

Accelerating Public Access to Research Data

WORKSHOP REPORT

This report provides the summary outcomes from a 2018 workshop supported by the National Science Foundation, Association of Public and Land-grant Universities (APLU), and the Association of American Universities (AAU), which brought together 30 institutional teams of research officers, librarians, information technology officers, general counsel, and faculty. These teams developed institutional plans to make publications and data more accessible.

Kacy Redd, Katie Steen, Sarah Nusser, Toby Smith, Tyler Walters, Jeff Chasen, James Luther, and James Reecy

Contents

Executive Summary	2
Goals of the Project	5
Participants at the Workshop	6
Thirty institutions were represented at the Workshop	6
Workshop Summary	7
Welcome from the National Science Foundation, sponsor of the workshop.....	7
Overview of Open Science	7
Federal Agency Presentations and Related Discussions	8
Areas Identified by Participants as Challenges to Public Access of Research Data.....	9
Campus roadmaps	13
Future Roles of APLU and AAU: Responses from Workshop Participants	15
APLU and AAU Next Steps	16
Appendix A - Participant Directory	18
Appendix B - Materials from the Workshop	23
Pre-work and pre-reading for the Workshop	25
Crowd-sourced resources	25
Appendix C - Institutional Application Responses from August 2018	26
Appendix D - AAU and APLU Steering Committee on Public Access	77
Appendix E - Acknowledgments	79

Citation: Redd, K. J., Steen, K., Nusser, S, Smith, T., Walters, T, Chasen, J., Luther, J., and Reecy, J. (2019). Accelerating Public Access to Research Data Workshop. Washington, District of Columbia: Joint publication by the Association of Public and Land-grant Universities and Association of American Universities. DOI: 10.31219/osf.io/63mxh. Available at <https://www.aplu.org/projects-and-initiatives/research-science-and-technology/public-access/workshop-on-public-access-report-aplu-aaug-2019.pdf>.

Executive Summary

The Association of Public and Land-grant Universities (APLU) and the Association of American Universities (AAU), with support from the National Science Foundation, convened the *Accelerating Public Access to Research Data Workshop* on October 29-30, 2018. The purpose of the workshop was to provide a venue for learning, sharing, and planning (campus roadmaps) to support research universities as they create and implement institutional and cross-institutional strategies and systems to provide public access to research data. It also provided a forum for participants to hear from federal agencies concerning their current activities and plans regarding data access.

To date, institutional efforts to provide public access to research data have lacked coordination. Additionally, a long-term multi-institutional strategy for data access has been slow to develop due to the complexities of data management and the decentralized nature of the research enterprise. Access to data presents a particularly difficult challenge given the technical knowledge required and the variation in data creation and use across disciplines. While providing the public with access to taxpayer-funded research data is challenging, it will ultimately speed the pace of scientific advancement and innovation and strengthen research integrity. The workshop and report, together with prior and subsequent engagement by APLU and AAU, will help to accelerate public access to research data.

Audience for the Workshop and this Report

The workshop targeted key university stakeholders who need to be engaged in evaluating, assessing, developing, and implementing policies and practices that support and promote public access to data at their institutions. The purpose was to convene a team of campus stakeholders from multiple institutions who would benefit from focused engagement with their own campus partners to develop a roadmap for implementation of a campus-based strategy to advance public access to research data. The workshop was also designed to encourage discussions among campuses to explore the trade-offs involved in specific implementation strategies and to discuss how they might work together across institutions to create the coordinated responses required to build cross-institutional structures and support and advance public access to research data.

Space and funding constraints prohibited AAU and APLU from accommodating all workshop applicants¹. Thus, one of the broader audiences for this report are those universities that were unable to attend the workshop and that could benefit from the workshop discussions as they develop and implement new institutional policies and practices to promote public access to data.

¹ While teams from 30 universities attended the workshop, a total of 52 universities submitted proposals to send university teams.

What is in the Report?

This report provides a summary of the discussions that occurred during the workshop, an analysis of the common elements of the campus roadmaps, and next steps for APLU and AAU. The appendices contain the meeting materials, including crowd-sourced resources that support public access to data. Additionally, for the workshop, each institution submitted a brief statement detailing current activities to develop and implement policies, practices, or systems for public access to research data. The applications provide a rich data set detailing the progress and challenges of each institution as of August 2018. A subset of the universities agreed to share their applications, which are found in Appendix C.

Highlights from Campus Road Maps

Campus teams were asked to develop a roadmap for implementation of public access to research data. The most common actions included:

- Updating the campus data policy to support research data sharing
- Improving graduate student and faculty training on data management and sharing
- Engaging in communication and outreach to make the campus community aware of existing resources for data management and data sharing

Roles for APLU and AAU

Workshop participants identified areas where AAU and APLU might continue to support public access to data and related issues on their campuses. Their responses centered around the following recommendations:

- Advocate for the importance of and need for public access to data to senior institutional leadership
- Help collect and disseminate best practices and create learning opportunities for the higher education community
- Continue dialogue with federal agencies to encourage the standardization and harmonization of policies and practices
- Continue to advance public access and help convene the stakeholder community, including vice presidents of research, provosts, librarians, chief information officers, data scientists, researchers, faculty, students, legal counsel, federal agencies, scientific societies and more

Challenges that will require a multi-stakeholder approach

- The [*AAU-APLU Public Access Working Group Report and Recommendations \(2017\)*](#)² identified critical areas that need particular attention. These areas will require a more coordinated response than any single institution or association can tackle, and APLU and AAU welcome partners from the broad community to determine how to address these issues:
Develop guidance, services, and workflow systems to support researchers and enable consistent and rigorous data sharing practices within an institution
- Create the capacity for researchers to develop adequate documentation and descriptive metadata following applicable standards to support data sharing
- Consider promotion and tenure review processes that acknowledge and reward researchers who publish their data sets, given that review and publishing of digital research data has become a mainstay of the research methods of many disciplines and is mandated by federal research sponsors as a required scholarly product.

² AAU-APLU Public Access Working Group (2017). AAU-APLU Public Access Working Group Report and Recommendations. Available at <https://www.aau.edu/sites/default/files/AAU-Files/Key-Issues/Intellectual-Property/Public-Open-Access/AAU-APLU-Public-Access-Working-Group-Report.pdf>

Goals of the Project

The National Science Foundation provided funding to APLU and AAU to host a workshop and support post-workshop campus site visits. The goals of the project were to:

- Goal #1: Accelerate the progress of research institutions in developing and implementing institutional plans to provide public access to data
- Goal #2: Foster cross-institutional collaboration that yields effective models to publicly share data, reduces the resources needed to enable public access to data across research universities, and builds consensus on key elements that foster effective storage and sharing of data in ways that are findable, accessible, interoperable and reusable (FAIR)
- Goal #3: Foster discussions among various data access stakeholders from universities, federal agencies, and the research community to facilitate common, streamlined, and efficient approaches that help facilitate, support, and encourage public access to data

To accomplish these goals, AAU and APLU convened a workshop in October 2018. The workshop marked progress in accelerating the development and implementation of institutional plans and is the focus of this report. In planning and executing the workshop, the Project Team identified additional challenges and areas for discussion to assist AAU and APLU in fully realizing the grant's second goal: yielding effective data sharing models. The workshop's focus on small and large-group discussions to surface common and effective approaches to support public access to data (Goal #3) was integral in identifying these challenges and areas for discussion (detailed on pp. 8-10).

The workshop drew upon and incorporated guidance from the [*AAU-APLU Public Access Working Group Report and Recommendations*](#), which included recommendations and actions for universities and federal agencies to advance public access to data in a viable and sustainable way. The Report clearly stated that universities have a responsibility to develop and support some of the key infrastructure required to comply with the public access policies of the federal agencies so that data collected through federally-funded research can be shared³. At the same time, the Report noted that federal agencies have a role in providing the necessary resources to make these data available and provide consistent and clear policies, definitions, and compliance guidelines across the federal government to reduce the burden on researchers and institutions, and to minimize the cost across the research enterprise.

The format of the workshop involved convening small teams from 30 universities. The workshop involved presentations from key federal agencies, nonprofits, and scientific societies that actively promote public access to research data; small group sharing across institutions and stakeholders; and time for each institutional team to develop a roadmap to plan for implementation of public access to research data on its campus.

³ The Office of Science and Technology Policy (OSTP) in 2013 released a memo directing all federal agencies that fund more than \$100 million dollars in research to develop plans to make publications and data from their funded research available to the public. Available at https://www.science.gov/docs/ostp_public_access_memo_2013.pdf

Participants at the Workshop

The workshop was held on October 29-30, 2018 in Washington, DC. Each institution brought a team of three to six people that represented campus stakeholders who were working together to develop institutional solutions to support public access to research data. Teams generally included representatives from the university's research office, library, information technology, compliance or general counsel's office, and faculty.

Appendix A is a full participant directory; participating institutions are noted below.

Thirty institutions were represented at the Workshop

Arizona State University	The Ohio State University	University of Minnesota
Brandeis University	Penn State University	University of New Hampshire
Carnegie Mellon University	Stanford University	The University of New Mexico
Cornell University	The University of Texas at Austin	University of North Carolina Greensboro
Duke University	University of California, San Diego	University of Southern California
Georgia Institute of Technology	University of California, Riverside	University of Toronto
Iowa State University	University of Illinois at Urbana-Champaign	The University of Utah
McGill University	University of Massachusetts Amherst	University of Virginia
Michigan Technological University	University of Michigan	Utah State University
Montclair State University		Virginia Tech
New Mexico State University		

Workshop Summary

Welcome from the National Science Foundation, sponsor of the workshop

The workshop was supported by funding from the National Science Foundation (Award #1837847). Amy Friedlander, Deputy Office Director, Office of Advanced Cyberinfrastructure, NSF opened the workshop with welcoming remarks on the importance of providing public access to research data and NSF's efforts to advance and support data sharing practices.

Overview of Open Science

Alexa McCray, Professor of Medicine, Harvard Medical School and chair of the National Research Council's Board on Research Data and Information, during her keynote address, [presented](#)⁴ some of the key recommendations from the National Academies 2018 report, [Open Science by Design](#)⁵. Dr. McCray spoke of an inflection point in the interplay between research practice and sponsor and publisher requirements, and the need for persistent and coordinated efforts by stakeholders across the research enterprise. In addition, she described the six components of an "open science by design" framework to organize efforts that would support researchers and their scholarly processes from conceptualization to dissemination. She stressed the need for universities to find ways to reward researchers for embracing open scholarship and the need for sponsors to support researchers in the public dissemination of their scholarly outputs. For example, research funders should play a role in the support and development of FAIR repositories. She also encouraged the community to think about long-term data preservation, to consider community standards for saving and archiving outputs that are valuable, and to continue dialogue on these critical issues.

Audience members raised a number of challenges encountered by campuses attempting to accelerate public access to research data, including:

- Countering resistance to public data sharing from researchers and their unwillingness to take on the work associated with preparing publicly accessible data
- Creating strategies to foster generational change through graduate education and prepare students for new forms of scholarship
- Resolving the tension between open science principles and data security practices
- Developing a focus on the quality of shared data, as well as the software code that would be shared as part of the documentation

⁴ Dr. Alexa McCray's presentation is available here: https://drive.google.com/file/d/1q-iShexJR8-6JHcFF_C8bBYflxoBsUGt/view

⁵ National Academies of Sciences, Engineering, and Medicine. (2018). *Open science by design: Realizing a vision for 21st century research*. National Academies Press. Available at <https://www.nap.edu/catalog/25116/open-science-by-design-realizing-a-vision-for-21st-century>

Federal Agency Presentations and Related Discussions

To advance discussions among institutions and funding agencies, the workshop included participants from several federal agencies, including the Office of Science and Technology Policy (OSTP), the Department of Defense (DoD), the National Science Foundation (NSF), the National Institutes of Health (NIH), the Department of Energy (DOE), and the National Institute for Standards and Technology (NIST). Representatives from NSF, DOE, and the National Library of Medicine at NIH participated in a panel to outline agency perspectives and answer questions from the audience on the requirement that federally-funded research outputs be made publicly available.

Amy Friedlander, Deputy Office Director in the NSF Office of Advanced Cyberinfrastructure, highlighted applications from the Office of Advanced Cyber infrastructure that raise challenges for open science (e.g., large facilities that generate huge and continuous flows of data). Dr. Friedlander also highlighted the need for communities to better understand the value of the different types of data that they create, as some types of data may need to be kept longer than other types. She noted that there is evolution in a federal agency's data access policies, including the guidance on Data Management Plans.

Carly Robinson, Acting Associate Director in the DOE Office of Scientific and Technical Information, described DOE's approach to evaluating Data Management Plans (DMP), specifically evaluating whether a DMP supports the validation of research results, and outlined the agency's efforts to provide researchers and the public with tools to support access to a range of scholarly research products. She provided the audience with several [tools](#)⁶ being developed within DOE for data sharing, including accessing [Scholix](#)⁷, a framework that links scholarly literature, data, and other research outputs (e.g., software).

Jerry Sheehan, Deputy Director at NIH's National Library of Medicine, shared NIH's [strategic plan for data](#)⁸ science and its data commons infrastructure. NIH is building on current efforts to better link data, articles, and other research outputs. He particularly emphasized the role that sharing research data has in larger efforts to be more transparent about the research process and promote rigor in practice.

The agency representatives shared the following during the question and answer portion of the panel session:

- More formal mechanisms for harmonization of data sharing requirements are being developed through the OSTP National Science and Technology Council's (NSTC) Interagency Working Group on Open Science. The working group consists of 22 agencies and is specifically focusing on sharing agencies' policies and practices and working to develop coordinated federal guidance.

⁶ U.S. Department of Energy (DOE)-funded research results and tools are discoverable at <https://www.osti.gov/ostigov-links-research-results>

⁷ Scholix is a framework for linking scholarly literature and data. Visit <http://www.scholix.org/home>.

⁸ For the presentation on NIH's Public Access Plan, visit <https://drive.google.com/file/d/1h-0QTWPWGeF8G8eX1YAU4e5AiJsm3K5n/view>

- Agencies are working to create connections across their repositories, for instance, through exposing publication and data records for discovery by a tool such as Google Dataset Search. DOE has piloted this approach. Agencies publishing data records to data.gov is another option that was raised for improved dataset findability.
- The agencies have heard from the community of the need for data standards, the need of researchers for help in using the standards, and the need for adequate funding for data curation and preservation.

Throughout the workshop, agency representatives had the opportunity to meet with institutional representatives and discuss challenges to data access and opportunities for better cooperation between agencies and grantees. Agency representatives found the workshop very engaging and were interested in more opportunities to participate in multi-institutional and cross-campus convenings. The institutional representatives also welcomed more opportunities for dialogue on data access and sharing.

Areas Identified by Participants as Challenges to Public Access of Research Data

To prepare for team and role-related discussions, AAU-APLU Public Access Working Group members presented about current progress and barriers in implementing public access to data. The panelists included Utah State University (Mark McLellan), Iowa State University (Sarah Nusser) and Duke University (James Luther). Following the presentations, there was robust conversation which is summarized below.

Policy and Practice Challenges

There is a disconnect between institutional and agency data policies, implementation, and practices. Many agency and institutional data policies do not fully address the nuances of data curation, storage, handling, stewardship, ownership, security, and sharing that often vary greatly across disciplines. Additionally, there are competing interests and priorities within agencies and institutions related to public access, data privacy, data security, research development, industry partnerships, technology transfer, etc. There is often a lack of consistency and little training and guidance on how program officers interpret agency policies and work with researchers to bridge the gap between what is stated in limited and/or competing agency priorities and practices. Harmonization of policies and practices within and across agencies would provide a supportive foundation for institutions to create, update, and implement effective institutional policies.

Institutions find it challenging to adequately address and respond to gaps in practices, partly due to a lack of strategic forums for dialogue around policies and practices that allow for discussions that are cross-campus, inter-institutional, cross-disciplinary, and that include research funders. It is also difficult to convene all relevant parties to proactively develop institutional data access policies given time demands and daily responsibilities that require institutions to address urgent and immediate campus

issues. Workshop participants found the APLU-AAU convening helpful because it provided an opportunity for such dialogue.

A few areas emerged that are key elements to fostering effective data sharing:

- Emphasizing data management plans in peer review of proposals and increasing the consistency of those reviews, which may require additional training of reviewers on assessing a quality data management plan
- Providing guidance and tools to develop more meaningful data management plans and facilitating data sharing (e.g., provide templates for metadata and data management plans), leveraging disciplinary expertise as appropriate
- Providing guidance on what data is best for curation, contribution, and archiving; standards which need to be set by the community of researchers in collaboration with federal agencies

Culture and Recognition Challenges

Many of the participants identified the challenge of obtaining buy-in on campus at every level, including senior administrators, department chairs, and faculty, to implement policies that recognize the sharing of research data per federal requirements. To further engage faculty and promote culture change, researchers need clear incentives in campus tenure and promotion guidelines, as well as shared data standards within scientific societies. Additionally, they need to believe that sharing data will help to advance their field of science, benefiting both them and others working within their particular disciplines, as well as across disciplines. Currently, there is a lack of tangible rewards or recognition for good data stewardship within the academy. To achieve sustainable culture change, participants identified the need to make open scholarship intrinsic to research practices, raise awareness with faculty, incorporate data sharing in promotion and tenure guidelines, and develop additional research incentives for faculty.

