

| Field | Response |
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| 1. Contact Information Name | Dr. Radhey S. Gupta |
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| 2. Please indicate the alignment of your research expertise to one or more of the following GWF objectives/ deliverables: | Predict water futures – use Big Data to make informed decisions, better models to assess change in human/natural land and water systems |
| 3.1 Please indicate the alignment of your research expertise to the GWF Science Pillar 1 – Diagnosing and Predicting Change in Cold Regions: | 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: | 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 |
| 4. Please indicate the alignment of your research expertise to one or more of the following user needs: | 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. |

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| <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:</p> | <p>Lakes Erie and Ontario, the Niagara Region Watershed, and recreational lakes around Toronto</p> |
| <p>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:</p> | <p>Using genome sequence information, my lab has pioneered the discovery of numerous highly specific molecular markers in the forms of conserved signature indels (CSIs) and conserved signature proteins (CSIs) that are distinctive characteristics of many organisms (bacteria, protozoa, plants and animals) that are of importance for evaluating water quality and its impact on human health. The identified molecular signatures provide highly specific means for monitoring the presence or absence of different microorganisms as well as other water quality related organisms in water resources. Based on these markers, and working in collaboration with Dr. Herb Schellhorn’s group, we have developed new, both wet-lab as well as in silico methods, for efficient and cost effective screening of the presence or absence of different water quality related pathogenic as well as non-pathogenic organisms in environmental samples. Thus, we will contribute to the GWF program by helping to comprehensively understand the differences in microbial and other water quality-related organisms in geographically distinct water resources and then determine how the compositions of these organisms, some of which serve as indicators of human health effects, are impacted by the environmental changes.</p> |