



Predicting risks and opportunities for ecosystem services function under future climate change and climate variability



**Greg Goss,
University of Alberta
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Wetland alteration and viability depends on:

- Amount of water entering a wetland during the period of saturation and inundation
- Natural alteration: streamflow change as a result of climate change and climate variability
- Anthropogenic impact: stream diversion, ground water withdrawal, and impoundment for use in agriculture, industrial development, and municipalities (amongst others)

Predicting Alberta's Water Future (PAWF):



Project team

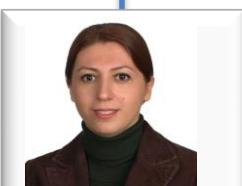
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Climate change data and models



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Groundwater



Dr. V. Adamowicz
[University of Alberta](#)
Socio-economic Analysis



Dr. S. Kienzle
[University of Lightbridge](#)
Basin water yield-ACRU model



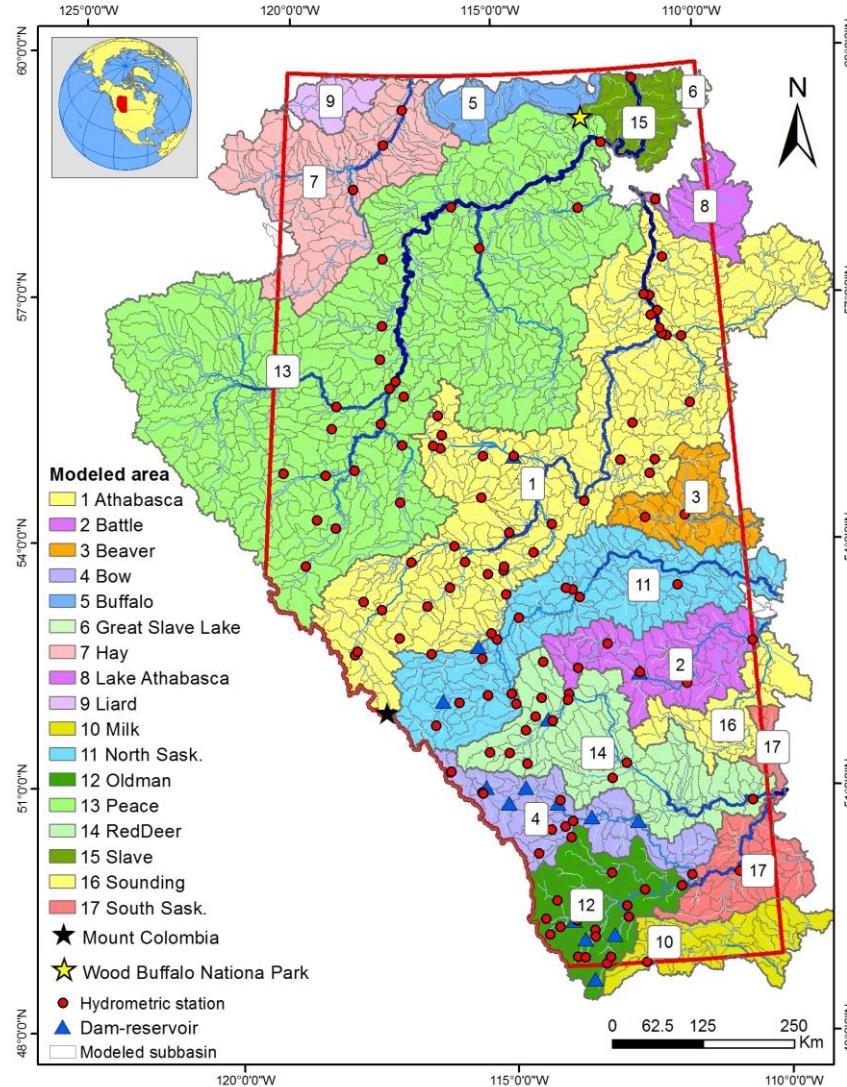
Dr. S. Marshall
[University of Calgary, CIRC](#)
Glaciers and climate change

