

Elements



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THE NEWSLETTER OF THE CANADIAN GEOPHYSICAL UNION

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LE BULLETIN DE L'UNION GÉOPHYSIQUE CANADIENNE

PRESIDENT'S COLUMN

Dear Colleagues,

The Canadian geophysical sciences community has much to celebrate as we move into 2015. In the past few months we have had several of our colleagues earn prestigious recognitions nationally and internationally. Congratulations from the CGU to our members and affiliates who have been so prestigiously recognized:

Gail M. Atkinson, Department of Earth Sciences, Western University, and Past-President CGU, has been Elected **Fellow of the Royal Society of Canada**. Gail is a renowned expert in earthquake ground motions and seismic hazard analysis. She is an international leader in the development of models to predict earthquake ground motions as a function of magnitude and distance, and in their use to solve engineering problems. She also pioneered novel methods that use ground motion recordings to understand better the processes that generate and propagate earthquake motions. Congratulations, Gail!

Nigel Roulet, Department of Geography, McGill University, has been Elected **Fellow of the Royal Society of Canada**. Nigel has made outstanding contributions to our understanding of how climate, hydrology and ecosystem structure function by uniquely combining ecohydrology and biogeochemistry, investigating the transport and transformation of elements and compounds and the greenhouse gas and carbon balance of peatlands, including their sensitivity to climate variability and change. Congratulations, Nigel!

Gerald Jones (IRNS-eau, Quebec) has been **Elected Fellow of the International Union for Geodesy and Geophysics** for “his pioneering contributions to the crosscutting field of snow ecology and for his relentless work towards the establishment of an International Association of Cryospheric Sciences within IUGG”.

In recognition of their exceptional contributions to international cooperation in geosciences, and eminence attained in the field of Earth and space sciences, we have several Canadian colleagues who have earned the title of **Conferred Fellow of the International Union of Geodesy and Geophysics** (IUGG) and its Associations:

Roland List, Department of Physics, University of Toronto, Former Secretary General, International Association of Meteorology and Atmospheric Sciences.

Gordon McBean, Department of Geography and Centre for Environment and Sustainability, Western University, President International Council for Science and Former Bureau member IUGG.

Lawrence Mysak, Professor, Department of Atmospheric and Oceanic Sciences, McGill University and Former President International Association for the Physical Sciences of the Oceans.

Gordon Young, Executive Director CGU, Professor Emeritus, Wilfrid Laurier University, Former Secretary General and Past-President International Association of Hydrological Sciences.

The CGU plays an important role on the international stage, and the recognition of our members reflects this. As I arc toward my final duties as President in Montréal in May at our joint assembly with AGU and GAC-MAC, I can see a near future where the CGU and Canada are fully recognized as the world leaders in the geophysical sciences that we are.

I look forward to seeing you in May.



Brian Branfireun



Dear CGU members,

Our annual meeting this year, the 2015 AGU-CGU-GAC-MAC Joint Assembly, promises to be exceptional. Over 2,200 abstracts have been submitted for the conference, covering all aspects of geoscience from “Atmospheric deposition of various pollutants at local, regional and global scales “ to “What accuracy can be expected for the geomagnetic field variations derived from paleomagnetic records?” The fact that the AGU, GAC and MAC are joining us means a lot of opportunities for multidisciplinary exchange of views.

You are warmly invited to attend the conference which will be held in Montreal from 3rd to 7th May 2015. The conference venue, the Palais des Congrès, is centrally located a few blocks away from Chinatown and Old Montreal, to add an interesting cultural dimension to your experience.

Please visit regularly the conference website at <http://ja.agu.org/2015/>. More information will become gradually available about housing and travel, pre- and post-conference field trips, and the technical program. Please be sure to register for the Annual Banquet on Wednesday night.

There is a full slate events before and after the meeting, including fieldtrips in the Montreal Region, such as an excursion to the Mer Bleue Bog (led by Nigel Roulet and Tim Moore) and a tour of subglacial landsystems of the Upper St. Lawrence Valley and Lake Ontario region (<http://ja.agu.org/2015/field-trips/>). Additionally there are many workshops and short courses, including “Teaching with NASA Climate Models” and “Technical Writing for Students”

(<http://ja.agu.org/2015/workshops/>).

