

## NATIONAL SCIENCE FOUNDATION (NSF)

Advisory Committee for Polar Programs (AC-OPP)

Spring Meeting, April 12-13, 2023

Meeting Held Online

### MINUTES

#### Action Items Arising From the Spring 2023 AC-OPP Meeting:

- 1) Items that arose for possible inclusion in the agenda of the fall 2023 Advisory Committee for Geosciences (AC/GEO) meeting:
  - a) The CHIPS and Science Act, including the mandated Research Security and Integrity Information Sharing and Analysis Organization (RSI-ISAO).
  - b) The international aspect of science, with associated challenges and opportunities, including balancing restrictions on activities with robust international collaboration.
  - c) Meeting with Dr. Rebecca Keiser, NSF Chief of Research Security Strategy and Policy.
  - d) Outcomes of online surveys regarding GEO name change.
  - e) NSF response regarding diversity, equity and inclusion (DEI) subcommittee report.
  - f) Discussion of working with indigenous communities.
  - g) Discussion of a path forward regarding the physical qualification program.
  - h) DEI and the impact on marginalized populations with attention to possible ways data can be mined for a better sense of who is excluded.
  - i) Discussion of safety topics related to crevasse risk mitigation, sea ice, and concerns within the community and NSF about risk management.
  - j) Meeting with a representative of the Directorate for Social, Behavioral, and Economic (SBE) Sciences for insight on including social scientists in the conversation.
  - k) Discussion of how GEO links to the larger NSF Director of Diversity and Inclusion.
  - l) Extending principles for the conduct of research in the Arctic to conduct across the globe, possibly including discussions with Rebecca Kaiser.

#### Attendance and Membership

AC-OPP Members Present:

Dr. Meredith Nettles, Lamont-Doherty Earth Observatory, Columbia University, Chair, AC-OPP

Dr. Philip J. Bart, Louisiana State University

Dr. Ryan E. Emanuel, Department of Forestry and Environmental Resources, North Carolina State University

Dr. Allyson Hindle, University of Nevada, Las Vegas, School of Life Sciences

Mr. Steve Iselin, US Navy (Ret), Iselin Consulting Enterprise, LLC

Dr. Vera Kuklina, Department of Geography, George Washington University

Dr. Kristin O'Brien, Institute of Arctic Biology, University of Alaska

Dr. Jessica O'Reilly, International Studies, Indiana University – Bloomington

Dr. Brittany Schmidt, Department of Astronomy, Cornell University

Dr. Mary-Louise Timmermans, Earth and Planetary Sciences, Yale University

AC/GEO Members Present:

Dr. Kaatje Kraft (Chair), Department of Sciences, Whatcom Community College  
Dr. Lihini Aluwihare, Scripps Institution of Oceanography  
Dr. Robyn Mieko Dahl, Department of Geology, Western Washington University  
Dr. Kusali Gamage, Austin Community College  
Dr. Vernon Morris, Chemistry and Environmental Sciences, School of Mathematical and Natural Sciences, New College for Interdisciplinary Arts and Sciences  
Dr. David B. Parsons, School of Meteorology, University of Oklahoma  
Dr. Barbara Romanowicz, Graduate School, University of California Berkeley  
Dr. Cathy Whitlock, Department of Earth Sciences, Montana State University  
Dr. Daniel R. Wildcat, Haskell Environmental Research Studies, Haskell Indian Nations University

AC/GEO Members Not Attending:

Dr. Kristin Wilson Grimes, University of the Virgin Islands  
Dr. Francisca Oboh-Ikuenobe, Department of Geosciences and Geological and Petroleum Engineering, Missouri University of Science and Technology  
Dr. Tammi Richardson, Biological Sciences, University of South Carolina

AC-OPP Subcommittee, Office of Polar Programs and other NSF staff (presenters and speakers):

Dr. Sethuraman Panchanathan, NSF Director  
Dr. James Ulvestad, Acting OPP Director  
Dr. Charles Barber, Chief Diversity and Inclusion Officer, NSF  
Dr. F. Fleming Crim, University of Wisconsin at Madison  
Ms. Rhonda Davis, Office Head, Office of Equity and Civil Rights (OECR)  
Mr. Jon M. Fentress, Safety & Health Officer, OPP  
Ms. Amanda Greenwell, NSF Office of Legislative and Public Affairs (OLPA)  
Dr. Alexandra Isern, Acting Assistant Director, GEO  
Dr. Michael Jackson, Acting Section Head for the Antarctic Sciences Section (ANT), OPP  
Ms. Melissa Lane, Staff Associate for Information Management, GEO  
Ms. Sara Eckert, Communications Specialist, OPP  
Dr. Amy Leventer, Antarctic Research Vessel (ARV) Science Advisory Subcommittee (SASC), Colgate Univ.  
Mr. Timothy McGovern, Program Manager, Ocean Projects, OPP  
Dr. James McManus, Division Director for the Division of Ocean Sciences (GEO/OCE)  
Dr. Jennifer Mercer, Section Head for the Arctic Sciences Section, OPP  
Dr. Karen Marrongelle, NSF Chief Operating Officer (COO)  
Dr. Vladimir Papitashvili, Program Director, Astrophysics and Geospace Sciences & Antarctic Instrumentation, OPP  
Dr. Patten, Deputy Assistant Director, GEO  
Dr. Polly Penhale, Senior Advisor, Environment, OPP  
Mr. Mike Prince, ARV Project Manager

Ms. Stephanie Short, Section Head for the Antarctic Infrastructure and Logistics Section (AIL),  
 OPP  
 Ms. Sarah Williams, Branch Chief, OECR;

**Wednesday, April 12**

Welcome and Introductions; Conflict of Interest (COI) Review

Dr. Nettles; Dr. Ulvestad; Dr. Papitashvili

Dr. Ulvestad and Dr. Nettles provided brief introductory remarks and referenced the upcoming merger with AC/GEO. Dr. Papitashvili briefed the committee on conflicts of interest and the role of Federal advisory committees under the Federal Advisory Committee Act (FACA).

Dr. Ulvestad introduced himself and reviewed the budget and staff changes.

**National Science Foundation Budget (\$M)**

	Actual	Estimate***	Request
	FY 2022	FY 2023	FY2024
Research and Related Activity	\$6965	\$7827	\$9030
STEM Education	1147	1371	1444
MREFC	121	187	305
AOAM, NSB, OIG*	444	491	536
Total	8676	9877	11315
Mandatory**	304	233	239

\*Agency Operations and Award Management, Office of the National Science Board, and Office of the Inspector General

\*\*Mandatory spending includes H-1B Visa funds directed to STEM education, and Donations

\*\*\*FY 2023 Estimate includes \$1038M from Disaster Relief Supplemental

Science, Technology, Engineering, and Mathematics (STEM), Major Research Equipment and Facilities Construction (MREFC), Agency Operations and Award Management (AOAM), National Science Board (NSB), Office of Inspector General (OIG)

**Office of Polar Programs Budget (\$M)**

	Actual	Estimated	Request
	FY 2022	FY 2023	FY2024
Research	\$111	\$116	\$107
Education	4	4	4
Infrastructure (incl. Env, Safety, Health)	430	426	455
Total	545	545	566
AIMS Construction/AIR (MREFC)	90	60	60
GEO Directorate	1580	1613	1802

Note: The level of detail in NSF’s public FY 2024 budget request has been reduced relative to recent years, so this breakdown is less detailed than the AC has seen previously. Antarctic Infrastructure Modernization for Science (AIMS). Antarctic Infrastructure Modernization for Science (AIMS)

Dr. Ulvestad also discussed staff updates.

New Hires

- Joseph Miller - Antarctic Infrastructure & Logistics Section - Program Manager, Facilities Construction & Maintenance
- William Ambrose - Antarctic Sciences Section - Program Director, Organisms & Ecosystems
- David Porter (Intergovernmental Personnel Act (IPA) assignee) - Antarctic Sciences Section - Program Director, Ocean & Atmospheric
- Gina Selig - OPP Front Office - Knauss Sea Grant Fellow

#### Details

- Bill Kinser, Budget, Finance, and Award Management (BFA)/Division of Acquisition and Cooperative Support (DACS) —> Antarctic Infrastructure & Logistics Section - Program Analyst
- Jim Ulvestad, Office of the Director (OD) —> OPP Front Office - Acting Office Director
- Roberto Delgado - Arctic Sciences Section - Program Director, Arctic Observing Network —> OD
- Nancy Sung - OPP Front Office - Science Policy Advisor —> Office of International Science & Engineering (OISE)

#### Retired

- Kelly K. Falkner - OPP Front Office - Office Director

#### Departures/Transfers

- Russell McElyea - Antarctic Infrastructure & Logistics Section - Program Support Contract Specialist
- Robert Moore (IPA) - Antarctic Sciences Section - Program Director, Astrophysics & Geospace
- David Sutherland (IPA) - Antarctic Sciences Section - Program Director, Ocean & Atmospheric
- Jennifer Rhemann - Antarctic Sciences Section - Science Assistant
- Angela Lyons - OPP Front Office - Program Specialist (Transferred to GEO/ Ocean Sciences (OCE))
- Maria Vernet (IPA) - Antarctic Sciences Section - Program Director, Organisms & Ecosystems
- Roberta Marinelli (IPA) - OPP Front Office - Office Director
- All Kristan - OPP Front Office - Knauss Sea Grant Fellow
- Olivia Lee (IPA) - Arctic Sciences Section - Program Director, Arctic Observing Network

Dr. Mercer added that Greg Anderson is on detail through the summer.

#### Upcoming Field Seasons and COVID-19

Dr. Mercer; Ms. Short; Dr. Jackson; Dr. Bart

Dr. Ulvestad noted that there is a medical review panel that advises NSF as consultants. To prepare for the next Antarctic season, OPP is standing up an AC subcommittee of external people who will hear the proposed COVID posture for the next Antarctic season and write a report to the AC in May.

Dr. Mercer discussed the upcoming Arctic field season and changes. OPP is planning for and currently building the construction camp to embark on recapitalizing the infrastructure at Summit station on top of the Greenland ice sheet, which will move the main station function across the runway to the north side to mitigate snowdrift accumulation when there are large storms.

She provided planned deployment numbers for field projects, deploying researchers and science staff. OPP is back to and above normal 2019 levels before the pandemic. There are 161 projects new or planned for this year not experiencing COVID impacts. There were 37 projects deferred and OPP is working to catch up on their research. The number of canceled projects has gone down dramatically.

Turning to Navigating the New Arctic (NNA), several program officers are involved in the working group and on the steering committee. The NSF 2024 budget request says the Big Ideas are ending as a unifying concept in FY 2023, as planned. The intent is to have it overtaken by a new effort that will build on the core successes of the convergence research and engaging with local communities that have emerged and grown out of the NNA projects. Proposals submitted to the last deadline for NNA in FY23 are being reviewed. The final set of awards will be made during this fiscal year.

Dr. Mercer listed planned research cruises in the Arctic, which includes University-National Oceanographic Laboratory System (UNOLS), chartered US vessels, the Canadian Coast Guard and Sweden. She highlighted three projects, the United States Coast Guard Cutter (USCGC) Healy, which is supporting Nansen and Amundsen Basin Observational System (NABOS). Historically it was supported by Russian R/V Akademik Tryoshnikov. This year, USCGC Healy will support the cruise. Russia has new rules for “warships” operating inside its boundaries. Russia has also submitted a new boundary claim to the United Nations (UN) Convention on the Law of the Sea (UNCLOS).

Dr. Mercer highlighted GreenDrill: The response of the northern Greenland Ice Sheet to Arctic Warmth, an Arctic Natural Sciences (ANS) Award project. The hypothesis is that the northern The Greenland Ice Sheet (GrIS) responds more sensitively to Arctic warmth than the southern GrIS. Measurements of multi-cosmogenic nuclides will be made in bedrock core samples collected along ice margin-inland transects at strategic sites throughout northern Greenland. The project will generate a critical benchmark for the ensemble of state-of-the-art ice sheet and climate modeling efforts. The project was recently highlighted at the 2022 American Geophysical Union (AGU) meeting. The project is logistically intensive, operating in a challenging environment and is the first use of the Agile Sub-Ice Geological (ASIG) Drill in Greenland.

Dr. Mercer discussed the Arctic Beaver Observation Network (A-BON), which is also an ANS Award project. Principal investigators (PI) work with residents of three Alaskan communities (Shungnak, Kotzebue, and Noatak) to document long-term, experiential observations of beaver habitat and activity, particularly changes wrought to the landscape and fish. This understanding will be combined with satellite images of beaver ponds across the entire Arctic to determine the extent of beaver engineering and recent changes. A-BON will coordinate circumarctic efforts

surrounding this issue, encouraging dialogue and data sharing among local communities, scientists, and land managers.

Next, she provided the COVID approach for the 2023 Arctic Field Season:

- Requirements are posted on the Battelle Arctic Gateway and the NSF website
- The priority remains to protect the health of program participants and prevent the spread of COVID in the Arctic, particularly to communities and research stations, while meeting original project goals to the extent possible.
- Arctic Sciences Section's (ARC) goal is to implement appropriate prevention and response measures.
- Quarantines and Polymerase Chain Reaction (PCR) tests are no longer required. However, Rapid Antigen Testing is required.
- Vaccination and bivalent boosters are required for travel to Toolik Field Station, Alaska (AK) and all locations in Greenland.
- Projects are responsible for all costs incurred by a COVID outbreak in their project, including additional costs of accommodations or commercial flights. NSF has no obligation to provide additional field time if COVID or other issues prevent the project from accomplishing its goals.
- All researchers must comply with travel restrictions imposed by their institution and federal/national, state, regional, local, and tribal governments, or operators that control access.
- Researchers are responsible for developing and implementing a protective plan for their field team. It must verify informed consent that is approved by leadership at their institution. This plan ensures the awardee institution is aware of and accepts the risks of the fieldwork.
- All travelers should follow good practices to avoid contracting or spreading COVID, including Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO) recommendations.

Additional important information for Arctic fieldwork this year includes:

- Thule Air Base has been renamed "Pituffik Space Base" - all references to Thule will be updated.
- Everyone supported by NSF is expected to comply with the Polar Code of Conduct and the Principles for Conducting Research in the Arctic.
- Projects should not expect to go to the field sooner than one year from the time of award. Projects requiring icebreaker or UNOLS assets should not expect to go to the field sooner than 18 months from the time of award. These expectations are outlined in the new solicitation.
- Requests for Additional Logistics Support require a science justification submitted to both their science program officer (PO) and regional Arctic Research Support and Logistics (RSL) program manager.
- Ensure deployment readiness with logistics providers – minimum time requirements are Alaska – four weeks, Greenland/International - six weeks, Air Charters – eight weeks (NSF is reviewing all Air Charter requests).
- 24/7 phone line is for emergencies, not to make logistics changes in the middle of the night.

- Support staff in remote camps will be reduced going forward.

Regarding the new solicitation:

- Target Dates added for Arctic Natural Sciences and Arctic Social Sciences Programs (Mid-January and Mid-July of each year). All other programs remain no deadline.
- New Supplementary Documents:
  - Plan for Safe and Inclusive Working Environments (2 pages)
  - Results of Prior NSF Support information is now required in a supplementary document and not the project description (3 pages)
  - Ethical considerations and approaches to the proposed work (1 page)
  - Updated OPP Data Management Policy (2 pages)
- Flexibilities for letters of collaborations from community-based organizations.
- Intended program submission is now indicated in the last line of the project summary.

Dr. Jackson continued the presentation with deployment numbers for FY20-23:

Fiscal Year	Total deployments	Total grantees deployed	Deploying science events
FY20	3094	651	108
FY21	1072	93	19
FY22	1442	213	42
FY23	2614	530	90

For the 2022 to 2023 Antarctic field season:

- Planned full catch-up season plus new science initiatives.
- C-17 delays created early impacts.
- COVID protocol pivot in November resulted in cancelling many projects and reducing scope on many more.
- Despite the issues there were numerous success stories.

Dr. Jackson provided a science summary for 2022-2023:

- Science supported from stations (McMurdo Station (MCM), South Pole, Palmer) and in the near field had more success.
  - Long-Term Ecological Research (LTER) project Dry Valleys, Mt. Erebus seismic installs, and Allan Hills ice coring were successful.
- Difficult year for sea ice with two projects cancelled and others impacted.
- Some science canceled early Antarctic Search for Meteorites Program (ANSMET) due to logistic resource constraints.
- COVID posture pivot forced cancelling Polenet, West Antarctic Ice Sheet Divide (WAIS Divide) and Siple Dome science and some Long Duration Balloon (LDB) activities. All will be prioritized for future seasons.
- Deep-field teams were most affected by delays and COVID posture pivot.
  - Two Thwaites teams (Geophysical Habitat of Subglacial Thwaites (GHOST) / Thwaites Interdisciplinary Margin Evolution (TIME)) estimated they achieved 10% of goals; this will have knock-on effects for outyears.