Institutions raised several questions about training that may be ripe for further exploration at future meetings:

- How can we engage students and faculty and educate them on good data sharing practices?
- How do we go beyond introductory training to sophisticated data sharing practices for faculty, staff, and students?
- How do we appropriately recognize and reward faculty who actively make their data publicly accessible?
- What tenure and promotion guidelines should institutions develop to incentivize the public sharing of data?
- Should guidelines vary by discipline and, if so, how?

Tracking Compliance Challenges

Another challenge is tracking researcher and institutional compliance with federal requirements to publicly share data. Once grant money is received, few institutions have a workflow that can track data

deposition. While final grant reports are tracked, they are typically not reviewed for appropriate data sharing compliance. Campuses highlighted that it is unclear what happens when grant leadership (principal investigator) changes or the grant closes - who becomes responsible for sharing the data and maintaining public access? In general, there is a lack of effective tools currently available to institutions and their researchers to assist in tracking data access compliance.

REQUIREMENTS FOR DATA MANAGEMENT TRACKING

While considering how to stand up a successful, enterprise-wide data management system, the University of North Carolina at Greensboro developed a working list of critical components that included the following “needs”:

- Establish an inventory of data repository sites
- Characterize sites by data type stored, data size requirements
- Raise awareness of data management policies, processes and external and internal resources
- Articulate campus data management partners including the Library, Information Technology Services, Office of Research and Engagement and others
- Establish on-campus infrastructure dedicated to data management
- Certify platform security
- Develop common data definitions, e.g. unstructured data, structured data
- Standardize data forms (including conversion process), format, naming conventions, cleanliness of data
- Define metadata labels and use of metadata labels
- Establish standardized data citation format modeled on an existing digital repository (assign unique identifiers for a data set)
- Develop standard data use agreement and data governance protocols
- Identify/standardize file types to be shared and data fields to be tracked
- Create processes to:
 - track use of data
 - De-risk data sharing
 - Track data management compliance
 - Integrate institutional, research and community data
 - Deprovision data

For UNC Greensboro’s roadmap outlined at the workshop, see:

<https://drive.google.com/file/d/1uyEyqgkw8ldgpEM-gQOfXEUSzxvzts6/view?usp=sharing>

Funding Challenges

Participants were concerned about current campus funding constraints and the availability of campus resources (operating and capital expenses, human capital, state funding) to support public data access. The federal requirement for data sharing does not currently have a clear funding model, and there is not a clear plan to sustainably fund repositories and other data infrastructure. They expressed concern about the challenge in defining up-front cost projections for public access at institutions. Also, participants highlighted the need to ensure funding for data management and access in a flexible manner that does not reduce the amount of funding for core science.

One university raised the concern that most universities are using distributed solutions because there is no strong central solution to meet the needs of the research community. The requirement to share research data is currently forcing universities toward cheap and fragile solutions.

FUNDING CHALLENGES

Constrained resources
(operating and capital expenses, human capital, state funding)

Unclear funding model for data sharing

Determining costs is very difficult: Policy management, compliance tracking, IT costs, library costs, personnel, etc.

Campus roadmaps

During the workshop, campus teams were asked to develop an institutional roadmap for implementation of public access to research data. The most common actions included:

- Updating the campus data policy to support research data sharing
- Improving graduate and faculty training on data management and sharing
- Engaging in communication and outreach to make the campus community aware of existing resources for data management and data sharing.

Policies/Practices/Compliance

Many of the campus roadmaps included either forming or revitalizing their cross-campus working groups on data sharing. In the applications for the workshop, 11 of the 30 institutions had a formal inter-unit task force or committee (e.g., Provost's Office, Research Office, Libraries, Information Technology), while 14 institutions had begun to talk about data sharing but did not have a formal task force. There was a consensus that librarians, information technology officers, vice presidents of research and their staff, campus compliance and legal staff, and faculty are vital members to include in such a committee. Participants also noted the importance of being connected to the federal government relations staff as they are tracking policy changes at the Office of Science and Technology Policy, within the federal agencies and in Congress.

Many of the campuses plan to update their data policies. Three institutions said they want to develop a data strategic plan, not just a data policy. Participants from Duke University shared that their university's strategic plan⁹ included data sharing and that this plan was an asset for their work on advancing public access to research data.

A common element of many plans was the need to review and further develop data management workflow and compliance activities to track data management plans and define a process for data sharing after the grant has ended to meet funder requirements.

Training and Rewarding Faculty

While many participants discussed that rewarding faculty was necessary for any successful implementation of a data sharing policy, only seven institutions included it in their campus roadmaps.

⁹ Duke University's Strategic Plan references new modes of scholarly communication and reviewing Promotion and Tenure criteria. See page 37 at <https://strategicplan.duke.edu/wp-content/uploads/sites/15/2017/09/TogetherDuke-Sept2017.pdf>.

Those institutions that included rewards for data sharing focused on increasing the visibility of faculty who were sharing data, providing departmental incentives, rewarding faculty for data quality, and building incentives in research workflows for data curation (e.g., badges, gamification). Many more institutions planned to focus on graduate student and faculty training and proposed integrating this topic into Responsible Conduct of Research training.

Importance of Support Services, Tools, and Resources

Many institutions noted support services were needed to enable public access to data. Some of the roadmaps identified the desire to have the library as a one-stop shop for data sharing by providing tools/resources (e.g., boilerplate DMP, trusted repositories) for researchers. Campuses also noted the need to highlight good data sharing practices; help with data deposition; and provide an infrastructure/portal for research data. Other services that were mentioned included conducting a data asset audit to determine available data sets on campus, surveying faculty and departments about their data curation needs, and convening disciplinary curation committees to define disciplinary standards for metadata.

EXAMPLE CAMPUS ROADMAP

Campus roadmap from the University of New Hampshire developed during the Workshop.

1. Ensure PIs are complying with Data Management Plans (DMP) and public access requirements; develop a process to capture DMPs that are submitted electronically
2. Define university policy/guidance for considering data retention/reusability/appraisal criteria
3. Establish the ability to mint Digital Object Identifiers (DOIs) through the library
4. Develop guidance on workflow for PIs; integrate workflows into DMPs
5. Identify long-term storage solutions for unpublished data (which does not have the same public access requirement currently from federal agencies)
6. Identify procedures for data preservation and public access repository solutions
7. Deploy active storage repositories and connect to larger DOI workflows
8. Identify policies, practices, and procedures to ensure data integrity:
 - a. Define requirements for integrity controls on public data access
 - b. Ensure suitable security controls exist for all storage environments
 - c. Develop standards/processes to vet external repository security and evaluate policies to ensure federal compliance
 - d. Identify processes for integrity checks when data is transferred to repositories and at each workflow stage; provide guidance for researchers on methods
9. Develop processes for training researchers
10. Ensure shared data are visible on faculty profiles and they receive credit in P&T processes
11. Coordinate with other data-related working groups to establish a communication plan

Future Roles of APLU and AAU: Responses from Workshop Participants

In a post-workshop survey, workshop attendees shared their thoughts on how APLU and AAU might continue to support public access to data and related issues on campus. Their responses centered around the following recommendations:

- Advocate for the importance of and need for public access to data to senior institutional leadership
- Help collect and disseminate best practices and create learning and sharing opportunities for campuses on this topic
- Continue to dialogue with federal agencies and encourage standardization and harmonization of policies and practices
- Continue to promote and advance the importance of public data access and help convene and encourage the stakeholder community to work together to better achieve it

Advocate for the Importance of Public Access to Senior Campus Leadership

A few attendees highlighted the need for APLU and AAU to engage senior campus leadership on the need for and benefits of public access to research data. As presidential associations, APLU and AAU regularly convene senior campus leadership and can play a unique role in demonstrating the need to develop campus policies supporting public sharing of research data.

Help Collect and Disseminate Best Practices and Create Learning Opportunities

A majority of the responses suggested providing opportunities for the community to learn from one another. Attendees suggested that teams could submit best practices, case studies, failures, visions, etc., with the associations assisting in their dissemination. Several responses discussed the need to have a coordinated mechanism to share experiences and solicit feedback on draft institutional policies. They would like to see APLU and AAU continue to provide opportunities for institutions (and multiple campus stakeholders) to learn about what is working well at different campuses. As one respondent wrote:

This meeting has helped serve as a nucleus around which to organize people and initiatives - and to have a sense of urgency to develop definitions, plans, and coalitions. Frankly, being selected helps our leadership see why this is an institutional issue, and not an individual scholar issue. We would appreciate continued networking and support - maybe even some visits with others who are in this as well.

Sharing practices can also provide safety in numbers as the higher education community begins navigating a space with conflicting priorities. As one respondent expressed, “Share data, protect data, destroy data, or what? We need help navigating these conflicting streams, or at least the safety that numbers and shared practices can provide.”

Participants encouraged APLU and AAU to keep moving this effort forward. As one participant wrote, “I think they can provide some organizational capacity for the issue and an umbrella under which we can work to collectively put out a set of definitions, policies, practices, and also by which we can influence policy of funding agencies.” Additionally, respondents encouraged the associations to include the Association of Research Libraries (ARL) and Federal Demonstration Project (FDP).

It was clear the workshop provided participants from a variety of roles across campus an opportunity to come together, many of them for the first time, to think strategically about how to best provide public access to research data.

Continue to Dialogue with Federal Agencies to Encourage Standardization and Harmonization of Policies and Practices

Several respondents highlighted the need for APLU and AAU to continue to engage the federal agencies to discuss the challenges of public data access, the need for standardization of federal agency policies and practices, and to encourage the allocation of appropriate federal resources and support for this work.

APLU and AAU Next Steps

The Workshop resulted in 30 institutional roadmaps that will help accelerate the progress of research institutions in developing and implementing institutional plans to provide public access to research data. AAU and APLU will follow-up with campuses on the progress on these roadmaps.

APLU and AAU are committed to continuing to foster discussions among various data access stakeholders from universities, federal agencies, and the research community to facilitate common, streamlined, and efficient approaches that help facilitate, support, and encourage public access to data. One of the calls from the workshop was for APLU and AAU to continue to convene stakeholders in the research community on public data access. In response to that call, AAU and APLU have convened a Steering Committee to help develop a vision for future activities in the form of a strategic plan which will incorporate the lessons learned from this workshop. As part of these efforts, the Steering Committee and association staff will assess the impact of the 2018 October Workshop and identify opportunities for institutional collaboration, develop communication mechanisms to keep workshop participants engaged and connected, and suggest additional convenings and follow-up activities to accelerate public access to data. The charge and membership of the Steering Committee is in Appendix D.

The AAU-APLU Public Access Working Group Report and Recommendations (2017) identified critical areas needing particular attention. These areas will require a more coordinated response than any single institution or association can tackle. APLU and AAU welcome partners from the broad community to determine how to address these issues. Critical areas of attention that require a coordinated effort:

- Develop supporting guidance, services, and workflow systems to guide researchers and support consistent and rigorous data sharing practices within an institution
- Create the capacity for researchers to develop adequate documentation and descriptive metadata following applicable standards to support data sharing and reuse
- Consider promotion and tenure review processes that acknowledge and reward researchers who publish their data sets, given that review and publishing of digital research data has become a mainstay in the research methods of many disciplines and is mandated by federal research sponsors as a required scholarly product

To foster cross-institutional collaboration and learning that reduces the resources needed for public access to research data, APLU and AAU are: 1) promoting inter-campus site visits so institutions can learn directly from one another; 2) exploring follow-on events with representatives of institutional teams and new institutions; and 3) creating asynchronous virtual opportunities for the community to continue to share practices. AAU and APLU have been awarded an 18-month grant from NSF (Award # 1939279) and NIH to continue this work and build on the campus roadmaps created during the workshop. The grant will support a reconvening of the participants from the October 2018 workshop and two national summits in 2020, all designed to develop a guide to assist research institutions in developing and implementing effective policies and practices to accelerate public access to research data. To inform the first convening in February 2020, AAU and APLU have created a follow-up survey to assess the progress of the 2018 workshop participants.

In summary, the associations will convene stakeholders to share effective practices and policies for the public access of research data, provide guidance to campuses as they develop and implement these policies and practices, and coordinate with various organizations to achieve the goal of public access of research data.

Appendix A - Participant Directory

2018 Workshop on Accelerating Public Access to Research Data

- Ashley Adair, Digital Archivist, University of Texas Libraries
- Nora Allred, Assistant Director for Scholarly Communications and Collections, Michigan Technological University
- Stephen Anderson, Senior Associate University Counsel, University of Illinois at Urbana-Champaign
- Joe Banez, Assistant Director, Congressional & Governmental Affairs, Association of Public and Land-grant Universities
- Asbed Bedrossian, Director of Enterprise Middleware Applications, University of Southern California
- Karl Benedict, Director of Research Data Svc, University Libraries, University of New Mexico
- Lisa Berreau, Associate Vice President for Research, Utah State University
- Sara Bible, Associate Vice Provost for Research, Stanford University
- Barbara Biederman, Associate Counsel, Iowa State University of Science and Technology
- Lizbet Boroughs, Assistant Vice President for Federal Relations, Association of American Universities
- Laura Boucheron, Associate Professor, New Mexico State University
- Rori Boyce-Werner, Information Security Compliance Program Manager, University of New Hampshire
- Susan Braxton, Prairie Research Institute Librarian, University Library, University of Illinois at Urbana-Champaign
- Sara Brenner, Senior Policy Advisor, White House Office of Science & Technology Policy
- Patrick Bridges, Director, Center for Advanced Research Computing, University of New Mexico
- Neil Bright, Associate Director for Research Cyberinfrastructure, Georgia Institute of Technology
- Kelly Briner, Director, Data Governance, Arizona State University
- Curtis Brundy, AUL Collections and Scholarly Communication, Iowa State University
- Stephen Capaldo, Associate University Legal Counsel, Virginia Tech
- Jacob Carlson, Director of Research Data Services, University of Michigan-Library: Research Data Services
- Jeff Carrico, Associate Dean Library, Georgia Tech
- Michael Carroll, Professor, American University Washington College of Law
- Zach Chandler, Director of Research IT & Innovation, Stanford University
- Thomas Cheatham, Professor / Director, University of Utah
- Isabella Chu, Associate Director, Data Core, Stanford Center for Population Health Sciences
- Curtis Cole, CIO / Assoc Prof Clinical Medicine and Healthcare Policy & Research, Weill Cornell Medicine
- Patricia Condon, Research Data Services Librarian, University of New Hampshire
- Tom Cramer, Associate University Librarian, Stanford University

- Silvia da Costa, Director of Faculty Research Relations, University of Southern California
- Diane Dagefoerde, Deputy Chief Information Officer, The Ohio State University
- Matthew Dalton, Chief Information Security Officer, University of Massachusetts/Amherst
- Mark DeLong, Director of Research Computing, Duke University
- Anurupa Dev, Lead Specialist, Science Policy, Association of American Medical Colleges
- Amy Dittmar, Vice Provost, Academic and Budgetary Affairs, University of Michigan
- Sean Dudley, Executive Director, Research Technology Office, Arizona State University
- Diana Dugas, Cyber Infrastructure Architect, New Mexico State University
- Kimberlee Eberle-Sudre, Director of Policy Research, Association of American Universities
- Mariam Elsayed, Program Analyst, Department of Energy, Office of Science
- Ana Enriquez, Scholarly Communications Outreach Librarian, Pennsylvania State University
- Dean Evasius, Associate Vice President for Research Development, University of Virginia
- Lori Ferris, Associate Vice-President, University of Toronto
- Thomas Finholt, Dean, School of Information, University of Michigan
- Candace Fleming, Vice President of Information Technology, Montclair State University
- Israel Fletes, Exec Director Academic & Research Systems, University of California, Riverside
- Amy Friedlander, Deputy Office Director, National Science Foundation
- Niall Gaffney, Director of Data Intensive Computing, University of Texas at Austin
- Kevin Gardner, Director of Strategic Initiatives, University of New Hampshire
- Jason Gerson, Senior Program Officer, PCORI
- Howard Gobstein, Exec VP, Association of Public and Land-grant Universities
- Gretchen Greene, Data Science Group Lead, National Institute of Standards and Technology
- Ed Hackett, Vice Provost for Research, Brandeis
- Martin Halbert, Dean of University Libraries, UNC Greensboro
- Randolph Hall, Vice President of Research, University of Southern California
- Debra Hanken Kurtz, Associate University Library for Technology Services, ASU Library
- Patricia Henning, Associate Vice President for Research, University of New Mexico
- Scott Herness, Vice Provost for Research and Dean of The Graduate School, Montclair State University
- James Hilton, Vice Provost for Academic Innovation and Dean of Libraries, University of Michigan
- Mike Huerta, Assoc Director, National Library of Medicine, NIH
- Ronald Hutchins, Vice President for Information Technology, University of Virginia
- Heidi Imker, Director, Research Data Service and Assoc Professor, Library, University of Illinois at Urbana-Champaign
- Meredith Jacob, Public Lead - Creative Commons USA, American University Washington College of Law
- Emily Janke, Director, Institute for Community & Economic Engagement, UNC Greensboro
- Linda Johansen, Manager, Core IT Services, University of New Mexico
- Lisa Johnston, Research Data Management/Curation Lead, University of Minnesota
- Jason Jones, Analytics & Innovation Manager, Guilford County Government
- Patricia Jones, Associate Director for Research, Beckman Institute, University of Illinois at Urbana-Champaign

