



Advancing Research Impact in Society

**ADVANCING  
RESEARCH  
IMPACT IN SOCIETY**  
2-Year Report

OCTOBER 1, 2020

## ARIS LEADERSHIP TEAM

- Oludurotimi Adetunji  
*Brown University*
- Jennifer Fields  
*University of Arizona*
- Megan Heitmann  
*Iowa State University*
- Michael Jacobson  
*Binghamton University*
- Paula Jasinski  
*Green Fin Studio*
- Matt Johnson  
*Penn State University*
- Kemi Jona  
*Northeastern University*
- Janice McDonnell  
*Rutgers University*
- Kevin Niemi  
*University of Wisconsin-Madison*
- Amy Pratt  
*Northwestern University*
- Susan D. Renoe  
*University of Missouri*
- Julie Risien  
*Oregon State University*
- Diane Rover  
*Iowa State University*
- Natalie Shaheen  
*Illinois State University*
- Thomas J. Tubon, Jr.  
*Madison College*
- Laurie Van Egeren  
*Michigan State University*
- Sara Vassmer  
*University of Missouri*
- Jory Weintraub  
*Duke University*

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## OVERVIEW

Founded in September 2018 by a \$5.2 million grant from the National Science Foundation (NSF), the Center for Advancing Research Impact in Society (ARIS, OIA-1810732) works with national and international researchers and engagement practitioners to build capacity, advance scholarship, grow partnerships, and provide resources to help demonstrate the impact of research and engage with their communities and society. The ARIS Center emphasizes support for serving traditionally underserved populations, while providing inclusive public engagement to ensure a diverse STEM workforce.

Over the past two years, ARIS has taken strides to further its mission through the work of three initiative areas: the development of key **Partnerships**, creating and curating **Scholarship**, and research impact **Training**. This report will give a broad overview of activities and accomplishments of each initiative and a summary of administrative and communication efforts.

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## ADMINISTRATIVE UPDATE

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### PERSONNEL

ARIS has advisors and partners representing more than twenty-five leading organizations and expertise from around the world. In Spring 2020, five members were added to the ARIS leadership committee, bringing the core working unit of ARIS to a total of seventeen members. Leadership committee members self-select into one of four initiatives: Administration & Communications, Partnerships, Scholarship, and Training. Our Council of Experts provides oversight to ARIS activities and initiatives and delivers recommendations for the future direction of our organization.

## Leadership Team



**Oludurotimi Adetunji**  
*Brown University*



**Jennifer Fields**  
*University of Arizona*



**Megan Heitmann**  
*Iowa State University*



**Michael Jacobson**  
*Binghamton University*



**Paula Jasinski**  
*Green Fin Studio and Chesapeake  
Environmental Communications*



**Matt Johnson**  
*Penn State University*



**Kemi Jona**  
*Northeastern University*



**Janice McDonnell**  
*Rutgers University*



**Kevin Niemi**  
*University of Wisconsin-Madison*



■ Amy Pratt  
*Northwestern University*



■ Susan D. Renoe  
*University of Missouri*



■ Julie Risien  
*Oregon State University*



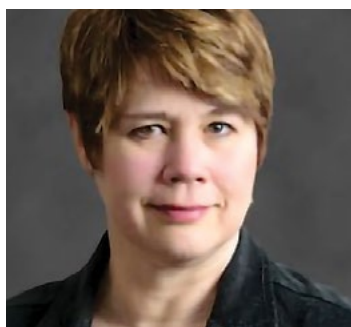
■ Diane Rover  
*Iowa State University*



■ Natalie Shaheen  
*Illinois State University*



■ Thomas J. Tubon, Jr.  
*Madison College*



■ Laurie Van Egeren  
*Michigan State University*



■ Sara Vassmer  
*University of Missouri*



■ Jory Weintraub  
*Duke University*

<https://www.researchinsociety.org/about-us/aris/leadership-team>



## Council of Experts



**Jamie Bell**  
*Center for the Advancement of  
Informal Science Education*



**Rena Cotsones**  
*Northern Illinois University*



**Lindsay Currie**  
*Council on Undergraduate  
Research*



**Corey Garza**  
*CSU-Monterey Bay*



**Deborah Hanuscin**  
*Western Washington University*



**Eric Marshall**  
*Kavli Foundation*



**Beronda Montgomery**  
*Michigan State University*



**Craig Ogilvie**  
*Montana State University*



**Aditi Pai**  
*Spelman College*

<https://www.researchinsociety.org/about-us/aris/council-of-experts>



David Phipps  
*York University (Canada)*



Douglas Randall  
*University of Missouri*



John Saltmarsh  
*University of Massachusetts  
Boston*



Toby Smith  
*Association of American  
Universities*



Leonie van Drooge  
*Rathenau Institute (Netherlands)*



PAST COUNCIL MEMBER  
Elizabeth Ambos  
*Council on Undergraduate  
Research*



PAST COUNCIL MEMBER  
Ruth Jones  
*National Aeronautics and Space  
Administration*



PAST COUNCIL MEMBER  
Kei Koizumi  
*American Association for the  
Advancement of Science*



PAST COUNCIL MEMBER  
Jason Tyszko  
*U.S. Chamber of Commerce  
Foundation*

## Evaluation Team

In 2019, ARIS selected the Science Education Resource Center (SERC) at Carleton College to lead the evaluation efforts of center activities.

The SERC team has over 30 years of experience conducting evaluations for programs, including formative and summative assessments of program activities, website impact studies, and team evaluations.



■ Ellen Altermatt, Ph.D.



■ Ellen Iverson, Ph.D.





## ARIS COMMUNITY

ARIS contracted with [AmericanEagle.com](https://www.AmericanEagle.com) to develop its website, social media plan, and branding strategy. Currently, [www.researchinsociety.org](https://www.researchinsociety.org) includes resources, training opportunities, and a jobs board that resulted from a collaboration with ARIS partners at Stanford University and the University of Southern California. In Spring 2020, community members were migrated from our listserv to a new communication platform, Higher Logic, located under sign-in on the ARIS website. Approximately 100 individuals who were first-year Summit attendees were also offered membership. This has resulted in a total of 900 members with ten discussion groups. Each group offers libraries where documents and materials can be shared and discussed.

Website Visitors	12,279
Sessions	21,045
Page Views	54,070
Minutes Average Session Duration	2:30
<b>GENDER</b>	
Female	46%
Male	54%
<b>AGE</b>	
18-24	27%
25-34	33%
35-44	15%
45-54	13%
55-64	6%
65+	6%

## NABI-ARIS TRANSITION

In Fall 2019, a group of ARIS community members came together in St. Louis, with support from the Kavli Foundation, to develop a pathway to sustainability. Over the course of three days, the transition team formed the framework for a membership structure and gave recommendations for next steps forward for our community.

A key part of the transition was sunsetting the National Alliance for Broader Impacts (NABI) website ([broaderimpacts.net](http://broaderimpacts.net)) and ending our former NABI listserv, which had been the primary mode of communication with our community and moving to an online platform hosted on the ARIS website. Members can participate in the ARIS online community by creating an account and profile on the ARIS website and by posting comments, questions, and feedback on various forums found there.

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### ARIS TRANSITION TEAM

- Oludurotimi Adetunji, Brown University
- Jamie Bell, CAISE
- Michael Gonzales, MG Consulting
- Kania Greer, Georgia Southern University
- Megan Heitmann, Iowa State University
- Jane Horwitz, University of Pennsylvania
- Kemi Jona, Northeastern University
- Janice McDonnell, Rutgers University
- Ann McMahon, University of Washington
- Nathan Meier, University of Nebraska-Lincoln
- Kevin Niemi, University of Wisconsin-Madison
- Elizabeth Nysson, Miami University
- Amy Pratt, Northwestern University
- Susan Renoe, Executive Director & PI, University of Missouri
- Julie Risien, Oregon State University
- Amanda Rosenzweig, Delgado Community College
- Diane Rover, Iowa State University
- Dennis Schatz, Pacific Science Center
- Tom Tubon, Madison Area Technical College
- Laurie Van Egeren, Michigan State University
- Sara Vassmer, University of Missouri
- Jory Weintraub, Duke University
- Anahita Zare, Massachusetts Institute of Technology

# ARIS INITIATIVES: TRAINING, SCHOLARSHIP, & PARTNERSHIPS

## TRAINING TEAM



■ Jennifer Fields  
*University of Arizona*



■ Megan Heitmann  
*Iowa State University*



■ Matt Johnson  
*Penn State University*



■ Janice McDonnell  
*Rutgers University*



■ Natalie Shaheen  
*Illinois State University*



■ Jory Weintraub  
*Duke University*

From 2018-2020, the training team has conducted multiple institutional site visits, training sessions, and webinars reaching nearly 3000 participants across the country (see Appendix I). During this time, they have created new content and modules and have worked with center evaluation staff to evaluate their process and effectiveness of materials.

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## INSTITUTIONAL SITE VISITS

The training team considers institutional site visits and trainings a staple in our activity to build the capacity of researchers and institutions. Most of the participants in trainings delivered at institutions are researchers. Included in these site visits is the opportunity for ARIS representatives to have small-group discussions with institutional administrators and broader impacts professionals. Over the course of two years, ARIS leadership conducted sixteen institutional site visits and reached a total of 689 participants.

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## CONFERENCE TRAINING SESSIONS

The Training Team and ARIS leadership are invited to, and attend, several conferences annually. ARIS representatives often conduct trainings or sessions within these conferences. During years one and two of the ARIS Center, ARIS leadership presented twenty-nine training sessions and reached a total of 1800 participants. Additionally, ARIS participated in four conference table events, reaching upwards of 3750 event attendees.

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## WEBINARS

In addition to in-person trainings, the team has begun including webinars in their offerings. Webinars allow ARIS to reach a broader audience and conserve resources. ARIS leadership has conducted eleven webinars and reached 471 participants. Three of these webinars were requested by other membership organizations, NORDP and NCURA, and were open to both the ARIS community and the hosting organizations' communities. In Summer 2020, ARIS began regular Office Hour events staffed by ARIS leadership. Office Hour topics include Re-envisioning the BI Criterion, Inclusive SciComm, and Engagement from 6+ Feet Away. In addition, ARIS is hosting an International Impact series featuring colleagues from Canada, South Africa, The Netherlands, and the United Kingdom.

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## EVALUATION OF TRAININGS

The ARIS Training Team developed a post-training survey and administered it after institutional site visits and the NORDP Community Webinar. This survey was designed to solicit feedback on the quality of trainings offered, to identify materials and activities that are seen as useful, and to identify areas that may need improvement.

Evaluations were distributed at these institutional site visits: Arkansas EPSCoR, Trinity University, University of Kansas, University of California-Merced, and the University of Iowa. Responses were received from 100 participants.

EVALUATION STATEMENT	% OF RESPONDENTS WHO AGREED OR STRONGLY AGREED
I am satisfied with the training.	98%
The training was useful.	92%
I gained skills, tools, or resources that are helpful in my job.	95%
I would recommend this training to others.	94%

The most frequent responses to the open-ended questions are in the table below:

Things participants learned from training	<ul style="list-style-type: none"> <li>■ What NSF sees as important</li> <li>■ Where to find resources nationally and locally</li> <li>■ How to integrate BI throughout the proposal and throughout your research life</li> <li>■ How to develop a BI plan</li> <li>■ The importance of evaluation and tools to use</li> </ul>
Things participants will use from training	<ul style="list-style-type: none"> <li>■ NABI/ARIS resources and how to find local resources</li> <li>■ Evaluation tools, especially the logic model</li> <li>■ Broader Impacts Identity and integrating activities into research and personal life.</li> </ul>

The ARIS training team also administered an evaluation survey after the NORDP Community Webinar. Forty-three participants responded to the survey.

EVALUATION STATEMENT	% OF RESPONDENTS WHO AGREED OR STRONGLY AGREED
The webinar met its learning objectives.	91%
I expect to apply what I've learned in the near future.	81%
The material covered in the webinar will be useful to me.	93%
The panelists were knowledgeable about the topic.	100%



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## DEVELOPMENT AND FINDINGS OF NEEDS ASSESSMENT FOR ARIS STAKEHOLDERS

A Training Needs Assessment Survey was designed by the ARIS Training Team in consultation with Dr. Douglas Spencer of Edu, Inc. to gather information that could be used to better serve the needs of researchers and BI professionals. Survey administration began in March 2019. External evaluators from the Science Education Resource Center (SERC) summarized data from the first year of data collection (i.e., from March 2019 to February 2020). These data are being used to 1) inform the development of training materials and 2) inform revisions to the current Training Needs Assessment Survey and the development of new survey instruments and interview protocols that will be designed to better understand the characteristics and needs of a growing BI community.

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### KEY FINDINGS

The first administration of the ARIS Training Needs Assessment survey provided valuable insights into the interests of, perceived challenges faced by, and perceived training needs of BI professionals, university administrators, and researchers. For example:

- **BI activities of interest:** The majority of respondents in all three groups reported an interest in serving the Higher Education, K-12 Education, and Public Education sectors with their BI work.
- **Perceived challenges:** Perceived challenges varied somewhat across groups. The most frequently cited challenges among BI professionals included securing funding for staff and programs and building interest among scientists. Although challenges related to “audience” (e.g., building interest) were also identified by researchers; this was a challenge that fewer than 1 in 5 university administrators cited.
- **Training topics and delivery:** Perceived training needs and preferred training methods also varied somewhat across groups. The most frequently cited training needs among BI professionals included learning more about showing Return on Investment or Collective Impact, broadening participation in STEM disciplines, designing sustainable BI, developing metrics, and evaluating BI activities. While roughly three-quarters of researchers expressed interest in learning more about how to construct a BI activity (including learning how to build a BI team, create a Community Engagement plan, and develop a budget and timeline), only about half of university administrators cited this as

an area of interest. As a group, university administrators expressed less interest in training focused on building the capacity of BI professionals generally (e.g., by managing and reporting BI or by building community) than in training focused on building BI at their institution (e.g., by engaging in community engagement planning or by building BI infrastructure). As a group, BI professionals were more interested than university administrators and, especially, researchers in receiving training at national and regional meetings and conferences. Both university administrators and researchers reported interest in receiving BI training at their home or a nearby institution.

