www.mountainwaterfutures.ca

Twitter: @MWFutures

Mountain Water Futures

Global Water Futures: Pillar 3

CANADA FIRST RESEARCH EXCELLENCE FUND | APOGÉE CANADA FONDS D'EXCELLENCE EN RECHERCHE

UNIVERSITY OF SASKATCHEWAN

UNIVERSITY OF WATERLOO

McMaster University

LAURIER Inspiring Lives.

Mountain Water Futures

MWF aims:

a) improve our ability to predict future hydrological regimes, and plan appropriate adaptations in Canada's western mountains

b) provide users and stakeholders across a range of sectors with better information, tools and techniques to manage uncertain water futures in Canada's mountain west

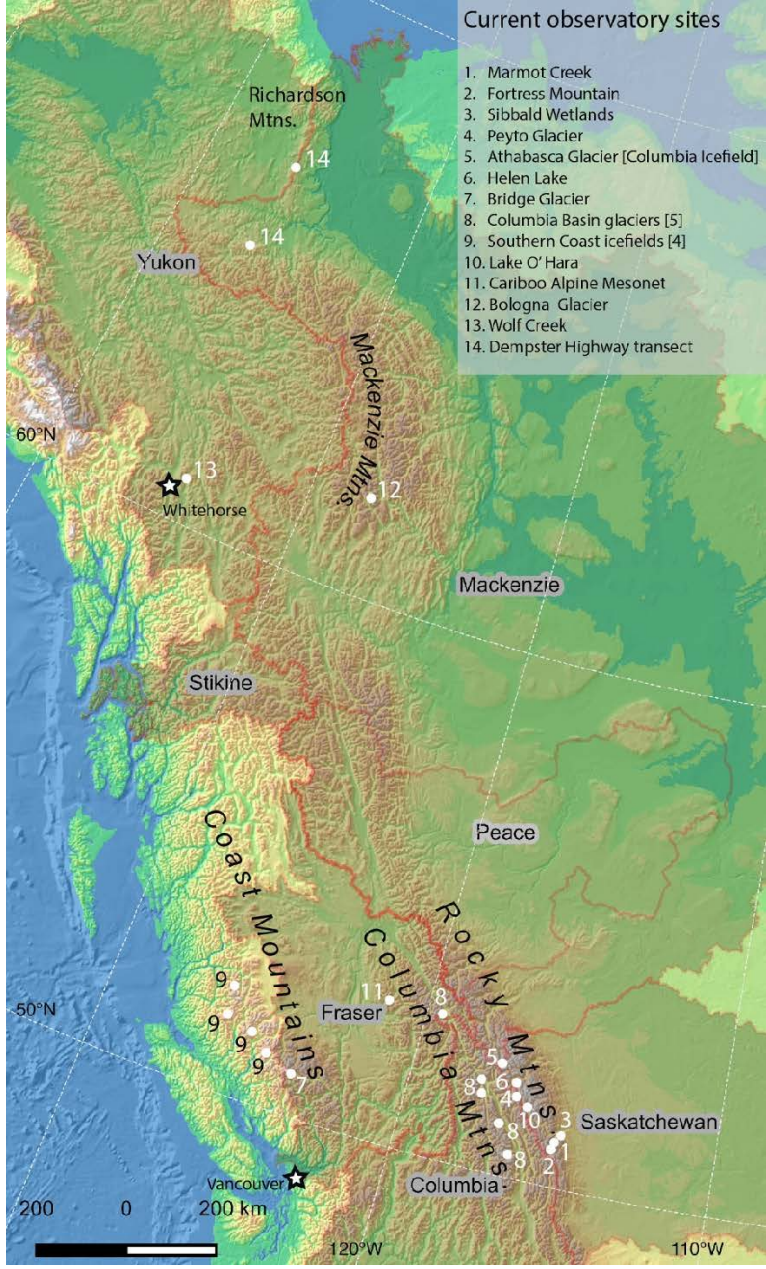
Themes: MCE, CRY, SGW, VEG, WET, MOD

Investigators

- Dr. Sean Carey (PI), McMaster University
- Dr. Masaki Hayashi (Co-PI) U. of Calgary
- Dr. Brian Menounos (Co-PI) U. Northern BC
- Dr. Stephan Déry, U. Northern BC
- Dr. Jeffrey McKenzie, McGill University
- Dr. Richard Petrone, University of Waterloo
- Dr. John Pomeroy, U. of Saskatchewan
- Dr. Rebecca Rooney, University of Waterloo
- Dr. Ronald Stewart, University of Manitoba
- Dr. Julie Thériault, UQAM
- Dr. Cherie Westbrook, U. of Saskatchewan
- Dr. Francis Zweirs, U. Victoria, PCIC

