Supplement of Geosci. Commun., 8, 339–356, 2025 https://doi.org/10.5194/gc-8-339-2025-supplement © Author(s) 2025. CC BY 4.0 License.





## Supplement of

## From 5 to 35: fostering the next generation of Arctic scientists

Jenny V. Turton et al.

Correspondence to: Jenny V. Turton (jenny@arcticfrontiers.com)

The copyright of individual parts of the supplement might differ from the article licence.

Table S1: List of countries which have been represented by participants of the Emerging Leaders program and the year in which they have participated. The residence of the participant (or their institution) and not the citizenship of the participants is collected. Listed alphabetically. During the COVID19 pandemic, the 2021 Emerging Leaders program was run online with 25 participants being chosen from the previous 5 annual cohorts, therefore 2021 is not included in the table.

Residence of	V (D
Participant	Year of Participation
Austria	2016, 2022
Belgium	2020
Canada	2014 - 2024
China	2018
Denmark	2020, 2022
Finland	2014, 2016
France	2018, 2023
Germany	2015, 2018, 2019, 2020, 2023
Greece	2020
Greenland	2018
Iceland	2017
India	2019, 2020, 2024
Ireland	2018 - 2024
Italy	2022
Netherlands	2017, 2018, 2019, 2023, 2024
New Zealand	2016
Norway	2012-2024
Poland	2014, 2022
Russia	2012, 2016-2022
United Kingdom	2016, 2020, 2023, 2024
Ukraine	2019
United Arab Emirates	2013
United States of America	2012-2024

## Criteria and Evaluation of Applicants for Emerging Leaders and Student Forum

The Student Forum and Emerging Leaders programs require participants to apply to the program and be selected to take part. This is due to the high interest in the programs, with many more people applying than spaces to accommodate them, and due to specific requirements of certain funding agencies (which differs depending on the funding provider).

Ensuring a diverse range of participants is essential to all Young Programs. The only strict criteria are that the participants must be between 18 and 35 years old for the Emerging Leaders program and a full-time bachelor or master's student for the Student Forum.

For Emerging Leaders, the evaluation criterion is two-fold: points based on individual assessments and considering the group as a whole. Individual assessments evaluate the responses of three questions and a motivational video. The questions are: 1) what their field of interest/engagement in the Arctic is, 2) why they wish to participate in the program, and 3) what their expectations for the program are. Reviewers look for clarity, an obvious relationship to the Arctic, accomplishments, drive and a strong engagement, and a true interest and value in the candidate's participation. The 30-second motivational video is used to understand their connection to the annual theme (e.g co-existence). The reviewers look for a personal answer which expresses the candidate's expertise but demonstrates a broader consideration. The candidate should also showcase clear and concise communication. If the candidate is a member of an Indigenous community or from an Arctic/Northern community (definition differs depending on the country's definition of the Arctic and disadvantaged northern areas), then this provides an additional point.

Secondly, the reviewers consider the group as a whole. An aim of the Emerging Leaders program is for the participants to learn from each other, especially regarding the realities of Arctic life from different countries. Therefore, diversity within the group with respect to age, gender, nationality, profession and/or research area is evaluated. The applicants must provide a CV and demographic information for this part of the evaluation.

For the applicants are firstly split into different funding pools, based on which institution they study at, as different funding amounts are ring-fenced for students from specific countries or regions. The applications are evaluated anonymously, to reduce the unconscious bias of the evaluator. Following this, the students are graded up to four points based on their response to questions on their previous experience in international projects (with more points provided to those who have not previously had opportunities to travel), their connection and interest in the Arctic, and their expected outcomes from taking part in the project. Once the students are ranked, certain demographic information is then revealed, to consider the group dynamics, as it is important to consider all genders, backgrounds and study topics.

Table S2: Full quotes from the various programs. For the Science for Kids and Science for Schools quotes, some quotes have been translated to English (from Norwegian originally). Some of the Emerging Leader quotes are transcribed from videos taken during the program.

Program	Quotes
Science for Schools Teacher	As an educator, I feel a deep responsibility to inspire students to explore the Arctic region, recognizing how this fragile ecosystem impacts the entire planet. Arctic Frontiers 'Science for Schools' not only deepens students' knowledge of important issues in this region but also encourages them to become informed advocates for sustainability, and as future leaders to make choices preserving our world for the coming generations.
Science for Schools Teacher	Focus on real science. The students get an insight into what it really means to do scientific work.

