



NONPOINT SOURCE SUCCESS STORY

Rhode Island

Addressing Failing Septic Systems and Controlling Stormwater is Improving the Pettaquamscutt River

Waterbody Improved

The Pettaquamscutt River (also called Narrow River) is near the mouth of Narragansett Bay and historically was known as a productive shellfishing area. However, nonpoint source (NPS) pollution from urban stormwater runoff and failing septic systems within the watershed contributed to increased bacteria levels in the river, which caused the entire length of the river to be closed to shellfishing activities. NPS investments over many years, including green stormwater infrastructure and septic system repairs, have significantly improved fecal coliform levels based on standards for shellfish consumption in the Pettaquamscutt River. Project partners expect water quality to continue to improve, and they are working toward the goal that shellfishing may resume along the river in the future.

Problem

The Pettaquamscutt (known colloquially as the “Narrow”) River is on the western side of the mouth of Narragansett Bay in Rhode Island (Figure 1). It is a tidal estuary that drains parts of three Rhode Island towns (North Kingstown, South Kingstown and Narragansett). For centuries, the river was a productive shellfishing estuary. In 1986, however, elevated levels of fecal coliform bacteria led to a permanent closure of its entire length to shellfishing. The primary sources of bacteria in the watershed are stormwater runoff, inadequately treated wastewater from failed/failing septic systems located in close proximity to the water, and direct loadings from waterfowl. A Rhode Island Department of Environmental Management (RIDEM) total maximum daily load (TMDL) for fecal coliform in the watershed was approved in 2001 and has been implemented over the past 20 years.

Story Highlights

Since the river’s permanent closure to shellfishing in 1986, the towns in the watershed have implemented structural and nonstructural NPS best management practices (BMPs) to reduce bacteria. The towns of Narragansett and South Kingstown both sewered large sections of each town in the 1990s, and all three towns have implemented onsite wastewater management plans (OWMPs) to better manage onsite wastewater in their nonsewered areas. Having state-approved OWMPs in place has enabled the towns to

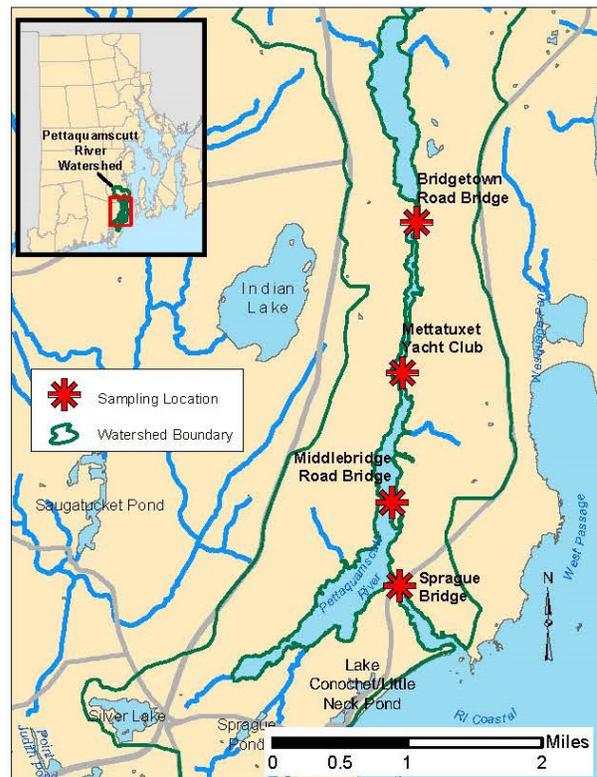


Figure 1. Pettaquamscutt River, Rhode Island.

access Rhode Island’s Community Septic System Loan Program, which has allowed the towns to provide low-interest loans to their citizens to replace and repair failing septic systems.

Each watershed municipality has an ongoing Phase II municipal separate storm sewer system program and submits reports annually to RIDEM to document progress in treating municipal stormwater runoff. To date, over \$2.3 million in federal and state funding has been invested in stormwater improvements in the watershed, not including local match. The Town of Narragansett has been installing stormwater BMPs for many years to address the TMDL; more recently, the Town of South Kingstown installed 10 bioinfiltration swales paid for by state bond funds.