Current Status

- MWF inception meeting
- Legacy sites
  - YT, NWT, AB, BC
- Student recruitment
  - Year 1 students recruited
  - Active advertisement



Collaboration with GWF Core

Modelling

- Hydrological & Water Quality Forecasting
- Climate and Diagnostic Hydrological & Water Quality Modeling
- WRF, VIC-GL, CRHM, CHM
- Data assimilation support

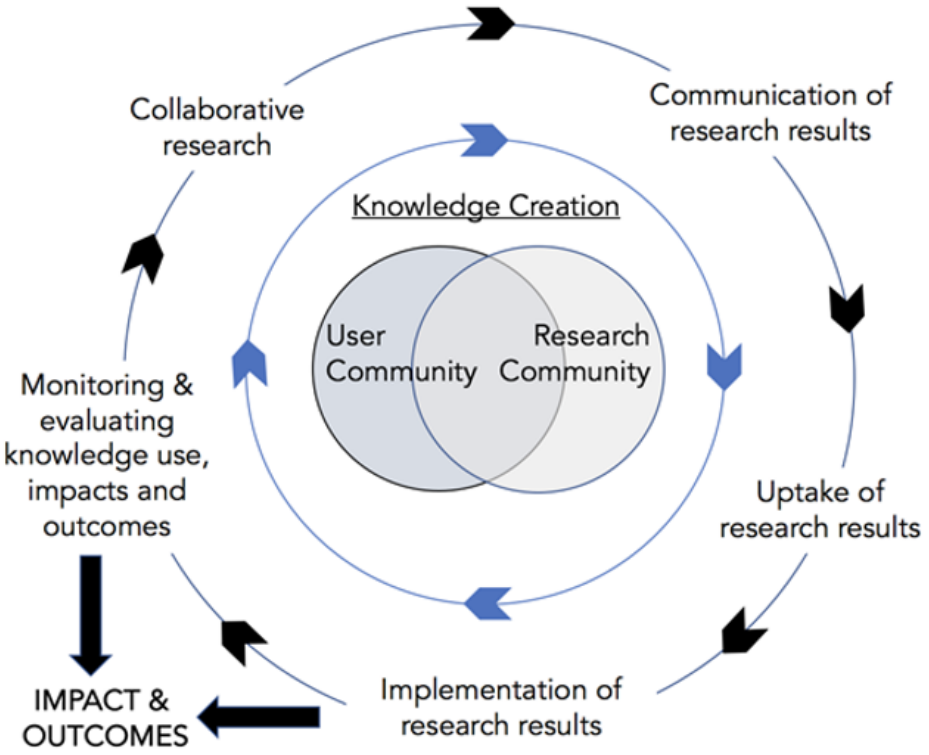
Data Management

- Data organization, QA/QC, transfer from McMaster to core data, computing management
- Field technicians collect, QA/QC, transfer data

User Engagement and KM

Users:

- Government and First Nations
- NGO’s
- Corporations
- Tourism/Recreation
- International



Knowledge Moblization:

