Northwestern | BUFFETT INSTITUTE FOR GLOBAL AFFAIRS

Buffett Undergraduate Research Fellowship Opportunity

Environmental and social effects of minerals mining in Southern Hemisphere nations

Faculty Mentor: Jennifer Dunn, Professor, McCormick School of Engineering and Applied Science

Project Synopsis: Since 2023, Northwestern has been collaborating with universities in South America and Australia to understand the effects of critical minerals mining including contributing to water scarcity, polluting water, causing biodiversity loss, and encroaching on agricultural lands. Critical minerals include lithium, copper, nickel, and cobalt. Minerals are used in technologies including lithium-ion batteries for electric vehicles, data centers, and solar panels, among other uses. Our research into the effects of critical minerals mining has been carried out through the Center for Sustainable, Resilient, Responsible Global Minerals Supply Chains (SuReMin). Our research has uncovered substantial data gaps that impede the ability to characterize these impacts using tools like life cycle assessment. We continue to build open access data sources and analyses to support community and policy maker understanding of the environmental and social effects of minerals mining in countries around the world. In this project, we aim to work with two undergraduates to continue to build datasets and analyses that can address the shortcomings our research has unveiled.

Project Term: Summer and Academic Year 2026

Project Location: Hybrid, on campus and about 2 weeks in Santiago, Chile or Bolivia

Job Description: The goal of this research is to expand our data compendium that supports calculations of critical minerals mining social and environmental effects. We will be focusing on Chile, Australia, and potentially other South American nations like Bolivia and Peru. If time permits, we may expand focus to African nations. Students joining us could support this goal in one of or more ways including the following:

- Use machine learning to explore community sentiment about new or expanding mines as expressed in public comment documents
- Extract information from emerging data sets in the literature about water pollution and carbon stocks in mining-relevant regions to include in the compendium
- Gather water and energy consumption, pollution release data and statistics from mining company reports and government databases

Students with Spanish language competency may be invited to visit partners in Chile or Bolivia for 2-3 weeks. Day-to-day work will consist of identifying data sources in the literature, from governments, and from companies and extracting information from those data sources. Data science/coding skills are valuable to work efficiently with data sources so some experience is ideal.

Time Commitment: The student will join us for a full-time summer internship on the Evanston campus that may include travel to South America. Exact hours outside a set of core hours from 9-3 can be flexible.

Number of available positions: Two