



American Geophysical Union Fall 2019 Meeting
Infusing Diversity into Arctic and Antarctic Programs

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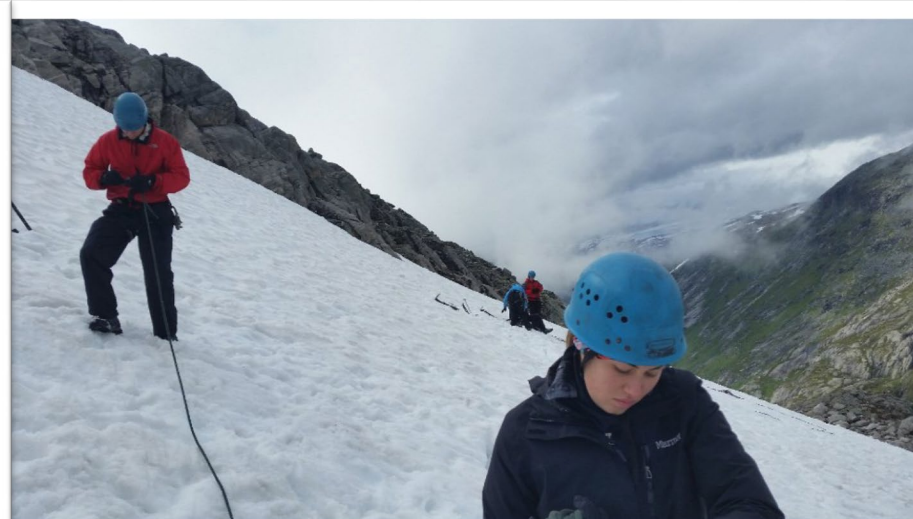
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Abstract

This invited paper describes the objectives and activities associated with a model for achieving exceptional results in the inclusion of women and underrepresented students in polar related research projects. The model addresses deficits in minority polar participation and ways to create clear pathways for undergraduate students to pursue careers in polar science.

The vision for this project was driven by the compelling need to draw on the integration of research and education to attract a diverse pool of talented students into careers related to polar science, and cyberinfrastructure (CI), including teaching and education.



The Generic Model

- **Partnership:** Significant involvement of MSIs and Minority Professional Organizations with appropriate budget inclusion. Give them a voice
- **Access points:** Opportunities for beginners and all students
- **Field Opportunities:** After appropriate training, students spend time on glaciers, in the Arctic and Antarctic or other field locations.
- **Distinguish Lecture Series and Seminars:** Provide mentoring opportunities for the community.

The CReSIS Instance of the Model

- **Partnership:** Significant involvement of MSIs and Minority Professional Organizations. (ADMI, Haskell, ECSU) with appropriate budget inclusion. Give them a voice.
- **Access points** for beginners and all students (8 week training at ECSU; AY training at Haskell; Internships at all partner sites. REU site for pre-service teachers.
- **Field Opportunities:** (Juneau, Norway, Greenland, WAIS, etc)
- **Distinguish Lecture Series and Seminars:** Held at Haskell and ECSU.



What is possible using these methods ?

Demographics for the REU students are given in the chart below; women made up 42% to 63% and minorities made up 66% to 89%.

	2010	2010	2011	2011	2012	2012	2013	2013
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Women	11	42%	22	63%	12	55%	13	50%
White	5	19%	12	34%	4	18%	3	11.5%
Black	20	77%	21	60%	17	77%	21	80.8%
Hispanic	1	4%	1	3%	0	0%	0	0
Asian	0	0%	1	3%	0	0%	0	0
Native American	0	0%	0	0%	1	5%	2	7.7%
Total	26		35		22		26	

Plus CReSIS minority graduate student participation went from 7% in yr.1 to 40% currently.

