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Inorganic Nutrient Variability in Prairie Potholes

Our question was: do inorganic nutrient levels in prairie potholes allow an adequate environment for aquatic vertebrate survivability? The hypothesis states: Phosphorus concentrations will be the rate limiting inorganic factor for aquatic vertebrate survivability in prairie potholes.

Using standard protocol, surface, middle, and bottom samples were collected and pH, Dissolved Oxygen, and Water Temperature were measured at the deepest point in each of four ponds. The samples were analyzed for Nitrogen and Orthophosphate with test kits and Phosphates were measured with a Spectrophotometer in a commercial lab. Summer, fall, and winter samples were collected. We found great variability throughout the ponds. Overall, the ponds had high Nitrogen and Phosphorus levels with Phosphorus being higher on the bottom. They were alkaline. Low Dissolved Oxygen levels were found on the bottom except at fall turnover. Two ponds had stressfully low Dissolved Oxygen levels under the ice throughout the water column. We found that all of our ponds had adequate or excess Nitrogen and Phosphorus levels to support aquatic vertebrates. Eutrophication from farm and ranch operations could stress or kill fish, due to algae blooms and ensuing low oxygen levels. Water column oxygen levels are also threatened by ice cover in the winter.