

**DOE Award Number DE-FG02-12ER26086/DE-SC0008645**  
***Final Performance Report for the Board on Research Data and Information***  
**Policy and Global Affairs Division**  
**National Academy of Sciences**  
**August 15, 2012 – August 14, 2015**

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Below is the summary of our activities during the performance period of this grant, from August 15, 2012 through August 14, 2015. We met or exceeded all targeted deliverables. We also spent all the funds under this award by August 2015.

#### **Events during the Performance Period**

- Seventh BRDI Board Meeting, August 29-30, 2012**

The Board met at the main NAS building in Washington, DC to plan our activities and assess their progress. We also held a sponsor roundtable focusing on the interagency “big data” program. For the agenda and presentations, see:

[http://sites.nationalacademies.org/PGA/brdi/PGA\\_070714](http://sites.nationalacademies.org/PGA/brdi/PGA_070714)

- BRDI Symposium: Global Scientific Data Infrastructures, August 29, 2012**

BRDI hosted a symposium and discussion on Global Scientific Data Infrastructures on August 29, 2012. This event examined potential near-term actions and outcomes that can serve as a focus for community efforts toward a global organization for the exchange of scientific data, initial referred to as the Data Web Forum (DWF). The agenda, links to slides and audio files, and additional information is available at [http://sites.nationalacademies.org/PGA/brdi/PGA\\_070715](http://sites.nationalacademies.org/PGA/brdi/PGA_070715).

This was an early public meeting in the formation of a major new non-governmental international scientific data organization, the Research Data Alliance, which was formed several months later. This provided a lot of visibility for BRDI in the international research community. We also got the new RDA to use the NAS facilities for its second plenary meeting this September, which was an extension of our involvement.

This “mini-symposium” is one in a series of such meetings that we have held in conjunction with our regularly scheduled Board meetings. They are intended to highlight a major issue of current importance, either in response to a sponsor’s interest or following up on ideas generated by the Board itself. Such symposia provide much greater visibility of the Board, with over 100 attendees at each meeting, a service to the sponsors and broader research community, and may be used to generate further Board activity in the future.

- US-China Workshop on Data Intensive Science, October 24-25, 2012**

The US CODATA and Chinese CODATA committees organized a 2-day workshop in Shanghai, China, on all aspects of data sharing in data-intensive scientific disciplines. The summary report of the workshop is expected to be published in the CODATA Data Science Journal.

This was an example of a bilateral and capacity building effort on the part of the US CODATA.

- **CODATA International Conference and General Assembly, October 27-November 2, 2013**

The International Committee on Data for Science and Technology (CODATA, [www.codata.org](http://www.codata.org)) is an interdisciplinary committee of the International Council for Science (ICSU). It is concerned with various types of quantitative data resulting from experimental measurements or observations in the natural and social sciences, and the engineering disciplines. It gives particular emphasis to data management problems common to different scientific fields and to data sharing among these disciplines. The U.S. National Committee for CODATA (the U.S. CODATA) functions as a bridge between the scientific and technical community in the United States and the international CODATA on data issues addressed in the natural and social sciences. The U.S. CODATA is represented by BRDI.

CODATA held its 23rd International Conference and General Assembly in October 27-November 2, 2012, in Taipei, Taiwan. Several USNC/CODATA members and staff participated in organizing the program and individual sessions, and gave presentations in this event. The U.S. National Delegate and other U.S. participants in the CODATA leadership are very influential in setting the organization's agenda and leading its activities. The results of both the Conference and the General Assembly are available at <http://www.codata.org>.

The conference was followed by the CODATA General Assembly, the organization's plenary business meeting. At that CODATA General Assembly, Prof. Sara Graves of the University of Alabama at Huntsville, a member of the CODATA Executive Committee and the US CODATA was elected to a 4-year term as Secretary General, and Bonnie Carroll, CEO of Information International Associates, was elected to the Executive Committee. Several U.S. co-chairs of CODATA Task Groups concluded, continued, or began their terms as well. For a list of Task Groups and their focus and membership, see: <http://www.codata.org/taskgroups/index.html>.

In addition to the activities summarized above, we provided a forum for the international CODATA projects and issues at each BRDI meeting and held meetings and conference calls of the US CODATA principals between the BRDI meetings to focus on the US interests in the organization's work. Taken together, the planning, broad involvement and leadership of the US in the international CODATA organization has made it the most productive and influential national member of that organization.

- **Eighth BRDI Board Meeting, February 26-27, 2013**

We held this Board meeting at the main NAS building to continue planning and advising on the Board's projects. We also held a sponsor forum and a session with publishers' representatives to

discuss issues pertaining to the linking of data to journal articles. More information about this meeting may be found at: [http://sites.nationalacademies.org/PGA/brdi/PGA\\_081669](http://sites.nationalacademies.org/PGA/brdi/PGA_081669).