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## DEVELOPMENT OF A SCOPE AND SEQUENCE FOR ARIS TRAINING PROGRAM

Janice McDonnell interviewed NABI stakeholders to develop the needs assessment data into a plan for developing a comprehensive training program that would advance the field in the treatment and execution of Broader Impacts in NSF funded projects. Included in the supplementary documents is a concept map diagram of our current list of modules to be developed over the next three years of the ARIS grant. We have built off of our very successful BI 101 program offered in many university venues over the course of the last four years. Our current development plan is to construct four new units including

- **Module 1:** Exploring Your Options for Achieving BI (topics: Understanding your Audience, Working with Next Generation Learners (K-12), Working with Emerging Workforce, Working with the Current Workforce, Strategies for Working with Audiences, and Strategies to Broaden Participation),
- **Module 2:** Building your BI Identity (topics: Academic Scholarship, Intellectual Merit and BI Integration, and Science Communication Strategies),
- **Module 3:** Constructing a BI Activity (topics: Building your BI Team, Partnerships, Creating a BI Plan, Introduction to Logic Models/Theories of Action, Writing SMART Objectives, and Developing Milestones and Timelines),
- **Module 4:** Implementing and Evaluating your BI Activity (topics: Working with an Evaluator, Evaluating Your Return on Investment, Types of Evaluation, Collective Impact Assessment), and
- **Module 5:** Building the Capacity of BI Professionals (topics: Effective Practices to Support Researchers, How to Create Culture Change, Managing and Reporting, Building a BI portfolio).

These modules and topics have shifted and changed over the past six months and will continue to change as we collect additional input from our stakeholders.

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## DEVELOPMENT OF MODULE 3: CONSTRUCTING A BROADER IMPACT STATEMENT

We developed a draft version of Module 3 for pilot testing with researchers. We chose to start with developing learning objectives, resources, assessments, and activities for researchers. We partnered with Dr. Gordon Kingsley from Georgia Tech to develop a series of hands-on activities focused on partnerships. In Fall 2019, Module 3 was piloted at the Rutgers University Early Career Workshop. Feedback gathered from workshop participants was used to revise and improve the module for publication to the larger ARIS community.

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## BROADER IMPACTS WIZARD

The training team is developing a 2.0 version of the 2004 Broader Impact Wizard created by the NSF-funded Center for Ocean Science Education Excellence (COSEE). This tool is being updated and expanded to reflect new advice and information to help researchers broaden the impact of their research on society. The new version will be launched in fall 2020 on the ARIS website.

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## IN-DEPTH ORGANIZATIONAL COHORT MODEL

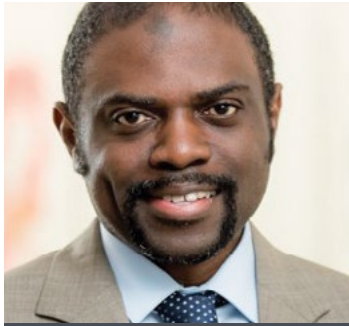
The ARIS Training Team is developing a program to promote establishment and expansion of research impacts (RI) support offices, centers, and infrastructure at academic institutions and research centers, and organizations nationwide.

- This program will be built around cohorts of up to five institutions per year that are selected by application.
- Applications must demonstrate a commitment on the part of the institution to participate for the duration of the 1.5-year program.
- Over the course of the 1.5 years, the BI professionals at each participating institution, with the guidance of ARIS, will complete a variety of training activities and exercises to enhance their BI skillset, establish and expand partnerships with local community organizations, and work with upper-level administration at their institution to solidify the institutional commitment to supporting BI efforts.

The ultimate goal of this program is to generate more effective RI support at the institutional level and, ultimately, increase the quality and quantity of innovative, effective RI programs across the United States.

In 2020, we launched the pilot cohort that includes Michigan State University, Purdue University, University of Idaho, University of Nebraska, and University of California–Berkeley.

## SCHOLARSHIP TEAM



■ Oludurotimi Adetunji  
*Brown University*



■ Matt Johnson  
*Penn State University*



■ Amy Pratt  
*Northwestern University*



■ Julie Risien  
*Oregon State University*



■ Laurie Van Egeren  
*Michigan State University*

The goal of the ARIS Scholarship initiative is to recognize excellence, support innovation, and elevate the use of evidence in research impacts practice. The initiative includes the Awards program and the ARIS Fellows program.

## AWARDS

ARIS recognizes individuals and groups undertaking exemplary work in the societal impacts of research.

### 2019 Awards

**ARIS presented four inaugural ARIS Broader Impacts Champion Awards during the April 2019 Broader Impacts Summit in Tucson, Arizona:**



Neal Lane

*Rice University's Baker Institute for  
Public Policy*

**Neal Lane**, Ph.D., is the Senior Fellow in Science and Technology Policy at Rice University's Baker Institute for Public Policy and holds the titles of Malcolm Gillis University Professor emeritus and Professor of Physics and Astronomy emeritus at Rice University. Prior to returning to Rice University in January 2001, Dr. Lane served in the Bill Clinton Administration as Assistant to the President for Science and Technology and Director of the White House Office of Science and Technology Policy (1998-2001), and before that as Director of the National Science Foundation (1993-98). He was Rice's Provost and Professor of Physics prior to his time in Washington. He has also served as Chancellor of the University of Colorado at Colorado Springs (1984-86). He received his B.S. (1960), M.S. (1962), and PhD (1964) in physics from the University of Oklahoma.





■ Shirley Malcom  
AAAS

**Shirley Malcom**, Ph.D., is senior advisor and director of SEA Change at AAAS. In her almost 40-year tenure at the Association, she has worked to improve the quality and increase access to education and careers in STEM as well as to enhance public science literacy. Dr. Malcom is a trustee of Caltech and regent of Morgan State University. She is a former member of the National Science Board, the policymaking body of the NSF, and served on President Clinton's Committee of Advisors on Science and Technology. Malcom, a native of Birmingham, Alabama, received her PhD in ecology from Penn State, masters in zoology from UCLA and bachelor's with distinction in zoology from the University of Washington. She holds 17 honorary degrees. Malcom serves on the boards of the Heinz Endowments, Public Agenda, National Math-Science Initiative, and Digital Promise. In 2003, Malcom received the Public Welfare Medal of the U.S. National Academy of Sciences, the highest award given by the Academy.



■ Dahlia Sokolov  
*House Committee on Science,  
Space, and Technology*

**Dahlia Sokolov**, Ph.D., is the Staff Director for the Research & Technology Subcommittee of the House Committee on Science, Space, and Technology. In this role, Dahlia advises Committee Members on oversight and legislative issues regarding the National Science Foundation; the National Institute of Standards and Technology; interagency R&D initiatives; STEM education across the federal government; international S&T cooperation; federal policies for university research; all matters relating to competitiveness, technology, standards, and innovation; and R&D at the Departments of Transportation and Homeland Security. During her first two years with the Committee, Dahlia worked on energy issues, including nuclear energy R&D. Dahlia joined the committee staff as an American Institute of Physics Congressional fellow in 2004 and joined the professional staff in 2005. Dahlia is serving under the leadership of Chairwoman Eddie Bernice Johnson and previously served under the leadership of former Chairmen Boehlert and Gordon. Before coming to Congress, Dahlia completed a postdoctoral research fellowship at the National Cancer Institute. She has a Ph.D. in Bioengineering from the University of Washington and a B.S. in Engineering Physics from the University of California at Berkeley.



■ **Wanda E. Ward**  
*University of Illinois at Urbana-  
Champaign*

**Wanda E. Ward**, Ph.D., is Executive Associate Chancellor for Administration and University Relations, Office of the Chancellor, University of Illinois at Urbana-Champaign, where she serves as Chief of Staff to the Chancellor. Prior to joining the University of Illinois at Urbana-Champaign, Ward served in various leadership positions throughout her 26 years at the National Science Foundation, including: Senior Advisor to the Director; Head of the Office of International and Integrative Activities; Deputy Assistant Director for Social, Behavioral and Economic Sciences; and Deputy Assistant Director for Education and Human Resources. In addition, she served as Assistant Director for Broadening Participation at the Office of Science and Technology Policy (OSTP), White House Executive Office of the President (2015-2017). Ward earned the BA in psychology and the Afro-American Studies Certificate from Princeton University and the PhD in psychology from Stanford University. She was awarded a Ford Foundation Fellowship; the American Psychological Association (APA) Presidential Citation; the Federation of Behavioral, Psychological and Cognitive Sciences Richard T. Louttit Award; and the U.S. Presidential Rank Award for Distinguished Executive.

## 2020 Awards

In 2020, ARIS presented awards in three categories: **Impacts Goals**, **Impacts Innovations**, and **Enduring Achievement**. **Honorees will be awarded at the next in-person Summit, as our ceremony was postponed due to the Covid-19 pandemic.**



■ Matt Wilkins  
Vanderbilt University

**Impact Goals Awards** are for significantly advancing engagement in and translation of research to public benefit in one or more of the nine areas identified by the National Science Foundation (inclusion, STEM education, science literacy, well-being, STEM workforce development, partnerships, national security, economic competitiveness, and infrastructure).

### **2020 Impact Goal Award Recipient—Matt Wilkins**

is an ecologist and evolutionary biologist committed to growing a more curious and science literate society. Toward this end, he founded the Midwestern SciComm conference at the University of Nebraska-Lincoln, and currently works with Vanderbilt's Center for Science Outreach and Metro Nashville Public Schools to create and teach mind-expanding, interdisciplinary lessons for middle school students. His long-term goal is to commit fully to Galactic Polymath, a social enterprise that will work directly with researchers and nonprofits to translate expert knowledge into creative, active learning experiences for grades 5+ that make it easy for teachers to connect national standards with the real world and diverse career opportunities.

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**Impact Innovations Awards** recognize recipients for developing new approaches to, and strategies for, engagement in and translation of research to optimize societal impacts.



■ Center for Educational Networks and Impacts  
Virginia Tech

**2020 Impact Innovations Award Recipient—Center for Educational Networks and Impacts, Virginia Tech—**

The mission of the Center for Educational Networks and Impacts is to advance high-quality SEAD teaching and learning opportunities in the P-12 contexts for all and become a leader in STEM

workforce development from early childhood through professional practice. It serves as a center for research and evaluation support for Virginia Tech and its P-12 SEAD/STEM-related projects and programs and as a portal to bring visibility to STEM K-12 learning experiences, innovations, and opportunities across the region and Commonwealth. They broker partnerships among stakeholder groups to ensure that new and granted-funded projects and programs have sustained and broader impact.

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**Enduring Achievement Awards** honor long-term achievement undertaking research engagement and translation for impact.



■ Portal to the Public  
The Institute for Learning Innovation

**2020 Enduring Achievement Award Recipient—Portal to the Public, The Institute for Learning Innovation**

helps engagement practitioners develop high-impact, sustainable support systems for scientists who are committed to the notion that social impact is an essential part of their work. Portal's customizable, evidence-based framework and

ready-to-go resources address everything from recruiting and mentoring scientists, to designing and implementing programs that connect these scientists with public audiences for meaningful conversations and activities about science.

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## ARIS FELLOWS

The ARIS fellowship program supports professionals, researchers, faculty, educators, graduate students, and others from universities, colleges, and other organizations working to advance practice and improve outcomes of research impacts.

The goal of the program is to increase the quality and availability of scholarship and resources about research impacts through projects that synthesize existing scholarly work or explore new horizons and innovations to advance knowledge about research impacts. Fellows work in cohorts and meet regularly using a community of practice model that supports collaboration and connection across the many disciplines and institutions that make up the ARIS community.

ARIS awarded four individual and two collaborative Fellowship awards in early 2019.

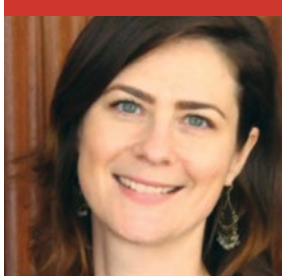
### 2019 ARIS Fellows



**Amelia Bachleda**, Ph.D., University of Washington, is a science communicator, getting the latest child development science to people who can use it to improve the lives of children. Amelia is developing an easy-to-use infographic tool that will help researchers brainstorm and develop impactful and collaborative BI activities.

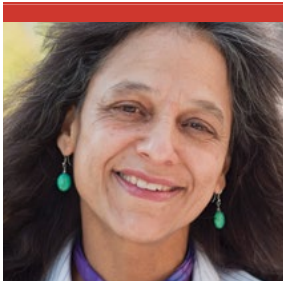


**Bernadette Connors**, Ph.D., Dominican College of Blauvelt, is a biological sciences educator and advocate for the research and practice of inclusive pedagogies. Bernie is creating and curating resources to help researchers and educators design effective educational offerings that empower disabled learners in STEM.



**Jeanne Garbarino**, Ph.D., RockEDU Science Outreach, is a biomedical scientist who works to promote a culture and support practice of science outreach among scientists. Jeanne is working with Kyle on creating a simple and flexible framework to help outreach practitioners document and share their work. They aim to build a virtual library and connection platform that can ultimately elevate outreach practice.

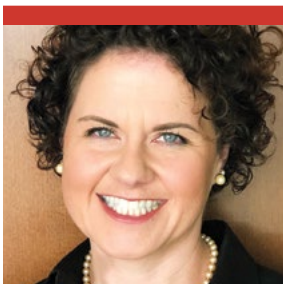




**Nalini Nadkarni**, Ph.D., University of Utah, is a forest ecologist and science communicator who directs the STEM Ambassador Program and other projects to bring science to non-traditional public groups. Nalini is working with Cat and Caitlin on conducting a field review to understand how ecologists communicate about their public engagement activities and developing a tool to support similar investigations in other disciplines.



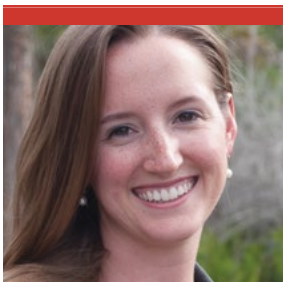
**Cathlyn (Cat) Stylinski**, Ph.D., University of Maryland, is a public engagement researcher and practitioner who designs and assesses citizen science, examines impacts on scientists, and supports informal science educators. Cat is working with Nalini and Caitlin on conducting a field review to understand how ecologists communicate about their public engagement activities and developing a tool to support similar investigations in other disciplines.



**Heatherlun Uphold**, Ph.D., Michigan State University, uses implementation science to study how research is applied in practice. Heatherlun is examining dissemination practices across several disciplines to inform the development of tools that expand reach, acceptability, and utility of research that support public health.



**Kyle Marian Viterbo**, MS, is a science communicator and trained physical anthropologist who plays at the intersection of science and comedy using stand-up to help other scientists hone their communication skills. Kyle is working with Jeanne on creating a simple and flexible framework to help outreach practitioners document and share their work. They aim to build a virtual library and connection platform that can ultimately elevate outreach practice.