- TIME early career group stuck in MCM proposed “eggs on toast” alternative.
- South Pole science was nearly fully successful.
- Temporarily getting a sixth LC130 helped getting total deep field hours but phasing of hours was problematic.
- Despite significant delays due to COVID protocols, The Research Vessel/Icebreaker (RVIB) Nathaniel B. Palmer (NBP) and RV Laurence M. Gould (LMG) science was successful with only a few project cancellations.

He also provided the 2023-2024 science season plan:

- Must clear the three-year backlog of field science and prioritize delayed projects. Developing plan now but hope to prioritize:
  - Polenet (delayed three seasons)
  - Provide support out of WAIS for remaining Thwaites initiatives
  - Provide support for ANSMET (delayed 3 seasons)
- Moving forward on new science initiatives
  - Exploring using Arctic Truck logistic support for deep field logistics out of South Pole.
  - Center for Oldest Ice Exploration (COLDEX) work
  - The Sensitivity of the West Antarctic Ice Sheet to 2° Celsius (SWAIS 2C) project will be drilling at Kamb Ice Stream (KIS)
- Out of ~105 science events for next season we will defer nine projects (some at PI request) and modify scope on five projects to fit within bedspace and LC130 flight hour constraints.

In other ANT section news, Dr. Jackson discussed:

- Split solicitations into field work (with deadline) and non-field work (no deadline).
  - Field work proposals require concept outlines to scrub logistics requests.
- New Program Directors
  - Will Ambrose – Organisms and Ecosystems fed permanent
  - Dave Porter – Oceans and Atmosphere IPA assignee from Lamont
- In process of hiring fed permanent Oceans and Atmospheres PO and Science Assistant

Dr. Jackson concluded with a discussion of COVID protocols for next season, which are in process. Last season didn’t work well for science or logistics. Pivoting protocols was traumatic. Next season they will identify and manage illness rather than use a pure positivity number. This year the community was canvassed. The science representatives did debriefs with their projects coming out of the field. And a broadcast email was sent to all deployers to get feedback on their COVID experience. A COVID protocols panel will meet at the end of the month and craft recommendations. So, it would be premature to state the COVID processes for the season.

### *Discussion*

Dr. Bart said he went into the field last season and encountered some of the issues mentioned, with a project cancelled because of COVID on the ship. He asked if the protocols in place are new for this season.



Dr. Mercer said they are new for this season and much less restrictive. People were being held to long quarantines for deployment to summit stations, for example, with mandated PCR testing. So, it's a reduction in the approach, but hopefully smart and practical. In response to a further question about responsibility falling on the science teams in terms of delays and how that might impact them getting back into the field, Dr. Mercer said OPP was as accommodating as possible moving people around and spreading them out. But in some cases, if people need to move to the hotel, the project will be responsible for that cost. Dr. Bart discussed how multiple groups deploying together need to have early conversations about how they're going to the field to best prevent delays.

Dr. Nettles said some of the elements mentioned are new and some were in place last year. A challenge in overall COVID management is that it's moving into the realm of the same way we handle other risks at the institutional level, but because it has been different in the past few years; it's a bit of a shift. Dr. Mercer responded that groups need a robust plan in place signed off by their universities. Masking will be required on the LC130 flights to Greenland, so groups will have to start working on COVID mitigation plans well in advance it's a good idea to tie them to other groups that they're traveling with.

Dr. Nettles acknowledged the extreme effort NSF has put in over the last few years to keep things moving forward and being flexible and supporting teams and the many hours and the support put in over the last few years.

Dr. Hindle asked about the C-17 issues and whether they were just a one off or if NSF thinks these issues are growing over time and moving into a new a new plan for supplying the continent in the early season. Dr. Jackson responded that it was a one off. As any aircraft fleet starts to age, they will have more maintenance issues. But the C-17 is still the workhorse of logistics movements for the United States Air Force (USAF), and by proxy, the US Antarctic Program. Ms. Short added a concern about less output for the fleet and the funding being put in. NSF is looking to use the Antarctic infrastructure recapitalization program to expand overland traverse capabilities for less reliance on the fleet and is working with the Department of Defense (DoD) to renegotiate the memorandum of agreement (MOA) with them to get the most science per dollar and is working with the Air Guard to recapitalize the fleet, which is critical to the Antarctic Program and the nation. There has been movement on the Hill towards recapitalization. But we need to get that moving so we have a recapitalization effort that better serves the nation and the program.

Dr. Mercer said the C-17 was the real calamity at the start of the season. But the Air Guard is also an important component. The horizon on recapitalization is long, obviously. NSF has been working with USAF and there is a high-level USAF-NSF agreement requiring support of the USAF and Arctic operations. With respect to the C-17s, they are the workhorse and a limited resource. Normally, they're reliable, but she experienced using them in Greenland. If the military is using the C-17s in other places, that has some effect on us. If they break down, they're down hard. If one C-17 goes down, it can be down for five days. But they're otherwise normally reliable.

Dr. Ulvestad reported on discussions with the Air National Guard leadership and the New York guard commander. The costs of buying that infrastructure go up just as the cost of other infrastructure, so we're working to contain it. But those folks are in the same boat we are. The Air Guard has to get inflation raises and we're paying for that through our logistics with the military. Recapitalization takes 10-plus years, once you get funded, and it's not funded.

Dr. Nettles noted that recapitalization is an ongoing theme. She discussed a public meeting in the middle of May where the subcommittee will report out through the AC.

### Diversity, Equity and Inclusion Discussion

Dr. Ulvestad

Dr. Emanuel provided an update on the Committee on Equal Opportunities in Science and Engineering (CEOSE), which met in February and finalized the 2021-2022 biannual report to Congress on broadening participation of underrepresented individuals and STEM education and the STEM workforce. It is to be released publicly no later than June. He provided general points about the report, the second of three reports on an overarching theme called making visible the invisible. The focus is intersectionality, or the multiple overlapping identities with respect to gender, race, ethnicity, ability and more. Intersectionality informs people's lived experiences in positive and creative ways, but people can also face barriers and disadvantages connected to overlapping identities, including discrimination. The report will highlight some limitations and current data collection efforts by NSF and the National Center for Science and Education Statistics (NCSES) and offers recommendations for how NSF can address these limitations to better promote diversity, equity, inclusion and accessibility in science and engineering. The report also covers NSF challenges and responses associated with the COVID pandemic.

Dr. Barber said a number of reports have overarching themes and there is a synergy with some of the efforts upcoming at NSF.

Dr. Ulvestad continued the presentation with a timeline of events since mid-2022:

- August 2022 – Creating Helpful Incentives to Produce Semiconductors (CHIPS) and Science Act signed into law.
  - Section 10327: “The Director shall appoint a senior agency official within the Office of the Director as a Chief Diversity Officer.”
- September 2022 – AC-OPP Subcommittee Report on Diversity Equity and Inclusion accepted.
- October 2022 – United States Antarctic Program (USAP) Sexual Assault/Harassment Prevention and Response (SAHPR) report published.
- December 2022 – Dr. Charles Barber appointed as NSF Chief Diversity and Inclusion Officer (began service in January 2023), fulfilling the requirement of Section 10327 of CHIPS and Science Act.
  - <https://beta.nsf.gov/news/nsf-appoints-charles-chuck-barber-chief-diversity>

Reviewing the subcommittee report from last year, he highlighted five principal recommendations:

- “Amplify Indigenous priorities and perspectives throughout OPP’s programs and activities.”
- “Employ the Collective Impact (CI) model as a means to set the DEI agenda in OPP and to sustain it over time.”
- “Recruit and hire a new Program Officer responsible for DEI leadership in OPP.”
- “Enhance engagement with Minority Serving Institutions (MSIs), faculty, and graduate students to cultivate diverse participation and contributions to polar research.”
- “Engage and work with other NSF programs to remove structural barriers in postdoctoral and graduate fellowship programs and consider increased investment in both.”

Dr. Ulvestad concluded with more information on the CHIPS and Science Act, Sec. 10327:

- “The Chief Diversity Officer is responsible for providing advice on policy, oversight, guidance, and coordination with respect to matters of the Foundation related to diversity and inclusion, including ensuring the geographic diversity of the Foundation programs. Other duties may include:
  1. Establishing and maintaining a strategic plan that publicly states a diversity definition, vision, and goals for the Foundation;
  2. Defining a set of strategic metrics ... [linked to the above strategic plan];
  3. Advising in the establishment of a strategic plan for diverse participation by individuals and institutions of higher education, including community colleges, historically Black colleges and universities, Tribal Colleges or Universities, minority serving institutions, institutions of higher education with an established STEM capacity building program focused on Native Hawaiians or Alaska Natives, and Established Program to Stimulate Competitive Research (EPSCoR) institutions;”

Dr. Barber said it’s important NSF not build programs and capabilities just to meet requirements in the CHIPS and Science Act and executive orders. We should be doing it because it’s the right thing for the sake of society. His approach is different than other chief diversity officers. He is going to help harmonize diversity and meritocracy without compromising one for the other. Meritocracy is important for the data model he is building. He discussed looking at under representation as an equity issue, not quotas, or affirmative action. This helps focus on how we look at under representation as an equity issue. He wants to identify keystone leader behaviors and practices that attribute to under representation and make our work enduring. He wants whatever is put in place to withstand changes in administration. He is not an activist. He is interested in the organizational change work needed to achieve those the outcomes and in practical application as opposed to activism. We cannot continue looking at this from a compliance perspective. His office is centered around culture, versus compliance. If he does his job right, there will be a decrease in discrimination and sexual harassment complaints. Diversity is not about black and white. It is about all characteristics of society. He wants to teach other chief diversity officers to build this program where it’s not divisive and not combative or blame focused. He serves in a leadership capacity in the government’s chief diversity officers’ Executive Council and will be talking to lawmakers and Senate staff about his approach at NSF.

### *Discussion*

Dr. Nettles said the AC is on board with harmonizing diversity and meritocracy. This is about making sure the brilliant minds out there that we have not been benefiting from and a lot of these official spaces are brought in for the quality of the science and the quality of our knowledge and understanding. She welcomed that Dr. Barber will help synchronize these efforts across NSF and through their programs. Referring to a posted comment, she said everything is tightly linked together between what we might have classically called DEI efforts and sexual harassment issues and structural barriers.

Dr. Barber said it's all culture work and he is updating what he calls NSF's culture strategy. Though culture is the underpinning, he will not lose the emphasis of the needed DEI outcomes. Capturing the missing millions is not only an NSF responsibility; we must partner with other scientific entities.

Mr. Iselin said he was confused by the collective impact model. He added the subcommittee was passionate about the recommendations, and he appreciated Dr. Barber acknowledging that adding a staff member is significant. If it gets shrugged off, it will disenfranchise those who worked on the subcommittee. Dr. Barber said he does not control funding. Without disrupting any grassroots activity across NSF, he wants to create a governance framework to have more awareness about all the good work taking place. He wants to continue to be a partner and a catalyst. Dr. Ulvestad discussed possibly getting the new individual be a science program officer half time and DEI the other half. Keeping the person well connected to the science programs will make them more effective. Dr. Barber wants to look at the DEI structure across NSF. He wants to integrate some of the subcommittee recommendations into the overarching implementation plan, which will be coming out soon. Mr. Iselin said split duties are okay. The key is to have a person clearly identified that people know how to contact to help coordinate these issues.

Dr. Kuklina said indigenous communities, especially in Alaska, struggle with Internet connectivity. It is important for NSF to be present at scientific events and community meetings. Dr. Barber said most conversations he has in the DEI space re the indigenous community are about the healthcare system. But there are other issues, and he wants to establish an NSF Employee Resource Group (ERG), if we don't yet have one for the indigenous community.

Dr. Ulvestad responded to an online Chat question about the weekly wire, which he said is an internal NSF publication, which may not be available outside NSF. He will follow-up.

Dr. Nettles said there have been several conversations about a joint meeting with CEOSE. She said Dr. Isern is open to that as AC-OPP merges with AC/GEO.

Dr. Emanuel asked for a written response from NSF to the subcommittee recommendations. As some recommendations are bigger than OPP, he did not know if that should be rolled into a larger response. Dr. Ulvestad will provide a written response. His understanding of the collective impact model is a way of looking at the problem that says you're being intentional about the process of deciding what you're going to do, your goals, and structuring your organizational process to achieve those objectives. That model is one framework that fosters generative work around setting agendas that is intended to be as responsive to community priorities as it is

conducive to discovery and transformative science. So, it's a way to make sure everybody's at the table when it comes to setting the agenda.

Dr. Bart said the report includes fantastic recommendations beyond the five mentioned in the front. Some include specific language about investments. He asked for that to get attention also to support DEI initiatives.

Dr. Nettles said there are certain things NSF can't do legally and it could be helpful to have clarification about those boundaries. It was extremely helpful to have the discussions so far with Dr. Ulvestad and have this continue as a front and center piece of the work we do within OPP and with the AC.

### ARV Updates

Mr. McGovern, Mr. Prince, Dr. Leventer

Mr. McGovern updated ARV project internal activities at NSF as they relate to the ARV, beginning with the overall schedule. The project is in the preliminary design phase and nearing completion. A Preliminary Design Review (PDR) was conducted last February to assess readiness to advance to the final design phase, with a recommendation the project advance to final design. A facilities readiness panel (FRP) met last week to consider advancing to the final design. The PDR panel's first recommendation:

- NSF should formalize a standing science advisory group or committee to review the ARV Project at regular intervals and provide recommendations directly to NSF staff for consideration and referral to the Vessel Integrator for action as appropriate. This advisory group should:
  - a) have rotating membership from a diverse and inclusive range of Antarctic scientists and operations experts;
  - b) should have representation on the configuration control boards, including any de-scoping and opportunity actions;
  - c) continue through construction and the one-year warranty period; and
  - d) be captured in the upcoming [new] Vessel Integrator contract.

Mr. McGovern provided the following response:

- NSF: Concur – to be done prior to finalizing new Vessel Integrator RFP later FY23.
  - Review and revise SASC charter
  - Update Section 2 of the PEP to better describe the continuing
  - role of the SASC
  - Update the role of the SASC in the
  - NSF ARV Internal Management Plan (IMP)

Mr. McGovern will provide more information on the results of the internal review and the status of the project at the next meeting.

### *Discussion*

Dr. O'Reilly asked about the fifth International Polar Year in 2033 and whether there are there plans for the new vessel to be part of the research events. Dr. Jackson said the USAP is planning on participating in events; he did not know if the research vessel would be ready.

Dr. O'Brien said the ARV subcommittee is interested in more feedback from the community and is looking forward to Town Hall events for greater input. Dr. Nettles said the committee might help generate a list of topics for those Town Halls.

Dr. Leventer said a format has been developed in terms of size and how to advertise them, as well as an initial list of things people might be interested in to address that. More input is desired on the landing craft and science survey boats, including the kinds of science that could be done and their capabilities. Input is also needed on the aquarium room incubators and environmental chambers and the capabilities of those separately and together, as well as trace metal work and other analytical chemistry. She suggested starting with a targeted group then maybe open it up more broadly.

Mr. Iselin applauded the subcommittee's extensive work and said they had done a wonderful job. Dr. Nettles agreed and praised the subcommittee's work. She addressed the structural aspects of the way science is done that may be better or worse for encouraging broad participation and support and the safety of scientists and staff in the field as an example of the benefits of bringing in diverse perspectives from those working in different realms to open our eyes to other ways of doing things. She suggested a discussion on ways that operating in the remote and confined environment of a ship could be altered to help support broader participation and advancement by the talent we need involved in science.

Dr. Leventer said a document is being put together to move private space for confidential discussions and PI meetings not associated with birthing to non-birthing desks or have them separated from state rooms. She agreed it would be good to have a Town Hall discussion on how to make a ship a friendlier, more inclusive, diverse place.

Mr. Prince said the designers asked if office spaces available to anybody should be in the birthing areas or closer to the working deck and were told a little of both.

Dr. Nettles asked where the discussion stands with respect to gathering community input, the interaction with the National Academies report and that part of the decision-making process? Dr. McGovern said his is continuing to have these discussions. Regarding the moon pool, the decision has been made financially. They added length to the ARV and looked at increasing the aviation deck, originally identified as for mostly drone activity. It has been increased in size and looks like it can support a single light helicopter to be used in conjunction with another vessel with full helicopter capabilities. There would have to be some dramatic tradeoff to increase the size of the helicopter deck to accommodate two full-size helicopters and increase the hangars to accommodate those. The National Academies is continuing to look at this, among other things. Part of their charge is to identify ways to mitigate gaps in requirements.

