ALBERTA INNOVATES

CLEAN RESOURCES

ENVIRONMENTAL INNOVATION

WATER INNOVATION

Sustaining Healthy River Valleys

The project will advance methods to assess the health of riparian woodlands which could serve as diagnostic indicators of the broader health of river ecosystems. Field-based assessments will be conducted, including tracking alluvial groundwater, and vegetation indices will be developed from satellite remote sensing. Conditions along healthy versus degraded river reaches will be compared in the South Saskatchewan River Basin, and archived satellite imaging will allow historic comparisons with field patterns. The project will also apply satellite vegetation indices and field assessments to analyze the outcomes from deliberate environmental Functional Flow regimes that were recently implemented for some regional rivers.

There is substantial international interest in diagnostic indices of riparian health and a collaboration that has been established with American scientists will further assess the field and remote sensing methods for other regulated rivers in western North America.

Riparian cottonwoods on the Oldman River near the Lethbridge Northern Irrigation District weir (Stewart Rood, 2019)

FUNDING DETAILS

RECIPIENT:
University of Lethbridge / Dr. Larry Flanagan

PARTNERS:
City of Calgary, Alberta Environment and Protected Areas, USGS, Vast Resource Solutions

TOTAL BUDGET:
$864,000

AI FUNDING:
$270,000

PROJECT DATES:
MAY 2019 – JAN 2023

PROJECT TRL:
Start: N/A
End: N/A

APPLICATION

The primary objective of the project is to develop and test tools to quantify the health of riparian woodlands and riverine ecosystems in southern Alberta and elsewhere. A focus will be innovative, cost-effective, real-time measures, with site-based methods for detailed, mechanistic analyses and remote sensing tools for spatial upscaling. The outcomes of the project will help managers and stakeholders to make informed decisions regarding watershed management and will provide crucial information for fulfilling the objectives of Alberta's Water for Life Strategy.

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PROJECT GOALS

- Develop and calibrate new health assessment methods that could be diagnostic, inexpensive, and suitable for upscaling.
- Develop field-based and remote sensing methods that could diagnose river valley health to reveal stress before irreversible thresholds are passed, and to inform dam operations and river resource management.
- Emphasize rivers of the South Saskatchewan River Basin (SSRB) in southern Alberta, which provides the national focus for irrigation development.

BENEFITS TO ALBERTA

- Near real-time health assessment tools will benefit water users by revealing the threat of drought stress before irreversible thresholds are reached. This information will assist Alberta Environment and Protected Areas in mitigating risks to agriculture and other downstream users by optimizing dam operations regimes.
- Maintaining healthy riparian woodlands will help intercept water contaminants such as nutrients from fertilizers or manure, or from agricultural chemicals. This will serve to protect water quality, aquatic ecosystems and biodiversity (e.g. invertebrates, fish, etc.)
- HQP training. The specialized skills gained by the students and researchers who participate in the project will increase their employability.

6 Jobs

15 Publications

12 Students Trained

1 practice/policy

CURRENT STATUS

FEB 2023

The project has completed numerous scientific studies and made substantial progress in drafting journal papers and technical reports. The scope of activities has been expanded to take advantage of modest additional funding that became available later in the project. As a consequence, the project completion date was extended until June 2023.