**Caitlin Weber**, MS, University of Utah, is a conservation ecologist who helps scientists increase public access to science in novel settings such as correctional facilities, senior centers, and cafes. Caitlin is working with Nalini and Cat on conducting a field review to understand how ecologists communicate about their public engagement activities and developing a tool to support similar investigations in other disciplines.



**Rachel Yoho**, Ph.D., Miami University, is a STEM educator and researcher with a background in biology and environmental biotechnologies. Rachel is developing multimedia resources to empower educators to create connections between classroom learning and society using inclusive and welcoming language and environments.

## 2020 ARIS Fellows

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**Elyse Aurbach**, Ph.D.

*Center for Academic Innovation, University of Michigan*

**PROJECT:** Expanding the Utility and Impact of the Michigan Public Engagement Framework



**Ellen Kuhn**, MA

*Center for Academic Innovation, University of Michigan*

**PROJECT:** Expanding the Utility and Impact of the Michigan Public Engagement Framework



**Gigi Owen**, Ph.D.

*Climate Assessment for the Southwest, University of Arizona*

**PROJECT:** Evaluating the Societal Impacts of Climate Change Research: A guidebook for natural and physical scientists



**Alison M. Meadow**, Ph.D.

*Climate Assessment for the Southwest, University of Arizona*

**PROJECT:** Evaluating the Societal Impacts of Climate Change Research: A guidebook for natural and physical scientists



**Barbara A. Burke**, MA, MLS

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College of Technology*

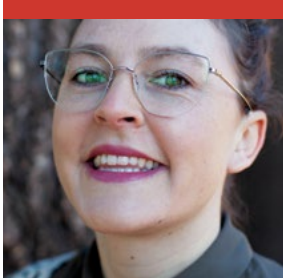
**PROJECT:** Charting Research Impacts in Minority Serving Institutions: Does One-Size Fit All?



**Patrick Corbett**, Ph.D.

*Office of Sponsored Programs, New York City  
College of Technology*

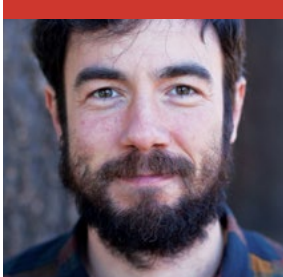
**PROJECT:** Charting Research Impacts in Minority Serving Institutions: Does One-Size Fit All?



**Sophie Pierszalowski**, Ph.D.

*Office of Undergraduate Education, Oregon State University*

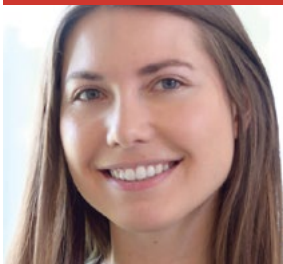
**PROJECT:** Mentoring the next generation: A roadmap for using undergraduate research to broaden participation and impact in STEM



**Thaddaeus Buser**, Ph.D. Candidate

*College of Agricultural Sciences, Oregon State University*

**PROJECT:** Mentoring the next generation: A roadmap for using undergraduate research to broaden participation and impact in STEM



**Sarah Olsen**, Ph.D.

*Lawrence Hall of Science, University of California, Berkeley*

**PROJECT:** A toolbox for scientists and educators to co-create high-quality non-formal learning experiences



**Natasha Wingerter**, Ph.D. Candidate

*College of Agricultural and Life Sciences, University of Idaho*

**PROJECT:** A toolbox for scientists and educators to co-create high-quality non-formal learning experiences



**Susan Rowe**, Ph.D.

*Precollege Programs, Oregon State University*

**PROJECT:** An Introduction to Successful K-12 Broader Impacts Planning and eLearning Pathways

## PARTNERSHIPS TEAM



**Kevin Niemi**

*University of Wisconsin-Madison*



**Susan D. Renoe**

*University of Missouri*



**Thomas J. Tubon, Jr.**

*Madison College*

The ARIS Partnerships team is pleased to work with many national and international organizations to expand our collaborative efforts. ARIS views partnerships through two lenses: purpose and approach. Purpose encompasses strategic value, ability to learn from one another, potential to advance knowledge and identify new insights, and potential for systemic transformation. Approach views partnerships on a continuum ranging from coordination of effort (networks existing separately but sharing information for a shared goal) to cooperative partnerships that support each organization's goals to an interwoven collaboration that jointly develop efforts to effect change<sup>1</sup>.

<sup>1</sup> Coghlan, D. & Coughlan, P. (2015) Effecting Change and Learning in Networks Through Network Action Learning *The Journal of Applied Behavioral Science*. 51: 375-40. \*WEEK 2; Docherty, P., Huzzard, T., de Leede, J., & Totterdill, P. (2003). *Home and away: Learning in and learning from organisational networks in Europe*. Brussels, EU: Innoflex Research Report.; Himmelman, A.T. (2002). *Collaboration for a Change: Definitions, Decision-making Models, Roles, and Collaboration Process Guide*. Himmelman Consulting: Minneapolis, MN.

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## CURRENT ARIS PARTNERS

- American Association of Community Colleges (AACC)
  - Advancing & Evaluating the Societal Impact of Science (AESIS)
  - Consortium for Advanced Manufacturing of Cell and Tissue-based Products (AMCTP)
  - Broader Impact Design (BID)
  - Center for Advancement of Informal Science Education (CAISE)
  - Council of Scientific Society Presidents (CSSP)
  - The Council on Undergraduate Research (CUR)
  - InnovATEBIO-NSF-funded Center for Biotechnology
  - The International Network of Research Management Societies (INORMS)
  - Leaders in Science and Technology Engagement Networks Network (LISTEN)
  - National Federation of the Blind (NFB)
  - National Organization for Research Development Professionals (NORDP)
  - Promotion and Tenure – Innovation and Entrepreneurship (PTIE)
  - Research Impact Canada (RIC)
- 

## SPECIAL INITIATIVES

The ARIS partnership with the National Organization for Research Development Professionals (NORDP) is coordinated and strategic in purpose. This year, the partnership included reciprocal webinars for each organization's members. ARIS held a webinar on BI101 with more than 160 NORDP members participating. The reciprocal webinar on Research Development offered by NORDP drew more than 50 ARIS members.

ARIS partnered with Research Impact Canada (RIC) to create an on-line tool kit of impact resources. The toolkit is hosted on RIC's website:

<https://resources.researchimpact.ca/>.

ARIS and the National Federation of the Blind, along with several other organizations, came together to host 61 participants for the Broadening Participation of Persons with Disabilities in STEM Virtual Conference on March 17-18, 2020, to engage in broad conversations with persons with disabilities and other stakeholders on ways to encourage people with disabilities in STEM careers, including workplace expectations, social and communication skills, common challenges, biases, and inclusion.



This convening continued the conversation on promising practices for broadening the participation of individuals with disabilities in STEM, which will lead to further proposed research in accessibility issues. Specifically, participants worked to define and develop communities of practice that expand engagement of stakeholders in fostering STEM education and careers that are welcoming and accessible to people with disabilities, discussed how to sustain synergistic and lasting relationships among stakeholders to foster systemic changes regarding the inclusiveness of STEM education and careers, and discussed evidence-based practices to increase the numbers of individuals with disabilities moving through critical junctures to STEM careers. The convening was sponsored by a conference grant from the National Science Foundation (MCB-1940655).

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## BROADER IMPACTS SUMMIT

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### 2019 SUMMIT – TUCSON, AZ

The seventh annual Broader Impacts Summit was held April 30-May 2, 2019, hosted by the University of Arizona at the Westward Look Wyndham Grand Resort and Spa. There were 181 participants. The Summit was kicked off by a keynote address highlighting the past five years of NABI accomplishments and introduced the newly awarded Center for Advancing Research Impact in Society (ARIS). Dr. Susan Renoe (PI, NABI, ARIS) discussed the transition from NABI to ARIS and gave the community time to ask questions about the new center.

**Dr. Suzi Iacono**, Head of the NSF Office of Integrative Activities, gave a keynote talk and provided data compiled on broader impacts trends in funded and non-funded proposals. **Dr. Lina Dostilio** delivered an engaging keynote, “Now, These Are My People!” that highlighted the important work that members of engaged scholarship and broader impacts communities do. On Wednesday evening, participants traveled to Biosphere II to tour the research center and listen to a panel discussion led by Cyverse.

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### 2020 SUMMIT - VIRTUAL

The 2020 ARIS Summit was originally slated to be held April 28-30 in Durham, North Carolina. As a result of the COVID-19 pandemic, ARIS Summit organizers converted the in-person event to a virtual conference, sponsored by the Kavli Foundation. Partnering with KnowInnovation (KI), ARIS provided a three-day, immersive, virtual experience where attendees were able to view pre-recorded videos and participate in interactive sessions utilizing Zoom and KISTorm, software

developed by KI that allows users to have an autonomous experience during virtual meetings and conferences. Over the course of three days, approximately 300 attendees participated in two plenary panels focused on broader impacts and faith-based audiences and partnering with Minority Serving Institutions. Approximately 100 attendees were new to ARIS. Keynotes were given by **Dr. Suzi Iacono**, head of the National Science Foundation (NSF) Office of Integrative Activities, **Dr. Kelvin Droegemeier**, acting NSF Director and Director of the White House Office of Science & Technology Policy, and **Mohamed Noor**, Dean of Natural Sciences, Duke University.

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## SUMMIT EVALUATION

An end-of-event survey was administered at the conclusion of the Summit to complement two roadcheck surveys administered on the first and second days of the Summit. As a group, respondents agreed that the Summit 1) provided information that was valuable to their own work and worthy of sharing with colleagues at their own and other institutions and 2) provided important opportunities to network with other BI professionals. Additional key findings and implications are summarized in Appendix III.

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## NEXT STEPS

- **Future of Broader Impacts:** As the National Science Board (Vision 2030) and others re-imagine American Science moving forward, ARIS will be part of the conversation. We are working on a position paper outlining our thoughts on the next iteration of Broader Impacts and the relationship between research and society.
- **NSF INCLUDES Proposal:** ARIS is building on its Broadening Participation of Persons with Disabilities in STEM conference and the resulting network to submit an NSF INCLUDES Alliances proposal in January 2021.
- **Membership:** As part of the sustainability plan, ARIS was moving to a fee-for-membership model beginning January 2, 2021. However, with the financial pressures on organizations due to the pandemic, and with a desire to extend membership to as many individuals as possible, the decision was made to extend free membership in ARIS through December 31, 2021. At that time, the fee-for-membership model will be re-evaluated.
- **Credentialing:** A key component of the ARIS proposal was the professionalization of the BI field. ARIS is working to complete a credentialing process for BI professionals. We anticipate that program to launch in late 2021 or early 2022.

# APPENDIX I

## TRAINING 2018-2020

DATE	PLACE	INSTITUTION/ CONFERENCE	SESSION TITLE	TRAINERS	PARTICIPANTS
<b>INSTITUTIONAL SITE VISITS</b>					
1/4/2019	Petit Jean, AR	Arkansas EPSCoR Workshop	BI 101	Jory Weintraub and Janice McDonnell	80
1/9-11/2019	San Antonio, TX	Trinity University BI Workshop	BI 101	Tom Tubon and Kevin Niemi	75
1/10/2019	Newark, DE	Polarizing Your Science Workshop University of Delaware	BI 101 and BI Identity	Janice McDonnell	35
2/5/2019	Lawrence, KS	University of Kansas	BI 101, Infrastructure, and CAREER	Susan Renoe and Sara Vassmer	35
4/4/2019	Merced, CA	University of California-Merced	BI 101, BI 102	Jory Weintraub and Megan Heitmann	30
4/8/2019	Iowa City, IA	University of Iowa	BI 101, BI 102	Jory Weintraub and Megan Heitmann	36
4/15/2019	Raleigh, NC	Duke University	BI 101	Jory Weintraub	48
11/4/2019	Pocatello, ID	Idaho State University	BI 101	Jory Weintraub	35
11/5/2019	Boise, ID	Boise State University	BI 101	Jory Weintraub	30
11/6/2019	Moscow, ID	University of Idaho	BI 101	Jory Weintraub	60
11/19/2019	Rolla, MO	Missouri University of Science & Technology	Let's Talk Broader Impacts	Susan Renoe	10
12/5-6/2019	Tucson, AZ	University of Arizona	BI 101, Evaluation, BP, BI Identity	Jory Weintraub and Julie Risien	50
12/9/2019	Tempe, AZ	Arizona State University	BI 101, BI Identity	Jory Weintraub and Julie Risien	40
1/17/2020	Piscataway, NJ	Rutgers University, Busch Campus	BI Pilot Workshop	Janice McDonnell	20
2/3-4/2020	Lincoln, NE	University of Nebraska-Lincoln	Beyond Broader Impacts, Integrating Research and Education & NSF CAREER Workshop	Susan Renoe and Sara Vassmer	80
3/4/2020	Piscataway, NJ	Rutgers University Center for Dermal Research	BI Pilot Workshop	Janice McDonnell	25
<b>Total Site Visit Participants</b>					<b>689</b>

DATE	PLACE	INSTITUTION/ CONFERENCE	SESSION TITLE	TRAINERS	PARTICIPANTS
<b>CONFERENCE TRAINING SESSIONS</b>					
9/6/2018	Charlottesville, VA	National Radio Astronomy Observatory (NRAO)	BI 101	Jory Weintraub	15
9/29/2018	Kingston, RI	#Inclusivescicomm, a Symposium on Advancing Inclusive Public Engagement with Science, University of Rhode Island	Unlock Research Funding with Inclusive Engagement	Oludurotimi Adetunji	50
10/10/2018	Narragansett, RI	Artic Researchers and Informal Science Education (ARISE) Workshop, University of Rhode Island Graduate School of Oceanography	Integrating Broader Impact Activities and Advancements in Learning Sciences	Oludurotimi Adetunji	60
10/13/2018	San Antonio, TX	2018 SACNAS Conference	Expanding Diversity as a Broader Impact of Your Research	Jory Weintraub	40
1/5/2019	Seattle WA	American Astronomical Society	Research Impacts	Lyndele von Schill, NRAO National Radio Astronomy Lab (U of W VA)	50
4/30/2019	Tucson, AZ	2019 NABI Summit	BI 101	Jory Weintraub	25
4/30/2019	Tucson, AZ	2019 NABI Summit	The Role of Engagement Database as a Tool for Knowledge Transfer, Connectedness and Co-Creation	Oludurotimi Adetunji	30
4/30/2019	Tucson, AZ	2019 NABI Summit	Connecting Across Campus, STEM and Educational Research Partnerships	Megan Heitmann and Diane Rover	25
5/17/2019	Madison, WI	NSF Coordination Network for Advanced Manufacturing of Cell and Tissue-Based Products, Executive Leadership Meeting	BI 101 and ARIS Introduction	Megan Heitmann and Kevin Niemi	30
6/20/2019	San Francisco, CA	American Society of Microbiology (ASMicrobe) Conference	BI 101	Jory Weintraub	25

