

Field	Response
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1. Contact Information   Phone	519-888-4567 x33377
2. Please indicate the alignment of your research expertise to one or more of the following GWF objectives/ deliverables:	<p>Improve disaster warning – develop scientific knowledge, monitoring and modelling technologies, and national forecasting capacity to predict the risk and severity of extreme events</p> <p>Predict water futures – use Big Data to make informed decisions, better models to assess change in human/natural land and water systems</p> <p>Inform adaptation to change and risk management – propose governance mechanisms, management strategies, and policy tools to reduce the risk of water threats, design adaptive strategies, and enhance economic opportunities</p>
3.1 Please indicate the alignment of your research expertise to the GWF Science Pillar 1 – Diagnosing and Predicting Change in Cold Regions:	<p>Hydrometeorology and Climate Change – improve understanding and prediction of how climate change influences water availability and extreme events</p> <p>Hydrology and Terrestrial Ecosystems – improve understanding and prediction of hydrological and terrestrial processes and watershed hydrology and how processes and systems will evolve and interact under a changing climate</p> <p>Water Quality and Aquatic Ecosystems – improve understanding and prediction of how climate changes in climate, hydrology, and land use impact water quality and the health of aquatic ecosystems</p> <p>Human–Water Systems – address the human dimensions that will determine water futures, including governance, policy, communities, border, and water resources management</p>

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3.2 Please indicate the alignment of your research expertise to the GWF Science Pillar 2 – Developing Big Data and Decision Support Systems:	<p>Big Data for Water – sensors, sensing, instrumented river basins, data analysis systems</p> <p>Decision Support Systems – predictive and diagnostic modelling system development and deployment for hydrology, water quality and water resources</p>
3.3 Please indicate the alignment of your research expertise to the GWF Science Pillar 3 – Designing User Solutions:	<p>Water Environment – ecosystem health and conservation, water management</p> <p>Energy &amp; Natural Resources – including mining and hydroelectricity</p> <p>Other Industry – Including Insurance, Finance, Measurement and Engineering sectors</p>
4. Please indicate the alignment of your research expertise to one or more of the following user needs:	<p>Projects to improve environmental monitoring, including sensors, drones, satellites, river basin observatories, lake buoys, software development, chemical fingerprinting, real-time monitoring, citizen science, and integration of Big Data platforms for Cold Region water science.</p> <p>Model development to support climate change impact assessment, including regional climate change modeling, hydrological and ecological modeling, specifically involving improvements in forecasting and predictive capacity, downscaling, and scenario development of water futures.</p> <p>Risk reduction and analysis tools, including forecasts of floods, droughts, wildfires, and freezing rain (and other weather and climate extremes); water quality assessments; disease risk analyses; and integrated assessments. These tools alert industry and government to potential problems and allow cost/benefit analyses for potential risk mitigation.</p>
5. Please list regions of Canada and the biomes (e.g. mountains, boreal forest, Great Lakes–St Lawrence), watersheds, and/or river basins where you are interested in conducting research for GWF:	Anywhere in Canada really – all

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6. Please list any other expertise or recent experience (subjects, river basins, technology) not covered by above query that could help us in assessing your alignment with the GWF programme:

Since 2005, my research group develops open-source, parallizable, adaptable, yet simple decision-support software for model calibration and optimal water resources management applications. This software is in the form of single and multi-objective optimization algorithms that can handle continuous, integer or mixed-integer optimization problems.

My colleague James Craig and I have formalized a hydrologic model INvalidation framework we would like to see used to guide future hydrologic model development research.