

Global Water Futures: Solutions to Water Threats in an Era of Global Change Request for Proposals: "Transformative Solutions to User and Stakeholder Needs" (Science Pillar 3) – Letters of Intent November 22, 2016

GLOBAL WATER FUTURES

SOLUTIONS TO WATER THREATS

IN AN ERA OF GLOBAL CHANGE

Summary

The Strategic Management Committee (SMC) for the Global Water Futures (GWF) programme, funded by the Canada First Research Excellence Fund (CFREF), invites Letters of Intent to develop transformational and transdisciplinary research projects guided by user/stakeholder needs, which will put Canada at the forefront of "Cold Regions"¹ science and will provide significant socio-economic benefits to Canada. This is the first of a series of requests for user-focussed proposals under Pillar 3 of GWF; additional calls with be aimed at supporting transformative disciplinary and multidisciplinary science to underpin the GWF programme (Pillar 1),

The SMC is seeking to fund major integrative projects in alignment with the vision of GWF:

- To provide Canada with the information and tools needed to prepare for and manage water futures in the face of unprecedented environmental and societal change ensuring health and wellbeing; and,
- To provide world-leading water science for Cold Regions and to be a global partner of choice for developing user-focussed solutions to water security.

Projects may be pan-Canadian, drainage basin-based, or have a regional focus (having ability to scale-up to national level). They should be trans-disciplinary, with active user support and engagement. Three years of funding are available in this call, though proposals that develop a vision for up to 7 years are encouraged, and funding could be extended subject to performance in meeting measurable deliverables after 3 years.

In order to facilitate the process for integration of multidisciplinary science with user needs, the GWF will organize 4 information sessions on November 25 (UofS), December 1 (UWaterloo in the AM and Wilfrid Laurier U in the PM) and December 2 (McMasterU), which will provide a platform for the science community to come together and develop transdisciplinary projects and submit Letters of Intent (LOI) by end of January 2017. The details of information sessions are as follows:

- November 25 University of Saskatchewan: Convocation Hall, Peter McKinnon Building from 2:00 – 5:00 pm
- December 1 University of Waterloo: EC5-1111 from 9:00 am 12:00 noon (East Campus 5)

¹ Note: Cold Regions are those regions dominated by "cold" water processes such as snow, ice and frozen soil











- December 1 Wilfrid Laurier University: Senate Board Chambers, John Aird Centre from
- 12:30 3:00 pm
- December 2 McMaster University: JHE-328 (the Engineering building) from 9:00 am 11:30 am

These information sessions will be facilitated by the GWF SMC and will provide an opportunity for the science community to get additional information and further clarification on the application process. A presentation on comprehensive user/ stakeholder needs assessment will be delivered at that time.

The successful LOIs will be invited to submit full proposals by April 10, 2017. The LOI process will be an iterative one allowing the SMC to ensure alignment of proposed projects with the GWF transdisciplinary vision. A proposal may be led by any Faculty member of one of the 4 partner institutions or any Faculty member who was personally invited to be a participant in the GWF proposal (representing an additional 14 Canadian universities).

Background

At least half the world's population is dependent upon water from 'cold regions' where snow, ice and frozen soils drive water availability and quality. Cold regions are severely affected by climate change and human activity, resulting in dramatic rates of warming, changing water availability and unsustainable water use. Canada and much of the world are ill prepared for this unprecedented shift, which has already resulted in intensified floods and droughts, reduced water availability, degraded water quality and loss of ecosystem services, costing billions in economic loss and impacting the health of populations. Addressing how to protect communities and society against these intensifying water threats and consequent health and socioeconomic risks in the face of climate uncertainty and human-induced global changes is one of the world's grand challenges.

Our response, through GWF, will transform the way communities, government, and industry prepare for and manage water-related risks in an era of unprecedented change.

GWF's overarching goal is to deliver risk management solutions—informed by leading-edge water science and supported by innovative decision-making tools—to manage water futures in Canada and other cold regions where global warming is changing landscapes, ecosystems, and the water environment.

End-user needs will be our beacon and will drive strategy and shape our science as we focus on three main goals:

• Deliver new capability for providing disaster warning to governments, communities and the public, including Canada's first national flood forecasting and seasonal flow forecasting systems, new drought warning capability, and water quality models and monitoring that warn of hazards to health and drinking water supply;

- **Diagnose and predict water futures** to deliver improved scenario forecasting of changing climate, landscape and water for the future, with information outputs tailored to the needs of users. This will enable us, for example, to assess risks to human health from changing flood, drought and water quality; and
- Develop new models, tools and approaches to manage water-related risks to multiple sectors, integrating natural sciences, engineering, social and health sciences to deliver transformative decision-making tools for evidence-based responses to the world's changing cold regions. New models will define changing risk from floods and drought, and allow end-users to plan sustainable infrastructure investment to manage future risk.

User Needs

An extensive consultation was conducted while securing letters of support from 156 partners associated with the GWF project. A list of current partners is available at http://gwf.usask.ca/partners.php. These include federal, provincial and territorial government departments and agencies, urban and rural communities, First Nations, the agriculture, mining and oil and gas industries, hydropower utilities, the environmental monitoring and data industries, and the insurance and finance sectors. The following is a high level summary of needs assessment based on the information provided in the letters of support:

- 1. Projects to improve **environmental monitoring**, including sensors, drones, 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 modelling and hydrological and ecological modelling, specifically involving improvements in forecasting and predictive capacity, downscaling, and scenario development of water futures.
- 3. **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.
- 4. **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.
- 5. **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.
- 6. 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.

Budget

A total budget of \$10 million over 3 years is available for this call. The maximum allowable funding per project is \$2 million over 3 years with possibility of extension for up to 7 years. The available funding is mostly for hiring of highly qualified personnel with the expectation that major equipment purchases will be met from other sources. Although not required, it is expected that the proposed transdisciplinary projects will leverage funding from either existing or new sources. Such added value will be viewed favourably in the review process. Please note that no overhead funding is allowed in the budget allocation. Integration of international components in the projects will be encouraged.

Eligibility

Project Principle Investigator or Co-investigator – must be from one of the 4 partner universities (including adjunct professors) or a *named investigator* from one of the other 14 university letters of support. PI or co-Is can receive funding from GWF in a project and projects may distribute funds via sub-agreements with Co-Is.

Project Collaborators – project collaborators who can contribute to science, development, outreach and user interaction. Collaborators cannot receive direct or sub-contracted project funds from GWF.

Projects can include investigators from more than one institution, and this is encouraged.

Proposal Development Process

The following process will be followed by GWF to secure, assess, and approve project applications:

- Step 1 Invitation: Invite the research community from the four partner institutions and pre-selected researchers from the other 14 Canadian universities to attend one of the information sessions. (*Deadline: November 18*)
- Step 2 Request for Proposal: Release a request for proposal (RFP) draft document having working guidelines and assessment criteria prior to the scheduled information sessions. *(Deadline: November 24)*
- Step 3 Information Sessions: Each partner university will host half-a-day information sessions at their respective institutions: UofS November 25; UWaterloo (AM)/WLU (PM) December 1, and McMasterU December 2. During these sessions, the attendees will be asked to participate in breakout discussion sessions based on key biomes, drainage basins and pan-Canadian projects. The attendees will also be asked to fill in an online

questionnaire to outline their personal area of interest and how it relates to the GWF mission. *(Deadline: December 2)*

- Step 4 Letter of Intent (LOI): The goal of the above information sessions will be to encourage development of group-based transdisciplinary LOI. However, individuals will also be allowed to submit LOI. (*Deadline for receipt of LOIs: January 30*)
- Step 5 Review LOI: The SMC will review LOIs, preferably with advice from the International Science Advisory Panel. The SMC will identify similar or complementary projects and recommend combining groups as appropriate.
- Step 6 Report to Investigators: GWF will inform successful LOIs and invite full proposals by **February 17, 2017**
- Step 7 Full Proposals: Full proposals will be due on April 10, 2017
- Step 8 Proposal Review: The full proposals will be reviewed by the SMC with feedback and recommendations from the International Science Advisory Panel. (*Deadline: May 1 - tentative*)
- Step 9: Funded projects will be informed (Deadline: May 15 tentative)

User Engagement: It is expected that the proposed projects will include existing GWF partners (list provided at the GWF website) and these should be approached, in coordination with Dr. Phani Adapa of the GWF secretariat, in order to avoid any conflict of interest, redundancies, and to facilitate the process. Any new partner willing to participate in a GWF project must provide cash or in-kind support to the GWF programme.