DATE	PLACE	INSTITUTION/ CONFERENCE	SESSION TITLE	TRAINERS	PARTICIPANTS
7/15-18/2019	New Orleans, LA	Science Teacher Technology Training (ST3)	3-Day Educator workshop for Biotechnology and Emerging Tech	Tom Tubon	12
7/22-25/2019	St. Louis, MO	High Impact Technology (HI-TEC) Conference	Integrative Efforts for Promoting Broader Impacts in the NSF ATE Community through ARIS	Tom Tubon, Megan Heitmann, and Kevin Niemi	60
7/30/2019	Madison, WI	BioPharmaceutical Technical Center Institute (BTCI): Biotech the Basics	Promoting Broader Impacts in the Biosciences	Tom Tubon	24
8/19-20/2019	Palm Beach, FL	NSF Coordination Network for Cell & Tissue Manufacturing, Special Interest Group – Florida	Integrated presentation for Biomanufacturing and ARIS / Broader Impacts	Tom Tubon	14
9/17/2019	Madison, WI	ForwardBIO Annual Meeting	Supporting the Training Continuum	Tom Tubon	150

DATE	PLACE	INSTITUTION/ CONFERENCE	SESSION TITLE	TRAINERS	PARTICIPANTS
9/28/2019	Kingston, RI	University of Rhode Island, #Inclusive SciComm Conference	Addressing NSF's Broader Impacts Criterion through Inclusive SciComm	Jory Weintraub and Oludurotimi Adetunji	25
10/2/2019	Madison, WI	Wisconsin ForwardBIO BioHealth Summit	Integrated presentation for Biomanufacturing and ARIS / Broader Impacts	Tom Tubon	50
10/8/2019	New Orleans, LA	NOBIC South CEO Conference	Panel for Bioscience Workforce Development Programs and Career Development Pathways (BI)	Tom Tubon	125
10/17-18/2019	Alexandria, VA	Distinguished lecture co-sponsored by the Office of Integrative Activities and Engineering Division, National Science Foundation	Broader Impacts: Coming of Age	Susan Renoe	30
10/17-18/2019	Alexandria, VA	Committee on Equal Opportunities in Science and Engineering (CEOSE)	Leveraging Broadening Participation to Advance Research Impacts in Society	Susan Renoe	10
10/22-25/2019	Washington, D.C.	NSF Advance Technological Education PI Conference	Broadening Impact for Professionals in the ATE Community and Beyond	Thomas Tubon, Kevin Niemi, Megan Heitmann, Bernie Siegel, Amanda Rosenzweig	300
10/30/2019	Honolulu, HI	SACNAS-NSF Developing Skills for Advanced Careers Workshop	BI 101	Jory Weintraub	40
11/07/2019	Merced, CA	2019 CCBM Workshop	Current Trends in Broader Impacts	Sara Vassmer	40
1/20/2020	Miami, FL	World Stem Cell Summit: Regenerative Medicine Manufacturing Society	Panel for Bioscience Workforce Development Programs and Career Development Pathways (BI)	Tom Tubon	200



DATE	PLACE	INSTITUTION/ CONFERENCE	SESSION TITLE	TRAINERS	PARTICIPANTS
1/28-31/2020	New Orleans, LA	NSF ATE Mentor Connect Meeting	Mentoring for new applicants for NSF ATE Funding: Broadening Impact for Professionals in the ATE Community and Beyond	Tom Tubon	200
3/17-18,2020	Virtual Meeting	ARIS	ARIS Broadening Participation for Persons with Disabilities in STEM	Tom Tubon and Susan Renoe	65
4/17/2020	Virtual Meeting	ARIS	ARIS Broadening Participation for Persons with Disabilities in STEM - Follow-Up	Tom Tubon and Susan Renoe	26
5/8/2020	Virtual Meeting	ARIS	ARIS Broadening Participation for Persons with Disabilities in STEM - Special Interest Group	Tom Tubon and Susan Renoe	14
6/1/2020	Virtual Meeting	NSF CMat ERC REM Summer Research Speaker Series	Integrated presentation for Biomanufacturing and ARIS / Broader Impacts	Tom Tubon	65
<b>Total Training Session Participants</b>					1800
TABLE EVENTS					
8/5-7/2019	Athens, GA	NSF Cell Manufacturing Technologies Engineering Research Center Annual Meeting	ARIS Table	Tom Tubon	200
10/22-25/2019	Washington, D.C.	NSF Advance Technological Education PI Conference	ARIS Table	Thomas Tubon, Kevin Niemi, Megan Heitmann	650
1/19/2020	Miami, FL	Future of Medicine Day at the Frost Museum of Science	NSF ARIS Information Table with NSF InnovATEBIO and ST3 Accessible Science	Thomas Tubon, Alex Gorgevska, and Amanda Rosenzweig	2400
2/6-8/2020	Washington, DC	NSF Emerging Researchers Network Conference	ARIS Table	Tom Tubon	500

DATE	PLACE	INSTITUTION/ CONFERENCE	SESSION TITLE	TRAINERS	PARTICIPANTS
<b>Total Table Event Participants</b>					3750*
<b>WEBINARS</b>					
11/26/2018	Webinar	Arkansas EPSCoR Webinar	BI 101	Jory Weintraub and Janice McDonnell	40
12/6/2018	Webinar	Arkansas EPSCoR Webinar	Diversity and Broadening Participation	Jory Weintraub and Janice McDonnell	40
2/1/2019	Webinar	SciEngage Virtual Meeting	BI 101	Susan Renoe	70
6/26/2019	Webinar	NORDP Community Webinar	Understanding the NSF Broader Impacts Criterion (With a Little Help from Your Friends at NABI/ARIS)	Jory Weintraub, Janice McDonnell, and Megan Heitmann	168
9/25/2019	Webinar	ARIS	Establishing a BI Support Office at your Institution	Jory Weintraub	30
1/14/2020	Webinar	NCURA	BI 101	Jory Weintraub	24
1/15/2020	Webinar	Arizona State University	BI 101	Jory Weintraub	10
1/16/2020	Webinar	NCURA	BI 101	Jory Weintraub	21
6/11/2020	Webinar	ARIS	Office Hours: Re-envisioning the BI Criterion	Susan Renoe	25
6/24/2020	Webinar	ARIS	Office Hours - Part 2: Re-envisioning the BI Criterion	Susan Renoe	25
6/30/2020	Webinar	ARIS	International Research Impact Series: REF Introductory Workshop	David Sweeney, Research England, UKRI	18
<b>Total Webinar Participants</b>					471
<b>OVERALL NUMBER OF PARTICIPANTS</b>					<b>2960</b>

\*Table Events were not included in final total training participants.

# APPENDIX II

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## **RESPONSE FROM ARIS COUNCIL OF EXPERTS TO ARIS 2-YEAR REPORT AUGUST 14, 2020**

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### **INTRODUCTION**

The ARIS Council of Experts applauds ARIS for a successful two-year period, captured in its two-year report. The National Alliance for Broader Impacts (NABI) transitioned successfully to become Advancing Research Impact in Society (ARIS). The report is a comprehensive overview of ARIS activities and results. It shows clearly that ARIS is delivering and achieving its mission to work with scientists and engagement practitioners. It illuminates how ARIS builds capacity, advances scholarship, grows partnerships and provides resources; and explains how ARIS helps scientists and engagement practitioners engage with and demonstrate the impact of research in their communities and society. We congratulate the ARIS team for holding so many successful trainings and for evaluating their achievements thoroughly and carefully, in the true spirit of ARIS. We also fully realize that ARIS, like many higher-education centric organizations, is operating – and will continue to operate for the foreseeable future – in an ecosystem marked by disruptive economic, social, and demographic change.

In this letter, the Council of Experts provides ideas, potential focus areas, and suggestions for ARIS to consider over the next few years to improve its ability to deliver on its mission, and to achieve success in these challenging times. Rather than static recommendations, we intend these to be starting points for ongoing dialogue on how ARIS and all its members can work together to build on the successes of the past years.

In the remainder of this letter we will briefly describe the wider context and current developments in which ARIS operates and relate them to the mission and vision of ARIS. From there, and with the knowledge of the achievements of the past two years, we will address several potential focus areas and we suggest options to minimize risks and maximize opportunities. This is intended to enable ARIS to prepare (even better) for the remaining grant period and the period thereafter.

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## CURRENT CONTEXT AND DEVELOPMENTS

The ARIS Council of Experts sees a trend towards prioritization of broader impacts of research. There is growing concern that society doesn't benefit from the advancement of knowledge, and mounting unease that research doesn't respond effectively to societal challenges. These are developments in the U.S. as well as in other countries and regions in the world, including Canada and Europe. In response, we observe movement from science agencies (besides NSF, they include NASA, the Department of Energy, the US Department of Agriculture in the United States as well as private foundations) to prioritize assessment, achievement, and evaluation of research impacts. The mission of ARIS, to advance impacts of research for the betterment of society, is clear, timely and relevant beyond the NSF context.

Another trend we see globally, and strongly in the U.S., is toward greater diversity along many dimensions among students, staff, and those that are involved in and affected by research. We see ARIS as a natural enabler of this emphasis on increasing diversity, equity, and inclusion, with its tradition of reaching out and including new institutions and communities. We think of the attention ARIS has devoted to improving access for persons with disabilities, as well as the attention paid to knowledge creation and utilization of all academic disciplines, including social sciences and humanities.

There are two recent developments that result in a completely new situation for almost everyone and every organization. These are, of course, the global COVID-19 pandemic and the renewed and strong attention to achieving equity and justice for Black, Indigenous and People of Color (BIPOC), sparked by the murder in the U.S. of George Floyd at the hands of uniformed policemen. Many researchers feel the urge to contribute or otherwise engage in addressing the twin challenges of fighting the pandemic and fighting racial injustice. We think ARIS is in a unique position to respond to these developments by providing researchers the tools and opportunities to contribute and engage their science toward addressing these important societal issues.

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## RECOMMENDATIONS - FOCUS AREAS

**We encourage and reaffirm the importance of ARIS lead role in championing NSF's Broader Impacts criterion** and serving as a primary resource for achieving, improving, and sustaining research impacts across the breadth of science and engineering research. ARIS has the opportunity to develop best practices, trainings, and other tools for achieving research impact, with necessary adaptations to reach beyond NSF's Broader Impacts framework. **We encourage ARIS to continue to extend its focus to include all disciplines.** And we appreciate the focus on professional development and institutional embeddedness, as this provides the best opportunity for continued professional attention and expertise for broader impacts.

Next, we wish to support ARIS in its efforts to achieve better, more balanced representation and participation in the STEM enterprise and beyond. We are happy that the two-year report demonstrates that ARIS is being intentional in its approach to serving persons with disabilities, which comes at a time when the broader STEM community is awakening to the longstanding relative neglect of this population. The new partnerships with the National Federation of the Blind and other organizations are a promising start to building a community of practice and a toolkit of successful practices, not only to include persons with disabilities in research but also to achieve direct impacts for all persons with disabilities.

But we would be remiss if now, in summer 2020, the Council of Experts did not **urge ARIS to meet the moment by amplifying its efforts to help researchers and research institutions achieve racial equity and justice.** We refer of course to the renewed attention for the position of BIPOC in general and their unbalanced representation in and participation in higher education and research. We also recognize the COVID-19 pandemic, viewed through a lens of racial equity and social justice, calls on individuals and organizations, including ARIS, to examine what efforts can be made to address systemic anti-BIPOC racism. The current context creates an imperative for ARIS to center the issue of equity and justice within broader impacts of research.

This should not be through one-off statements of support but through sustained strategy and programming that is accountable to affected stakeholders. As summarized by Council member Beronda Montgomery, “It is much easier to espouse commitment to such issues through declaring alliance with individuals from aggrieved populations in response to a publicly-engaged national agenda with platitudes rather than specifically demonstrating lived commitment to social justice in leadership practices through engagement with and deployment of specific and meaningful interventions for the same populations at one’s own institution.”<sup>2</sup> *We would like to emphasize that ARIS has long demonstrated lived commitment to social justice and we applaud the idea to submit an NSF INCLUDES proposal in the near future. This will not only provide resources but will also force the community to think carefully about how lasting change and impact can happen for equity and inclusion in the STEM enterprise.*

Finally, racial equity and the social/economic recovery from COVID-19 requires efforts of and engagement with all academic disciplines. Equity - based on race and ethnicity, sexual orientation, gender and gender identity, and disability - is an issue also addressed specifically by social sciences, humanities and creative arts. Employment (skills), labor markets, consequences (and causes) of racism, discrimination, pandemics and crises are addressed by social sciences. Historical and current social contexts can be addressed through engagement with the humanities. Animating the current moment and driving social justice can be expressed through engagement with the creative arts. **We therefore encourage ARIS to continue to reach out to all academic disciplines.** All

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<sup>2</sup> <https://scholar.valpo.edu/cgi/viewcontent.cgi?article=1316&context=jvbl>

disciplines are needed, and many researchers across the board feel the urge to engage and contribute.

In providing areas for ARIS to consider, we have confidence that the ARIS toolkit of trainings, evaluation, research support, community building, awards, convenings, and other activities offer effective options to continue to build a research impacts community and to enhance research impacts in all types of research.

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## RECOMMENDATIONS - MAXIMIZING IMPACT AND MINIMIZING RISKS

During the past years, ARIS has grown and its activities have diverged. In these extraordinary times, ARIS remains very well-positioned to advance the broader impacts of research and education investments. As aforementioned, it is clearly imperative for ARIS to extend its programs and services to accelerate workforce development and positive research impacts for groups historically underrepresented.

We recommend that ARIS consolidate and maintain focus on partnerships and activities that will scaffold on the substantial progress achieved during the first phase of the current grant. Otherwise ARIS may become overextended and run the risk of reducing its current momentum and achievements. We are not suggesting that ARIS pivot to a new set of goals and activities. On the contrary, **we suggest that ARIS continue to build its efforts strategically, and that it chooses to focus on activities that will yield measurable outcomes within the grant period.**

Some guiding questions for ARIS to consider going forward include:

1. What is ARIS uniquely qualified to undertake to help advance broader participation and success of individuals with disabilities and BIPOC?
2. If new partnerships are considered, how may these partnerships be built quickly and efficiently, and with connection to existing programs and partnerships already affiliated with ARIS?
3. What changes in the assessment of broader impacts may need to be considered to specifically measure education and workforce advances for BIPOC students and professionals and individuals with disabilities?

