



THE PATH OF PHOSPHATES AND NITRATES

RUNOFF

Agricultural runoff contains phosphate and nitrate and adds to the issue

RIVERS AND ESTUARIES

The excess of nutrients cause a buildup of dead plant material in rivers after the HAB



SEWAGE

Excess nitrates and phosphates enter groundwater from private septic leach fields



LAKES AND PONDS

This sewage and runoff then makes its way into lakes and ponds in which it causes eutrophication and HABs



OCEAN

Once the nutrients reach the ocean, they cause more HABs which result in fish kills and the death of marine life



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- Collect all water at once or add set amounts of nitrate and phosphate to tap water to control the testing more
- Measure the phosphate, nitrate, and pH at several points during testing
- Try using lower concentrations of the treatments

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TREATMENT EVALUATION MATRIX

Mixture	Nitrate Removal	Phosphate Removal	Cost	Environmental Impact
50% Alum 50% Clay	44.28% in 6 hrs	73.24% in 6 hrs	\$1.915 per pound	± 0.2 pH
25% Alum 75% Clay	40.81% in 6 hrs	47.28% in 6 hrs	\$1.28 per pound	± 0.0 pH
75% Alum 25% Clay	35.44% in 6 hrs	59.50% in 6 hrs	\$2.55 per pound	± 0.14 pH

INDIVIDUAL ACTION

- **Urea-Based Fertilizer** has the highest nitrogen concentration of most lawn fertilizers being 46% nitrogen. This makes runoff from these particular fertilizers especially harmful to the environment
- **Rooting Loam** is another particularly harmful kind of soil as it contains 5% phosphorus and has high phosphate-fixing capacity
- **Synthetic Chemical Fertilizers** contain substantial concentrations of not only urea but also ammonium sulphate and other such nutrients that, when in runoff, can cause massive algal blooms



- Limiting the usage of harmful fertilizers is an easy way to individually help prevent HAB's and the resulting catastrophic death of marine life
- Additionally, being aware of the contents of any lawn or garden products allows for environmental awareness when choosing products for outdoor use