Project Title: What are the economic and environmental benefits to ranchers and society of detecting woody plants in grasslands using satellite images?

1 student

Academic Background: Agriculture, Agricultural economics, Econometrics, Economics, or related background

Start date: 2 June 2025

Date flexible: Yes. The latest acceptable start date is the last week of June to ensure participation in fieldwork training and the fieldwork component.

Brief description of specialized research area (100 words):
The research area focuses on agricultural economics and environmental science. The student will explore consumer preferences for sustainably produced products and the economic benefits of sustainable grassland ecosystems on the environment. Fieldwork will provide hands-on experience in the grassland ecosystem, the core focus of our research.

Research project description (300 words):

This project aims to uncover the economic benefits to ranchers and the broader environmental advantages of detecting woody plant expansion (WPE) in grasslands. WPE adversely impacts the sustainability of rangelands. With growing consumer interest in sustainably produced products, accurately detecting WPE can provide transparency about the sustainability of meat and milk from these areas. This transparency can enable producers to command a premium for sustainably produced products, as consumers show a higher willingness to pay for them.

Grasslands also offer substantial environmental benefits through, for instance, carbon sequestration. We will systematically review the literature to highlight these benefits.

Funded by the Canadian Space Agency under the ROSEO program (Research Opportunities in Satellite EO: https://www.asc-csa.gc.ca/eng/funding-programs/programs/smartearth/contributions-grants-contracts-awarded.asp), this 3-year project is titled: “Enhancing Woody Plant Encroachment Detection in Grasslands Using Multi-Source EO Data and Modern Data Processing Technologies Benefiting Canadian Environment and Economy”.

Our diverse project team includes members with backgrounds in agricultural economics, ecology, and remote sensing, from various cultural backgrounds. We offer hands-on research opportunities for undergraduates, supervised by experienced and early-career researchers. Join us to research one of the most important and beautiful ecosystems on our planet!

Required skills/background of the student (100 words):

- Background in Agriculture, Agricultural Economics, Econometrics, Economics, or a related field.
- Experience in conducting literature reviews.
- Strong organizational skills and attention to detail.
- Basic knowledge of Excel, Word, and PowerPoint; programming skills in R are a plus.
- Fieldwork experience is an asset.

A proactive and enthusiastic attitude towards learning and problem-solving is essential for skill development and the success of the project.

Required role of the student (300 words):
As a senior undergraduate student, you will contribute to a dynamic interdisciplinary team, participating in weekly project meetings to collaborate and network with fellow researchers. Under the guidance of an early-career researcher, you will assist in various research tasks to support the project's objectives.

Your responsibilities will include conducting literature reviews and participating in fieldwork in the grasslands of the Canadian Prairie. The fieldwork involves comprehensive training for one week, followed by up to two weeks of fieldwork, offering you the chance to experience the natural habitat of the prairies.

During fieldwork, you may need to:

- Walk long distances
- Carry equipment
- Use measuring tools (e.g., measurement tape, GPS, camera)
- Collaborate with team members
- Weigh, sort, and dry biomass samples

Examples of your tasks may include:

- Drafting weekly presentations and presenting progress to the research team
- Conducting literature searches and reviews
- Extracting metadata
- Performing initial analysis based on literature reviews

This role offers a unique opportunity to immerse yourself in an interdisciplinary project with a team dedicated to creating a collaborative environment. Additionally, you will discover Saskatoon, known as the land of living skies, situated on Treaty 6 Territory of the First Nations and the Homeland of the Métis.

INTERESTED?

APPLY HERE: https://globalink.mitacs.ca/#/student/application/projects
(Look for the last name "Guo" in the field of "Faculty last name" and put "Saskatchewan" as the "Faculty Province" to find the project: **Project ID 46274-What are the economic and #environmental benefits to ranchers and society of detecting woody plants in grasslands using #satellite images?**