- **Finding the Needle in the Haystack: A Symposium on Strategies for Discovering Research Data Online, February 26, 2013**

This symposium highlighted some of the different approaches to finding data, providing examples that are both broadly interdisciplinary as well as discipline-specific to finding the right data at the right place in the right time. Although common solutions were not offered to this set of problems, we did shed some light on the underlying issues and provided an opportunity for experts working in this area to interact, both among each other and with the audience. More information, including the agenda, slides, and audio, is here: [http://sites.nationalacademies.org/PGA/brdi/PGA\\_081268](http://sites.nationalacademies.org/PGA/brdi/PGA_081268).

- **9th BRDI Board Meeting, September 23-24, 2013**

The 9th BRDI Board Meeting was held at the NAS Keck Center in Washington, DC. The meeting included an extensive discussion of the Public Access to government and government-funded research data and information, along with an update on changes to CODATA and a closed planning meeting for Board members only. To view the agenda, please visit [http://sites.nationalacademies.org/PGA/brdi/PGA\\_084188](http://sites.nationalacademies.org/PGA/brdi/PGA_084188).

- **BRDI Symposium: Privacy in a Big Data World, September 23, 2013**

Big data describes the phenomenon of an explosion in quantities of scientific data available for research. Big data implies new ways of thinking about data that emphasize their reuse and repurposing, and the recombination and aggregation of data from multiple sources; these are practices that are often in tension with traditional ideas about privacy and anonymity. How can we provide adequate privacy protection for individuals without impeding research and innovation? How do these different regulatory approaches to privacy impact national and transnational research? Has society's perspective on privacy evolved in a digital world, and how may it have to change further in the future? This Symposium explored current developments in these and related areas. More information, including the agenda, is here: [http://sites.nationalacademies.org/PGA/brdi/PGA\\_084312](http://sites.nationalacademies.org/PGA/brdi/PGA_084312)

- **10<sup>th</sup> BRDI Board Meeting, March 11, 2014**

This meeting, held in Washington, DC at the main NAS building, mostly in executive session, was focused largely on planning of Board projects. Since it was a closed meeting, there is no additional information about it on our website.

- **Planning workshop on Strategies for Economic Sustainability of Publicly Funded Data Repositories, March 12, 2014**

This planning workshop was held at the main NAS building in Washington, DC. Detailed information about this event, including the agenda and presentation slides, is available at: [http://sites.nationalacademies.org/PGA/brdi/PGA\\_087151](http://sites.nationalacademies.org/PGA/brdi/PGA_087151).

- **Developing Data Attribution and Citation Practices and Standards**

This project, which ended on March 31, 2014, held a workshop in Washington, DC on September 17-18, 2013 to develop a set of consensus Data Citation Principles with other groups working on this topic. It was part of a larger CODATA-ICSTI Task Group activity. That activity was finalized in February 2014 with a Joint Declaration of Data Citation Principles, which are available here: <http://www.force11.org/datacitation>. Active worldwide dissemination of these Principles is underway.

We also issued an online report, **OUT OF CITE, OUT OF MIND: THE CURRENT STATE OF PRACTICE, POLICY, AND TECHNOLOGY FOR THE CITATION OF DATA**, which was published by the CODATA Data Science Journal in September 2013, and is available here: [https://www.jstage.jst.go.jp/article/dsj/12/0/12\\_OSOM13-043/](https://www.jstage.jst.go.jp/article/dsj/12/0/12_OSOM13-043/) article. (DOI: 10.2481/dsj.OSOM13-043). The BRDI/US CODATA staff serves as the staff for the CODATA-ICSTI Task Group.

- **U.S. China Workshop on Moving Forward on Data Policy and Cooperation in Earth Observations**

This 2-day meeting was held in August 25 - 26, 2014 in Washington, DC. Presentations are available at the BRDI website ([www.nas.edu/brdi](http://www.nas.edu/brdi))

- **Legal Interoperability of Research Data**

BRDI held a half-day session on the RDA-CODATA Interest Group (IG) on the Legal Interoperability of Research Data, at the Plenary 4 meeting of the Research Data Alliance in Amsterdam on September 22-23, 2014.

- **11th BRDI meeting, October 22, 2014 and associated activities (October 21-23, 2014), Washington, DC**

BRDI held its Board Meeting on October 22, a Symposium on the Interagency Strategic Plan for Big Data, the BRDI Data & Information Challenge Presentations, and the Workshop on Developing IP Law Principles for Research Data.

**BRDI Competition and Prize:** A BRDI steering committee has overseen a competition on the theme of publicly available research data and information, and awarded prizes in memory of Lee Dirks, Microsoft Research, at the 11th BRDI Board meeting. Adam Asare et al. won first place with their work entitled "ITN TrialShare: Enabling True Clinical Trial Transparency," and the runner-up award was given to Mahadev Satyanarayanan et al. for their work "Olive: Sustaining Executable Content over Decades." For additional information: [http://sites.nationalacademies.org/PGA/brdi/PGA\\_085255](http://sites.nationalacademies.org/PGA/brdi/PGA_085255).

