

## **The effects of nitrogen deposition on the belowground carbon cycle in two southern California ecosystems**

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N availability can affect primary productivity, plant community composition, and plant, root, and soil respiration. We propose to study the effects of N deposition on belowground C cycling in two southern California ecosystems: a ponderosa pine forest (San Bernardino National Forest) and a creosote desert (Joshua Tree National Park). The area east of Los Angeles has the highest N deposition rates in the country, regularly receiving 20-45 kg N/ha/yr, with some areas receiving more than 90 kg/ha/yr (Fenn et al. 2003). Consequently, C cycling in the affected ecosystems may experience major changes. Using existing plots in forest and desert ecosystems where N deposition rates have been manipulated, as well as sites located along local to regional gradients of N deposition, we will assess the impacts of N deposition on microbial biomass and turnover, root biomass and turnover, soil C content and turnover, net N mineralization rates, and litter quality. We will use  $^{14}\text{C}$  to determine turnover times of carbon in soil, root, and microbial biomass. This study will be part of a cross ecosystem comparison to determine patterns of response to N fertilization. This project supports the Kearney mission by increasing understanding of the processes governing the storage and flow of carbon pools in soils in California and quantifying the impacts of anthropogenic N deposition on C transformations in soils.