

# Annual Performance Review of International Affiliations

Assessment of the Partnership between  
the National Research Council of Canada (NRC) and  
the *Canadian Geotechnical Society (CGS)*  
in support of Canada's affiliation with the  
*International Society for Soil Mechanics and Geotechnical  
Engineering (ISSMGE)*

*Submitted by the NRC Partner/Canadian National Committee (CNC) to the NRC Grants to International Affiliations Program Secretariat and NRC's Expert Reviewers.*

The Annual Performance Review provides a means for the NRC Grants to International Affiliations Program Secretariat and NRC's Expert Reviewers to assess the impact of Canada's International Affiliations. The APR is conducted through a Questionnaire and Response Assessment Framework focused on evaluating two unique criteria: The relevance of the International Affiliation within a Canadian context (Importance), and; the capacity of the supporting NRC Partner/CNC to generate beneficial results and outcomes for Canadians (Effectiveness). International Affiliations demonstrating a high level of importance within a Canadian context, and whose NRC Partners/CNCs effectively generate multiple beneficial results and outcomes for Canadians, will have the most pronounced and positive impacts, and will be considered as the strongest candidates for continued support.

The APR is a mandatory assessment and questionnaire responses should be submitted to the NRC Grants to International Affiliations Program Secretariat before the deadline (i.e January 29, 2016). Failure to submit a questionnaire response will result in the cancellation of support within the International Affiliations Grant Transfer Program (IAGTP).

The APR Questionnaire and Response Assessment Framework will also be used to evaluate the candidacy of new applicants requesting support within the IAGTP. Applicants should answer Section 1 as outlined, and for Section 2, provide a description of the specific steps or strategic plan that would be implemented to generate the desired results and outcomes.

Questions should be answered concisely and in point form.

**Reviewer Contact Information**

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Title Executive Director

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**General Information on the International Affiliation**

Name of Union/affiliation International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)

Name of Canadian Partner Canadian Geotechnical Society (CGS)

Annual Due \*Specify type of currency 8109.80 GBP

Category of Membership Adherence Canadian National Committee (CNC)

# Annual Performance Review Questionnaire

## Section 1: Assessment of the Importance of the International Affiliation

### 1. Is the International Affiliation Important within a Canadian Context?

a) Does the field of science represented by the International Affiliation support Canada's identified S&T Priorities and Policy Objectives?

Describe how the field of science represented by the International Affiliation supports the S&T priorities affirmed by the Federal Government in the 2007 S&T Strategy and/or advances the S&T policy objectives of Canadian institutions and organizations such as NSERC, SSHRC, CIHR, NRC, etc. (Federal priorities for Canadian S&T investment focused on environmental science and technologies, health and related life sciences and technologies, information and communications technologies, and natural resources and energy)

- The fields of science and engineering represented by the ISSMGE and CGS are directly related to activities involving: **resource extraction and minimizing the environmental footprint of extraction projects** (oil, gas and mining); **energy development** (hydroelectric, nuclear, hydrocarbon); **natural hazard risk identification and mitigation** (flooding, landslides, earthquakes); **soil and groundwater quality and sustainability**. All of these activities directly support the **Environmental Science and Technology**, and **Natural Resources and Energy S&T** priorities.
- **Technical Divisions/Committees:** relevant S&T focus areas for each organization include:
  - ISSMGE: Dams; Earthquakes; Energy Geotechnics; Floods; Frost; Geo-environmental; Offshore Engineering; Slope Stability; Sustainability; Underground Construction
  - CGS: Soil Mechanics and Foundations; Cold Regions; GeoEnvironmental; Hydrology; Landslides; Mining; Sustainability
- **Cognate International Organizations:** The ISSMGE and CGS are affiliated with cognate international organizations that are also relevant to these S&T themes, including the **International Association of Engineering Geology (IAEG)**, the **International Society for Rock Mechanics (ISRM)**, the **International Permafrost Association (IPA)**, the **International Geosynthetics Society (IGS)**, and the **International Association of Hydrogeologists (IAH)**. Members of CGS elect to become formally affiliated with at least one of these cognate organizations (see Section 3). The cooperation between ISSMGE, ISRM and IAEG is well integrated, leading to the formation of three joint committees.
- **Coordination:** ISSMGE plays a pivotal integrating role with all of the cognate international organizations, and so CGS's ongoing association with ISSMGE is viewed to be critical. In fact, **CGS has been a member of ISSMGE since its inception.**

**Assessment Rating for 1.a) Response: Provide rating here**

**High:**

The NRC Partner/CNC has demonstrated that the field of science represented by the International Affiliation strongly supports the Canadian S&T Priorities affirmed in the Federal Governments 2007 S&T Strategy and/or the S&T policy objectives of Canadian organizations such as NSERC, SSHRC, CIHR and the NRC.

**Medium:**

The NRC Partner/CNC has demonstrated that the field of science represented by the International Affiliation moderately supports the Canadian S&T Priorities affirmed in the Federal Governments 2007 S&T Strategy and/or the S&T policy objectives of Canadian organizations such as NSERC, SSHRC, CIHR and the NRC.

**Low:**

The NRC Partner/CNC has not demonstrated that the field of science represented by the International Affiliation supports the Canadian S&T Priorities affirmed in the 2007 Federal Strategy or the S&T policy objectives of Canadian organizations such as NSERC, SSHRC, CIHR and the NRC.

