Ressources naturelles Canada | Natural Resources Canada

EARTH SCIENCES SECTOR

GEO-MAPPING FOR ENERGY AND MINERALS (GEM) CALL FOR GRANT PROPOSALS

Geological Survey of Canada

2017

Canada

Call for Grant Proposals:

Geo-mapping for Energy and Minerals Program (GEM)

The GEM program has an available budget to fund grant agreements with Canadian academic collaborators to address GEM Research objectives. Over the next four years, the program is looking to support innovative proposals to help develop long-term Canadian geoscience capacity and to address pressing resource industry needs in the North.
The program is currently seeking proposals for projects to be completed by September 30, 2019.

Proposals must be received by 11:59 pm EST on March 3rd, 2017 to NRCan.GEM-GEM.RNCan@canada.ca
Any additional documentation submitted (or not submitted via the proposal template) will not be considered in the evaluation.

For more information:
NRCan.GEM-GEM.RNCan@canada.ca

Please circulate this call for proposals to any additional parties who may be interested.

Program Context

The Geo-Mapping for Energy and Minerals (GEM) program is a 12 year initiative to significantly advance and modernize geological knowledge in the North. Phase 2 of the GEM Program (GEM-2) was announced by Prime Minister Harper on August 22, 2013, with renewed funding of $100M over seven years to complete modern regional scale geological maps and data sets for Canada's North. GEM will continue to provide geoscience knowledge that has been instrumental to making informed resource investment and land-use decisions in the North.

To reduce knowledge gaps in geosciences in northern Canada, the GEM Program is calling on the Canadian academic community in developing long-term Canadian capacity and in complementing existing GEM research.

Program Objectives

- Collect, acquire and analyse data by using and developing innovative multidisciplinary regional geo-mapping methods, as it applies to energy and minerals exploration.
- Produce high quality innovative science products and ideas and develop geological models and regional geoscience frameworks

Criteria

- Research conducted must focus on priority research areas for GEM
- Research must be complementary to the science questions being addressed for the 6 research areas (as outlined in the following section)
- Proponents must describe the linkages of their proposed research to the program objectives stated above
- Research must be conducted independently of any involvement by the Government of Canada, such as direct collaboration with government employees and analytical work performed in government laboratories
- Proposed research must contribute to long-term Canadian research capacity, demonstrating innovation in the development of ideas and methods that are applicable to industry needs
- Established, high-performance and high-capacity Canadian research groups (established Chairs, Consortiums, etc.) will be prioritized
- Proponents that leverage non-Government of Canada resources from other partners/collaborators (e.g., industry/university cash/in-kind support, etc.) will be prioritized
- Selection will be based on scientific merit and capacity to deliver the proposed work

Priority GEM Research

- Six priority research areas have been identified in northern Canada based on geoscience knowledge gaps and the underlying regional geological structure (see Figure 1)