Dr. Leventer said she talked at the National Academy workshop with different science groups and colleagues about the two capabilities and how their science could be accomplished without a moon pool or a full helicopter capability. We need to see what the National Academy has to say.

Dr. Ulvestad said the polar research vessel from the late 2000s and early 2010s was a concept that fell down of its own weight because we tried to put too much stuff on it and it got too expensive. We don't want to go down that path again.

Dr. Nettles the ARV is a critical piece of infrastructure for conducting the important science in the poles and she spoke of finding the path that allows it to get built. The ship is an amazingly capable vessel, and we'll need to find ways, through a variety of means, to provide support for the things that science needs to get done. She spoke as someone who has spent a lot of time in helicopters, not all supported from ships, but wanting to make use of that capability. One of the discussions we could have is to get our heads around the ways the helicopter-supported science that needs to be done can be achieved. It doesn't always mean the ship needs to be hosting the flight deck for the helicopter; you can support helicopter-based science in a lot of ways without flying off the ship every day. This is what the National Academies report is focused on: How do we get the science capability we need from the suite of available resources. No one piece of infrastructure provides everything we need. There are many to provide input to the ongoing discussion around the needs requirements and evolving set of capabilities of the ship. The ARV webpage has a place for input and the subcommittee has been open to receiving input directly. The webpage has a wealth of information and documents related to the whole process, as does the AC webpage.

### South Pole Prioritization

Dr. Crim, Mr. Iselin

Dr. Ulvestad said he looked at the AC meeting minutes and saw the South Pole Prioritization Committee was discussed extensively. But there was never a vote making it a subcommittee. OPP had to check to make sure it was legally a subcommittee, or could charter it as a subcommittee. To take advice from this group, it has to obey FACA, which means the report has to go to this AC, which has to vote to accept it. The committee's charge was not to prioritize what OPP does at the South Pole; they were asked to help recommend a process to use to prioritize the science at the South Pole.

Dr. Crim began with the subcommittee's motivation and charge

- Motivation
  - Demand for the resources of South Pole station substantially exceeds the capacity of the facility and associated logistics
- Charge
  - Propose a framework and decision rules for prioritization that accommodate the diversity of disciplines, the capacity for world class science, and scientific priorities in different fields.

He also reviewed the membership:

- Jean Cottam Allen (NSF, Physics)

- Michelle Buchanan (Department of Energy (DOE), Office of Science)
- Fleming Crim (NSF (ret), Directorate for Mathematical and Physical Sciences (MPS), OD)
- Steve Iselin (US Navy (ret), AC-OPP)
- Michael New (The National Aeronautics and Space Administration (NASA), Science Mission Directorate)
- Christine Smith (the National Oceanic and Atmospheric Administration (NOAA), Global Monitoring Lab)
- Alan Tomkins (NSF, Social and Economic Science)

He reviewed logistics and limits:

- Constraints
  - Transport (aircraft and traverses)
  - Lodging (150 beds at South Pole Station)
  - Power (generation and fuel storage 600 kW)
- Trade-offs
  - Operating South Pole Station requires substantial OPP resources
  - Demands on aircraft and field resources can overwhelm the rest of the Antarctic science program
  - Balancing demand is a continuing challenge

He said this boils down to limits on resources forcing difficult choices. The subcommittee was tasked with providing advice on how to make those difficult choices, transparently and consistently. That led to thinking about review and eligibility:

- Required Elements in Proposals
  - Best or only
  - Science outcomes
  - Technical maturity
  - “Baseline” and “threshold” resources
  - Operation timeline and duration
  - Lifecycle (including decommissioning)
  - Appropriate management plan
- Science Technology Logistics Review
  - Agencies evaluate and rank proposals sent to OPP
  - Establish a common deadline for receiving vetted proposals
  - OPP reviews logistical and management readiness at both “baseline” and “threshold” levels

Dr. Crim asked how one then gets to a prioritization and selection and communicate that, leading to a discussion of prioritization, selection and communication:

- OPP Formal Review for Project Selection
  - Agency priorities
  - Science portfolio
  - Project type and size
  - Project time sensitivity and urgency



- Timescale of implementation and completion
- Logistical and management readiness
- Active Projects and Continuation Requests
  - Periodic review of current projects against proposed timelines
  - Review requests for continuation or increases in existing projects as new proposals

Dr. Crim emphasized that balancing these factors fairly and transparently is daunting, leading to a discussion of:

- Advising and Communication
  - To promote transparency and communication, establish an advisory group of scientific and agency stakeholders

In conclusion, he summarized the subcommittee's recommendations, drawing from elements discussed earlier:

- Required elements in proposals
- Agencies rank proposals sent to OPP
- Common deadline for receiving vetted proposals
- OPP reviews logistical and management readiness (“baseline” and “threshold”)
- OPP formal review for project selection
- Periodic review of current projects against proposed timelines
- Review requests for continuation or increases in existing projects as new proposals
- Establish an advisory group of scientific and agency stakeholders

Mr. Iselin said some members felt the charge was to come up with a mathematical formula that would spit out the perfect answer, but quickly realized none exists. There's never going to be perfect answers as to which projects get performed. But the subcommittee wanted to provide a framework and some relief to the people currently tasked with teeing up these prioritization decisions, sometimes with imperfect information. That's why a lot of the recommendations on process, standard timeline and standard content of the proposals will go a long way towards helping that balancing act. Regarding the recommendation to have a committee involved, he said every year national priorities are going to change, and science is going to change. Having an ear to the ground through a subcommittee to the AC will allow NSF to get that feedback.

Dr. Crim said the subcommittee talked about who's the decider; maybe there has to be somebody finally making decisions about how these statistics are deployed. And someone is going to end up not being able to do something they and their community thinks is important and it's going to have to be delayed. The question is how to do that in a way that at least makes everybody know what's going on.

### *Discussion*

Dr. Ulvestad asked about the capital investment review board that considers capital investments in all the Antarctic and how it relates to the advisory committee. Dr. Crim said his group steered clear of questions about expanding South Pole Station. The proposed advisory group would promote two-way communication. OPP worries their decisions, which are driven by different

constraints, aren't clear to the community. This kind of communication can make stakeholders more sophisticated about what the constraints are coming to the South Pole. It is communicating, given the boundary conditions, how the optimization works.

Mr. Iselin said the advisory group, if it stood up, would bring in participation from other federal agencies in a more active way. He would not have that group involved in the decision process. Post decision, NSF would provide them feedback; this group could say NSF got it right on 80% of the things and here are a couple of things we're concerned about to consider during next year's program review.

Dr. Nettles said that until and unless the AC accepts the full report of the subcommittee, it doesn't become a public document. So, the full description of the recommendation for the advisory group is not yet publicly available. But she said her understanding from the report is the group would provide advice and suggestions to improve the submission and review process and be informed by results of the annual prioritization and review. But that group would not be involved at the pre-award decision making phase. Dr. Crim agreed, saying his group does not believe you could form a group that could effectively make those pre-operational decisions.

Dr. Nettles added that AC-OPP will, after July first, be merged with AC/GEO, which will have a number of advantages in raising the profile of the important work done in polar programs. She said OPP has been working to make sure two-way communication can occur in a robust manner in that new structure. One possibility is for a standing subcommittee focused on polar logistics and infrastructure and safety-related issues and she asked for thoughts on the extent to which the advisory group Dr. Crim's group is recommending ought to operate with a sole focus on the South Pole prioritization or whether it might be a focused subcommittee.

Dr. Crim said his group was not aware of the merger until late in its process and tried to refer to a subcommittee of the appropriate AC. Having thought mostly about South Pole Station, he may have a narrow viewpoint. What we're trying to do is solely focused on the South Pole Station. But he does not know if the logistical constraints that determine what projects go forward are more severe at the South Pole Station than at Antarctic stations. His impression is that to do something substantial at the South Pole is a higher bar than to do something at McMurdo.

Dr. Nettles conveyed a question from the online Q&A about whether the subcommittee examined the role of planning grants and enhanced engagement between the proposing PI and OPP logistics experts. Dr. Crim said there's a sentence or two in the report about it. The program officers get a lot of consultation. The group discussed a more formal kind of interaction. For example, an agency might ask someone from OPP to sit on a review panel as an advisor. That sort of informal conversation is important. You can't throw a proposal to do something at the South Pole over the transom and let somebody evaluate it. That back and forth is very important. His group did not want to propose setting up structures, but it could be more formal if a proposing agency felt formal participation will help them. Mr. Iselin said the group was mindful about leaving this recommendation broad enough for NSF to make the right choice, in terms of transparent communication.

Dr. Jackson said it was a well-done report. The field work proposals and putting in logistics concept outlines prior to submitting a full proposal will help with the interactions between the PI community and the available resources and help them schedule their activities in the longer term. It may not work as effectively for some larger projects because of resource requirements. With other federal partners, who have PIs that will be putting in proposals, we're going to ask they follow our same deadlines and get those concept proposals. We can help them write a better proposal and help us better understand the logistics requirements and the needs of the community.

Dr. Ulvestad said this sort of pre-proposal check-in and maybe light consultation can be useful. But more substantial projects want NSF to be part of their design team and we don't have the resources for that early in the prioritization process. We'd have to stage this consultation very carefully in time relative to the prioritization, so we don't overwhelm our people.

Dr. Nettles said increasingly NSF is providing mechanisms for pre-planning smaller proposals that help with planning to allow development of projects to get to the stage where they are suitable for that kind of interaction. That's a useful way to help get a possible project to the stage where it can be planned in this way without overwhelming resources, hopefully. She also discussed the membership of the subcommittee, which highlights the ways federal agencies are interacting with this nexus at NSF and OPP for doing work at the pole. And that's where increased communication transparency, and potentially the subcommittee we're discussing, could help educate the broader user community.

Dr. O'Brien said she liked the proposal. The greater transparency and communication could be helpful for new investigators and bringing new people into the field. Perhaps some of that could extend to other divisions in OPP.

Dr. O'Reilly said the check on projects and their timelines and how they're meeting their timelines scared her, because everything always runs a little long. Her NSF grants have gone over, and it was always an assumption that it was okay. She asked what the assumption is for exceeding timelines at the South Pole and how might that best be communicated. Dr. Crim said everyone has had projects go too slowly and he did not imagine it's "Oh, you're two months over, you're done." He was imagining a periodic check in against how it's going, and in some cases a negotiated modification of that timeline. Dr. Jackson said he encounters this often. Logically, every proposal that comes in that is funded should have a sunset plan. If the award runs out on an experiment, and the investigator's plan is to put in a renewal, we don't want them to take their instrumentation out, put in a renewal proposal, and have to put that instrumentation right back in. We work closely with project investigators to make sure we understand what their plan is and needs are, and what's best for the program.

Dr. Nettles said the intent is often to make sure the project is well supported by doing regular check-ins to make sure the project has what it needs to move forward successfully and allow resources to be apportioned in a useful way and released to other projects. It's scary to hear prioritization. And scary to hear we need to check in on the timeline. But in the communication, it will be a critical piece to work with investigators to make sure the intent is clear, and that everything is transparent.

Mr. Iselin said the other federal agency reps on the committee were skeptical as to their involvement and worried what we would recommend. But in the end, they unanimously agreed that improved communication and transparency and an opportunity to provide input would be helpful.

Dr. Nettles asked for a vote to accept and transmit to NSF the report from the South Pole Prioritization Subcommittee. The eight AC members present voted unanimously in favor.

### Physical Qualifications in Polar Programs

Dr. Ulvestad, Mr. Fentress

Dr. Ulvestad said this topic has been in the news and people have talked about it at AGU meetings, and NSF has received letters about it. There is a requirement in The Code of Federal Regulations (CFR) for the physical qualifications (PQ) process. No one disputes we should have some process. There are arguments about how it should work or what the criteria should be. Much of what we do is risk based. In going to the poles, someone may choose to take personal risks. But if they put themselves in a situation where, because of a health issue, 10 others have to be at risk to get them out, we have to think about all 11. You can't think you're going to write an equation and get an answer. There's no model that gives you that kind of a formalism. There have been concerns about implicit or explicit bias. When you get a PQ packet, it doesn't ask for ethnicity. But, there are correlations of diseases with age. Age correlates with potential illnesses, risks or challenges. We look at the medical data. We don't look at ethnicities. It's a challenge to think about conditions that might be correlated with genetics and have people say, we're being biased. He is interested in input about whether there are implicit biases we're not taking into consideration.

Mr. Fentress started his presentation with the PQ process for Antarctica:

1. Purpose. The medical clearance process has been developed (45 CFR Part 675) to mitigate, as reasonably possible, the inherent risks of deployment to the polar regions.
2. The PQ process and Physical Qualification Guidelines are included in our NSF OPP Safety and Occupational Health policy currently published on public facing NSF webpage.
3. Applicability. All Antarctic personnel - governmental, military, grantee, contractor, and distinguished visitors - proposed for deployment to USAP stations and vessels south of 60° south latitude.
4. NSF Form 1700
  - a. Deployment Information
  - b. Medical History
  - c. Laboratory Testing
  - d. Medical Exam
  - e. Dental Exam

He made this comparison to the Arctic Program:

- PQ still required per the NSF OPP Safety and Occupational Health (SOH) policy
- Same PQ guidelines utilized

- Same process: Prime contractor’s subcontractor, CU-Anschutz does the PQs and waivers come to NSF for determination
- PQ only required for Summit Station if outside a “flight cycle”
- Utilize an electronic submission process

\*150+ go through the PQ process in the Arctic versus up to 2800+ in the Antarctic

Sample PQ guidelines: Cardiovascular

Condition	Unrestricted Clearance	Restricted Clearance	Not Physically Qualified	Comment
General	Absence of clinical symptoms or signs of angina, congestive heart failure, syncope or arrhythmia, with a baseline ECG indicating no evidence of myocardial infarction (MI), significant arrhythmia, conduction delays or ventricular hypertrophy.	Medical signs or symptoms of angina, congestive heart failure, arrhythmia, including dizziness, syncope and palpitations, with a normal evaluation including a stress ECG, halter monitor and cardiology consultation addressing the presumptive etiology and prognosis for the underlying condition	<p>Winter-over, field camp or South Pole candidates with any current evidence of signs, symptoms, or cardiovascular tests suggestive of a current cardiac condition, excluding benign structural abnormalities.</p> <p>Unexplained chest pain, dyspnea, orthopnea or edema.</p> <p>Cardiac conditions treated with medications that may require drug monitoring. Such medications may include, but are not limited to, warfarin, digoxin, and certain antiarrhythmics.</p>	<p>Limited capacity to diagnose and treat cardiovascular disease on the Antarctic continent.</p> <p>Remote or winter evacuation unfeasible.</p> <p>Cardiac conditions treated with medications that require drug monitoring. Such medications may include, but are not limited to, digoxin, and certain antiarrhythmics.</p>

Mr. Fentress discussed some of the proactive actions taken to manage risk:

1. OPP SOH team brought on a physician who was also an epidemiologist (Direct contract) who had experience deploying to Antarctica and was a past member of our Medical Review Panel.
2. OPP SOH hired an Industrial Hygienist who had experience managing operations in hospitals to assist in management of the SOH Medical program.
3. Closely worked with our Medical Review Panel (MRP), a group of federal physicians from various organizations such as NASA and DoD.
  - Advised on PQ guideline adjustments (Centers for Disease Control and Prevention (CDC) identified high risk factors/Vaccination)
  - Helped review CV deployment protocols for infection control
4. We mandated full COVID vaccination as part of the PQ process.
5. We added a 2 year “test pilot” PQ raising the age from 45 to 65 after vaccination
6. We worked extremely close with our Office of General Counsel (OGC) and OECR professionals.

Mr. Fentress said the process is not perfect and discussed continuous improvement initiatives that are underway:

1. PQ guidelines are being reviewed for risk.
  - Annual review underway by all contractor physicians and by the MRP. Recommendations are then provided to NSF for consideration in regards to operational limitations and risk tolerance.
  - Additional CV-related guidelines that are still in effect are being reviewed considering shift in CV risk
2. Implementing a multi-part PQ Communication Plan
  - Improvement to PQ packets (USAP only)
  - Public facing PQ webpage on the NSF website (will have info specific by program where needed)
    - PQ and waiver process details
    - Forms
    - FAQs
    - Recent Updates
    - Survey/Feedback
3. Adding a step in the waiver process for a participants to communicate why they feel their waiver should be approved.
4. Adding a step where those who have already deployed and then get not physically qualified (NPQ) still receive a formal NPQ Change letter that identifies clearly why their PQ is being changed to NPQ (rare but does occur).
5. Improving the submittal process so that there is an electronic option where participants can submit and also verify that paperwork was successfully received.
6. USAP Prime contractor is implementing an enhanced quality assurance (QA) process of their subcontractor (University of Texas Medical Branch (UTMB))

*Discussion*

Dr. Mercer said these are good changes for the USAP and noted the three section heads and Dr. Ulvestad are involved in these conversations as well. We're involved in addressing these issues and challenges. She said PQs for summit station are required if deploying between flight periods and for deep field deployments longer than 30 days. OPP also reserves the right to require PQs if it's necessary in extreme circumstances. Since moving the process to the Arctic contractor, they have a policy of confirming all information is submitted within 48 hours.

