



The map above shows the factor applied to a pound of nitrogen discharged from a wastewater treatment plant (a point source) in each of the 11 Long Island Sound management zones to obtain a trade equalized pound of nitrogen.

WHAT DOES TRADE EQUALIZED MEAN?

Trade equalization is a calculation of the effect a pound of nitrogen leaving a point source will eventually have when it reaches Long Island Sound. Western Long Island Sound is the focus of interest in this calculation because the ongoing problem of hypoxia is usually confined to this part of the Sound. In the Eastern Sound, the impact of nitrogen-enriched water is lower because of its proximity to the open ocean. There is a greater exchange of nitrogen-rich water with ocean water, which has much lower concentrations of nitrogen. Furthermore, nitrogen “load” from wastewater treatment plants, which is discharged directly into Long Island Sound, has more impact than load discharged far up tributary rivers, where biological, physical, and chemical processes have more time to act and remove the nitrogen from the system. Using the connections among nitrogen, rivers, currents and hypoxia a calculation is made to assign a loading factor to each point source, which is meant to assess the contribution of that source relative to a source discharging directly into Western Long Island Sound (which scores a 1.00).

If a coastal wastewater treatment plant is in the eastern part of the Sound, not all of the nitrogen discharged will end up in the Western Sound. Some of the nitrogen will be carried out of the Sound by currents through the Race. The calculation of this loss due to currents is called “transfer efficiency.” Similarly, if an inland wastewater treatment plant discharges nitrogen into a river, some of the nitrogen will be lost before the river waters reach Long Island Sound. This “river attenuation” is also taken into account when calculating nitrogen loads. Transfer efficiency and river attenuation are multiplied together to calculate the trade equalization. For example, a plant located in Central Long Island Sound might have a transfer efficiency of .75 (meaning 75% of the nitrogen ends up in Western Long Island Sound, and 25% is lost) and a river attenuation factor of 0.75 (meaning 75% of the nitrogen makes it to Long Island Sound, and 25% is lost), the trade equalized load for this plant would be 0.75×0.75 or 0.56, meaning that a reduction of 100 pounds of nitrogen from this plant equates to a reduction of 56 pounds of nitrogen from a plant discharging directly into Western Long Island Sound. This conversion factor allows managers to focus their efforts on removing the nitrogen that has the most impact on the health of Long Island Sound.