See you in Montreal,

Claire & Jeff

Claire Samson, CGU conference co-chair

Jeffrey McKenzie, CGU representative on the local organization committee

CGU OUTREACH REPORT

In 2014 the Executive of the CGU decided that, in order to invigorate the Canadian geoscience community, there was an urgent need to:

- define strategies and measures to promote CGU;
- facilitate and encourage recruitment of CGU members;
- expand the influence of CGU within the Canadian and global geoscience communities.

As a result it was decided to engage Sarah Boon and Dave Lewis of Creekside Communication to provide the elements of an Outreach Program for CGU. Dave is a past member of CGU, while Sarah has been a CGU member since 1999, and served as Secretary (2009-2011) and Vice President (2011-2013) of the CGU Hydrology Section.

After successfully completing an initial short contract to propose the elements of an outreach program, Creekside Communication has embarked upon a process to upgrade CGU communications and outreach over the next three years. The outreach program is designed to engage a number of audiences for CGU

including:

- CGU members;
- Non-members within the Canadian geophysical community;
- North American and global geophysical communities;
- Non-geophysicists with interests in geophysical issues;
- Decision-makers at local, national and international levels;
- The media.

During the first year of implementation of the outreach program it is expected that the CGU website will be overhauled and developed with the addition of facilities to include modern means of communication such as Twitter and Facebook. In addition, the production, content and style of CGU newsletters will be overhauled. Subsequently, additional methods of engaging the Canadian and international earth science research communities will be developed in order that CGU become a more attractive and dynamic entity with links to major organizations both national and international.

This is a major undertaking by CGU to take the Union into a dynamic future. **CGU members can expect to be hearing from Sarah and Dave in the near future.**

CANADIAN BID TO HOST IUGG 2019

Every four years the International Union of Geodesy and Geophysics (<http://www.iugg.org/>) holds its Scientific Assembly – this year it will be held in Prague, Czech Republic (<http://www.iugg2015prague.com/>). During the Prague Assembly the 70 countries adhering to the Union will vote on where to hold the 2019 Assembly. In December 2014 Canada, through CGU, put in a bid to host the 2019 Assembly in Montreal. Letters of support for this bid have been received from the Prime Minister, the Mayor of Montreal, the National Research Council, the City of Montreal and the Palais des congrès. The bid is being coordinated through the Palais and the full bid may be seen at: www.congresmtl.com/Communications/Bids/IUGG2019/IUGG2019_Brochure.pdf

HIGHLIGHTS FROM SECTIONS

Biogeosciences Section

Submitted by Merrin Macrae

The Biogeosciences section of the CGU continues to grow. There have been 29 BS sessions proposed for the upcoming AGU-GAC-MAC-CGU Joint Assembly in Montreal. We are also co-hosting the Eastern section student conference at Wilfrid Laurier University with HS and ESPS on February 7th 2015. We are pleased with the growth to our membership over the past few years and look forward to continuing to bring new members to the CGU.

Student awards are given out each year for the best student papers (oral and poster presentations in BS section). We have recently found a sponsor for this award. Western Ag Innovations has agreed to sponsor a student award for the best student paper in Biogeosciences.

We have been investigating designing a logo for our section. In keeping with what other sections are

doing, we hope to have a common format across all of the CGU sections.

Earth Surface Processes Section

Submitted by Jaclyn Cockburn

This, the newest Section of CGU, is moving forward with several ESPS sponsored and co-sponsored sessions at the AGU-GAC-MAC-CGU Joint Assembly in Montreal this May. We will also host our first AGM at the Joint Assembly and remind members of CGU that ESPS is now an option for membership affiliation during the CGU membership renewal. We look forward to seeing you at the Joint Assembly in May. Other highlights follow:

→ Get involved

Our executive is looking for a Treasurer, if you are interested please email any member of the executive (Peter Ashmore – pashmore@uwo.ca; Chris Hugenholtz - chhugenh@ucalgary.ca; Jackie Cockburn – jaclyn.cockburn@uoguelph.ca)

→ Join us at the Student Conference, Feb 7 at Wilfrid Laurier University

ESPS is teaming up with other Ontario members of the Hydrology Section and Biogeosciences Section for the Annual CGU Student Conference, \$30 registration fee (cash only).

