IRIS Impact Report
Fall 2018

IRIS

**INSTITUTE FOR
RESEARCH ON
INNOVATION & SCIENCE**

Contents

This document is our first attempt to collect in one place general information about the work IRIS does and the impact we have. I come away from reading it impressed by the breadth of what we have accomplished together in three short years. IRIS is a national and growing consortium of universities, a source of reporting and information to support outreach on behalf of universities and the academic research endeavor, and a home for a growing national research community that addresses questions of fundamental interest to social scientists and of practical interest to policy makers and universities.

The IRIS professional staff has grown to include 13 people who are working to improve data and reporting, developing and maintaining a cutting-edge IT infrastructure for securely taking and sharing data, managing the day-to-day business of a sprawling consortium and providing support to researchers located at 21 institutions across the country. The value IRIS provides to member universities, to the science policy community, and to researchers is becoming ever more apparent. We're very pleased to be able to share more information about who we are and what we do with all of you.

Jason Owen-Smith
IRIS Executive Director

What is IRIS?

IRIS is a national consortium of research universities organized around an IRB-approved data repository. IRIS develops data for research and reporting to understand, explain and improve the public value of higher education.
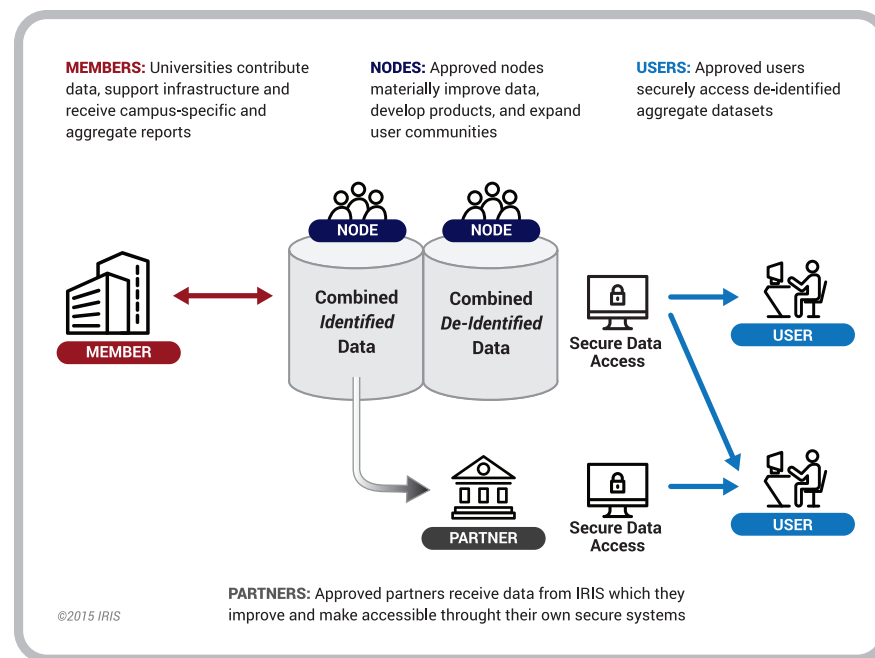
UNIVERSITIES
Provide and Use the Data

IRIS provides member institutions with university-specific reports based on their data, highlighting the impacts of their research efforts and investments.

RESEARCHERS
Refine the Data

IRIS creates a secure data enclave for the research community by collecting, integrating, warehousing, and making large-scale data accessible to researchers.

POLICY MAKERS
Leverage the Data

IRIS provides policy makers with credible data on the value of research to address pressing social science and policy questions.

MEMBERS: Universities contribute data, support infrastructure and receive campus-specific and aggregate reports

NODES: Approved nodes materially improve data, develop products, and expand user communities

USERS: Approved users securely access de-identified aggregate datasets

MEMBER

NODE   NODE

Combined *Identified* Data   Combined *De-Identified* Data

Secure Data Access

USER

PARTNER

Secure Data Access

USER

PARTNERS: Approved partners receive data from IRIS which they improve and make accessible throught their own secure systems
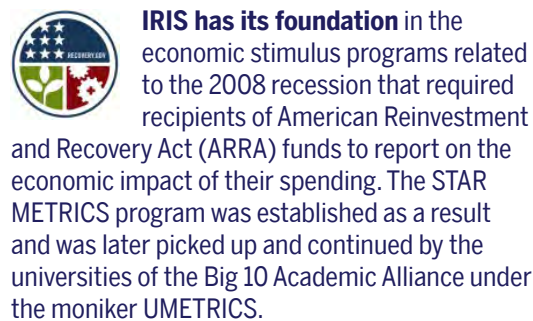
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IRIS member universities
contribute data, help support the IRIS infrastructure with an annual membership fee, and receive campus-specific and aggregate reports.
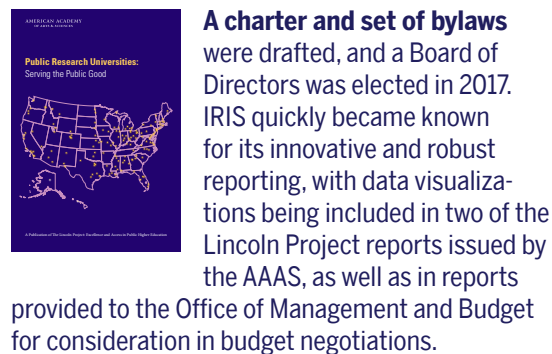
IRIS nodes make important data improvements, develop
and refine data products that go back to members, and help expand user communities.

