

GEOSCIENCE AND GENDER

THE PROBLEMS OF THE PAST AND THE NEEDS FOR THE FUTURE

Sarah Devriese, PhD, GIT

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University of British Columbia

WHO ARE WE?

- There are approximately **12,600 geoscientists** in Canada
- Geoscientists = geologists, geochemists, and geophysicists
- How many are women?
 - Any guesses?
 - 10%?
 - 20%?
 - 30%?
 - 40%?

WHO ARE WE?

- There are approximately **12,600 geoscientists** in Canada
- Geoscientists = geologists, geochemists, and geophysicists
- How many are women? **Only 19% are women**





WOMEN GEOSCIENTISTS IN CANADA (WGC)

- **Our mission**

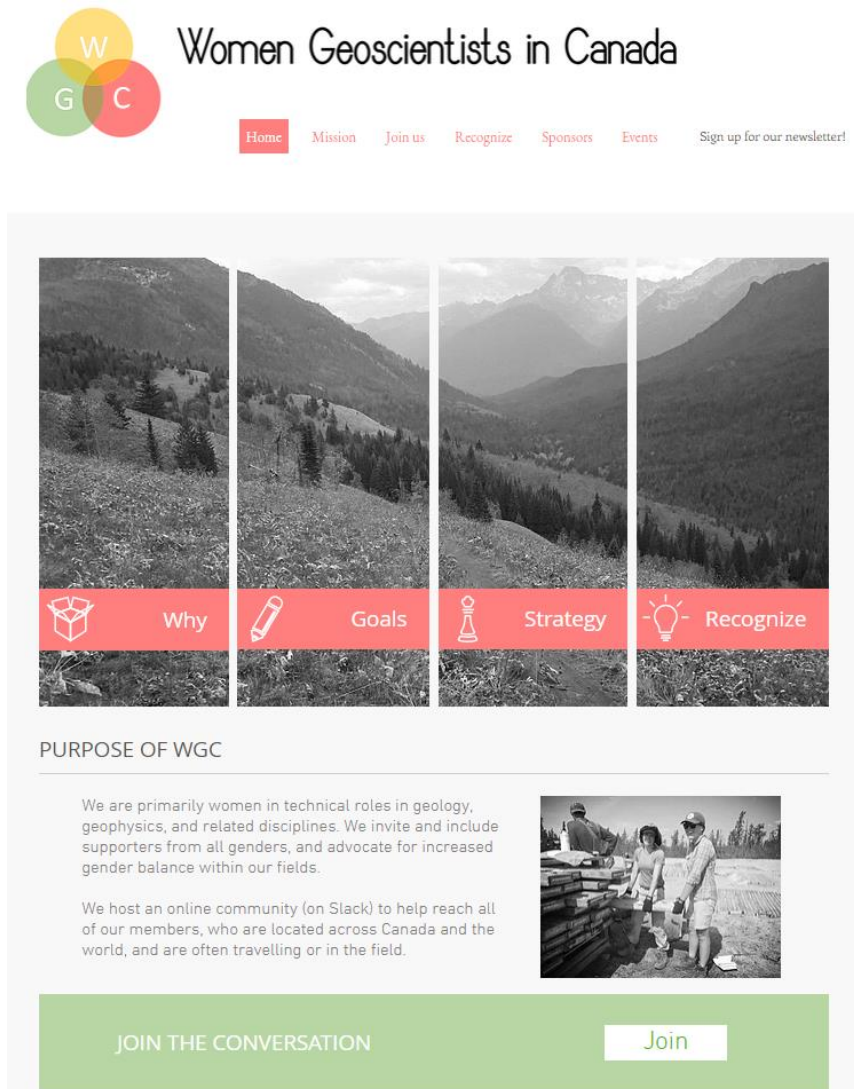
- Retain women in geoscience and reach gender diversity at all career levels

- **Our strategy**

- Online community to foster relationships and belonging
- Encourage participation to elevate women into leadership positions
- Demand action from societies and companies to break down barriers
- Mentorship program to coach and direct young geoscientists

OUR FIRST YEAR

- Started a Slack community and created a website
- Held 5 meet-ups in Vancouver, Toronto, and Keystone
- Presented talks in Saskatoon, Sudbury, and Vancouver (today!)
- Co-sponsored a public speaking workshop
 - Sponsored 2 female students to attend
- Monthly newsletter and blog posts
- Social media presence (@WIM_WGC on Twitter)
- Blossoming alliance with Women In Mining BC and #metoomining
- Talks/meetings with AMEBC, PDAC, SEG, and APGO
- Six geoscientists on our board; monthly executive meetings





THREE THOUGHTS THAT BUG US

- Retention
- Our image
- Representation

AND WE'RE RESEARCHING AND
STARTING CONVERSATIONS ABOUT



RETENTION

IN UNIVERSITY

- **40-50%** of undergraduate geoscience degrees in the US and Canada, depending on the source. Yet our workforce only consists of **19%** women.