- SnowCast meeting
- Core KM team engagement

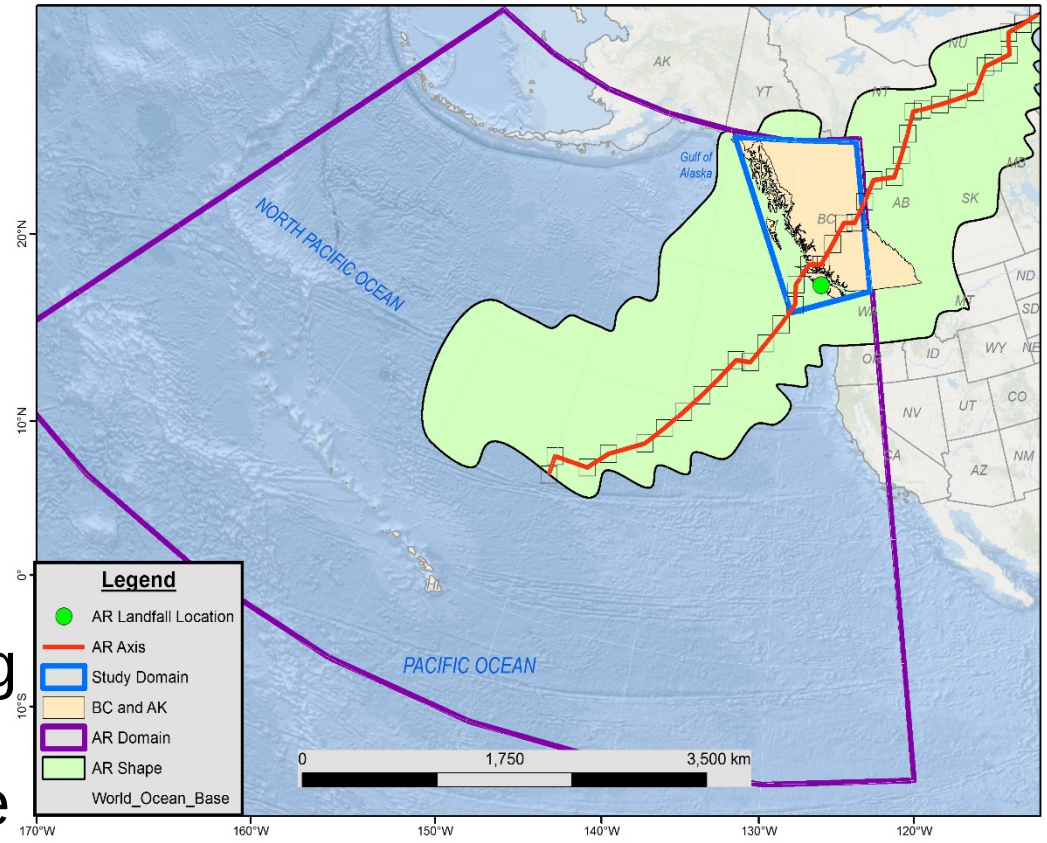
Mountain Climate Extremes

Context:

- Mountain west prone to extreme precipitation events
- Considerations for streamflow, snowpacks, avalanche

Objective:

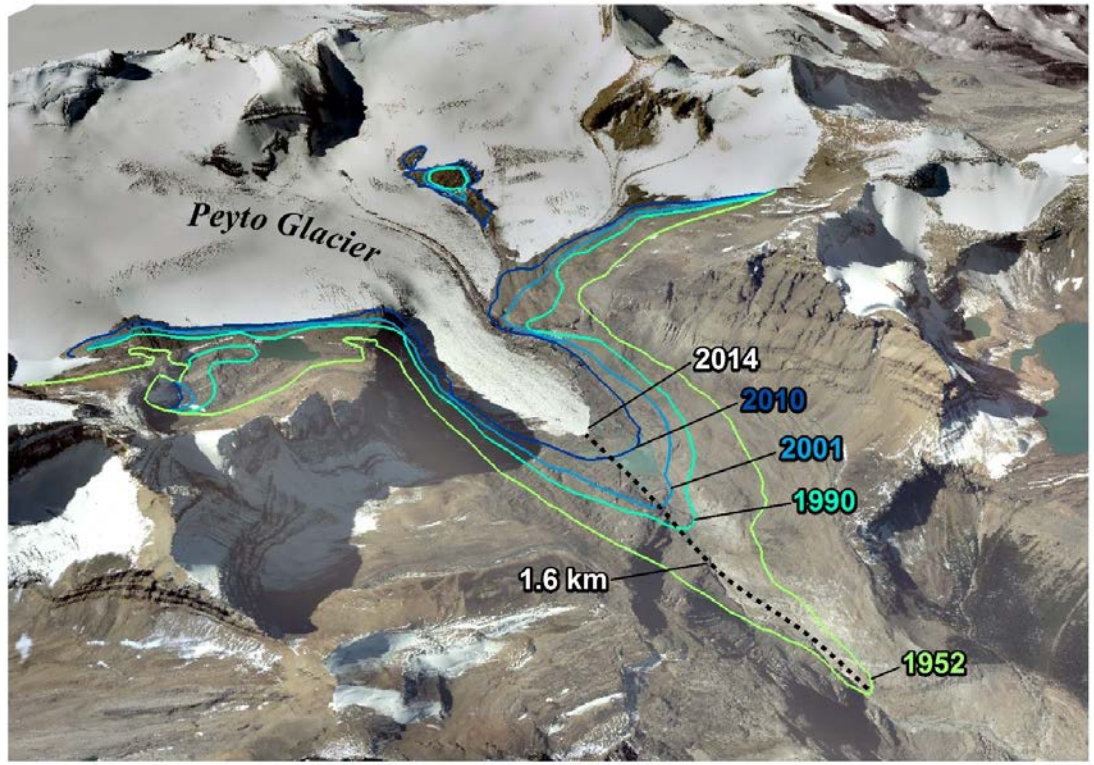
- Study extreme events leading to flooding as well as their links to the transient snowline