Project Management

Each successful project must provide a biannual progress report. Project progress against proposed deliverables will be reviewed annually by the SMC. A critical evaluation of the funded projects will be conducted towards end of year 3 and will inform subsequent calls for projects including renewal of projects.

GWF Core Support

GWF will be providing core support teams for the programme as follows:

- Social Science Engagement Team
- Computer Science Team Human Computer Interface and Re-engineering Codes
- Observatories, Observations and Data Management Team
- Modelling Core Team
 - Hydrological and Water Quality Forecasting
 - o Climate and Diagnostic Hydrological & Water Quality Modeling
 - Water Resources Modelling

Interaction with GWF Core Support, as evidenced by support of or use of these teams' capabilities, is desirable for successful projects.

Letter of Intent Outline

Any group or individual planning to submit a LOI must use the following working guidelines for development of the LOI:

- 1) User-need led mapping on at least one identified user-need with at least one user integrated into the consortia
- 2) Transformative excellent science that transforms the approach to the problems
- 3) Transdisciplinary addressing the issue from multiple disciplines
- 4) Relevant to proposed scope and GWF objectives
- 5) Making use of core GWF activities/facilities instrumented river basins, modelling, big data
- 6) Pan-Canadian in ambition can be focussed initially on a regional strength, but must aspire and show how it will have national impact and scope the working

The letter of intent should not exceed 6 pages of content (excluding CVs) and will be submitted online (link to be provided soon). The format and maximum lengths of sections are:

- Project Title
- Names of PI and Co-PIs and contact information (as needed)
- Names of Eligible Co-Is and their affiliations (as needed)
- Names of Non-eligible Collaborators and their affiliations (as needed)
- Summary (1/2 page).
- Rationale showing alignment to User/Stakeholder Needs (1/2 page)
- Objectives and Methodology (both 3 year and 7 year plans) (1 page)
- Science deliverables and Timelines (1/2 page)
- Alignment of Solution with the GWF Vision and User Needs (1 page)
- List of Partners and their Roles (1/2 page)
- Budget (no justification required; include any leveraging opportunity) (1/2 page)
- HQP Training (number of undergraduate, MSc, PhD, PDF, others to be trained (1 line)
- Request for GWF Core Support from instrumented research basin and laboratory technical support or data, remote sensing data, core forecasting, diagnostic or water resource modelling or models, Social Science Teams, IT Teams, Data Management Teams (1/2 page)
- 2-Page CVs of each of the PIs and Co-PIs

Letter of Intent Evaluation Criteria

The criteria that will be evaluated and their relative weighting are listed here:

• Alignment of the project rationale to user/stakeholder needs identified in the GWF user needs assessment process, and/or the GWF proposal including its letters of support . 20%

- Clear scientifically-credible objectives that strategically support GWF objectives and the defined rationale and a transdisciplinary methodology that is designed to achieve these objectives in the timelines and budget requested. 10%
- Scientific deliverables that support user/stakeholder needs in a timely fashion and align with the GWF vision as noted in the project rationale. 30%
- Efficient and effective use of GWF programme resources i.e. include any leveraging opportunity. 10%
- Substantial HQP training. 5%
- A track record of research, leadership, and outreach success (for individuals or as a team) as evidenced by high impact metrics, such as influential recent key publications, awards, tri-council research funding success and outreach activity. 25%

Contact – GWF Secretariat

Phani Adapa, PhD, PEng Director of Operations Global Water Futures Programme National Hydrology Research Centre 11 Innovation Blvd, Saskatoon, SK S7N 3H5 Phone: 306-966-2271 Email: <u>phani.adapa@usask.ca</u> <u>gwf.project@usask.ca</u> Web: <u>http://www.globalwaterfutures.ca</u>



Global Water Futures: Solutions to Water Threats in an Era of Global Change Request for Proposals: "Transformative Solutions to User and Stakeholder Needs" (Science Pillar 3) – Full Proposal

Submission Deadline: April 10, 2017

Full Proposal Guidelines

The following guidelines should be used for the development of full proposals. These should be:

- 1) User-needs led mapping onto at least one identified user-need with at least one user integrated into the consortium
- 2) Transformative excellent science that transforms the approach to the problems to be addressed
- 3) Transdisciplinary engaging users in the project activity and integrating disciplines as appropriate
- 4) Relevant to GWF scope and objectives as defined in the GWF proposal
- 5) Making use of core GWF activities/facilities as appropriate
- 6) Pan-Canadian in ambition can be focussed initially on a regional strength, but must aspire to and show how it will have national impact and relevance

Budget

Following review of LOIs, SMC has allocated a total budget of \$14 million over 3 years for this call. The maximum allowable funding per project is \$2 million over 3 years with possibility of extension for up to 6 years. The available funding is mostly for hiring highly qualified personnel with the expectation that major equipment purchases will be met from other sources. It is expected that the proposed transdisciplinary projects will leverage direct funding and/or in-kind support from either existing or new sources. Such added value will be viewed favourably in the review process. Please note that no university overhead funding is allowed in the budget allocation. Integration of international components in the projects is encouraged. The funded projects will formally begin on June 1, 2017.

Eligibility

The Project Principal Investigator and Co-investigators must be either from one of the 4 partner universities (including adjunct professors) or a *named investigator* from one of the other 14 university letters of support. PIs will receive project funding from GWF and will distribute funds to the Co-Is. Projects can include investigators from more than one institution, and this is encouraged.

Project Collaborators can be contributors to science, development, outreach and/or user interaction. Collaborators cannot receive direct or sub-contracted project funds from GWF. Collaborators will often be drawn from user or stakeholder organizations but can include others including international collaborators.











Full Proposal Development and Review Process

The following process will be followed by GWF to secure, assess, and approve full project applications:

- Step 1 Invitation: GWF will inform successful LOIs and invite full proposals by February 17, 2017
- Step 2 Full Proposals: Full proposals are due on April 10, 2017
- Step 3 Proposal Review: Each full proposal will be sent for peer review by 3 international reviewers, drawn from the ISAP and additional experts. *(Deadline: May 5, 2017)*
- Step 4: The SMC will review all proposals, together with the feedback and recommendations from the international reviewers and International Science Advisory Panel. (*Deadline: May 11*)
- Step 5: Funded projects will be informed (Deadline: May 15)

Knowledge Mobilization (KM): Existing and new GWF partners should be approached for letters of support in coordination with Dr. Phani Adapa of the GWF secretariat in order to avoid any conflict of interest, redundancies, and to facilitate the process. Any new partner willing to participate in a GWF project must provide direct or in-kind support to the GWF programme. We note that KM is an active, iterative, and interactive process between scientists and users from beginning to end; guidelines for good practice will be provided.

Project Management

An operational management committee comprising all project PIs will meet monthly. Each successful project must provide a biannual progress report. Project progress against proposed deliverables, including knowledge mobilisation and data management, will be reviewed annually by the SMC. This will include an audit of progress against knowledge mobilisation plans. A critical evaluation of the funded projects will be conducted towards the end of year 3 and will inform subsequent calls for projects including renewal of projects.

Data Policy

The full proposals must adhere to the GWF data policy and data management plan (details to follow soon in a separate document).

Our policy is that all research data collected with the use of funding through the GWF programme (including CFREF and other funding partners) must be preserved and submitted for archiving in our central data repository within a reasonable period of time. As part of this process, and under the terms and conditions of GWF funding, researchers are expected to:

- Adhere to national and/or international standards or best practices in data collection and management procedures (e.g. data processing, quality assurance and control, documentation, etc.) where relevant and/or possible;
- Liaise with the GWF data management core team on a regular basis to ensure prompt submission of high-quality and properly documented datasets to the central repository;

- The GWF data management core team may impose specific protocols to be followed in some circumstances, where feasible and/or necessary, to ensure compatibility and standardization of various datasets;
- Report on data management and submission activities as part of regular scientific and progress reports to the GWF Strategic Management Committee or other relevant overseeing body.