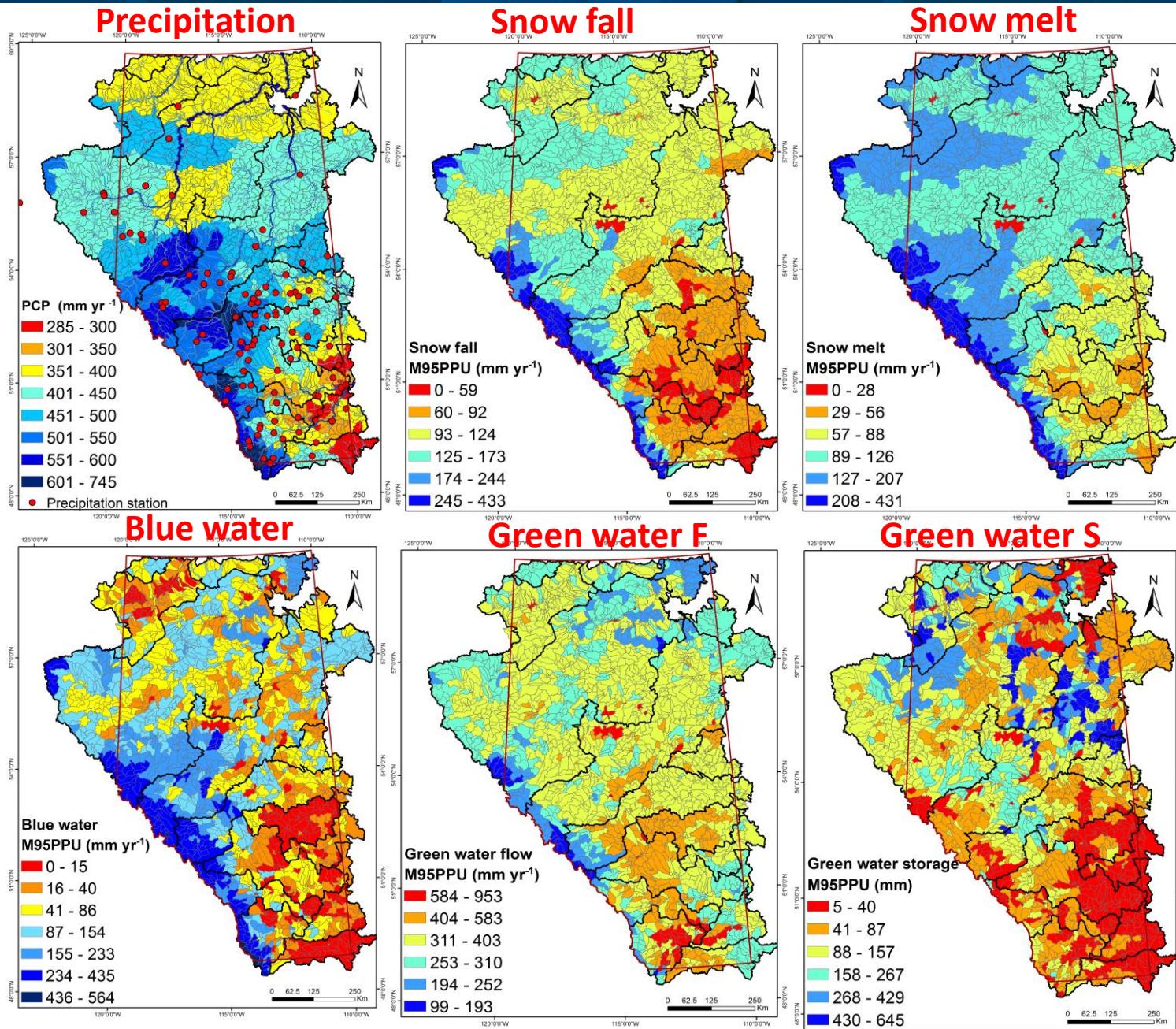


Dr. K. Abbaspour
[Eawag, Switzerland](#)
Hydrological modeling



- **Study area:** 2255 subbasins were delineated using SWAT with a 200 km² drainage area
- **Model calibration-validation (1983-2007):** at 129 hydrometric stations