Cryosphere

Context:

- Snowpack, glacier, icefield, permafrost cover decreasing, and duration of snowpack cover reduced
- Altered runoff volumes, timing, chemistry



Objective:

- Identify changes in cryosphere and how these impact water cycling and users, and how hydrological and land surface models can best represent the cryosphere to predict runoff at daily to seasonal time scales

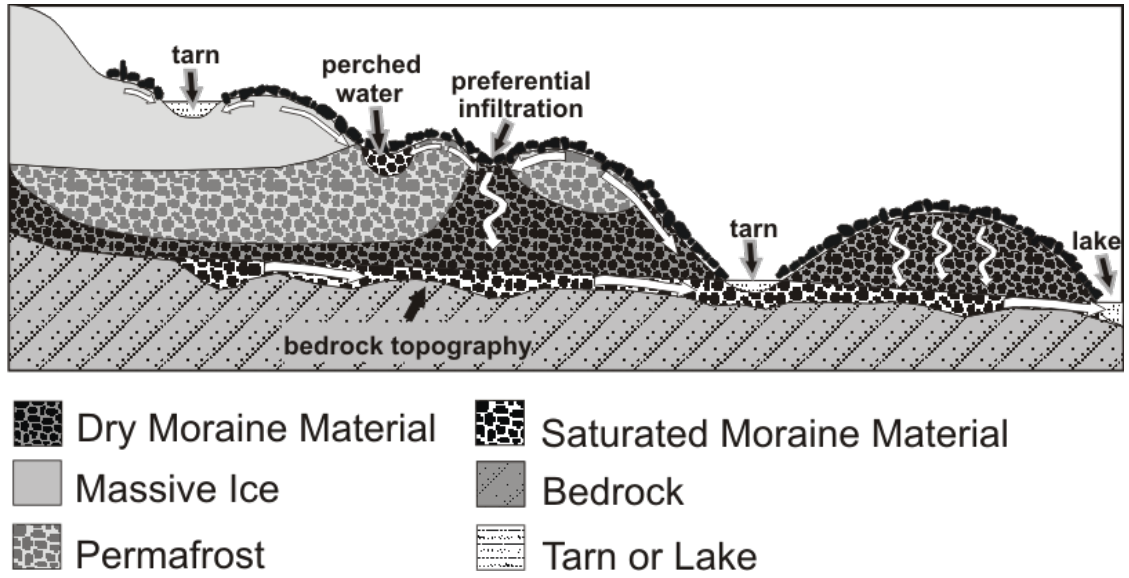
Surface-Groundwater Interactions

Context:

- Rivers controlled by snowmelt/storm runoff during high-flow, groundwater during low-flow, uncertain due to changing climate and permafrost regime
- Critical for thermal regime, hydropower, municipal water supply

Objective:

