Project Title: The Relative Importance of Bacteria and Algae in Reservoir Carbon Cycling
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Project summary: The goal of the proposed project was to examine the role of bacteria and algae in nutrient reservoir ecosystems. We empirically assessed the hypothesis that the relative importance of bacteria and algae in carbon **(**C) cycling in aquatic ecosystems varies directly with ecosystem productivity. Several recent studies have hypothesized that the relative importance of heterotrophic bacteria should be highest in unproductive low-nutrient-availability ecosystems and lowest in productive high-nutrient-availability ecosystems. We utilized a cross-system continuum design in which bacterial and algal C cycling were examined in a set of central Texas reservoirs representing a range of productivity **(**oligotrophic to eutrophic). Measurements of bacterial and phytoplankton productivity were obtained 2 times per reservoir from July October 2006. Water was collected from a fixed location and we determined phytoplankton and bacterial production rates **(**ug C/m2/d).Our results appear to support the hypothesis that bacteria play a large role in nutrient cycling of oligotrophic systems. The proportion of nutrients **(**C, nitrogen and phosphorus) contained in bacteria and the ratio of bacterial production to primary production declined with increasing productivity. The ratio of dissolved organic C **(**DOC) to particulate organic C **(**POC) also declined with increasing productivity. Data from central Texas reservoirs follow the same general patterns as observed in lakes and reservoirs from other regions of North America. When combined, these data support the prediction that the relative importance of bacteria declines with productivity, and this pattern appears to be robust across pelagic systems from a diversity of locations.