Dr. Nettles said this topic requires further discussion. The questions in the Chat and Q&A will be transmitted to NSF and the AC so we can consider them further. She also encouraged the email submission of further questions. She suggested special office hours on PQ. It is also something to consider for an AC co-hosted Town Hall topic. Summarizing questions from the Q&A and elsewhere, there is not much opposition to the idea there needs to be a PQ process for remote deployments. The safety and occupational health policy on this topic is quite reasonable. The challenge is implementation. Mr. Fentress and Dr. Mercer are saying NSF is working to improve implementation, where there's a gap. But that needs a broader discussion, because transparency, customer service and the waiver process keep coming up. If everything were implemented consistent with the intent of the safety and occupational health policy, we wouldn't be having some of the community discussions that have come up. There are multiple points where information enters the PQ process, other than the clean version, that you can write on a flowchart. And that leads to lack of transparency and people feeling they may be unfairly treated. It is for the good of the community that we take a close look at implementation with the lens, not only of the medical situation, but of the human beings going through the process. She is happy NSF has put quite a bit of effort into this discussion recently and wants to find ways to continue that discussion and review and move forward with something that is a benefit to the community and appropriately reduces risk for the institutions involved. She had had asked Dr. Hindle to help facilitate a discussion on the topic, but there is not time now.

Dr. Hindle said NSF is taking this seriously and we appreciate that thinking on how to improve things in the long run. It is one of the issues that makes implementation difficult. She asked how NSF sees its role. Decisions are being made on the ground and the logistical processing of paperwork is happening several tiers down. This is not the prime contractor, but a subcontractor. So, NSF is separated from the day-to-day, which is true for every aspect of logistical support in the polar program and the polar regions. It is concerning that there are so many lags in the process that maybe we're losing resolution on bias. It's hard to pick that out when everybody's experience is taking substantially longer than the proposed timelines. She asked what NSF's role is overseeing the day-to-day and whether NSF sees that improvements can happen.

Mr. Fentress said for the Antarctic program, we have activity-based managers that are like assistant contracting officer representatives. An AVM manages the implementation of the medical program and assesses the performance by UTMB. She deploys every year, spends time in the clinic, may go to UTMB in Galveston. We paid to ensure there's a medical PQ system in place, and they subbed it out to UTMB. It's been that way for about 10 years. We have someone who is like Contracting Officer Representative (COR) who ensures and oversees the performance of UTMB.

Mr. Fentress said when he worked at the Corps of Engineers, he did the same job. The clinic was a direct contract to him. He could walk down the street and into the clinic, which is a different system than NSF has. He did not know of any plans to change that. Dr. Nettles said that highlights one of the big challenges. She asked Mr. Fentress to respond to the questions in the Q&A. She and Dr. Ulvestad will determine how to continue the discussion in appropriate venues.

### Policy and International Engagement Update

Dr. Mercer, Dr. Penhale

Dr. Mercer discussed Arctic interagency progress, illustrating how Arctic policy in the interagency space is set up, beginning with the 1984 legislation, the Arctic Research and Policy Act (ARPA), which established the Arctic Research Commission (USARC) and the Interagency Arctic Research Policy Committee (IARPC). The Arctic Executive Steering Committee is a presidentially mandated committee, which has established the Bering Sea Task Force.

Discussing the National Strategy for the Arctic Region (NSAR), she said it was first released in 2013, updated in Fall 2022 and the implementation is in final review. The USARC recently released its most recent report on goals and objectives for Arctic research, 2023 to 2024. IARPC was tasked with developing a report to Congress on the need to establish and maintain the sustained Arctic observing network, which was delivered to Congress in December of 2022. Also, the Secretariat is now supported by a contract to Alaska Native Ukpeagvik Iñupiat Corporation (UIC) Science.

Dr. Mercer discussed the nomination to the Senate of Michael Sfraga, of Alaska, to be Ambassador at Large for Arctic Affairs.

Regarding Russia there is no news and NSF continues to follow White House guidance.

Dr. Penhale continued the presentation by highlighting key topics to be discussed at the June meeting of the Antarctic Treaty Consultative Meeting (ATCM)/ Committee For Environmental Protection (CEP) in Helsinki:

- Resolution 4 (2022) Berlin: Antarctic Climate Change and the Environment (ACCE)
  - Welcomed SCAR's Decadal Synopsis and Recommendations for Action, including ensuring that agencies responsible for Climate Change negotiations and national Antarctic science bodies receive a copy of the Synopses and Recommendations
- Scientific Committee on Antarctic Research's (SCAR) key messages in its ACCE report:
  - The urgency for action, both regional and global, for mitigating projected impacts of climate change
  - The need to develop large-scale integrated research approaches across national Antarctic programs
  - The need to improve projections of Antarctic cryosphere change, especially in a global sea level rise context
  - The need to understand Antarctic biodiversity change
  - The need to further the understanding of tropical-high latitude climate teleconnections and climate models



- The requirement to develop timely and regular communication about environmental changes in the Antarctic, and their implications
- The meeting agreed to hold a full-day joint session of the CEP and the ATCM, with SCAR and COMNAP, to consider the implementation of the ACCE recommendations
- The Joint ATCM/CEP Climate Change Day is to focus on the implementation of the ACCE recommendations
- Key themes: Outreach and Communication, Research Needs and Coordination, Actions and Policy Proposals

She turned next to the Convention for the Conservation of Marine Living Resources (CCAMLR):

- Ecosystem-based approach to fisheries management
- Entered into force in 1982, 27 Members, 10 acceding states
- Objective of the Convention is the conservation of Antarctic marine living resources, which includes ‘rational use’ (harvesting)
- Annual meetings on resource management and marine conservation
- CCAMLR has agreed to develop a representative system of Marine Protected Areas (MPAs) based on the best available science and has also agreed a framework that describes the objectives and requirements for establishing MPAs
  - First CCAMLR MPA: South Orkney Islands Southern Shelf MPA, adopted 2009
  - Second CCAMLR MPA: Ross Sea region MPA—Earth’s largest MPA, adopted 2016
    - Covers 1.55 million km<sup>2</sup> (1.12 million km<sup>2</sup> fully protected)
    - Result of unanimous support for a joint New Zealand and US proposal to CCAMLR

Dr. Penhale continued the presentation with a review of the Third Special Meeting of the commission (CCAMLR-SM-III), In Santiago, Chile, in June 2023:

- Three more MPAs have been proposed over the past 11 years:
  - East Antarctica MPA
  - Weddell Sea MPA
  - Antarctic Peninsula-Domain 1 MPA
- Little progress has been made during the past decade towards agreeing the three new MPA proposals
- At CCAMLR-41 (2022), the Commission agreed to hold an extraordinary meeting of the Commission on how to reach consensus on progressing MPA implementation
  - Objective of the Third Special Meeting: to agree through dialogue on an inclusive approach that will facilitate the Commission to reach consensus on how to progress MPA design, designation, implementation and the establishment of research and monitoring plans (RMP) based on the best scientific evidence available, taking relevant adopted conservation measures into account
- Topics to be discussed:
  - Best practices and evaluation of the lessons learned and effectiveness of the overall conservation measures related to marine protected areas already adopted by CCAMLR

- How the adopted general framework for the establishment of CCAMLR MPAs (CM 91-04 (2011)) could be improved
- How to progress the MPA proposals

Dr. Kuklina continued with a review of international collaboration initiatives:

- The International Polar Year (IPY) 2032/2033
  - Joint Polar Conference in 2030 by International Arctic Science Committee (IASC) and Scientific Committee on Antarctic Research (SCAR)
- Fourth International Conference on Arctic Research Planning (ICARP IV) Process - 2025
  - ICARP conference to be convened in Boulder, Colorado, in 2025

She concluded with a discussion of possibilities for international collaboration in the Arctic Northern Asia:

- In face of being one step away from World War III, two steps away from irreversible climate change, three steps away from depletion of natural resources studies in Antarctic cannot compensate understanding the issues of security, diversity of human strategies and responses to environmental transformations, and Indigenous creativity in stewarding lands sustainably. Therefore, there is a need to:
  - Maintain existing collaborations - synthesis of knowledge & student capacities;
  - Curate existing data and information in open sources using new digital methods and software;
  - Engage with growing diaspora of scholars and Indigenous Peoples who retain strong connections with homeland for person-to-person collaborations;
  - Explore opportunities of studies in countries with similar climatic environmental and historic-cultural conditions in the pan-Arctic watershed
  - Develop strategies for re-engagement in studies of Eurasian Arctic and active role in the International Polar Year 2032-2033

### *Discussion*

Dr. Nettles emphasized the ongoing challenge around the world with how to maintain the scientific, cultural and artistic connections that contribute to stability and advancing science and the needs of humanity when the government situation is not such that those contacts can be conducted or are not being conducted at the diplomatic level. She liked the broad thinking about how to approach the most critical problems in a way that critical intellectual activity and human connections can be maintained.

Dr. Mercer said OPP is very aware of the concern for the safety of the Russian scientists and there is concern about communication at the academic levels because of possible threats to their safety. Dr. Nettles said she knows many researchers are being careful about how they communicate with colleagues. Dr. Kuklina said this communication still exists. We are still able to maintain person-to-person professional communications.

Dr. O'Reilly asked about the special workshop in June, saying she watched MPA proposals take so long just to be met with resistance. She asked about expectations for how to shift gears at this

meeting and if it is just hope that more informal time devoted to these issues will help build trust and consensus. She asked if the naysayers are planning to be there in person.

Dr. Penhale said proponents of MPAs have discussed how to break this log jam. It may be unclear to those not convinced how catch limits will be determined. She recommended clarifying the opportunities for harvesting, so groups won't feel as threatened. She also advised not trying to define best available science, because that gets you nowhere. Some naysayers would like a more defined approach to the benefits of MPAs and more definition in the required research and monitoring programs required for MPAs. Because at some point, these are going to be reviewed to see if what has been proposed as a protection system actually works. These MPAs have a sunset clause, which is different than other MPAs. But it was the only way to get consensus. Some parties do not want constrictions on anything they might do in the future, even if they haven't thought of it, which is a challenge. But we have new twists and approaches we're going to put forward, though nothing will be decided until the full meeting.

Dr. O'Brien noted that the Ross MPA will be reviewed after 35 years, and asked if NSF can help identify the benefits of the Ross Sea MPA. Dr. Penhale said they were engaged in that, as is New Zealand and Italy. There is a 10-year review soon. NSF is collecting research results from currently funded projects, or international programs, to present the case that the MPA is working. But even 10 years is not a long time. We're crossing our fingers that this will go well. We're hearing a lot more interest in research in the Ross Sea by US investigators. Hopefully, we'll have funded projects in the future to continue our leadership that was based on 40 years of NSF research.

Dr. Nettles said these presentations always highlight the interlinked international aspects of polar science. But it's a broader topic within NSF, she said, and asked whether there's anything the committee should know or be aware of in the research security strategy policy round. Dr. Ulvestad said most of what NSF has been thinking about in the research security realm has been in the space of individual awards and awardees. But we run a lot of wide-open scientific facilities with visitors from various places who are not vetted. If you look at where the government is going in the next three or four years, if the Arctic becomes more of a zone of conflict the US government might get more interested in what we're funding people to do in the Arctic, where we're sending them and where they're coming from.

Dr. Nettles referenced the tension between the openness of research and the robustness of international collaborations versus what happens when one or more bad actors lead to reevaluation and how to balance restrictions on activities against supporting robust international collaborations. That's the research security topic that would be good to revisit in a future meeting. It's also appropriate for our broader GEO focus at some point.

Dr. Ulvestad said the CHIPS and Science Act mandated NSF to fund a group to set up the RSI-ISA0 to be a tool for researchers to provide information about problematic institutions. So, which institutions have close affiliations with the People's Liberation Army. That is fraught with challenges, But we are mandated to figure out how to set up something of value to the community. Dr. Nettles said that's something to come back to for further discussion.

## AC-OPP Merger with AC/GEO Discussion

Dr. Nettles, Dr. Ulvestad

Dr. Nettles said everyone has been working closely to make the merger go smoothly and figure out how to make that new structure in which we will serve as one AC for all of GEO be a benefit to OPP for a robust two-way communication so OPP can get the input it needs. Those of us with polar science interests can bring input from the community to that discussion to serve the needs of the polar science community. Along with the broader GEO community of which we are apart, there's a long history of how ACs get formed and moved around. Everyone who's a member of AC-OPP will be transitioned into being a member of AC/GEO and will receive a new letter around July 1. In terms of membership balance, in OPP, we've benefited from having members who are polar, but who might not primarily identify with one of the other parts of GEO, but might be coming from the Directorate for Biological Sciences (BIO) or MPS. Those perspectives are valuable for the AC and Dr. Isern has indicated she agrees with that. As part of the membership balance, there will be a commitment to continuing to bring such perspectives into the broader AC that serves all of GEO. We will be standing up the ARV Science Advisory Subcommittee seamlessly under GEO; it now exists as an AC-OPP subcommittee. It will transition to being a subcommittee of GEO and members shouldn't notice. Although GEO, outside of polar, supports some big and important infrastructure and facilities projects, OPP has a lot of that expertise that's focused on polar. We anticipate forming a standing subcommittee focused on polar infrastructure logistics and safety under AC/GEO, to have an ongoing group focused on those issues providing input to OPP and into GEO more broadly. That will be of benefit to OPP and to the broader GEO enterprise. The goal is to draw on OPP expertise to strengthen all of GEO and for OPP to have a broader and deeper opportunity to draw on expertise from other parts of GEO. She acknowledged there are concerns and questions that have arisen and opened the floor for discussion.

### *Discussion*

Dr. Bart asked about the motivation for the merger. Dr. Ulvestad said Dr. Isern has been concerned that a lot of what OPP is concerned with is what showed up in the Earth System Science National Academies report. We in the polar regions do a lot of work that is part of Earth System Science. If you if you think about the Earth system, you think about sea level rise and melting glaciers in the Arctic and the Antarctic and why are we sitting out there in OPP separate from the rest of the GEO community that's thinking about that. If you're thinking about the whole Earth, you should be thinking about not just the physical causes of climate change but the biological impacts of climate change. That was a lot of the rationale for moving them closer together. If you think about Antarctic research vessels. Well, we have sitting in GEO a whole academic research fleet. And we should be thinking a little bit more about how those integrate than we have been.

Dr. Kuklina said she was concerned how social scientists will be represented and if there will be room for indigenous scholars to participate in discussions. Dr. Nettles said that also goes to concerns raised across astrophysics. Our models for the way research should be approached in the Arctic should be used to inform the ways we do research across the whole spectrum of geosciences and elsewhere. It's important to keep those perspectives within the AC. She hopes to

strengthen that representation on the committee and engage in a broader discussion of the ways scientists interact with and produce knowledge with local communities drawing on the experience that people like yourself have and other Arctic scientists. She hoped that is a space where we could grow representation and discussion in the broader GEO community.

Dr. Kraft said AC/GEO can benefit from work already happening with indigenous communities. That's an opportunity for this merger to bring together valuable perspectives. Regarding research on climate change, we might need to make sure we're including social scientists. For some researchers, that's a recent revelation and so it's important to continue in the GEO community. If you're not including social scientists in the conversation, your research isn't having the impact you want. The AC could meet in the fall with someone from the Directorate for Social, Behavioral, and Economic (SBE) Sciences, or have a joint session, to make sure that voice isn't getting lost. Dr. Patten said GEO partners strongly with SBE and BIO and it is critical to continue that type of representation within the AC. Dr. Nettles said the last comments echo what the NSF Director has said about the importance of connecting to social and behavioral science. It's something we need to keep front and center.

Dr. Hindle said it is a concern in the biology community that over years as polar programs have moved in and out of GEO, that voice and those concerns easily get lost. Dr. Nettles made the distinction between biology, which would primarily feel at home in BIO compared with biology that would primarily feel at home in GEO. It's important as we look towards convergence research we need to be keep strengthening those connections. She said Dr. Isern has emphasized, in so many words, that geosciences is important to the future of the nation and the planet. It needs the profile and seat at the table that reflects that and it's going to be stronger with a closer tie with polar science. But that also means working across the other directorates and forging closer ties with BIO and computational infrastructure and Directorate for Technology, Innovation, and Partnerships (TIP), MPS and SBE. It's an advantage that we're starting off in the AC-OPP, with that kind of membership. We need to make sure we are bringing that into the mix in AC/GAO.

