Remote sensing of vegetation recovery on abandoned farmland in California's Central Valley

Bren Environmental Leadership Program Summer Fellowship

Project Background

California's Central Valley is a major agricultural region, but decades of groundwater overuse and recurring drought have led to widespread farmland abandonment. When agricultural land is taken out of production, many fields remain unmanaged, leaving bare soil exposed to wind erosion, which can degrade local air quality. However, natural revegetation on these fields has the potential to stabilize soil, reduce dust emissions, and provide other ecosystem services. Despite its importance, natural revegetation on abandoned farmland remains poorly understood. Do these fields experience vegetation growth at all? If so, are the returning plants predominantly annuals or perennials? What environmental factors determine whether a field remains bare or transitions to a vegetated state?

This project aims to answer these questions by using satellite imagery to quantify and classify revegetation patterns on a 30-year time series of abandoned agricultural fields. We seek a student that will contribute to this research by (a) conducting a literature review on revegetation pathways in arid abandoned agricultural landscapes (b) selecting and using satellite derived vegetation indices to analyze plant cover and monitor changes in vegetation over time (c) using Google Earth Engine (GEE) to process satellite imagery and classify stages of revegetation (d) creating visualizations and summary reports of findings.

Qualifications

- Interest and enthusiasm for remote sensing, land cover change, and vegetation dynamics
- Some experience with GIS, remote sensing, python, and Google Earth Engine is helpful, but additional training will be provided
- Ability to work independently and as part of a team
- Excellent organizational skills and attention to detail

Details

The position is 10 weeks, 35 hours per week, with exact dates flexible between mid-June to mid-September. The position can be in-person/hybrid/remote. The student will receive a $6500 stipend. This position is part of the Bren Environmental Leadership Program – the student will participate in professional development training during the summer and a poster session at the Mantell Symposium on Environmental Justice and Conservation Innovation in Fall 2025. Applicants must be full-time UCSB continuing undergraduate students (not graduating within the 2025 calendar year).

How to Apply

Please submit applications here by April 2. Applications should include:

- A brief statement (2-3 paragraphs) or cover letter describing why you are interested in this project and how your experience and qualifications make you a good fit for the position. We are committed to fostering an inclusive environment and supporting diverse students in Environmental Science, including those from underrepresented, low-income, and first-generation college backgrounds, and those active in DEI, environmental justice, or social justice. We welcome insights into how your experiences or perspective might shape your contribution to the BEL community.
- A resume or CV, including any relevant coursework and previous experience

Interview and Selection Process: Approximately two weeks after the submission deadline, applicants selected for interviews will be notified by email. Though only some students will be selected for interviews, all applicants will be notified of the status of their application when the interview/selection process is complete (approximately 3-4 weeks after application deadline).