Provide additional comments here if necessary. Limit 1000 characters.

b) Does the International Affiliation support a critical and highly developed Canadian scientific network?

or

Does the field of science represented by the International Affiliation hold the potential to bring forth scientific advancements that would benefit Canadians, thereby warranting the creation a new Canadian scientific network?

Describe the key components and features of the Canadian S&T network, highlighting the number of public and private scientists active in the field (students, professors, researchers, and doctors), the number of public institutions and private companies engaging in basic research, applied research, and/or commercialization activities (and the total value of their investment in each activity), and the capacity of global markets to acquire related products and services.

or

Describe the S&T advancements (knowledge related, products and services, processes and applications) proposed and in development that could impact favorably on Canadians, enhancing our quality of life, ability to contribute to global challenges, environmental performance and sustainability, global competitiveness, international relations, and economic performance and prosperity.

- Canadians have a longstanding track record of internationally significant contributions to Soil Mechanics and Geotechnical Engineering: the Canadian S&T network is mature and very well-established. The roots of CGS date back to 1947 initially as an Associate Committee of the National Research Council, then formally incorporated as a not-for-profit learned society in 1972. The CGS is a member of both the Engineering Institute of Canada and the Canadian Federation of Earth Sciences, and is the CNC of the ISSMGE. The CGS has held **68 National Conferences** and supports the **Canadian Geotechnical Journal** (one of the top-ranked internationally peer reviewed journals in this area of endeavor) which has been published for 52 years. It publishes the **Canadian Foundation Engineering Manual** (in both official languages), which is the Canadian de facto professional practice reference also widely used in other countries, and that is associated with the **National Building Code of Canada** and the **Canadian Highway Bridge Design Code**; this manual is also used widely in other countries. The CGS's Geotechnical Research Board formally liaises with the National Research Council and other national bodies on matters related to soil mechanics and geotechnical engineering. The CGS represents **1,500 members in fields of professional practice, research and education, government and regulatory bodies, and materials suppliers and contractors.**
- **Every Canadian university with an engineering faculty/school has accredited programs** in one or more of: civil engineering (including the geotechnical sub-discipline); geological engineering; mining and/or petroleum and/or resource engineering. **The total number of professors working in areas covered by ISSMGE and CGS is estimated to be over 100** and many of these hold prestigious research Chairs. **The university programs are tightly integrated with professional practice and job prospects are good for new graduates** at both undergraduate and advanced degree levels.
- The number of Canadian firms with business interests in geotechnical engineering and the related geosciences is estimated to be several hundred (mostly small to medium enterprises (SMEs)). **A representative selection of these directly supporting CGS through Corporate Sponsorships** include consulting companies that are national and international

in scope (Klohn Crippen Berger, Thurber Engineering, Naviq Consulting Inc., Golder Associates, Knight Piésold Consulting, MEG Consulting, Stantec, Trek Geotechnical, GKM Consultants and Downunder Geotechnical Ltd.), geotechnical software developers (Geo-Slope International, and Rocscience), and suppliers and contractors (Reinforced Earth, Insitu Contractors and Mobile Augers and Research). There are almost 1000 current listings of Geotechnical Engineering jobs through popular Canadian on-line sites.

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**Assessment Rating for 1.b) Response: Provide rating here**

**High:**

The NRC Partner/CNC has demonstrated that the International Affiliation supports a critical and highly developed Canadian scientific network comprising large numbers of public and private scientists, an extensive base of public and private companies engaging in basic research, applied research, and/or commercialization, and connected to global markets with a pronounced demand for related products and services

**or**

The NRC Partner/CNC has described a suite of knowledge growth opportunities, products, services, processes and applications currently being developed within the relevant field of science, and has clearly demonstrated their potential to bring forth scientific advancements that would benefit for Canadians in areas related to quality of life, contribution to global challenges, environmental performance and sustainability, global competitiveness, international relations, or economic performance and prosperity.

**Medium:**

The NRC Partner/CNC has demonstrated that the International Affiliation supports moderately developed Canadian scientific network comprising intermediate numbers of public and private scientists, a significant base of public and private companies engaging in basic research, applied research, and/or commercialization, and connected to global markets with the potential to acquire related products and services.

**or**

The NRC Partner/CNC has described a proposed suite of knowledge growth opportunities, products, services, processes and applications that could be developed in future within the relevant field of science, and has clearly demonstrated their potential to bring forth scientific advancements that would benefit for Canadians in areas related to quality of life, contribution to global challenges, environmental performance and sustainability, global competitiveness, international relations, or economic performance and prosperity.

**Low:**

The NRC Partner/CNC has not demonstrated that the International Affiliation supports a scientific network that is relevant and developed in Canada.

**or**

The NRC Partner/CNC has not described any current or proposed future knowledge growth opportunities, products, services, processes or applications that could bring forth scientific advancements that would benefit Canadians in areas related to quality of life, contribution to global challenges, environmental performance and sustainability, global competitiveness, international relations, or economic performance and prosperity.

Provide additional comments here if necessary. Limit 1000 characters.

## Section 2: Assessment of the Effectiveness of the Supporting NRC Partner/CNC

### 2. Does the NRC Partner/CNC ensure the representation, promotion, and protection of Canadian interests in the international scientific community?