- Heather Joseph, Executive Director, SPARC
- Eric Kaltman, Data Curation Fellow, Carnegie Mellon University
- Mary Lee Kennedy, Executive Director, Association of Research Libraries
- Maya Kobersy, Associate General Counsel, University of Michigan, Office of the Vice President and General Counsel
- Gary Koretzky, Vice Provost for Academic Integration, Cornell University
- Sherry Lake, Scholarly Repository Librarian, University of Virginia
- Helen Lasthiotakis, Executive Director, Strategic Partnerships & Office, Vice-President Research & Innovation, University of Toronto
- Carolyn Lawrence-Dill, Chair, Bioinformatics and Computational Biology, Iowa State University
- Peggy Layne, Assistant Provost, Virginia Tech
- Lew Lefton, Asst. VP of Research Cyberinfrastructure, Georgia Tech
- Gina LeMay, Director, Sponsored Ops & Info Systems, Michigan Technological University
- David Lifka, Vice President, CIO, Cornell University
- Stefanie Lindquist, Deputy Provost, Vice President for Academic Affairs, Arizona State University
- Kim Littlefield, Assoc. Vice Chancellor for Research and Engagement, UNC Greensboro
- Mike Lohrbach, Director, Iowa State University
- Jim Luther, Assoc. VP Finance & Compliance Officer, Duke University
- Greg Madden, Senior Advisor for Research Computing and Cyberinfrastructure, Penn State University
- Steven Mandeville-Gamble, University Librarian, University of California, Riverside
- Ruth Marinshaw, CTO - Research Computing, Stanford University
- Raleigh Martin, AAAS Science & Technology Policy Fellow, National Science Foundation
- Alexa McCray, Professor of Medicine, Harvard Medical School
- Timothy McGeary, Associate University Librarian for Digital Strategies & Technologies, Duke University
- Mark McLellan, Vice President, Research & Graduate Studies, Portland State University
- Sian Meikle, Director, Library Information Technology, University of Toronto
- Andrew Mendoza, Legal Counsel and Policy Advisor, White House Office of Science and Technology Policy
- Erik Mitchell, University Librarian, University of California, San Diego
- Eliot Moss, Professor, University of Massachusetts Amherst
- Jim Murphy, Associate Dean for Research, College of Arts & Sciences, New Mexico State University
- Daureen Nesdill, Research Data Management Librarian, University of Utah
- Sarah Nusser, Vice President for Research, Iowa State University
- Andrea Ogier, Director, Data Services, Virginia Tech
- Kristina Ohrvall, Director, Strategic Initiatives, Office of Vice-Principal, Research and Innovation, McGill University
- Josh Olson, Chief Information Officer, Michigan Technological University
- Laurie Owen, Assistant Vice Chancellor for Research, University of California, San Diego

- Matt Owens, Executive Vice President and Vice President for Federal Relations, Association of American Universities
- Dennis Owens, Associate General Counsel, University of Utah
- Dina Paltoo, Assistant Director for Policy Development, National Library of Medicine/National Institutes of Health
- Virginia (Ginny) Pannabecker, Director, Research Collaboration & Engagement, Virginia Tech
- Mark Paris, Associate University Librarian for Scholarly Resources & Discovery, Brandeis University
- Pegah Parsi, Campus Privacy Officer, University of California, San Diego
- Chuck Pavloski, ICS-ACI Chief Architect, Penn State Institute for CyberScience
- Andrea Payant, Metadata Librarian, Utah State University
- Sandy Payette, Interim Assoc. Univ Librarian and Director of IT for Research & Scholarship, Cornell University
- Michael Pazzani, Vice Chancellor, Research & Economic Development, UC University of California, Riverside
- Jennifer Perloff, Scientist, Brandeis University
- Nici Pfeiffer, Director of Product Development, Center for Open Science
- Joanne Polzien, Executive Director, Compliance, Integrity, & Safety, Michigan Technological University
- Viviane Poupon, Executive Director, Strategic Initiatives, Montreal Neurological Institute, McGill University
- Allison Rabinowitz, Program Associate, PCORI
- Laura Raderman, Policy and Compliance Coordinator - Information Security, Carnegie Mellon University
- Karen Ramsden, Research and Projects Specialist, Montclair State University
- Kacy Redd, Assistant Vice President for STEM Education Policy, Association of Public and Land-grant Universities
- James Reecy, Associate Vice President for Research, Iowa State University
- Rebecca Reznik-Zellen, Head, Science and Engineering Library, University of Massachusetts Amherst
- Theresa Ridgeway, Research Computing Center, University of New Hampshire
- Jenn Riley, Associate Dean, Digital Initiatives, McGill University
- Jodi Roberts, Director, Research Integrity & Compliance, Utah State University
- Carly Robinson, Acting Associate Director for Access and Operations, Department of Energy
- Nancy Ross, Associate Vice-Principal, Research and Innovation, McGill University
- Erin Rothwell, Assistant Vice President of Research Integrity and Compliance, University of Utah
- Betty Rozum, Data Librarian, Utah State University
- Shelley Rusincovitch, Associate Director of Operations, Duke
- Judy Ruttenberg, Program Director for Strategic Initiatives, Association of Research Libraries
- Matt Sanders, Research Scientist, Georgia Tech
- David Scherer, Scholarly Communications and Research Curation Consultant, Carnegie Mellon University Libraries

- Emily Schriver, Senior Associate General Counsel, The Ohio State University
- Amy Scott, Associate Vice President for Federal Relations, Association of American Universities
- J. Ray Scott, Sr. Manager, Storage and Virtualization, Carnegie Mellon University
- Jessica Sebeok, Deputy Vice President for Federal Relations and Counsel for Policy, Association of American Universities
- Christopher Sedore, Vice President and CIO, University of Texas at Austin
- Jerry Sheehan, Deputy Director of the National Library of Medicine, National Institute of Health
- James Spayd, Penn State Data Commons, Penn State
- Shelley Stall, Director of Data Programs, American Geophysical Union
- Katie Steen, Policy Associate, Association of American Universities
- George Strawn, Board Director, National Academies
- Larry Sutter, Professor, Michigan Technological University
- Nathan Taback, Professor, University of Toronto
- Christopher Thomas, Administrator, Defense Technical Information Center
- John Towns, Deputy CIO, University of Illinois
- Cynthia Vitale, Head, Digital Scholarship & Data Services, Pennsylvania State University
- Loren Walker, Director of Research Development, University of Massachusetts Amherst
- Ruth Wallach, Associate Dean for Public Services, USC Libraries, University of Southern California
- Maureen Walsh, Scholarly Sharing Strategist, The Ohio State University
- Keith Webster, Dean of University Libraries, Carnegie Mellon University
- Janet Weisenberger, Senior Associate Vice President for Research, The Ohio State University
- Jonathan Wheeler, Data Curation Librarian, University of New Mexico Libraries
- Jeff Whitworth, Assistant Vice Chancellor, University of North Carolina at Greensboro
- Nicholas Wigginton, Assistant Vice President for Research, Research Initiatives, University of Michigan Office of Research
- James Wilgenbusch, Senior Associate Director, University of Minnesota

Appendix B - Materials from the Workshop



2018 WORKSHOP ON ACCELERATING PUBLIC ACCESS TO RESEARCH DATA

October 29-30, 2018 – FHI 360 Conference Center in Washington, DC

DAY 1 – Monday, October 29

8:00 – 8:30 am	Breakfast
8:30 – 8:40 am	Welcome and Framing for the Workshop Amy Friedlander , Deputy Office Director, Office of Advanced Cyberinfrastructure, NSF
8:45 – 9:30 am	Keynote Address Alexa McCray , Professor of Medicine, Harvard Medical School and chair of the National Research Council's Board on Research Data and Information.
9:45 – 10:30 am	Federal Agency Public Access Plans and Perspectives <i>Agency representatives are invited to all of the meeting.</i> Amy Friedlander , Deputy Office Director, Office of Advanced Cyberinfrastructure, National Science Foundation Carly Robinson , Acting Associate Director, Office of Scientific and Technical Information, Department of Energy Jerry Sheehan , Deputy Director, National Library of Medicine, National Institutes of Health
10:30 – 11:15 am	University Models for Data Sharing Panelists: Mark R. McLellan , Vice President for Research & Graduate Studies, Portland State University

[Sarah Nusser, Vice President for Research, Iowa State University](#)

[James Luther, Associate Vice President Finance & Compliance officer, Duke University](#)

- | | |
|------------------|---|
| 11:15 – 12:00 pm | Roundtable discussions among agencies and universities on common issues. |
| 12:00 – 12:15 pm | Tools and Resources
<u>Heather Joseph, Executive Director of SPARC</u>
<u>Public Access Submission System (PASS)</u> |
| 12:15 – 1:30 pm | Lunch with team |
| 1:30 – 2:30 pm | Breakout discussions on What is Working and Not Working on Your Campus . Share a challenge and a success. Choose one of the following tables: <ul style="list-style-type: none">• Policies/Practices/and Compliance• Technology Platforms• Training and Rewarding Faculty• Cost and Funding Model |
| 2:45 – 4:00 pm | University Team Time

Develop goals, roadmap and strategy with institutional teams.

For each domain below, list the resources available, anticipated challenges, metrics of success, and possible next steps (action plan, timeline, and what will we do tomorrow) <ul style="list-style-type: none">• Policies/Practices/and Compliance• Technology Platforms• Training and Rewarding Faculty• Cost and Funding Model |
| 4:00 – 4:15 pm | Group Discussion and Reflection |
| 4:30 – 5:30 pm | Networking Reception and Sharing of Draft Plans |

DAY 2 – Tuesday, October 30

- | | |
|----------------|-------------------------|
| 8:00 – 8:30 am | Breakfast |
| 8:30 – 9:15 am | Group Discussion |

What areas require agreement across universities?

9:30 – 10:15 am

Roundtable Discussions

Teams share plans in small groups.

10:30 – 12:00 pm

University Team Time

Refine and share plans in common folder.

12:15 – 2:00 pm

Lunch, Group Discussion, and Wrap Up

Pre-work and pre-reading for the Workshop

- NASEM's Open Science by Design [Executive Summary](#) and [report](#). This report explores specific examples of open science and discusses a range of challenges, focusing on stakeholder perspectives. It is meant to provide guidance to the research enterprise and its stakeholders as they build strategies for achieving open science and take the next steps.
- AAU/APLU [report and recommendations](#) on public access details actions universities and federal agencies can take to ensure public access to federally-sponsored research data. The report also contains data management resources to provide universities with the information, tools, and additional guidance for making data publicly available.
- [Beginning list of data management resources](#), includes federal plan analysis here: <https://libraries.mit.edu/scholarly/research-funders/>.

Crowd-sourced resources

The workshop provided a document to crowdsource resources that would provide universities with resources, tools, and guidance for making publications and data accessible. The list is not comprehensive. We welcome additions, which you can send to Kacy Redd at kredd@aplu.org.

The resource document is here:

https://docs.google.com/document/d/1k9wJLxeorazqMdnctiTi_Vhx_NN_cfXwIDrauwW_Ks/edit#

Appendix C - Institutional Application Responses from August 2018

For the Workshop on Accelerating Public Access to Research Data, each institution submitted an application and a brief statement detailing current activities being pursued to develop and implement policies, programs or systems for public access to research data.

The applications provide a rich data set for where committed and concerned institutions were in **August 2018**. We have received permission to share these applications in the workshop report.

Notes

We have provided some demographic information for each institution drawn from the 2015 Carnegie Classification¹⁰. These are provided at the end of each application. The categories that we included are:

2015 Carnegie Basic Classification:

- Doc Univ: Highest Research Activity;
- Doc Univ: Higher Research Activity; or
- Doc Univ: Moderate Research Activity

SECTOR: Sector of institution (control and level combined)

- Public, 4-year or above or
- Private not-for-profit, 4-year or above

OBereg: geographical region code

LANDGRNT: Land-grant institution

- 0 = No
- 1 = Yes

MEDICAL: Institution grants a medical degree (MD, DDS, DMD, DO, DVM)

- 0 = No
- 1 = Yes

HBCU: Historically Black College or University

- 0 = No
- 1 = Yes

HSI: Hispanic Serving Institution

- 0 = No
- 1 = Yes

MSI: Minority Serving Institution

- 0 = No
- 1 = Yes

This material is based upon work supported by the National Science Foundation under Grant No. (1837847). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



¹⁰ "The Carnegie Classification of Institutions of Higher Education ®." Carnegie Classifications, carnegieclassifications.iu.edu/downloads.php.

Brandeis University

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

If an interested institution wanted to learn more, is there a point of contact? If so, please provide his or her contact information here: ehackett@brandeis.edu

Do you have a committee or working group charged with addressing public access to data?

We have begun to meet but do not have a formal taskforce, working group, or committee

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

Matthew Sheehy, University Librarian; Mark Paris, Associate Librarian for Scholarly Resources; Prof. Cindy Thomas, Associate Dean for Research, Heller School for Social Policy and Management; Ed Hackett, Vice Provost for Research; Steve Karel, Senior Research and Technology Specialist, Division of Science; Paul O'Keefe, Associate Provost for Research Administration

What unit(s) is or will this planning group report to?

Provost office

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

Pre-award staff at Brandeis University work with faculty on requirements for data management plans in NSF and NIH proposals, and the Library and Division of Science hold workshops on data access and sharing. We have an institutional repository for publications and data but there is mixed use of this resource. The only formal requirement at the moment for open access is for Masters Theses in our Brandeis Institutional Repository. We do not have a university policy on who pays for storing data, and labs often disagree about what exactly to store and for how long. Our IT policy is to provide storage at no cost as long as the size of storage is "reasonable". But what is reasonable? Finally some faculty are doing contract work for HHS that requires data to be destroyed at the end of the project! We are at a stage where this workshop would be invaluable to learn from others and to become part of a learning community on best practice for data access policies.

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

The Library, in collaboration with the Provost, has established a fund to finance payment of article processing fees for Brandeis University authors who wish to publish in open access journals. Open access monograph publishing by high-quality, peer-reviewed scholarly presses will also be considered on a case-by-case basis. Open access funds demonstrate an institution's concrete support for new and innovative research publishing models. The fund is administered through the Brandeis Library and is available to Brandeis University faculty, postdoctoral fellows and research associates, graduate students, undergraduate students, and staff. We want to expand this fund to cover expenses associated

with public access to data. In addition, the Provost's office maintains an annual research grant award fund of up to \$250,000 to support innovation in faculty research. We hope to make public access to data an area of funding priority in the coming year.

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

The following are questions/topics that our group would be interested in learning/discussing more about at this workshop: 1.) Since this is a growing area for libraries, how can we increase collaboration across campus and between universities? We are fortunate in Boston to have the Boston Consortium and Boston Library Consortium but are there examples/models of doing this well for data access? 2.) Experiences with implementing electronic notebooks on a scale greater than a single lab and establishing appropriate standards for these notebooks. 3.) Want to join a community that is collectively and expertly deciding how to handle data to shorten the search path to a durable solution for data management and sharing. 4.) How best to give credit for data sharing outside of journal publication format in academic evaluations 5.) Examples of collaborative efforts to create repositories or databases aimed at achieving national scale (both examples of where this worked and where it did not). 6.) How to address confidentiality concerns (e.g. when working with medical patient data) 7.) How to manage the volume of data and the cost of storing and sharing it. 8.) Making complex databases navigable to other scientists through live searchable databases.

Carnegie Classification: Doc Univ: Highest Research Activity

SECTOR: Private not-for-profit, 4-year or above HBCU: o

OBereg: New England CT ME MA NH RI VT HSI: o

LANDGRNT: o MSI: o

MEDICAL: o

Duke University

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

Do you have a committee or working group charged with addressing public access to data?

Yes, there is a formal inter-unit task force or committee (e.g., Provost's Office, Research Office, Libraries, IT)

Other (please specify)

Yes, there have been multiple informal and formal groups, including the inter-unit faculty working group charged by the Provost called the Digital Research Data Services Faculty Working Group. This group was co-chaired by Larry Carin and Tracy Futhey, had around 10 faculty members, as well as ex officio representation from OIT and the Libraries.

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

The only group listed above that is emphasizing Public Access is from the Libraries specifically: Timothy McGeary, Associate University Librarian for Digital Strategies and Technology Joel Herndon, Head of Data & Visualization Services Sophia Lafferty-Hess, Research Data Management Consultant Jennifer Darragh, Research Data Management Consultant RACI (Research Administration Continuous Improvement) is a cross institutional initiative chaired by the VP of Finance and includes senior admin and faculty leadership from both the School of Medicine and the Campus. It is anticipated that this group will also be provided regular updates and support.

What unit(s) is or will this planning group report to?

This group reports officially to the University Libraries, but collaborates extensively with the Provost's Office, Vice Provost of Research, Office of Research Support, Research Computing, Office of Information Technology, the School of Medicine, Trinity College of Arts & Sciences, Pratt School of Engineering, Nicholas School of the Environment, Sanford School of Public Policy, Social Science Research Institute, and the Office of Research Costing Compliance.

