

Wastewater Impact Reduction

Treatment Plant Upgrade

Many tried and true upgrade technologies exist that will significantly reduce the discharged nutrient levels.

Denitrifying Septics

Modified conventional septic systems can achieve a 40% reduction in average nitrate levels.

Sewer Systems

Collecting sewage for treatment at a central location where high yield treatment methods are available is cost efficient once transmission main costs are amortized. A hybrid of septic/central-where the septic effluent is piped to a central plant instead of a leaching pit or field-appears promising and less costly.

Septic Maintenance

Properly maintained conventional septic systems do provide denitrification to a limited degree. Pumping on recommended

intervals and care in what goes into the drains are advisable.

Discharge Location

Translocation of wastewater from nitrogen sensitive to non-sensitive areas is effective when no adverse effects are created.

Recycle/reuse

Sanitized effluent can be utilized for irrigation. The nutrients help reduce added fertilizer needs.

The Town of Yarmouth's Bayberry Hills Golf Course uses irrigation water reclaimed from a septage treatment plant.

Fertilizer Usage Reductions

Reduced Reliance

The use of low nutrient demanding plants, shrubs and trees can provide attractive environmentally sensitive landscape designs.

Eliminate large lawns that need fertilizers.

When fertilization can't be avoided, use a minimum of a slow-release type.

Provide and maintain a deep growing base to maximize root mass and limit leaching.

Runoff Impact Reduction

Limit Sources

Paved or otherwise impervious surfaces should be minimized to the greatest extent practical. Parking lots, roadways, sidewalks and other solid surface areas can be constructed to smaller acceptable sizes.

Stormwater should be directed to constructed or naturally vegetated areas for nutrient removal via biological processes. Storm drains or similar devices should be preceded by vegetated swales.

This pamphlet was prepared by the Mashpee Environmental Coalition to assist the reader in developing an understanding of causes for the continuing nutrient destruction of our embayments and some actions that will protect them.

It is not intended to be a complete treatise but rather a basis for thought on how to help save our environmental heritage for future generations

Nutrient Enrichment is destroying our bays & estuaries

Contaminant Sources

Wastewater Fertilizers Run-off

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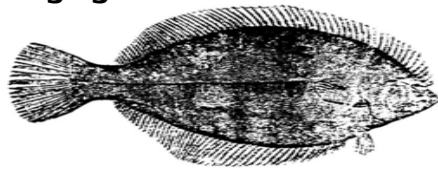
What is Nutrient Enrichment?

Over-enrichment of surface water bodies by nitrogen and phosphorus stimulates excessive algal growth. Usually phosphorus is the problem in fresh water and nitrogen in estuaries.

Algal blooms can occur as surface scums, suspended in the water column or as mats on the bottom.

The Impacts

Algal blooms destroy eel grass beds (scallop/flounder nurseries) by blocking light.



flounder

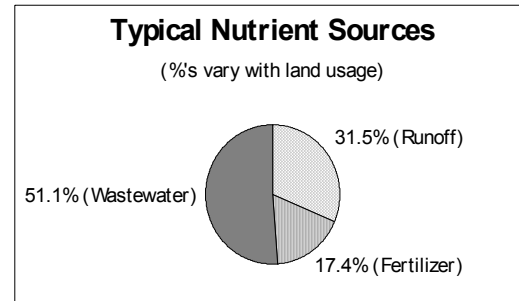
Some algal species, potentially stimulated, contain harmful toxins.

Algae eventually settle on the bottom and decompose via bacterial action that:

- Builds up muck
- Causes severe turbidity
- Creates offensive odors
- Reduces depths

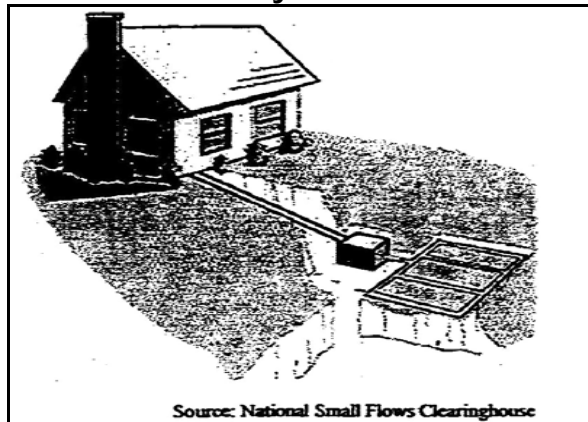
The gravity of excessive water column oxygen depletion due to algal decomposition can not be overstated. Fish and shellfish are placed at risk.

Nutrient Sources



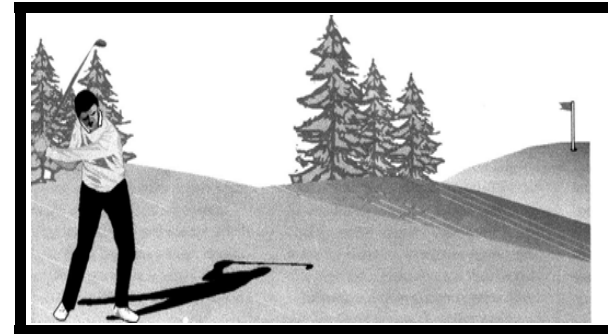
Wastewater

Effluent discharged from cesspools, septic systems and wastewater treatment plants becomes part of the groundwater that feeds our bays and estuaries.



The concentrations of nutrients vary with the source -for example, commercial or residential- and the amount of nutrient reduction treatment, if any.

Fertilizers



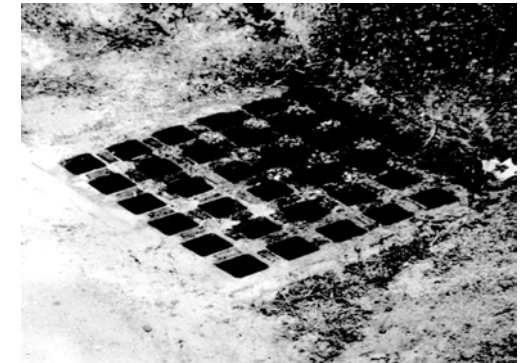
The application of fertilizers for lawns, agricultural purposes and golf courses is a common practice. It is unfortunate that some leaching of their nutrients is a common occurrence. The severity of the leaching to groundwater varies with soil types, fertilizer types, levels of irrigation and weather. Leaching rates of 25% are common.

Runoff

Airborne particles that originate both here and from areas as far away as the Midwest land on roofs and on paved as well as vegetated surfaces.

These nutrient loaded particles are joined by pet/bird droppings and the by-products of vehicle use to create a loaded gun that is triggered by rainfall.

They are collected by rain or snow that has picked up additional nutrients aloft to create stormwater.



(gateway to the estuary)

Reasonable estimates have placed this nitrogen source from impervious surfaces in the range of 660 pounds of 5-10-5 fertilizer applied per acre leaching to groundwater each year.