- a) Does the NRC Partner/CNC consult with the domestic science community to identify and consolidate opinions, concerns, suggestions, and perceived challenges, and does it ensure their presentation to and support within the International Affiliation?

Document the consultative processes, meetings and assemblies, surveys and questionnaires, and discussion forums employed to obtain input from Canadian stakeholders, and describe the subsequent actions taken to promote and support stakeholders' interests within the International Affiliation.

- The CGS has both **centralized and regional/local administrative structures**, and there exists an **effective two-way means of exchanging ideas and information between local and national levels**.
- The **national level structure consists of a Board of Directors, an Executive Committee, 7 Technical Divisions and 7 Committees**; CGS also includes a Geotechnical Research Board devoted to the promotion of research and the development of related resources. Attempts are made to ensure **regional representation** on all of these entities. The **Board of Directors meets officially once per year at meetings held in conjunction with the national conference**; the **Executive Committee meets formally twice per year**, and informally as required (at least 3-5 times per year by conference call). The **national divisions, committees and GRB report to the Executive through a mid-year report and an end-of-year report**. The latter are posted on the CGS's web site and are available to the general membership.
- There are **20 local/regional sections** across Canada each with their own Executive committee. The main function of the local/regional sections is to **organize and coordinate regular technical presentations of local/regional interest**. They also **work with the national level to sponsor the local presentation of a Cross Canada Lecture Tour twice a year**, and to sponsor the annual national conference on a rotating basis throughout the country. The **local/regional sections are represented on the national Board of Directors and report to the Executive Committee through a mid-year report and an end-of-year report**. The latter are available to the general membership through the CGS's web site. Most local/regional sections have their own www sites hosted through the CGS national site.
- **The involvement of students and young professionals in CGS and ISSMGE activities is proactively fostered**. CGS supports the **Canadian Young Geotechnical Engineers and Geoscientists Conference** series which has turned into an event held every three years in conjunction with the CGS annual national conference. This conference series parallels the European Young Geotechnical Engineers Conference and International Young Geotechnical Engineers Conference series. Most local/regional CGS sections have special events to encourage student involvement, and the CGS has programs to provide financial support for students attending the CGS annual conference. Fostering the early

careers of young geo-professionals is seen as being a key to sustaining a long-term strong base of Highly Qualified People in support of Canada's S&T priorities.

- **Fostering discussion of R&D issues happens at the grass-roots level in the local/regional sections where ideas may then be forwarded through an appropriate division/committee for further consideration at the national level.** Alternatively, R&D issues may be raised within a division/committee's activities and brought to the general membership through the Executive Committee or Board of Directors. **Within the national structure, the Geotechnical Research Board (GRB) has historically had the formal responsibility for liaising with federal organizations such as NRC and NSERC, representing the country's geotechnical engineering interests.**
- Within academia, the **geotechnical research community has demonstrated a strong proactive industrial interaction**, leading to wide-spread engagement of industry in various national funding initiatives (primarily through NSERC) and establishing industrially sponsored or endowed research chairs. The vast majority of these chair holders are active participants in CGS.
- **Canada's geotechnical interests are subsequently brought to bear at the ISSMGE through Canadian participation in the international organization's Technical Committees and Executive. Canadians currently hold the position of chair or vice-chair on 7 of the ISSMGE's 31 Technical Committees, and hold 28 membership positions in total.**
- A similar level of Canadian participation exists at the committee level of the other cognate international associations previously mentioned (IAEG, ISRM, IPA, IGS and IAH)

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Assessment Rating for 2.a) Response: Provide rating here

**High:**

The NRC Partner/CNC engages in consultative processes such as meetings and assemblies, surveys and questionnaires, and discussion forums, outside of regular membership meetings, at least once a year. The NRC Partner/CNC has demonstrated that stakeholder input gathered during consultative processes is promoted and supported within the International Affiliation.

**Medium:**

The NRC Partner/CNC engages in consultative processes such as meetings and assemblies, surveys and questionnaires, and discussion forums, outside of regular membership meetings, at least once every two years. The NRC Partner/CNC has demonstrated that stakeholder input gathered during consultative processes is promoted and supported within the International Affiliation.

**Low:**

The NRC Partner/CNC does not engage in consultative processes, outside of regular membership meetings. The NRC Partner/CNC has not demonstrated that stakeholder input gathered during consultative processes is promoted and supported within the International Affiliation.

Provide additional comments here if necessary. Limit 1000 characters.

**b) Does the NRC Partner/CNC ensure that Canadian Delegates participate strategically in the conduct of General Assemblies of the International Affiliation?**

Describe the contributions of Canadian Delegates to the General Assemblies of the International Affiliation. Highlight contributions (note whether presentation, discussion, debate, vote, etc) that lead to the selection of research priorities, conference and symposium themes, areas of focus for international projects and collaborations, proposed constitutional amendments, etc, reflective of Canadian interests.