Long term average: 1986-2007

Model calibration-validation-uncertainty analysis

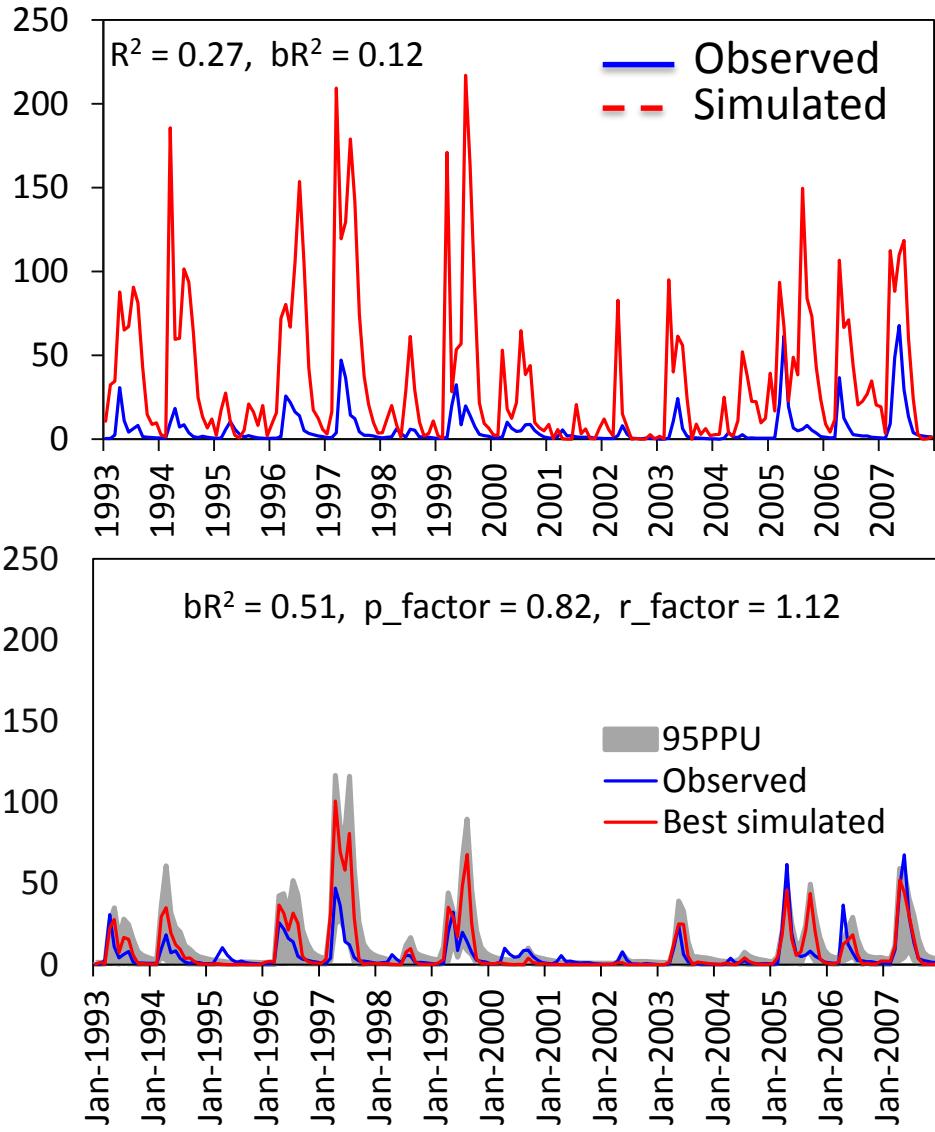
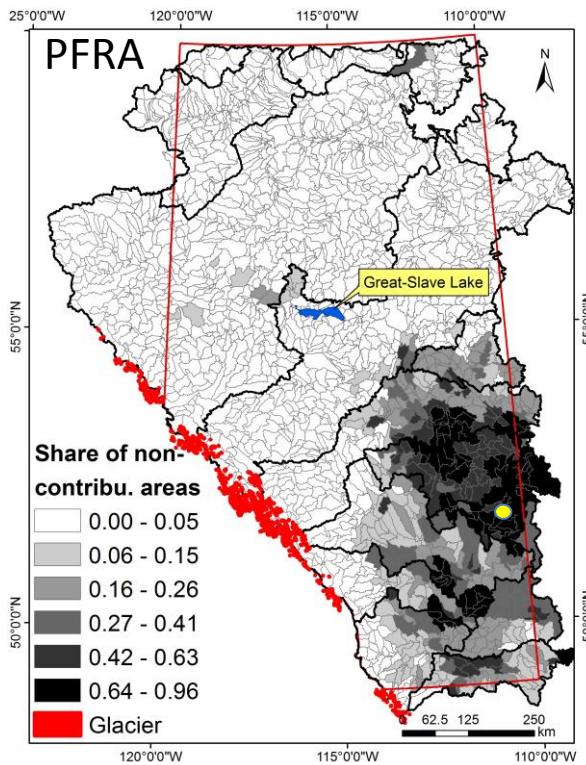
- Climate data
- Reservoirs
- Potholes
- Glaciers
- Geo-spatial parameters
- Agriculture



Potholes:

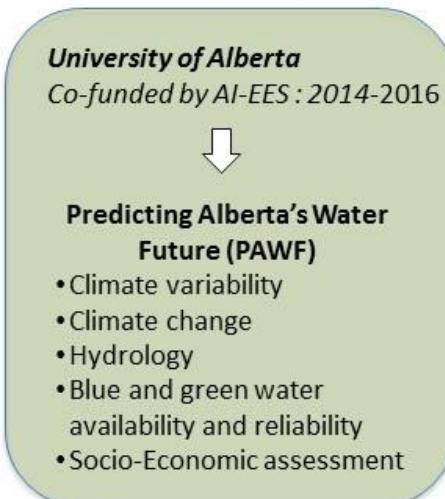


Battle River Near The
Saskatchewan station (drainage
area of 2,598 km²)



A Linked Groundwater : Surface water model is required

Previous investments



ACWA Project

Integrated Assessment of Supply/Demand Risks

ABMI project
3 years: 2017-2019

AI-EES project:
Integration of the models
3 Years: 2017-2019

ALMA project
3 Years: 2016-2018

Projected Outputs

Viability and necessity of Adaptation Responses

1. Identification of successful adaptation strategies for the Integrated Water Management in the SSRB
2. Multi-stakeholder engagement/acceptance of adaptive strategies
3. Identification of risks and opportunities (sector specific)
 - Economic
 - Social
 - Environmental

A scenic landscape featuring a turquoise lake in the foreground, surrounded by a dense forest of green coniferous trees. To the left, a steep, rocky mountain face is visible, showing signs of erosion and patches of snow. In the background, a range of majestic, rugged mountains rises against a bright blue sky filled with wispy white clouds.

Thank you for your
attention