RIDEM's Shellfish Growing Area Monitoring Program is part of the state's implementation of the U.S. Food and Drug Administration's National Shellfish Sanitation Program (NSSP). The NSSP regulates the interstate shellfish industry for safety by requiring states to maintain certification of shellfish as safe for direct human consumption through continuous bacteriological monitoring of their shellfish harvesting waters. Although there is no minimum sampling requirement because the Pettaquamscutt Growing Area is still classified as prohibited, the Shellfish Growing Area Monitoring Program has regularly sampled for fecal coliform since 1996. Sampling for shellfish consumption standards occurs at four locations: Bridgetown Bridge, Mettatuxet Yacht Club, Middle Bridge and Sprague Bridge (see Figure 1). These four sites are in the southern portion of the estuary, near its well-flushed tidal mouth. The locations are sampled under all weather conditions 6–12 times per year. NSSP fecal coliform compliance statistics (geometric mean and 90th percentile) are calculated annually and reported in RIDEM's annual Shellfish Program Classification Report.

Results

The geometric mean of fecal coliform in the Pettaquamscutt River has steadily decreased between 1996 and 2020. NSSP uses a standard of 14 colony-forming units per 100 milliliters of water (cfu/100 mL). For the past 4 years, at least two of the sites have had geomeans at or below the NSSP standard, and a third monitoring station has produced geomeans below or at the standard for 3 of the last 4 years (Figure 2).

For the 90th percentile standard, NSSP applies a variability calculation requiring that recent observations be less than 31 cfu/100ml. This variability standard complements the geometric mean standard by quantifying the frequency of random pollution

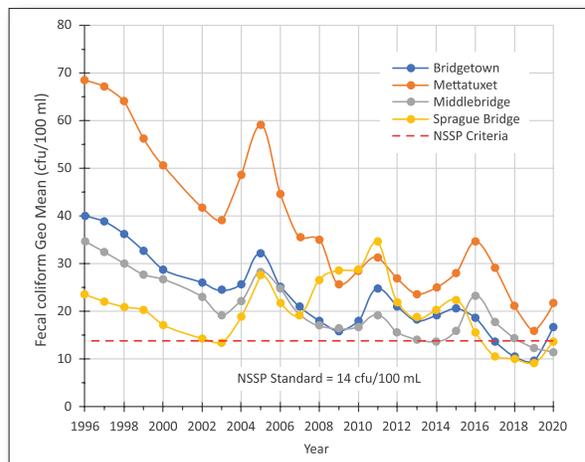


Figure 2. Fecal coliform geometric mean (1996–2020).

events that can cause unsafe bacteria levels. While the mean level of bacteria has been trending downward towards attaining the NSSP geometric mean standard, bacteria levels are still frequently spiking to unacceptable levels, resulting in exceedance of the NSSP 90th percentile variability standard. Because of this variability, the coliform bacteria levels in these areas are not currently stable enough to warrant a return to the opening of shellfishing for public consumption. Nevertheless, the results show that the continued long-term investments in water quality have improved fecal coliform levels at the four currently monitored stations. Continued investments in the watershed are expected to result in the estuary meeting water quality standards for all its designated uses, which will return an important shellfishing resource to the public.

Partners and Funding

Partners have included federal, state and local organizations. Federal funding sources include Clean Water Act section 319 funds (\$544,028), a U.S. Environmental Protection Agency Targeted Watershed Initiative Grant (\$85,714), and the State Revolving Fund (\$20,000). State contributions include money from an Aqua Fund state bond fund (\$303,000), the Narragansett Bay and Watershed Restoration Fund (\$1,318,649) and the Rhode Island Coastal Resources Management Council (\$30,006). Local funding includes matches from the towns of Narragansett (\$568,000) and South Kingstown (\$658,130) and funds from the Town of Narragansett's Road and Stormwater Projects Local Bond (\$17 million).



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