Nonnative salmon alter nitrification in Great Lakes tributaries

April 5 2013

Nonnative species can affect the biogeochemistry of an ecosystem. For instance, Pacific salmon have been introduced as a sport fishery in many streams and lakes beyond their native range, but their introduction may be altering nitrogen cycling in those ecosystems.

Salmon excrete ammonium, which can be transformed into nitrate by bacteria in a process known as nitrification. Nitrate can be used by plants as an inorganic nitrogen source, but in excess it can also cause potentially harmful algal blooms to grow and, at high concentrations, is considered a pollutant in drinking water.

Levi and Tank measured sediment nitrification rates before, during, and after the salmon run in 2009 to study the effects of nonnative Pacific salmon in five tributaries to the Great Lakes in Michigan and Ontario. Though the variation in nitrification rates was habitat-specific, the researchers observe increases in sediment nitrification rates in these streams. These changes in the form of dissolved inorganic nitrogen can affect nutrient dynamics not only where the salmon are but also in ecosystems located downstream. Fisheries managers may need to monitor the quantity and type of inorganic nitrogen export to avoid possible unintended consequences for ecosystems associated with introduced salmon populations.

More information: Nonnative Pacific salmon alter hot spots of sediment nitrification in Great Lakes tributaries, *Journal of Geophysical Research-Biogeosciences*, doi:10.1002/jgrg.20044, 2013