As GWF sub-projects are proposed and developed, careful consideration must be given to the data production, needs, and use of these projects, and a detailed data management plan is required for each. Researchers are strongly encouraged to liaise with the data management core team in developing their plans.

Data should be submitted internally to the data management core team and central archive as soon as possible. This team will be able to provide technical assistance and support in various aspects of data processing, quality assurance and control, and archiving. Internal GWF datasets will be safeguarded and will only be released publically with the consent of the data originator or after the embargo period.

(Note: Continuation of funding to individual GWF sub-projects is contingent on provision of data in accordance with the GWF data policy and the data management plans developed from the outset of each project. Any exemptions must be fully justified and approved by the GWF Strategic Management Committee.)

GWF Core Support

GWF will be providing core support teams for the programme as follows (details regarding scope of the core teams is provided "Global Water Futures Core Support Teams document):

- Knowledge Mobilisation Team providing advice, guidance and support to facilitate user engagement and communication with research teams (University of Saskatchewan -Patricia Gober and Toddi Steelman; Wilfrid Laurier University - Alison Blay-Palmer; and University of Waterloo – Kevin Boehmer)
- Computer Science Team providing advice, guidance and support for software development of improved models, model coupling and Human Computer Interfaces (University of Saskatchewan Kevin Schneider; and University of Waterloo Jimmy Lin)
- Data Management Team providing timely archiving and delivery of data to users. (University of Saskatchewan - John Pomeroy; McMaster University - Sean Carey; Wilfrid Laurier University - William Quinton; and University of Waterloo - Jimmy Lin)
- Technical Team supporting field observatories, observational analysis and key laboratories.
- Core Modelling Team developing national capability and frameworks for Hydrological and Water Quality Forecasting, Climate Modelling, Hydrological & Water Quality Modelling and Water Resources Modelling (University of Saskatchewan Alain Pietroniro

and John Pomeroy; University of Waterloo – Phillippe van Cappellen; McMaster University – Sean Carey)

Interaction with GWF Core Support teams, as evidenced by support to or use of these teams' capabilities, is desirable for successful projects.

Full Proposal Outline

The format and approximate page limits for sections are as follows:

- Project Title
- Name of PI and contact information
- Names of Eligible Co-Is and their affiliations
- Names of Collaborators and their affiliations
- Full Proposal (max. 23 pages; attach pdf)
 - Summary (0.5 page)
 - Rationale showing alignment to User/Stakeholder Needs and GWF Vision (1 page)
 - Objectives and Methodology (both 3 year and 7 year plans) (8 pages)
 - Project Deliverables and Timelines including Knowledge Mobilisation Plan (total 3 pages)
 - Roles of Collaborators and User/Stakeholder Organisations (2 pages)
 - Project Management (1 page)
 - Data Management Plan (1 page)
 - HQP Training Plan (0.5 page)
 - Budget with Justification (include cash and in-kind support from users/stakeholders, and defined allocations to co-Is) (4 pages)
 - Linkage to GWF Core Support teams (1 page)
 - References (1 page)
- 4-Page CVs of each of the PIs and Co-Is (attach all CVs as one pdf file) CV Requirements:
 - Page-1: Name/ Affiliation, Current Job Title, Key Awards, Distinction: A track record of research and outreach success as evidenced by high impact factors, outreach and leadership, Research Funding Track Record;
 - Page-2: A narrative describing up to 5 of the most significant contributions to knowledge as well as any experience of user engagement and knowledge mobilization;
 - Page-3: The relationship to other grants, including other GWF projects in which the PI/Co-I is involved;
 - Page-4: Key publications including h-index.
- 2-Page letters of support from each of the users/stakeholders (attach PDF as one file) should provide an overview of who the partner is; why they are interested in participating, what they expect to gain through the collaboration; and what they are contributing to the collaboration (cash and/or in-kind contributions).

Full Proposal Evaluation Criteria

The criteria that will be evaluated and their relative weighting are listed here (note that successful projects must meet all criteria to a satisfactory level):

- Rationale Alignment of the project rationale to user/stakeholder needs identified in the GWF user needs assessment process, and/or the GWF proposal including its letters of support. 10%
- Knowledge Mobilization including user and stakeholder needs Deliverables that address user/stakeholder needs in a timely fashion, align with the GWF vision as noted in the project rationale, and governance mechanisms to ensure that users are collaborators working inside the project. Proposals must provide an adequate knowledge mobilization plan to be successful. 25%
- Objective and Methodology: Clear scientifically-credible objectives that strategically support GWF objectives and the defined rationale and methodology to achieve these objectives on the timelines and within the budget requested. 25%
- Project Management Plan (including detailed role of co-investigators and how the project will be managed) 5%
- Data Management Plan 5%
- Budget Justification & User Support, including allocations to co-investigators and expenditure categories by sub-topics. Description of HQP training, specification of user direct and/or in-kind support, and use of GWF programme resources. 15%
- A track record of research, leadership, and outreach success (for individuals or as a team) as evidenced by high impact metrics, such as influential recent key publications, awards, tri-council research funding success and outreach activity. 15%

Submission Process

Full applications must be submitted using the GWF online submission form by April 10th, 2017. To access the application site, the applicant will need the University of Saskatchewan's <u>Network</u> <u>Services ID (NSID)</u>.

Online submission site: <u>http://gwf.usask.ca/proposals/online-submission.php</u>

Contact – GWF Secretariat

Phani Adapa, PhD, PEng Director of Operations Global Water Futures Programme National Hydrology Research Centre 11 Innovation Blvd, Saskatoon, SK S7N 3H5 Phone: 306-966-2271 Email: phani.adapa@usask.ca; gwf.project@usask.ca Web: http://www.globalwaterfutures.ca





Global Water Futures: Solutions to Water Threats in an Era of Global Change Request for Proposals – Letters of Intent for Pillars 1 and 2 March 29, 2017

Summary

The Strategic Management Committee (SMC) for the Global Water Futures (GWF) programme, funded by the Canada First Research Excellence Fund (CFREF), invites Letters of Intent (LOI) to develop transformational research projects directed towards **Pillar 1 - Diagnosing and Predicting Change in Cold Regions** and **Pillar 2 - Developing Big Data and Decision Support Systems.** Eligible GWF investigators can submit LOI up until June 16, 2017.

Proposed science, big data and decision support system projects should complement and show consistency with GWF core teams and strategies and should be in alignment with the vision of GWF:

- To provide Canada with the information and tools needed to prepare for and manage water futures in the face of unprecedented environmental and societal change ensuring health and wellbeing
- To provide world-leading water science for Cold Regions and to be a global partner of choice for developing user-focussed solutions to water security

The three-year projects will aim to put Canada at the forefront of water science and innovation. Whilst any aspect of Pillars 1 and 2 can be the subject of an LOI, projects of particular interest to the SMC will be strategic to the needs of GWF. Strong project LOI will include those that make the case that their objectives are not adequately covered by GWF Core Support activities and by Pillar 3 User-need Led Projects. For instance the SMC identifies strategic research needs in the areas of:

- Water and health
- Social science and governance
- Innovative sensors
- Science in support of big data analytics and high end computing
- Groundwater
- Cold regions processes

Note that there will be a separate request for proposals focussing on First Nations water issues.

The successful LOIs will be invited to submit full proposals by September 2017. A proposal may be led by a full-time faculty member of one of the 4 partner institutions or any faculty member













who was personally invited to be a participant in the GWF proposal (representing an additional 14 Canadian universities).

Background

At least half the world's population is dependent upon water from 'cold regions' where snow, ice and frozen soils drive water availability and quality. Cold regions are severely affected by climate change and human activity, resulting in dramatic rates of warming, changing water availability and unsustainable water use. Canada and much of the world are ill prepared for this unprecedented shift, which has already resulted in intensified floods and droughts, reduced water availability and degraded water quality, costing billions in economic loss and impacting the health of populations. Addressing how to protect communities against these extreme water threats and consequent health risks in the face of climate uncertainty and human-induced global changes is one of the world's grand challenges.

Our response, through GWF, will transform the way communities, government, and industry prepare for and manage water-related risks in an era of unprecedented change.

GWF's overarching goal is to deliver risk management solutions—informed by leading-edge water science and supported by innovative decision-making tools—to manage water futures in Canada and other cold regions where global warming is changing landscapes, ecosystems, and the water environment.

