



Interannual Trends of Flowering Phenology and Native Species Richness in Mediterranean Vernal Pools

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Abstract

Nearly 90% of California's vernal pool habitats have been destroyed by human activity in the past 100 years. The University of California, Merced manages one of the largest actively protected vernal pool habitats in the state, the UC Merced Vernal Pools and Grassland Reserve (MVPGR), aimed at conserving rare native species and landscapes through research, teaching, and outreach. Because the reserve was only recently established, little is known about the interannual patterns of vernal pool plants occupying the region. Consequently, the phenological and demographic responses of the native species inhabiting the MVPGR to reduced precipitation, biological invasions, and cattle grazing has not been quantified. The goal of this dissertation is to investigate the composition, flowering time, and invasion intensity of vernal pool plant communities across multiple climate years. Chapter 1 focuses on two wildflowers native to California, *Limnanthes douglassi* ssp. *rosea* (meadowfoam) and *Trifolium variegatum* (whitetip clover), and quantifies each species' phenological response to variable precipitation and temperature across 7 years. Additionally, population abundance and within-pool distributions of both focal species in response to competition and eutrophication were assessed. Chapter 2 focuses on plant community responses to abiotic and biotic dynamics across zones within pools, which are established by soil texture and flooding gradients. Chapter 2 expands upon Chapter 1 by characterizing the community composition, invasion intensity, and interannual flowering trends of 42 plant species across three zones: pool basin, edge and upland. The findings will elucidate the sensitivities and ramifications of climate change, invasion, and eutrophication on the MGVPR. Conserving the native species also requires community participation in the management and legislative process, and ideally the scientific process. Chapter 3 examines several recruitment and retention methods for a citizen science project involving UC Merced undergraduates and provides guidance on how to achieve a long lasting and high engagement project.

Schedule

Date: 05/05/2022

Time: 02:00 pm- 05:00 pm

Zoom Link:

<https://ucmerced.zoom.us/j/81123572497?pwd=dVFOaFlwOUUM4RlRWMkdPcTRxcDBWZz09>

More Information

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Biography

Brandon Hendrickson was born in Santa Ana, California in 1995. His parents regularly took him to parks, zoos, and science museums, and he quickly became curious about how the world worked. Just like every wonderstruck observer who witnesses a marvelous phenomenon, his journey started with a "what?" – What makes the flowers grow? A simple question on the surface, yet one rich with complexity that when prodded, unlocks the colorful world of plants. He has met amazing minds from across the world with a similar fascination and has worked with colleagues whose expertise in academia and hearts full of compassion have blessed his time in science. UC Merced is where he married his wife, found friendships, and learned from the best. He regularly finds himself gazing up from his work and towards the striking peaks of the Sierra Nevada on a clear morning, and thinking "How beautiful the places a simple question will take you?"