Science for Schools Teacher	The opportunities students get to work interdisciplinary and that they get time to immerse themselves in a topic.
Science for Schools Pupil	It was fun to do my own research and be out and take my own samples.
Science for Schools Pupil	I enjoyed the opportunity to collaborate with researchers and the organisation.
Science for Schools Pupil	Good way to acquire knowledge.
Science for Schools Pupil	Nice to do something practical with a big project.
Science for Schools Pupil	It was very nice to work with researchers and to carry out practical work to collect data myself, and the poster exhibition was also a lot of fun.
Science for Schools Pupil	Nice to do a slightly bigger and more practical project.
Science for Schools Pupil	Arctic frontiers motivated me to further pursue scientific subjects, and aim for studies involving these.
Science for Schools Pupil	After the project I have continued to be aware and raise awareness around the topic of climate change.
Science for Schools Pupil	Fantastic project to be part of.
Science for Schools Pupil	I learned how interconnected everything in the Arctic is and how much the food chain depends on the algae. I also learned how many different factors there were to consider when trying to answer whether algae blooms would increase or decrease from increased temperature and how hard it was to determine what would really happen.
Science for Schools Pupil	Arctic Frontiers was an opportunity to apply skills I've learned from [school name] (researching & investigating, structuring & organizing the poster, and presenting) to a project with higher stakes. The project made me realize how all the skills I've learned in a school setting could be applied to a setting that seemed a bit more real. It became particularly real when we attended the real Arctic Frontiers conference and showed our work to scientists. Presenting at the real conference made me realize that the work we've been doing is a part of the work that many adults do for a living, and many of the skills are translatable. Presenting there also made me very conscious of the legitimacy of the work we've done, and the

Science for	sources we used. In a school setting, I found that it was never too dangerous if we used a questionably credible source because it was just schoolwork, but now we were presenting our <i>schoolwork</i> to real scientists who were serious about this kind of work. I don't think there was anything actually wrong with our sources, but it made me conscious of the importance of being critical when deciding what sources to use, especially in an important project. We actually ended up presenting in front of some researchers who were very knowledgeable about our topic, which made me realize how much more there was to learn.  That we got to try and see what it's like to do research.
Schools Pupil	That we got to try and see what it's like to do research.
Science for Schools Pupil	I was already interested in science before doing the Arctic Frontiers but the project gave me some hands on experience on what it was like to do research on the Arctic in a similar way that the actual scientists do it.
Science for Schools Pupil	I liked that you had to think quite a lot for yourself, and that you had to find a problem and do a project on it.
Science for Schools Pupil	Something new and different, it was fun to be presented and to be able to participate in AF itself.
Science for Schools Pupil	To meet researchers and get to present our work to people who know a lot about the field was great.
Science for Schools Pupil	Varied school work: Conducting a poster exhibition. Booklet accompanying the project.
Science for Schools Pupil	The people were committed and knew a lot.
Student Forum Participant	Don't miss out on this amazing opportunity! Two years ago I was fortunate enough to participate in the Forum myself and I met an amazing bunch of likeminded people, some of whom I still meet during conferences, work, and travelling.  If you want an opportunity to widen your network, meeting similar future leaders and experts, if you want to gain more skills during Arctic Frontiers and learn from others, be sure to apply and not miss out!
Student Forum Participant	Very interesting. Felt like I saw the bigger context around the specific thesis I'm working on. Good to learn by talking to people and listen, as an addition to reading in the library.
Student Forum Participant	Very interesting, educative and inspirational.

_	
Student Forum Participant	The mentoring seasons were extremelly useful . Seeing the perspective from someone who is already within the world we want to was a light of guidance among all the questions and uncertainty that surrounds our path already. I was also really glad that this person gave us personal advices and perspectives. The Friday group project were really interesting to listen and argue with my colleagues since I consider that the best to improve is by listening and adapting others thought to you own ideas. It was a bit dissapointing that the people on charge of the feedback was so polite that in the end I felt they were saying no so much in order to keep a polite possition in the posture. Ultimately, the Arctic Youth meeting was a fresh input into the subject and a vit of hope for the future.
Student Forum Participant	Very interesting and a great way to make the most out of the conference experience while being in contact with locals and students from other arctic countries
Student Forum Participant	The workshops were interesting and I enjoyed that we had the ability to actually discuss and think the issues within our different backgrounds. The Arctic Youth meeting was interesting but possibly could be aimed for a slightly younger participation or a slightly more information beforehand. I liked that the group work was not too strictly set and we could build the ideas.
Student Forum Participant	Eye opening to see different perspectives and opinions. Wish I did this earlier during my studies.
Student Forum Participant	I really enjoyed the student forum it was incredible to be able to have a groups of students to connect with at the conference.
Student Forum Participant	The student forum program was an amazing experience! It was an overwhelming week but extremely valuable and meaningful to me.
Student Forum Participant	The student forum program was the best experience I have had in my life and I think it will be the best forever. I think the program went smoothly and was greatly organized. In my opinion and I believe it's the same for my student peers, the length of the program was short. I would say a 10 or 12 days length would be perfect, with something like 3 days before the conference and 3 days after the conference in order for us to interact better and have a chance to share our thoughts for the help of the Arctic, because I believe that we as youth have the motivation, will, and knowledge to act and react.
Student Forum Participant	Great to have a varied group. Would like to have more arranged meetings with scientist and or politicians to voice our opinion.
Student Forum Participant	I am richer from this experience. It opened interesting collaboration opportunities and it was really stimulating and inspiring.