Budget

A budget of up to \$5 million over 3 years is available for this call. Depending on the size of the team and project scope: smaller projects could request up to \$200K per year and larger projects (consortia) could request up to \$500K per year. The available funding is mostly for hiring highly qualified personnel and operating expenses with the expectation that major equipment purchases will be met from elsewhere. Please note that no overhead funding is allowed in the budget allocation. Integration of international components in the projects will be encouraged.

Letter of Intent Process

The following process will be followed by GWF to secure, assess, and approve project/network applications:

- Step 1: Release a request for proposal (RFP) document having working guidelines and quality criteria for Pillars 1 and 2 (*Deadline: March 30*)
- Step2: Receive LOI (Deadline: June 16)
- Step 4: SMC to review LOI with advice from International Science Advisory Panel
- Step 5: If required, the SMC to identify similar or complementary projects/networks and combine teams
- Step 6: Inform successful LOI and invite full proposals (Deadline: July 14, 2017)

- Step 7: Full proposals due (*Deadline: September 22, 2017*)
- Step 8: The full proposals will be provided to the International Science Advisory Panel (ISAP) and for international peer review for feedback and recommendations to the SMC. (Deadline: October 6, 2017)
- Step 9: Funded projects will be informed (Deadline: October 20, 2017)

Project Management

Each successful project must provide a bi-annual progress report and its progress against proposed deliverables will be reviewed annually by the SMC and user groups panel. A critical evaluation of the funded projects/networks will be conducted at the end of year 3.

GWF Core Support

GWF will be providing core support teams for the programme as follows:

- Computer Science Team Human Computer Interface and Re-engineering Codes
- Observatories and Data Management Team
- Modelling Core Team

Interaction with and enhancement of these teams is desirable and some support is likely to be available from these teams for agreed collaboration with successful projects. The full strategy documents for these teams should be consulted.

Letter of Intent Outline

The letter of intent should not exceed 10 pages (excluding CVs)

- Project/Network Title
- Names of PI and Co-PIs and contact information (as needed)
- Names of Co-Is and their affiliations (as needed)
- Summary (1/2 page)
- Rationale (1 page)
- Objective (both 3 years and 7 years plans) (1 page)
- Science deliverables and Timelines (2 1/2 pages)
- Alignment with the GWF Vision (1 page)
- Budget (no justification required; include any leveraging opportunity) (1 page)
- HQP Training (1 pages)
- International Partnership and/or field work (1 page)
- Request for GWF Core Support (1 page)
- 2-Page CVs of each of the PIs and Co-PIs

Evaluation Criteria

Any person or group planning to submit an LOI should use the working guidelines for development of the LOIs, which are outlined as follows:

- 1) Transformative excellent science that transforms the approach to water problems (30%)
- 2) Relevance to Pillar 1 and/or 2 and to GWF objectives (30%)
- 3) Complements, enhances and/or uses Core GWF activities/facilities instrumented river basins, modelling, big data (15%)
- 4) Identifies a science or technical topic(s) that requires strategic investment by GWF due to lack of national capacity, insufficient core support from GWF or inability to adequately address the topic(s) in Pillar 3 proposals. (25%)

Submission Process

Please email your application package as one pdf file to Phani Adapa, Director of Operations, Global Water Futures at <u>phani.adapa@usask.ca</u>

Contact

Phani Adapa, PhD, PEng Director of Operations Global Water Futures Programme National Hydrology Research Centre 11 Innovation Blvd, Saskatoon, SK S7N 3H5 Phone: 306-966-2271 Email: phani.adapa@usask.ca Web: http://gwf.usask.ca; www.globalwaterfutures.ca





Global Water Futures: Solutions to Water Threats in an Era of Global Change Request for Full Proposals for Pillars 1 and 2

July 18, 2017

Submission Deadline: September 22, 2017

Summary

The Strategic Management Committee (SMC) for the Global Water Futures (GWF) programme, funded by the Canada First Research Excellence Fund (CFREF), recently concluded its Letter of Intent (LOI) review process and is now inviting the Principal Investigators of selected projects to submit full proposals by **September 22, 2017** to develop transformational research projects directed towards **Pillar 1 - Diagnosing and Predicting Change in Cold Regions** and **Pillar 2 - Developing Big Data and Decision Support Systems.**

The SMC received 36 LOIs for a total funding request of nearly \$21 million, and a budget of up to \$5 million over 3 years is available for this call. The LOIs were carefully reviewed by the SMC against the criteria outlined in the call for LOIs and consequently 17 LOIs have been invited to submit full proposals (47% success rate).

Background

At least half the world's population is dependent upon water from 'cold regions' where snow, ice and frozen soils drive water availability and quality. Cold regions are severely affected by climate change and human activity, resulting in dramatic rates of warming, changing water availability and unsustainable water use. Canada and much of the world are ill prepared for this unprecedented shift, which has already resulted in intensified floods and droughts, reduced water availability and degraded water quality, costing billions in economic loss and impacting the health of populations. Addressing how to protect communities against these extreme water threats and consequent health risks in the face of climate uncertainty and human-induced global changes is one of the world's grand challenges.

Our response, through GWF, will transform the way communities, government, and industry prepare for and manage water-related risks in an era of unprecedented change.

GWF's overarching goal is to deliver risk management solutions—informed by leading-edge water science and supported by innovative decision-making tools—to manage water futures in Canada and other cold regions where global warming is changing landscapes, ecosystems, and the water environment.













Eligibility

Any full-time faculty member of one of the 4 partner institutions (University of Saskatchewan, University of Waterloo, McMaster University and Wilfrid Laurier University) or any faculty member who was personally invited to be a participant in the GWF proposal (representing an additional 14 Canadian universities) are eligible to be the Principal Investigator (PI) or Co-Investigator (Co-I) of Pillars 1-2 projects. Adjunct faculty members with the 4 partner institutions are eligible to be Co-Is on a project. All other researchers can be included in the proposal as non-funded collaborators. Projects can include investigators from more than one institution, and this is encouraged.

Project Collaborators can be contributors to science, development, outreach and/or user interaction and there are no restrictions on where they are based. Collaborators cannot receive direct or sub-contracted project funds from GWF.

Budget

A budget of up to \$5 million over 3 years is available for this call and projects can request up to \$500K per year. The available funding is mostly for hiring highly qualified personnel and operating expenses with the expectation that major equipment purchases will be met from elsewhere. Please note that no overhead funding is allowed in the budget allocation. The funded projects will formally begin on January 1, 2018.

Full Proposal Process

The following process will be followed by GWF to secure, assess, and approve project/network applications:

- Step 1: Release a request for proposal (RFP) document having working guidelines and quality criteria for Pillars 1 and 2 (*Deadline: March 30, 2017*)
- Step2: Receive LOI (Deadline: June 16, 2017)
- Step 4: SMC to review LOI with advice from International Science Advisory Panel
- Step 5: If required, the SMC to identify similar or complementary projects/networks and combine teams
- Step 6: Inform successful LOI and invite full proposals (Deadline: July 14, 2017)
- Step 7: Full proposals due (*Deadline: September 22, 2017*)
- Step 8: The full proposals will undergo international peer review for feedback and recommendations to the SMC. *(Deadline: October 22, 2017)*
- Step 9: Funded projects will be informed (Deadline: November 13, 2017)

Project Management

An operational management committee comprising all project PIs will meet quarterly. Each successful project must provide an annual progress report. Project progress against proposed

deliverables, including knowledge mobilisation and data management, will be reviewed annually by the SMC. A critical evaluation of the funded projects will be conducted towards the end of year 3 and will inform subsequent calls for projects including renewal of projects.

Data Policy

The full proposals must adhere to the GWF data policy and data management plan (details to follow soon in a separate document).

Our policy is that all research data collected with the use of funding through the GWF programme (including CFREF and other funding partners) must be preserved and submitted for archiving in our central data repository within a reasonable period of time. As part of this process, and under the terms and conditions of GWF funding, researchers are expected to:

- Adhere to national and/or international standards or best practices in data collection and management procedures (e.g. data processing, quality assurance and control, documentation, etc.) where relevant and/or possible;
- Liaise with the GWF data management core team on a regular basis to ensure prompt submission of high-quality and properly documented datasets to the central repository;
 - The GWF data management core team may impose specific protocols to be followed in some circumstances, where feasible and/or necessary, to ensure compatibility and standardization of various datasets;
- Report on data management and submission activities as part of regular scientific and progress reports to the GWF Strategic Management Committee or other relevant overseeing body.