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

In January 2016, the Digital Research Data Services Faculty Working Group submitted a series of recommendations to Provost Sally Kornbluth that include: • Full-time dedicated Research Data Specialists and Repository Ingest Specialists to support data management planning, compliance, public access, and retention requirements (four positions created and filled in January 2017); • Funding to support baseline, minimum levels of computing and digital storage for research data projects available to all faculty projects; • Funding to support a minimum level of research storage for long-term archiving and preservation of faculty research data in the Duke Digital Repository that cannot be deposited into a discipline-based repository, or to meet: o the required amount to meet all federal requirements for

research publications and data; o the required amount to meet non-federal external funding agency or sponsor requirements; o the recommended amount as specified by a faculty governance policy for strategic designation for long-term preservation; In May 2018, Duke joined the Data Curation Network, a membership of experts from nine major academic and non-profit institutions. The Data Curation Network, through funding by the Alfred P. Sloan Foundation, aspires to develop services to collectively, and more effectively, prepare and maintain research data in ways that make it findable, accessible, interoperable and reusable (FAIR) collectively, and curate a wider variety of data types (e.g., discipline, file format, etc.) beyond what any single institution might offer alone.

[Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?](#)

The Duke University Libraries provides data management planning, repository infrastructure, and services, and data curation services for open access publications and publicly-accessible research data through the Data & Visualization Services (DVS) department. DVS provides consulting services and instruction that support data-driven research at no cost to patrons. The team of consultants and interns offers support in data sources, data management, data visualization, mapping and GIS (geographic information systems), data curation, and data cleaning. The Duke Digital Repository (DDR) supports the activities of the University's faculty, researchers, students, and library staff by preserving, securing, and providing public access to digital resources. The DDR extends the Duke University Libraries' ongoing mission of preservation and access to information, including research data, scholarly output, digital collections, archival records, and other digital materials that provide enduring value for intellectual inquiry and documentation of University activities. To guarantee the reliability and effectiveness of the DDR, the Libraries maintain essential technology platforms and offer expertise in curation, data management, and archival practice. Duke Research Computing offers services to researchers across Duke and often in collaboration with researchers at other institutions. The group provides cluster computing services through the Duke Compute Cluster and offers storage, a protected computing environment for researchers using sensitive data, and well-tailored virtual machines of various configuration. Duke Research Computing offers wide-ranging education and training opportunities to the Duke community and seeks in its activities to bring researchers together who apply computational and quantitative methods to every field represented in the University's faculty.

[What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.](#)

As this has been a national issue for several years and a challenge for all parties, sponsors and institutions to implement and manage, we anticipate that there will be an opportunity to explore and foster potential cross-institutional collaborations, engaging in an open and honest dialogue about the real and significant costs to sustaining public access to research data, the need for more centralized or national activity rather than decentralized, every-institution-for-itself model. Another suggestion I would make is to engage in dialogue about the critical importance for research data to remain OPEN rather than allowing for-profit publishers to control the market and data ultimately funded by taxpayers. As the above are elements that were addressed in the November 2017 AAU-APLU Public

Access Working Group Final Report, we hope to continue the progress initiated by this report. • Awareness and active adoption of data curation / data science workflows by researchers in active and on-going research activities that enable effective and efficient depositing, publishing, and discovery / access of research data. • Human capacity for data management and data curation consulting and workshop instruction to meet the demand of institutional research needs. The Data Curation Network project is specifically focused on this challenge. • Effective and sustainable strategies to de-identify sensitive or restricted data to make it publicly accessible while maintaining the provenance, integrity, and protection of the raw research data. • Scale of digital storage to meet the pressing demand and exponential growth of scientific data in digital formats. Commercial services are costly and require additional costs for storage; independent, general, or disciplinary repository often require membership models and additional costs to sustain deposits. Local institutional repositories require human resources to develop, operate, and maintain infrastructure and storage, regardless if the storage is on-premises or off-premises. • Infrastructure and human resources to meet best practices and accepted guidelines for digital preservation is more costly than business continuity / disaster recovery practices for commodity digital storage. • Costing aspects of this requirement, whether they be funded by the sponsor or the institution, will have significant budgetary implications. • Practical integration of data management planning, compliance, public access, and retention requirements in a manner that is cost-effective and fully supportive of the faculty research objectives. • Execution of public data access requirements in a manner that fully supports recent concerns about rigor & reproducibility and research integrity objectives.

Carnegie Classification: Doc Univ: Highest Research Activity

SECTOR: Private not-for-profit, 4-year or above

MEDICAL: 1

OBEREG: Southeast AL AR FL GA KY LA MS

HBCU: 0

NC SC TN VA WV

HSI: 0

LANDGRNT: 0

MSI: 0

Georgia Institute of Technology

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

If an interested institution wanted to learn more, is there a point of contact? If so, please provide his or her contact information here: Lew Lefton, lew.lefton@gatech.edu

Do you have a committee or working group charged with addressing public access to data?
We have begun to meet but do not have a formal taskforce, working group, or committee

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

Lew Lefton, Assistant Vice President of Research Cyberinfrastructure, EVPR Jeff Carrico, Associate Dean for Scholarly Communication and Access, Library Neil Bright, Associate Director for Research Cyberinfrastructure, Office of Information Technology Matt Sanders, Director of Research Operations, Institute for People and Technology TBD, Georgia Tech Research Corporation (GTRC)

What unit(s) is or will this planning group report to?

Executive Vice President of Research (EVPR) Office of the Provost (via Library) Office of Information Technology

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

Georgia Tech considers data as an Institutional asset. Like our other assets, such as equipment, facilities, and people, it needs to be managed strategically. We have been discussing and developing policies, programs, and systems to facilitate public access to research data for many years. Although we have made some good progress in some areas, there is still much room for improvement. We have existing policies on Data Access and Open Access among others. We also have a repository of digital content (mostly scholarly publications, not large amounts of research data) called SMARTech which is managed by the Library. Faculty can use this to make their work openly available, no matter where they publish. Training and communication around our policies and services has been a mixed bag and could definitely improve. The Library assists faculty with basic data management plans needed for NSF and other granting agencies. However, as datasets grow larger and more complex, we are finding that data management plans and data management processes are not handled consistently across the campus. Institutional investments have been made in our centralized and shared research computing group which stores a large amount of research data that can be made openly available. Although we have not established technology to do that yet, we have invested in an underlying networking and storage architecture (ScienceDMZ) which facilitates sharing.

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

The Institute is making a major investment in a new 21 story building in downtown Atlanta called CODA. The facility will be home to one of the largest data centers in the Southeast (80000 sq. ft.) and will benefit from a top-of-the-line networking architecture that will allow significant amounts of data to flow in and out very quickly. As an anchor tenant in CODA, Georgia Tech units will occupy a large percentage of the space alongside corporate and industrial tenants. There will be ample open and collaborative areas through the building to foster interactions. In particular, our Computational Science and Engineering School will be located there along with two of our Interdisciplinary Research Institutes, namely the Institute for Data Engineering and Science (IDEaS) and the Institute for Information Security & Privacy (IISP). In addition, some of the more data and analytics intensive activities affiliated with the Georgia Tech Research Institute (GTRI) will be there as will the Office of Information Technology. Researchers in these units work with a broad spectrum of data including life sciences (e.g. omics datasets), imaging, multimessenger astronomy, climate, materials science, and more. The NSF South Big Data Hub, which is managed jointly by Georgia Tech and UNC Chapel Hill is also part of this potent mix. This shows that Georgia Tech is fully committed to supporting the data sciences, and the fact that we are participating in this workshop shows that the institution is absolutely in support of making our data as open as possible.

[What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.](#)

Our institution is very distributed, and it's a challenge to identify what data we have, where it's located, whether or not it's being well managed, and how is it being made available for sharing when appropriate. This challenge is made greater since data arrives in so many different ways. It is produced in labs with experimental equipment, by large scale simulations, and via field work (including massive amounts of sensor data). We are also increasingly receiving data from external sources and collaborators for us to analyze. Data management includes being stored on well-maintained infrastructure with well-understood and efficient metadata systems. Such management responsibilities are not clearly mapped out or offered as a campus level service, resulting in unevenness. Another challenge we face is developing a sustainable funding model. Research is usually done under a grant or contract which funds people to collect and analyze the data and sometimes (but not always) infrastructure costs to host and secure it. However, when that funding is gone, we still have a long tail of cost to maintain archives and/or to make the data open for public access. Leveraging cloud services is appealing since that converts capital expenses to operational expenses, but subscription and leasing models used in public clouds is not well aligned with research funding models. We are hopeful that this workshop will give us an opportunity to compare notes with peers, learn from others, and inspire us to create a more open and usable data ecosystem at Georgia Tech.

Carnegie Classification: Doc Univ: Highest Research Activity

SECTOR: Public, 4-year or above

MEDICAL: o

OBereg: Southeast AL AR FL GA KY LA MS

HBCU: o

NC SC TN VA WV

HSI: o

LANDGRNT: o

MSI: o

Iowa State University

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

If an interested institution wanted to learn more, is there a point of contact? If so, please provide his or her contact information here: James Reecy, Associate Vice President for Research, Iowa State University, jreecy@iastate.edu

Do you have a committee or working group charged with addressing public access to data?

Yes, there is a formal inter-unit task force or committee (e.g., Provost's Office, Research Office, Libraries, IT)

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

James Reecy, Associate Vice President for Research (co-chair) Curtis Brundy, Director II, Library (co-chair) Mike Lohrbach, Director Information Technology Systems and Operations (co-chair) Barbara Biederman, Assistant University Counsel Jerry Zamzow, Assistant Vice President for Research Lisa Lorenzen, Director of the Office of Intellectual Property and Technology Transfer Sarah Kaatz, Director of the Office of Responsible Research Brooke Langlitz, Director of the Office of Research Integrity Tammy Polaski, Associate Director of Sponsored Programs Administration Megan O'Donnell, Librarian Sunil Singh, Information Technology Services Security and Policies Joshua Rosenbloom, Professor and Chair of Economics Philip Dixon, Professor of Statistics Richard Lesar, Professor and Interim Chair of Materials Science and Engineering Carolyn Dill, Associate Professor of Genetics, Development and Cell Biology Volker Hegelheimer, Professor and Chair of English Sarah Nusser, Vice President of Research (co-sponsor) Beth McNeil, Dean of the University Library (co-sponsor) Kristen Constant, Interim Chief Information Officer (co-sponsor)

What unit(s) is or will this planning group report to?

Vice President for Research (Sarah Nusser) University Library (Beth McNeil) Chief Information Officer (Kristen Constant)

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

The Iowa State University Data Sharing Task Force (DSTF, see 3) was formed in December 2017. The DSTF was charged with collectively considering the set of actions and guidance needed to support researchers and the institution in providing public access to research data. To accomplish this charge, four sub-groups were formed to carry out the DSTF's work in the areas of Policy, Compliance, Research Practice, and Systems and Services. Activities to date include the following. 1) A draft university research data policy is under review to facilitate data management and sharing, and will be shared for stakeholder input this fall. 2) An initial data disclosure process has been developed for declaring intent

to share data, developing a project agreement that supports sponsored funding award terms, and evaluating a data product to ensure it is appropriate and ready for sharing. 3) A pilot data sharing platform called DataShare has been developed to host data for sharing (up to a maximum volume) or linkages to the location of data shared via a trusted repository. 4) Testing of the above three components is under way.

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

In terms of human resources, DSTF members and other research, information systems, and library staff have spent significant time discussing, developing and implementing a prototype system, draft data sharing guidelines and an initial process to support data sharing on campus. We anticipate this task force requiring at least one more year to address more complex issues of research practice and support for proper use of data. Beyond human capital, the University Library, CIO and VPR have collectively invested \$93K for a 2-yr FigShare license to create a pilot platform to share \ data from Iowa State researchers with the public. The DSTF is charged with outlining infrastructure required to support systems and processes.

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

Our greatest future challenge is in building good research practice across all disciplines to produce high quality data that withstands public scrutiny and facilitates data reuse. This hinges on considering data development phases across the entire lifecycle of a project. We need to develop supporting guidance, training and systems for proactively designing research studies for sharing data; documenting study objectives and data acquisition methods; and documenting post-data collection data processing, analyses, and the data set itself. Part of this involves creating a more coherent culture and practice around open science/scholarship, such as pre-registering studies, use of open lab notebooks (e.g. GitHub), tools for managing data throughout its lifecycle, and identifying and publishing in open access journals. In addition, we need to update how we reward sharing of research data (and other scholarly products) in the promotion and tenure process. In preparation for institutional compliance, we need to develop the capacity to register intent and monitor progress towards data sharing on sponsored agreements. And then there are the financial commitments that will be required to create a responsive system for public access to research data that minimizes burden to our researchers. We would benefit from learning about any of these areas, how other institutions are approaching them, and how we can work across institutions to cooperatively support and reduce the cost of implementing public access to research data at universities.

Carnegie Classification: Doc Univ: Highest Research Activity

SECTOR: Public, 4-year or above

HBCU: o

OBEREG: Plains IA KS MN MO NE ND SD

HSI: o

LANDGRNT: 1

MSI: o

MEDICAL: 1

McGill University

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

If an interested institution wanted to learn more, is there a point of contact? If so, please provide his or her contact information here:

Dr. Nancy Ross, Associate Vice-Principal, Research and Innovation, McGill University

Do you have a committee or working group charged with addressing public access to data?

Yes, there is a working that has met over recent years composed of members from the Office of the VP Research, Libraries and IT.

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

Dr. Nancy Ross, Associate Vice-Principal, Research and Innovation Ms. Anne Marie Durocher, Senior Analyst, Strategic Initiatives, Office of the Vice-Principal, Research and Innovation Ms. Jenn Riley, Digital Librarian and Associate Dean, Libraries Various Representatives from McGill IT Services New: Representative from McGill's Montreal Neurological Institute and Hospital - the first Open Science Institute in the world.

What unit(s) is or will this planning group report to?

Vice-Principal, Research and Innovation

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

McGill's Montreal Neurological Institute (MNI), is a global leader in Open Science. As stated on the MNI website: "Open Science is a no-barrier approach to scientific research that is gaining ground within the academic community. Its principles are simple: allow research data and materials to move freely from one research team to another, between disciplines and toward the creation of innovative businesses." There is much that McGill as a whole, as well as other institutions, can learn from the experience of the MNI. We trust that intra-institutional learning will be supported by several years of collaboration between the Research Offices, Libraries and IT services at McGill on research data management. McGill is now in the process of developing an Institutional Data Management Strategy in response to the Canadian federal government's desire to have data collected with public money shared widely. McGill is part of a Canada-wide shared data management plan assistant/tool that supports faculty members in development of data management plans. Digital librarians at McGill are currently being trained to advise on depositing and citing data, data sharing issues and data lifecycle planning. Perhaps the best example of a large investment in a data repository at McGill is the C-BIG Repository. C-BIG is a one-of-a-kind deposit of brain material and data. It is primed to become the world's largest library of brain

imaging, clinical, demographic, genetic (DNA) and cellular data, and samples from patients with neurological disorders.

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

There has been long term institutional buy-in on the importance of open data for the integrity of science and data as a public resource that can be most efficiently used if shared widely. This buy-in has opened up space for staff time in the office of the Vice-Principal, Research and Innovation, Libraries, IT and Human Ethics to develop data management strategies. Staff from McGill's Office for Sponsored Research have been engaged to ensure compliance through their funding application and awards management process. In summer 2018, McGill engaged the research community locally and nationally with the development of a detailed response to the Canadian federal research granting council's Draft Policy on Research Data Management (http://www.science.gc.ca/eic/site/o63.nsf/eng/h_97610.html). Canada is currently having a national conversation about open data and McGill is a leader in this conversation.

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

McGill's most current and pressing challenges with respect to providing public access to university data are twofold: first, there is a needed cultural change in the way some disciplines value data management and sharing (i.e., McGill is a large public university where some disciplines have been used to sharing data for a long time, routinely publish datasets and submit data along with research findings and others have no experience with managing and sharing data) and second, is the ongoing debate about further development of McGill-specific repositories versus joining other existing repositories. We hope to hear from other institutions grappling with these issues. We are also interested in learning best practices for resourcing and absorbing additional data management and sharing costs (development of metadata and high quality data dictionaries, best practices in repository development) in a public institutional environment.

Michigan Technological University

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

If an interested institution wanted to learn more, is there a point of contact? If so, please provide his or her contact information here:

Gina Lemay, gllemay@mtu.edu

Or

Josh Olson, jolson@mtu.edu

Do you have a committee or working group charged with addressing public access to data?

Yes, there is a formal inter-unit task force or committee (e.g., Provost's Office, Research Office, Libraries, IT)

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

David Reed, VP/Research; Shane Mueller, Assoc. Prof., Cognitive & Learning Sci.; Josh Olson, CIO; Nora Allred, Asst. Dir., Schol. Commun. & Collections; Joanne Polzien, Exec. Dir., Comp., Integrity & Safety; Gina LeMay, Dir., Sponsored Ops & Info. Systems; Tammy LaBissoniere, Dir., Sponsored Programs Accounting Lisa Jukkala, Director, Sponsored Programs Office

What unit(s) is or will this planning group report to?

Vice President for Research

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

Initially created an informal group to discuss the regulation changes and impacts to the campus research community. Created a webpage detailing the public access requirements for publications. Established the Research Data Working Group (RDWG) in September 2017. It is a broadly represented working group that can operate at a high level, and will form ad hoc groups to address particular issues as they arise. It is comprised of faculty and staff volunteers. --The RDWG drafted a broad research data principles policy, approved by the Board of Trustees on 5/4/18. --Several working groups have been established within the RDWG to draft and propose policy/procedure language for: a. Archiving datasets b. Archiving publications c. Controlled unclassified information (CUI) Note, the intent is to utilize the Digital Commons platform in the processes. The library hosts and manages an institutional repository, Digital Commons @ Michigan Tech, capable of archiving research data sets. Library staff include a repositories librarian who oversees the institutional repository and develops and delivers outreach to the campus. The library will also be delivering workshops on data management planning starting in Fall 2018.