CReSIS IMPACT

A large percentage of women and underrepresented students participated in the program, with:

- 55% being female students
- 80% minority students (African American, Hispanic and Native American).
- 44% of the participants who provided information regarding their socio-economic status shared they were from single-parent households with an annual income of less than \$45,000.
- Discovery of a new world feature: Elizabeth City State University Bay in Antarctica. Malcolm LeCompte, Robert Bindschadler, Linda B. Hayden, *Temporal Reduction and Loss of an Ice Shelf in Pine Island Bay, Antarctica: 1972 – 2003*, IEEE-GRSS Journal of Selected Topics in Applied Earth Observations and Remote Sensing (GRSS-JSTARS) GRSL-00258-2012, IEEE-JSTARS-2012-00405.R1





Field Opportunities

Antarctica Team: Jerome Mitchell and Teresa Stumpf, Carolyn Branecky, Randy Justin

Arctic Team: Emma Reeves, Andrew Brumfield, Maya Smith, Ya'Shonti Bridgers, James Headen, Joel Santiago, Je'aime Powell, Arianna Varuolo-Clark



CReSIS RET Experience

(Access points for beginners)

Goals for Program:

- Increase knowledge base about research and technologies that advance understanding of ice-sheet and glacier dynamics.
- Understand the role of CReSIS in the development of reliable models to predict future sea level rise in a changing climate.
- Use new knowledge and teaching experience to create lesson plans for middle and high school students that incorporate CReSIS research and polar science.

Experiences at CReSIS

- Attended presentations by CReSIS scientists and engineers about current research and state-of-the-art technologies.
- Created a lesson mapping sea level rise for the K-8 *Ice, Ice, Baby!* curriculum.
- Developed lesson plans based on the remote sensing technology used in CReSIS research.



Partnership with Minority Professional Organizations

Minority Professional Organizations have long been committed to mentoring and nurturing the professional development of underrepresented students. They provide a rich source of expertise and commitment.

- Consider Partnership with these Minority Professional Organizations
- National Association of Black Geologists and Geophysicists (NABGG)
- Advancing Hispanic/Chicano and Native Americans in Science (SACNAS)
- The Association of Computer and Information Science/Engineering Departments at Minority Institutions (ADMI)
- National Society of Black Physicists (NSBP)
- National Association of Mathematicians (NAM)
- National Society of Black Engineers (NSBE)
- National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE)
- National Alliance of Black School Educators
- National Technical Association, Inc. (NTA)
- National Institute of Science (NIS)

STCs and other projects make a big effort to get to SACNAS or NSBE or ??? And passed our hundreds of fliers and applications only to get zero or little follow-up?

Think“Partnership”

Not just“Recruitment

Partnership: Significant involvement of MSIs and Minority Professional Organizations. (ADMI, Haskell, ECSU) with appropriate budget inclusion. Give them a voice.



ADMI budget \$125K/year

- * Support for student presenters
- * CReSIS research related seminars
- * Graduate school prep
- * Recruitment booth
- * ADMI representation on CReSIS Education committees



Suggestions

- Give the MPO or MSI a voice in constructing the partnership. It will not be successful otherwise.
- You need input from the MPO or MSI to construct an honest and productive partnership.
- Refer to the joint UNH/ECSU journal article.
- Organize strategy sessions that are not just 1-shot recruitment visits.

Suggestions

- They need lecturers for discipline area seminars. They need distinguished lectures and may consider naming the seminars after your organization.
- This is also a great opportunity to meet students face-to-face. The coffee or refreshment period after the seminar is very important. Get contact info for all students you talk with you after your presentation. Follow up with them.



Distinguished Lectures





Distinguished Lectures and Seminars



Suggestions

- Have the MPO to nominate 5-6 students for a conference travel award from your organization.. You can specify your requirements: Classification, GPA, major, research interest, etc. should be factors.
- Mentor the students during the conference. Attend sessions with them to bring your discipline area relevance to what they hear. Let them know about other opportunities you have for them i.e. internships, AY scholarships, etc
- Name seminars/lecture series after your organization.
- Make presentations as part of the MPO conferences.



One last Suggestion:

Join the organization

and

encourage your colleagues
to do the same.

Summary

- ✦ Consider ways to partner with minority professional organizations .(I.e. joint meetings/events, speakers, etc).
- ✦ Give the MPO or MSI a voice in constructing the partnership. It will not be successful otherwise.
- ✦ Consider ways to increase scholarships and fellowships funds.
- ✦ Consider entry level and advanced summer research training programs based on the Team concept.
- ✦ Consider Academic Year lecture Programs on MSI campuses
- ✦ Add MPOs in proposals as partners with appropriate budgets.
- ✦ Sponsor student participants in their events.
- ✦ Conduct professional development seminars at their events

Thank you for your interest.



Questions?