- **The Future of the Commons: Data, Software, and Beyond**

During the performance period of this award, BRDI started organizing, together with members of RDA, NFAIS, and CENDI, “The Future of the Commons: Data, Software, and Beyond,” a November 18, 2015 workshop hosted by BRDI at the National Academies of Sciences, Engineering, and Medicine’s Keck Center in Washington, DC, on November 18, 2015. Among the speakers are John Wilbanks (Chief Commons Officer at Sage Bionetworks), Robert Grossman (University of Chicago), Jerry Sheehan (OSTP), and Maurie Kelly (Penn State University).

- **12th BRDI/ US CODATA Board Meeting**

BRDI started organizing a US CODATA/BRDI board meeting for November 19, 2015, immediately after the workshop, including newly appointed BRDI members and several U.S. agency representatives.

## **Published Reports**

In addition to our openly available description, agendas, presentation slides, and audio proceedings from most of our meetings (see links above), we published the following book-length reports during this period of performance:

- **For Attribution: Developing Data Attribution and Citation Practices and Standards, November 2012**

The U.S. CODATA and BRDI, in collaboration with the CODATA-ICSTI (International Council for Scientific and Technical Information) Task Group on Data Citation Standards and Practices, held a 2-day international symposium and workshop in Berkeley, CA. The event focused on: a) the universal as well as field-specific or context-specific technical, scientific, institutional, financial, legal, and socio-cultural issues that need to be considered in developing and implementing scientific data citation standards and practices; and b) the status of data attribution and citation practices in individual fields in the natural and social sciences in United States and internationally. A summary report has been published. The meeting background, agenda, speaker bios, and presentation slides are available at:

[http://sites.nationalacademies.org/PGA/brdi/PGA\\_063656](http://sites.nationalacademies.org/PGA/brdi/PGA_063656). The report (DOI: 10.17226/13564) is freely available online at: [http://www.nap.edu/catalog.php?record\\_id=13564](http://www.nap.edu/catalog.php?record_id=13564).

- **The Case for International Scientific Data Sharing: A Focus on Developing Countries, December 2012**

BRDI, in collaboration with the NRC Board on International Scientific Organizations (BISO), and the International Council of Science’s Committee on Freedom and Responsibility in the Conduct of Science (CFRS), organized a 2-day international symposium in April 2011. This event examined various issues that promote or hinder data sharing in public research and made a

compelling case for the benefits to science and society of international data sharing. The symposium held five sessions, each one focused on an important set of issues in data sharing. There were presentations by national and international experts from governmental organizations, academia, non-governmental organizations, and industry. A proceedings report has been prepared by the BISO and BRDI directors, and published in December 2012. The CFRS already has released a policy statement on this topic. The symposium agenda, speaker bios, and presentation slides are available at: [http://sites.nationalacademies.org/PGA/biso/PGA\\_061353](http://sites.nationalacademies.org/PGA/biso/PGA_061353). The report (DOI: 10.17226/17019) is freely available online at: [http://www.nap.edu/catalog.php?record\\_id=17019](http://www.nap.edu/catalog.php?record_id=17019).

- **The Future of Scientific Knowledge Discovery in Open Networked Environments, December 2012**

BRDI organized a two-day workshop in March 2011 to bring together key stakeholders in the scientific knowledge discovery area for intensive and structured discussions. The objective was to obtain a better understanding of the state-of-the-art and trends in the study of computational knowledge discovery in the open online environment and to develop a range of options for future work in this area. A summary report from that meeting was published in December 2012. Additional background information, the meeting agenda, speaker bios, and presentation slides are available on the BRDI website at: [http://sites.nationalacademies.org/PGA/brdi/PGA\\_060422](http://sites.nationalacademies.org/PGA/brdi/PGA_060422). The report (DOI: 10.17226/18258) is freely available online at: [http://www.nap.edu/catalog.php?record\\_id=18258](http://www.nap.edu/catalog.php?record_id=18258).

- **Future Career Opportunities and Educational Requirements for Digital Curation, April 2015**

The Board's consensus study entitled "Preparing the Workforce for Digital Curation," which was separately funded, was published solely in electronic version and released on April 22, 2015. The full report (DOI: 10.17226/18590) can be downloaded free of charge at <http://www.nap.edu/catalog/18590/preparing-the-workforce-for-digital-curation>. As of the end of the performance period for this award, it was downloaded well over 1,500 times, well above average for Academies reports of that age. The report was downloaded by individuals in the U.S., Canada, and other countries around the world. "Preparing the Workforce for Digital Curation" ranked in the upper 28% and the upper 22% in policy for science and technology downloaded from the National Academies Press website. The Altmetric score for this report was 98, in the top 5% of all research products of that age. Additional information about this study is available at [http://sites.nationalacademies.org/PGA/brdi/PGA\\_069853](http://sites.nationalacademies.org/PGA/brdi/PGA_069853).

Print copies of all reports may be ordered through the National Academies Press at: (<http://www.nap.edu>). Additional information about the background of each of these projects may be found on the Board's website at [www.nas.edu/brdi](http://www.nas.edu/brdi).