

# Hypoxia in Long Island Sound

## WHAT IS HYPOXIA?

Hypoxia is defined as low levels of oxygen dissolved in the water. During the summer, the surface water of Long Island Sound heats up and forms a distinct layer "floating" over the bottom water, which is denser due to greater salinity and cooler temperatures. The layers lead to a pycnocline, a sharp density gradient that restricts the oxygen-rich surface waters from mixing with bottom waters. At the same time, nutrients, particularly nitrogen, fuel the overgrowth of planktonic algae. As the algae and the microscopic animals that feed on algae die and sink to the bottom, they are consumed by bacteria, which also take up oxygen in the process. A significant loss of oxygen in the bottom waters results in hypoxia, a condition that impairs the feeding, growth, and reproduction of aquatic life.

Nitrogen sources include sewage treatment plants, septic tanks, and runoff from roads, lawns, and farms.

Nitrogen deposits from air pollution

Nitrogen

Nitrogen

Algal blooms

Poor water clarity

Aquatic plant growth inhibited

Algae die and sink to bottom

**CHAETOCEROS**  
A microscopic algae abundant in the Sound.

**LOW DISSOLVED OXYGEN**  
Bacteria use oxygen to decompose algae and other organic matter.

**SHELLFISH**  
Immobile marine life unable to move from hypoxic zones

**CRUSTACEANS**  
Most lobsters and crabs able to move from hypoxic zones

**FISH**  
Able to move from hypoxia

Lighter, fresher, warmer surface layer

**PYCNOCLINE**  
Blocks oxygen flow to bottom waters

Heavier, saltier, cooler lower layer



ILLUSTRATION BY STEPHEN ROUNTREE