

Microbial Numbers and Denitrification Potential of Upper Mississippi River Sediments

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Nitrogen loading from the Mississippi River has been correlated with the timing and extent of hypoxia in the Gulf of Mexico. We initiated preliminary studies of sediment microbial processes in several habitats around Pool 8, near La Crosse, Wisconsin, to determine potential impacts of microbial communities on dissolved-nitrogen species in river and pore water. Nitrate reduction was not observed in *in situ* microcosms with pore water containing less than 2 mg/L DOC. However, nitrate reduction was observed when pore water DOC was 10 mg/L or more. Numbers of aerobes, heterotrophic fermenters, and denitrifiers were similar in pore waters at all locations, with slightly more denitrifiers found in high-nitrate (4 mg-N/L) pore water. Higher numbers of aerobes, heterotrophic fermenters, denitrifiers, and sulfate reducers were found on sediments with high-DOC pore water than with low-DOC pore water. Low numbers of iron-reducers and sulfate-reducers ($<10^2$ /mL or g) were found in pore water and on sediments. Methanogens were not present at concentrations greater than 2/mL or gram except in a Lotus bed habitat. These preliminary analyses indicate diverse habitats support potential denitrification and that sediment or pore water carbon may affect denitrification potential.