

Estuarine Rivers like the Taunton River, Mount Hope Bay and the larger Narragansett Bay system are ecological, recreational and economic power houses! TRWA volunteers conduct monitoring at multiple locations in the watershed to ensure the health of the river.

Background:

- From Route 24 downstream the Taunton River is tidally influenced and classified SB;
- 43 cities and towns in 562 square mile watershed (30% of Narragansett Bay watershed);
- The Taunton and Nemasket Rivers support the largest alewife run in Massachusetts; and
- The Taunton River and its main tributaries are a nationally designated Wild and Scenic River.

Largest Problems:

- Excess nitrogen loading to lower watershed (saline waters) and too high phosphorus in ponds and upper watershed causes excess plant and algae growth limiting the diversity of aquatic life that can live there (more diversity = greater ecological, recreational and economic value of the watershed, estuary and bay);
- Stormwater caused loss of stream habitat (scour + organism flushing) and pollution loading;
- Low summer stream flows due to high surface and groundwater withdrawals, insufficient water conservation, and loss of rain water to rapid run-off rather than infiltration for groundwater storage and base stream flow replenishment;
- Loss of stream buffers and wildlife habitat due to poorly planned development.

Why we monitor?

- Give the Taunton River main stem and major tributaries a health check once a month March to November (weather permitting);
- Note changes in water quality parameters and problems;
- Identify areas needing further monitoring;
- Document need for action by regulatory agencies and community leaders to address problems.

TRWA monitoring results and what they mean?

- **Nitrogen** (currently we measure **Nitrate** (NO₃) part of total nitrogen (**TN** = organic N + Ammonia + **Nitrate** + Nitrite) [**TN** should be less than 0.45 mg/L for good water quality]
 - In 2015 TRWA measured **Nitrate** levels 2 to 5 times recommended TN estuarine target levels in the Taunton River (all 4 main stem monitoring locations Berkley to Bridgewater), the Three Mile River (at the 2 lower of 3 monitoring locations) and a tributary Chuckamucksett Brook in Berkley.
 - Based on TRWA monitoring and studies sponsored by MassDEP and others in the lower river and throughout Mount Hope Bay its clear upstream wastewater treatment plants and others sources need to reduce nitrogen loads for additional watershed-wide health improvement. Wastewater treatment plants are 66% of the TN load to the watershed. Stormwater and other nonpoint sources deliver 34%.
 - Middleboro and the Regional Norton/Foxboro/Mansfield WWTP have new Clean Water Act permits which became effective in 2014. These renewed permits will lead to reductions in TN levels on reasonable schedules. [Reducing upstream levels so they are not transported downstream.]
 - Taunton's attempts to appeal TN limits or delay the effective date failed before both the EPA Environmental Appeals Board (5/3/2016), and more recently the Federal First Circuit Court of Appeals which denied the City's request for a stay. Taunton may still pursue its appeal in the First Circuit but must concurrently comply with its WWTP

upgrade schedule. Based on previous similar cases and the record in this appeal the City's chances for a successful appeal are very small.

- The Bridgewater permit was appealed 11/17/2016 (10 days late). EPA has requested dismissal. The EPA Appeals Board has deferred a dismissal decision until 2/6/2017 because both sides have signaled that a compromise implementation schedule may be able to be reached by that date.
- The Brockton permit was reissued 1/11/2017. Brockton has piloted TN reduction modifications which achieve TN levels of 2 mg/l or less well below the new permit limit (equivalent to 3.33 mg/l at typical summer WWTP plant flows (90% of design flow)). Brockton's permit like the other permits in the watershed gives the City 5 years to upgrade and refine operations to meet the final permit limits. The City may petition for a longer schedule in the unlikely event more time is needed.
- The last major permits in the watershed needing reissuance are Somerset and Fall River. Somerset like Taunton discharges to the sensitive heart of the estuary with no attenuation by distance. EPA has indicated in the permit fact sheets for the other watershed permits that it contemplates a limit equivalent to 3.7 mg/l (4.12 mg/l at summer WWTP flows of 90% design flow) for Somerset.
- Fall River further down the estuary has less TN impact despite its large flow. Fall River is completing comprehensive facilities planning to determine how various levels of TN control (e.g. 8 mg/l or 5 mg/l) might be phased with its last phases of combined sewer overflow abatement for maximum environmental benefit.
- Nitrogen is the active ingredient in lawn and agriculture fertilizers. It dissolves in water and flows easily with groundwater to streams if applied at levels greater than what grass and crops need to grow. Regulation to assure fertilizer application does not exceed the agricultural agronomic requirement, stream buffers, and education of homeowners and landscaping companies on both application rates and clean up from impervious surfaces are needed to address these nitrogen loads.
- **Total Phosphorus**
 - Levels in freshwater rivers and streams (above route 24 and tributaries should have total phosphorus levels (TP) less than 0.10 mg/L;
 - Levels in lakes, ponds, impoundment or streams just upstream of lakes, ponds and impoundments should have TP levels below 0.05 mg/L;
 - Most WWTPs in the upper watershed already remove TP. TRWA monitoring measured TP levels below the riverine target at most locations or slightly elevated in some upper and lower Taunton River main stem and Three Mile River samples;
 - The new WWTP permits include somewhat lower TP limits as needed;
 - Phosphorus attaches to particulates and gets filtered out by soils making it much less mobile than nitrogen;
 - Stormwater from parking lots and roads contains TP from auto exhaust deposition and fluid leaks which can be effectively removed by infiltration based stormwater controls.
- **Fecal coliform**
 - Levels in freshwater streams and rivers should have less than 400 colonies/100ml (normal background is 0 to 100 colonies/100ml);
 - High levels of coliform bacteria indicate the potential presence of pathogens that might cause illness (usually gastro-intestinal) to swimmers or kayakers;
 - The Mill River sampling location at Ingell St. in Taunton had several values greater than 1000 colonies/100ml, upstream Washington and Whittendon Streets values were 500 to 1000 colonies/100ml;
 - All other sampling locations (17) were normal (low) to borderline which means except for the Mill River the watershed sampling results looked good for water contact.

- **Future of monitoring program**

- With additional funding from donations, new member dues and other sources TRWA hopes to train new volunteers and fund additional lab analysis in order to expand regular monthly monitoring further up into the watershed and its tributaries. In 2016 we hope to begin monitoring the Town and Matfield Rivers important headwater tributaries of the Taunton. The Taunton River begins where these rivers join in Bridgewater.
- Someday when nitrate levels fall to below suggested criteria (the instream target levels that meet water quality standards), nitrate less than 0.4 mg/l (indicating TN is approaching the recommended 0.45 mg/l level). Begin sampling select monitoring locations periodically for total nitrogen to see how much nitrogen is not accounted for by monitoring only nitrate.
- Nitrate is monitored by TRWA and most citizens' programs because it has a low reporting level of 0.05 mg/L, low analysis cost and as long as instream Nitrate levels are well above TN targets (as in the Taunton watershed) is sufficient to highlight problem areas.

What do citizens need to do?

- **Work together cooperatively on watershed stewardship** so we all can enjoy the ecological, recreational and economic benefits of a healthier Taunton River Watershed!