

All RUSS units have been removed from the lakes.
They will be redeployed in the spring.

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Understanding Lakes

Understanding Lake Ecology Index	
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NUTRIENTS

Aquatic organisms influence (and are influenced by) the chemistry of the surrounding environment. For example, phytoplankton extract nutrients from the water and zooplankton feed on phytoplankton. Nutrients are redistributed from the upper water to the lake bottom as the dead plankton gradually sink to lower depths and decompose. The redistribution is partially offset by the active vertical migration of the plankton.

In contrast to DO, essential nutrients such as the bioavailable forms of phosphorus and nitrogen (dissolved phosphate, nitrate, and ammonium) typically increase in the spring from snowmelt runoff and from the mixing of accumulated nutrients from the bottom during spring turnover. Concentrations typically decrease in the epilimnion during summer stratification as nutrients are taken up by algae and eventually transported to the hypolimnion when the algae die and settle out. During this period, "new" input of nutrients into the upper water may trigger a "bloom" of algae. Such inputs may come from upstream tributaries after rainstorms, from die-offs of aquatic plants, from pulses of urban stormwater, direct runoff of lawn fertilizer, or from leaky lakeshore septic systems. In the absence of rain or snowmelt, an injection of nutrients may occur simply from high winds that mix a portion of the nutrient-enriched upper waters of the hypolimnion into the epilimnion. In less productive systems, as those in Northeastern Minnesota, significant amounts of available nitrogen may be deposited during rainfall or snowfall events (wet deposition) and during the less obvious deposition of aerosols on particles (dry deposition). For instance, Lake Superior has been enriched by as much as 300 µg during this century, presumably due to air pollution. Nitrogen and phosphorus in dry fallout and precipitation may also come from dust, fine soil particles, and fertilizer from agricultural fields.

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