The NSERC PermafrostNet Science Communication Toolbox for Researchers – An Evaluation

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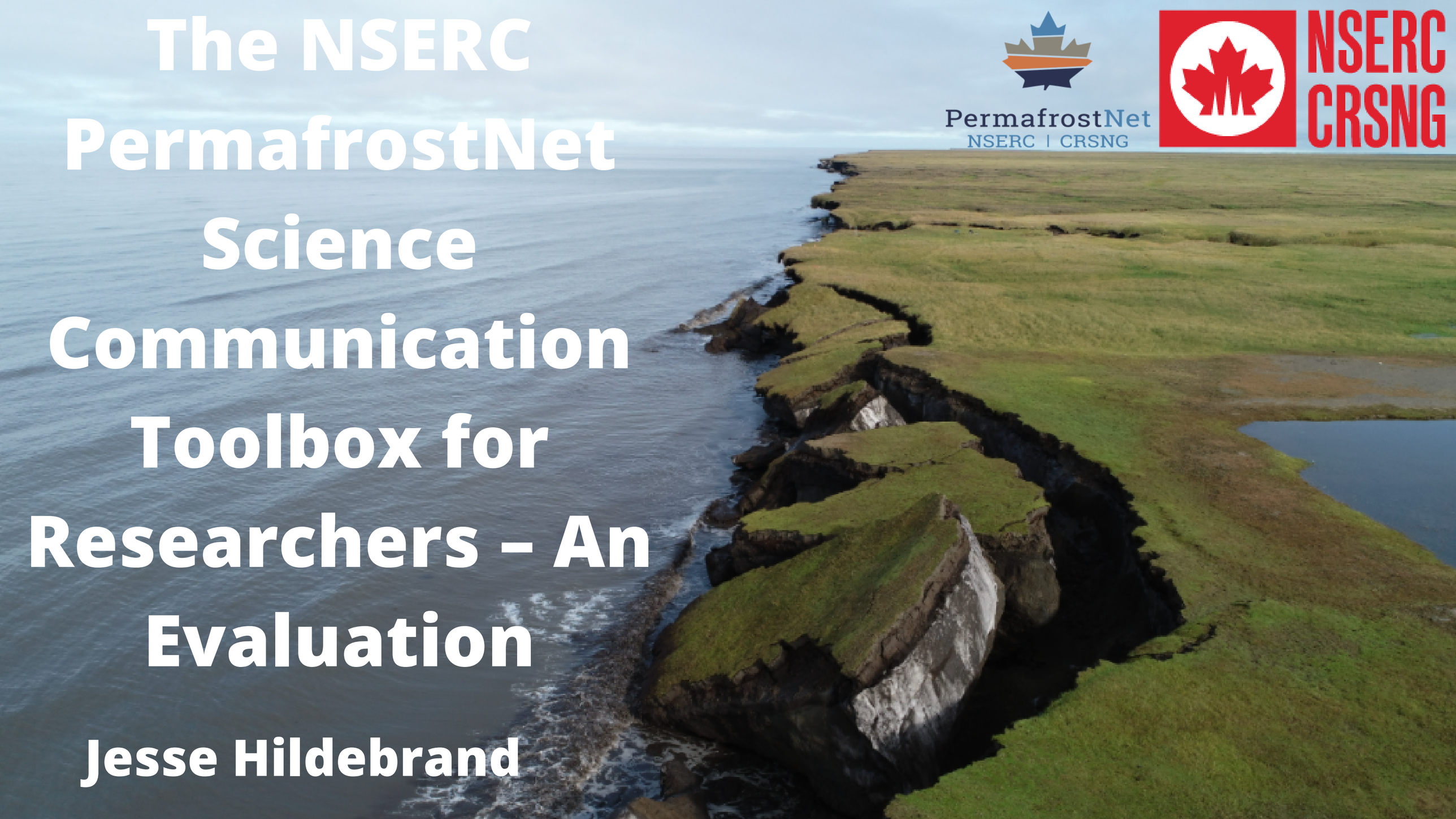


1. Summary

The purpose of this evaluation is to provide an external perspective on the NSERC PermafrostNet science communication training course which took place from January 6th, 2021 to March 31st, 2021. Sources of data for this evaluation include qualitative assessments of the preparatory work done by the program coordinator team, Pre-course evaluation detailed surveys, in-workshop polls, and summative interviews with course attendees. This independent evaluation was commissioned by NSERC PermafrostNet and funded by the National Science and Engineering Research Council

