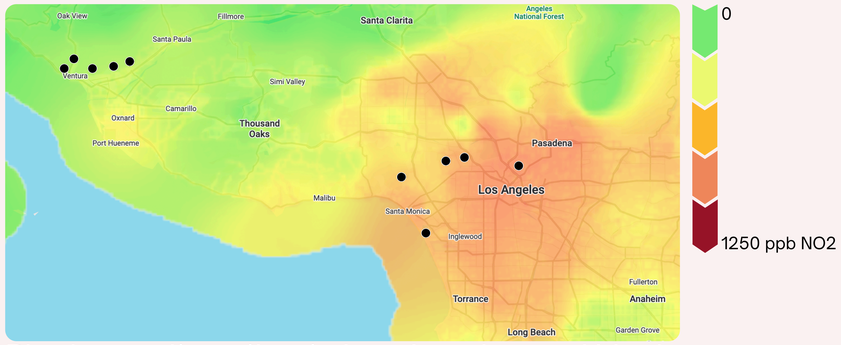
How Does Nitrogen Affect Native *Eriogonum fasiculatum*?

Sacha H. M. Medjo-Akono*, Casey P. terHorst
Department of Biology | California State University, Northridge

Background

Southern California's chaparral ecosystems are facing pressures from nitrogen (N) pollution due to urbanization, agriculture, and fossil fuel emissions. This excess nitrogen can disrupt native plant communities adapted to nutrient-poor soils.

Eriogonum fasciculatum **(California Buckwheat)**, an ecologically and culturally important shrub, may cope with such changes through phenotypic plasticity or local adaptation.



Plant sampling sites in Los Angeles and Ventura counties

Aims

This study investigates:

1. Whether *E. fasciculatum* shows **local adaptation** to its native nitrogen soil levels.

2. Whether populations display **phenotypic plasticity** in response to differing nitrogen conditions.

Data Collection

Traits

- Specific leaf area
- Root:shoot ratio

Fitness

- Growth rate
- Flower number

Statistical analysis

Two-way nested ANOVA with maternal line nested in origin nitrogen levels, and treatment as factors.

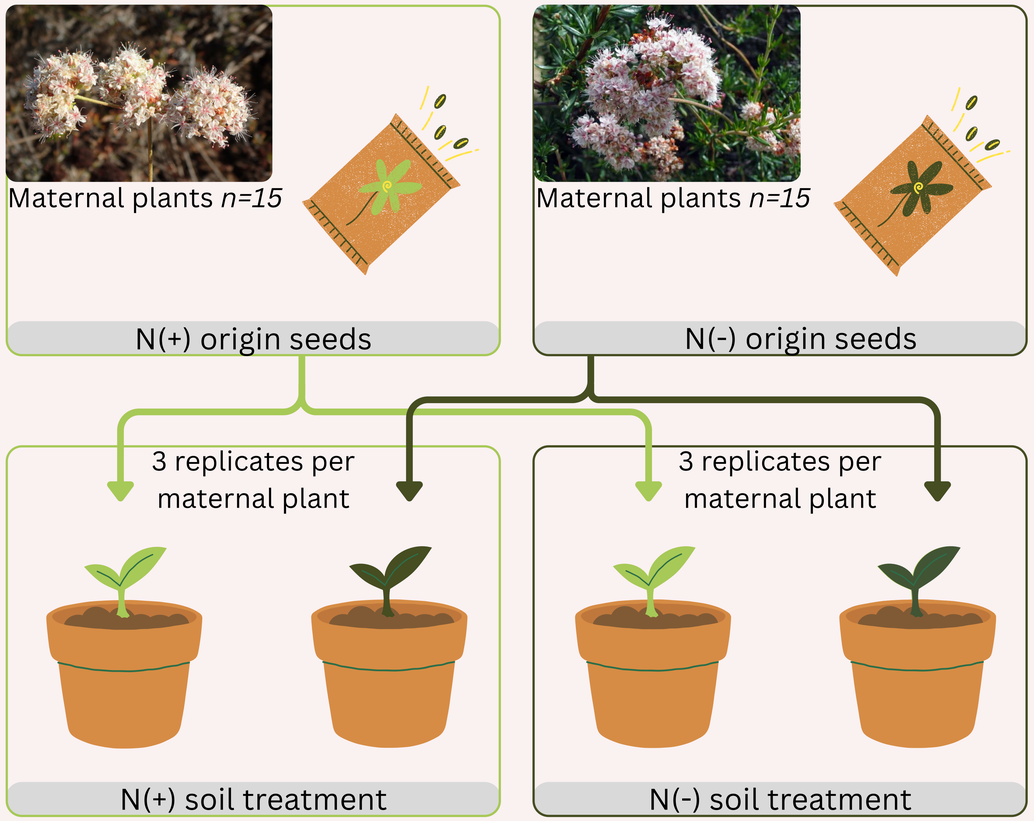
Methods

Wild Seed and Soil Collection

Wild seeds from maternal plants in natural parks and preserves

Soil samples taken near each plant root. Nitrogen/Nitrate levels analyzed to create a gradient

Greenhouse Experiment



Expected Outcomes

Plasticity
Traits vary within populations when grown under different N treatments.

Local Adaptation
Plants perform best in their native soil conditions.

Significance

Enhancing the understanding of plant resilience to nitrogen pollution.

Ecological and evolutionary insights on the responses of Southern California species to human disturbances.

Stewardship of culturally significant species to Tongva peoples and their ancestral lands.

Acknowledgements

Committee members Dr. Cheryl Courtney-Hogue, Dr. Jeremy Yoder, and the Department of Biology at CSUN.

Funding and support provided by Bridges to PhD, the National Institutes of Health, and the Center for Diverse Leadership at UCLA.

U-RISE and Bridges to the Ph.D.
CALIFORNIA STATE UNIVERSITY NORTHRIDGE