left to locate where and in which watershed you. Never heard of the Pettaquamscutt River? You probably know it as the Narrow River that eventually leads to Town Beach.



Use this map to locate where you live and then determine your watershed address.

NARROW RIVER continued from page 1

ragansett is required to take steps to reduce the amount of pollution entering the rivers and ponds of Narragansett, and Narragansett Bay. For more on Phase II, see <http://www.dem.ri.gov/programs/benvirom/water/permits/ripdes/stwater/>.

The Mettatuxet Beach Example Will Help All of RI and More

Dr. Thomas Boving, Associate Professor of Hydrogeology at URI in partnership with the Southern Rhode Island Conservation District (SRICD), has been and will continue to study how well the Mettatuxet Beach stormwater treatment system removes solids, bacteria and nutrients from stormwater. Dr. Boving measured stormwater samples collected from the Mettatuxet neighborhood prior to the installation of the system in order to compare stormwater quality before and after treatment. The system was designed and fitted with valves to direct the flow of runoff through the system allowing Dr. Boving to study how well each part works alone and in conjunction with the other parts. In about three years, Dr. Boving and SRICD will be in a position to tell others how effective each part of the system is in removing pollutants from stormwater - providing valuable information to others in southern New England seeking to tackle similar problems. We will keep you posted as the results come in.

Watershed Course for Teachers Sponsored by the Narrow River Preservation Association

By Veronica M. Berounsky, NRPA Board of Directors

For the second time in three years, Narrow River Preservation Association (NRPA) has offered the course, "Watershed Science for Educators," a 3-credit graduate level course through the University of Rhode Island Special Programs. The course provides information about watersheds in general and the Narrow River and its watershed in detail. Using the "Active Watershed Education (It's AWESome!)" curriculum, it includes a matrix relating the curriculum to RI education standards. The course covers wetland and saltmarsh ecology, water resources, water quality, cultural resources, and citizen action. Emphasis is placed on understanding the natural processes of a watershed and the results of human interaction with these processes. Interactive lessons are also included. In addition to classroom sessions, there are two field trips. One examines point sources of pollution (a waste water treatment plant) and non-point sources of pollution (individual septic disposal systems, neighborhood stormdrains, detention ponds, and other stormwater management systems). The second is to the Narrow River where students can conduct water quality sampling, identify plants and animals, and observe the directly ecosystem.

The course is led Denise Poyer, Program Director for the Wood-Pawcatuck Watershed Association. Annette DeSilva, NRPA coordinator of the volunteer River Watch sampling program, will give a presentation on that program. Veronica Berounsky, NRPA Education Committee, gave a presentation about NRPA and a photographic tour of the River and Watershed. The original "AWESome!" Curriculum was developed by the Southern Rhode

Island Conservation District. In 2004 NRPA received funds from the Rhode Island Foundation, the Horace A. Kimball and S. Ella Kimball Foundation, and the Chace Foundation to update the curriculum and offer the course to Narrow River teachers at no charge except credit fees. This year's course runs February 1 through mid-April, is funded mainly by the Chace Foundation. Visit the NRPA web site for more information: www.narrowriver.org, or email us at nrpa@narrowriver.org

The 24 teachers in the current Watershed Science for Educators course are a diverse group, teaching kindergarten through high school, with most at the middle school level. Most teach science and come from both public schools and charter schools. One is a newly retired teacher who moved to the area and wanted to learn about "her" new watershed. Another worked as an environmental engineer before becoming a teacher. Some live in the Narrow River Watershed and teach elsewhere, and vice versa. They will reach about 1500 students each school year. That's 1500 more students and families who will learn more about Narrow River and its Watershed and can become better stewards of our environment.



Teacher demonstrating rain on a watershed model at the "Watershed Science for Educators" class while other teachers and the instructor look on.

Photo taken by V.M. Berounsky

Looking Ahead

In 2006, the Town of Narragansett developed ambitious plans to address its most pressing stormwater pollution concerns, and also applied for state and federal funding to help implement those plans. Here is a brief summary. For more information, please contact Alicia Lehrer at the Southern Rhode Island Conservation District, the Town's Stormwater Management Coordinator, at 401-284-1885.