Mr. Iselin said that if you merge the people currently involved in both committees, you'll end up with too many people, and maybe not the right quality, flavor or expertise. He asked if NSF leadership will more proactively and less collegially try to form the group to where you need it to be. He also encouraged the use of subcommittees, such as the standing subcommittee for polar infrastructure, which he applauded. He adds value in that regard and the committee won't have anyone like him when he leaves.

Dr. Nettles said the formation of the committees is quite deliberate and we're merging a smaller AC-OPP with a smaller AC/GEO, because folks have rotated off both. In the fall it will be time to make strategic decisions about populating the committee. Dr. Patten said that's why we have great AC co-chairs. There's a lot of discussion around who to ask to serve on the ACs. He agreed with the use of subcommittees for providing focus on a particular issue that might come to the fore to get in depth thought and feedback.

Dr. Ulvestad said in forming an AC, you want people with different areas of expertise, but making sure they not only represent that area of expertise but the good of the whole community.

Also, it is valuable to have subcommittees. In MPS, they typically were not standing subcommittees; they focused on a particular thing and went away. The ARV subcommittee has stood for quite a while and thinking about a polar logistics subcommittee we might think about them differently than the subcommittee Dr. Crim reported out from earlier that was focused with one charge and then goes away. Both have value. But we should not accidentally end up with 10 standing subcommittees.

Dr. Kraft said there is a specific plan for the AC/GEO membership balance that talks about a variety of expertise and institutional representation. If you're rotating off and worried about not having representation for what you bring, suggest people who could fill the capacities you feel are missing. Encouraging the community to be interested in serving helps broaden our knowledge of who potentially could be candidates.

Dr. Nettles said it's not obvious there's an enormous swath of the scientific community that knows NSF has ACs that advise in this capacity. That's a place we could do better. She raised the question of how many people in the community are aware of the merger. The news went out in official communications via OPP and GEO newsletters. And there was a Town Hall open to everybody, though it was attended mostly by NSF folks. She has heard from folks in the polar science community, but they are the people carefully watching everything that goes up on the NSF webpage.

Dr. Timmermans asked about putting the full list of the merged committee online to look at the two memberships together. Dr. Nettles said putting the membership lists side by side produces the full membership of the merged AC, though there are updates needed to some of the terms. The merged committee won't formally exist until July 1, at which point it will be on the GEO webpage.

Dr. Ulvestad said the AC is required to have a balanced plan. It's a legal requirement we think through carefully and publish. Dr. Nettles said the balance plan is good and reasonable and as with so many things, implementation is important, and we want to think through carefully the specifics of how that's achieved. There will be another discussion of the merger with AC/GEO tomorrow, including how to take advantage of what AC-OPP is bringing to the table. For broader GEO initiatives, we're going to hear where we can plug in and ways OPP can benefit from initiatives and activities within AC/GEO and the larger GEO Directorate. GEO is in the process of standing up a subcommittee on climate justice. OPP folks should be engaged in that discussion. There is a clear connection there right off the bat. There are a number of other initiatives coming along that are right up our alley.

#### Wrap-up

Dr. Nettles, Dr. Ulvestad

Dr. Bart raised the PQ discussion and said the process was very last-minute this year. He sensed an understaffing problem at UTMB. It was hard to get anyone on the phone or any reply. When he reached someone, they intimated there was a staffing shortage. He was amazed to be getting notices about whether someone was going to be PQ'd at the last minute. He hopes there will not be a repeat this year.

Dr. Nettles said it's worth recognizing the level of stress and risk that imposes, as well as potential detrimental health outcomes. That's an important thing is to address.

Dr. Ulvestad said we've done a lot of comparing between the Arctic and the Antarctic over the last few months. One of the challenges is the Arctic subcontractor is running a patient-focused system. It's easier to do that with 150 people than with a couple thousand. The staffing you need is a lot more for 2000. If we could distribute that 2800 throughout the year, we could get an annual staffing that accommodated that, if you're trying to staff for this peak. It's hard for UTMB to staff people up as temps to make medical calls on medical information for three months. We need to think more creatively about how to deal with the surge that overwhelms them. Dr. Bart added that the person he spoke with said for the rest of the year they're fine. It's preparation for this big mobilization to get down there for the summer. Dr. Nettles said it's not unpredictable there will be a surge. It's a known challenge and she knows groups that had the same situation before COVID. We need to think through the goals and structure.

Dr. Hindle added that how we follow up depends on what timeline we're talking about. Because Dr. Ulvestad presented many ideas for implementation. And some are going to come online this year to help logistically, but diversity and bias are larger discussions that take time and need transparency. There are also issues of logistical rollout. And we're coming up on another surge. Antarctic slips are due in a couple of days. We have all observed degradation of customer service over the years, and it's something our teams experienced last year. When we got them on the phone, they were not nice. There has been a degradation of that experience that has led to stress and frustration. That's in the hands of the subcontractor. Which conversation we have depends on the framework and venue.

Dr. Nettles said there's several different conversations we need to have in several different timeframes. Some are things being worked on now, things that can be implemented on a shorter timeframe that are the obvious things, like transmission of information, electronic versus fax. And there are things for a longer discussion. There is a lot of confusion, and people haven't felt they can access the information they need. Part of it is the office hours type discussion, where people can ask their questions and hear what NSF is planning. Some of that is the longer timeframe of working with the goals of appropriately managing and reducing risk in a framework explicitly committed to and actively working against explicit and implicit biases. It's not enough to not ask for certain information; you need to actively work to combat potential, implicit bias. We also need to look at places where other information gets injected into the stream. She is concerned about perceived or real interactions between, for example, sexual harassment issues and the PQ process. We should consider multiple venues for moving forward with the discussion to address different pieces of the puzzle.

Dr. Ulvestad said NSF is aware of the customer service issues. The last presentation bullet was about figuring out how to do better oversight of the contractor and through them the subcontractor on the PQ process. That's challenging because the formal relationship is with the contractor, not with the subcontractor. We're not unable to do so, but we must do it mindfully and pay close attention. That's an area we're looking to do better on.

Dr. Bart asked, regarding the bottleneck, if the solution is to have them start the process earlier. Dr. Ulvestad said Mr. Fentress talked about moving the initial deadline back from eight weeks to 12. If you can spread out that bump, that's helpful. But we're also challenged on the front end by getting our budgets so late from Congress; we don't necessarily know what we're going to fund in time to get PQ packets out.

Dr. Bart said Mr. Fentress spoke about allowing a PQ to last for 2 years so folks going in back-to-back seasons might not have to go through the process again. Dr. Ulvestad said there was a pilot last year but he does not know how many people were involved. He said NSF has talked about making that more routine and having more people in a 2-year or a 3-year status. Dr. Bart said age might play a role.

Dr. Nettles said Mr. Fentress's answer to a similar question about whether the 2-year PQ would be available this year is in the Q&A. She also said the Chat has a link to the safety and occupational health policy available on the Web. There is a PQ section where some of the technical issues are discussed.

## **Thursday, April 13**

### Welcome

Dr. Kraft, Dr. Nettles

Dr. Kraft opened the second day of the AC-OPP meeting, being held jointly with AC/GEO, with excitement about the joint meeting in anticipation of the coming merger of the two ACs. She said there is a great knowledge base across the two ACs that will enrich the conversations into how to think about Earth through a systems approach. Dr. Nettles echoed what Dr. Kraft said about the opportunities for the merged committees and called on members and staff to introduce themselves.

### Geoscience Directorate Updates

Dr. Isern

Dr. Isern began with an update on a capability just added to GEO regarding data analytics, and a new staff member, Josh Trapani, who joined GEO in late March 2023 as a Data Research Analyst. Dr. Isern said he will be central to enhancing the capability for data analytics and for telling the geosciences story and better demonstrating that the money we're receiving to invest is making impacts.

Moving on to FY24 priorities and NSF-wide activities, she discussed the CHIPS and Science Act, which supports and empowers NSF's three major priorities:

- Strengthening Established NSF
- Inspiring The Missing Millions
- Accelerating Technology and Innovation

She listed some of the things the CHIPS and Science Act has put into place:

- Authorizes a doubling of the NSF budget over 5 years



- Strengthens fundamental research
- Establishes Technology, Innovation & Partnerships
- Invests in STEM Education
- Advances diversity in STEM
- Addresses research security

Turning to NSF's FY24 budget request to increase the budget to approximately \$11.3 billion, an increase of 18.6 percent, she listed the main emphasis areas as:

- Building a Resilient Planet
- Create Opportunities Everywhere
- Advance Emerging Industries for National and Economic Security
- Strengthen Research Infrastructure

She went into more depth on the focus areas, starting with building a resilient planet, discussing:

- Response of Earth's systems to changing climate
- Adaptation and resilience
- Clean energy technologies
- Nature-based solutions
- Greenhouse gas measurements and removal

Building a resilient planet is an NSF-wide effort that includes two pillars:

- US Global Change Research Program
  - Mandated by Congress to coordinate federal research and investments in understanding the forces shaping the global environment, both human and natural, and their impacts on society.
- Clean Energy Technology (CET)
  - Foundational and translational research and education investments to support transformative CET to achieve a carbon-neutral, equitable, resilient and sustainable US economy.

She said her office has worked over the past year, year and a half with our staff, the research community, and across the agency to develop some of the key ideas that are the basis for building a resilient planet:

- National Security
- Climate Change
- Tech. Leadership
- Clean Energy

When thinking about building resilient planet, NSF is unique in bringing all the disciplines to the table, she said. Building a resilient planet advances priorities laid out in the CHIPS and Science Act, including creating opportunities that are equitable and accessible to all and encouraging and investing in people helping their communities while also helping to understand the changes happening in those communities.

Moving to GEO and major NSF investments for FY24, she listed:

- National Resilience Research Network: \$47.50 M
- ObsX - Investing in observing infrastructure: \$20 M
- GEO Access: \$8 M
- Climate Equity Fellows: \$15 M

Dr. Isern provided a brief TIP update, discussing Regional Innovation Engines:

- April: Type I Award Announcements
- Spring-Summer: Type II Awards in Review

The goal is to foster innovation ecosystems around the country. Type I awards were focused on planning grants to help assemble a team that could compete for a Type II, which is for a full regional innovation engine for up \$260 million.

Staying with TIP, she highlighted the announcement of new Convergence Accelerator Tracks:

- Track K: Equitable Water Solutions
- Track L: Real-World Chemical Sensing Applications
- Track M: Bio-Inspired Design Innovations

Another TIP opportunity, launched in March, is known as the Prototype Open Knowledge Network (Proto-OKN):

- New opportunity: March 2023
- NASA, National Institutes of Health (NIH), NOAA, US Geological Survey (USGS), and the Department of Justice's (DOJ) National Institute of Justice
- \$20 million initiative to build a prototype of an open knowledge network
  - Publicly accessible
  - Interconnected data repositories and knowledge
  - Enables data-driven, AI-based solutions

She said TIP can catalyze the innovation already being done within the geosciences and help build capacity in the geosciences. In January, GEO released a Dear Colleague Letter (DCL) for a new IPA to get a rotator with expertise in the geosciences and expertise in the innovation space to be a joint appointment with TIP and help build bridges and understand each other's needs, strengths and where we can make significant investments.

Dr. Isern also addressed NSF-wide opportunities announced in February called Accelerating Research Translation (ART). The program will support:

- Activities to build institutional infrastructure and capacity for research translation
- Educational/training opportunities
- Immediate translational research activities

She also provided an update on Growing Research Access for Nationally Transformative Equity and Diversity (GRANTED), to grow the capabilities of emerging institutions to compete within the research enterprise to level the playing field:

- DCL (NSF 23-037) to encourage conferences and workshops
- Updated Program Description published February 15, 2023

There have been a lot of discussions lately with the EPSCoR team, which is working to improve program impact within different jurisdictions and states. There have been discussions on broadening the institutions we're investing in. She provided a summary of EPSCoR funding:

- Research Infrastructure Improvement (RII) Programs
  - (78-84% of budget)
- Co-Funding W/ NSF Directorates & Offices
  - (16-22% of budget)
- Outreach and Workshops
  - (0.5-1% of budget)

Within the EPSCoR FY24 budget request is a new focus area on advancing climate change research and resilience capacity to expand opportunities to disproportionately affected communities.

Turning to GEO incubators, the FY23 budget requests includes incubators focused on:

- Global Climate Challenges
- Diversity and Education Programs
- Special Emphasis Programs
- Geoscience Cyber-infrastructure

To bring these incubator spaces to life, GEO has received approval for the new Division of Research Innovation, Synergies, and Education (RISE), which will take its place alongside the Division of Atmospheric and Geospace Sciences (AGS), the Division of Earth Sciences (EAR), the Division of Ocean Sciences (GEO/OCE) and OPP. RISE has four priorities:

- Catalyze new systems-level approaches to climate science
- Attract underrepresented groups to geo careers & support geoscience education
- Join with other parts of NSF in major integrative research and education efforts
- Foster exchange of scientific information nationally and internationally

She listed the following RISE opportunities:

- Geosciences Open Science Ecosystem Program (23-534)
  - Improve openness and scientific value of cyberinfrastructure
  - Democratize access to cyberinfrastructure
  - Strengthen capacity of geoscientists to access, utilize, and collaborate around open science resources
  - Advance open science principles

Dr. Isern highlighted a DCL titled GEO-EMpowering Broader Academic Capacity & Education ([EMBRACE](#)):

- Expand access and participation of investigators from
  - Historically excluded groups in GEO disciplines
  - Historically excluded institutions
- Solicitation forthcoming

She also highlighted preparations for the great American solar eclipses of 2023 & 2024:

- NSF 23-014 DCL:

- Invites submissions to AGS for science and outreach
- Solar Eclipse Observations with the Airborne Coronal Emission Surveyor (ACES)

Re geoscience student admission and retention, she cited US Department of Education statistics: “Between 2009 and 2020, total undergraduate enrollment decreased by 9 percent (from 17.5 million to 15.9 million students).” Looking at data specific to the geosciences, she said that from about 1955 to recently, there was an overall increase in the geosciences till about the 1980s. At that point, graduate student numbers more or less plateaued. Undergraduate numbers showed more dynamic range, but in the graduate student numbers from about 2016 there has been a long-term decline, as there has been in the undergraduate numbers. There has been about a 10 percent drop in graduate enrollments. Of those, the master’s were about 23 percent and doctoral degrees about 29 percent.

She listed student enrollment drivers as:

- Decline in college-age population
- COVID-19 pandemic
- Energy transition

Discussing strategies for change, she cited:

- Connecting science to careers
- Partnership across the pipeline
- Strong mentorship
- Financial assistance
- Fostering research and community engagement experiences

Reflecting on the ongoing discussion about changing GEO’s name, she referred to the US National Academy of Sciences, Engineering and Medicine (NASEM) report and said the directorate studies the Earth system, from geospace to the center of the Earth. She Some professional societies tied to the geosciences articulate their audience as Earth and space sciences. The budget requests call for understanding Earth’s systems. GEO is increasingly funding transdisciplinary research across the Earth system. Even the GEO website categorizes GEO within Earth in the environment. Earth resonates better with the public and congressional appropriators. They know what the Earth is; they’re not necessarily sure what geoscience does. GEO needs to think whether its name tells the story about its investments. AC members to provide were encouraged to provide feedback [online](#) regarding student admission and retention and the potential name change.

### *Discussion*

Dr. Timmermans said the name geosciences has connotations of geology, which is traditionally the broader earth sciences and over the years became more specific to hard rock geology. That relates to the enrollment statistics. She asked if there were emerging areas that took away from the enrollment numbers, that would traditionally be thought of as in the geosciences.

Dr. Isern said she wondered if the drop post ‘80s and early ‘90s in undergraduate numbers was when a lot of environmental science degrees came in; maybe that changed the counting.

Dr. Morris said in Arizona there are large increases in the college-age population among Latinx and asked what may have led to the recent decreases beyond the recession and if the decreases were differentiated by region or discipline.

Dr. Isern stressed thinking about getting to the next level of regionality and why is it different when we move into a domain level. We need to have more of these data. The challenge is that geoscience is considered in some collections as physical science. GEO gets mixed in with other things. We can work with the American Geosciences Institute (AGI) and other groups.

Dr. Parsons said the breakdown by discipline by minoritized groups and regions is important. Artificial intelligence (AI) is changing the field and we're losing masters students like mad and changes how we teach our undergraduates and graduate students. Dr. Isern mentioned RISE, co-located incubators and said cyber infrastructure has been looking into how we can advance our connection to AI.

Dr. Parsons said it's strange to have the undergraduate senior class over 50, when it used to be almost half that, but doctoral students are being reeled in by these companies.