In addition to these specific cautions, risks may ensue if two large domains of ARIS's work – dissemination and sustainability – do not become more central foci during the remaining grant period. Guiding questions would include:

4. ARIS's dissemination efforts have been within a relatively small range of outlets, such as ARIS workshops, on-line communities, and the annual meeting. How can ARIS dissemination efforts be scaled up? Might ARIS expand its dissemination to take full



advantage of its partners' communication avenues? Would it be impactful for ARIS to produce updated written materials that could be disseminated through diverse channels, including NSF?

5. With regard to sustainability, the central question remains: how can ARIS's sustainability post-grant be maximized? ARIS's planned grant seeking efforts are essential, but do not constitute a long-term sustainability strategy. There will be a market for the proposed credentialing program, but it will take time to develop as a viable revenue stream. ARIS has made the right decision to postpone the movement to a membership fee-based organization for (at least) one year. Whether an alternative membership fee-based structure should be considered, in addition to a delay in instituting such a structure, should be considered. Additionally, are there other ARIS sustaining strategies that should be considered in addition to membership fees, credentials, and grants?

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## CLOSING

Again, we applaud ARIS for its successful transition period. As the higher education ecosystem in the US is grappling with the impacts of the global COVID-19 pandemic on economic stability, as well as a reckoning with systemic racism, we see unique contributions that ARIS can make. Addressing ecosystem-wide issues requires the building of community and the ability to have trust-based community-wide discussions. The foundational work of ARIS in building communities around broader impacts and having established leading voices that engender trust as a foundation for communication around difficult issues has positioned ARIS to advance meaningful impact in this area. ARIS is uniquely positioned to start meaningful conversations across the ecosystem about the future of broader impacts and equity-based support in research, which are directly related to the ARIS mission "to advance impacts of research for the betterment of society and the expansion of research." We look forward to the continued innovation and creativity of the ARIS team in addressing the issues at hand.

This document has been prepared and is unanimously endorsed by a subset of the ARIS Council on Experts. In alphabetical order, these are:

- Elizabeth Ambos, consultant, former executive officer for Council on Undergraduate Research
- Kei Koizumi, science policy consultant, former Senior Advisor for Science Policy, American Association for the Advancement of Science (AAAS)
- Beronda Montgomery, MSU Foundation Professor of Biochemistry & Molecular Biology; Assistant Provost for Faculty Development – Research, Michigan State University
- David Phipps, Assistant VP Research Strategy & Impact, York University, Canada
- Leonie van Drooge, senior researcher, Rathenau Instituut, the Netherlands

## APPENDIX III



# ADVANCING RESEARCH IMPACT IN SOCIETY (ARIS) YEAR 2 FORMATIVE EVALUATION REPORT

**JANUARY 2020 – AUGUST 2020**

### SERC EVALUATION TEAM

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## EXECUTIVE SUMMARY

The Center for Advancing Research Impact in Society (ARIS) was launched in September 2018 with funding from the National Science Foundation (NSF Grant #1810732) to “advance the rigor, relevance, and practice of broader impacts (BI).” During the five-year grant period, project leaders are seeking to accomplish three objectives linked to eleven specific tasks. This report represents the work of the external evaluation team at the Science Education Resource Center (SERC) in providing an independent, formative assessment of whether Center activities are being implemented as proposed (implementation evaluation) and desired outcomes are being achieved (outcome evaluation) during a truncated Year 2 evaluation period (from January 2020 to August 2020) during which project leaders needed to quickly adjust to new realities introduced by the Covid-19 pandemic. Consistent with a Development Evaluation (DE) approach, the goal of this work is to provide project leaders with the information they need to continuously adapt and improve ARIS materials and programming throughout the grant period.

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## KEY ACTIVITIES AND OUTCOMES

### Objective 1. Professionalize the BI community

During the first year of the grant cycle (September 2018 to August 2019), ARIS leaders developed a Training Needs Assessment Survey to gather information that could be used to better serve the needs of researchers and BI professionals. In Year 2, survey responses have been valuable in

- identifying the “core competencies” of BI professionals,
- curating existing resources and developing new resources that align with topics in which BI professionals have expressed the greatest interest, and
- providing professional development opportunities, including the virtual April 2020 Summit, that meet the needs of BI professionals with a diverse set of interests, including interests that fall outside of the relatively small set of domains (i.e., initiatives designed to increase diversity and activities designed to engage K-12 audiences) with which broader impacts has been traditionally associated.

One mechanism for developing new resources is through the ARIS Fellowship Program which is currently soliciting applications for its third cohort of fellows. Products from the first cohort of fellows are now publicly available on the ARIS website. Connecting fellows and/or other community members to mentors will be an important next step in accelerating both resource development and community building efforts, especially in new priority areas (e.g., workforce development and increasing access among persons with disabilities).

### Objective 2. Build the capacity of researchers to effectively address the BI criterion

During Year 2, the ARIS Training Team has made significant progress in creating BI Wizard 2.0 and has been actively engaged in ARIS professional development programming, including hosting an array of institutional site visits, conference training sessions, and webinars that have – despite the Covid-19 pandemic – engaged more than 800 community members. In addition, the ARIS training team is in the process of developing and revising five training modules and implementing a pilot program with five academic institutions designed to “promote the establishment and expansion of *research impacts* (RI) support offices, centers, and infrastructure at academic institutions and research centers, and within professional societies nationwide.” The first set of training sessions for these pilot institutions is scheduled for September 2020.

### Objective 3. Build infrastructure

ARIS has established several promising connections with international colleagues/institutions (including Research Impact Canada) and has developed a number of initiatives, resources (including the ARIS website and the Higher Logic platform), and partnerships (including with the community of persons with disabilities) designed to grow and expand the ARIS community. Initial analyses of participation metrics and website analytics indicate success in these areas. For example, as of August 2020, the website had 17,896 visitors who initiated 83,954 pageviews. From April 2019 to June 2020, there has been a 293% increase in users and a 139% increase in pageviews.

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## KEY RECOMMENDATIONS

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### OBJECTIVE 1. PROFESSIONALIZE THE BI COMMUNITY

As efforts to professionalize the BI community continue, it will be important to purposively solicit feedback both from experienced BI Professionals who are affiliated with prominent academic institutions in the United States and from BI professionals who represent a more diverse set of experiences and who hail from a more diverse set of organizations. Project leaders will also need to work to develop a robust search tool to enable users to effectively and efficiently locate appropriate resources and to identify community member experts on the ARIS website. A system for vetting resources for quality will also need to be developed. As noted by the Council of Experts, a key challenge faced by ARIS leaders is to determine how to simultaneously expand its reach (e.g., by “extending its focus to include all disciplines” and by “amplifying its efforts to help researchers and research institutions achieve equity and justice” for persons in the BIPOC and disability communities) without becoming “overextended” and running “the risk of reducing its current momentum and achievements.”

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### OBJECTIVE 2. BUILD THE CAPACITY OF RESEARCHERS TO EFFECTIVELY ADDRESS THE BI CRITERION

Tasks related to Objective 2 are numerous, and team members run the risk, again, of becoming “overextended.” Project leaders might consider working with the SERC evaluation team to reflect on and refine the logic model included in the NSF proposal to 1) clarify goals, 2) set priorities, 3) clarify strategies and resources, 4) identify appropriate formative and summative assessment tools, 5) negotiate workloads and timelines, and/or 6) document accomplishments and barriers. Participation metrics, website analytics, usability studies, and other evaluation tools (e.g., landscape analysis and action planning tools that the Training Team is currently developing for the institutional research

impacts training program) will be important in refining resources and training materials and ensuring that accomplishments related to key project goals (e.g., increasing uptake of materials and lasting impacts from professional development opportunities) are being documented.

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## OBJECTIVE 3. BUILD INFRASTRUCTURE

In Year 3, the SERC evaluation team will work with ARIS project leaders to develop and implement new evaluation tools designed to supplement existing tools (e.g., end-of-event surveys) to better document program successes, identify areas for improvement, and demonstrate how both the human and technological resources that have been built during the first two years of the project (e.g., a strong leadership team and the new Higher Logic community platform) can be best mobilized to ensure lasting impact. First, interviews with project leaders will be valuable in identifying barriers to achieving desired goals and ensuring that developing materials and programming are well-aligned with new knowledge (e.g., as gained from conversations with long-term and new collaborators and from insights provided by the Council of Experts), available resources, and shifting demands (e.g., as necessitated by the Covid-19 pandemic). Second, usability studies will be valuable in developing the Broader Impacts Wizard and ARIS website search tools. Third, regular review of participation metrics (e.g., from webinars, workshops, and the annual Summit) and website analytics (e.g., from the ARIS website, the Higher Logic platform, and the GamePlan reporting tool) will be valuable in characterizing the ARIS community, determining how used and useful particular resources are to this community, and guiding discussions about goals for these programs and tools to ensure lasting impact. Finally, social network analyses (SNA) will be valuable in identifying community experts and in documenting both the growth of the ARIS community over time and areas where these community connections might be expanded or strengthened.

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## PROJECT OBJECTIVES

The Center for Advancing Research Impact in Society (ARIS) was launched in September 2018 with funding from the National Science Foundation (NSF Grant #1810732) to “advance the rigor, relevance, and practice of broader impacts (BI).” During the five-year grant period, project leaders are seeking to accomplish three objectives linked to eleven specific tasks.

### ■ Objective 1. Professionalize the BI community through five activities

- Task 1.1. Identify and disseminate core competencies for BI professionals

- Task 1.2. Develop high-quality BI resources
- Task 1.3. Build capacity through robust professional development
- Task 1.4. Develop a fellowship program to support innovation in BI practices
- Task 1.5. Develop a cadre of BI mentors to provide on-going support for BI professionals

■ **Objective 2. Build the capacity of researchers to effectively address the BI criterion**

- Task 2.1. Develop high-quality resources for researchers
- Task 2.2. Conduct professional development for researchers and their institutions

■ **Objective 3. Build infrastructure to support and adapt to the emerging BI field enable the continuous improvement of Center operations through evaluation of programs, resources, and activities**

- Task 3.1. Enable continuous improvement of Center operations through evaluation of programs, resources, and activities
- Task 3.2. Apply formative data to help the Center be dynamic and adaptable to stakeholder needs
- Task 3.3. Collaborate with international colleagues to share promising practices and resources
- Task 3.4. Seek to move BI beyond NSF to become an integral part of the national research enterprise

## METHODS

This report represents the work of the external evaluation team at the Science Education Resource Center (SERC) in providing an independent, formative assessment of whether program activities are being implemented as proposed (implementation evaluation) and desired outcomes are being achieved (outcome evaluation) during a truncated Year 2 evaluation period (from January 2020 to August 2020) during which project leaders needed to quickly adjust to new realities introduced by the Covid-19 pandemic.<sup>1</sup> Pandemic-related challenges – including unprecedented budget deficits, faculty and staff furloughs, restrictions on travel, and heightened levels of uncertainty – appear likely to continue during the entirety of Year 3 of the grant period (from September 2020 to

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<sup>1</sup> SERC's contract to provide evaluator services to the ARIS project began on January 13, 2020 and will end on August 31, 2021. The University of Missouri has the option of renewing the contract for two additional periods (i.e., through Year 5 of the grant).



August 2021). The current report summarizes Year 2 evaluation information collected through 1) participation in virtual bi-weekly meetings with the ARIS leadership team and staff, 2) review of program artifacts, and 3) analysis of survey data. Consistent with a Development Evaluation (DE) approach, the goal of this work is to provide project leaders with the information they need to continuously adapt and improve ARIS materials and programming throughout the grant period.

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## **ACTIVITIES, OUTCOMES, AND RECOMMENDATIONS**

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### **OBJECTIVE 1. PROFESSIONALIZE THE BI COMMUNITY**

In 2014, the National Alliance for Broader Impacts (NABI) was established with funding from the National Science Foundation (NSF) to create and support a community of practice among BI professionals. A key aim of the ARIS Center is to continue to grow and professionalize the practice of this community through five key activities: 1) identifying and disseminate core competencies for BI professionals, 2) developing high-quality BI resources, 3) building capacity through robust professional development, 4) developing a fellowship program to support innovation in BI practices, and 5) developing a cadre of BI mentors to provide on-going support for BI professionals.

#### **Task 1.1 Identify and disseminate core competencies for BI professionals**

During the first year of the grant cycle (September 2018 to August 2019), Center leaders developed a Training Needs Assessment Survey designed to gather information that could be used to “better serve the needs of researchers and BI professionals.” A central goal of the survey was to identify the “core competencies” (i.e., the skills, knowledge, and behaviors) of BI professionals and to share this information via white papers, presentations, or publications. Key Year 2 activities, outcomes, and recommendations related to Task 1.1 are described here.

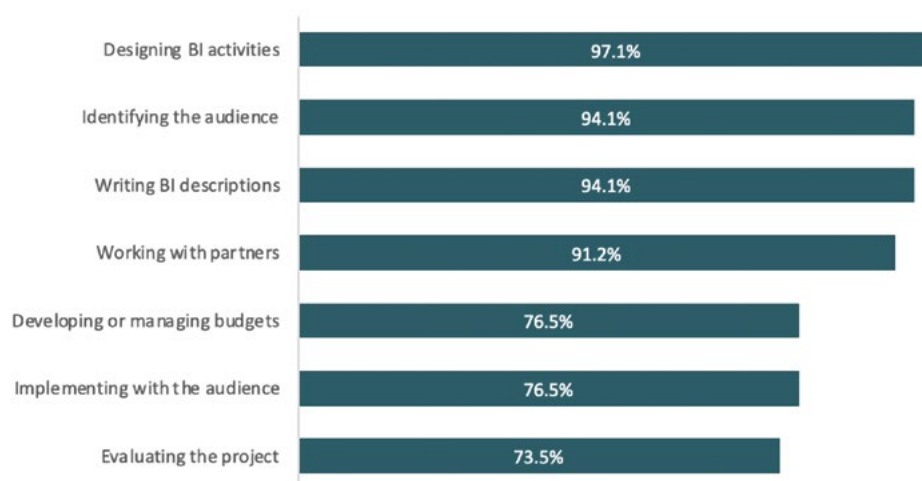
#### ***Activities and Outcomes***

Administration of the Training Needs Assessment Survey began in March 2019. From March 2019 to February 2020, the survey was distributed to the NABI mailing list ( $n = 675$ ) and completed by 111 individuals (a 16.4% response rate), 38 of whom identified as BI professionals. In February 2020, data were analyzed by the SERC evaluation team and a full report of survey findings was provided to project leaders.