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

The library has recently formed a Scholarly Communications department, one of the goals of which is to develop awareness of mandates for publicly accessible data, data management planning, and data curation for public access. Within the department are staff with ever-developing expertise in data management. The leader of this department is well-positioned to work with other institution stakeholders in developing institution-wide approaches to open data. The library also hosts and manages an institutional repository, Digital Commons @ Michigan Tech, capable of archiving research data sets. The repository is optimized for discovery via Google Scholar and is designed based on an open access concept (although embargo and restrict access is also possible). Google Drive and Sites may be a helpful resource for making large data sets available.

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

One of the key challenges for our institution is finding effective ways to connect with researchers in varying disciplines at their "point of need. The library has tried various outreach models, but we believe an institution-level approach to public access may improve collaboration. Additional benefits of a more institution-level approach is transparency, reduction of duplication of efforts, and identifying and capitalizing on the knowledge of experts across the institution. Other challenges include: 1. Size of the data and long term storage. (Mainly for the GIS research data which may need to be shared if generated as a result of a government contract.) 2. Who manages the system with the data? (Currently, this typically managed by the researcher, sometimes with assistance from IT.) 3. For data stored outside of Digital Commons, how do you index and make the systems available? 4. Data costs. We would like to learn how others are addressing these challenges and how they are planning for continued expansion into the future. Another challenge for this University is culture change. Shifting to a culture that not only embraces public access to data, but embraces and provides the infrastructure to ensure the data meets all quality principles. This shift involves not only systems but human capital and expertise as well.

Carnegie Classification: Doc Univ: Higher Research Activity

SECTOR: Public, 4-year or above

HBCU: o

OBEREG: Great Lakes IL IN MI OH WI

HSI: o

LANDGRNT: o

MSI: o

MEDICAL: o

Montclair State University

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

[Do you have a committee or working group charged with addressing public access to data?](#)

We have begun to meet but do not have a formal taskforce, working group, or committee

[Other \(please specify\)](#)

Montclair State University Digital Commons has an internal library committee for the repository composed of librarians with various backgrounds and one non-librarian administrator. This committee sets policies and procedures, reviews and approves all content, and provides assistance and training on proper use of the Repository. There is also an external committee for the repository which represents every administrative and academic unit at the University. This committee is charged with oversight and assisting in the marketing and promotion of the Repository. A data management plan as well as policies were created with the assistance of a librarian specializing in data as well as collaboration with the Office of Research and Sponsored Programs (ORSP) and the Institutional Review Board (IRB). This information is posted on the Repository webpage and assistance is available for any questions or concerns. All content must be reviewed and approved by a designated member of the Sprague library internal committee for the Repository with assistance from a member of ORSP and the IRB as necessary.

[Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.](#)

Judith Lin Hunt, Dean of Library Services Karen Ramsden, Research and Projects Specialist, Library Administration Scott Herness, Vice Provost for Research; Dean, The Graduate School Candy Fleming, Chief Information Officer Denise O'Shea, Head of Access Services and Technical Services, Library Ted Russo, Director, Office of Research and Sponsored Programs Hila Berger, Director, Office of Research Integrity

[What unit\(s\) is or will this planning group report to?](#)

The Office of the Provost.

[Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.](#)

During 2017, Sprague Library subscribed to Digital Commons (an Elsevier product) to bring an institutional repository to Montclair State University. Launched in March 2018, Montclair State University Digital Commons serves faculty and institutional interests by collecting, organizing, preserving, and disseminating faculty scholarship and creative works in a digital, open-access environment. It also brings together all of the University's research and creative works under one umbrella, with an aim to preserve and provide access to that research and encourage collaboration. The Commons is in the early stages of being populated with scholarly profiles and products. In June 2018, a

data management plan and data policies and procedures were created and implemented for use on the Repository site. The team that created the data plan consisted of a full time librarian and members from the Office of Research and Sponsored Programs and the Institutional Review Board. Both of these departments have existing policies regarding research and data and those policies were incorporated for use in uploading research data to the Repository. All content is reviewed and approved by a designated librarian before being publicly posted on the Repository. In addition, Faculty Training Sessions and workshops are provided by University Librarians to assist with developing and populating profiles and uploading scholarly content within the Digital Commons. The Office of Research and Sponsored Programs (ORSP) assists investigators with developing their Data Management Plans for grant submission. The ORSP provides templates, examples, and guidelines of data management plans to allow investigators to create plans appropriate to their experimental designs and data collection procedures.

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

The Digital Commons, which contains both researcher profiles and the data repository, is newly established at our institution. To date, adequate institutional resources for its inception and expected growth are extant. Fiscal support for the Digital commons has come from both the Provost's Office, which provided the institutional support for its acquisition, and Library's annual budget, which now contains a line item to cover its subscription fee (BePress). Resources are also provided in the form of staffing. Among other duties, four librarians dedicate time to the workflow approval process. Additionally, faculty and staff within the university community provide time on both internal and external committees. Deans work with faculty in their Colleges to promote the Digital Commons and encourage its utilization. Perhaps unique to public institutions in the state of New Jersey, Montclair State has just joined a statewide research consortium dedicated to driving an innovation economy within the state. Research with NJ is a free portal that showcases New Jersey's experts in science, technology, engineering and mathematics (STEM), including their professional backgrounds, publications, and achievements. The portal (www.ResearchwithNJ.com) is structured and branded to encourage collaboration between entrepreneurs, businesses, and New Jersey's academic research institutions. It is very similar in format to the Digital Commons and we are in the early planning stages of populating its database.

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

As previously stated, the Digital Commons is newly established at our institution. While great success has been achieved in its inaugural roll out, challenges remain. The ultimate success of the Digital Commons lies in its utilization. Obviously, there will be no public access to data with a 'bare cupboard' repository. Faculty buy in is essential; scholars need to create profiles, upload research articles, utilize the data repository. This will require education of the campus community and establishing a campus culture that creates the Digital Commons as the 'new normal' for scholarly activities. Creating the necessary campus partnerships will be a critical step towards achieving this goal. Another challenge lies

is maintaining adequate staffing as the Digital Commons grows. Dedicated staff time will need to increase proportionally to the expansion of its utilization. Other challenges lie in the lack of universality of database infrastructure and lack of shared principles and standardization of data policies across institutional, state, and federal agencies. One example is the interoperability of the Digital Commons, MSU's platform for the repository, with ReserachwithNJ, the state of New Jersey initiative. Whether a standardization exists is not yet known and, as an example, reformatting of scholarly profiles remains an open question. As we continue to implement and grow our repository, at an institution that is, in parallel, growing its research profile and infrastructure, we hope to gain from this workshop information and best practices from other institutions that have more established policies. Additionally, we hope to develop appropriate metrics and measures that may be used on the one hand to inform the Deans, Chairs, Provost, President and on the other hand to serve and inform the research community. We feel we will bring a unique perspective to the workshop of a growing research institution (recently designed Carnegie R3) who is rapidly building its research enterprise.

Carnegie Classification: Doc Univ: Moderate Research Activity

SECTOR: Public, 4-year or above

HBCU: o

OBereg: Mid East DE DC MD NJ NY PA

HSI: o

LANDGRNT: o

MSI: o

MEDICAL: o

New Mexico State University

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

If an interested institution wanted to learn more, is there a point of contact? If so, please provide his or her contact information here: Diana Toups Dugas, PhD, Cyber Infrastructure Architect, New Mexico State University, dugasdvt@nmsu.edu

Do you have a committee or working group charged with addressing public access to data?

We have begun to meet but do not have a formal taskforce, working group, or committee

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

Luis Cifuentes, Vice President for Research Norma Grijalva, Chief Information Officer Diana Dugas, Enterprise Cyber Infrastructure Architect Laura Boucheron, chair of the University Research Council & Engineering faculty member James Murphy, Associate Dean of Research, College of Arts & Sciences Curtis Ewing, Information and Communication Technologies' System Manager Susan Beck, Library liaison

What unit(s) is or will this planning group report to?

Primarily the Vice President for Research - who will work with the Office of the Provost and report to the University President

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

We have held some data management plan writing workshops on campus, but no official policies yet exist. We have formed a group with representatives from the Library and IT with regular reporting of progress to the VP of Research and the Provost. We have gathered some information from other universities regarding approaches and limited information on funding. Campus researchers have been surveyed to get a sense of their needs to support data access. Specifically in regards to storage space and whether a national repository is already identified as a location for their data. Once a decision has been made about which path to pursue, policies regarding data management and sharing will be developed. The New Mexico State University Library has developed an online guide for researchers to use prior to submitting a grant proposal in order for the proposal to be compliant with the Expanding Access memo of 2013. The website can be accessed at

<https://nmsu.libguides.com/c.php?g=400282&p=2721219>. Faculty training is an integral part to good data management and ideally will involve both initial training as well as follow-up visits to ensure that best practices continue to be employed throughout the life-cycle of each project. A few researchers have established partnerships with other institutions to host data.

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

We are currently investigating the best route for a repository and public access to this repository. Cost being a prohibitive condition, we are exploring several open-source options, as well as having developed a proof-of-concept for using OneDrive/Sharepoint plus on-site storage and custom scripts for webpage access. Discussions regarding required personnel for both running the back-end of the repository as well as data curation, preservation, and dissemination of best practices have started and will be considered as a component of the solution. NMSU is in the midst of a leadership change. Chancellor Dan Arvizu began his service this past June and President John Floros began July 1. At the same time, our new Vice President for Research, Luis Cifuentes joined the team. They are supporting the allocation of effort from these individuals to develop a sustainable plan for better implementation of public access.

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

The most pressing challenges are developing a system that works within the restricted budget we have for start-up and determining how to organize the repository system within the university. We hope to gather information on how other institutions start-up and maintain repositories without a large initial investment and without putting undo strain on proposal budgets. Regarding university hierarchy, we hope to better understand the possible repercussions of having the repository housed in/under the Library, IT, VP of Research, etc: what this means for access, development, researchers, and how it affects the perception of the repository and outreach necessary for compliance to data management protocols. We are also interested in ideas for moving forward efficiently as well as the opportunity to develop larger partnerships to address access more broadly.

Carnegie Classification: Doc Univ: Higher Research Activity

SECTOR: Public, 4-year or above

HBCU: 0

OBereg: Southwest AZ NM OK TX

HSI: 1

LANDGRNT: 1

MSI: 0

MEDICAL: 0

The Ohio State University

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

Do you have a committee or working group charged with addressing public access to data?

We have begun to meet but do not have a formal taskforce, working group, or committee

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

Diane Dagefoerde, Deputy CIO.

Jan Weisenberger, Senior Associate VP for Research.

Purnima Kumar, Professor and Chair, University Research Committee.

Emily Schriver, Associate General Counsel, Research.

Jen Yucel, Associate Vice President, Research Compliance.

Maureen Walsh, Scholarly Sharing Strategist, University Libraries.

Amanda Rinehart, Data Management Services Librarian, University Libraries.

Alison Armstrong, Associate Director for Research & Education, University Libraries.

What unit(s) is or will this planning group report to?

Provost's Office

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

- The Translational Data Analytics Institute fosters university and industry partnerships in data science, analytics methods, and application domains such as urban planning and biological and social sciences. It offers educational programming and student engagement in data science and analytics.
- OSU has a University Policy for Research Data and there are a number of groups that have addressed public access to data including: the Libraries Advisory Task Force on Federal Public Access Policies, the Research Data in the Library Task Force, and the University Research Committee.
- University Libraries Research Commons and the Scholarly Sharing Program Area offer faculty and students workshops and training on data sharing and have invested in infrastructure and services to support the public access of data, including Data Management Services, Copyright Services, and the sharing of small data sets via OSU's institutional repository.
- OSU's Enterprise Project is a major business process transformation and system implementation initiative currently underway. A key component is the new Reporting and Analytics Environment (RAE) the Office of the CIO is building in Amazon Web Services. New dynamic reporting and data visualization tools will make university administrative data available to both public and internal audiences. This infrastructure could be leveraged to make research data available.
- The Office of the CIO's Enterprise Security group lead the Institutional Data Policy aimed at managing the university's risk of data loss and data exposure. Enterprise Security consults with researchers on complying with NIST and other data security regulations.

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

- University Libraries is committed to providing services that promote the open sharing of research, including data management planning, education, and consultations. The Libraries long standing commitment to supporting researchers and scholarly sharing provides a solid scaffolding of programs and partnerships to contribute to the expansion of OSU's services and infrastructure supporting public access to data.
- An Amazon Web Service (AWS) service provided through the OCIO is available to any faculty or staff member who could use it to provide public access of data.
- The Ohio Supercomputer Center provides storage and access to large data sets.
- LabArchives became available to all faculty, staff and students in January 2018 and is a cloud-based Electronic Lab Notebook application, which allows users to electronically create, store, share and manage data.
- Translational Data Analytics Institute provides a Data Commons to support research and instruction.
- The new Reporting and Analytics Environment will make administrative data available to the public. Much of the infrastructure behind this could be leveraged to make research data available.
- OSU currently has enterprise agreements in place that enable leveraging cloud resources to store and serve data sets at scale.
- The Enterprise Project has a significant Data Governance component. This effort is transforming daily business processes to include data definitions, data access, metadata management and data integrations. This university-wide capability on the administrative side, coupled with the University Libraries extensive data management resources for research, position OSU well to manage a diverse ecosystem of data that the public will be able to consume.

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

OSU's challenges with respect to providing public access to university data are around awareness, buy-in, and sustainable infrastructure in the form of both equipment and people. Connection, integration, and prioritization of the resources and services available has been uneven. There is a parallel challenge around best practices and support for the management, hosting, and preserving of data for public access. Cross-institutional collaboration that fosters alternative models to publicly sharing data and the opportunity to work with peers and stakeholders on these issues could accelerate OSU's progress in developing and implementing institutional plans to provide public access to data. We would benefit from understanding where our peers are with addressing public access to research data, what mechanisms they have found successful to create a culture which advances access, and how they sustain their initiatives.

OSU's key challenges:

- Sustainable infrastructure, both equipment and people.
- Role-based access to data – who will have access when.

- Shifting data protection laws (for example, the EU's General Data Protection Regulation) - how to modify and track data as it moves across dispersed data sets, especially when consent is changed or revoked?
- Data use agreements or restrictions in the sharing of data (e.g. acknowledgement or attribution), and how to monitor or enforce.
- Architecting systems for global data management and delivery – thinking and planning towards a “data.edu” concept as opposed to a “data.osu.edu” concept.
- Increased industry funding that shifts data ownership to private companies.

Carnegie Classification: Doc Univ: Highest Research Activity

SECTOR: Public, 4-year or above

HBCU: o

OBEREG: Great Lakes IL IN MI OH WI

HSI: o

LANDGRNT: 1

MSI: o

MEDICAL: 1

Penn State University

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

If an interested institution wanted to learn more, is there a point of contact? If so, please provide his or her contact information here: Greg Madden, Senior Advisor for Research Computing and Cyberinfrastructure, Office of the Vice President for Research, gregmadden@psu.edu

Do you have a committee or working group charged with addressing public access to data?

Yes, there is a formal inter-unit task force or committee (e.g., Provost's Office, Research Office, Libraries, IT)

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

Penn State is treating public access to research data as a broad cross-disciplinary effort engaging many units and people from across the university. Leadership is being provided by the University Libraries and the Office of the Vice President for Research. Co-Chairs of the Open Access Committee are: Karen Estlund, Associate Dean for Technology and Digital Strategies, University Libraries; Greg Madden, Senior Advisor for Research Computing and Cyberinfrastructure, Office of the Vice President for Research.

What unit(s) is or will this planning group report to?

The planning group was charged by the Provost and the Dean of the University Libraries and is co-chaired by a representative of the Vice President for Research.

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

Penn State's current activities in support of public access include work related to technologies, processes, education, consulting, and policies. On the technology side, we have implemented both an Open Data repository as well as an Open Scholarship repository and are actively pursuing improvements that will make these repositories function as an integrated whole. On the policy side, our University Faculty Senate has passed an Open Access Resolution and university leadership has convened an Open Access Committee to create a policy to follow behind the resolution. In terms of consulting and education, Penn State supports both in-person and online training and consultations around data management, metadata, and archiving practices, while also providing services to review funder-required data management plans. For public access to data, Penn State has operated Data Commons since 2011. Developed at Penn State's Institutes of Energy and the Environment, Data Commons is a repository for data created by individuals at Penn State, government agencies, and other academic institutions, providing a resource for data sharing, discovery, and archiving. For public access to scholarship, Penn State has operated ScholarSphere since 2012. Developed at the University Libraries, ScholarSphere is an institutional repository that curates and preserves over 1700 public access

datasets created by Penn State researchers. Each dataset deposited in ScholarSphere undergoes a set of curation treatments and reviews to support its reuse and ongoing persistence, including the creation of metadata, file audits, and the assignment of a digital object identifier (DOI).