- Abstract deadline is January 23, 2015, abstracts should be emailed to cgulaurier@gmail.com as a Microsoft Word file attachment
- Abstracts must include: the title, author(s), affiliation(s), email address of the student presenter, followed by the abstract body. Please use 12-font, Times New Roman. Abstracts must not contain images or diagrams, and must not exceed one-page. Please save your abstracts using the following template: LASTNAME_FIRSTNAME_SECTION.docx. (For SECTION, indicate one of HS, BS or ESP)
- The conference programme will be posted in the week of 26 January on the Cold Regions Research Centre website: www.coldregions.ca.

Geodesy Section

Submitted by Joe Henton

On behalf of the Geodesy Section I would like to wish you all a Happy New Year. We are all looking forward to the 2015 Joint Assembly cosponsored by AGU, CGU, GAC, and MAC to be held in Montréal, May 3-7, 2015. Thank you to all who have organized geodesy-themed and geodesy-affiliated session and workshop proposals that will certainly contribute to a vibrant meeting. We also wish to thank JW Kim and Kristy Tiampo who as members of the Scientific Program Committee represent the interests of the geodetic sciences for this upcoming meeting.

The executive would also like to reiterate that the CGU-GS may be able to provide financial support for new initiatives that provide recognition and/or benefit to our members (*e.g.*, ideas suggested during past Annual General Meetings have included establishing an award to honour distinguished scientists in the field of geodesy and “seed-money” to support for student-focused activities and workshops). Please forward your ideas or proposals on how to develop a more vibrant Geodesy Section.

Finally I would like to finish-up this report with another “Geodetic Corner” (please note that I am open to a better title) where we can take the opportunity to use *Elements* to highlight topical information from

and/or for the Canadian geodetic community. In this issue we have a note from Lisa Nykolaishen of the Geological Survey of Canada reporting on the on-going geodetic monitoring efforts following the M7.8 Haida Gwaii earthquake - Canada's second largest recorded earthquake.

Geodetic Corner: “Crustal Deformation Associated with the 2012 M_w7.8 Haida Gwaii Earthquake”

by Lisa Nykolaishen (Geological Survey of Canada – Pacific)

The magnitude 7.8 low-angle thrust earthquake (and associated tsunami) off the west coast of southern Haida Gwaii on October 28, 2012 provided Canadian scientists the opportunity to study a local large thrust earthquake and has provided important information towards an improved understanding of geohazards in coastal British Columbia. Most large events along the Pacific-North America boundary in this region have involved strike-slip motion, such as the 1949 M8.1 earthquake on the Queen Charlotte Fault. In contrast, along the southern portion of Haida Gwaii, the young (~8 Ma) Pacific plate crust also underthrusts North America and has been viewed as a small-scale analogy of the Cascadia Subduction Zone. Although in a remote and challenging environment, fieldwork campaigns following the earthquake have been carried-out throughout southern Haida Gwaii for on-going geodetic monitoring of the displacement field, providing scientists a rich data-set. Global Positioning System (GPS) data collected in the weeks following the event were used along with historical data sets to determine coseismic offsets at sites throughout southern Haida Gwaii. The largest measured offset was 115 cm in a SSW direction, accompanied by 30 cm of subsidence. These offsets are consistent with a shallow dipping thrust earthquake beneath the Queen Charlotte Terrace (Nykolaishen et al., 2015). Additional campaign-style GPS surveys have since been repeated by the Canadian Hydrographic Service (CHS) at seven vertical reference benchmarks throughout Haida Gwaii, significantly improving the coverage of coseismic offset observations in the region. Postseismic displacement measurements have been limited to six sites, where up to 6 cm of motion over approximately 14 months has been observed, varying in azimuth between SSW and SE. In addition to the postseismic displacement field, preliminary timeseries analysis suggests that more than one physical process may be contributing to the on-going surface displacements: mantle relaxation, afterslip and possibly induced aseismic slip on a deeper segment of the Queen Charlotte Fault located offshore of southern Moresby Island. Data collection is on-going and subsequent analyses are expected to provide a better understanding of the earthquake cycle in this region.