Among the key findings from the Training Needs Assessment Survey was that although none of the BI professionals indicated that their main job or role was “grant writer” and only 7.9% reported working in a grants office, the vast majority (89.5%) indicated that

they participated in writing grant proposals. Among these individuals, 58.8% indicated that they and their staff *supported* 10 or more Broader Impacts projects each year and 32.4% indicated that they and their staff *implemented* 10 or more Broader Impact projects each year. As shown in Figure 1, BI professionals also reported engaging in a wide range of specific BI tasks including designing BI activities (97.1%), identifying and implementing with the audience (94.1% and 76.5%, respectively), working with partners (91.2%), developing or managing BI budgets (76.5%), and evaluating BI projects (73.5%).

**Figure 1. Percentage of BI Professionals who participated in grant writing who reported being involved in each activity.**



These findings are consistent with conclusions drawn by the Training Team from their own review of the Training Needs Assessment survey data and from a systematic review of the extant literature. Specifically, in a document outlining a developing “short list” of competencies, the Training Team notes that BI professionals engage in a wide range of BI activities related to program administration, project development, and resource development and management that require BI professionals to 1) demonstrate institutional leadership, 2) understand the history and context of outreach, engagement, and broader impacts, 3) identify, use, and identify foundational scholarship, 4) identify, negotiate, and cultivate high-quality partnerships, 5) engage in capacity-building activities with stakeholders and community partners, 6) support faculty and staff development efforts, and 7) do all of this work in a way that promotes “diversity, pluralism, multiculturalism, equity, inclusion, and cross-cultural understanding.” The next step in identifying “core competencies” is to conduct a Delphi study wherein feedback on the “short list” is reviewed by a small group of experienced BI professionals. The Training Team is currently working to secure IRB approval for this study. Concurrently, the SERC evaluation team is working to develop a tool to assess BI professionals’ self-efficacy with regard to each of these competencies.

## Recommendations

Combined with other Training Team efforts, the Training Needs Assessment Survey appears to have been an effective tool in helping to identify the “core competencies” of BI professionals. This conclusion is bolstered by the experience level of the BI professionals who responded to the survey from March 2019 to February 2020. Specifically, 92.1% of respondents reported holding a Master’s, Professional, or Doctoral degree and 75.7% reported having 10 or more years of experience. At the same time, survey findings should be interpreted with some caution given that the number of BI professionals who responded was both small ( $n = 38$ ) and relatively homogenous. For example, all of the respondents indicated that they worked in the United States. Among those who indicated that they worked for an academic institution, most indicated that they worked at a research university (86.5%) and that they did not work for a minority serving institution (83.3%). In future efforts designed to identify, pare down, and disseminate information about core competencies, it will be important to purposively solicit feedback both from experienced BI Professionals (as is the intention for the planned Delphi study) and from BI professionals who represent a more diverse set of experiences and who hail from a more diverse set of organizations.

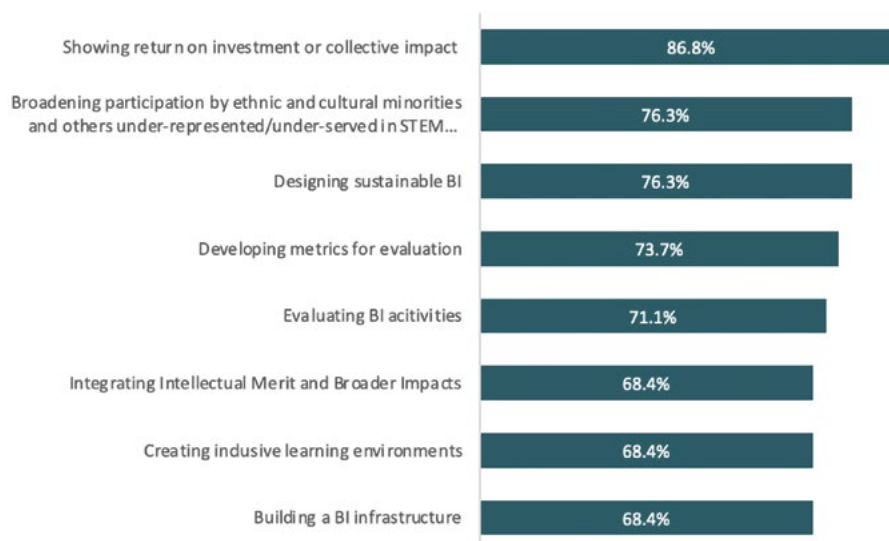
### Task 1.2. Develop high-quality BI resources

In 2015, NABI created *Broader Impacts Guiding Principles*, a three-page document designed, in part, to help BI professionals and researchers develop their Broader Impacts plans. A key goal for the ARIS project is to expand the toolkit for BI professionals by continuing to synthesize existing resources and develop new resources that align with core competencies and priorities identified in the Training Needs Assessment Survey. Key Year 2 activities, outcomes, and recommendations related to Task 1.2 are described here.

### Activities and outcomes

BI professionals ( $n = 38$ ) who completed the Training Needs Assessment Survey from March 2019 to February 2020 (see Section 1.1) were asked to identify the BI topics they were most interested in learning more about. Topics that were selected by more than two-thirds of respondents are presented in Figure 2. As shown, among the training topics that generated the most interest were those related to evaluation (e.g., showing return on investment or collective impact; 86.8%), diversity, equity, and inclusions (e.g., creating inclusive learning environments; 68.4%), and building institutional capacity (e.g., by building BI infrastructure; 68.4%).

**Figure 2.** Percentage of BI Professionals who expressed interest in learning more about each topic



As part of their efforts to address these areas of interest, ARIS project leaders worked to sunset the National Alliance for Broader Impacts (NABI) website. In its place, project leaders created a new ARIS website: [www.researchinsociety.org](http://www.researchinsociety.org). One feature of the new website is a growing collection of online resources. Among the 38 resources currently included on the website are foundational documents (e.g., *Broader Impacts Guiding Principles*, *Perspectives on Broader Impacts*, and *The Current State of Broader Impacts*) and archived materials from

ARIS and other organizations. Through a partnership with Research Impact Canada, several of these resources as well as additional resources are also available at <https://resources.researchimpact.ca/>. As shown in Table 1, many of these resources are targeted at BI professionals and align very closely with the topic areas in which BI professionals have expressed the greatest interest.

**Table 1. Sample of BI resources available on ARIS website**

TOPIC	SOURCE	TITLE
Showing return on investment or collective impact	ARIS Summit	<i>Collecting and Communicating the Evidence of Impact (Phipps, 2020)</i>
Broadening participation	CAISE	<i>Broadening Perspectives on Broadening Participation in STEM</i>
Designing sustainable BI	ARIS Summit	<i>Make Love Happen: Lasting Broader Impacts Relationships are Possible (Farley, Little, &amp; Keith, 2020)</i>
Developing metrics for evaluation/ Evaluating BI activities	ARIS Summit	<i>TransFORMing your Evaluation Practices (Peterson, 2020)</i>
Integrating intellectual merit and broader impacts	COSEE	<i>Broader Impact Wizard</i>
Creative inclusive learning environments	ARIS Summit	<i>Words Matter: Inclusive Teaching of Ambiguous Classroom Concepts (Yoho, 2019)</i>
Building a BI Infrastructure	ARIS Webinar	<i>Establishing a BI Support Office at Your Institution (2019)</i>

Although the Training Needs Assessment Survey may be an effective tool in assessing “perceived needs,” “expressed needs” are better assessed through systematic examination of the behaviors of community members. As shown in Table 2, an initial review of website analytics data gathered from April 2019 to August 2020 indicates that users are accessing foundational documents via the ARIS website.

**Table 2. Pageviews for foundational NABI/ARIS documents**

TITLE	PAGEVIEWS	UNIQUE PAGEVIEWS
Broader Impacts Guiding Principles	991	890
Perspectives on Broader Impacts	529	451
The Current State of Broader Impacts	430	329
<b>TOTAL</b>	1950	--



## **Recommendations**

Efforts to determine gaps in knowledge and resources should continue. One approach to gathering this information is, as proposed, through annual administration of the Training Needs Assessment Survey. The SERC evaluation team offered a number of recommendations for this survey in their February 2020 report including 1) soliciting responses from a larger, more diverse sample, 2) assessing the resource needs of individuals who do not identify as BI professionals (including university administrators and researchers, but also informal educators and evaluators and others who fall outside of prescribed categories), and 3) revising some survey items to better assess level of interest.

A system for vetting resources for quality will need to be developed. As new resources are collated, project leaders will also need to work to develop a robust search tool to enable users to effectively and efficiently locate appropriate resources on the ARIS website and/or on the websites of partner organizations (e.g., Research Impact Canada). A usability study may be an important next step in developing this tool. By observing users as they attempt to search for information or resources, the SERC evaluation team could assist project leaders in better understanding where barriers exist in users' ability to have an effective and efficient experience. Website analytics can, in turn, be helpful in determining how used and useful these resources are to the community. In addition to examining user and pageview metrics, website analytics can also be valuable in understanding the behaviors of users in general (e.g., what does the typical user do after clicking on a link to a foundational document?), the distinct patterns of behaviors of different types of users, and how actual behaviors differ from ideal behaviors (i.e., from what project leaders would *like* for users to do).

### **Task 1.3. Build capacity through robust professional development**

Since 2014, the work of BI professionals and the institutions and researchers they engage has been supported through participation in an annual Summit sponsored by NABI. A key aim of the ARIS Center is to provide support for the Summit and to develop other professional development opportunities for BI professionals. Although BI is often equated with a relatively small set of domains (i.e., initiatives designed to increase diversity or broaden participation and activities designed to engage K-12 audiences), the ARIS Center seeks to develop professional development opportunities that focus on additional domains, including workforce development, national security, and economic competitiveness. Key Year 2 activities, outcomes, and recommendations related to Task 1.3 are described here.

#### **Activities and outcomes**

Although the Training Needs Assessment Survey did not specifically ask respondents

to indicate their interest in workforce development, national security, and economic competitiveness, survey findings did indicate that BI professionals and the researchers they support have substantial interest in pursuing a range of BI work beyond the types of work most often associated with BI. For example, more than half of respondents expressed interest in projects related to *Public Education* [including managing or coordinating an education of public outreach program (86.8%)] and *Policy* [including participating in projects that develop programs or materials for the public or managers/policymakers (52.6%)].

With a theme of “Expanding Broader Impacts,” the April 2020 ARIS Summit sought to address this diversity by providing participants a range of professional development opportunities that both included and extended beyond initiatives designed to increase diversity or broaden participation and activities designed to engage K-12 audiences.

Due to the COVID-19 pandemic, the Summit was held virtually with support from KnowInnovation (KI). Over the course of three days, approximately 300 attendees participated in Summit activities. Keynote talks were given by Dr. Suzi Iacono, head of the National Science Foundation (NSF) Office of Integrative Activities, Dr. Kelvin Droegemeier, acting NSF Director and Director of the White House Office of Science & Technology Policy, and Mohamed Noor, Dean of Natural Sciences, Duke University.

An end-of-event survey was completed by 69 participants. Data were analyzed by the SERC evaluation team and a full report of survey findings was provided to project leaders in May 2020. Key findings are highlighted here.

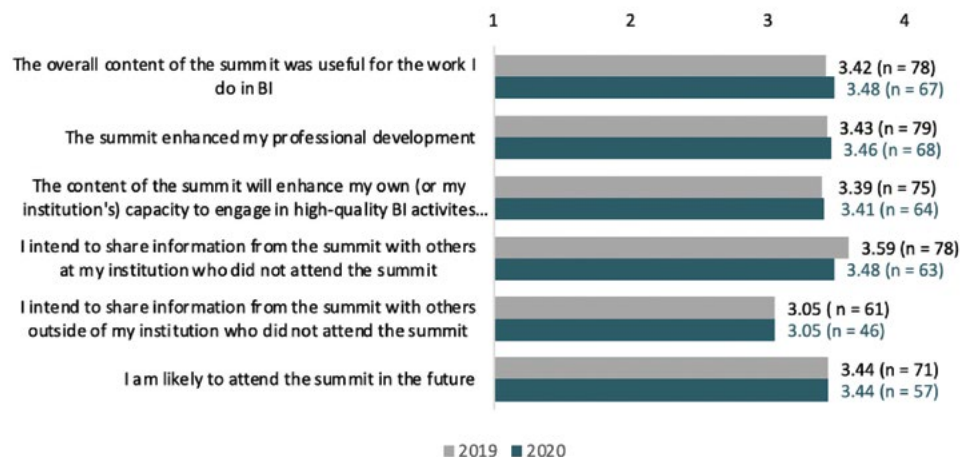
1. As shown in Table 3, and consistent with the Summit theme of “Expanding Broader Impacts,” Summit participants had the opportunity to participate in panel discussions and lightning/talks posters exploring engagement with several overlooked communities both within and outside of STEM.

**Table 3. Sample ARIS Summit PD opportunities**

TITLE	FORMAT
<i>The MSU Center for Interdisciplinarity: Centering the Arts and Humanities in Interdisciplinary Research</i>	Presentation
<i>Ship Happens: Embracing the Potential for Citizen Science in Marine Tourism</i>	Lightning/Poster Talk
<i>Engaging Communities of Faith in Broader Impacts Activities</i>	Panel Discussion
<i>Science with Seniors: A Model Program Senior Citizen-Centered STEM Outreach</i>	Lightning/Poster Talk

2. As a group, respondents agreed that the Summit provided information that was valuable to their own work and worthy of sharing with colleagues at their own and other institutions. As shown in Figure 3, the overall impact ratings of 2020 respondents (1 = strongly disagree, 4 = strongly agree) did not differ significantly from the ratings of 2019 respondents, despite the unexpected and rapid transition to an online format.

