Nutrients Transferred to Surface Water

Nutrients (organic and inorganic) stored, concentrated, or applied are transported to receiving surface waters in quantities that degrade water quality and limit its use for intended purposes.

What is it?
Water bodies require nutrients, such as nitrogen and phosphorus, to be healthy, but too many nutrients can be harmful. Many of our nation’s waters, including streams, rivers, wetlands, estuaries, and coastal waters, are affected by applied nutrients to neighboring fields. The effect to a given water body depends on its location and the source of nutrients.

Why is it important?
High levels of nitrate in drinking water can cause serious public health concerns. Additionally, increased nitrogen and phosphorus levels in water can produce excessive aquatic vegetation and algal blooms resulting in reduced dissolved oxygen, harmful toxins, and increased water temperature. In extreme cases dissolved oxygen may be so low that dead zones, known as hypoxia, exist where most aquatic life cannot survive. Algal blooms can impart an undesirable taste to potable water that is difficult to remove by water treatment. High ammonia levels are toxic to some freshwater fish species.

What can be done about it?
Management is the key to protecting water quality by reducing the transport of nutrients into surface water. Nutrient management specifies the rate, source, placement, and timing of plant nutrients needed for production, while minimizing movement of the nutrients to surface waters. Nutrients may also be lost due to erosion, runoff, irrigation, and drainage, so applicable practices should be installed to address these concerns. Nutrients should not be applied to sensitive areas such as established setbacks, wetlands, sinkholes, wells, or rapidly permeable soil areas.

Nutrients Transferred to Surface Water at a Glance

<table>
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<th>Problems / Indicators</th>
<th>Typical Causes</th>
<th>Examples of Typical Solutions</th>
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<tr>
<td>Algae blooms, mass death of fish or aquatic organisms, dissolved oxygen concentrations, hypoxia</td>
<td>Overusing fertilizer (both residential and agricultural usage)</td>
<td>Nutrient management planning to address the form, rate, placement, and timing of plant nutrient application</td>
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<td>Soluble nutrients</td>
<td>• Cover crops</td>
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<td>Poor soil structure</td>
<td>• Crop rotations</td>
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<td>Decreased infiltration</td>
<td>• Conservation buffers and setbacks from surface water</td>
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<td>Conventional tillage</td>
<td>• Residue management to improve the soil’s ability to retain nutrients</td>
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<td>Erosion of nutrient-laden soil</td>
<td>• Livestock production practices, such as feed management, animal waste storage, and handling animal mortality</td>
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<td>Runoff from cropland, animal feeding operations and pastures, picking up nutrients and depositing them in water bodies</td>
<td>• Drainage water management</td>
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<td>Low nutrient holding capacity of soil</td>
<td>• Irrigation water management</td>
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