Dr. Nettles raised the shift from geology to environmental science and how that's getting counted. Having the major called Environmental Science was a great way to bring students back in. Now the pressure is on climate science. It's not fundamentally different curricula. It's an understanding in this discovery type of major of what you want to study and where that fits in sustainability. And there is the aspect of what career you can do; we have quite a few students interested connecting with environmental and climate science, but they're also excited about machine learning and things they hear about that maybe they don't really understand. The idea that engaging with Earth Science, broadly, is a way to learn how to handle complex data and real world applications is attractive. Maybe that's part of telling the story of the careers you can do with a GEO degree.

Dr. Isern said GEO thought of whether it could leverage the informal education program in EDU. That could get into the cool things you can do with observations and data and machine learning. Also, the EPSCoR workshops and conference opportunities are a way to get investigators and students together to explore ideas and collaborations for forged partnerships.

Dr. Gamage said at community colleges there are less and less geoscience majors. Since 2020, her school's classes are offered mostly online and it's very popular. It is difficult to continue undergraduate research with this group. We have to think differently about how to bring research into these online classes. Dr. Kraft said her school's our online classes fill first. Where overall enrollment is declining for community colleges across the country, there is a mini surge of students interested in Earth systems. Community colleges have struggled at tracking what their students do after they leave. And there aren't science degree programs at the two-year college level.

Dr. Isern responded to a question in the online chat regarding where biology belongs and renaming EAR. GEO does a lot of biology. It's never going to be a clean stovepipe. We want it to

be porous. GEO also does astrophysics. No name is going to be perfect. It's a benefit to rebrand and shows we're forward thinking. We shouldn't fear a new name.

Dr. Bart said his university is seeing declines in enrollment at the graduate and undergraduate levels. It attracts many students interested in the energy sector. Some of that softening in the market has affected enrollment. But we've seen other units pick up folks and they're geo-centric. Environmental Sciences has seen a bump; also, oceanography. His department is thinking about rebranding.

Dr. Dahl said she works with pre-service teachers. Since COVID, she has seen a rise in students interested in Earth science teaching, even though that's not a big component of high school science. It may be related to climate change, which is a big factor in students' minds. We often forget about that as a pathway for scientists, but K-12 teaching is also a big part. Dr. Isern said that's our pipeline and Earth science educators in K-12 are going to use our science to teach math, physics, and chemistry.

Dr. Kraft said one challenge is that it's a discovery-based science. If they're getting more exposure in high school, there is less of that discovery process.

Responding to a comment in the online Q&A that the public does not recognize the difference between Earth with a capital "E," and earth, with a lowercase "E," which de-emphasizes ocean sciences with respect to its role in addressing climate change, Dr. Isern said the Earth is about 77 percent water and referred the comment to ocean scientists. Dr. Kraft said there was a similar question in the online chat asking if AC-OPP members not in geoscience or science departments have comments on the GEO enrollments with respect to their engagement with students' interdisciplinary work.

Dr. Aluwihare said that with Ph.D. students at Scripps, the application pressure has not decreased. But there have been a lot of retirements. So, the number of Ph.D. students Scripps is accepting into areas like the geosciences and biological sciences is decreasing. Whereas in oceans and atmospheres, there is a slight increase. On the name change, this is an ongoing debate at Scripps, because it is an institution of oceanography. People say it doesn't reflect the Earth. She said what "Earth" means to the public versus to us is something to think about.

Dr. Kraft read a comment in the online chat regarding a name change at Yale from geology and geophysics to Earth and Planetary Sciences; a distinct uptick in undergraduate majors followed. Dr. Kraft asked if "Earth" is better than "GEO," if people don't have a fundamental understanding of either of those concepts.

Dr. Romanowicz said at Berkeley, "geology and geophysics" was changed to "Earth and Planetary Science" a long time ago, which was beneficial. She asked about using "Earth and Planetary Science," though planets are part of NASA. She also asked about using "Earth's Atmospheric and Ocean Sciences," and if it's ambiguous without added attributes.

Dr. Kraft said part of the discussion is about which acronym resonates. She referenced the online Q&A regarding how to look at data once the geosciences are defined, using NCSES for more

granularity. Dr. Isern said it is possible to disaggregate data in the Science Indicators report. She was not sure about undergraduate numbers for international students but it is important to capture.

Dr. Kraft said there is a broader narrative happening across the country regarding how expensive higher education is and whether it's worth it. She asked who that narrative is impacting and referenced information indicating Black Americans are economically disadvantaged in some cases with college degrees, because of the tax structure. It is necessary to think about how that narrative is playing into the declining numbers.

Dr. Nettles spoke about partnerships, saying computer science departments have huge increases and have launched interesting cross-disciplinary programs, including courses related to programming and data science for the humanities. She suggested working on sucking in students with those kinds of interests, with a role for joint programs that tap into that interest in a way that allows people to get into the data science machine learning computer science realm, but with a focus that pulls them into whatever we're going to call it. She asked about RISE catalyzing systems level approaches to get the more deeply interdisciplinary work off the ground and the tension between needing experts within a discipline and the time it takes a for them to learn to speak the same language to move an interdisciplinary piece of work forward.

Dr. Isern talked about ways to get around barriers about language differences. You've got a panel with four different experts and they each review their part and don't really like the rest of it. She asked about being creative in breaking this down in the review process to be more effective at reviewing these broader activities. Keeping the connection to the divisions is critical, as is building partnerships and ensuring existing connections remain. One challenge is RISE is not only going to be for GEO, it's a central area for thinking about the Earth system. We can use some of the funds for venture capital to encourage things, but we're also doing this for the agency. Scaling is something were struggling with and what success looks like in five years. We've opened this space up to have computation connected to climate connected to education and workforce, and having that flow into the rest of the directorate in a more permeable way. We're trying to create something that's scalable, so if we don't get the resources we expect, we still want to do something impactful.

#### Discussion of Pending AC Merger and Future Directions

Dr. Kraft, Dr. Nettles

Dr. Nettles said she and Dr. Kraft would like to kick off a discussion about the merger by looking at what members of both ACs think about bringing expertise in the AC-OPP into GEO and leveraging activities and thought processes in GEO in the context of RISE and cross-disciplinary efforts within the larger framework of GEO. She asked for thoughts on where members see activities within OPP that might connect with RISE or other directorates on catalyzing the system's level approach, attracting underrepresented groups to GEO careers, joining other parts of NSF in integrative research and education and fostering the exchange of scientific information nationally and internationally. One of the issues is OPP sometimes has expertise from areas that might not traditionally be thought of as GEO and whether OPP can bring that in.

Dr. Isern said the social and behavioral sciences are going to be critical at the start from anything we do in climate and systems research. We'd like to share a staff member because they're understaffed and under-resourced in SBE. We want to enhance these areas that are not traditional.

Dr. Kraft referenced yesterday's AC-OPP session and topics that came up that AC/GEO might not be as familiar with. The ARV is in the design phase, working its way through the approval process to bring it on board by 2027. Bringing a giant research vessel from design phase into implementation is exciting, but also the GEO community is familiar with the idea of big research vessels. She referenced conversation across different communities thinking about this through different lenses, the OPP subcommittee on polar logistics and conversations around physical qualifications for serious remote work and the challenges that come with preparing for it. She spoke about the many places these conversations have been happening and bringing those different conversations together.

Dr. Nettles asked what can be done to better connect research that's traditionally happening within OPP in the polar disciplines and infrastructure with what's happening in other areas of GEO.

Dr. Whitlock suggested looking for the overlap in RISE and asked about enhancing capacity and reaching out to emerging research institutes and how they relate to a building a new research vessel and polar logistics. The Environmental Research and Education Committee is talking about making research more sustainable with a lighter environmental footprint. That affects both programs. She'd like to look at some of the OPP areas they're growing in and linking that to RISE.

Dr. Nettles said a big part of the discussion around the proposed ARV looks at reducing the environmental footprint and OPP is looking at how to do field research in a way that is effective but minimizes the impact on the environment. That connects directly to discussions in other parts of GEO.

Dr. Isern said regarding bringing more intentionality to working across traditional boundaries, that will help develop some of these connections. We've been talking about a makerspace of partnering and bringing the disciplines together. OPP has tended to be self-contained. In Arctic science, for example, it is part of the definition; it's things that happen in the Antarctic. Because it's geographically defined, it creates a geographic boundary, but it still does biology. It could provide an opportunity to think about the sciences differently by enhancing those bridges and helping us think from this facility standpoint. We can't ignore our facilities, it's half of our Geo budget. So how can we better leverage those capabilities across all of what we do, including the polar regions. It is important to carry that experience and understanding to what the rest of GEO does.

Dr. Nettles said the AC-OPP yesterday discussed a report by a subcommittee that looked at how to prioritize use of South Pole Station which is oversubscribed and used by many agencies and; that's an equally difficult question for a number of big facilities and infrastructure pieces within



GEO. We had a positive experience going through that difficult exercise of having a group tasked to look specifically at how to do rules of engagement for that prioritization.

Dr. Parsons said there's an opportunity with cooperation. A lot of large ice loss events in the Arctic are associated with Arctic cyclones influenced by midlatitude Rossby wave breaking, for example. Sometimes there have been barriers to looking at research problems that extend across the Arctic into the mid-latitudes or tropics. There's an opportunity as an atmospheric scientist for polar to learn more about how things are operating. And there's much we on the GEO side can learn about OPP and how things work. A good opportunity is talking about the marginalized in minoritized communities living in Oklahoma on land acquired with 38 tribes and nations. The people in Oklahoma are excited about having the links to the tribal nations and nations in the Arctic. So there's opportunities to learn from each other. He said he was excited about the merger; there are challenges, but opportunities for learning on both sides.

Dr. Nettles said there's been an equivalent frustration from the polar side. There are a lot of glaciers south of 60 degrees latitude. Bringing that knowledge across has caused frustration. OPP spent a lot of time working on principles for the conduct of research in the Arctic. That shouldn't just be the Arctic; we need the same kind of principles for conduct across the globe. It's something for upcoming discussions of the ways we can inform each other about working with local communities of all types, but particularly recognizing that when we're working with indigenous peoples, it's not just a question of the Arctic, because it's a global question.

Dr. Gamage asked if once the merger happens, will there be a three-day meeting or a two-day meeting? Dr. Nettles said the intent is one AC without additional days. The new AC will likely rely on subcommittees, but the intent is not to have a separate part of the agenda for OPP. Because of specific infrastructure and logistics and safety concerns, we want to make sure we're really getting robust continuing input into polar programs and stand up a subcommittee focused on polar infrastructure, logistics and safety. That group will report out through this merged committee.

Dr. Isern referenced an online Q&A comment that there was one committee before. Though we've done this before, we should think about the meetings and how long they should be, and how long is fruitful. We have a lot of ideas of things we want to talk to the AC about, but we recognize you're busy.

Dr. Ulvestad said when he was in NPS, little pockets of the AC would go off and talk to individual divisions. He said that didn't work because it was divisive. It detracted from the system level and overall strategic thinking.

Dr. Kraft said we've been saying we have important ideas across this community and to separate it out is a false narrative. Conversations around the Antarctic research vessel are relevant to all of us. The Sexual Assault/Harassment Prevention and Response (SAHPR) Program report was produced by the polar community, but its deeply relevant to the GEO community. Bringing them together is going to benefit all our communities by having these conversations together rather than separating them out.

Dr. Nettles said key issues that have emerged from the AC-OPP discussions are being tracked and she will work with Dr. Kraft and Dr. Ulvestad and Dr. Isern to make sure that in the transition there are appropriate means of continuing to track those and bring them to the full group.

Dr. Timmermans said the idea that it's all one system resonates. From a physical oceanographer's perspective, as the mid-latitude ocean structures are found further and further north into the Arctic, it seems a shame to delineate these two regionally the same way as for atmospheric dynamics. Overall, it's a positive merger.

Dr. Nettles said the Office of Polar Programs is not being merged with another division, rather the advice-giving mechanism is becoming less isolated and can take into account all those connections. This comes up in different places, particularly around DEI efforts and sexual assault and harassment prevention efforts. But there are things that need to be done on the ground within the individual offices or divisions, and then we need to find effective ways to connect those to break down the disciplinary or other structural barriers. You've got to do some of the research in the poles in regions that rely on the kind of support OPP can provide. And you've got to be able to connect that effectively across what's in a different bin at NSF.

Dr. Romanowicz asked about the membership of the merged committee. Dr. Nettles said people rotated off each committee. Joining the two makes a relatively big committee. There have been discussions with Dr. Isern and Dr. Ulvestad about the balanced plan. We don't want a huge committee. But we want to make sure we keep bringing in voices from other folks in polar science who have an intellectual home in one of the other directorates like SBE or BIO to strengthen the committee. We'll be looking carefully at who is rotating off and who we need to bring on and make a committee that is not enormous, although initially it is just the gluing together of the two individual committees. Dr. Isern said it is a delicate balance, because we don't want a huge committee, but you want representation. We also want to make sure we continue and strengthen ties to the other directorates.

Dr. Bart said his community is interested in the oceanographic part of the story. He looks at the continental margin and reconstructing the ice retreat. Much of the modern observations indicate the oceanographic influence is dominating, whether the ice advances or retreats. Maybe this is the perfect platform where some of those processes going on in the mid- and northern latitudes can be better incorporated.

Dr. Hindle said she was considering topics for a merged committee and which would be boring for people on the GEO side. She raised the issue of a quorum if the committee is too large. But, it's not a disadvantage to have a large committee, because the work of putting together the meeting is the work and it doesn't add effort to have more people at that meeting.

Dr. Nettles said it is difficult to have a robust discussion when you have too big a committee. The combined committee is going to try to have a robust in-person meeting in the fall and encourage everybody to attend.

Dr. Isern said there have been discussions about meeting at a facility such as the National Center for Atmospheric Research (NCAR), which is central and gives the opportunity to have part of the meeting focused on the systems level.

Dr. O'Brien said there will be synergies by combining the ACs. With respect to the Antarctic research vessel, it'd be helpful to have more input while we're continuing with the design from people who have expertise with logistics.

Dr. Emanuel emphasized that an example of a potential synergism comes up in the DEI subcommittee report AC-OPP just finished. Dr. Nettles said that's an example of a place where you need agency-wide leadership and strategy within the directorates and divisions figuring out how to respond to that DEI subcommittee report in a way that's effective. This ought to benefit all of GEO and set good examples for the rest of NSF.

#### Preparation for Meeting with NSF Leadership

Dr. Kraft, Dr. Nettles

Dr. Kraft and Dr. Nettles led the joint session through the process of developing a list of questions and talking points to use at the upcoming meeting with the Dr. Panchanathan and Dr. Marrongelle.

#### NSF in the Federal Landscape

Ms. Greenwell

Dr. Nettles said the AC invited Ms. Greenwell after talking about NSF in the broader federal landscape and the challenges and opportunities of a budget of about \$10 billion, which puts it in a different category of federal agency. The AC would like Ms. Greenwell's perspectives on where NSF sits in the federal landscape and what it might want to be aware of and the challenges and opportunities.

Ms. Greenwell said NSF has had support on both sides of the aisle for its mission. That means more awareness from those who didn't pay attention to NSF before. It gives NSF an opportunity to talk about the mission, things we're doing and how we are critical to national and economic security and the future of STEM for the country. It also means we need extra awareness about the things we're doing internally and how we are pulling things together, and things we need to relay to the scientific community and other stakeholders. There are folks that don't want to see NSF succeed in the ways we're trying to and would try to use some of those things to their advantage.

Dr. Nettles asked about additional things at this higher budget level that may impact operations. Ms. Greenwell said regarding the budget levels and the CHIPS and Science Act, there are many things we're working through that are not going to happen in the first year. But the agency is having conversations at higher levels about the structures in place or not in place so we can meet the current mission, but also looking at the requirements placed on us through that legislation to make sure we get that done by the end of the five-year authorization.

Dr. Patten asked about administrative congressional priorities and the research the community would like to do and workforce development challenges. Ms. Greenwell said NSF has been trying to do more messaging and packaging towards the workforce issue. Congress and industry are clamoring for that, finding the workers we need today. We can package some of the direct ties of investments that the GEO community is making into those things. This doesn't need to be four-year or Ph.D. degrees. There are many areas where folks need those workers, so being able to tie some of the investments or specific programs is critical. GEO has a lot of examples of things that lend itself to the national security and economic security messages of research that has created jobs and an ability to stay competitive globally. Dr. Nettles said that connects to a discussion this morning of enrollments and recruitment and retention of students. Highlighting that workforce piece is useful to hear, in addition to national and economic security.

Dr. McManus asked about changes to expectations per interagency activities. Ms. Greenwell said that expectation was there before, but it's stronger now. When Congress gives that level of funding, they expect us to leverage that with other partners. They don't want redundancy. So, making sure we continue to work closely with the Department of Commerce when looking at implementing TIP and other new programs, and not just in funding areas, but where we have synergies in some missions, where we can utilize our community but also connect with this group over here that's going to make what you're trying to carry out on in your agency even stronger. The director has put that front and center for one of his key priorities for us to work throughout the federal government and with industry, foundations, etc.