**Figure 3. Impact ratings from 2019 and 2020 ARIS Summit participants**

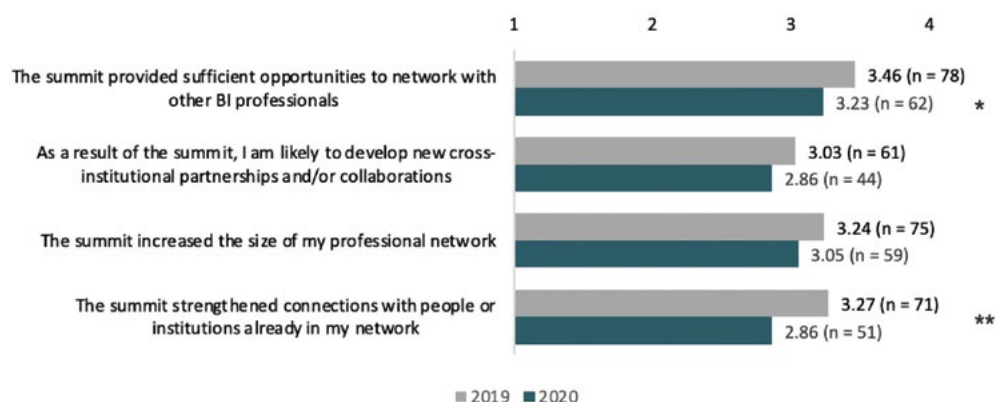


Consistent with these findings, respondents expressed overwhelming appreciation to ARIS leaders and to KnowInnovation for their rapid and agile transition to an online format. For example:

“The Summit was wonderful. While different from what we are used to, the 2020 Summit still managed to provide excellent professional development, build and strengthen connections to colleagues, and left me feeling excited and energized about the network of people doing this work, and about my own work on a personal and professional level.”

3. As a group, respondents also agreed that the Summit provided opportunities to network with other BI professionals. As shown in the figure below, networking ratings were generally lower than overall impact ratings and, for two items, significantly lower than ratings from 2019 respondents. Importantly, however, several respondents commented that the virtual meeting had the advantage of eliminating financial or scheduling constraints that would have made participation in an in-person Summit challenging or impossible.

**Figure 4. Networking ratings from 2019 and 2020 ARIS Summit participants**



\*  $p < .05$ . \*\*  $p < .01$ .

### Recommendations

The majority (> 80%) of individuals who responded to the Summit end-of-event survey reported that they were female, not Hispanic or Latino, and White. Over half of respondents (> 65%) reported that they held staff positions at academic institutions, while a sizeable minority reported that they were faculty members (15.9%) or professionals employed by a non-academic institution (11.6%). There was considerable diversity in respondents' level of experience doing BI work and in their prior Summit attendance, with more than half of respondents (58.0%) indicating that this was their first Summit. To the degree that respondents are representative of the estimated 300 Summit participants, these findings suggest that project leaders will need to continue to work to increase the demographic diversity of Summit participants while, at the same time, offering programming that meets the needs of a professionally diverse community representing a range of organizations and prior experience with Broader Impacts work.

Both the successes of the April 2020 ARIS Summit and the lessons learned from a rapid transition to an online format will prepare ARIS leadership well for future virtual meetings that may be necessitated by new health and/or economic realities associated with the Covid-19 pandemic and its aftermath. Whether in-person or online, meetings should provide opportunities to welcome and meaningfully engage newcomers. Efforts to do so (e.g., by offering complementary ARIS membership to first-time Summit participants) are already underway.

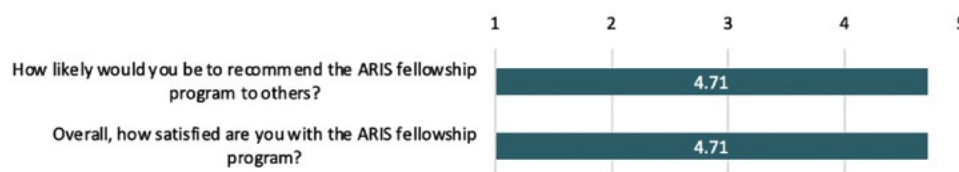
## Task 1.4. Develop a fellowship program to support innovation in BI practices

During the first year of the grant cycle (September 2018 to August 2019), project leaders developed the ARIS Fellowship Program to support “professionals, researchers, faculty, educators, graduate students and others working to advance research impact practice” to create products designed to “increase the quality and availability of scholarship and resources about research impacts.” Key Year 2 activities, outcomes, and recommendations related to Task 1.4 are described here.

### Activities and Outcomes

In April 2020, three fellows from the first cohort of ARIS 2019 Fellowship Program presented their products at the April 2020 ARIS Summit. These products are available to the BI and research communities on the ARIS website at <https://www.researchinsociety.org/scholarship/fellowships>. In January 2020, the second cohort of ARIS fellows ( $n = 11$ ) was announced. Fellows participated in bi-monthly meetings and submitted the first draft of their products in July 2020. In August 2020, members of this cohort were invited to complete a survey designed to provide formative feedback on their experiences to date. Among the seven fellows who completed the survey before the end of August 2020, satisfaction appears strong as reflected in both Likert-scale (see Figure 5; where 1 = very unlikely/very dissatisfied and 5 = very likely/satisfied) and open-ended responses.

**Figure 5. Satisfaction ratings for 2020 ARIS Fellows**



“Getting a chance to connect with the fellowship group, meet other who share my interests in societal impacts, and build a professional network have been incredibly valuable. I do not work in a situation where I have much opportunity to engage deeply in discussion about societal impacts from research. In fact, many people look down on any work outside of “basic science.” So, it has been particularly gratifying to connect with this group around our shared interests and professional development.”

Applications for the 2021 ARIS Fellowship Program are due in September 2020. Consistent with goals outlined in Task 1.3, priorities for the 2021 program include “developing strategies and best practices for creating research impacts through workforce development programs such as career and technical training and advanced technical training centers and institutes.”

## ***Recommendations***

The SERC evaluation team will soon provide project leaders with a full report summarizing responses from surveys administered to both 2019 and 2020 fellows. This report will include formative feedback that can guide continued work in developing a strong Fellowship program with lasting impacts. For example, in their open-ended responses, several of the 2020 Fellows indicated a desire for opportunities to a) network with, learn from, and form deeper connections with other fellows, and b) access the expertise and technological tools available from the broader ARIS community. Fellows also offered specific suggestions about how these goals might be accomplished including by inviting speakers, adding resources (e.g., tools for preparing IRB applications), strengthening connections between new and “older” fellowship cohorts, and introducing more community of practice meetings.

### **Task 1.5. Develop a cadre of BI mentors to provide on-going support for BI professionals**

A key aim of the ARIS center is to develop a distance mentoring program that can “expedite the development of a pipeline of BI professionals and future leaders.” The expectation is that mentors will be selected (e.g., based on an assessment of core competencies as developed in Task 1.1), trained, and then matched with mentees for virtual meetings. Key Year 2 activities, outcomes, and recommendations related to Task 1.5 are described here.

## ***Activities and Outcomes***

ARIS leaders have implemented several initiatives that will be helpful in establishing a mentorship program. First, ARIS has partnered with 14 organizations – including the National Organization for Research Development Professionals (NORDP), Promotion and Tenure (Innovation and Entrepreneurships) (PTIE), and Research Impact Canada – with the goal of expanding opportunities for collaboration and information-sharing. Second, ARIS has recognized researchers and practitioners who are doing exemplary work in research impacts in a variety of areas including STEM access and workforce development, K-12 education, and public engagement through their Awards program. Third, beginning in June 2020, ARIS implemented a monthly “virtual office hours” program to allow experts to lead discussions on topics that are of immediate interest to the community. On September 16, ARIS will host an office hour focused on strategies for engagement during a time when Covid-19 requires social distancing. Finally, in June 2020, ARIS launched their inaugural monthly e-newsletter, ARIS impacts. The newsletter is designed to update community members on new ARIS initiatives and the good work of ARIS community members. In the September issue, community efforts to engage graduate students in research impacts will be highlighted.



## **Recommendations**

Once the “core competencies” of BI professionals have been identified (see Task 1.1), efforts should be made to identify gaps in expertise and to identify individuals who might fill those gaps. Given efforts to expand the scope of ARIS to include research impacts from all disciplines (including the arts and humanities), special effort should be made to identify individuals with expertise who might be willing to serve as mentors in these areas.

Gathering early formative feedback on the successes and challenges of the mentorship program will be important in meeting the proposed outcome of the program: to “increase members’ deep ties and knowledge, strengthen networks, and solidify professional identity.” Social network analyses (SNA) could be helpful in determining whether these outcomes have been achieved. Indicators of success would include increased network density (i.e., an increase in the proportion of potential connections in a network that are actual connections) and, for mentors, increased betweenness centrality (i.e., evidence that mentors are increasingly serving as bridges between other members of the network).

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## **OBJECTIVE 2. BUILD THE CAPACITY OF RESEARCHERS TO EFFECTIVELY ADDRESS THE BI CRITERION**

The second key objective of the ARIS Center is to support the BI work of researchers through the creation of 1) high-quality resources designed to “increase efficiency and reduce redundancy by clarifying [researchers’] understanding of BI and increasing access to collaborators who can help them design, implement, evaluate, and disseminate their BI activities” and 2) professional development opportunities for researchers and their institutions. Importantly, the Center takes an inclusive view of the researcher role, to include individuals who are employed in staff and administrative roles as well as those who are in academic roles at all stages of their careers from emerging (e.g., undergraduate students, graduate) to established (e.g., tenured faculty).

### **Task 2.1. Develop high-quality resources for researchers**

In 2012, The Centers for Ocean Science Education Excellence Networked Ocean World (COSSEE NOW) developed a Broader Impact Wizard to assist faculty in the creation of Broader Impacts statements. The ARIS Center intends to update this resource to aid researchers in 1) identifying appropriate audiences, 2) developing appropriate budgets, 3) developing effective partnerships, 4) designing an evaluation plan, 5) accessing education literature to support effective project activity design, and 6) employing effective science communication strategies. Key Year 2 activities, outcomes, and recommendations related to Task 2.1 are described here.

## ***Activities and Outcomes***

After soliciting feedback from users at the 2019 ARIS Summit, a 2.0 version of the BI Wizard is near completion. The ARIS leadership team will have an opportunity to review this resource at their September 2020 meeting. One important change to the BI Wizard is that users are introduced to BI Planning as a cyclical process rather than a step-by-step, linear process. Users can begin their work at any point in the cycle, guided by embedded videos, worksheets, and helpful tips (e.g., on how to engage a K-12 audience). This approach more closely matches how the BI Wizard has been used to date (i.e., by BI professionals as either a lead-in tool or a follow-on tool as they work with researchers and/or build their own skill sets) while also meeting the needs of the audience for whom the tool was initially developed (i.e., early career researchers with little to no knowledge about the BI criterion).

## ***Recommendations***

A usability study may be an important next step in developing this tool. By observing users as they attempt to navigate the BI Wizard, the SERC evaluation team can assist project leaders in better understanding where barriers exist in users' ability to have an effective and efficient experience. Website analytics can, in turn, be helpful in determining how used and useful this tool is to the community. In addition to examining user and pageview metrics, website analytics can be valuable in understanding the behaviors of users (e.g., where do users typically begin their work in the BI Wizard?), exploring areas where actual behaviors differ from ideal behaviors (i.e., how does user behavior differ from how developers would like for the BI Wizard to be used?), and discerning patterns of use for the ARIS website that are unique to individuals who use the BI Wizard.

## **Task 2.2. Conduct professional development for researchers and their institutions**

A key aim of the ARIS Center's professional development activities is to "not only focus on basic and advanced concepts of BI" but to "enhance [researchers'] skills in science communication and how to understand and communicate the policy implications of their research." Key Year 2 activities, outcomes, and recommendations related to Task 2.2 are described here.

## ***Activities and outcomes***

The April 2020 Summit was the largest of the professional development opportunities hosted by ARIS from January 2020 to August 2020. As shown in Table 4, during this same time period, ARIS also hosted a number of smaller 1) institutional site visits, 2) conference training sessions, and 3) webinars that, together, engaged more the 800 individuals.

**Table 4. Year 2 Professional Development Activities.**

DATE	PLACE	INSTITUTION/CONFERENCE	SESSION TITLE	PARTICIPANTS
<b>INSTITUTIONAL SITE VISITS</b>				
1/17/2020	Piscataway, NJ	Rutgers University, Busch Campus	BI Pilot Workshop	20
2/3-4/2020	Lincoln, NE	University of Nebraska-Lincoln	Beyond Broader Impacts, Integrating Research and Education & NSF CAREER Workshop	80
3/4/2020	Piscataway, NJ	Rutgers University Center for Dermal Research	BI Pilot Workshop	25
<b>CONFERENCE TRAINING SESSIONS</b>				
1/20/2020	Miami, FL	World Stem Cell Summit: Regenerative Medicine Manufacturing Society	Panel for Bioscience Workforce Development Programs and Career Development Pathways (BI)	200
1/28-31/2020	New Orleans, LA	NSF ATE Mentor Connect Meeting	Mentoring for new applicants for NSF ATE Funding: Broadening Impact for Professionals in the ATE Community and Beyond	200
3/17-18/2020	Virtual Meeting	ARIS	ARIS Broadening Participation for Persons with Disabilities in STEM	65
4/17/2020	Virtual Meeting	ARIS	ARIS Broadening Participation for Persons with Disabilities in STEM - Follow-Up	26
5/8/2020	Virtual Meeting	ARIS	ARIS Broadening Participation for Persons with Disabilities in STEM - Special Interest Group	14
6/1/2020	Virtual Meeting	NSF CMat ERC REM Summer Research Speaker Series	Integrated presentation for Biomanufacturing and ARIS / Broader Impacts	65
<b>WEBINARS</b>				
1/14/2020	Webinar	NCURA	BI 101	24
1/15/2020	Webinar	Arizona State University	BI 101	10
1/16/2020	Webinar	NCURA	BI 101	21
6/11/2020	Webinar	ARIS	Office Hours: Re-envisioning the BI Criterion	25
6/24/2020	Webinar	ARIS	Office Hours - Part 2: Re-envisioning the BI Criterion	25
6/30/2020	Webinar	ARIS	International Research Impact Series: REF Introductory Workshop	18
7/7/2020	Webinar	ARIS	BI 101	9
8/4/2020	Webinar	ARIS	BI 101	11

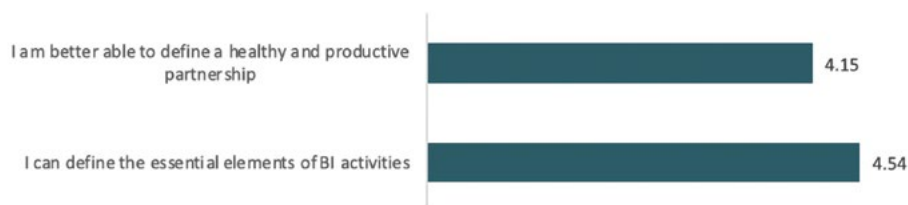
Surveys administered to participants after several of these events indicate that ARIS has been successful in meeting training goals in all three formats. For example:

### ***Institutional Site Visits***

In January 2020, the ARIS Center hosted a one-day professional development workshop for early career scientists at Rutgers University. Attendees were introduced to and engaged in hands-on learning related to a pilot version of one of four professional development modules (Module 3: Developing Broader Impact Activities) to be developed during the five-year grant cycle. In January 2020, data from an end-of-workshop survey were analyzed by the SERC evaluation team and a full report on survey findings was provided to project leaders. Four key findings emerged.