- As previously reported, **Canadians chair or co-chair 20% of ISSMGE's Technical Committees, and are members of 75% of those committees.** These committees work closely with a country's Organizing Committee for an ISSMGE event to define the conference and symposium themes, and as such **Canadian representatives can ensure that Canada's research priorities are represented at ISSMGE events.**
- **Canadians organized a major collaborative ISSMGE event in Toronto from 2-6 October 2011: the 14<sup>th</sup> ISSMGE Pan-American Soil Mechanics and Geotechnical Engineering Conference, along with the 64<sup>th</sup> Annual Canadian Geotechnical Society Conference, and also with the 5<sup>th</sup> Pan-American Conference on Teaching and Learning of Geotechnical Engineering. This was a showcase of Canadian leadership and talent to the international geotechnical engineering community.**
- **CGS played a strong coordinating role to have papers by Canadian scientists and engineers presented at the most recent 2013 ISSMGE International Conference in Paris, France (24 papers forwarded and all were accepted and published). The CGS President attended this same conference and voted on ISSMGE Council future directions (ISSMGE Council has a current policy of one vote per country; Canada mounted a strong but unsuccessful bid to change this voting to reflect a country's total membership)**
- **A CGS Member completed a 4-year term in the role Vice President North America to the ISSMGE council (2005-2008, J. Seychuk, P.Eng.) and a Canadian will assume this role again in 2017-2020.**
- **Canada made a strong but unsuccessful nomination for ISSMGE President (2005-2009)**

**Assessment Rating for 2.b) Response: Provide rating here**

**High:**

The NRC Partner/CNC has provided three examples where it has encouraged Canadian Delegates to present, discuss, debate, or vote on issues at General Assemblies of the International Affiliation. The NRC Partner/CNC has demonstrated that the contributions of Canadian delegates led to the successful selection of research priorities, conference and symposium themes, areas of focus for international projects and collaborations, proposed constitutional amendments, etc, that reflect and support Canadian interests.

**Medium:**

The NRC Partner/CNC has provided three examples where it has encouraged Canadian Delegates to present, discuss, debate, or vote on issues at General Assemblies of the International Affiliation. The NRC Partner/CNC has not demonstrated that the contributions of Canadian delegates lead to the successful selection of research priorities, conference and symposium themes, areas of focus for international projects and collaborations, proposed constitutional amendments, etc, that reflect and support Canadian interests

**Low:**

The NRC Partner/CNC has not provided three examples where is has encouraged Canadian Delegates to present, discuss, debate, or vote on issues at General Assemblies of the International Affiliation.

Provide additional comments here if necessary. Limit 1000 characters.

### 3. Does the NRC Partner/CNC ensure the promotion of Canadian contributions to international decision making?

**Does the NRC Partner/CNC successfully encourage Canadian scientists to rise to leadership and decision making positions within the International Affiliation?**

Identify Canadian Delegates that have successfully attained executive, committee, work-group, commission, or panel positions, and describe the beneficial outcomes they have generated or supported reflective of Canadian interests.

- **Current Canadian representation to the ISSMGE Technical Committees** includes the following: (C - Chair, VC - Vice Chair)
  - TC103: Numerical Methods: Richard Wan (VC)
  - TC104: Physical Modeling in Geotechnics: Andy Take (VC), Ryan Phillips
  - TC106: Unsaturated Soils: Del.G. Fredlund, Sai Vanapalli
  - TC203: Earthquake: Liam Finn, Dharma Wijewckreme
  - TC205: Safety and Serviceability: Richard Bathurst
  - TC206: Interactive Geotechnical Design: Ken Been (C) Dennis Becker
  - TC207: Soil-structure : Dipanjan Basu
  - TC208: Stability of Natural Slopes: J. Fannin (C), Denis Demers, Corey Froese
  - TC213: Geotechnics of Scour Erosion: Mario Ruel
  - TC215: Geo-Environmental: Kerry Rowe, Catherine Mulligan, Craig Lake
  - TC216: Frost Geotechnics: Jean-Marie Konrad
  - TC303: Floods: Myint Win Bo
  - TC304: Engineering Risk Assessment and Management: Gordon Fenton (VC)
  - TC306: Geo-Education: Jit Sharma
  - TC307: Sustainability in Geotechnical Engineering: Dipanjan Basu (C) Tim Newson, Catherine Mulligan
  - TC308: Energy Geotechnics: Greg Siemens, Dipanjan Basu
- Canadians are also represented on the **ISSMGE/IAEG/ISRM Joint Committee**:
  - JTC1: Landslides: Serge Leroueil, Jonathan Fannin, Oldrich Hungr
- **Canadians are similarly involved in the committees of cognate societies**:
  - IAEG: 4 committee members
  - ISRM: 20 committee members (2 as Chair; the VP for North-America is a CGS member (and former VP Technical).
  - IPA: 10 committee members
  - IGS: 12 committee members (2 Co-chairs)
  - IAH: 3 committee members
- **Canadian appointments to senior roles in ISSMGE are internationally viewed as historically strong** (relative to the Canadian membership base and the infrequency of these appointments):
  - President**, N.R. Morgenstern (1990-1994); also **Chair of the Executive Committee**
  - Senior Vice-President**, Victor Milligan (1994-1998)
  - Vice-President North America**, John Seychuk (2005-2008)
  - Suzanne Lacasse, in 2009-2010, was tasked with **reviewing the structure and content of all ISSMGE Technical Committees**
- **ISSMGE Influence and Outcomes**: in 2013 the Canadian contingent came out strongly *against* a proposal for amalgamation of ISSMGE with select cognate societies, as it felt such amalgamation would weaken Canadian representatives' abilities to bring to the fore

issues that were crucial to Canadian S&T in the geotechnical and related geoscience industries; the proposal was defeated.