- Identify aquifer systems, impacts by water inputs (glaciers, snowmelt, rainfall)
- Characterize ground-surface water exchange



Vegetation

Context:

- Vegetation influences dominant hydrological flux in watersheds (evapotranspiration)
- Gradient of vegetation exists across alpine environments

Objective:

- Improve capacity to predict changes in water yield from headwater basins by understanding and numerically representing the role of vegetation on water storage and cycling

Wetlands

Context:

- hydrological role of wetlands in mountain environments are poorly understood

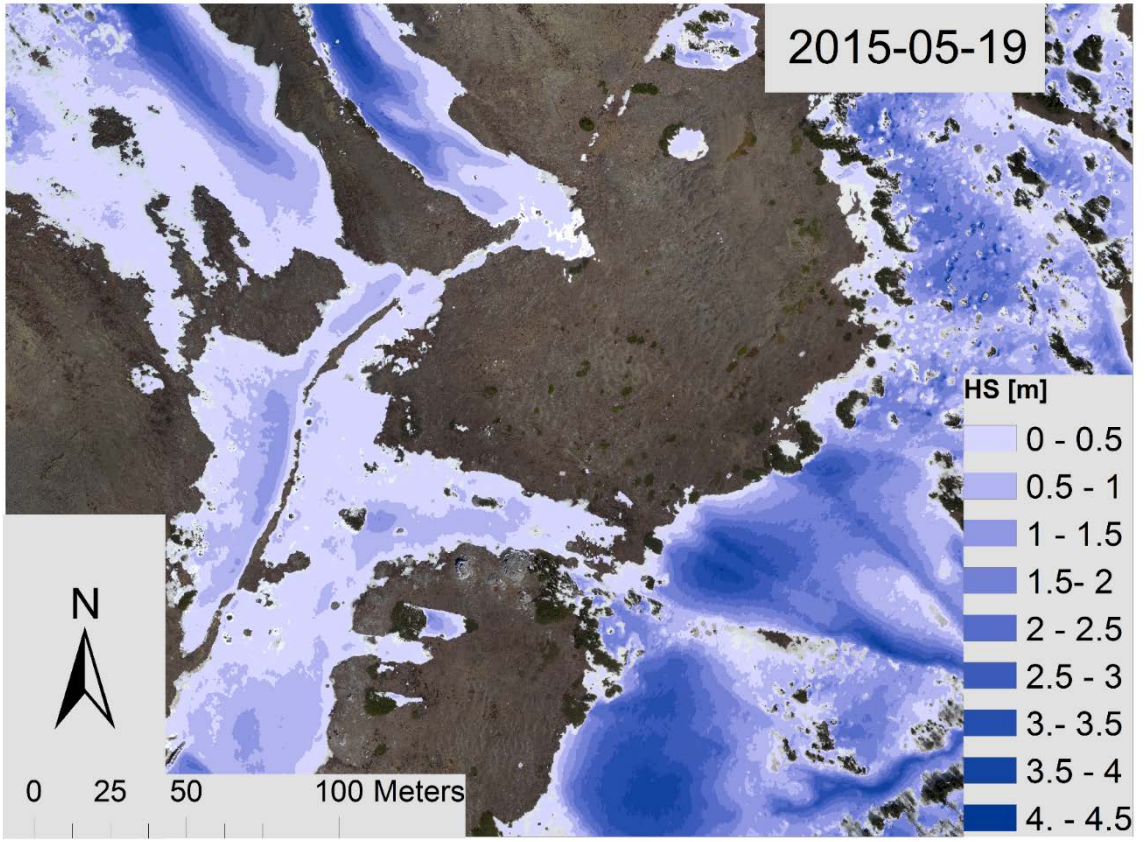
Objective:

- Establish eco-hydrological function and variability of alpine wetlands
- Assess their overall hydrological role in the changing mountain environment

Modelling

Context:

- Important to quantify the changing contribution of glaciers and snowpacks to runoff generation in its principal watersheds



Objective:

- Quantify the impacts of the changing cryosphere on streamflow generation and its timing
- Evaluate the response of peak flows to glacier melt using specific glacier modules coupled to hydrological models