Dr. Nettles asked Ms. Greenwell to expand on that train of thought with respect to international cooperation and greater visibility. The AC was recently talking about the importance of making strong connections with partner nations as the only thing that allows us to do the work we need to do. But there are challenges inherent in that.

Ms. Greenwell said that's been a huge priority for the director and referenced the Laser Interferometer Gravitational-Wave Observatory (LIGO) [announcement](#). NSF had a big role in working with them to make sure we have partnerships like that. The director continues stressing the importance of international partners, making sure we're talking about those that share our values and are going to continue to help us strengthen STEM for the nation and globally. And we know not everyone is sharing those same values. We need to make sure we're protecting the federal investments and the taxpayer dollars.

Dr. Isern said she and Ms. Greenwell have talked about how GEO can tell its story better and asked her how to amplify the climate message from NSF and the work we do with communities and education. Ms. Greenwell said they talked about the workforce messages, and she mentioned Congress and industry. How we can make those connections and help at all levels will be critical. Wherever we can tie it to national economic security, and showing this research led to X, which has done this for the economy, is vital. GEO has some of the most amazing visuals and tools and places; not just Antarctica, and the Arctic, but things we can bring people to. The more the community can bring this local official or member of Congress or person from my community to check this specific thing out, and not only tell the story, but show the visual and make that clear connection with these federal dollars that go here and make this happen, that supports these

students, that makes it more real for the folks making these calls in terms of what funding and language we get and the flexibilities we have.

Ms. Greenwell said the director is visiting institutions, including places NSF hasn't been before, and bringing members of Congress, so they can hear directly from faculty, students, and the community that's impacted by the investments. That that's made a huge difference in support and understanding more about what NSF does and why it's so important.

Ms. Greenwell said OLPA is constantly working to make sure we can get good information and connect with folks. Her office works with the communications liaisons. Her team helps Dr. Isern and GEO have that connection point. Her office has created a form it sends internally to make sure it is getting out to a broader group. It is doing a better job of archiving the things that come in. It is important to have information on a paper coming out, or a student who worked on an amazing project, for social media or when something comes up that's timely.

Dr. Nettles said it sounds like a question of encouraging all of us to be communicating back to the program officers we work with about what's coming out of the research. Ms. Greenwell said her office is also looking for visuals. There are a lot of inquiries for B-roll video from some of these places your community works.

Dr. Isern suggested a Town Hal or luncheon for the community and office hours to talk about what would be useful. There's an assumption that it's only after papers are out, whereas some of the notes we get from the field and images and nice stories that tell about the impact of our investments are important.

Dr. Isern said there has been discussion about NSF's name. Because it is a foundation, people think it's private. As NSF gets bigger, that might get exasperated. Our brand is well known in the academic community, but beyond that it's not that well known. We've traditionally pushed away from having a brand because researchers produce the outcomes. But as we grow and get more attention on how we invest so you get outcomes, that confusion and lack of understanding of our brand and who we are is going to be more of a challenge.

Ms. Greenwell said the brand is critical and hopes there will be a policy soon. This isn't just discoveries that are going to be made decades from now. Folks can do things today because of investments NSF has made in the past. We need to step up our game, not only in the visual branding of pieces, but asking those we invest in to make sure they're clear in the ways they're communicating. Dr. Nettles said it was about making sure when we speak with media that it's clear it's NSF-funded research.

Dr. Schmidt asked about groups or societies outside of the audience, like AGU, that NSF works with to help disseminate these messages and enable scientists to do advocacy and outreach to Congress. Ms. Greenwell said her office works with many different societies, such as the Coalition for National Science Funding (CNSF) and the Association of Public and Land-Grant Universities (APLU). NSF is also trying to reach out to industry and others, which have a different type of influence, and reach people in places we haven't really been able to connect with before.

Dr. Whitlock said she has a large project in Yellowstone National Park with a strong paleo climate component. The park is interested in that and using that to communicate big issues to the four million visitors that come through. She hadn't thought before how to connect with NSF on that. She asked who to talk to and about opportunities to connect a park service.

Ms. Greenwell said the Park Service has been doing a great job on their social campaigns for the parks around the country. She offered to connect her team with Dr. Whitlock to look at potential opportunities for outreach and partnering with The US Department of the Interior.

Dr. Nettles emphasized the message that being involved in the geoscience workforce does not necessarily mean you have to be able to or want to travel to extremely remote places. It's not something everyone wants to do or is best suited to or can do. Making visible the support for the people and other types of research getting done is important, so we're not relying entirely on the image of the super outdoorsy who want to get lost in the wilderness for three months.

Ms. Greenwell said her office has used GEO-funded students and scientists and the scientist selfie has been popular on our social media, where we're having those folks tell their story. It doesn't have to be somebody in an extreme environment, but students talking about how they got excited about science and engineering and what it is they're doing and how that work is relevant to others. Those have been popular. She welcomes those kinds of connections to keep that pipeline going.

Dr. Nettles said many folks didn't realize it was an option to be a scientist until something came across the desk. It's great to have a lot of options for all the different ways you can be engaged with science, technology, etcetera, for people to imagine themselves there.

Dr. Kraft said she was unsure whether to tag NSF and asked about guidelines for thinking about social media. She was hesitant so as not to imply NSF is endorsing something they may not endorse. Ms. Greenwell said NSF loves getting tagged in social media. Her office does an NSF in the news that goes out every day and does a highlight for social. There is a social media policy internally for NSF workers. But if NSF helped fund the work you're doing, or something connected to something you're putting out there, that's the only way we're going to reach so many other people.

Dr. Ulvestad asked people to be mindful of the complicated international situation. NSF wants to promote international cooperation, but a big part of the CHIPS and Science focus is making sure we sustain US leadership in certain places. So, there's a dichotomy that people need to be aware of. NSF was tasked by CHIPS and Science to stand up a risk assessment center for helping universities and researchers evaluate the risk of their programs and collaborations. He said that's going to be coming in the next couple years. CHIPS in Science told NSF to stand it up at arm's length where NSF funds a group potentially from the research community to run this risk assessment center and interact with our colleagues.

Dr. Kraft referenced the challenges that occur as a function of being a federal agency and how communication works internally versus what gets communicated externally and challenges that

might come with that. She asked about the nuances as NSF gets to be a larger agency and gets more scrutiny.

Ms. Greenwell said she assumes what we're talking about or sending internally would go externally. But now it's more true, because before you may have folks externally that may see it, but not have NSF on their radar and not think anything more of it. Now that we are getting more of that attention and some folks that want to put NSF in a bad light or media where they're always looking for a headline, we need to be extra aware of that internally but also in how communities are talking about things that would reflect on the agency and the mission and especially for us trying to make sure we're getting out the strong messages about how important our mission is and how that's impacting people on a daily basis.

Dr. Nettles observed that it's an interesting place to be with the benefit of a bigger budget and the challenges that brings. The big message being that we need to work hard on communicating back to NSF as projects go along, so they have the opportunity to help us show people what the tax dollars are getting used for and having concrete examples.

Dr. Bart asked if anyone had experience inviting out a local representative or elected official, something he had never thought of doing.

Dr. Hindle said her congressional delegation returns calls and likes coming out and it's worth inviting them or their staff. She had them tour the labs in the animal facility as part of initiatives to inform folks about animal welfare legislation and working on research practices related to animal use. She said it's harder to get them in the field because of the geographical challenges. She suggested reaching out to a professional society and their legislative affairs group. Dr. Hindle said the people who hold the science portfolios like science. They like seeing what you do and like being able to say, our money went to these people and here are the students being supported. Some are passionate about education, some about biomedicine, some about economic development. You can figure that out quickly and highlight that part for them.

Dr. Kraft said her institution has strict requirements in terms of who can make official invitations on behalf of the institution. It would probably be frowned upon if she reached out to the person. Then the information can get diluted.

Dr. Hindle suggested introducing yourself to your university's government liaison office. The rule is you can't advocate on behalf of the university, but you are a researcher receiving funding from the National Science Foundation, particularly if one of your delegates is on one of the committees that's responsible for NSF appropriations. If your university is also angling for money from your delegation at the same time, you don't want to confuse your message. So best to run it through them.

#### Briefing with Office of the Director

Dr. Panchanathan, Dr. Marrongelle

Dr. Panchanathan thanked the ACs for their help and said the convergence of OPP and GEO to the earth systems view of the world is most appropriate and is energizing this entire systems

portfolio. Dr. Isern is doing a fabulous job. He will be having a meeting on SAHPR and OECR and acknowledged their hard work. We need to make sure there is a safe, healthy, productive environment for all researchers, staffers, and everybody else. There would be details on the website on the hotline this week. The hard work of NSF and many of the external constituencies is paying off. NSF got the largest ever increase of 12 percent in the FY23 budget. Coming with that are the desires of the administration, the Hill and others to do certain things which you need to prioritize and clearly know. A climate resilient planet falls squarely within their interests, which is not different from what we are all prioritizing. And the president's FY24 budget of \$11.3 billion is also fantastic for NSF. He listed his appearances with members of Congress around the country and testimony before Senate and House committees. He is trying to keep the message of the importance of the moment in terms of investment for impact, inclusion, and ideas.

Dr. Nettles thanked the director and reviewed discussions with Ms. Greenwell. The ACs are interested in following up on the SAHPR report and response, which originally came out of OPP and she thanked Dr. Panchanathan and Dr. Marrongelle for how that has been recognized as not only a polar programs issue and not only a GEO issue, but as an agency-wide issue and elevating the response to the level of a cross-agency effort and she acknowledged the individual leading the response and the importance of effort and expressed appreciation for the director's leadership. She reviewed other items on the agenda, including DEI in polar science. That's an interest shared across the GEO community. There is a potential for cross-agency strengthening and taking advantage of the pieces that need to be owned within different divisions and directorates for an on-the-ground response and the broader strategic agency-wide response. She asked about the ways Dr. Panchanathan sees the agency moving forward with supporting a broad agency-level response and the connections to the on-the-ground response.

Dr. Panchanathan said he wanted to address it as a systemic problem and a cultural issue, rather than just a response to a particular incident, so we are going deeper into this and you will find the common idea laid on the DEI. It's not just saying, Okay, let's hire this guy to do this or that. The objective is changing the culture. The actions can contribute to it, but they will not necessarily address the issue head on. One of the things we are focused on, therefore, is addressing the cultural issue on both these fronts. He was glad the AC-OPP met with Dr. Charles Barber because he exemplifies that, bringing a perspective of addressing the core issue of the culture. There was recently a two-day retreat with the leadership team, probably the most diverse of any agency. You must make the efforts to embrace excellence in every form and use that excellence to see how the culture of the entire agency can be addressed through that, and not just talk about it. At the retreat, the single point talked about was culture. There was an external consultant on culture who gave a set of ways in which you can look at where we are, where we need to be, and how we get there. It's not a one-time effort, it's an ongoing activity. On SAHPR, we want our actions to be immediate, actionable things that make people feel safer. That is, looking at the problem and finding a solution to the moment. But we are addressing the cultural issue also.

Dr. Marrongelle said permeating the conversations around the agency, particularly in the DEI space, but also the sexual assault and harassment prevention space, is that our communities are unique. We serve all of science and engineering and there are unique features of those communities. A hot button issue in the DEI space in computer science looks different from the



hot button issue in the DEI space in biology. Communities have a good pulse on those parts of the of their own cultures and their own inner workings that they need to do significant work in. We want to develop strategies supportive of all of that, recognizing there are unique features within different disciplines. In cyberspace, we had an opportunity with OPP to address a critical issue in a unique and isolated space. We're learning from that what we can take and fan out to other unique scientific spaces. There will be elements of what we put in place in the SAHPR response that we're going to translate to other field sites, vessels, and other locations, but there will be things about other locations that are unique that we will need unique solutions to. We have to find the right solutions for the right communities for the right environments.

Dr. Kraft said the work around DEI is something GEO and OPP have been involved in and the subcommittee for OPP recently completed its report. She mentioned the AC-GAO subcommittee of climate justice. These are around different issues, but also concerned with how we become a more inclusive and thoughtful community and issues of who is entering into these spaces and how we think about bringing people into the GEO directorate, writ large, and from the standpoint of the workforce and what that means in terms of the different pathways.

Dr. Morris said he appreciated the earlier comments and commitment to culture change as a critical first step towards addressing systemic issues around the SAHPR report and hopefully this can be a model for extending that to other systemic issues. He asked about channeling the Arizona State University (ASU) charter in accelerating how we include people but making sure they're successful and stay and thrive in the community. At ASU our online population is far more diverse than some of the immersion populations in geosciences, but they don't necessarily have access to research. Getting the research and professional development elements into the online space in ways can lead to the same type of success. He asked how NSF might catalyze innovation in that space. He said NSF has funded him for a two-year pilot program that has panned out and he's trying to figure out how to now translate that as a model. He asked where NSF is on thinking about this to create systemic change.

Dr. Panchanathan said there are some good lessons learned from the pandemic. This feeling that online means lesser quality is starting to fade. But learning includes research, maybe. So how do you enrich the learning process to provide opportunities for creative work, research. NSF is encouraging pilots in this regard. Also, in some cases, we are starting to increase the idea of internships and experiential learning, not necessarily limited to on-campus students, but also non-traditional learners. We're doing some of that through those targeted programs and we are making forays in terms of programs that are exemplifying the theme Dr. Morris talked about.

Dr. Marrongelle said there are a lot of lessons learned through the pandemic that we're in danger of losing sight of. There is a critical issue around access to data for researchers, for several decades, especially in the EDU Directorate. We understood that someone may not have the ability just to pick up and go do field work in a remote site for three weeks. And we have the ability to provide data, so with the right mentoring and access to data, we can provide those research experiences that are as rich for a variety of individuals. There has been work that has been undertaken throughout the foundation but spearheaded in EDU with a lens of trying to study and understand those research experiences. Through the pandemic, we spent a lot of time on projects understanding what mentorship was like in a virtual environment, what works and

what doesn't. We're doing some things with our NCSSES to make government-wide datasets available to a wider variety of people. These datasets are sometimes hard to come by. The training needed to get access to them is cumbersome. NCSSES has been charged with making those datasets more accessible and testing ways to enable access to that data so critical questions can be addressed. She raised that as a way to keep our eye on how that's working. This is going to roll out this year. The question is how that is working when we make these large datasets available to a wider variety of people and whether we are taking down the barriers of access to the data. There are new questions we're going to be able to ask and answer because of widening that access. That is a model we intend to learn from and look at replicating that throughout other disciplines. Data we collect in Antarctica, from telescopes, and so on — we should solidify some of these models. We want to understand how better models can work and how to improve those for greater access.

Dr. Panchanathan said the other thing the pandemic taught is you don't have to be physically in Antarctica to do all the work in Antarctica. A fifth grader in rural Montana should not be precluded from having access to a quantum foundry to excite inspiration. That provides more remote students getting access to the instrumentation, in addition to the data, so they can have research experiences that typically on campus students don't have.

Dr. Nettles said there is excitement about the progress with the ARV design process. At the same time, there are questions around aging infrastructure, and re-capitalization, everything from aircraft fleets, to drill ships. And for a particular community, it can be a big perturbation when we have one going offline or a delay in coming online, and it prompts us in the context of next generation facilities being even more expensive. She asked about long-term facilities and strategies to building the portfolio that spans disciplines in a way that has a robust process for deciding what to stop, start and continue.

Dr. Panchanathan said the terms Dr. Nettles uses were used in the retreat discussions. Start, stop continue is a theme he has been inculcating in the directorates at all levels, not just in terms of facilities and infrastructure. What are we starting? What are we continuing and evolving? What are we stopping? Also, the National Science Board has been increasingly focused on the prioritized list of infrastructure things and facilities we are going to be thinking about for the advancement of science into the future. We're putting an extra emphasis on that. Regarding facility maintenance and ensuring they are kept refurbished and operating, we are trying to see how that budgeting process does not take away from the ability to fund research. NSF is also trying to make a strong case for investments that must be increased in terms of infrastructure, and the angle we are using is national. We cannot lose the tremendous scientific promise we have by seeding leadership because we didn't invest at the appropriate time in the appropriate way. Even if the NSF budget were to double or triple tomorrow, we still will not have enough resources to do what we want to do. But we always have to have the mindset of two things. One, what do we stop, because we have done and we have achieved, or we tried, and it didn't work. What do we continue, but not just continue because it's good, but because it is evolving. And then what do we start. In all of this, we can never leverage enough assets from the federal government for what we need to do. We have to do interagency partnerships, industry partnerships, international partnerships of like-minded partners.