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

The University Faculty Senate, the Provost, the Dean of the University Libraries, and the Vice President for Research have all provided resolutions and/or resources in support of public access to research data over the last several years. In 2015, Penn State's University Faculty Senate passed an Open Access Resolution that supported the principle of open access to research results and encouraged faculty to provide access to their research output and directly-related research data in ScholarSphere and Data Commons. In 2017, the Provost and the Dean of the University Libraries jointly charged an Open Access Committee to develop an Open Access policy; this committee is nearing the completion of its work and intends to have a proposal in front of the University Faculty Senate in Fall 2018 or Spring 2019. The Committee will be recommending the adoption of a comprehensive Open Access Policy that encourages University researchers to make scholarly articles, instructional materials, and other materials (including data) openly available when appropriate. To support this new policy, the Committee will be recommending that resources be directed to a short-term project to put appropriate technologies and processes in place. The intention is to follow this with a permanent program supported and sustained by an ongoing commitment of resources. In addition to the above, the university has dedicated a website (open.psu.edu) to issues surrounding open data and the "open movement" in general, with the intention of creating a single source of information for all related issues.

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

We see many current and pressing challenges with respect to providing public access to university data, including: (a) building support among faculty for whom the immediate rewards of participating in public access programs are not readily apparent (i.e. convincing skeptical faculty that the benefits of participation outweigh the burden of compliance, or incentivizing participation); (b) improving and integrating the various technologies and applications at the intersection of research data and research administration in order to create a low-impact technological solution that can minimize the compliance effort needed on the part of faculty; (c) clarifying issues surrounding intellectual property rights, data ownership, data stewardship, and data licensing with respect to research data sets, such that both the faculty and the university are comfortable with the policies and understand their practical implications; (d) unifying then clarifying the university's expectations surrounding research data management practices, data management plans, data access plans, data security plans, and other data-related plans and practices; (e) simplifying research administration by developing practices and processes by which "public data" and "secured data" can be treated as two sides of the same coin, with the primary difference being that public data are subject to compliance requirements, while secured data are subject to both compliance requirements and security requirements. We hope to learn what others are

doing with respect to the questions above, to learn what additional questions are being asked, and to adopt any techniques that are being used successfully elsewhere.

Carnegie Classification: Doc Univ: Highest Research Activity

SECTOR: Public, 4-year or above

HBCU: o

OBEREG: Mid East DE DC MD NJ NY PA

HSI: o

LANDGRNT: 1

MSI: o

MEDICAL: o

University of California, Riverside

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

Do you have a committee or working group charged with addressing public access to data?

We have begun to meet but do not have a formal taskforce, working group, or committee

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

Michael Pazzani, Vice Chancellor for Research and Economic Development (Former director of Information and Intelligent Systems Divisions at CISE/NSF, and former Board of Regents of National Library of Medicine and member of UC Systemwide Library and Scholarly Information Advisory Committee) Steven Mandeville-Gamble, University Librarian, UCR and Immediate Past Chair of UC Systemwide Library Committee, Danna Gianforte, Associate Vice Chancellor for Computing and Communications and Chief Information Officer.

What unit(s) is or will this planning group report to?

Vice Chancellor of Research and Economic Development

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

The University of California Riverside Library has built a suite of tools and services to support long-term public access to research data as part of a coordinated effort of the UC Libraries system-wide and leveraging services provided by the California Digital Library, a unit of the University of California Office of the President. Services include: assistance writing data management plans (see: <http://guides.lib.ucr.edu/c.php?g=291771&p=1943633>); assistance using UCR DASH (<https://dash.ucr.edu/xtf/search>), a data sharing platform that is searchable and fully indexed both in Scopus and Thomson-Reuters Data Citation Index, complete with a unique Digital Object Identifier (DOI) for each dataset loaded into DASH; as well as assistance using UC Merritt (see: <http://merritt.cdlib.org/>), a long-term digital preservation platform that enables the UC community to manage, archive, and share valuable digital content. The Library's Research Services department provides support for campus research data management needs, including enabling public access to data. Two library staff members, a Data Librarian and an Open Research Librarian, serve as the primary experts. They provide guidance through targeted outreach, workshops, and consultations. Additionally, the library maintains online resources. The UCR Library currently maintains two websites that identify the local as well as system-wide resources available to researchers: Managing Your Data (see: <https://library.ucr.edu/research-services/managing-your-data>) and Research Data Management

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

UC Riverside has established a 5 Petabyte storage capacity (2.5 Petabytes duplicated) on campus to store research data. In collaboration with the staff of the UC3 (University of California Conservation Curation Center), who manage the Merritt, DASH, and EZID infrastructure described above, to use the interface expertise of the UC3 staff to create and install a robust front end to the research data platform on the UCR campus. Together with three other campuses of the UC system, this combination of a UC3-developed front end and local campus storage is being tied together into a distributed digital preservation platform to ensure long-term access to the research data. UCR is the first campus to actively begin this work, and significant effort has already been invested by the UC3 staff and UCR's Information Technology Solutions operation. The UCR Library is developing the front end service model to assist researchers to navigate the new platform. While a specific go live date has yet to be announced, it is anticipated that this service will be in place by the end of the 2018-2019 academic year. Server acquisition was centrally funded. Library permanently reallocated staff to this project

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

1. We have the financial backing and campus buy-in to get this underway. However, we anticipate that some users will jump at the opportunity to make their data widely available, some will reluctantly comply with federal requirements, and others will resist. What are the best means of promoting the benefits of sharing data. 2. We have some permanent funding for staff that can assist with metadata but how do we educate the campus on the importance of Data Provenance, metadata, etc. 3. Our hardware was purchased with one-time funds. How do we sustain this in N years when a hardware refresh is needed and/or when the data exceeds our capacity.

Carnegie Classification: Doc Univ: Highest Research Activity

SECTOR: Public, 4-year or above

HBCU: 0

OBEREG: Far West AK CA HI NV OR WA

HSI: 1

LANDGRNT: 1

MSI: 1

MEDICAL: 0 [Note: UCR does have a medical school]

University of Massachusetts Amherst

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

Do you have a committee or working group charged with addressing public access to data?

We have begun to meet but do not have a formal taskforce, working group, or committee

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

Leslie Button, Associate Dean for Research and Learning (UMass Libraries) Thea Atwood, Data Services Librarian Loren Walker, Director of the Office of Research Development Jen Donais, Assistant Vice Chancellor, Compliance and Support Services, Office of Research and Engagement Elliot Moss, Professor, Information and Computer Science Matthew Dalton, Chief Information Security Officer, IT

What unit(s) is or will this planning group report to?

Research Council

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

UMass Amherst has a data policy and an information security policy and efforts are currently underway to develop a Data Classification Matrix to guide researchers in providing public access to data. Staff from Information Technology, the Libraries, and Research and Engagement have been active collaborators for several years. The partnership has grown out of policy development, shared training initiatives, and referrals based on unit expertise. For example, the Office of Grants and Contracts Administration (OGCA) refers researchers who ask for advice on developing a data management plan to the Libraries, which houses expert knowledge through the Data Working Group (DWG) lead by the Data Services Librarian. The Libraries offer both educational opportunities and resources for scholars, including workshops on data management plan preparation and best practices, and a managed repository as one option for providing public access to campus-generated research data.

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

UMass Amherst has already dedicated resources to providing public access to data, understanding there is more to be done in this area. The UMass Libraries manage the campus institutional repository, ScholarWorks. ScholarWorks is one option for providing public access to campus-generated research, as it has done so for public access to articles and other scholarly materials since its inception in 2008. UMass Amherst is also part of the Massachusetts Green High Performance Computing Center (MGHPCC), which recently became partners in the Northeast Storage Exchange (NESE), an NSF funded initiative. NESE is a high capacity, cost effective, scalable, and accessible data store that will enable new levels of collaborative research.

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

There are several challenges, including the lack of an overall strategy to support public access to data across the campus. Without such a strategy, expertise and resources are unevenly distributed. This results in time and effort spent on deployment and maintenance rather than tackling research questions. The campus offers no integrated services for data management, data storage, and data curation. The long-term requirements of data support, archiving and management are well beyond the duration of typical project budget periods, yet UMass Amherst has no mechanism for estimating what those costs might be. The campus lacks a cost-recovery model, based on the estimated financial burden of short and long-term data management. An easy to use, transparent, robust, and cost-effective centralized data management system, with adequate support through a thoughtfully developed, yet flexible funding model should make the option of using the University system an easy decision for most researchers. There is also a challenge around data security, especially what can be shared and how to do that as well as data ownership and intellectual property concerns that impact these issues as well. We are eager to learn about governance models other institutions have put in place to manage the overall lifecycle of research data: •How do they provide integrated service? •Who is part of the governance structure? •How did they develop their budget model to support access to data? •What level of service does each institutional unit provide, for example, IT vs. the library, vs. outsourcing? What is the cost model? What support systems do they have in place? What have they invested in locally? What models are in place for the long-term curation of data? •What policies or mechanisms have they had to develop to provide public access to data?

Carnegie Classification: Doc Univ: Highest Research Activity

SECTOR: Public, 4-year or above

HBCU: o

OBEREG: Mid East DE DC MD NJ NY PA

HSI: o

LANDGRNT: 1

MSI: o

MEDICAL: o

University of Minnesota

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

If an interested institution wanted to learn more, is there a point of contact? If so, please provide his or her contact information here:

Jim Wilgenbusch -- jwilgenb@umn.edu

Lisa Johnston -- ljohnsto@umn.edu

Do you have a committee or working group charged with addressing public access to data?

There is a formal inter-unit task force or committee (e.g., Provost's Office, Research Office, Libraries, IT) that was charged with implementing our [Research Data Policy](#) (effective Jan 2015), however, public access to data is not required for all data generated at the University.

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

Jim Wilgenbusch, Senior Associate Director, Minnesota Supercomputing Institute, Office of the Vice President for Research -- jwilgenb@umn.edu

Lisa Johnston, Data Management/Curation Lead and Director of the Data Repository for the University of Minnesota (DRUM), University Libraries -- ljohnsto@umn.edu

What unit(s) is or will this planning group report to?

Office of the Vice President for Research
Office of Information Technology
University Libraries

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

The University of Minnesota established several multi-unit/multi-level committees that provide comprehensive oversight concerning research data. In 2015, UMN's VPR charged a multi-unit committee of university leaders to serve on the Use Case Categorization Scheme (UCCS) committee to provide oversight and evaluate use cases regarding research data. One year later the VPR and the CIO charged a group of faculty and technology professionals to provide guidance to our campus storage service providers concerning storage acquisitions, how to effectively implement the delivery of storage services, and how to sustain effective storage services over the long term. This committee became known as the Storage Redesign and Restructure Committee (SRRC). The SRRC recommended the establishment of a University Storage Council that will report to the Use Case Categorization Committee (UCCS) and has broad membership across the University system (e.g., Collegiate and system campus representatives, Academic Health Center, Office of the Vice President for Research, Office of Information Technology). The Storage Council is now in the process of creating UMN's

Storage Champion Program, which will provide common training for the University's IT professionals and provide an in depth knowledge of available storage solutions on and off campus.

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

The University of Minnesota provides several institutional resources to provide public access to data. The UMN Libraries provides a research data archive called the Data Repository of the University of Minnesota (DRUM, <http://z.umn.edu/drum>). DRUM is one of the first US repositories to be CoreTrustSeal certified and all data are reviewed by a distributed team of data curation experts (via the Data Curation Network, <http://datacurationnetwork.org>) to ensure that they conform to FAIR standards to reuse. DRUM is a publicly available collection of digital research data generated by U of M researchers, students, and staff. Anyone can search and download the data housed in the repository, instantly or by request. New research domain specific repositories are also being created to address the specific requirements of their communities. For example, The College of Food Agriculture and Natural Resource Sciences (CFANS) and the Minnesota Supercomputing Institute (MSI) at the University of Minnesota have merged domain expertise in the food and agricultural sciences with HPC and bioinformatics expertise to drive the development of a next-generation AgrolInformatics data discovery and analysis platform dubbed G.E.M.S. This platform, is helping to address the availability of newer and larger sources of interoperable Genetic, Environmental, Management, and Socioeconomic data (collectively referred to as G.E.M.S) related to agriculture allows researchers to solve problems at multiple functional, temporal and spatial scales related to crop sustainability and food production.

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

Issues related to data use agreements and data privacy present the greatest challenges to our institution with respect to providing public access to university data. I hope to learn how other institutions are addressing data use agreements and data privacy concerns. I'm also very interested to learn how other institutions are coordinating with the various data service providers across their campuses and sustaining the growing need for data storage resources in their various forms (active storage, repositories, and archives).

Carnegie Classification: Doc Univ: Highest Research Activity

SECTOR: Public, 4-year or above

HBCU: o

OBereg: Plains IA KS MN MO NE ND SD

HSI: o

LANDGRNT: 1

MSI: o

MEDICAL: 1

University of New Hampshire

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

If an interested institution wanted to learn more, is there a point of contact? If so, please provide his or her contact information here: Patricia.Condon@unh.edu

Do you have a committee or working group charged with addressing public access to data?

Yes, there is a formal inter-unit task force or committee (e.g., Provost's Office, Research Office, Libraries, IT)

Other (please specify)

The University of New Hampshire has a formal inter-unit committee (the Data Management Steering Committee (DMSC), co-chaired by the CIO and Dean of the Library), charged, in part, with developing and providing oversight of policies and procedures needed to improve the University's data management practices. A task force specifically charged with addressing public access to data has not yet been formed.

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

Patricia Condon, Research Data Services Librarian Terry Ridgeway, Research Computing Center Program Manager

What unit(s) is or will this planning group report to?

The planning group will report to the University of New Hampshire Data Management Steering Committee (DMSC), which is responsible for providing institutional leadership, strategic planning, policy and procedure development and oversight, as well coordination and collaboration across all UNH campuses regarding the effective management of data to support the University's culture, values, mission and stated goals. DMSC membership includes; the Vice President for Enrollment Management, the Vice President for Advancement, the Dean of Students, the Senior Vice Provost for Academic Affairs, the Senior Vice Provost for Research, the Associate Vice President for Finance, the Chief Human Resources Officer, the CIO (Co-Chair), the Dean of University Library (Co-Chair), and the chairs of authorized task forces and working groups. The DMSC reports to the Use of Data and Technology Governance Committee, which is responsible for providing senior leadership and strategic oversight of information technology and data across the University.

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

The University of New Hampshire recognizes the importance of data sharing in the advancement of knowledge and education, and accordingly has a Policy on Ownership, Management, and Sharing of

Research Data (<https://www.unh.edu/policy/unh/viii-research-policies/c-unh-policy-ownership-management-and-sharing-research-data>), which was originally drafted in 2004 and is regularly reviewed and updated. We also have the newly launched Data Catalog @ UNH Scholars' Repository, a searchable inventory of public access data sets that UNH researchers have deposited in external repositories. The objective of the Data Catalog is to improve and promote the discovery of UNH research data, and foster an institutional culture of responsible data sharing and reuse. Several units at UNH offer education and training for faculty, staff, and students in areas such as data management planning, data sharing, and open access. These include in-class instruction for students and workshops for faculty and staff; a web-based training module on the management of research data (<https://rit.sr.unh.edu/training/rcr-training/data-management.html>); and the Data Management Toolkit (<http://libraryguides.unh.edu/datamanagement/toolkit>) and the Responsible Conduct of Research & Scholarly Activity (<http://libraryguides.unh.edu/RCR>) research guides. Additionally, we have a suite of support offerings that include consultation for data management planning and review of plans, and assistance identifying and vetting appropriate repositories for data sharing and long-term preservation.

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

UNH has personnel in the Library, Research Computing Center, IT, and other units across campus that contribute to the strategic direction of research data services including support for public access to data. The Library has a dedicated Research Data Services Librarian whose role is to support the growing data management, preservation, and sharing needs of the UNH research community. The Research Computing Center is a centrally-supported unit that provides a variety of services to the research community. UNH has formalized its technology governance structure to address coordination of data management matters, and create an infrastructure that allows for better synergies, communication, and strategic direction across all technology arenas. It is within this governance structure that the DMSC provides a venue for contributions across campus and to ensure that research data services are handled systematically across the institution. UNH has an institutional repository that provides some functionality for making data discoverable and accessible to the public and houses the newly launched Data Catalog. While the Scholars' Repository has the ability to act as a data repository for UNH research, we do not yet use it to house data because it currently lacks the preservation infrastructure needed for secure and sustainable data preservation and sharing. The research computing center also has the ability to provide these types of services but neither the Library nor the RCC is resourced currently to provide these broadly across the university.

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

The most current and pressing challenges that UNH faces with respect to providing public access to research data are: Institutional Culture: Beyond our Policy on Ownership, Management, and Sharing of Research Data, a unified message about UNH's commitment to preservation, sharing, and public access of UNH research data. A commitment from UNH researchers to cultivate an institutional culture of responsible data sharing, access, and reuse. Infrastructure: Consistent workflow/process to help

researchers share/make data available (note: we have a strong support infrastructure, but we need to continue to align our services to help guide researchers). Build a strategic long-term data storage infrastructure (the first phase of which is now funded) that would allow researchers and administrators to store and curate data, and to adhere to the various statutory and contractual data retention requirements. Sustainability: Plan/roadmap for developing, adapting, and staying current with new guidance/requirements. Understanding and advocating for resource (personnel and funding) required to support the development and sustainability of support. Hope to Learn: We would like to gain a better understanding of the current landscape around public access to research data. As an outcome of this workshop, we would like to be able to ensure that the UNH roadmap and our current services align with best practices so that what we are doing now and what we do in the future supports interoperability and the potential for cross-institutional infrastructure for public access to data. We would like to communicate strategic goals and planning for future investments required for supporting public access to data to the UNH leadership and broader community. As an outcome of this workshop, we would like our roadmap to take into account best practices, our institutional culture, and the resources we have available, as well as plans for resources needed for future infrastructure building.