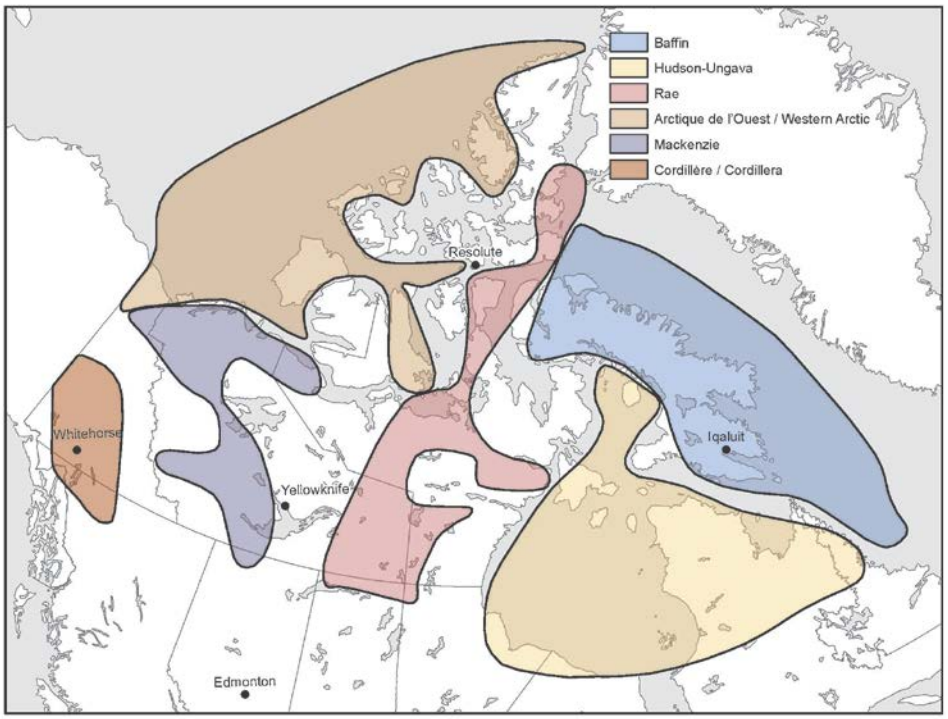

Figure 1: GEM Priority Research Areas

- Proposed research **must** advance modern geological understanding in at least one region of interest, by contributing to the following priority themes:
    1. Metallogeny of northern Canada
    2. Glacial history and drift prospecting of northern Canada
    3. Evolution of Canada's northern sedimentary basins
    4. Thermochronology and low temperature thermal history of northern Canada
    5. Tectonothermal evolution of northern Canada
    6. Characterization of seabed features in Canada's northern petroleum basins
    7. Crustal architecture of northern Canada

Key scientific questions for each research area are outlined below

<u>Cordillera</u>

1. Where are the major suture zones, what do they represent tectonically, and what is the resulting provinciality of mineral potential in the newly subdivided terranes?
2. What are the lithospheric and crustal scale controls on gold and base metal fertility?
3. How did Cordilleran tectonic evolution influence the formation of its mineral deposits?

<u>Western Arctic</u>

1. What is the stratigraphic and structural history of the margins of the Arctic Ocean?
2. What is the structural and stratigraphic architecture of the Canada Basin and how does it compare to the onshore margins?

3. How did the opening of the Arctic Ocean control deposition of source rocks, depth and timing of burial, and timing of uplift across the region?
4. Are pre-Cretaceous petroleum systems present or preserved in the onshore from the Mackenzie Delta to the Sverdrup Basin?
5. What was the role of the High Arctic Large Igneous Province in petroleum maturation and preservation and did it lead to iron-oxide copper-gold, Pb-Zn or Ni-Cu-PGE mineral potential?

Mackenzie

1. What controlled deposition of source rocks, depth and timing of burial, and timing of uplift across the region, and their impact on petroleum systems?
2. Does petroleum generation pre-date the formation of Late Cretaceous-Tertiary structural traps in the Mackenzie Corridor region?
3. Are there tectonic linkages between mineralizing events in the Selwyn Basin and faulting and fluid events on the Mackenzie Platform that would impact exploration for lead and zinc?
4. Is there potential for carbonate-hosted Pb-Zn deposits under the thick glacial overburden between Hay River and Kakisa Lake/Fort Providence?
5. Are there knowledge gaps in ice flow patterns that would impact drift prospecting in the northern Cordillera?
6. What specific aspects of the Quaternary glacial and depositional history are required to address petroleum potential and mineral exploration and development in the Mackenzie Corridor?
7. What important gaps remain regarding the regional glacial depositional and dispersal framework for the southern Mackenzie Corridor that are impeding mineral exploration (e.g. Pb-Zn)?
8. What are the specific gaps to be addressed regarding the controls on fluid conduits, past and present to support exploration?

Rae

1. What is the orogenic architecture of the Rae Province, and how does it determine the distribution of mineral resources?
2. What are the nature, distribution and significance of 2.6 Ga events in the Rae Province?
3. How does the glacial history of the Keewatin sector of the Laurentide ice sheet inform mineral exploration in the Rae Province? Specifically, will understanding of the location and migration history of the ice divide and the effect on till composition of sand derived from Mesoproterozoic basins improve exploration outcomes in the region?
4. What are the nature, history and mineral potential of the Thelon orogenic zone and does it extend through the Arctic archipelago into NW Greenland?

Baffin

1. In the Baffin region, how did the geologic evolution and tectonic framework control the development of the sedimentary basins and potential petroleum systems?
2. Can the petroleum potential of the Baffin region sedimentary basins be characterized by acquiring new onshore and offshore data, conducting analogue studies and linking to the wealth of new information from Greenland?
3. Is the Precambrian architecture of Baffin Island controlling the distribution of mineral resources and are unrecognized mineral systems present in NW Baffin Island?
4. Are there specific knowledge gaps in the glacial history of the Baffin region that limit exploration? For example, how do the glacial history and changing paleoglaciological conditions affect the glacial transport

patterns in the Nettilling – Amadjuak lakes region, SW Baffin Island, and what is the impact for mineral exploration in this drift covered region?

Hudson-Ungava

1. How have tectonic factors such as faulting, burial and exhumation influenced the architecture and geological evolution in relation to petroleum prospectivity of the Hudson Bay basin?
2. What mechanisms have influenced the formation, evolution and hydrocarbon potential of Hudson Strait and Foxe Basin, including opening of the Labrador Sea?
3. Do Proterozoic circum-Superior belts have mineral or hydrocarbon potential beyond the known deposits?
4. What is the tectonic framework and mineral potential of the Core Zone, and will improved understanding of the glacial history in the Quebec-Labrador border region improve exploration outcomes?
5. Does the brittle faulting associated with the opening of the Labrador Sea and observed in Hudson Strait impact potential mineralization in the Ungava Peninsula?
6. How does the Precambrian geology beneath Hudson Bay inform correlations across the eastern Arctic?