Student Forum Participant	The student forum was overall great and teachful experience. It was no nice to meet ppl (sic) from different countries and backrounds.
Student Forum Participant	Meeting all these people from different countries and making new friends. Some things, especially the group work were a bit rushed and sometimes the communication between leaders and students was not so smooth, for example some students knew about something that others didn't, when to be where etc. My overall favourite event was the last one on Thursday with APECS. It was nice to connect to people . The overall mood was super friendly and I'd 100 % recommend anyone to do this.
Student Forum Participant	Really good conference and as a student member, it was nice to have actually access to everything. The week is full of opportunities and also demanding and I would recommend this conference/student forum to other students to participate as well.
Student Forum Participant	It was okay, overall it felt like business as usual type conference. With big words like sustainability and talks about ambitions and policies that may or may not be implemented. It was in my opinion nothing new, and a little boring, because you have heard it before.
Student Forum Participant	'I got to meet all these new students from different backgrounds, different universities, giving new perspectivesgaining all this new knowledge about stressors in the Arctic.'
Student Forum Participant	'I think maybe my study direction is a bit clearer now.'
Student Forum Participant	'It has truly invigorated my passion for the topic of the Arctic and left me more ambitious than ever to tackle whatever is ahead.'
Student Forum Participant	'I am richer from this experience. It opened interesting collaboration opportunities, and it was really stimulating and inspiring.'
Student Forum Participant	'The mentoring seasons were extremely useful. Seeing the perspective from someone who is already within the world we want was a light of guidance among all the questions and uncertainty that surrounds our path already. I was also really glad that this person gave us personal advices (sic) and perspectives.'
Emerging Leaders Participant	This experience made it clear—youth voices are essential, but still underrepresented. We cannot wait, we need more young, diverse leaders at the decision-making table.  One fellow Emerging Leader's insight will stick with me: knowledge must flow across latitudes, connecting perspectives from East to West, not just North to High North or North to South.

Emerging Leaders Participant	'It's been such a great opportunity to engage with people outside my field, it's an excellent environment to expand ones horizon and to learn and it provides a great networking opportunity.'
Emerging Leaders Participant	'[The program] provided insightful and new perspectives and motivated and energized me to work towards these issues in the future.'
Emerging Leaders Participant	Prior to the conference it would be great to ask to each EL, what is your goal for the conference? Who would you like to meet, in which network would you like to be introduced? But also, what do you want to bring? What do you want to share with the others from your experience? We could better prepare the conference in term of networking and meeting people, but also we could better learn from each other in an adapted frame
Emerging Leaders Participant	'The week brought insightful conversation, enlightening experiences, and a hopeful view for the future. It was inspiring to hear the work that's being done in other countries.'
Emerging Leaders Participant	I really liked the concept of inviting participants from different sectors with different backgrounds where we discussed phasing today's challenges regarding Ocean Decade. Me as a participant highlighted that I often have discussions with other marine biologists and often agree with them since we "talk the same language". To be able to solve challenges I learned that it is important to have open mindset and include different perspectives towards a subject (the people with different background)! It also helps along to make even more people understand why it is important to solve these challenges we were discussing. I really like the discussions when I saw the way other people were thinking! This is also how projects can be created between other institutions!
Emerging Leaders Participant	I believe we are in the need of activities such as building bridges across the Arctic and beyond, creating space for green innovation and facilitating a positive dialogue beyond boundaries.  Initiatives like the Emerging Leaders might be crucial to achieve such activities.
Emerging Leaders Participant	Very inspiring and enlightening to discuss all the work being done in other countries. This experience has brought so much inspiration, questions, and hope for the future.
Emerging Leaders Participant	It was very inspiring to discuss complex issues like green shift with people with so much different knowledge, expertise and perspectives. The networking aspect of EL, especially from North America has a great value and potential for future cooperation.