Carnegie Classification: Doc Univ: Higher Research Activity

SECTOR: Public, 4-year or above

HBCU: o

OBEREG: New England CT ME MA NH RI VT

HSI: o

LANDGRNT: 1

MSI: o

MEDICAL: o

University of New Mexico

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

Do you have a committee or working group charged with addressing public access to data?

Yes, there is a formal inter-unit task force or committee (e.g., Provost's Office, Office of the Vice President for Research, University Libraries, and Central IT)

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

1. Prof. Patrick G. Bridges, Director, Center for Advanced Research Computing and Chair, Research IT Advisory Board 2. Prof. Karl Benedict, Director, UNM Research Data Services 3. Duane Ej Arruti, UNM Chief Information Officer 4. Prof. Jon Wheeler, Data Curation Librarian 5. Grace Faustino, Research Information Technology Project Manager, Office of the Vice President for Research 6. Terry Babbitt, Vice Provost for Enrollment and Analytics

What unit(s) is or will this planning group report to?

1. Office of the Provost 2. Office of the Vice President for Research 3. Office of the Chief Information Officer 4. University Libraries

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

The UNM IT Research Technology Advisory board has recently begun examining the best ways to provide broad institutional support for research data management, including public access to research data. This includes developing policies and systems that enable this, and is integrating past work on data management and access policies, programs, and systems performed in disparate institutional units.

Past and continuing efforts in this direction at UNM include:

1. The UNM Research Data Services Center (supported by UNM Libraries and the Office of the Vice President for Research) provides faculty with assistance in the management, publication, and preservation of research data;
2. Institutional policies in development in the Provost's office through the UNM Data Governance Board;
3. Computational and data resources provided through the UNM Center for Advanced Research Computing and UNM Information Technologies;
4. Department-level research and institutional service centers such as the Earth Data Analysis Center, the Office of Institutional Analytics, the Bureau of Business and Economic Research, and Geospatial and Population Studies Institute.

Each of these units has separately examined policies, programs, and systems for public access to research data in the context of their missions, but UNM is still in the early stages of developing an

institution-wide approach to the challenges of public access to research data that integrates the experiences, best practices, and knowledge of each of these units.

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

UNM currently maintains repositories for managing, providing access, and preserving research data, specifically UNM's public institutional repository (<http://digitalrepository.unm.edu>), a LibSafe hosted dark archive, and long-term replicated data preservation through the Digital Preservation Network (DPN). Additionally, UNM developed a beta open data site in partnership with the City of Albuquerque (<http://opendata.unm.edu/>) that includes digital collections, events, goods and services, locations and schedules. Faculty in the College of Libraries associated with UNM's Research Data Services center regularly teach course modules and workshops on the responsible conduct of research that includes the use of research data preservation systems, and work with faculty to develop and implement award-associated data management plans. On-site facilities that host the systems that preserve and provide access to research data and research artifacts are provided through institutional resources housed at the UNM IT data center and at the data center of the UNM Center for Advanced Research Computing. UNM's digital repository, the LibSafe archive, and DPN are all hosted in off-campus facilities.

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

A key challenge at UNM is encouraging researcher adoption and use of institutional data management techniques, services, and systems that can provide public access to research data. Many researchers instead use discipline-specific, locally-provided, or ad-hoc data management techniques that impede systematic research data management, access and availability. Collecting suggestions and best practices for addressing this would be very helpful.

Diverse discipline and agency-specific data access and management policies and practices are also a significant challenge in this area. Specifically, diverse requirements and approaches make it difficult to develop consistent institutional policies and systems that support the full range of research requirements while meeting FAIR (Findable, Accessible, Inter-operable, and Re-useable) data access/publication goals. In addition, we are examining and do not yet have a solution for how to integrate data management and public data access into full workflows for handling research proposal, initiation, and closeout (e.g. pre-award and post-award contract and grant services).

Finally, we would be interested in the challenges and opportunities for creating state-wide, regional, and national coalitions to encourage, provide, and support public access to research data.

Carnegie Classification: Doc Univ: Highest Research Activity

SECTOR: Public, 4-year or above

HBCU: 0

OBEREG: Southwest AZ NM OK TX

HSI: 1

LANDGRNT: 0

MSI: 1

MEDICAL: 1

The University of North Carolina at Greensboro

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

If an interested institution wanted to learn more, is there a point of contact? If so, please provide his or her contact information here: Kim Littlefield, Ph.D., Assoc. Vice Chancellor for Research and Engagement.

Do you have a committee or working group charged with addressing public access to data?
We have begun to meet but do not have a formal taskforce, working group, or committee.

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

Jeremy Bray, Ph.D., Professor and Head of the Department of Economics, UNCG; IDEA Member; MetroLab Member Richard Cox, Digital Technology Consultant, University Libraries, UNCG; IDEA Member; MetroLab Member Xiaoli Gao, Ph.D., Associate Professor, Department of Math and Statistics, UNCG; IDEA Member; MetroLab Member; UNCG Liaison to the National Consortium for Data Science Ken Gruber, Ph.D., Evaluation Section Chair for the Center for Youth, Family & Community Partnerships, UNCG; IDEA Member; MetroLab Member Martin Halbert, Ph.D., MLIS, Dean of University Libraries, UNCG Donna Heath, M.S. Vice Chancellor of Information Technology Services, UNCG Emily Janke, Ph.D., Associate Professor, Department of Peace and Conflict Studies, UNCG; Director of the Institute for Community and Economic Engagement; IDEA Member Jason Jones, Analytics and Innovation Manager, Guilford County, MetroLab Co-Chair Kim Littlefield, Ph.D., Associate Vice Chancellor for Research and Engagement, UNCG; APLU Council on Research, Research Leaders Fellow Somya Mohanty, Ph.D., Assistant Professor, Department of Computer Science, UNCG; IDEA Member; MetroLab Member Jane Nickels, Chief Information Officer, Director, Information Technology Department, City of Greensboro Terri Shelton, Ph.D., Vice Chancellor for Research and Engagement, UNCG; Interim Director, Institute Data, Evaluation and Analytics (IDEA); MetroLab Co-Chair Stephen Sills, Ph.D., Associate Professor, Department of Sociology, UNCG; Director, The Center for Housing and Community Studies; IDEA Member; MetroLab Member Jeff Whitworth, M.S., Assistant Vice Chancellor for Enterprise Infrastructure, UNCG

What unit(s) is or will this planning group report to?

University of North Carolina Greensboro, Office of the Chancellor, Office of the Provost, and the Office of Research and Engagement

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

The University of North Carolina Greensboro (UNCG), is a "R2-Higher Research and Community Engagement"-designated¹, Minority Serving Institution² poised to affect change and drive implementation of public access to research data in sustainable and cohesive ways. UNCG's activities

are focused in three areas: infrastructure investments (structural and expertise) that leverage internal and external resources; partnerships that build regional capacity; and work force development to promote robust use, and ensure responsive evolution of, a public access system. These efforts to build an innovative public access system are informed by the APLU/AAU Public Access Working Group Report, agency (NSF and NIH public access plans), model open data platforms, and the needs and priorities of local and regional community partners. UNCG led the NC System and nation in creating innovative open access systems and tools (NC Docks; Journal Finder) and committing funds to support open access publishing and campus discussions about open access scholarly communications. UNCG is a key steering committee member in the new Guilford County Community Indicators Project whose goal is to build an interactive, community-wide platform to support public access to data. UNCG's IDEA is part of the core constituency of UNCG – Guilford Co. MetroLab Network. UNCG is a member of the Community Indicators Project (CIC) and has been invited to join the National Neighborhood Indicators Project (NNIP). The new, interdisciplinary Data Analytics Master's Program, will produce graduates grounded in FAIR public access standards. The emerging public access policy will extend UNCG's existing Access to and Retention of Research Data policy.

[Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?](#)

UNCG resources and expertise dedicated to the emerging effort to build a public access system include the: University Libraries (UL), Institute for Community and Economic Engagement, Institute for Data, Evaluation and Analytics, Research Advisory Council, Office of General Counsel, Office of Research and Engagement (ORE), and Information Technology Services (ITS). These efforts are campus-wide and align with UNCG's strategic plan. UL and ITS are leading the institution's efforts to establish nascent structural and outreach components of a public access system. The UL are redesigning physical spaces to better serve the data access needs of the community and recently hosted the Scholarly Communications Symposium focused on open access issues. ITS is bringing, in collaboration with industry, next-generation, cloud-based research computing and storage solutions to campus and has been instrumental in creating a regional "Data Lake" to house UNCG research and program data as well as data collected on behalf of, and/or in collaboration with a myriad of community partners. These efforts have the full support of the UNCG Chancellor and Provost. Each UNCG resource brings invaluable civic, community, regional and national partnerships and affiliations that will multiply the collective effort and impact. The return on the investment in partnership-building is enormous; Greensboro has already saved millions of dollars by negotiating joint use of broad band assets. UNCG's partners include: City of Greensboro, Guilford County, Community Foundation of Greater Greensboro, UNC System, Western PA Regional Data Center, MetroLab Network, CIC, and NNIP.

[What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.](#)

UNCG is rapidly gaining momentum and profile in the open and public access domains. UNCG has established some public sharing of research/scholarly data but it is often researcher-dependent and/or sponsor-mandated. Our goal is to make public sharing of data a "way of doing business." To do this we

have identified the following challenge-opportunities: Create innovative, public access systems that complement, rather than compete with or are redundant to, agency-established resources. Addressing this challenge requires being part of the discussion involving agency, community and university stakeholders to define needs, prioritize efforts and maximize the efficient use of limited resources to create systems that are meaningfully FAIR; Develop and implement systems that are FAIR, open and secure. This will require public dialogue on what facilitates use, what privacy concerns exist and how to solve challenging security issues that prevent databases from being integrated; Ensure that researchers/scholars understand the value and importance of creating data that meet FAIR standards and to provide resources to help them functionally establish and/or transition data to be FAIR compliant. This will mean coaching researchers/scholars on the front end of a project during the research design process and making resources available for translating existing data. This will also mean defining how the practice of open, public data management impacts promotion and tenure. Scholarship examining the impact of open/public access activities suggests that there are broader implications of open and public access that relate to how faculty perceive “community” and practice “engagement.”; Implement a broad curriculum audit to understand how we train undergraduate and graduate students in open data and scholarship practices and if we are adequately preparing them for a data rich and tech savvy world. This is an educational, social and economic development imperative that when operationalized will organically promote significant and sustainable cultural change. UNCG and partners have begun the process of mapping the strengths, weaknesses, opportunities and barriers (including a review of existing policies that may hinder open and public access to data), partnership gaps (what additional expertise and voices do we need in this conversation?) and local and regional resources and assets. This will allow the team to, within the next year, generate an evidence-based, shared vision of a FAIR public access system for the Greensboro region and to begin to substantively establish infrastructure to build out the vision. This means, minimally, defining what the timeline (complete with accountability milestones) and objectives of the subsequent phases of the build out are, defining roles, establishing a budget, defining desired outcomes (to inform development of assessment and evaluation activities), the elements of the governance structure and sustainability plan and importantly, developing ways to host data and/or link or point to data, in a fully integrated way, on agency-established public access platforms. Our system building efforts will be tuned at the outset to accommodating data from, and being accountable to, the wide-range of active public access/community indicator projects. In addition, UNCG ORE will initiate processes and training to ensure that data created in projects funded by ORE-sponsored internal funding programs and by ORE Centers and Institutes abides by FAIR standards. This plan provides a robust development roadmap and unique access to many and varied sources of data with which to test system functionality, stability and security. A UNCG-Guilford team will benefit from strategic networking with presenters and attendees at the workshop to maximize and align our efforts with the broader national effort. The team will ideally take away information to assist in steering internal, and navigating external conversations, insight into peer public access culture and perceived (and real) barriers/sensitivities and resource commitments, robust ideas for policy development and approaches to broadly assess and evaluate the system. For its part, UNCG and the Guilford County community will contribute its unique insights on the development and utilization of NC Docks and its experience working with multiple, strong community partners to facilitate the creation and implementation of a FAIR public access system.

1Carnegie Classification- http://carnegieclassifications.iu.edu/classification_descriptions/basic.php

2Minority Serving Institution-US Department of Education Office of Postsecondary Education:
https://sponsoredprograms.uncg.edu/wp-content/uploads/2017/04/FY2017-00297600_2017_letter.pdf

Carnegie Classification: Doc Univ: Higher Research Activity

SECTOR: Public, 4-year or above

MEDICAL: o

OBEREG: Southeast AL AR FL GA KY LA MS

HBCU: o

NC SC TN VA WV

HSI: o

LANDGRNT: o

MSI: o

University of Toronto

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

If an interested institution wanted to learn more, is there a point of contact? If so, please provide his or her contact information here: Helen Lasthiotakis, Executive Director, Strategic Partnerships & Office of the Vice-President, Research & Information, University of Toronto, h.lasthiotakis@utoronto.ca

Do you have a committee or working group charged with addressing public access to data?

We have begun to meet but do not have a formal taskforce, working group, or committee

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

- Vivek Goel, Vice-President, Research & Innovation
- Larry Alford, University Chief Librarian
- Lori Ferris, Associate Vice-President, Research Oversight & Compliance, Division of the Vice-President, Research & Innovation
- Bo Wandschneider, Chief Information Officer
- Helen Lasthiotakis, Executive Director, Strategic Partnerships & Director, Office of the Vice-President, Research & Innovation

What unit(s) is or will this planning group report to?

Division of the Vice-President, Research & Innovation, University of Toronto Libraries, Chief Information Officer

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

With over 14,000 researchers and 19,000 graduate students, the University of Toronto (UofT) and its nine partner hospitals are a vital research engine. UofT typically ranks first among Canadian universities in a broad range of disciplines, and is among the world's top research- and innovation-intensive institutions, often ranked as the top public university. UofT Libraries (UTL) provide advice and assistance to help researchers comply with open access policies: journal selection, copyright, and repository selection and submission, including depositing to TSpace - a free and secure UofT research repository to disseminate and preserve our researchers' scholarly record. UTL also provides Dataverse, a repository for research data collected by researchers and organizations affiliated with Ontario universities, as well as the Map and Data Library that includes hundreds of geospatial and numeric data sets. UofT has invested in advanced research computing through SciNet - Canada's largest supercomputer centre, providing researchers with computational resources and expertise. The SciNet High Performance Storage System is a tape-backed hierarchical storage system that serves as a repository for archiving data, currently storing nearly 9 PB of data. UofT is also host to a Statistics Canada regional Toronto Research Data Centre that provides researchers with secure access to microdata from population and household surveys, administrative data holdings and linked data. The

UofT Data Governance Working Group, established this year, supports and advises on the implementation of a Data Governance Framework that will include Data Governance Guidelines with the goal of improving the accuracy, accessibility, transparency of the university's data.

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

We have identified a need for a UofT-wide service model to coordinate support for research data access and management. The Division of the Vice-President, Research & Innovation and the UofT Libraries are proposing the establishment of a Centre for Research & Innovation Support to be operational in early 2019. The Centre will serve as a visible, efficient and integrated support hub through which researchers will be able to access supports and training for data management and public access to data. We have learned that such training are needed by our researchers, especially as related to interdisciplinary data sets, and for data management in disciplines where public access to data is not the norm. UTL is collecting and curating an ever-increasing amount of digital research data. This brings with it new opportunities (broader access, the ability to engage in text and data mining) but also new challenges in how we keep these resources whole, integral, and usable. Project Canopus is a new, 2-year initiative to advance the state of our digital preservation. The project has three key deliverables: a unified digital asset management system, a preservation processing pipeline, and an end-user-facing "Dropbox" style client to aid in transfer of digital content on campus. UTL is also working with the Quebec government and Canadian Association of Research Libraries to turn our installation of Dataverse into a national repository. We are working with legal counsels to update our terms of use in anticipation of moving Dataverse to a national repository.

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

The Canadian research granting councils are in the process of issuing a new policy on Research Data Management that will require individual researchers and institutions to prepare research data management plans and to enable access to data from publicly funded research. As noted in Question 6, while UofT has invested in supporting research data infrastructure, these supports are fragmented throughout the university, and not all are configured for public access; nor do we provide unified training for data management and access to data for our researchers. It would be helpful to discuss how best to provide support, guidance, services, and workflow systems to guide researchers for data sharing practices. We are challenged in considering an appropriate set of principles for public access to data given the rich and heterogeneous set of research data agreements with partners (other universities, private sector, government agencies). For example, many of our researchers collaborate with US researchers and we believe the workshop will also provide us a unique opportunity to learn more about US open research data approaches and vice versa. Given the international disciplinary nature of research data sharing, such a dialogue would be particularly helpful. Many disciplines do not have a culture of public access to data. Given the breadth and depth of research at the University of Toronto, considering appropriate supports and education to change the practices and research data culture will

be a challenge for the university. We will also need to consider how guidelines for public access will be consistent with our policies for ethics approval, confidentiality, and conflict of interest.

