The Stages of Eutrophication

The Science Behind the "Pond Scum Blues"

High levels of nutrients* over-stimulate the production of surface planktonic algae and floating plants like duckweed (in fresh water) or seaweed (large floating, macrophytic algae in marine habitats).

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Surface mat or bloom of algae blocks out light to submerged plants.

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Death of submerged vegetation from inability to photosynthesize food and oxygen.

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Bacteria multiply to consume all of this extra organic matter.

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This uses up nearly all of the available dissolved oxygen in the body of water.

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Fish and other animals in the food chain begin to suffocate and die.

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The food chain collapses and the pond or body of water "dies."

***Possible sources of excess nutrients:** (Source: *An Assessment of Coastal Hypoxia and Eutrophication in U.S. Waters.* The National Science and Technology Council Committee on Environment and Natural Resources, November, 2003.)

Urban and suburban sources:

- Municipal wastewater treatment plants are the primary point
- Stormwater runoff from combined sewage systems in older cities
- Septic system failures.
- Fertilizer and pesticide runoff from lawns and golf courses.

Agricultural sources:

- Leaching and runoff of fertilizers and pesticides from farm land and wastes from livestock feeding operations

Atmospheric sources:

- Oxidized nitrogen from coal burning power plants and automobile emissions.