2. Methods

Evaluator co-developed survey and poll questions with the program coordinator team. Evaluator attended or viewed every workshop session. Analytics data were gathered by the course team. Interviews were 20 minutes in length and conducted by the evaluator online. All data gathered by the program coordinators was shared with the evaluator to allow for analysis and reporting

3. Results

Pre-Course Assessment

The project team created a well rounded and diverse slate of seven workshops designed well to appeal to their target audience. Their willingness to discuss and deliberate to make their programs maximally effective was noteworthy, as was their willingness to bring in more skilled and experienced guest speakers on topics where they lacked personal in depth expertise. Drawing on real world science communication examples and providing ample opportunity for participant engagement within sessions were key decisions. Incorporating a flexible approach to running the workshops to learn from mistakes and listen to attendees was a strategy from the get go and a very uncommon one.

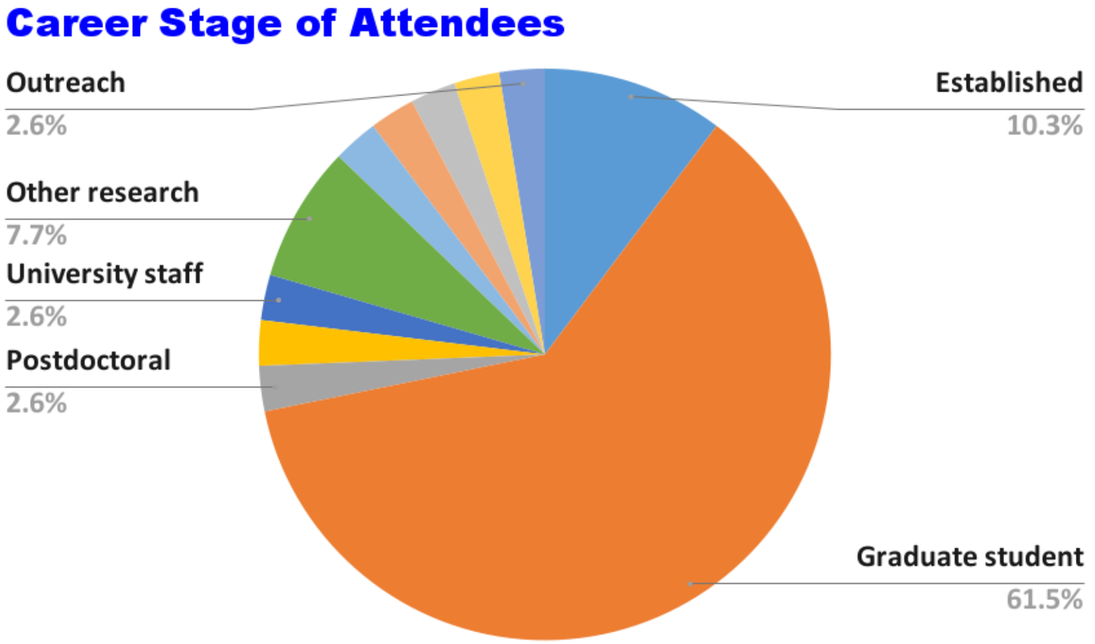
The project team provided a large number of easily accessible, easy to use resources to bolster the learning of participants. A Microsoft Teams channel allowed for participants to ask questions and connect with coordinators. Alongside background readings, activities, recordings and templates of great examples of science communication, this was a very beneficial supplement to the course.

Finally, the team had clear goals for their workshops and for measuring their impact. Funded science communication workshops and training courses are just beginning to come to Canada in earnest, and the NSERC PermafrostNet team was very deliberate in planning this one as a potential future model for others to follow.

Participant Demographics

For the NSERC PermafrostNet SciComm course 39 people registered. 25 female researchers and 14 male researchers were drawn from institutions across Canada and beyond, representing 7 Provinces and Territories (plus Japan and Germany), and nearly 20 Universities, government bodies and surveying companies. There was a wide range of expertise levels, including established researchers and trained outreach scientists, with over half the registrants listing themselves as graduate level researchers. 4 reigstrants identified themselves as visible minorities, and 1 identified themselves as Indigenous.

Chart 1. Career Stage of Attendees



Surveys

Each participant was invited to participate in a pre-course survey.

