**Life History Traits as Mediators of Solitary Bee Responses To Climate-Warming

Anthony H. Slominski*, Department of Ecology, Montana State University Bozeman
Laura A. Burkle, Department of Ecology, Montana State University, Bozeman

Climate-warming is uncoupling plant-pollinator interactions by causing species-specific shifts in seasonal flowering periods and pollinator activity times (i.e. phenologies). The mechanisms mediating pollinator responses to warming are poorly understood, preventing conservation professionals from identifying the most at-risk species and limiting our understanding of the potential effects of climate warming on plant-pollinator communities. The goal of this study was to experimentally investigate whether solitary bee (*Hymenoptera* spp.) overwintering life stages influence phenological responses to climate-warming. Climate-controlled growth chambers where used to manipulate the temperature bees experienced while developing and overwintering. Results suggest that different physiological constraints associated with overwintering in the prepupal life stage compared to the adult life stage may influence how solitary bees respond to climate-warming in predictable ways. Bees that overwinter as adults may be more prone to phenological mismatches in the spring, while bees that overwinter as prepupae may be more prone to phenological mismatches in mid summer. In addition, the phenologies of bees that overwinter as adults may be converging with the phenologies of bees that overwinter as prepupae, causing reduced pollinator abundance during late summer and altering competition among bees for nectar and pollen during early summer. This work demonstrates that life history traits of bees may mediate their responses to climate-warming. These findings contribute to a better understanding of the effects of climate warming on pollinator species, with implications for preserving pollination services in Montana, as well as informing future studies investigating the effects of climate warming on plants and pollinators.