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**Assessment Rating for 3.) Response: Provide rating here**

**High:**

The NRC Partner/CNC has provided three examples where it has successfully encouraged Canadian scientists to attain executive, committee, work-group, commission, or panel positions. The NRC Partner/CNC has demonstrated that members attaining leadership and decision making positions have advanced Canadian interests and generated beneficial Canadian outcomes.

**Medium:**

The NRC Partner/CNC has provided three examples where it has successfully encouraged Canadian scientists to attain executive, committee, work-group, commission, or panel positions. The NRC Partner/CNC has not demonstrated that members attaining leadership and decision making positions have advanced Canadian interests and generated beneficial Canadian outcomes.

**Low:**

The NRC Partner/CNC has not provided three examples where it has successfully encouraged Canadian scientists to attain executive, committee, work-group, commission, or panel positions.

Provide additional comments here if necessary. Limit 1000 characters.

#### 4. Does the NRC Partner/CNC encourage and support Canadian scientists to take advantage of emerging international networking opportunities?

**Are Canadian scientists developing international relationships, partnerships, and collaborations through participation in the International Affiliation?**

Identify key contacts and relationships cultivated, and international partnerships or collaborations established, between Canadian scientists and other world class scientific leaders and experts

- **The ISSMGE is the nexus** through which international experts in geotechnical engineering and the related geosciences meet and interact, sharing ideas and perspectives, and spawning **new ideas for subsequent collaborations**. Some example outcomes of such interactions include the following:
- The ISSMGE hosts a series of **webinars** (<http://www.issmge.org/en/resources/recorded-webinars>) and recent examples of Canadians who have had an opportunity to share their knowledge and expertise through these virtual presentations include Dr. Peter Roberston (Professor Emeritus, U of Alberta, Feb 2015), and Dr. Kerry Rowe (Professor, Queen's U Kingston, April 2012)
- Canadians have made presentations at ISSMGE-sponsored events and thereby **brought attention to world-class Canadian facilities** that attract research internationally, including:
  - C-CORE, the geotechnical centrifuge centre in St. John's Newfoundland (Dr. Ryan Phillips, Geotechnical Engineering)
  - CEMI, Center for Excellence in Mining Innovation (Doug Morrison, President & CEO)
  - OSTRF, the Oil Sands Tailings Research Facility at U of Alberta (Dr. Ward Wilson)
  - The Large-Scale Retaining Wall Test Facility (for testing full-scale geosynthetic reinforced soil walls and slopes) at RMC (Dr. Richard Bathurst)
- The interactions fostered through ISSMGE and the cognate organizations have led to the **invitation of many international speakers taking part in the CGS Cross-Canada Lecture Tour**, which is an internationally renowned lecture series: in its 56+ year history there have been 52 Canadian speakers and 44 international speakers; 49 professors, 28 consultants, and 11 from government agencies (a complete list is available on the CGS www site [http://www.cgs.ca/pdf/CGS Awards and Honours Past%20Recipients Nov 2015 FINAL .pdf](http://www.cgs.ca/pdf/CGS_Awards_and_Honours_Past%20Recipients_Nov_2015_FINAL.pdf) ). Recent international speakers include **Nick Sitar (University of California, Berkeley, E Kavazanjian, Arizona State University, M Jefferies, Golder Associates, UK, Steve Vick (mining consultant, USA), Sarah Springman (ETH Zurich, Switzerland), and Kyle Rollins (Brigham Young University, USA)**. Other countries represented include Greece, Australia, England, Hong Kong, South Africa, Norway, Italy, Portugal, France, China, Austria, Hungary, and Czechoslovakia.
- Canadians have taken leadership roles in sponsoring international specialty conferences in coordination with ISSMGE and cognate organizations (examples of recent such conferences appear in the next section).

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**Assessment Rating for 4.) Response: Provide rating here**

**High:**

The NRC Partner/CNC has identified and described 4 to 5 relationships, international partnerships, or collaborations established with world class scientists, fostered through participation in the International Affiliation, and has provided key contact information.

**Medium:**

The NRC Partner/CNC has identified and described 1 to 3 relationships, international partnership, or collaboration established with world class scientists, fostered through participation in the International Affiliation, and has provided key contact information.

**Low:**

The NRC Partner/CNC has not identified any relationships, international partnerships, or collaborations established with world class scientists, fostered through participation in the International Affiliation.

Provide additional comments here if necessary. Limit 1000 characters.

**5. Does the NRC Partner/CNC encourage and support Canadian scientists to take advantage of opportunities to showcase Canadian achievements, technologies, and capacity?**

**a) Does the NRC Partner/CNC host Scientific Conferences in Canada?**

Provide a concise overview of any scientific conferences hosted in Canada in the last 5 years, providing information on the conference's themes and objectives, number of attendees, participating countries, key speakers and presenters and the substance of their discussions and presentations, spin-off developments, feedback from participants, and identify any major conference outcomes with Canadian or Global implications. (If no scientific conferences have been hosted in the last 5 years, provide information on any unsuccessful bids made in the last 5 years)

