

CLEAN RESOURCES

ENVIRONMENTAL INNOVATION

WATER INNOVATION PROGRAM

FUNDING DETAILS

Assessing water connectivity in rural and urban watersheds for improved water management

This project will improve our understanding of the connectivity of surface water and groundwater to support sustainable water management in water-stressed urbanizing areas of Alberta. The hydrologic function of undeveloped natural systems will be compared to innovative low impact development (LID) systems for managing stormwater in urbanizing areas. Knowledge of pre- and post-development water flow and water treatment performance in the specific geologic and climatic setting of Alberta will be used to optimize the design of LID systems and guide strategies for improved management of water quantity and quality.



RECIPIENT:
University of
Calgary



TOTAL BUDGET:
\$1,577,965



PROJECT DATES:
JANUARY 2020 –
APRIL 2023



PARTNERS:
City of Calgary,
Town of Okotoks,
NSERC, Bow River
Basin Council



AI FUNDING:
\$460,320

APPLICATION

The knowledge generated from this project will assist a variety of end users involved in surface water, groundwater and stormwater management. The data and tools generated will benefit municipalities and have policy relevance for Alberta regulatory agencies assessing and mitigating impact of development on hydrologic systems. Results will also be used by water-focused community groups in need of relevant information to support development and implementation of sustainable water management plans.



ALBERTA INNOVATES CLEAN RESOURCES

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PROJECT GOALS

The overall goal of this project is to comprehensively evaluate surface water-groundwater connectivity in urban and rural watersheds to support sustainable water management.

The key goals of the project are:

- Obtaining high-quality hydrological data in urban and natural settings, with particular emphasis on frozen soil processes, to improve understanding of surface water, stormwater and groundwater linkages.
- Assessing the hydrologic function and water quality treatment performance of LID systems and their associated influence on groundwater.
- Developing and refining hydrologic assessment tools at local and regional scales for improved characterization of water flows and quality prior to and after urban development.
- Informing best management practices for LID system design for stormwater management in the unique geologic and climatic (cold and dry) setting of Alberta.

BENEFITS TO ALBERTA

The successful implementation of this project and the knowledge generated from it could result in:

- More flexible, effective water management through improved understanding of hydrologic function within pre- and post-development landscapes.
- Valuable new data and modeling tools for assessing and mitigating impacts of development on hydrologic systems at the urban-rural interface.
- Advancement of best management practices for LID designs in cold regions, which will benefit communities in Alberta and across Canada.
- Science-based guidance for policy development, including the provincial Groundwater Management Framework and City of Calgary guidelines for ephemeral and intermittent streams.
- Collaborations between municipal, provincial, academic and non-governmental agencies (e.g., watershed councils) to support sustainable watershed management plans.
- Better prediction of hydrologic system response to drought and flood, as well as potential changing climate conditions.



6 Publications



9 Students
Trained

CURRENT STATUS

APRIL 2020

This important project is in the initial stages of implementation, including student training, site selection and field deployment. Current staff are continuing field research at crucial pre-development hydrological monitoring sites and a pilot bioretention facility in the Town of Okotoks. The project team is also reviewing and selecting additional LID system sites within Calgary and other nearby field sites for monitoring surface and groundwater connections.