Reference: Nykolaishen, L., H. Dragert, K. Wang, T. S. James, and M. Schmidt (2015). GPS Observations of Crustal Deformation Associated with the Mw 7.8 2012 Haida Gwaii Earthquake. Bulletin of the Seismological Society of America (in press).

Hydrology Section

Submitted by Bill Quinton



Since the last issue of Elements, the Hydrology section has introduced two new subcommittees: Northern Research Basins Committee and ii) Committee on Isotope Tracers (<http://cgu->

ugc.ca/sections/hydrology/committees/). The Section appointed as the Member-at-Large, Dr. Tim Duval (University of Toronto) to oversee the renewal of sub-committees in areas of interest to the Hydrology Section. HS members are encouraged to propose new and/or renew previously active sub-committees. The Special Issue of Hydrological Processes for the Canadian Geophysical Union – Hydrology Section was published in July, 2014 (Vol 28 Issue 14) and featured 15 articles. The special issue for the papers presented at the May, 2014 CGU-HS meeting will be published in August, 2015. The CGU-HS has joined with the BS and ESP sections for the purpose of the eastern student meeting. This joint meeting will be hosted by the Cold Regions Research Centre at Wilfrid Laurier University on 7 February, 2015.

REPORT FROM CHAIR OF CGU AWARDS PROGRAM

Submitted by Kristy Tiampo

Best Student Paper Awards

CGU offers ten awards to recognize outstanding performance in scientific research and presentation by students: <http://cgu-ugc.ca/awards/best-student-paper-awards/>.

While those interested in applying should go to the website for specific details on each award, please note that submission deadlines fall into the following three categories:

1. Papers and presentations judged at the CGU annual meeting in May 2015.
2. Papers for which the deadline is April 1, 2015.
3. Both the Don Gray Scholarship in Canadian Hydrology and the Stan Paterson Scholarship in Canadian Glaciology had a deadline of January 15, 2015.

Student Travel Support: CGU offers student travel support to the CGU annual meeting. The deadline is April 1, 2015. The application form is available at: <http://cgu-ugc.ca/awards/student-travel-support/>.



Canadian Geophysical Union

Union Géophysique Canadienne

A strong CGU is a strong voice for Canadian geoscientists. The CGU represents the interests of Canadian geoscientists in many ways, such as in organized scientific meetings, interactions with funding agencies, and in advocacy of the role of science in society and policy-making.

Earth Sciences are key to Canada's prosperity, safety, sustainability and sovereignty. Understanding the processes involved in Earth Sciences forms the basis of efficient and effective management of Earth's resources and underpins modes of lessening threats of some devastating Earth processes.

Membership in CGU implies:

- Membership in an organization dedicated to the advancement and dissemination of geophysical research;
- Opportunity to nominate, recognize, and celebrate the achievements of other Canadian geoscientists and students through various awards;
- Eligibility for receiving prestigious awards – for well-established scientists, young scientists and graduate students, as detailed on the CGU website;
- Provision of connections within and between CGU Sections through newsletter and website;
- Opportunity for members to post job openings, especially important for graduate students;
- Affordable membership fees relative to many other organizations;
- Contributions towards developing the next generation of geoscientists;
- Possible participation in regional student and other conferences.

CGU Annual Meetings provide special opportunities:

- To present current research to the geoscientific community and learn about the activities of other scientists – something particularly important to students;
- To emphasize Canadian-focused research alongside research of more general interest;
- To attend presentations on leading edge research from renowned scientists;
- To interact with other Canadian geoscientists and special Invited Speakers;
- To attend information sessions held by granting agencies;
- To be more visible to fellow Canadian geoscientists as some of them would be reviewers of grant applications;
- To enlarge social networks as Annual Meetings are often held with other organizations.

Become a member of CGU and enjoy the benefits! www.cgu-ugc.ca

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Editor's Note: ELEMENTS, the newsletter for the Canadian Geophysical Union, is published and distributed to all CGU members twice each year; one Summer issue and one Winter issue. We welcome submissions from members regarding meeting announcements or summaries, awards, division news, etc. Advertisements for employment opportunities in geophysics will be included for a nominal charge (contact the Editor). Notices of post-doctoral fellowship positions available will be included free of charge.

Submissions should be sent to the Editor:

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Electronic submission is encouraged