As GWF projects are proposed and developed, careful consideration must be given to the data production, needs, and use of these projects, and a detailed data management plan is required for each. Researchers are strongly encouraged to liaise with the data management core team in developing their plans.

Data should be submitted internally to the data management core team and central archive as soon as possible. This team will be able to provide technical assistance and support in various aspects of data processing, quality assurance and control, and archiving. Internal GWF datasets will be safeguarded and will only be released publically with the consent of the data originator or after the embargo period.

(Note: Continuation of funding to individual GWF sub-projects is contingent on provision of data in accordance with the GWF data policy and the data management plans developed from the outset of each project. Any exemptions must be fully justified and approved by the GWF Strategic Management Committee.)

GWF Core Support

GWF will be providing core support teams for the programme as follows (details regarding scope of the core teams is provided "Global Water Futures Core Support Teams document):

- Knowledge Mobilisation Team providing advice, guidance and support to facilitate user
- engagement and communication with research teams (University of Saskatchewan -Patricia Gober and Toddi Steelman; Wilfrid Laurier University - Alison Blay-Palmer; and University of Waterloo – Kevin Boehmer)
- Computer Science Team providing advice, guidance and support for software development of improved models, model coupling and Human Computer Interfaces (University of Saskatchewan Kevin Schneider; and University of Waterloo Jimmy Lin)
- Data Management Team providing timely archiving and delivery of data to users. (University of Saskatchewan - John Pomeroy; McMaster University - Sean Carey; Wilfrid Laurier University - William Quinton; and University of Waterloo - Jimmy Lin)
- Technical Team supporting field observatories, observational analysis and key laboratories.
- Core Modelling Team developing national capability and frameworks for Hydrological and Water Quality Forecasting, Climate Modelling, Hydrological & Water Quality Modelling and Water Resources Modelling (University of Saskatchewan – Alain Pietroniro and John Pomeroy; University of Waterloo – Phillippe van Cappellen; McMaster University – Sean Carey)

Interaction with and enhancement of these teams is desirable and some support is likely to be available from these teams for agreed collaboration with successful projects. The full strategy documents for these teams should be consulted.

Full Proposal Outline

The format and approximate page limits for sections are as follows:

- Project Title
- Name of PI and contact information
- Names of Eligible Co-Is and their affiliations
- Names of Collaborators and their affiliations
- Full Proposal (max. 21 pages; attach pdf)
 - Summary (0.5 page)
 - Scientific Rationale (1 page)
 - Objectives and Methodology (both 3 year and 7 year plans) (8 pages)
 - Project Deliverables and Timelines (total 1 page)
 - Roles of Collaborators and User/Stakeholder Organisations (1 page)
 - Project Management required for projects having a total budget of more than \$500,000 over 3 years (1 page)
 - Data Management Plan (up to 1 page)
 - HQP Training Plan (0.5 page)
 - Knowledge Dissemination Plan (up to 1 page)
 - Budget with Justification (include any cash and in-kind support from users/stakeholders, and defined allocations to co-Is) (up to 4 pages)

- Linkage to GWF Core Support teams and Pillar 3 projects (1 page)
- References (1 page)
- 4-Page CVs of each of the PIs and Co-Is (attach all CVs as one pdf file) CV Requirements:
 - Page-1: Name/ Affiliation, Current Job Title, Key Awards, Distinction: A track record of research and outreach success as evidenced by high impact factors, outreach and leadership, Research Funding Track Record;
 - Page-2: A narrative describing up to 5 of the most significant contributions to knowledge;
 - Page-3: The relationship to other grants, including other GWF projects in which the PI/Co-I is involved;
 - Page-4: Key publications including h-index.
- Where appropriate, please provide 2-Page letters of support from users/stakeholders (attach PDF as one file) including an overview of who the partner is; why they are interested in participating, what they expect to gain through the collaboration; and what they are contributing to the collaboration (cash and/or in-kind contributions).

Full Proposal Evaluation Criteria

The criteria that will be evaluated and their relative weighting are listed here (note that successful projects must meet all criteria to a satisfactory level):

- Research Rationale Alignment of the project science needs with GWF vision. 10%
- Objective, Methodology, Innovation and Deliverables: Clear, innovative and scientificallycredible objectives that strategically support GWF goals, the methodology to achieve these objectives on the timelines and within the budget requested and a list of project deliverables. 40%
- Project Management and Data Management Plans (including detailed role of coinvestigators and how the project will be managed) 10%
- Budget Justification, including allocations to co-investigators and expenditure categories by sub-topics. Description of HQP training, specification of user direct and/or in-kind support where appropriate, and use of GWF programme resources. 10%
- Communications and Contributions: Knowledge Dissemination. 5%
- Incorporation of SMC feedback from the LOI process. Pass/Fail
- A track record of research and leadership as evidenced by high impact metrics, such as influential recent key publications, awards, tri-council research funding success and outreach impact. 25%

Submission Process

Please email your application package by September 22, 2017 as one pdf file to Phani Adapa, Director of Operations, Global Water Futures at <u>phani.adapa@usask.ca</u>

Contact – GWF Secretariat

Phani Adapa, PhD, PEng Director of Operations Global Water Futures Programme National Hydrology Research Centre 11 Innovation Blvd, Saskatoon, SK S7N 3H5 Phone: 306-966-2271 Email: phani.adapa@usask.ca; gwf.project@usask.ca Web: http://www.globalwaterfutures.ca





National Hydrology Research Centre 11 Innovation Boulevard Saskatoon, SK S7N 3H5 Canada Tel: (306) 966-2021; Fax: (306) 966-1193 Email: gwf.project@usask.ca

EXPRESSIONS OF INTEREST Request for Proposals – Indigenous Community Water Research Funding Global Water Futures: Solutions to Water Threats in an Era of Global Change April 23, 2018

Summary

The Strategic Management Committee (SMC) for the Global Water Futures (GWF) program, funded by the Canada First Research Excellence Fund (CFREF), invites Expressions of Interest (EOI) to develop research projects under the **Indigenous Community Water Research Funding** stream. Over the last year, the GWF program has reached out to numerous researchers and Indigenous community partners for advice on what water research GWF and Indigenous communities can conduct together to help address the water issues experienced by Indigenous communities in Canada. We wish to promote further discussion and action on these research ideas through development of Indigenous community - university researcher partnership projects and will support these projects with operating funds and provision of our core data from climate and water models, remote sensing and surface observations. The SMC has committed up to \$2 million to provide operating support for these projects. Eligible GWF university investigators who participated in the GWF workshop on Co-Developing a Strategy for Indigenous Community Water Research can submit an EOI. The research team in these projects is encouraged to include Co-Principal Investigators from both university and Indigenous communities. University investigators must be full-time faculty members of one of the 4 GWF partner universities or faculty members who were personally invited to be a participant in the GWF proposal.

Both fledgling and established Indigenous Community – university partnerships are encouraged to co-design research proposals with the Indigenous Communities involved. GWF is seeking proposals that are in alignment with the GWF vision, and are of high quality. The GWF vision includes:

- Providing Canada with the information and tools needed to prepare for and manage water futures in the face of unprecedented environmental and societal change ensuring health and wellbeing
- Providing world-leading water science for Cold Regions and to be a global partner of choice for developing user-focussed solutions to water security

It is expected that the EOIs will address the critical local and regional water and climate research needs identified by their participating Indigenous community. During the GWF workshop on **Co-developing a Strategy for Indigenous Community Water Research**, the following themes were identified by the indigenous community partners:

• Citizen science (capacity building; monitoring; data acquisition)













- Decision support and visualization (web of knowledge; data sharing; computer apps)
- Impacts of floods, droughts, climate change, forestry and water management on water flow
- Environmental flows (quantity; quality; habitat; sediment)
- Western and traditional science (overlap; differences; standing)
- Cultural strengthening as an outcome of research
- Water and health (linking environmental and human health and livelihoods)
- GIS and remote sensing tools (permafrost mapping; drones; autonomous sensors)
- Governance and policy (legislation; knowledge)

The above themes are not exhaustive and are examples of some of the existing concerns raised by the indigenous community representatives during the workshop.

