Abstract
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Consequences of global climate change: The effects of increased rainfall on carbon storage in coastal prairie grasslands

Models of global climate change predict a 50-100% increase in mean annual rainfall in northern CA in the next 50 years, either as increased winter rainfall or as an extension of the rainy period into the late spring and early summer. Soil carbon pools in northern CA coastal prairie grasslands can be expected to change in response to altered water availability; the nature of these changes will depend strongly on the timing of increased rainfall. Direct effects of increased winter rainfall could include increased leaching of dissolved organic carbon (DOC) from saturated soils; alternatively, saturation could slow decomposition and result in larger soil C pools. In contrast, increased late-season rain may extend the active period of soil microorganisms, increasing soil respiration rates and thus decreasing total soil C. Changing rainfall will also affect soil C storage in coastal prairies indirectly, through its influence on plant community productivity and composition. In contrast to annual-dominated interior grasslands, coastal prairies contain a mix of annual and perennial grasses and forbs, which are likely to respond very differently to increased winter vs. late-spring rainfall. Because these functional groups differ strongly in phenology, productivity, and tissue quality, changes in their relative abundances could result in significant changes in soil C dynamics. In my research, I will examine how several key elements of coastal prairie C storage (C inputs, the potential for decomposition, soil respiration and leaching of dissolved organic carbon) respond to experimental addition of water during the winter vs. spring in a meadow site at the UC Angelo Coast Range Reserve.