The survey was designed to gather demographic data around where participants were joining the course from, their organization/university affiliation, as well optional questions as their gender, and status as an Indigenous person, minority or person with a disability. The goal was to get an understanding of just who within the NSERC PermafrostNet community was interested in attending the course, and to assess whether the course was appealing to those historically excluded from scientific professional development opportunities.

Questions were included on why participants were taking the course and hoped to gain from it, as well as the concerns, hopes and expectations they had going in.

Finally, detailed queries were made on the specifics of science communication activities participants had engaged in in the past, and their own confidence in engaging in those activities. These questions led coordinators to facilitate direct in-workshop testing out and trying of certain activities (writing social media posts, creating visual science communication aides) and so were an important facet of the development of the course.

Surveys

Table 1. Attendee Responses to "Why are you taking this training workshop?"

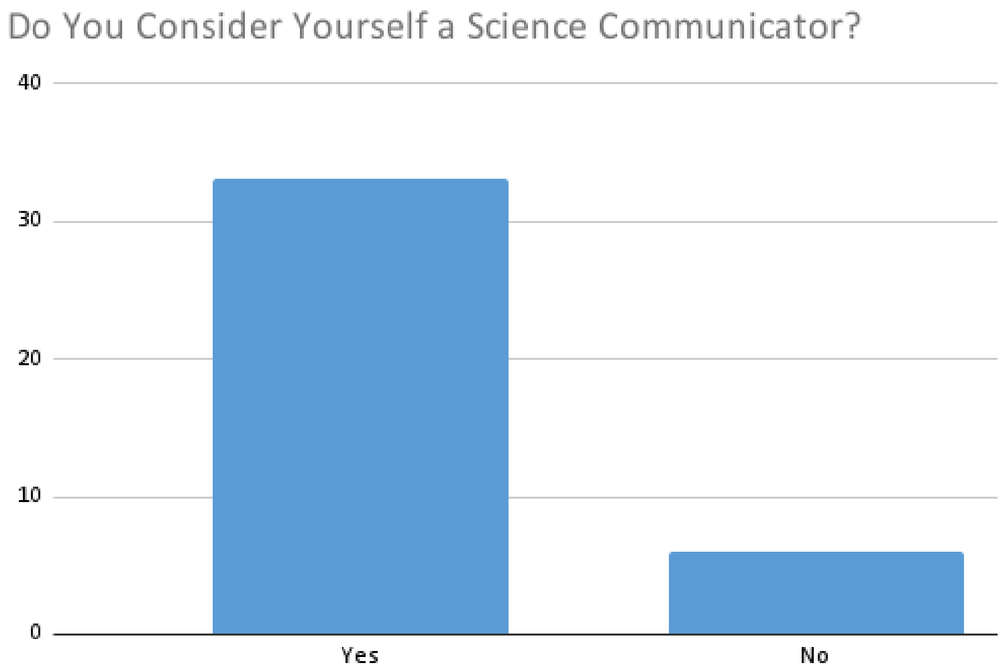
Why are you taking this training workshop i.e. what do you hope to learn and what skills do you hope to gain out of it?
I am starting my PhD this year and I want to learn how to best communicate my research to stakeholders and community members that could benefit from it.
I would like to get tips on how to engage/keep interested a non-specialist audience (or specialist for that matter), especially with English as a second-language
As it has been several years since I've attended workshops on Science Communication and I've mainly presented to audiences who were relatively familiar with my field of research, I would like to get a refresher on and learn about newer techniques how to effectively communicate to a broader audience and what the key aspects to keep in mind / what to avoid are or to learn about ways to keep the audience engaged.
Develop a greater understanding of how to communicate to a generalist audience, and how to be more engaging online.
Improving my ability to concisely and clearly present scientific findings, particularly in figures
To learn from others.

Attendees listed a wide array of reasons for wanting to take part in the course. From starting out in their fields and wanting to begin their professional lives as effective communicators to experienced professionals looking for a refresher. Many highlighted the importance in particular of hoping to become more effective at influencing policy and engaging with Indigenous communities.

Surveys

Attendees were asked first if they considered themselves a Science Communicator, with the majority (84.6% - see Chart 2) saying yes. Follow up questions detailed attendees past examples of conducting science communication activities, as well as their perceived confidence in doing those activities.