Emerging Leaders Participant Emerging Leaders Participant	My summer experience with [job provider] would never have been possible without my participation in the Arctic Frontiers Young & Emerging Leaders program.  The Arctic Frontiers Emerging Leaders program was a pivot experience in my professional development as an environmental scientist. This program brought together a group of emerging leaders from various global perspectives, experiences and backgrounds who challenged my paradigm of what it means to be a global citizen and scientist. Working together as a team, we addressed complex problems facing our Northern regions and how we could combine our diverse experiences to collectively work towards solutions.
Emerging Leaders Participant	Too many "lectures"/ mentor focus - more interactive participant sessions would have been nice!
Emerging Leaders Participant	I think there is room for more Indigenous representation in the Emerging Leaders Program and having Indigenous peoples presenting or speaking in the Emerging Leaders program.
Emerging Leaders Participant	More senior mentors would have been appreciated. This year's mentors (except for one - Freyr) didn't have enough relevant experience to provide us with useful mentorship. Although, the mentors we got were very nice and I am happy we got to know them.
Emerging Leaders Participant	Meeting everyone is amazing. The group brings very diverse knowledge and experiences, and everyone comes from different parts of the world.
Emerging Leaders Participant	I enjoyed that there is so many people with a different sort of background and opinions but everyone has a clear vision of the Arctic and how development should go. Everyone is super interactive so there is great communication going on. I like that everyone gets to know each other better and creates a network for the future.
Emerging Leaders Participant	The group is very passionate, which is what I enjoy the most. Everybody's priorities are different and it's exceptionally useful to see the priorities that perhaps I haven't thought about before or I haven't considered as thoughtfully and to hear those voices and those concerns from people that have different interests in the Arctic than I do.
Emerging Leaders Participant	I feel like the diversity of knowledge, cultures, lands, ecosystems that we've all come from have has really helped foster what I would describe as friendly debate over some issues, whereas we discovered that we have consensus over many more as well

Different groups of people take different approaches, its very much like a mixing pot of ideas and at the end you get something which really does reflect the diversity...

I've learnt so much from my fellow Emerging Leaders this year in terms of their lived experiences, their careers and where they've come from...

It really is a chance to learn and grow as both individuals and as leaders.

What I like is the breadth of industries that we come from. I didn't anticipate that it would be so wide reaching. Because we've had a lot of time together, both in a professional context and in a personal context, it's made it so that you get to see people on a human level and talk to them and get to know them and understand how their opinions have been formed and allows you to enter that space and see eye-to-eye on things and broaden my understanding of things which isn't always the case with just a professional context. You don't always get the whole picture...

I appreciate the respect that everyone has shown everyone else.

In the formulated simulations it is interesting and thought-provoking activity but when I've actually got to know someone and how their ideas came to be, its in those [informal] spaces.

Table S3: List of words used in the analysis of aims two and three which reflect careers and jobs.

Word(s)	Frequency
science/scientist(s)	11
project	11
opportunity(ies)	10
knowledge/know	9
perspectives	8
future	8
mentor(s)/mentoring/guidance	7
network/networking	6
opinion(s)	6
learn(ed)	6
presenting	6
context	4
ideas	4
researchers/research	4
skills	4
useful	4
educate/educator/experts	4
challenges	3
discuss	3
diverse	3

poster	3
practical	3
professional	3
questions	3
motivation/motivate	3
collaboration/cooperation	3
communication	2
connect	2
consider	2
development	2
discussions/conversation	3
diversity	2
critical	1
acquire	1

Table S4: A template of the week's activities during the AFSF program.

Sunday	Monday	Tue	sday	Wednesday	Thursday	Friday	Saturday	
	Attend Conference	Coffee with mentor in groups	Coffee with		Early Career Scientist Communication Workshop  Attend		Soft Skills Workshop	Workshop on Arctic future
	Attend Conference		in Conference	Attend Conference	Energy Transition Discussion	Group mentoring	Wrap up, evaluation	
	LUNCH	LUI	VCH	LUNCH	LUNCH	LUNCH	Farewell Lunch	
Welcome and icebreaker	International cooperation and sciencee diplomacy presentation	Arctic Geopolitics Discussion  Attend Conference		Ocean Discussion	Science to Policy Discussion	Presentation of final		
Meet mentor, Conference briefing, tasks for the week	Attend Conference			Migration Discussion	Work on final project	project		
	DINNER	DINNER		DINNER	DINNER			
Group Dinner	Evening Reception		nmunication ght	Fieldtrip to Fjellheisen	Cultural excursion: Nordnorsk Kunstmuseum	Group Dinner		

Table S5: An approximate timeline of preparations and activities for the four programs.

Inspiration Days

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Science for Kids												
Science for Schools												
Student Forum												
Emerging Leaders												

Main Activities - workshops, mentoring, presentation of results, poster events Communication with the schools, science centre and partners Application Period

Participants independent research

Reporting and applying for funding