- **CGS Annual Conference:** The CGS hosts the **longest running annual national geotechnical conference series in the world**. 2015 was the 68<sup>th</sup> event in Quebec City, Quebec from September 20 - 23, 2015, and was attended by more than 830 delegates, including about 140 students; it featured 380 Oral presentations and 28 Posters). The Conference was organized in collaboration with the Canadian National Chapter of the International Permafrost Association. Other recent annual conferences were held in **Regina (2014; 445 Canadian delegates and 39 International delegates from 10 countries, with over 180 technical papers presented; Montreal (2013; 739 delegates with 119 international delegates from 30 countries, and over 370 technical papers), Winnipeg (2012, 430 delegates), and Toronto (2011, 850 delegates; also a PanAm event organized with the ISSMGE)**. Each year the conference themes are set by the local organizing committee in consultation with the national VP Technical and the chairs of the CGS technical divisions/committees. The range of themes is comprehensive and most fit within the context of **Environmental Science and Technology**, and **Natural Resources and Energy S&T** priorities. In 2015 the S&T-related themes were: Climate Change and Sustainability; Cold Regions Geotechnics; Engineering Geology (Remote Sensing Applications, Terrain Analysis); Geoenvironmental Engineering (Site Remediation, Landfill and Waste Containment, Brownfield Redevelopment); Geosequestration; Geosynthetics; Hydrogeology and Groundwater (Isotopic Age Dating, Regional Groundwater Flow System, Groundwater Management); Infrastructure (Buried Utilities, Earth Dams, Pipelines); Landslides and Geohazards; Mining Geotechnics (Mine Waste Management, Water Management); Risk Assessment and Reliability; Rock Mechanics (Surface Mining Slope Stability, Underground Mines); Soil Mechanics and Foundations (Problematic Soils, Unsaturated Soils, Site Improvement, Gassy Soils); Transportation Geotechnics (Pavement, Aggregates). All submitted papers are peer reviewed for scientific content and submitted papers intended for commercial promotion are disallowed. **The conference is viewed by many in the scientific/R&D community as an opportunity to present emerging ideas and results, and to have these vetted in a comparatively open and informal context, before submitting more comprehensive results in the format of journal manuscripts that are subject to formal anonymous peer review.** As such these annual national conferences are a key component of technology transfer that ultimately benefits Canada in the identified S&T target areas. **The Conferences also allow graduate students to present their results for the first time to a wide audience - a critical part of the training to become a specialist in the various areas of geotechnique and related geosciences**

- **National Specialty Conferences:** In addition to the annual national conferences, CGS members organize specialty conferences targeted specifically at a national audience although international participation is also invited. Recent such events include the GeoHazards 6 Conference held in Kingston, June 2014 (145 Canadian delegates and 14 International delegates from 4 countries)
- **International Conferences:** CGS members have also recently organized international conferences, detailed in the next section.

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**Assessment Rating for 5.a) Response: Provide rating here**

**High:**

The NRC Partner/CNC has successfully hosted at least one scientific conference in Canada in the last 5 years. The NRC partner/CNC has provided a complete and concise overview of conference activities, confirming its status as a scientific conference, and has demonstrated that the conference produced beneficial results and outcomes for Canadian scientific advancement and Canadian scientists.

**Medium:**

The NRC Partner/CNC has competently bid to host at least one scientific conference in Canada in the last 5 years. The NRC partner/CNC has provided a complete and concise overview of the activities undertaken during the bidding process, and has demonstrated a well planned, organized, and strategic attempt to position Canada as a potential conference venue.

**Low:**

The NRC Partner/CNC has not hosted (in the last 5 years) or competently bid to host (in the last 5 years) any scientific conference in Canada.

Provide additional comments here if necessary. Limit 1000 characters.

**b) Does the NRC Partner/CNC encourage Canadian scientists to take active roles in international conferences, symposia, and workshops?**

Identify Canadian scientists that have spoken, presented, or advised at international conferences, symposia, and workshops and describe their accomplishments highlighting opportunities taken to showcase exemplary Canadian S&T achievements, demonstrate Canadian S&T knowledge and expertise, express Canadian S&T ideas and perceptions, and set forth recognized strengths in Canadian S&T capacity