Narrow River and Crooked Brook Stormwater Treatment

The Narrow River Stormwater Abatement Study, conducted over the last year primarily by consulting engineers Fuss & O'Neill, was an intensive investigation into all the possible ways to reduce bacterial pollution in nine priority neighborhoods that drain to the Narrow River. As a result, four catchments (connected storm drain systems that lead to one particular pipe or outfall draining to the River) were selected to focus pollution abatement efforts. They were chosen based on pollution causing potential and opportunities for treatment such as land availability. The four catchments selected for stormwater treatment focus are in the Edge-

water and Pettaquamscutt Terrace neighborhoods. Stormwater treatments recommended for those catchments are different forms of infiltration (allowing stormwater to filter through the ground). This is the most effective treatment for removing bacteria.

In addition, the Town plans to complete studies and designs for stormwater treatment systems in the Indian Trail, Pettaquamscutt Lake Shores and Mettuxet neighborhoods as well as all the catchments in the Crooked Brook subwatershed. Crooked Brook is the third largest tributary to the Narrow River, discharging to Pettaquamscutt Cove at the southern end of the Narrow River estuary, and is considered to be a major contributor of bacterial contamination. Narragansett Elementary, Middle and High School are in the Crooked

continued on page 4

Brook subwatershed, and the Town plans to include educational programs on clean water in the schools as part of this project.

Vacuuming Our Way to Cleaner Watersheds

The Highway Division of the Town of Narragansett plans to purchase a vacuum truck to help keep the streets and stormwater systems cleaner. Many of the stormwater treatment practices described in this newsletter require maintenance. The vacuum truck will allow the Town to clean out sediment from the dry pond when necessary to maintain proper working order. The vacuum can also be used to clean all the catch basins and drainage swales in Town, allowing them to help trap pollution that might otherwise enter waterways.

Compost Tea: The Brew of Choice for Organic Public Parks

The Town of Narragansett currently uses an Integrated Pest Management approach to parks maintenance to minimize use of chemical fertilizers and pesticides in the interest of public health. The

Narragansett Parks and Recreation staff were inspired to try a completely organic approach to athletic field maintenance after a workshop last summer by Chip Osborne, the manager of such a program in Marblehead, MA. The organic program includes:

1. Soil testing and adding appropriate nutrients from organic sources (such as a fish emulsion or seaweed extract)
2. Compost top dressing to add organic matter and useful soil flora and fauna
3. Application of compost tea (adds only microbes and not fertilizer to soil) two to three times during the growing season to protect plants and release nutrients available in soil for plant uptake
4. Regular soil aeration to allow aerobic soil conditions and optimal water uptake and retention

Compost tea is an application rich in beneficial micro-organisms, primarily bacteria and fungi, with no nutrients. Digestion and reproduction of these micro-organisms in the soil frees existing nitrogen for direct plant uptake with no nutrient run-off. This process results in enhanced soil and plant biology, creating a self-sustaining system. As science

demonstrates, such systems have greater capacity to attenuate storm water and associated pathogens.

Addressing Pollution in Point Judith Pond

Bacterial contamination in Point Judith Pond prevents the harvesting of shellfish, the Pond's designated use. Narragansett is planning projects that will address some of the areas of the Pond that have the greatest contamination along Gull Road and in Champlin's Cove. They include:

1. Conducting a study to help determine the sources of pollution along Gull Road,
2. Choosing the best locations in the Gull Road catchments and most suitable practices for reducing pollution,
3. Developing designs for at least two stormwater treatment practices in that area,
4. Improving Sunset Farm, a property owned by the Narragansett Land Trust, to prevent bacteria from animal manure from entering Champlin's Cove. The farm is adjacent to Champlin's Cove on the east side and is bordered by Foddering Farm Road, Pt. Judith Road and Daytona Avenue.

Stormwater Currents

A publication of the Town of Narragansett, Stormwater Currents is issued annually and distributed to all households throughout Town as part of the Phase II stormwater program.

The Engineering Department oversees content, and can be reached with questions at 401-782-0637. Please ask for John Lawless, Project Engineer. The newsletter was produced for the Town by the Southern Rhode Island Conservation District.



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