Background

At least half the world's population is dependent upon water from 'cold regions' where snow, ice and frozen soils drive water availability and quality. Cold regions are severely affected by climate change and human activity, resulting in dramatic rates of warming, changing water availability and unsustainable water use. Canada and much of the world are ill prepared for this unprecedented shift, which has already resulted in intensified floods and droughts, reduced water availability and degraded water quality, costing billions in economic loss and impacting the health of populations. Addressing how to protect communities against these extreme water threats and consequent health risks in the face of climate uncertainty and human-induced global changes is one of the world's grand challenges.

Our response, through GWF, will transform the way communities, government, and industry prepare for and manage water-related risks in an era of unprecedented change.

GWF's overarching goal is to deliver risk management solutions—informed by leading-edge water science and supported by innovative decision-making tools—to manage water futures in Canada and other cold regions where global warming is changing landscapes, ecosystems, and the water environment.

Budget

A budget of up to \$2 million over 3 years is available for this call. Depending on the size of the team and project scope: smaller projects (e.g. including only one community partner) are expected to request less than \$200,000 and larger projects (regional consortia with multiple community partners) can request less than \$400,000. The available funding is mostly for hiring highly qualified personnel, supporting Indigenous community involvement and operating

expenses with the expectation that major equipment purchases will be met from elsewhere. Please note that no overhead (indirect cost of research; e.g. salaries of administrative/support staff; cost of facilities and utilities) funding is allowed in the budget allocation.

Proposal Process

The following process will be followed by GWF to evaluate and approve project applications (dates determined by consensus at the Workshop):

- Step 1: Release a request for proposal (RFP) document (23 April, 2018)
- Step 2: Receive university-Indigenous community co-developed EOIs including any request for community funding to develop a full proposal (23 May, 2018)
- Step 3: SMC and three academic Indigenous advisors to review EOIs and budget (15 June, 2018)
- Step 4: Inform successful EOIs, provide feedback including budget limits, and invite full proposals (22 June, 2018)
- Step 5: Full proposals due (21 Sept., 2018)
- Step 6: Full proposals with evidence of community support will be discussed and reviewed by the joint SMC and Indigenous Advisory Panel (up to 7 members of Indigenous Communities including Elders/Chiefs) (**15 Oct., 2018**)
- Step 7: SMC to make final decisions (16 Oct., 2018)
- Step 8: Funded projects will be informed shortly after the final decision. Funding will start when all approvals are in place.

Project Management

Each successful project must provide yearly progress report. Project progress against proposed deliverables will be reviewed by the SMC. Projects should also report annually to their Indigenous community.

GWF Core Support

GWF will be providing core support teams for the projects as follows (please refer to additional attached files):

- Computer Science Team Human Computer Interface and Re-engineering Codes
- Observatories and Data Management Team
- Modelling Core Team
- Knowledge Mobilisation Team

If support is needed from the core teams then this should be indicated in the EOI. The full strategy documents for these teams is on the GWF website and should be consulted.

Expressions of Interest Outline

The EOI should not exceed 2 pages (excluding, Co-PI, Co-I and Indigenous Community Partners contact information and CVs)

- Project Title
- Name of Academic Co-Principal Investigator and contact information
- Name of Indigenous community Co-Principal Investigator and contact information.
- Names of Co-Investigators (university and Indigenous community) and their affiliations
- Names of Indigenous Community collaborators or other Partners and their affiliations
- Rationale for the Project (0.25 page)
- Outcomes, Legacies (including data) and Timelines (0.5 page)
- Objectives and Methodology (0.25 page)
- Knowledge Mobilization, Community Engagement and Capacity Building (0.5 page)
- Budget (no justification required; include any leveraging opportunity and need for core support) (0.25 page)
- HQP and Indigenous Community Training (0.25 pages)
- 2-Page CVs of each of the academic investigators.
- Request from the Indigenous community Co-PI for any funding to engage the community to develop a full proposal

Evaluation Criteria

The evaluation criteria were determined by discussion at the GWF workshop on Co-developing a Strategy for Indigenous Community Water Research on April 17-18, 2018 at Wanuskewin, Saskatchewan.

Rationale - Alignment of the project rationale to Indigenous community needs and GWF vision. Does the proposed project result in advancement in achieving the goals of UNDRIP, UNSDG, IUCN, TRC, GEWEX, Future Earth or UNESCO? 25%

Project outcomes and legacies – How project delivers water science and knowledge co-creation, builds on Indigenous and western sciences, develops new or deepens existing relationships, and provides potential for a transformative advance in understanding or developing community capacity. This includes a data management plan for traditional knowledge showing how traditional knowledge will be identified, collected, and handled to respect cultural practices and sensitivities of use/sharing. 20%

Objectives and Methodology - Clear goals, objectives and methodologies (or clear pathways to co-creating new methodologies that reflect western and Indigenous sciences, support Indigenous community needs, capacity building, knowledge dissemination and GWF objectives, and are achievable with the timelines and budget requested. 15%

Knowledge mobilization, community engagement and community capacity building. Is this a new or existing relationship? – if existing how does the relationship work; if new, is there an invitation from the community (or some other clear indication of community support/relationship)? Provide evidence of continuing engagement, reciprocal benefit, sharing information, using appropriate languages, partnerships with other groups, linking and connecting regional communities. Explain the potential for community capacity building and education development potential, how the community was involved in the design and how local knowledge holders were engaged. 20%

Budget Justification and timeline. A justification and annual outline of the budget (including HQP training and Indigenous community engagement) and any external support (cash and/or in-kind): 10%

Team capacity and potential. The capacity of the team to effectively conduct co-created research together, as evidenced by research, leadership, policy impact, community engagement, and other knowledge mobilisation success (for individuals or as a team). This may include knowledge of community way of life and/or ceremony, non-traditional research outputs, ongoing productive relationships and activities between researchers and communities, recent key publications, awards, tri-council research funding success and outreach activity. 10%

Submission Process

Please email your application package as one pdf file to Phani Adapa, Director of Operations, Global Water Futures at <u>phani.adapa@usask.ca</u>

Contact

Phani Adapa, PhD, PEng Director of Operations Global Water Futures Programme National Hydrology Research Centre 11 Innovation Blvd, Saskatoon, SK S7N 3H5 Phone: 306-966-2271 Email: phani.adapa@usask.ca Web: http://gwf.usask.ca; www.globalwaterfutures.ca





FULL PROPOSAL

Request for Proposals – *Indigenous Community Water Research Funding* Global Water Futures: Solutions to Water Threats in an Era of Global Change Deadline: September 21, 2018

Summary

The Strategic Management Committee (SMC) for the Global Water Futures (GWF) program, funded by the Canada First Research Excellence Fund (CFREF), invites Full Proposal to develop research projects under the **Indigenous Community Water Research Funding** stream. Over the last year, the GWF program has reached out to numerous researchers and Indigenous community partners for advice on what water research GWF and Indigenous communities in Canada. We wish to promote further discussion and action on these research ideas through development of Indigenous community – university researcher partnership projects and will support these projects with operating funds and provision of our core data from climate and water models, remote sensing and surface observations. The SMC has committed up to \$2 million to provide operating support for these projects. The research team in these projects is encouraged to include Co-Principal Investigators from both university and Indigenous communities. University investigators must be full-time faculty members of one of the 4 GWF partner universities or faculty members who were personally invited to be a participant in the GWF proposal.