- **Recent International Events:** CGS members organized the following and in so doing showcased Canadian strength and leadership to the international S&T community:
  - International Oil Sands Tailings Conference (Lake Louise, 7-10 Dec 2014; Drs. Ward Wilson and David Segó, U of Alberta)
  - International Discrete Fracture Network Engineering (Vancouver, 19-22 Oct 2014; Dr. Doug Stead, Co-Chair, Simon Fraser U)
  - International Short Course on Permafrost Engineering (UofAlberta, 5-10 Dec 2013; Dr. David Segó, U of Alberta)
  - Tailings & Mine Waste (Banff, 3-6 Nov 2013; Dr. Dave Segó, U of Alberta): over 385 delegates (with the two main keynotes given by CGS members, Dr. A. Kueper and Prof. M. Aubertin); this conference provided mine waste managers, engineers, regulators and researchers an opportunity to discuss the latest developments in tailings and mine waste management, to present new ideas and to make professional contacts with others who have mutual interests and goals
  - Int'l Workshop on Landslides in Sensitive Clays (Quebec City, 28-30 Oct 2013)
  - Four webinars on Geosynthetics organized with an American counterpart (NAGS)
- - International ISRM Congress (Montreal, 10-13 May 2015; Dr. Ferri Hassani, General Chairman; many CGS members attended with some presenting keynotes, including Prof. E. Eberhardt and Prof. D. Stead)
  - Global Joint Seminar on Geo-Environmental Eng. (Concordia, 21-22 May 2015)
- **Prestigious Lectures:** recent internationally highlighted Canadian experts include:
  - Dr Suzanne Lacasse, selected 55<sup>th</sup> Rankine Lecturer to be presented in London in March 2015: awarded since 1961, the Rankine Lecture is widely regarded as the most prestigious award in geotechnical engineering, and is sponsored by the British Geotechnical Society; topic to be announced
  - Dr. Peter Robertson, selected to present the H. Bolton Seed lecture at the International Foundations Congress in San Antonio, 17-21 March 2015; subsurface characterization using the cone penetration technique (CPT)
  - Dr Richard Bathurst, Giroud Lecturer at 10<sup>th</sup> International Geosynthetics Conference (Berlin, 21-25 Sept 2014): "Dr. Bathurst's contributions to the advancement of geosynthetics have been superb, and in multiple segments of our discipline," said Jorge Zornberg, IGS president. "They include far-reaching technical contributions for fundamental understanding of geosynthetics, key practical contributions to the engineering community at large, and unmatched contributions to the IGS."
  - Dr Suzanne Lacasse, 8<sup>th</sup> Terzaghi Oration at 2013 conference of ISSMGE (2-6 Sept 2013): Protecting Society from Landslides
- **R. Kerry Rowe International Named Lecture Series:** In an extraordinary recognition from the ISSMGE the R. Kerry Rowe Lecture was established, "in recognition of Professor Rowe's outstanding impact in the field of Environmental Geotechnics and excellence in scholarly achievements". The lecture is to be given at the opening plenary session of the

Environmental Geotechnics Congress held every 4 years. The inaugural lecture was given at the 18th International Conference on Soil Mechanics and Geotechnical Engineering held in Paris, France, September 2013 and at the 7th International Congress on Environmental Geotechnics held in Melbourne, Australia, November 2014. The lecture is delivered by a person "having made a distinguished recent contribution to the theory and practice of Environmental Geotechnics".

SECTION TO BE FILLED IN BY REVIEWER

**Assessment Rating for 5.b) Response: Provide rating here**

**High:**

The NRC Partner/CNC has provided 5 examples of Canadian scientists that have spoken, presented, or advised at international conferences, symposia, and workshops. The NRC Partner/CNC has outlined their activities and has documented opportunities taken to showcase exemplary Canadian S&T achievements, demonstrate Canadian S&T knowledge and expertise, express Canadian S&T ideas and perceptions, and set forth recognized strengths in Canadian S&T capacity

**Medium:**

The NRC Partner/CNC has provided 3 examples of Canadian scientists that have spoken, presented, or advised at international conferences, symposia, and workshops. The NRC Partner/CNC has outlined their activities and has documented opportunities taken to showcase exemplary Canadian S&T achievements, demonstrate Canadian S&T knowledge and expertise, express Canadian S&T ideas and perceptions, and set forth recognized strengths in Canadian S&T capacity

**Low:**

The NRC Partner/CNC has not provided at least 3 examples of Canadian scientists that have spoken, presented, or advised at international conferences, symposia, and workshops.

Provide additional comments here if necessary. Limit 1000 characters.

## 6. Does the NRC Partner/CNC disseminate important scientific knowledge and information to Canadian stakeholders?

Does the NRC Partner/CNC consistently distribute important reports, presentations, press releases, workshop toolkits, and, conference, committee, panel, commission, workgroup, and general assembly conclusions, recommendations, and summary reports to Canadian stakeholders?

Document the mechanisms of distribution used to inform stakeholders (such as regular membership meetings, website updates, newsletters, summary and annual reports, etc) and briefly describe the type of knowledge and information being disseminated.

- **Annual Conference, Membership Meeting, and Annual Report:** The CGS holds an annual conference **typically attended by 400-800 participants**. The location circulates throughout major Canadian cities and is organized each year by a local section in coordination with the national administrative body. The technical sessions provide an opportunity to exchange ideas and experience with recent S&T innovations. Every conference has an associated **Business Meeting open to all members, at which an Annual Report is tabled summarizing the year's key actions, achievements in S&T and dissemination of results, important decisions by the Board and Executive, and events related to the ISSMGE and cognate international associations**.
- **Website:** The CGS central national administration hosts the site [www.cgs.ca](http://www.cgs.ca), maintains its content (in both languages for the most part) and continuously solicits and updates information. **The site is the member's resource centre** for: on-line papers presented at CGS annual conferences since 1947; on-line Proceedings of Specialty Conferences; Webinars of important Lectures and Addresses; manuals for administration, awards and honors, and sponsoring conferences; a link for free on-line access to the Canadian Geotechnical Journal; on-line access to the trade magazine/journal Geotechnical News (which is also distributed in hardcopy); on-line ordering of publications from the Institute of Civil Engineers at discounted prices. In addition, the **general public has access to information** about the society, its executive, its by-laws, its recent annual and auditor's reports, its technical divisions and committees, a publicly accessible heritage archive, information about local/regional section activities (including links to their individual www sites), and links to other publications and websites.
- **News and Events updates:** The publication **Geotechnical News is circulated in print 4 times a year to all CGS members, as well as being available on-line**. The CGS contributes approximately one-third to two-thirds of the content which is coordinated with cognate American organizations. The **print version also has an international distribution of over 2,000 readers**. This is complemented by **E-News (CGS Geotechnical Info Net), an electronic (bilingual) bulletin sent to members approximately ten times per year but is also available to the general public** through the CGS www site. Among other things, these communications include information pertaining to the ISSMGE and other cognate international associations.
- **Peer-Reviewed Journals:** SCIMAGO recently released a new journal ranking system based on the Scopus database. This includes assessment of 96 journals in the category Geotechnical Engineering and Engineering Geology. This ranking is based on 'SJR', a new assessment measure that uses average weighted citations over a three year period, and which omits self cites. The top five journals ranked for their impact and influence are
  - 1. Geotextiles and Geomembranes (edited by CGS Member and Past President Dr