1. Survey respondents ( $n = 13$ ) agreed that that goals of the workshop were met. As shown in Figure 6, respondents were most likely to agree that, as a result of the workshop, they were “better able to define a healthy and productive partnership” (mean = 4.15 on a five-point scale from 1 “strongly disagree” to 5 “strongly agree”) and that they could “define the essential elements of BI activities” (mean = 4.54).

**Figure 6. Goal ratings from BI pilot workshop participants**



2. Respondents reported that they found spending time discussing the development of BI activities, hearing about successful partnerships, and thinking about budgets especially helpful.
3. Respondents reported that the workshop had changed their thinking about BI. Respondents were especially likely to report that they were now more likely to consider “impact identity” as an important component of their career trajectories ( $n = 5$ ) and more likely to think intentionally about BI throughout the grant proposal development process ( $n = 3$ ).
4. As a group, respondent reported being satisfied with the workshop (mean = 4.00 on a scale ranging from 1 = “very dissatisfied” to 5 = “very satisfied”). More than half of the respondents indicated that they would be “very likely” to recommend the workshop to a colleague (mean = 3.92 on a scale ranging from 1 = “very unlikely” to 5 = “very likely”). These sentiments were supported by respondents’ comments which included the following:

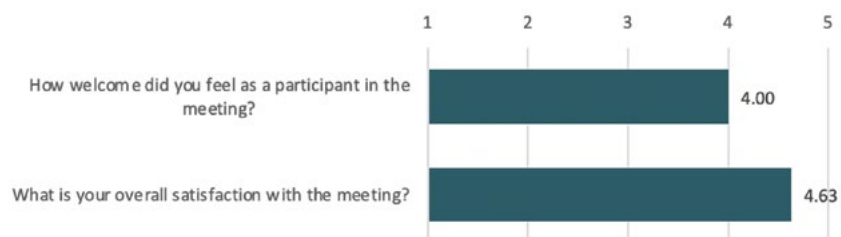
**"I found the workshop very helpful, and I will definitely write stronger BI statements as a result. Many thanks to the organizers for putting this together. What a great opportunity as a junior faculty member to improve grant writing skills and connect with colleagues."**

### **Conference Training Sessions**

In an effort to make STEM programs more welcoming and accessible to persons with disabilities (PWD), ARIS co-hosted a two-day online web conference on March 17 and 18, 2020. Project leaders sought an opportunity to "come together to engage in broad conversations with people with disabilities and other stakeholders on ways to encourage people with disabilities in STEM careers." Data from an end-of-event survey were analyzed by the SERC evaluation team and a full report on survey findings was provided to project leaders. Three key findings emerged.

1. Respondents ( $n = 8$ ) indicated that their goals were largely met, that the meeting provided a solid foundation for moving forward, and that they would like to continue to collaborate with this group.
2. Respondents indicated that they could more effectively engage in work to broaden participation of persons with disabilities with more information and other types of support including a) a centralized, accessible, peer-reviewed repository of materials and best practices, b) information about how to make existing curricula accessible, and c) information about how individuals without academic appointments can participate in programs funded by government agencies and foundations.
3. As shown in Figure 7, participants reported feeling welcome as a participant in the meeting (on a scale range from 1 = "not at all welcome" to 5 = "extremely welcome"). Participants were also report feeling satisfied with the meeting (on a scale ranging from 1 = "very dissatisfied" to 5 = "very satisfied").

**Figure 7. Satisfaction ratings from PWD conference participants**



These sentiments were supported by respondents' comments which included the following:

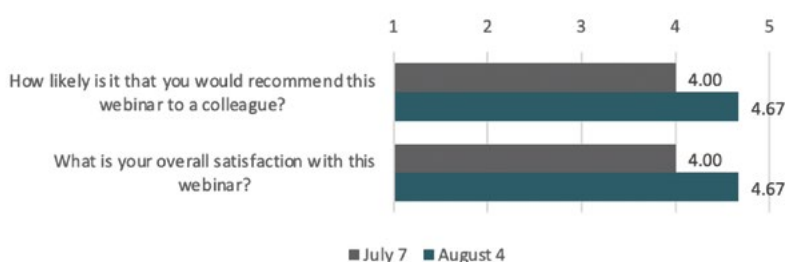
**"This was an awesome meeting. The experience and talent provided was exceptional."**

## Webinars

On July 7 and August 4, 2020, the Advancing Research Impact in Society (ARIS) Center hosted the first and second webinars in a series of six, two-hour “Broader Impacts 101” professional development webinars. The webinars were designed to “cover the history of the BI criterion, provide strategies for conceptualizing, developing, implementing and evaluating BI activities, and share tips on leveraging existing resources and establishing robust partnerships to build ‘BI identity.’” Data were collected from a registration survey administered prior to each webinar and from an end-of-event survey administered at the conclusion of each webinar. The end-of-event survey was completed by five of the eight registrants for the first webinar and six of the 15 registrants for the second webinar. Three key findings emerged from the registration surveys and end-of-webinar surveys.

1. As a group, respondents reported statistically significant gains in knowledge about the history and rationale of BI and gains in confidence in their ability to conceptualize BI activities.
2. Respondents indicated on a five-point scale ranging from (1 = very unlikely/very dissatisfied to 5 = very likely/very satisfied) that they were satisfied with the webinar and would recommend it to a colleague (see Figure 8).

**Figure 8. Satisfaction ratings from webinar participants**



3. Respondents indicated appreciation for the opportunity to get a broad overview of BI, for webinar leaders' willingness to answer questions and ability to provide helpful, concrete examples, and for opportunities to interact with colleagues during breakout sessions. For example:

**“The breakout session was very useful, particularly hearing from the other groups and realizing how many different interesting approaches we all took to creating a Broader Impacts plan for the same research project.”**

In addition to creating BI Wizard 2.0 and hosting institutional site visits, conference training sessions, and webinars, the ARIS training team is in the process of developing and revising five training modules focused on 1) exploring options for achieving Broader Impacts, 2) building BI identity, 3) constructing a BI activity, 4) implementing and evaluating BI activities, and 5) building the capacity of BI professionals. In addition, the



Training Team is implementing a pilot program with five academic institutions designed to “promote the establishment and expansion of research impacts (RI) support offices, centers, and infrastructure at academic institutions and research centers, and within professional societies nationwide.” The first set of training sessions for these pilot institutions is scheduled for September 2020.

### ***Recommendations***

Tasks associated with Objective 2 are numerous. Project leaders might consider working with the SERC evaluation team to reflect on and refine the logic model included in the proposal to 1) clarify goals, 2) set priorities, 3) clarify strategies and resources, 4) identify appropriate formative and summative assessments, 5) negotiate workloads and timelines, and/or 6) document accomplishments and barriers. Although end-of-event surveys are a useful tool (especially for providing formative feedback), they are often completed only by a small number of individuals. Participation metrics, website analytics, usability studies, and other evaluation tools (e.g., the landscape analysis and action planning tools that the Training Team is currently developing for the institutional research impacts training program) will be important in refining resources and training materials and ensuring that accomplishments related to key project goals (e.g., increasing uptake of materials and lasting impacts from professional development opportunities) are being documented.

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## **OBJECTIVE 3. BUILD INFRASTRUCTURE**

The third key objective of the ARIS Center is to build infrastructure to support and adapt to the emerging BI field. Key Year 2 activities, outcomes, and recommendations related to Objective 3 are described here.

### **Task 3.1. Enable continuous improvement of Center operations through evaluation of programs, resources, and activities**

### **Task 3.2. Apply formative data to help the Center be dynamic and adaptable to stakeholder needs**

#### ***Activities and Outcomes***

In addition to the current report, the SERC evaluation team has provided “real time” formative evaluation data to project leaders in the form of roadcheck survey reports (for workshops and the Summit), end-of-event survey reports (for workshops, webinars, and the Summit), and a Training Needs Assessment Survey report.

During Year 3, the SERC evaluation team will continue to collect evaluation data through 1) participation in virtual meetings, 2) review of program artifacts (including participation metrics and website analytics), and 3) analysis of survey data. In addition to these activities and new activities highlighted throughout this report (e.g., initiating website and BI Wizard usability studies), the SERC evaluation team will develop an interview protocol for and conduct interviews with project leaders to determine whether desired outcomes are being achieved, to identify barriers to achieving desired goals, and to ensure that developing materials and programming are well-aligned with new knowledge (e.g., as gained from conversations with long-term and new collaborators and from insights provided by the Council of Experts), available resources, and shifting demands (e.g., as necessitated by the Covid-19 pandemic).

### ***Recommendations***

To ensure that evaluation efforts are meeting the needs of project leaders and to ensure that findings are enabling continuous improvement, it may be fruitful for the SERC evaluation team to report out at bi-monthly leadership team and/or staff meetings.

## **Task 3.2. Collaborate with international colleagues to share promising practices and resources**

### ***Activities and Outcomes***

ARIS has established several promising connections with international colleagues/institutions. For example, ARIS has partnered with Research Impact Canada to create a toolkit of online resources available at <https://resources.researchimpact.ca/>. In addition, ARIS's advisory board includes two international members: David Phipps, York University (Canada) and Leonie van Drooge (Rathenau Institute, Netherlands). These partnerships have, in turn, led to discussions about Knowledge Mobilization (August 2020) and the launch, in June 2020, of an International Impact Series wherein "ARIS community experts from around the world lead continuing discussions on broader impacts topics." The first two sessions in this series focused on the Research Excellence Framework (2020), a system for assessing the quality of research in higher education institutions in the UK.

### ***Recommendations***

Identifying areas of convergence and divergence with international partners via white papers, presentations, and publications will be an important next step in engaging the international community.

### Task 3.3. Seek to move BI beyond NSF to become an integral part of the national research enterprise

A central goal of ARIS is to “engage stakeholder groups in a larger discussion to move the principles of the BI criterion beyond NSF and to clarify the value of engaging the public in research.”

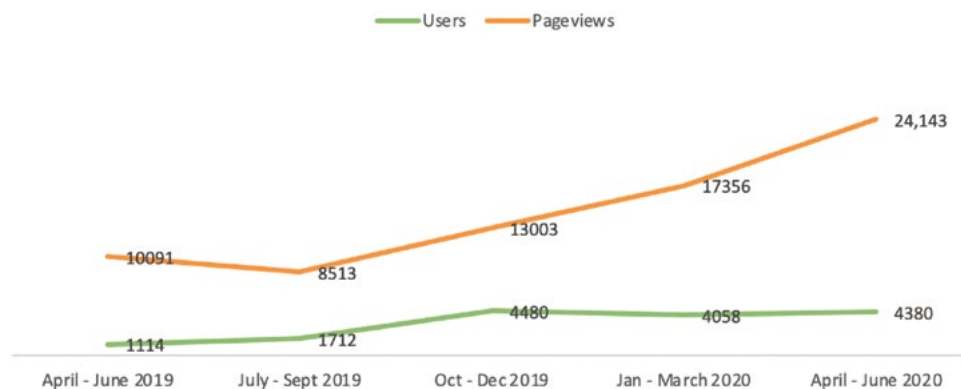
#### Activities and Outcomes

Much of the work that has been highlighted throughout this report, including efforts to expand the leadership team and to engage new partners, reflects this goal. One result of this work has been a growing network of ARIS community members, as evidenced in a variety of participation metrics. For example:

#### ARIS website analytics

During the first two years of the grant, project leaders worked to sunset the National Alliance for Broader Impacts (NABI) website. In its place, project leaders created a new ARIS website ([www.researchinsociety.org](http://www.researchinsociety.org)) website. As of August 2020, the website had 17,896 visitors who initiated 83,954 pageviews. As shown in Figure 9, the number of visitors and pageviews has increased since the website was launched in April 2019. From Q1 (April – June 2019) to Q5 (April – June 2020), there was a 293% increase in users and a 139% increase in pageviews.

**Figure 9. Number of ARIS website visitors and pageviews by quarter**

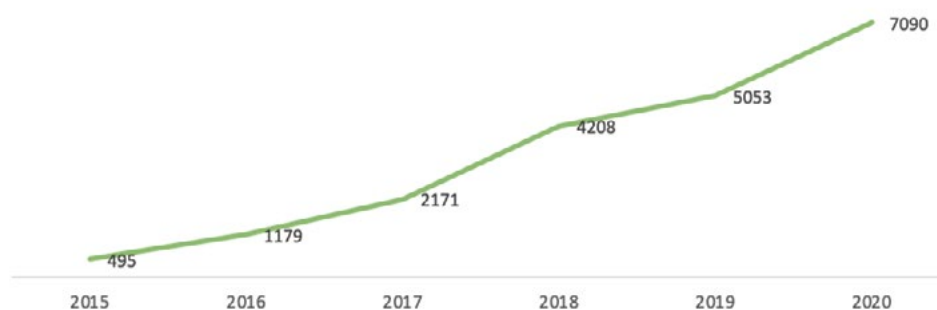


#### GamePlan Data

Project leaders have continued to connect with the growing ARIS community through myriad activities, including institutional site visits, conference presentations, webinars, workshops, office hours, and meetings. Project leaders have worked to compile information about these activities in GamePlan, by asking project to staff to record, for example, descriptions of the type of activity, the audience, and the number of individuals

engaged in the activity. Figure 10 present the cumulative number of attendees for all activities for which attendance data were recorded. From fiscal year (FY) 2015 to FY 2020, there was a 1,332% increase in attendance.

**Figure 10. Cumulative number of attendees in NABI/ARIS events from FY 2015 through FY 2020**



### **Recommendations**

In Year 3, the SERC evaluation team will work with ARIS project leaders to develop a plan for collecting and reporting out participation data in way that facilitates formative evaluation while minimizing the burden on staff. Gathering membership and website analytic data from the new Higher Logic platform will be especially important. Initial review of participation data suggests that GamePlan is a useful tool in creating an enduring record of important project activities (e.g., institutional site visits, webinars, and workshops). GamePlan is also helpful for recording contact information for individuals or for organizations for administrative purposes. If project leaders are interested in documenting the growth of the ARIS community, web analytics and social network analysis (SNA) methods may be especially useful. One SNA approach that might be fruitful is a “snowball method” wherein core network members report on their community connections (e.g., Please identify up to 10 people who are important in your professional network related to your “research impacts” work). These connections are then contacted to report on their connections, and this process continues until no new members of the network can be identified.



Advancing Research Impact in Society

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