Both fledgling and established Indigenous Community – university partnerships are encouraged to co-design research proposals with the Indigenous Communities involved. GWF is seeking proposals that are in alignment with the GWF vision, and are of high quality. The GWF vision includes:

- Providing Canada with the information and tools needed to prepare for and manage water futures in the face of unprecedented environmental and societal change ensuring health and wellbeing
- Providing world-leading water science for Cold Regions and to be a global partner of choice for developing user-focussed solutions to water security

It is expected that the full proposal will address the critical local and regional water and climate research needs identified by their participating Indigenous community. During the GWF workshop on **Co-developing a Strategy for Indigenous Community Water Research**, the following themes were identified by the indigenous community partners:

• Citizen science (capacity building; monitoring; data acquisition)











- Decision support and visualization (web of knowledge; data sharing; computer apps)
- Impacts of floods, droughts, climate change, forestry and water management on water flow
- Environmental flows (quantity; quality; habitat; sediment)
- Western and traditional science (overlap; differences; standing)
- Cultural strengthening as an outcome of research
- Water and health (linking environmental and human health and livelihoods)
- GIS and remote sensing tools (permafrost mapping; drones; autonomous sensors)
- Governance and policy (legislation; knowledge)

The above themes are not exhaustive and are examples of some of the existing concerns raised by the indigenous community representatives during the workshop.

Background

At least half the world's population is dependent upon water from 'cold regions' where snow, ice and frozen soils drive water availability and quality. Cold regions are severely affected by climate change and human activity, resulting in dramatic rates of warming, changing water availability and unsustainable water use. Canada and much of the world are ill prepared for this unprecedented shift, which has already resulted in intensified floods and droughts, reduced water availability and degraded water quality, costing billions in economic loss and impacting the health of populations. Addressing how to protect communities against these extreme water threats and consequent health risks in the face of climate uncertainty and human-induced global changes is one of the world's grand challenges.

Our response, through GWF, will transform the way communities, government, and industry prepare for and manage water-related risks in an era of unprecedented change.

GWF's overarching goal is to deliver risk management solutions—informed by leading-edge water science and supported by innovative decision-making tools—to manage water futures in Canada and other cold regions where global warming is changing landscapes, ecosystems, and the water environment.

Budget

As per SMC recommendation in the letter of invitation, which was an outcome of the Expression of Intent review process

Proposal Process

The following process will be followed by GWF to evaluate and approve project applications (dates determined by consensus at the Workshop):

- Step 1: Release a request for proposal (RFP) document (23 April, 2018)
- Step 2: Receive university-Indigenous community co-developed EOIs including any request for community funding to develop a full proposal (23 May, 2018)
- Step 3: SMC and three academic Indigenous advisors to review EOIs and budget (15 June, 2018)
- Step 4: Inform successful EOIs, provide feedback including budget limits, and invite full proposals (22 June, 2018)
- Step 5: Full proposals due (21 Sept., 2018)
- Step 6: Full proposals with evidence of community support will be discussed and reviewed by the joint SMC and Indigenous Advisory Panel (up to 7 members of Indigenous Communities including Elders/Chiefs) (**15 Oct., 2018**)
- Step 7: SMC to make final decisions (16 Oct., 2018)
- Step 8: Funded projects will be informed shortly after the final decision. Funding will start when all approvals are in place.

Project Management

Each successful project must provide yearly progress report. Project progress against proposed deliverables will be reviewed by the SMC. Projects should also report annually to their Indigenous community.

GWF Core Support

GWF will be providing core support teams for the projects as follows (please refer to additional attached files):

- Computer Science Team Human Computer Interface and Re-engineering Codes
- Observatories and Data Management Team
- Modelling Core Team
- Knowledge Mobilisation Team

If support is needed from the core teams then this should be indicated in the proposal. The full strategy documents for these teams is on the GWF website and should be consulted.

Full Proposal Outline

The proposal should not exceed 10 pages (excluding, Co-PI, Co-I and Indigenous Community Partners contact information, CVs, and community support letters)

- Project Title
- Name of Academic Co-Principal Investigator and contact information
- Name of Indigenous community Co-Principal Investigator and contact information.
- Names of Co-Investigators (university and Indigenous community) and their affiliations
- Names of Indigenous Community collaborators or other Partners and their affiliations
- Summary (0.5 page)
- Rationale for the Project (1.5 page)
- Outcomes, Legacies (including data) and Timelines (2.5 pages)
- Objectives and Methodology (2 page)
- Knowledge Mobilization, Community Engagement and Capacity Building (1 page)
- Budget (justification required; include any leveraging opportunity and need for core support) (1.5 pages)
- HQP and Indigenous Community Training (1 page)
- 2-Page CVs of each of the academic investigators

Evaluation Criteria

The evaluation criteria were determined by discussion at the GWF workshop on Co-developing a Strategy for Indigenous Community Water Research on April 17-18, 2018 at Wanuskewin, Saskatchewan.

Rationale - Alignment of the project rationale to Indigenous community needs and GWF vision. Does the proposed project result in advancement in achieving the goals of UNDRIP, UNSDG, IUCN, TRC, GEWEX, Future Earth or UNESCO? 25%

Project outcomes and legacies – How project delivers water science and knowledge co-creation, builds on Indigenous and western sciences, develops new or deepens existing relationships, and provides potential for a transformative advance in understanding or developing community capacity. This includes a data management plan for traditional knowledge showing how traditional knowledge will be identified, collected, and handled to respect cultural practices and sensitivities of use/sharing. 20%

Objectives and Methodology - Clear goals, objectives and methodologies (or clear pathways to co-creating new methodologies that reflect western and Indigenous sciences, support Indigenous community needs, capacity building, knowledge dissemination and GWF objectives, and are achievable with the timelines and budget requested. 15%

Knowledge mobilization, community engagement and community capacity building. Is this a new or existing relationship? – if existing how does the relationship work; if new, is there an invitation from the community (or some other clear indication of community support/relationship)? Provide evidence of continuing engagement, reciprocal benefit, sharing information, using appropriate languages, partnerships with other groups, linking and connecting regional communities. Explain the potential for community capacity building and education development potential, how the community was involved in the design and how local knowledge holders were engaged. 20%

Budget Justification and timeline. A justification and annual outline of the budget (including HQP training and Indigenous community engagement) and any external support (cash and/or in-kind): 10%

Team capacity and potential. The capacity of the team to effectively conduct co-created research together, as evidenced by research, leadership, policy impact, community engagement, and other knowledge mobilisation success (for individuals or as a team). This may include knowledge of community way of life and/or ceremony, non-traditional research outputs, ongoing productive relationships and activities between researchers and communities, recent key publications, awards, tri-council research funding success and outreach activity. 10%

Submission Process

Please email your application package as one pdf file to Phani Adapa, Director of Operations, Global Water Futures at <u>phani.adapa@usask.ca</u>

Contact

Phani Adapa, PhD, PEng Director of Operations Global Water Futures Programme National Hydrology Research Centre 11 Innovation Blvd, Saskatoon, SK S7N 3H5 Phone: 306-966-2271 Email: phani.adapa@usask.ca Web: http://gwf.usask.ca; www.globalwaterfutures.ca





Designing User Solutions - User Question-led Projects (Science Pillar 3) Request for Proposals – Project Renewals Only Submission Deadline: September 1, 2019

Pillar 3 Project Renewal

The following policy will guide the development of full proposals. Pillar 3 Project renewal proposals will:

- 1) detail how the projects will spend the rest of their existing budget, including any need for no-cost extensions,
- 2) describe the justification and proposed expenditure of an additional budget, noting that projects will end on August 31, 2023.
- 3) Describe their anticipated final products/outcomes from Phase 1 i.e. 2017-2020.

Budget

The Strategic Management Committee has allocated a total new budget of \$7.5 million for renewal of Pillar 3 projects for the period September 2020 – August 2023 for this call. The maximum allowable new funding per project is \$1.5 million. The available funding is mostly for hiring highly qualified personnel and operating expenses with the expectation that major equipment purchases will be met from other sources. It is expected that the proposed transdisciplinary projects will leverage direct funding and/or in-kind support from either existing or new sources. Such added value will be viewed favourably in the review process. Please note that no university overhead funding is allowed in the budget allocation. Integration of international components in the projects is encouraged.

Eligibility

It is anticipated that the same project Principal Investigators (PIs) will continue to lead the project team. Change in co-investigators including inclusion of additional members will be allowed if they are a tenured or tenure-track faculty member at a recognized Canadian university. PIs will receive project funding from GWF and will distribute funds to the Co-Is.

Project Collaborators can be changed and are expected to be contributors to science, development, outreach and/or user interaction. Collaborators cannot receive direct or sub-contracted project funds from GWF. Collaborators will often be drawn from user or stakeholder organizations but can include others including international collaborators.