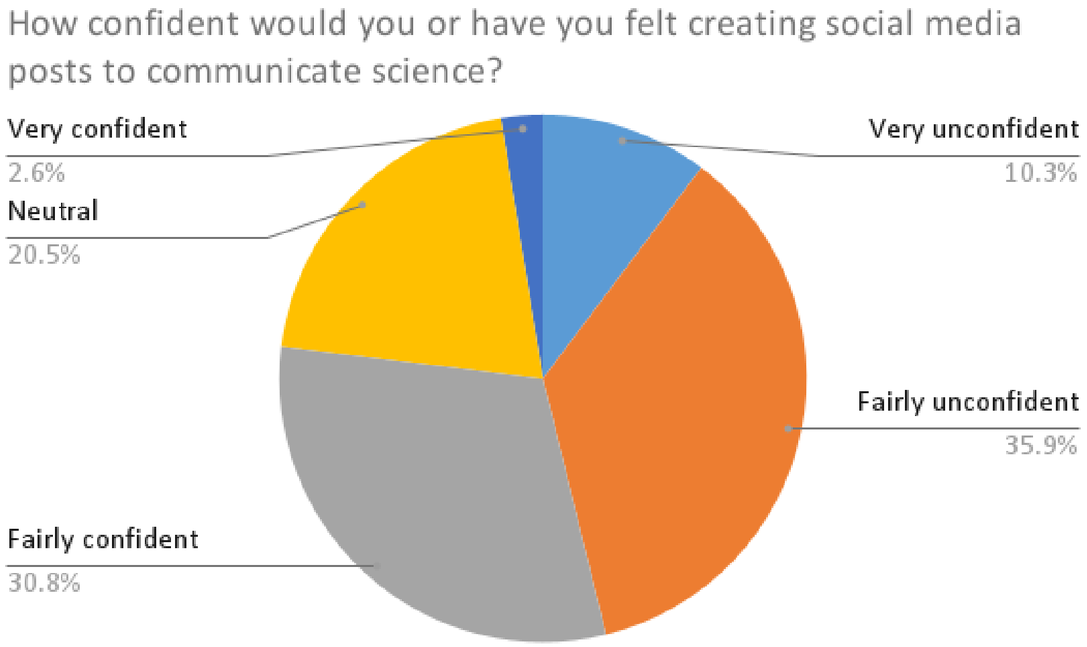
Chart 2. Do You Consider Yourself a Science Communicator?



Surveys

The overwhelming majority (75%+) of attendees had engaged in all four types of science communication in the last few years - notably having 'Giving a public presentation", "Created visual aides (posters,infographics), "Used social media to communicate science" and "Been an active participant in science policy discussions"

Chart 3: How confident would you or have you felt creating social media posts to communicate science?



In contrast to the fact that most attendees have actually done the communication activities this course is training for, a large percentage (often a clear majority) did not express confidence in their ability to do so effectively. Particularly social media post creation and taking a lead in policy discussions.

Surveys

As a final query in the pre-course surveys, participants were asked if there was anything else they'd like to add about their expectations, hopes, or concerns about the process or what they'd be getting through the workshops

