Kennedy, T.A., S.E. Hobbie., J.C. Finlay, August 7, 2003. "Longitudinal and seasonal patterns of metabolism along a desert spring stream." Ecological Society of America, Annual Meeting, Savannah, Georgia.

ABSTRACT- Longitudinal patterns in physical, chemical, and biological variables are a prominent feature of lotic ecosystems; however mechanistic studies of these patterns have rarely been conducted in desert systems or across small spatial scales. We estimated whole stream Gross Primary Production (GPP) and Respiration (R) along a 3 km reach of Jackrabbit Spring, a spring-fed stream in the Mojave Desert of southern Nevada, using the single-station dissolved oxygen change technique. A downstream decrease in GPP along Jackrabbit Spring is present throughout the year that is associated with a downstream decline in water temperature. Downstream increases in the severity of nutrient limitation and rates of detritus deposition, that may actually smother benthic algae, may also contribute to the longitudinal patterns in GPP. Overall, GPP was higher in spring and summer than fall or winter. GPP was low (0-2 g O_2.m^{-2}.d^{-1}) because of a combination of light and phosphorus limitation of algal growth. A dense stand of invasive saltcedar (*Tamarix ramosissima*) that dominates a 1 km portion of the study reach heavily shades Jackrabbit Spring, further reducing algal growth rates. Downstream decreases, and seasonal changes, in R were also driven by changes in water temperature. Longitudinal and seasonal patterns in R appear to drive across sites differences in organic matter accumulation. Additionally, a large manmade pool that is present mid-reach disrupts these longitudinal patterns, increasing R and reducing GPP at sites further downstream. These results are consistent with predictions from the "serial discontinuity hypothesis", which suggests that longitudinal patterns and linkages in lotic ecosystems are disrupted by impoundments, whether they are from a dam on a large regulated river or a pool in small stream.