Proposal Development and Review Process

The following process will be followed by GWF to secure, assess, and approve project renewals:



- Step 1: Projects that are compliant with financial and scientific reporting, data management and annual meeting participation requirements will be invited to submit renewal proposals by **June 1, 2019.**
- Step 2: Renewal proposals are due on September 1, 2019
- Step 3: Proposal Review Each renewal proposal will be sent for peer review by 3 international reviewers, drawn from the ISAP and additional experts. (*Deadline: October* 15, 2019)
- Step 4: The SMC will review all proposals, together with the feedback and recommendations from the international reviewers and International Science Advisory Panel and decide on renewal. *(Deadline: November 30, 2019)*
- Step 5: Projects renewals will be announced (Deadline: January 6, 2020)

Knowledge Mobilization (KM):

Existing and New GWF partners of current project should be approached for letters of support. Any partner willing to participate in a GWF project must provide direct or in-kind support to the GWF program. The letters should provide an overview of who the partner is; why they are interested in participating, what they expect to gain through the collaboration (existing partners should also include information on how they have benefited over last 3 years); and what they are contributing to the collaboration (cash and/or in-kind contributions).

We note that KM is an active, iterative, and interactive process between scientists and users from beginning to end. Therefore, the KM team should be consulted during preparation of project renewals to incorporate best KM practices.

Project Management

An Operations Management Team comprising all project PIs will meet once every six months. Each successful project must provide an annual progress report and bi-annual financial report. Project progress against proposed deliverables, including knowledge mobilization and data management, will be reviewed annually by the SMC. This will include an audit of progress against knowledge mobilization plans.

Data Policy

The full proposals for renewal must adhere to the GWF data policy and data management plan (<u>website</u>). Continuation of funding to individual GWF sub-projects is contingent on provision of data in accordance with the GWF data policy and the data management plans developed from the outset of each project. Any exemptions must be fully justified and approved by the GWF SMC.

GWF Core Support

GWF has six core support teams for the program that can provide some support to projects. For details see respective websites. A brief summary is:

- Knowledge Mobilization Team providing advice, guidance and support to facilitate user
- engagement and communication with research teams (University of Saskatchewan Lawrence Martz; Wilfrid Laurier University – Kelly Munkittrick; University of Waterloo – Kevin Boehmer; McMaster University – Sean Carey) [website]
- Communications Team supporting research communications to the public (VPR offices) [website]
- Computer Science Team providing advice, guidance and support for software development of improved models, model coupling and Human Computer Interfaces (University of Saskatchewan - Kevin Schneider; and University of Waterloo - Jimmy Lin) [website]
- Data Management Team providing timely archiving and delivery of data to users. (University of Saskatchewan - John Pomeroy; McMaster University - Sean Carey; Wilfrid Laurier University – Michael Steelworthy; and University of Waterloo - Jimmy Lin) [website]
- Technical Team supporting field observatories, observational analysis and key laboratories. [website]
- Core Modelling Team developing national capability and frameworks for Hydrological and Water Quality Forecasting, Climate Modelling, Hydrological & Water Quality Modelling and Water Resources Modelling (University of Saskatchewan – Alain Pietroniro and John Pomeroy; University of Waterloo – Phillippe van Cappellen; McMaster University – Sean Carey) [website]

Interaction with GWF Core Support teams, as evidenced by support to or use of these teams' capabilities, is desirable for successful project renewals.

Full Proposal Outline

The format and approximate page limits for sections are as follows (please use 12-font size and attach all documents as a single pdf):

- Project Title
- Name of PI and contact information
- Names of Eligible Co-Is and their affiliations
- Names of Collaborators and their affiliations
- Full Proposal for Renewal (max. up to 28 pages excluding CVs and support letters)
 - Summary (0.5 page)
 - Rationale showing alignment to User/Stakeholder Needs and GWF Vision (1 page)
 - Objectives and Methodology (8 pages)
 - Progress towards final products/outcomes during Phase 1, including major achievements i.e. 2017-2020. (3 pages)
 - New Project Deliverables and Timelines including Knowledge Mobilization Plan (total 3 pages)
 - Roles of Collaborators and User/Stakeholder Organisations (2 pages)

- Project Management (1 page)
- Data Management Plan (1 page)
- HQP Training Plan (including a statement on Equity, Diversity and Inclusion) (0.5 page)
- Plans for spending existing budget by August 31, 2020 and need for no-cost extensions (if any) (2 page).
- New Budget with Justification for the period of September 1, 2020 to August 31, 2023 (include cash and in-kind support from users/stakeholders, and defined allocations to co-ls) (4 pages)
- Linkage to GWF Core Support teams (1 page)
- References (1 page)
- 4-Page CVs of each of the PIs and Co-Is (attach all CVs as one pdf file) CV Requirements:
 - Page-1: Name/ Affiliation, Current Job Title, Key Awards, Distinction: A track record of research and outreach success as evidenced by high impact factors, outreach and leadership, Research Funding Track Record;
 - Page-2: A narrative describing up to 5 of the most significant contributions to knowledge as well as any experience of user engagement and knowledge mobilization;
 - Page-3: The relationship to other grants, including other GWF projects in which the PI/Co-I is involved;
 - Page-4: Key publications including h-index.
- 2-Page letters of support from each (both new and existing) users/stakeholders (attach PDF as one file). The letters should provide an overview of who the partner is; why they are interested in participating, what they expect to gain through the collaboration (existing partners should also include information on how they have benefited over last 3 years); and what they are contributing to the collaboration (cash and/or in-kind contributions).

Full Proposal Evaluation Criteria

The criteria that will be evaluated and their relative weighting are listed here (note that successful projects must meet all criteria to a satisfactory level):

- Rationale Alignment of the project rationale to user/stakeholder needs identified in the GWF user needs assessment process, and/or the GWF proposal including its letters of support. 5%
- Objective and Methodology: Clear scientifically-credible objectives that strategically support GWF objectives and the defined rationale and methodology to achieve these objectives on the timelines and within the budget requested. 25%
- Knowledge Mobilization including user and stakeholder needs Deliverables that address user/stakeholder needs in a timely fashion, align with the GWF vision as noted in the project rationale, and governance mechanisms to ensure that users are collaborators

working inside the project. Proposals must provide an adequate knowledge mobilization plan to be successful. 20%

- Project Progress and Achievements, and New Project Deliverables: good progress achieved in the first phase of the project with substantial achievements and outcomes that meet the stated objectives and expectations for HQP training, KM and outreach, data management and budget. A team track record of research, leadership, and outreach success as evidenced by high impact metrics, such as influential recent key publications, awards, tri-council research funding success and outreach activity. 30%
- Project Management Plan (including detailed role of co-investigators and how the project will be managed) 5%
- Data Management Plan 5%
- Budget Justification & User Support, including allocations to co-investigators and expenditure categories by sub-topics. Description of HQP training, specification of user direct and/or in-kind support, and use of GWF programme resources. 10%

Submission Process

Full applications must be submitted to Dr. Phani Adapa, Director of Operations, GWF by September 1, 2019 via email at <u>phani.adapa@usask.ca</u>

Contact – GWF Secretariat

Phani Adapa, PhD, PEng Director of Operations Global Water Futures Programme National Hydrology Research Centre 11 Innovation Blvd, Saskatoon, SK S7N 3H5 Phone: 306-966-2271 Email: phani.adapa@usask.ca; Web: http://www.globalwaterfutures.ca





ADDENDUM - Designing User Solutions - User Question-led Projects (Science Pillar 3) Request for Proposals – Project Renewals Only

Revised - Proposal Development and Review Process

The following process will be followed by GWF to secure, assess, and approve project renewals:

- Step 1: Projects that are compliant with financial and scientific reporting, data management and annual meeting participation requirements will be invited to submit renewal proposals by **June 1, 2019.**
- Step 2: Renewal proposals are due on September 30, 2019
- Step 3: Proposal Review Each renewal proposal will be sent for peer review by 3 international reviewers, drawn primarily from the ISAP and additional experts. (Deadline: November 15, 2019)
- Step 4: The SMC will review all proposals, together with the feedback and recommendations from the international reviewers and International Science Advisory Panel and decide on renewal. *(Deadline: January 25, 2020)*
- Step 5: Projects renewals will be announced (Deadline: February 15, 2020)