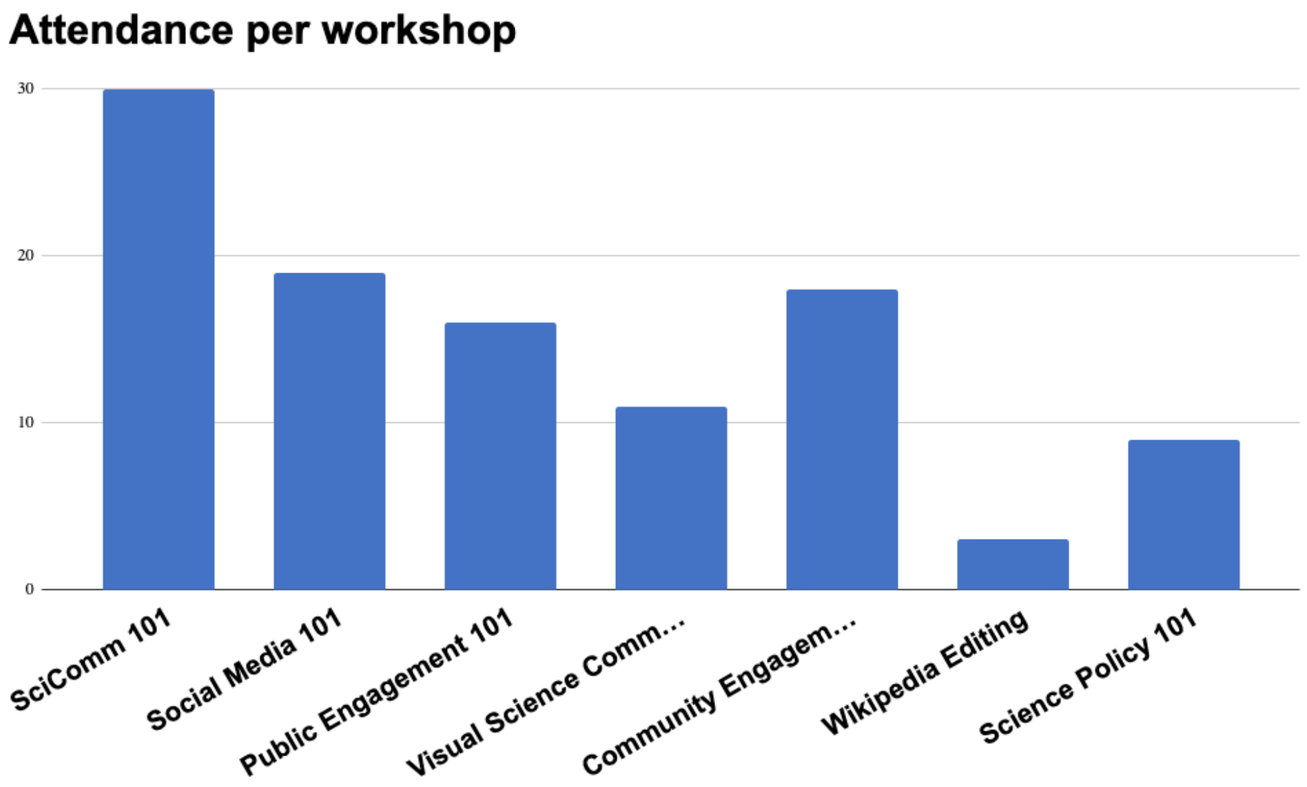
Table 2. Attendee Final Thoughts, Hopes, Expectations, Concerns

I hope you provide examples of good and bad science communication. Thanks for all your work! :)
I saw in the email that the workshops will be recorded for those who can't attend, which is great as I'm not sure if I'll be able to attend the following ones.
I'd like to learn about science communication in a more "professional" way than we can do in a self-taught way, applied to scientific knowledge. Thanks a lot for this opportunity !
It would be great to have summary documents for each of the workshops with the key ideas and resources.

Predominantly, the feedback in this final section highlighted the participants' excitement at the opportunity, their hope for concrete examples of effective communication and a more formal training opportunity, and for the programs to be archived to watch at a later date.

Workshop Attendance

Chart 3. Attendance per workshop



Considering the difficulty of scheduling a 1.5 hr block to attend each workshop, the attendance was exceptionally high - averaging nearly 40% of all registrants (15 people) live per program. SciComm 101 had over 75% of all those registered (30 people) attend live.

In the Pre-Survey participants were asked which sessions they were interested in attending and many had very specific choices, which I believe accounts for the drop in attendance from session 1 to most of the others. Wikipedia editing is the only true outlier with only 3 attendees.

Workshop Assessments

Each workshop had surveys at the halfway point and at the end assessing participant understanding of the concepts being taught to ensure the programs were achieving their aims and to allow for modifications if necessary. The data is unequivocal that the concepts in every program were understood by a significant majority of attendees.

In SciComm 101, 92% of respondees (23 people) 'agreed' or 'strongly agreed' they understood the concepts presented throughout the workshops first half, and all 24 respondees 'agreed' or 'strongly agreed' that they understood the concepts presented through the second half. In no session did more than 8% of respondees choose 'disagree' or 'strongly disagree', a testament to the skill of the primary and guest presenters.

Of Note

In two early workshops, an additional question was posed about whether a discursive format (featuring large and small groups breaking off to discuss and reconvene to share ideas) was an useful format for covering a topic and in both cases 90+ % 'agreed' or 'strongly agreed'. This query was added to see if the coordinator plan to include such opportunities throughout the course was being well received, and with that being the case the discursive format was incorporated into most future workshops.