GEM-2 GRANT PROPOSAL TEMPLATE

Proposed Project Title:
GEM-2 Grant Funding Being Requested ($CAN):
Academic Institution Name:

Project Authority/Principal Scientific Investigator	
Name, Title	
Department	
Mailing Address	
Phone #	
E-Mail	

Financial/Administrative Contact	
Name, Title	
Department	
Mailing Address	
Phone #	
E-Mail	

Indicate (X) which GEM priority Research Area(s) will be addressed by the project:

☐ Cordillera
☐ Western Arctic
☐ Mackenzie
☐ Rae
☐ Baffin
☐ Hudson-Ungava

Indicate (X) which GEM priority theme(s) will be addressed by the project:

☐ Metallogeny of northern Canada
☐ Glacial history and drift prospecting of northern Canada
☐ Evolution of Canada's northern sedimentary basins
☐ Thermochronology and low temperature thermal history of northern Canada
☐ Tectonothermal evolution of northern Canada
☐ Characterization of seabed features in Canada's northern petroleum Basins
☐ Crustal architecture of northern Canada

GEM-2 Program Objectives

1. Collect, acquire an analyse data by using and developing innovative multidisciplinary regional geo-mapping methods, as it applies to energy and minerals exploration
2. Produce high quality innovative science products and ideas and develop geological models and regional geoscience frameworks

Objective/Purpose:

Within the context of the GEM-2 Program Objectives shown above, provide a brief description of the scientific problem or knowledge gap to be addressed by the project (i.e. What will be done) *Limit: 500 characters*

Rationale:

Provide a clear and concise rationale why the project should be undertaken/funded *Limit 1500 chcarcters*

Research Team:

Provide evidence that the project team has the necessary capabilities, experience and qualifications to deliver the project *Limit: 1000 characters*

Notional Project Work Plan		
Activity Description of Method & Procedure to be used to complete the work	Project Milestone/ Accomplishment/Output	Anticipated Completion date
2017-2018		
2018-2019 and 2019-2020		

Budget:
Using the table below, provide a forecast as to how Grant funding is expected to be utilised

Budget Item	**2017-2018**	**2018-2019**	**2019-2020**	***Total***
Salaries & Benefits				
Student salaries (B.Sc., M.Sc., Ph.D)				
Postdoctoral fellows (PDFs)				
Organizational Staff members				
Field Equipment (including Rental/Leases)				
Machinery, field equipment				
Motor vehicles (i.e. automobiles, Trucks, ATVs, etc.)				
Aircraft, ships & boats				
Informatics equipment				
Field equipment (goods and products)				
Other eligible costs (please specify)				
Non-Field related Costs				
Computer equipment/software				
Office equipment including telecommunications equipment				
Communications material - costs related to publishing, printing services, exposition				
Facilities rentals				
Postage, freight, express & cartage				
Other meeting, workshop or training related expenses				
Other non-field related eligible costs				
Professional Services Costs				
Communication services				
Scientific and research services				
Laboratory services				
Informatics services				
Other professional services eligible cost				
Travel-related Costs				
Travel expenses				
Accommodation				
Food & beverages				
Fuel				
Administrative/Business Service Costs				
Specialized Business Services (Accounting & Audit, Administrative, Engineering and Architectural, Informatics, Translation, etc.) [Please specify type of service below]				
TOTALS				

Provide an estimate of other resources that will be contributed by the Proponent organization and other partners/collaborators					
Contributeur	Name of supporting organization	Description of Contribution/Support	Direct Cash contributions (an/or) Estimated cash value of in-kind support		
			2017-2018	2018-2019	2019-2020
Proponent Organizations					
Other Federal Departments					
Universities					
Industry					
Provincial/ Territorial Governments					
Other Non-governmental Organizations					

Benefits of Funding Project
To Canada: *Limit: 500 characters*
To Industry: *Limit: 500 characters*
To the Proponent: *Limit: 500 characters*
OTHER COMMENTS (*For example, has ESS/GSC previously provided Grant/Contribution funding; is the initiative supported by other stakeholders/ partners). Limit: 500 characters*

APPLICANTS ARE REMINDED:

- **Proposals must be received by 11:59 EST on March 3rd, 2017 [NRCan.GEM-GEM.RNCan@canada.ca];**
- **Only submissions that use the GEM-2 Grant Proposal Template will be deemed eligible for funding consideration, and the submission of any additional documentation will not be considered in the proposal evaluation**

(Name, and title of person submitting proposal:	Proposal submission Date: