

J. A. Mendoza<sup>1</sup>, S. A. Shaw<sup>1</sup>, B. A. Ball<sup>1</sup>. *How can altered precipitation patterns due to climate change affect the input of carbon into soils from plants?*

Climate change has altered temperature and precipitation patterns, affecting many processes such as decomposition and carbon cycling. In arid environments like the Sonoran Desert, where limited rainfall constrains microbial activity, it is important to understand how these environmental changes alter decomposition rates, therefore affecting the soil carbon storage. To better understand the effects of precipitation on decomposition in Sonoran Desert soil, we collected plant litter from two different dominant Sonoran Desert plant species (Creosote, *Larrea tridentata*, and triangle-leaf bursage, *Ambrosia deltoidea*) and decomposed them in laboratory vials in comparison to vials with no litter. Over a period of 9 months, the litter will be placed under controlled laboratory conditions with rainfall treatments simulating current and future climate pulse size (5 mm and 7.5 mm every 4 weeks), to analyze soil microbial respiration rates, litter mass loss, and soil carbon accumulation. Across 96 samples measured six times over two months, CO<sub>2</sub> release from *A. deltoidea* rose quickly and peaked early, while *L. tridentata* showed a slower increase that led to a larger peak later on. These patterns likely result from the litter quality and their responses to precipitation pulse size, with the more labile (easier for microbes to break down) *A. deltoidea* decomposing rapidly, and the more recalcitrant *L. tridentata* responding slowly but with a strong peak later when water was added. These patterns suggest that changes in rainfall due to climate change could alter the rates at which microbes respond to different litter types, which can in turn alter respiration rates in desert soils. The remaining months of the experiment will determine how these early shifts in microbial activity can influence decay rate and the amount of carbon is kept in the soil, affecting soil carbon storage in arid ecosystems.

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Integrated Research Theme:

1. Ecosystem Structure & Functioning