- So what happens after graduation?

- How do we stop the “leaky pipeline”?

- **Retention** is a key issue in our industry!

Table 1. US and Canadian comparisons of geoscience degrees awarded to women and the percentages by rank of female geoscience faculty. Note that the Canadian data report student enrolment rather than degrees awarded.

Academic Rank/Degrees Awarded	USA percentages as of 2002 (Holmes et al. 2008)	Academic Rank/Student Enrolments	Canadian percentages as of 2005-06 (CAUT 2009)
Full Professor	8.0	Full Professor	10.6
Associate Professor	14.0	Associate Professor	23.7
Ph.D. Degree	34.0	Ph.D. Enrolment	34.4
Masters Degree	45.0	Masters Enrolment	48.9
Bachelors Degree	42.0	Bachelors Enrolment	45.0

Nentwich, 2010, Geoscience Canada, Vol 37, No 3
<https://journals.lib.unb.ca/index.php/GC/article/view/18399/19870>

IN INDUSTRY

- A tremendous cost goes into training every newly hired geoscientist
 - Why lose that talent 5-10 years in?
- Our industry is aging... we need fresh ideas and people to take over
- More diverse teams have shown to be more productive and more risk-averse



OUR IMAGE



BATTLE UNCONSCIOUS BIAS

- “Heidi Roizen was a successful Silicon Valley venture capitalist who became the subject of a case study at Columbia Business School.

Professor Frank Flynn, presented half his class with the case study with Heidi’s name on it and gave half the class the same case study with her name changed to “Howard”.

The students rated “Howard” and Heidi, equally competent, but they liked Howard, but not Heidi.”

- That’s unconscious bias and we are all guilty of it

BATTLE UNCONSCIOUS BIAS

- Use inclusive language
 - Instead of “hey guys”, try “hello folks”
- Consider removing/marking out names when looking at resumes/papers
 - Benefits unconscious bias against women but also minorities
- Add or advocate for unconscious bias training
 - Increases awareness, how to recognize, and address
 - implicit.harvard.edu/implicit/canada/ or google “Harvard implicit”
 - <https://onlinelearning.cornell.edu/diversity-and-inclusion> Cornell University online course on diversity and inclusion... maybe UBC has something too?

ZERO TOLERANCE FOR HARASSMENT



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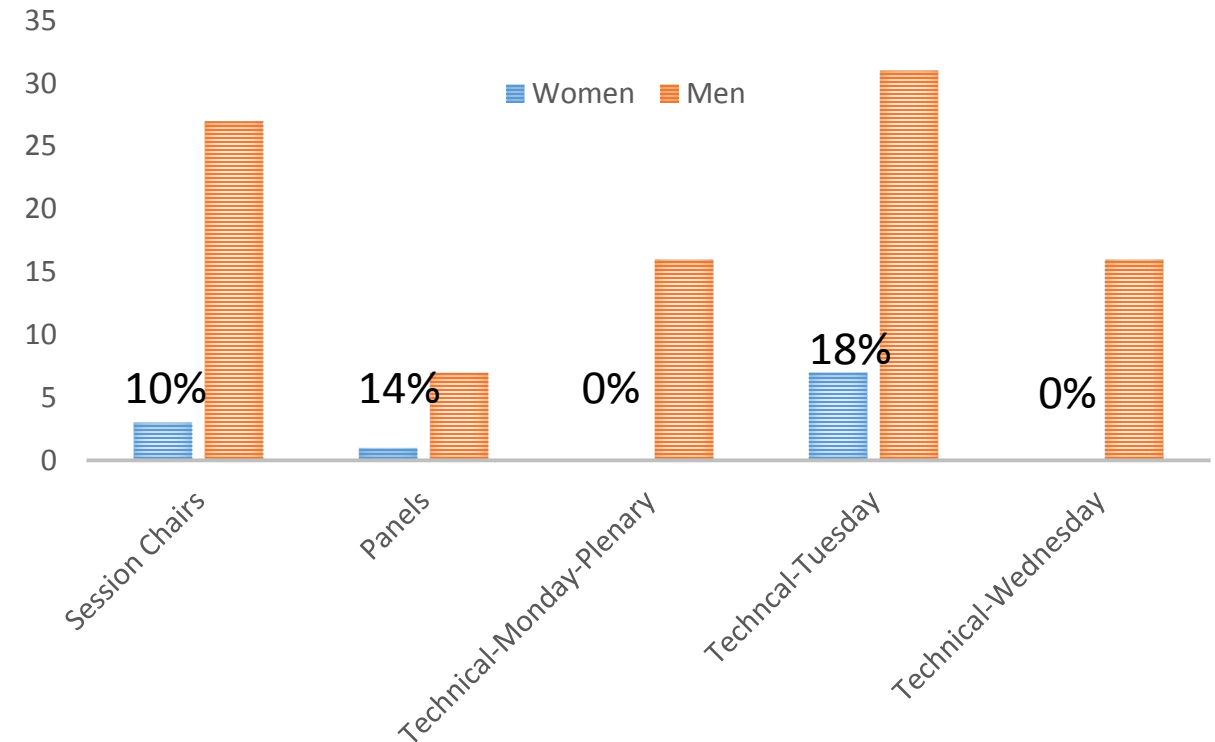
- To employers/universities
 - Check your policies and ensure there are clear procedures for reporting and dealing with harassment at all levels
 - Make part of safety culture and announcements
 - Advertise the zero-tolerance policy in common rooms
- To employees
 - If you are a victim, find a way to report it
 - If you witness something, SPEAK UP!
 - Get the victim out of the situation
 - Interrupt the situation
 - Tell your superiors about the situation