Post-Course Interviews

Six participants agreed to join in for 15-20 minute informal interviews about their experiences in the course. Questions focused on how participants discovered the course, what prompted them to take part, which workshops they attended, what they enjoyed/didn't like, and if and how they planned to utilize the skills they gained. Several key threads emerged from all the interviews:

- The NSERC PermafrostNet newsletter was the primary way people found out about the course, with many also listing direct outreach by program coordinator Dr. Tristan Maclean as being key to their taking part.
-All attendees had never done formal science communication training before and were excited to do so.
-Everyone thoroughly enjoyed the sessions. Special mention was made of the benefits of guest speakers for programs, the variety of topics covered and that they were recorded to return to later.
-All but one interviewee were fond of being able to gather in small groups to actually practice the skills in the sessions. Their reason was not liking being 'put on the spot'.
-Workshops were noted by several as being too long - with one hour listed as a better alternative length in future.
-With the pandemic situation noted as being an extenuating circumstance, all interviewees are keen to utilize the skills they gained during the course, and feel much more confident and prepared to engage in a wide array of science communication methods in the months and years to come.

Conclusion

The preparation and skill of the coordinators was crucial in rolling out an effective and well received science communication training course, attended by a diverse audience from across the entire NSERC PermafrostNet network. On both quantitative and qualitative metrics, the course was a success - with high rates of participation and knowledge acquisition, and as evidenced in the interviews a keen desire to utilize the skills gained as soon as possible in a variety of formats.

Special note should be taken on the importance of recording all the workshops to allow for later viewing, the use of guest speakers who can provide diverse perspectives, and the importance of in session opportunities to practice the skills being taught (social media posts, public speaking etc.)

By way of modifications to future workshop courses, the 1.5 hour run time of the workshops was noted as being overly long with a recommendation to shift to 1 hour programs. The significantly lower attendance for the Wikipedia Editing workshop would also indicate that it should be the lone removal from an otherwise very well attended slate of programs.

Appendix 1.Pre-Course and in-workshop questions

The questions asked during the pre-course survey were:

-Name
-Please Indicate your career stage
-Please provide the name of your institution/organization
-Please indicate the province/territory or country you are located in
-Gender (optional)
-Do you identify as Indigenous (optional)
-Do you identify as a person with a disability (optional)
-Do you identify as a member of a visible minority in Canada (optional)
-Do you consider yourself a science communicator?
-Why are you taking this training workshop i.e. what do you hope to learn and what skills do you hope to gain out of it?
-Have you done a public presentation, in person or virtually, to a non-specialist audience in the last 3 years?
-How confident would you or have you felt doing a public presentation to a non-specialist audience?
-Have you created visual science communication aids (including posters, infographics) in the last 3 years?
-How confident would you or have you felt creating effective visual materials to communicate science?
Have you used social media (Twitter, Instagram, Facebook, Tik Tok etc.) to communicate scientific concepts in the last 3 years?
-How confident would you or have you felt creating social media posts to communicate science?

Appendix 1.Pre-Course and in-workshop questions (cont.)

-If you would like to connect on social media please provide your details here.
-Have you been an active participant in science policy discussion (with government or community stakeholders) in the last 3 years?
-How confident would you or have you felt taking an active role in a science policy discussion around your work?
-Which workshops do you plan to attend?
-The evaluation of this workshop is meant to be as open as possible - is there anything else you'd like to add about your expectations, hopes or concerns about the process or what you'll be getting...

Appendix 1.Pre-Course and in-workshop questions (cont.)

The questions asked during in-workshop polls were

I understood the concepts presented during the first/second half of the workshop
Strongly Agree
Agree
Neutral
Disagree
Strongly Disagree

In addition, several workshops has specific polls pertaining to their subject matter, notably:
-Did you ever edit a wikipedia article before?
-On what scale do you expect your research to influence policy?
-Can you clearly see the implications of your research on decision making?
-Does your research involve impacts on human settlements?
-How much do you know about land use planning?

Appendix 2.Post-Course Interview Questions

Every effort was made to make each interview feel unique and personal to the participant. An introduction of the evaluator began each session, as well as a general and casual conversation learning about the participants work and life generally. It is my opinion that this sets the tone for the whole interview and helps facilitate more candid and helpful answers.

More set questions included:

-Where did you hear about this course?
-Had you ever done any science communication training before this?
-What prompted you to take the course?
-Were there any workshops in particular you most wanted to do? Why? Were there any you had no interest in? Why? What did you end up taking?
-Did you enjoy the course? Were there any parts you didn't like?
-Any general feedback on the way things were run that you would do differently?
-Have you had the chance to utilize any of the skills you learned during the course and if not do you plan to?

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