Kerry Rowe)

- 2. Geotechnique
- 3. Geosynthetics International (edited by CGS Member and 2013-2014 President Dr Richard Bathurst)
- 4. Structural Dynamics and Earthquake Engineering
- 5. Canadian Geotechnical Journal (edited by CGS Member Dr Ian Moore; see below)

These five journals are ranked ahead of the remaining journals in this category, including others widely acknowledged for their excellence.

- **Other:** In addition to the above means of disseminating S&T knowledge to stakeholders, the CGS also **collaborates with NRC to provide and Editor and Associate Editors for the Canadian Geotechnical Journal:** sponsors a **Cross-Canada Lecture Tour** twice a year given by an expert on a topic of strategic interest; and publishes the **Canadian Foundation Engineering Manual** in both official languages (the most recent 4<sup>th</sup> edition has sold over 4,200 copies and is internationally viewed as an outstanding state-of-practice reference)

SECTION TO BE FILLED IN BY REVIEWER

Assessment Rating for 6.) Response: Provide rating here

**High:**

The NRC Partner/CNC holds at least 1 membership meeting per year. The NRC Partner/CNC has a website to inform members of current issues and content is update at least twice a year and/or the NRC Partner/CNC distributes a newsletter to members at least twice a year. The NRC Partner/CNC publishes an annual report updating members of key actions, publications, decisions, and events related to the International Affiliation

**Medium:**

The NRC Partner/CNC holds at least 1 membership meeting per year. The NRC Partner/CNC has a website to inform members of current issues and content is updated at least once a year and/or the NRC Partner/CNC distributes a newsletter to members at least once a year. The NRC Partner/CNC publishes an annual report updating members of key actions, publications, decisions, and events related to the International Affiliation

**Low:**

If NRC Partner/CNC fails to complete the actions expected within the Medium category, then it will receive a rating designated Low

Provide additional comments here if necessary. Limit 1000 characters.

### Section 3: Membership Adherence

#### 7. Is the level of membership to which the NRC Partner/CNC adheres within the International Affiliation appropriate?

- CGS members (not including student, retired or second society member classes) each year elect to join one of the cognate international organizations. The breakdown of memberships for 2015 was as follows
  - International Society for Soil Mechanics & Geotechnical Eng. (ISSMGE) 820 (71%)
  - International Association of Engineering Geology (IAEG) 113 (10%)
  - International Society for Rock Mechanics (ISRM) 70 (6%)
  - International Permafrost Association (IPA) 90 (8%)
  - International Geosynthetics Society (IGS) 40 (3%)
  - International Association of Hydrogeologists (IAH) 23 (2%)
- As these numbers reflect the choices of individual members, it is clear that ISSMGE overwhelmingly represents the international interests of the majority of CGS members. Furthermore, the close association between ISSMGE, IAEG and ISRM means that the coordinated activities between these three international organizations represents the collective interests of over 87% of CGS members.

Provide an overview of the membership adherence levels available within the related International Affiliation, and include a breakdown of the resulting benefits and associated dues that correspond to each individual adherence level. Additionally, note the level to which the NRC Partner/CNC currently adheres. An example has been provided.

- This table is **not applicable** to the ISSMGE. The annual dues are based on the number of CGS members who have selected either the Soil Mechanics and Foundation Division or the GeoEnvironmental Division as their CGS Technical Division of choice. Once a national association is affiliated with ISSMGE there is simply one vote per national association (country) at all levels of ISSMGE governance.

**Table 1.**

International Union Name	Levels of Adherence Available	Dues Associated with Adherence level	Resulting Benefits for Adherence Level
Example: IU Climate	1	2000 euros	1 vote at General Assemblies

## Section 4: NRC Partner/CNC Feedback

### 8. How can the NRC Secretariat and AN ADVISORY COMMITTEE ON SCIENCE, ENGINEERING AND TECHNOLOGY better serve the scientific community and NRC Partners/CNCs?

- The existing coordination mechanisms grew out of the previous NRC Division of Building Research, the Associate Committee on Geotechnical Research, and the Canadian Geotechnical Society. The existing mechanisms are working to CGS's satisfaction.
- The Canadian Geotechnical Society has a longstanding history, a diverse membership of about 1,500 from all across the country, a well-managed administrative structure at both local and national levels, active technical programs that are aligned with Canada's S&T priorities, close associations with cognate international organizations (first and foremost ISSMGE, but also ISRM, IAEG, IPA, IAH, and IGS) and international recognition for the outstanding technical contributions made by CGS members.

NRC PARTNER/CNC COMMENTS