Sexual Assault/Harassment Prevention and Response Update  
Ms. Davis, Ms. Williams, Dr. Nettles, Ms. Short

Ms. Davis said OPP has been at the forefront of the sexual assault and harassment prevention response effort and has been a super partner, ensuring all the efforts we've made so far and are continuing to make a significant dent in the short term. As the director said, we are looking at it from a holistic way. A focus has been on Antarctica, but we are trying to get at some of the other locations too.

Ms. Williams said OPP served as the launching pad for getting this started and unblinkingly focusing the light on this. This week, the biggest update is launching the NSF Antarctic helpline, a crisis support line that went live Monday. This is specific to the USAP community. The intent is to provide 24/7 on demand crisis support for individuals and participants in USAP, both current and past, to give access to a compassionate trained human to talk to and be with and make someone feel less alone and help direct them to different resources. One is the USAP victims advocate, which OPP can take full credit for; it's a resource available to all USAP participants and is confidential. It provides information on options for reporting and engaging with OECR using the safer science inbox. Also specific to USAP, OECR has initiated an incident review team, a collaborative activity with OPP. We are reviewing every incident, report, communication and complaint to make sure we're not missing any because we want to make sure people have multiple avenues to report and contact us. We are taking a joint approach to ensure everything is being looked at and making sure each is addressed in an appropriate and timely way. The helpline is staffed by trauma-informed individuals who have been through training. OECR, alongside the Office of Inspector General, is undergoing trauma informed interview training. OECR is implementing an ongoing marketing and communications strategy to ensure everyone in the NSF community understands what constitutes sexual harassment and sexual assault, make sure they understand their options for reporting, and when there are supportive services available, making sure they're fully aware of those and how to access them. OECR is also making progress in the development of an IT-based case management solution to better ensure case processing accountability and accessibility of reporting data. This is the office's means of making sure we're being accountable, timely and accessing information and having a better understanding of the landscape with regard to sexual assault and sexual harassment. OECR is currently in the process of reviewing responses to requests for information that includes a variety of services and expertise relative to what we hope will be a robust prevention and response strategy, including culture change management, analysis and evaluation, restorative justice, mental health and support counseling services, and advocacy services. OECR has outreach and engagement with other federal partners who may be dealing with similarly challenging environments to gather information on promising practices for supporting safe field research. OECR has engaged several international partners, including meeting with Forum of Arctic Research Operators (FARO). OECR is pursuing a DCL to support research into promising practices around creating healthy and supportive organizational climates, and inclusive work environments.

Ms. Davis highlighted international engagements and work with the Air Force. We can't work in a vacuum and don't want to reinvent the wheel. OECR had a meeting with an Air Force person responsible for this and learned that if they tell the soldiers what not to do, those are the things

they do. But if you tell them how you want them to behave, they adhere to that better. Learning information like that is great to complement our proactive compliance approach and trying to get a handle on this topic. She asked anyone with suggestions to contact her office.

Ms. Short said an important next step on the USAP side is a culture survey coming this summer. It's important that as we're doing measures at the agency level and unique to the Antarctic Program, that we're able to measure progress and pinpoint where the issues continue to be and how those are moving over time. It will be an incidence and prevalence survey of current and recent USAP participants to make sure the efforts are pointed in the right direction, and trends are measured over time.

Ms. Davis highlighted restorative justice and restorative practices. OECR has been having discussions with NIH, with international colleagues and university colleagues about the potential use in settings where people come back and work together. And it may be a perpetrator there or a victim and they need to work together. We're trying to complement the compliance role to help these communities come together and work on healing trauma in a way they can be productive. We recently learned on a Title Nine compliance review the university had taken action to address bad situations. But the faculty and the students felt bad about the environment because with non-disclosure agreements they had no idea what happened. OECR is curious if restorative community practices would help these communities move forward and not have negative baggage and energy when the victim and the perpetrator are no longer in the workspace. She asked for any suggestions around restorative practices and restorative justice.

Dr. Ulvestad said he talked at the AC-OPP meeting yesterday about a visit to the Air National Guard from New York, which flies ski-equipped LC-130s into Antarctica and the Arctic. They discussed SAHPR and their approach to having deployed personnel act appropriately. The leadership is on board with that. It's complicated on the ice. There's a lot of players, a lot of jurisdictions, and people who have requirements to the universities. It's a challenging situation. We're going forward on all the fronts we can and affecting cultural and behavioral change.

### *Discussion*

Dr. O'Reilly said the helpline is a wonderful step forward. These practices and research show a serious commitment to working multi-dimensionally. As an anthropologist, she has been studying and working with Antarctic people and climate scientists for 20 years. She asks broad questions about their holistic experience. It's clear when something has come up that needs to be reported. She has encouraged interlocutors to do that. The description of the Air Force and modeling good behavior and explaining appropriate behavior is great. When she interviews scientists during a major project or intervals in a field season, or over the course of a research project, the last interview often brings up things that happened that don't get to the level of reporting. Things that gave them pause, that might deter them from going into the field again, or feeling unwelcome, are uncomfortable and it feels like a cultural thing. But not something they want to escalate to the level of calling a helpline; it's not acute and it doesn't feel like it needs to be reported. There's probably something like an exit interview to give people an opportunity, in a lower stakes environment, to express cultural concerns when it's fresh in mind. And in training for the next year, it's something that can address gray area issues that might help shift some of

the practices. Ms. Davis said those things are equally as large if it's deterred someone from coming back to do research in that area.

Ms. Short said there are a lot of harms that may not be at a level that somebody feels is quote unquote reportable, but makes them uncomfortable. OECR and OPP are expanding the training and toolkits for next season. They want bystander intervention training and other messaging to help people feel comfortable intervening or reporting in lower stakes ways. A consultant is building a lot into that training around building protective factors, so where there's quote unquote, lower-level behaviors, there are interventions or a way to handle that. And for the survey itself, it hasn't been determined when the optimal time is to conduct it. The first one is going to roll out in the summer and then look at the responses for information about what Dr. O'Reilly referenced.

Ms. Williams said one of the quotes from the listening sessions is how many yellow flags make a red flag. That's been a long-term hope to build a better relationship with the community, building more trust and opening up communication channels. So, that and getting information around what is assault and harassment, but also the gray, orange, or yellow area of stuff we want to hear about too to understand what's going on. Having surveys, maybe exit interviews, would be great. And being very open door and welcoming and being in a place that people can come to you and feel comfortable doing that.

Dr. Ulvestad said in this community of the ACs, you're thinking about researchers, but the majority of our people on the ice are contractors. And many are seasonal employees. If you wait until summer, a lot of them are not employed by that contractor anymore. They may be off fighting fires.

Dr. Nettles said it seems like it's going to take a variety of tailored approaches. The exit interviews we do with a lot of students are done as they're leaving, one-by-one as they come off ice.

Dr. Parsons asked about extending these NSF policies to have a safer, more equitable environment on NCAR aircraft or a university doing oceanographic work on their own vessels but funded by NSF. He asked how to broaden the impact beyond NSF facilities to people using the facilities with an intermediate or just universities funded by NSF research.

Ms. Davis said OECR doesn't want its focus to be so narrow it misses these other locations. We see the space as almost anything that includes field sites, vessels. The goal is where our money goes, we want our outreach to go. If we don't have a direct compliance arm, we need to use another entity, whether DOJ, Commerce, Labor, or other federal agencies. We have reached out to say, this is what we expect. We cannot be so narrow we don't broaden our reach.

Ms. Williams encouraged idea submission. She discussed the new requirement for the safe and inclusive field research plans to start to push award recipients to think about this and contemplate being supportive of their folks in the field. For the most part, it is a certification plan exists. But a couple directorates are requiring submission of those plans for review.

Dr. Morris asked about restorative justice and said geosciences tends to be a small in-group community and academically incestuous. He asked for an example of how that that looks. They may leave the field site or leave the program or switch to another university, but still be connected. At conferences, he's been at a table when that triggering was happening. He suggested a workshop that would help him be more trauma informed.

Ms. Davis said she went to San Diego for a training last year, because we're always trying to think of tools we can use to make a difference. When thinking of restorative justice, the individuals have to agree, first of all. We think of the victim and the perpetrator. There are situations where it's been hijacked because of what happened in that community. They gave a scenario at a campus where someone put the N-word on a whiteboard in the dorm, and it had everybody in an uproar. They decided to have a restorative practice community in that dorm. They were kicking off, and an African American male said it was him, joking with a friend and called him the n-word and wrote it on the whiteboard. Now they know who the person was, and it wasn't ill intentioned. They invited this person into the circle. And they facilitated that circle, because of the trauma everybody experienced. If you don't look African American, everybody's looking like it was you. After you get the perpetrator, whole communities are still impacted. And they still could probably be deterring other people from coming into the science discipline. We also have people who come to NSF that had trauma, and it's hard for them to hear of a PI they felt was involved in something and never dealt with.

Ms. Williams said not every scenario is right for restorative justice. A lot of thought would have to go into the right time and place to look to employ some of those practices. Some of them aren't going to be ripe for it; everybody has to be ready, and want to engage for it to be successful.

Dr. Nettles said several questions in the Q and A related to the theme of people in Antarctica working for a contractor. She asked what efforts are going to be applied to the contractor. Ms. Davis said her office has to look beyond the compliance work it is going to be doing. The Office of Budget, Finance and Award Management (BFA) is tweaking the process to address some challenges, knowing there are contractors on the ice who are impacted. Some don't feel they have a resource to go to and the organization is not looking out for them. The Equal Employment Opportunity Commission stated that it would accept complaints filed for them, which her office was not aware of until a few months ago. Her office is engaged in in a holistic way to talk to all the people involved, to make sure contractors are covered.

Ms. Short said there were contract changes aimed at screening contract deployers before they were employed and reporting more information to NSF than previously. NSF continues to follow that up with reviews of how the contractor is implementing the requirements in their contract all the way down to how the HR teams on the ice are receiving and responding to complaints. Systems of informal and formal practices and policies must be analyzed and change and NSF is attempting to march through on the contract side starting with the contract terms and training and how the teams on the ice are behaving when somebody comes to them with those kinds of concerns.

Dr. Nettles asked on behalf of the Q and A whether there will be an advocate or prevention trainer present at the South Pole next summer season. Ms. Short said there was overwhelmingly positive feedback regarding the advocate at McMurdo Station this past season. As a result, they extended that resource in the offseason virtually and are working with OECR on expanding that going forward. She could not promise an in-person advocate at the South Pole but is mindful of the impact it had at McMurdo. They are looking at ways to expand that to Palmer and other venues.

Dr. Nettles asked about adding protections or recording ability for scientists in the deep field. The hotline might not be possible for them if they can't talk on a satellite phone privately from a camp of tents. Ms. Short said that's a group we're mindful of. They did unique training for field teams before they went out and increased the number of communication devices. She welcomed other ideas.

Dr. Nettles also conveyed a question regarding changes to hiring practices for winter positions for next season. At the smaller South Pole and Palmer stations there were problematic incidents that may not immediately qualify as firing offenses but are significantly amplified. Ms. Short said we're changing hiring practices going into next season, particularly at places like South Pole, by hiring and building teams earlier. They heard in several listening sessions, particularly those focused on the South Pole, that when you come together as a team, sometimes these yellow behaviors can become problematic late in the season. Because of recruitment and retention struggles throughout COVID, it's going to be a heavy lift.

Dr. Nettles said as these practices are implemented, it becomes a more attractive place and that hopefully some of that recruitment and retention will ease as you have a bigger pool of people to draw from. She also conveyed a question about the Antarctic contractor and subcontractors. Ms. Short said part of the initial engagement with Leidos around the report was ensuring it had workplace policies comporting with what we expected and reviewed all the subcontract terms and conditions to make sure those requirements were there. OPP is working with Leidos and the subcontractors to understand if the policies and procedures are working and looking at training and outcomes on the ice. The NSF deployed footprint is small, and NSF is limited in its ability to do direct on-ice oversight. That's why the new reporting mechanisms are an important tool to get insight into whether these processes are in place and working. OPP is trying a top-down approach in terms of conditions and procedures and is encouraged by the reporting it is getting.

Dr. Nettles relayed a thank you to OPP for its work and courage to address systems and a question about ensuring institutions of higher education have meaningful, safe, and inclusive research environments. Ms. Williams said NSF has a lot of room to grow in this regard. Initial efforts, like the safe field research plan, will help NSF engage in conversations with them about what needs to be going on. These are big, hairy problems.

Dr. Nettles said you can take a compliance approach, or a culture and meaningful change approach. Different institutions approach that differently. We, as people within institutions of higher education, need to engage with the institutions around how these plans are implemented. There's a play to copy from something that has worked around risk management in OPP, which goes back to a workshop and follow-up workshops that were run around bringing researchers in

to learn and help develop good practices and generate a community of practice to help us all learn how to do this better, so we have meaningful, safe and inclusive research plans. NSF can't control what the institutions do other than having to check a box to submit the plan. She asked about strengthening work with risk management and Title Nine offices on the campuses and if some community of practice could come out of the research community.

Ms. Davis said her office has started more practical compliance approaches to its portfolio. When program officers do stakeholder engagement, outreach, and technical assistance, it is looking to tag along to listen, observe, and stay behind after they leave and have more engaging conversations with the university about what they learned to gain more information in a proactive compliance way to bring back and share with whatever applicable office went out there. Trying to create a community practice by having workshops is worth talking more about because it marries well with what we are trying to do on the stakeholder engagement side.

Ms. Williams mentioned the DCL and funding research in this area to look at what is going to be effective, or what is a promising place to start digging into further.

Dr. Nettles said the AC will be coming back repeatedly to this discussion. She conveyed a concern in the online Chat about addressing culture first as common and an empty DEI answer in higher education and that systems, practices and policies have to be analyzed and changed. Ms. Williams said there isn't one avenue for success. We all have different levers to pull, and all those levers need to be going for something to be effective. There is the DEI culture approach, the system's approach, a compliance approach and more. She wants to better understand them all and make sure NSF engages with the appropriate partners to make a difference.

Ms. Davis mentioned the CHIPS and Science Act and funding agencies speaking with one voice. We don't spend as much time with the lever we have with the Department of Education and having them work more collaboratively with us. Expanding collaborations is going to be key. That's why we started doing that internationally and in professional societies; speaking with the same voice, we can shift this significantly.

Dr. Nettles conveyed a question about whether there have been early quantifiable signs of success since NSF started implementing new measures and policies, such as fewer incidents or better morale, and the plan for holding perpetrators accountable when those people may not be NSF employees. Ms. Davis said it's too early to tell. A reduction right now probably is not necessarily a good sign because no one even knows you're doing something. We are starting these steps but haven't done them long enough to evaluate. Dr. Ulvestad said there is a requirement in awards that universities notify NSF if an administrative action has been taken against senior personnel on their award. It's been in place for several years, originally aimed at sexual harassment, but can be broader. If NSF is notified, it will consider whether to refer it to the inspector general.

Dr. Bart said in the field this past year several things were different, including the verbiage to the chief scientists about being aware of these issues. Also, when we got on board, the Marine projects coordinator, the subcontractor, did a nice job talking about sexual harassment, proper



behavior, and showed some videos. Those are good things, and it would be great to continue doing it in in the future.

Ms. Williams responded to an online question about sexual harassment and bad behaviors as it relates to research misconduct. She said, yes, it's in the CHIPS and Science Act that NSF enter into an agreement and update the responsible conduct and research report to include issues related to sexual harassment.

### Wrap-up

Dr. Nettles, Dr. Kraft, Dr. Isern, Dr. Ulvestad

Dr. Kraft reviewed agenda items for the fall meeting, including:

- Thinking about the CHIPS and Science Act and the international aspect of science, challenges, and opportunities that come with that.
- Inviting Dr. Rebecca Keiser, NSF Chief of Research Security Strategy and Policy.
- Outcomes of the online surveys Dr. Isern discussed
- An NSF response with regards to the DEI subcommittee report.

Dr. Isern added:

- A discussion about working with indigenous communities.

Dr. Nettles added OPP-specific items:

- Discussing a path forward related to the physical qualification program.

She said the last item is in the realm of things to strategize on for the transition of the committees and tracking issues that are closely linked to the DEI and sexual harassment prevention aspects and of specific interest to OPP.

Dr. Kraft said a question came up yesterday about DEI and the impact on marginalized populations and digging into the data for a better sense of who's being excluded. The idea that it's colorblind is probably not legitimate. So, recognizing there's sensitivity within the data and how to separate those out. PQ is specific to the polar community, but physical disqualifications are factors to think about from a broader GEO community perspective.

Dr. Nettles also mentioned:

- The new subcommittee that will be standing up for AC/GEO related to polar infrastructure, logistics and safety. There are safety topics to follow up on related to crevasse risk mitigation, sea ice, and concerns within the community and NSF broadly about risk management.

The meeting was adjourned.