REPRESENTATION

TAKE A LOOK AT ANY CONFERENCE...

- Chances are women are underrepresented in technical talks, as session chairs, and on panels
- Our observations confirm this from different conferences.
- And there's published research on this too.



Exploration '17 (October 2017) conference in Toronto

WHO ATTENDS CONFERENCES?

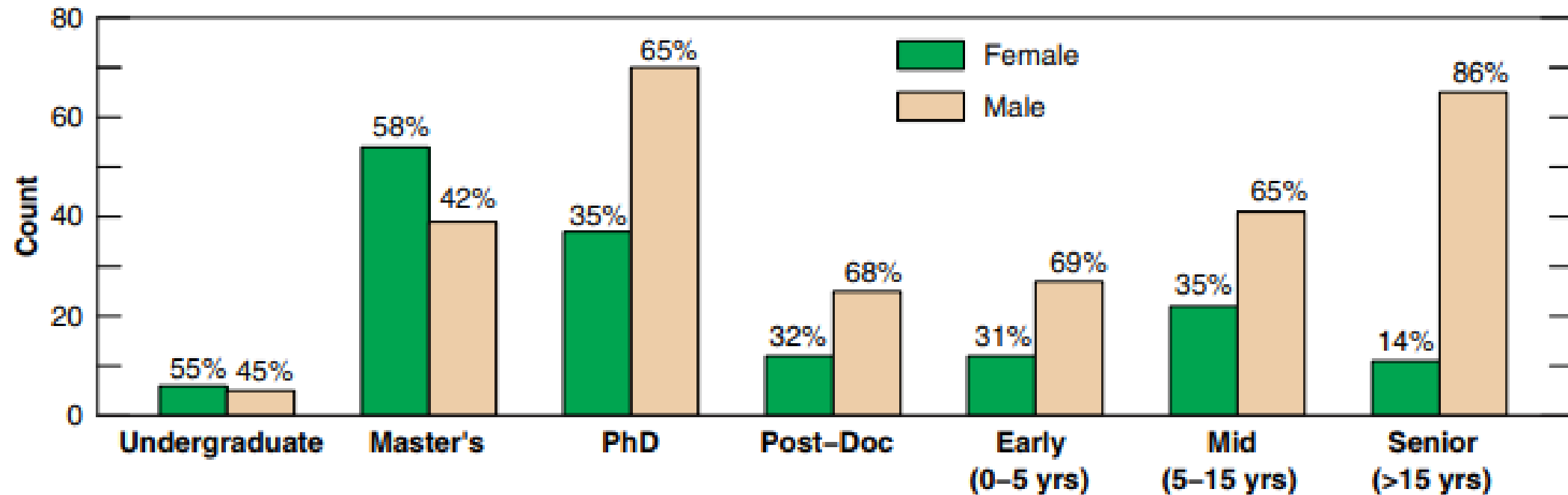


Fig. 1. Count of conference registrants by career stage. Note that career stage was self-identified by the registrants upon conference registration. Percentages correspond to fractions within each career stage.

WHO PRESENTS AT CONFERENCES?

Table 2. Demographic breakdown of conference attendees giving oral, invited, and poster presentations.

Presentation type	Number of presenters	Number of female presenters	Female presenters (%)	Number of male presenters	Male presenters (%)	Number of student presenters	Student presenters (%) ^a	Number of female students	Female students (%)	Number of male students	Male students (%)
Poster	149	57	39	92	61	92	62	40	70	52	57
Oral ^b	256	72	28	184	72	100	39	39	54	61	33
Invited oral ^c	21	4 ^c	19 ^c	17	81	NA	NA	NA	NA	NA	NA

^aIncludes undergraduate, Master's, and PhD students.

^bIncludes invited speakers.