University of Virginia

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

If an interested institution wanted to learn more, is there a point of contact? If so, please provide his or her contact information here: Sherry Lake, Scholarly Repository Librarian, University Library

Do you have a committee or working group charged with addressing public access to data?
We have begun to meet but do not have a formal task force, working group, or committee

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

- Ronald Hutchins, VP for Information Technology
- Sherry Lake, Scholarly Repository Librarian, University Library
- Dean Evasius, Associate VP for Research Development, Office of the Vice President for Research
- John Lazo, Professor, Pharmacology

What unit(s) is or will this planning group report to?
Office of the Vice President for Research

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

- Through VPR Office in partnership with UVA Libraries and the Data Science Institute, set up OSF-for-institutions to help with institutional collaborations and to increase the visibility of research outputs.
- The Data Science Institute and the University Library are developing a MOU with the Center for Open Science to support open scholarship with such collaborations as integrating OSF with UVA Repositories and the Open Data Lab.
- The Data Science Institute and the Library, jointly, hired a Wikimedian in Residence to push the Open scholarship agenda.
- The Data Science Institute and the Library are collaborating on a UVA Open initiative that will be presented to Deans and other university leaders. The goal of this initiative is to get buy-in and collaboration on a grounds-wide initiative to increase the openness of research and education at UVA including subsequently measuring the impact.
- UVA does not have specific policy regarding institutional data access and sharing. The closest statement on data sharing is a relatively unknown 2004 policy titled "Laboratory Notebook and Recordkeeping" <http://uvapolicy.virginia.edu/policy/RES-002>. In 2011, the Library with input from the VPR's Office created an "easy to read" document based on the 2004 policy title "Data Rights & Responsibilities" <https://data.library.virginia.edu/data-management/plan/privacy/datarights/>.

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

The University Library has invested in a local implementation of Dataverse. It has been available to the University Community since March, 2016, although growth in its use has been slow. Institutional support with policies and guidance to faculty on sharing data would help increase the use of UVA's data repository. Another initiative involving the Data Science Institute, UVA Library, Center for Open Science & the Public Library of Science is an Open Data Lab. The goal of the Open Data Lab is to provide a large corpus of open research data (products of research) that would be used for training in data analytics and reproducibility.

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

Pressing challenges on providing public access are people challenges. There is a lack of researcher commitment to and knowledge about options for sharing supported by UVA. UVA could improve public access to data by encouraging focused partnerships between researchers and relevant support functions. To do this there would need to be coordination and support from the University's libraries, the office of the Vice President for Research, the office of the Vice President for Information Technology and the Office of Sponsored Programs. UVA was one of the original partners in developing the DMPTool, but has not advocated its use energetically. The Library has in the past offered data management and data sharing workshops. But without institutional or department requirement, the workshops have not been well attended. UVA's participation in this workshop will expose key stakeholders to how peer institutions are handling public access to university research. From that experience, UVA can better determine what models will work here, whether they are top down or more grassroots, led by the researchers/departments or organizational entities such as research support offices, data institutes, and libraries.

Carnegie Classification: Doc Univ: Highest Research Activity

SECTOR: Public, 4-year or above

MEDICAL: 1

OBEREG: Southeast AL AR FL GA KY LA MS

HBCU: o

NC SC TN VA WV

HSI: o

LANDGRNT: o

MSI: o

Utah State University

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

If an interested institution wanted to learn more, is there a point of contact? If so, please provide his or her contact information here:

Betty Rozum, Research Data Librarian

Do you have a committee or working group charged with addressing public access to data?

We have begun to meet but do not have a formal task force, working group, or committee

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

Laurens H. Smith, Interim Vice President for Research and Dean of the School of Graduate Studies

Lisa Berreau, Assoc. Vice President for Research and Assoc. Dean, Research and Graduate Studies

Richard Inouye, Assoc. Vice President for Research and Assoc. Dean, Research and Graduate Studies

Betty Rozum, USU Research Data Librarian

Andrea Payant, USU Metadata Librarian

Jodi Roberts, USU Director of Research Integrity and Compliance

Kevin Peterson, USU Director of Sponsored Programs

What unit(s) is or will this planning group report to?

USU President

USU Executive Vice President and Provost

USU Vice President for Research and Dean for Graduate Studies

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

USU implemented Policy 588: Research Data Policy in May 2017. This policy defines Research Data, ownership, retention, describes USU's expectations for access to research data, transfer of research data, and authorities and responsibilities. In this policy, researchers are instructed to deposit, whenever reasonable, research data to an openly accessible data repository. A program was launched in late 2016 to facilitate access to the products of research resulting from federally funded awards. Motivated by the OSTP memo, this process captures and makes public the data management plan from successful awards, then annually asks researchers to supply information about publications and data that have been published as result of the award. These outputs are recorded in the USU institutional repository, DigitalCommons@USU, and catalog records are created for the datasets and added to OCLC's WorldCat. This process relies on strong partnerships:

- The Research Office's Sponsored Program Division, using the Kualu Grant Management System to notify the Data Librarian of successful awards;
- The Data Librarian, using DigitalCommons@USU to create records for awards and datasets and publications, and training faculty on best practices;
- The Metadata Librarian, using the Library's catalog and OCLC WorldCat to expose records and providing expertise on best metadata practices for the campus.

Training is provided to the campus community on request and annually at the grant proposal workshop by the Data Librarian. In the past 18 months the Data Librarian has conducted 79 consultations for the campus.

[Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?](#)

Division of Sponsored Programs (DSP) personnel (total 3.5) are involved in the initial steps in the research data management process. An additional person prepares a spreadsheet of new federal awards each month to see if data management plans (DMPs) and primary metadata documents (PMDs) are attached to the award documents in Kualu. This person then sends out the interim (annual) email reminders to faculty to update the PMD (if necessary). These contributions constitute up to 5% of each person's time. The Library has one full time faculty librarian with primary responsibilities in the area of research data management, and one faculty librarian who specializes in metadata and devotes approximately 10% of her time to research data management. Both have been trained in research data management. One student provides support at ten hours per week. DigitalCommons@USU is provided by the Library. There is no limit on the file size and the Library has unlimited storage. The Library subscribes to Amazon S3 as a back up service to DigitalCommons@USU and also had placed datasets into the Digital Preservation Network (DPN) for long-term preservation. The Library also provides all support for cataloging systems and programs.

[What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.](#)

Our process is still new to the campus and can be unfamiliar even to established PIs. Assisting researchers through each stage currently can require significant consultation. Obtaining data from researchers is challenging. Ensuring that data has been properly described, formatted and documented so it will be accessible and usable for the long term requires tactful yet firm conversations with researchers. We are interested in learning from other institutions best practices for working with faculty to facilitate data management. The long-term sustainability of the program may require additional investments in human resources if research outputs grow significantly.

Carnegie Classification: Doc Univ: Higher Research Activity

SECTOR: Public, 4-year or above

HBCU: o

OBereg: Rocky Mountains CO ID MT UT WY

HSI: o

LANDGRNT: 1

MSI: o

MEDICAL: 1

Virginia Tech

*This document has the responses from the application for the Accelerating Public Access to Research to Data Workshop. **Responses are from August 2018.***

If an interested institution wanted to learn more, is there a point of contact? If so, please provide his or her contact information here: Andi Ogier, alop@vt.edu

Do you have a committee or working group charged with addressing public access to data?
Activities are underway in individual units, but no coordination as of yet.

Who are the team members who are currently working or plan to work together to plan for public access to data? Please provide their names and titles.

Virginia Tech intends to convene a working group of individuals representing Information Technology, University Libraries, Office of Research and Innovation, and University Counsel to develop a strategy for public access to federally funded research data. Chief of staff Laurel Miner and Associate Vice President Research and Innovation, Scholarly Integrity and Research Compliance Lisa Lee will serve as Office of Research and Innovation representatives. Associate dean for research and informatics Julie Griffin, data services director Andi Ogier, and data curation services coordinator Jon Petters will serve as University Libraries representatives. University legal counsel Kay Heidbreder and associate university legal counsel Steve Capaldo will serve as University Counsel representatives. Associate Vice Provost for Academic Administration Ellen Plummer, Associate Vice Provost for Faculty Affairs Peggy Layne, and current chair of the commission on research Ginny Pannabecker will serve and ensure involvement of the university community through governance in the process of designing a system for public access to research data. Faculty members D. Sarah Stamps (Geosciences) and LaDale Winling (History) will participate in the working group, and as time allows in larger conversations about overall institutional strategy development. Workshop Attendees: Steve Capaldo, Associate University Counsel (scapaldo@vt.edu) Andi Ogier, Director, Data Services, University Libraries (alop@vt.edu) Laurel Miner, Chief of Staff, Office of the Vice President for Research, (laminer@vt.edu) Peggy Layne, Assistant Provost for Faculty Development, Office of the Executive Vice President and Provost (playne@vt.edu), LaDale Winling, Associate Professor, Department of History, (lwinling@vt.edu); Working Group: IT/Advanced Research Computing, Robert Settlege, IT/Security, Randy Marchany, University Counsel, Steve Capaldo, University Counsel, Kay Heidbreder, OVPRI/Chief of Staff, Laurel Miner, OVPRI/Research and Innovation, Scholarly Integrity and Research Compliance, Lisa Lee, University Libraries, Andi Ogier, University Libraries, Jonathan Petters, University Libraries, Julie Griffin, Geosciences, D. Sarah Stamps, History, LaDale Winling, Commission on Research, Ginny Pannabecker, Office of the Provost, Ellen Plummer

What unit(s) is or will this planning group report to?

The working group will report to a leadership team led by the Office of Executive Vice President and Provost, with membership to include leadership of the four divisions represented: IT, University Libraries, OVPRI, and University Counsel, as well as the current chair of the commission on research.

Provide a brief summary of current activities that your institution is pursuing to develop and implement policies, programs, or systems for public access to research data.

As a global, public land-grant university, Virginia Tech has always emphasized the value that its research enterprise provides to the public. In service of its land-grant roots and commitment to preserving and providing access to the scholarly record, the University Libraries has invested in a number of services, built into active research environments, aimed at helping researchers easily and effectively share their data. VTechData, the university's data repository, provides curation services for research data generated at Virginia Tech, and currently provides public access to 109 research datasets. In the last six months, the Libraries have partnered with Advanced Research Computing to implement Globus as a tool for transferring large datasets. We have offered DMP consulting services since 2012, and recently developed a data management inventory process that facilitates conversations about data management between graduate students and faculty mentors as a first step towards developing graduate school data policy. Pilots and assessments for this initiative should complete in the next year. We also offer a variety of educational opportunities to faculty and graduate students on data sharing, data publication, data analytics, and data visualization, including a for-credit graduate-level course entitled Data Management Skills. In addition, the Virginia Tech Transportation Institute provides access to a growing number of datasets (currently 69) derived from a petabyte-size dataset of driving data. Virginia Tech has also recently become a member of the Qualitative Data Repository from Syracuse University; this new partnership allows us to actively support curation and public access to qualitative datasets.

Provide a brief statement on what institutional resources have or will be dedicated to provide public access to data? What kind of support do you have from the institution?

The University Libraries will continue to provide both services and infrastructure dedicated to enabling open and public access to, and use of, research data. Existing services and infrastructures are being, and will continue to be, assessed and improved, with the goal of making public sharing of useful research data efficient, effective, and easy. Convening this representative working group, with the support of the Provost, will ensure that the University moves forward with a process for maximizing public access to research data with full buy-in from the faculty, staff, and administrative units on campus. Support from the Commission on Graduate Policies and Studies already exists in the form of the graduate data policy pilot program, and the involvement of a member of the University's Commission on Research will ensure that the outcomes of this working group will align with governance processes.

What are your institution's most current and pressing challenges with respect to providing public access to university data? What do you hope to learn from this Workshop? We plan to use your response to create small group discussions with other institutions with similar challenges.

One of the biggest challenges to providing public access to university research data is the time and effort it takes to shift academic culture. Mandated changes, such as the DMP and data sharing requirements from NSF, have made significant headway in this area; however, until we can show the direct, immediate, individual value of providing public access to research data to researchers and research groups on the ground (or in the lab), achieving significant buy-in will be difficult. Academic librarians have been working to slowly affect change within institutional culture for the past ten years. While significant gains have been achieved in affecting this change, there is still much more work to be done to change the landscape of scholarly and scientific measures of impact. Our goals for this workshop are many. We hope to: send a subset of our working group to the workshop in order to learn strategies for gaining both administrative (top down) and grassroots (bottom up) support for public access to research data; connect with other universities, particularly our peer institutions, to share knowledge and create a network of working groups across academic institutions that can share methods and processes for developing plans to provide public access to institutional research data; strategically create a small group of public research data champions at our institution, who can work to implement processes that achieve maximum faculty and administrative buy-in; and to contribute our thoughts, ideas, experiences, and questions to this national effort.

Carnegie Classification: Doc Univ: Highest Research Activity

SECTOR: Public, 4-year or above

MEDICAL: 1

OBEREG: Southeast AL AR FL GA KY LA MS

HBCU: 0

NC SC TN VA WV

HSI: 0

LANDGRNT: 1

MSI: 0

Appendix D - AAU and APLU Steering Committee on Public Access

Charge of the Steering Committee

The Steering Committee will serve as advisors to the Association of American Universities (AAU) and the Association of Public and Land-grant Universities (APLU) on next steps for building on the 2018 *October Workshop: Accelerating Public Access to Data* and 2017 [AAU-APLU Public Access Working Group Report](#).

Together, the Steering Committee and the association staff will develop a vision and strategy for accelerating public access to research data, articulated through a brief strategic plan document.

During the development of the strategic plan, the Steering Committee will offer feedback to APLU, AAU and the Workshop Planning Committee with the following activities:

1. Assess the impact of the October 2018 Workshop and identify opportunities to guide future collaborations among the community and challenges within the higher education community that should be addressed to incorporate data sharing into the research enterprise
2. Identify an approach to keeping the community engaged and networked through a collaboration/communication system that would facilitate sharing ideas, asking questions, and keeping the community abreast of developments
3. Suggest future activities to address issues in accelerating public access to research data, including
 - additional workshops to develop new approaches to issues faced by institutions in implementing and advancing public access to research data,
 - follow-up activities with federal agencies to support campus action plans that facilitate the sharing of research data, and
 - campus site visits to allow stakeholders from a variety of campuses to build on data sharing efforts through immersive, in-person discussions with their peers aimed at providing local support for an institution to implement data sharing for their researchers

In addition to guiding Workshop follow-up activities, the role of the Steering Committee is to act as thought partners with APLU and AAU to understand the scope and landscape of current data sharing practices and policies as well as the current levers that exist to influence institutional and cultural change.

Steering Committee Members

- **Greg Madden (Chair)**, Senior Advisor for Research Computing and Cyberinfrastructure, Pennsylvania State University
- **Jeff Chasen***, Associate Vice Provost, Integrity & Compliance, University of Kansas
- **Tom Cramer**, Assistant University Librarian and Director, Digital Library Systems and Services, Stanford University

- **Kevin Gardner**, Vice Provost for Research, and Professor, Civil and Environmental Engineering, University of New Hampshire
- **Heidi Imker**, Director, Research Data Science and Associate Professor, University Library, University of Illinois at Urbana – Champaign
- **James Luther***, Associate Vice President Finance & Federal Sponsor Liaison, Duke University
- **Sarah Nusser***, Vice President for Research, Iowa State University
- **Pegah Parsi**, Privacy Officer, University of California at San Diego
- **Jim Reecy***, Associate Vice President for Research, Iowa State University
- **Lawrence (Larry) Sutter**, Professor, Dept of Materials Science and Engineering, Michigan Technological University
- **Tyler Walters***, Dean of University Libraries, Virginia Tech
- **James (Jim) Wilgenbusch**, Senior Associate Director Minnesota Supercomputing Institute (GEMS), University of Minnesota
- Staff:
 - Kacy Redd, Associate Vice President, Association of Public and Land-grant Universities
 - Katie Steen, Federal Relations Officer, Association of American Universities
 - Toby Smith, Vice President for Policy, Association of American Universities

*Also served on the APLU-AAU Public Access Working Group and NSF Workshop Committee.

Appendix E - Acknowledgments

We thank the following for their help in developing the workshop and this report:

- Jeff Chasen, University of Kansas
- James Luther, Duke University
- Sarah Nusser, Iowa State University
- Kacy Redd (PI), APLU
- James Reecy (co-PI), Iowa State University
- Toby Smith (co-PI), AAU
- Katie Steen, AAU
- Tyler Walters, Virginia Tech



This material is based upon work supported by the National Science Foundation under Grant No. (1837847). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

The workshop was also supported by the Association of American Universities and the Association of Public and Land-grant Universities. We thank them for their support.



**Association
of American
Universities**
Inquiry · Innovation · Impact

Founded in 1900, the Association of American Universities is composed of America's leading research universities. AAU's 62 research universities transform lives through education, research, and innovation. Our member universities earn the majority of competitively awarded federal funding for research that improves public health, seeks to address national

challenges, and contributes significantly to our economic strength, while educating and training tomorrow's visionary leaders and innovators. AAU member universities collectively help shape policy for higher education, science, and innovation; promote best practices in undergraduate and graduate education; and strengthen the contributions of leading research universities to American society.



**ASSOCIATION OF
PUBLIC &
LAND-GRANT
UNIVERSITIES**

The Association of Public and Land-grant Universities (APLU) is a research, policy, and advocacy organization dedicated to strengthening and advancing the work of public universities in the US, Canada, and Mexico. With a membership of 239 public research universities, land-grant institutions, state university systems, and affiliated organizations, APLU's agenda is built on the three pillars of increasing degree completion and academic

success, advancing scientific research, and expanding engagement. Annually, member campuses enroll 4.9 million undergraduates and 1.3 million graduate students, award 1.3 million degrees, employ 1.3 million faculty and staff, and conduct \$44.9 billion in university-based research.