

Field	Response
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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>

Field

Response

3.1 Please indicate the alignment of your research expertise to the GWF Science Pillar 1 – Diagnosing and Predicting Change in Cold Regions:

Hydrometeorology and Climate Change – improve understanding and prediction of how climate change influences water availability and extreme events
 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
 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
 Human–Water Systems – address the human dimensions that will determine water futures, including governance, policy, communities, border, and water resources management
 Water and Health – determine how changes to climate, extreme events, hydrology and water quality will affect human health in urban, rural and Indigenous communities

3.2 Please indicate the alignment of your research expertise to the GWF Science Pillar 2 – Developing Big Data and Decision Support Systems:

Big Data for Water – sensors, sensing, instrumented river basins, data analysis systems
 Decision Support Systems – predictive and diagnostic modelling system development and deployment for hydrology, water quality and water resources

3.3 Please indicate the alignment of your research expertise to the GWF Science Pillar 3 – Designing User Solutions:

Water Environment – ecosystem health and conservation, water management
 Agriculture – including farming, food processing, country foods
 Energy & Natural Resources – including mining and hydroelectricity
 Other Industry – Including Insurance, Finance, Measurement and Engineering sectors
 Urban and Rural Communities
 Indigenous Communities

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4. Please indicate the alignment of your research expertise to one or more of the following user needs:

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.

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.

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.

Complex system modeling and analyses reflect the growing awareness of interacting dynamics in human-natural coupled systems. These studies emphasize the inter-relationships between water resources and transportation systems, infrastructure, energy generation, mining, food production, and source water protection.

Knowledge mobilization for decision support, including the facilitation of communities of practice, stakeholder engagement with science, visualization and Decision Theatres, development of place-based solutions for climate adaptation, and evidence-based decision making.

Merging Indigenous traditional knowledge with science for more effective climate adaptation, risk management, water governance, and sustainable development. Studies of environmental change and long-term, generational impacts of economic development on First Nations ecosystems and water resources.

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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:	Currently conducting, and interested in continuing to conduct research in: Yukon (Yukon River and Nahanni River watersheds; NWT: Mackenzie and Coppermine River watersheds BC: Elk River watershed Ontario/Quebec: St. Lawrence and James Bay watersheds
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:	Water quality, remote data collection, traditional and non-traditional isotopes, synchrotron-based XAS studies, reactive transport modelling, impacts of mining, industrial and agricultural systems