^cDoes not include plenary talks. There were four plenaries in total, two of which were given by women.

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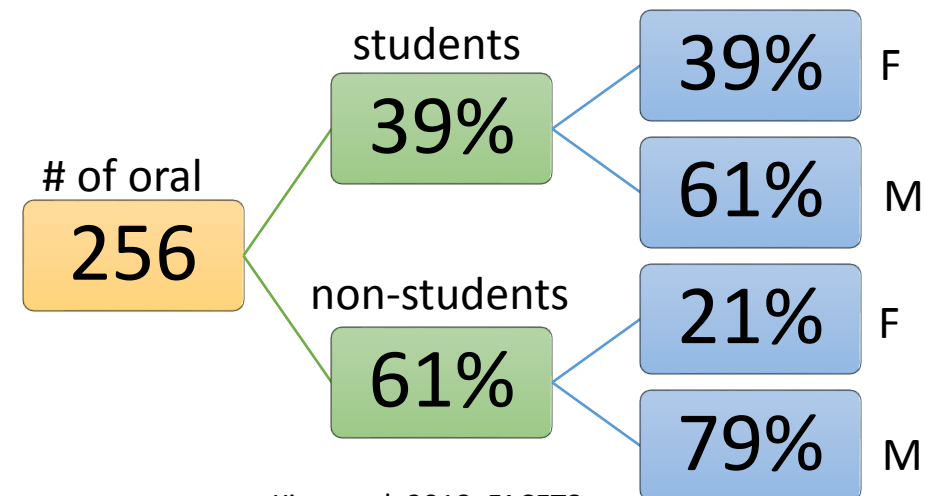
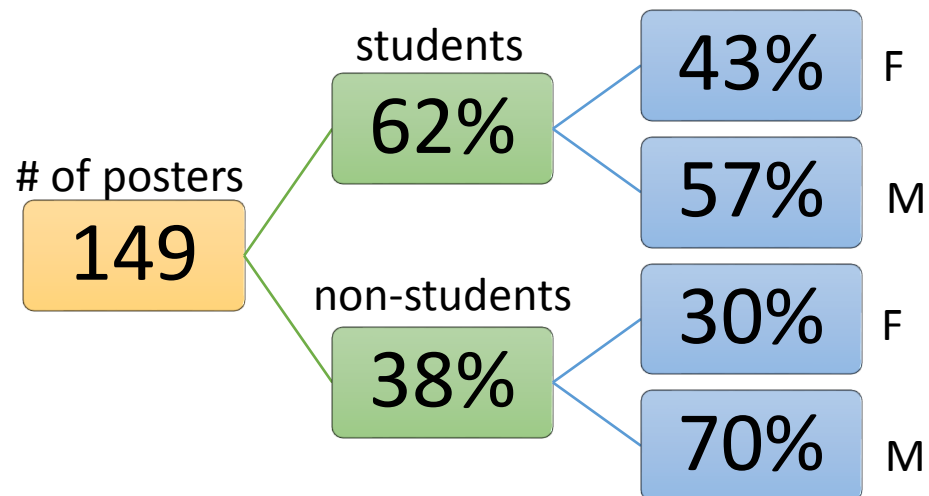
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THREE THOUGHTS: SUMMARY

- Retention
 - Fix the leaky pipeline
 - Retain the current workforce is more economic than hiring and training
- A new image
 - Address unconscious bias
 - Zero tolerance for harassment
- Better representation
 - Send more women to conferences
 - Demand professional societies to resemble their membership as chairs, committees, etc



THANK YOU

- Please check out our website: www.WGCanada.org
- Sign up for our monthly newsletter via the website
- Join our forum on Slack: <https://goo.gl/pabfXu>
or email us to get an invite
- Email us: WomenGeoscientistsCanada@gmail.com



NATURE COLLECTION ON ACHIEVING DIVERSITY IN SCIENCE

- <https://www.nature.com/collections/qsgnpdtgbr>
- Including
 - Gender inequity in speaking opportunities at the American Geophysical Union Fall Meeting
 - <https://www.nature.com/articles/s41467-018-03809-5>
 - Steps to improve gender diversity in coastal geoscience and engineering
 - <https://www.nature.com/articles/s41599-018-0154-0>

TIME LINE

- **Next 1-2 years**
 - Compile statistics – what is the situation now?
 - Research – what barriers do we face?
 - Promote opportunities
- **Next 2-6 years**
 - Advocate for representation of women at conferences and symposiums
 - Provide networking opportunities and mentorship program
 - Support parents pre- and post-parental leave (including work re-entry)
- **Next 7-10+ years**
 - Check in at Exploration '27 – how are we doing compared to Exploration '17?
 - Re-evaluate statistics from first year
 - Continue supporting, encouraging, and engaging women in geoscience careers

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