IRIS partners improve IRIS data by linking it to other
data assets and making de-identified versions available for research through their own secure systems.

IRIS users access de-identified aggregate data through the
IRIS Virtual Data Enclave (VDE). Census linked data are available through the Federal Statistical Research Data Center (FSRDC) System.

IRIS has its foundation in the economic stimulus programs related to the 2008 recession that required recipients of American Reinvestment and Recovery Act (ARRA) funds to report on the economic impact of their spending. The STAR METRICS program was established as a result and was later picked up and continued by the universities of the Big 10 Academic Alliance under the moniker UMETRICS.

IRIS was established in 2015 with start-up funding from the Ewing Marion Kauffman and Alfred P. Sloan Foundations as a way to understand innovation by exploring the flow of people and ideas into the economy through administrative data that includes people paid and purchases made for research activities.

IRIS
INSTITUTE FOR RESEARCH ON INNOVATION & SCIENCE

Rather than conceiving of impact by simply pointing to the end product of research (a publication) as the representation of scientific productivity, this approach traces all members of research teams and explores the impact of this spending. Situated at the University of Michigan in the Institute for Social Research, IRIS began to hire staff and acquire member universities.

Number of Employees By Sector

Education - 33,730 (32%)
21 universities

Private - 71,350 (68%)
21 universities

All   Grad Students   Post Docs

The first reports were issued in 2016 to members and by the end of its third year IRIS had over 30 members, with many more exploring membership.

| 2008-2014 | 2015 | 2016 |
| 2017 | 2018 | Going Forward |

A charter and set of bylaws were drafted, and a Board of Directors was elected in 2017. IRIS quickly became known for its innovative and robust reporting, with data visualizations being included in two of the Lincoln Project reports issued by the AAAS, as well as in reports provided to the Office of Management and Budget for consideration in budget negotiations.

The first cohort of **member universities renewed** their commitment to IRIS this year. IRIS produced the initial specialty reports.

A second election was held for the IRIS Board of Directors.

IRIS funded the first cohort of researchers using UMETRICS data to answer questions of social and economic impact through the IRIS Researcher Awards.

In the future, we plan to launch **affiliate IRIS memberships** and appoint a Policy & Outreach Committee.

IRIS will fund the second cohort of researchers using IRIS data through IRIS Researcher Awards.

IRIS Researcher Awards

IRIS Highlights

Average Salary for a Graduate Student in IRIS Data After Leaving an Institution

$100,000
$80,000
$60,000
$40,000
$20,000
$0

$58,290 — year 1
$85,347 — year 5

30+ papers published or drafted using IRIS UMETRICS data and **3** books
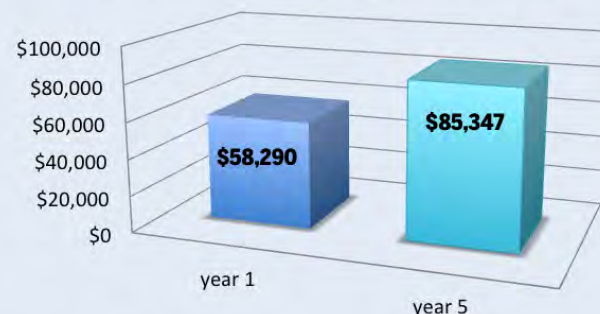
399 researcher help desk queries completed

The average wage paid by vendors associated with IRIS universities is over **$10,000** higher than the national average

592,811 research employees in IRIS UMETRICS data

Research employees in IRIS data found employment in all **50** states, as well as the District of Columbia

30+ Universities contribute data

84 researchers using data in the IRIS Virtual Data Enclave from 21 institutions

2 annual research data releases since 2016

256,062 sponsored project grants in IRIS UMETRICS data

Grant Collaboration Network

IRIS University Research Spending Report by Congressional District

$1 - $183,200
$183,201 - $531,300
$531,301 - $1,214,800
$1,214,801 - $3,120,600
$3,120,601+
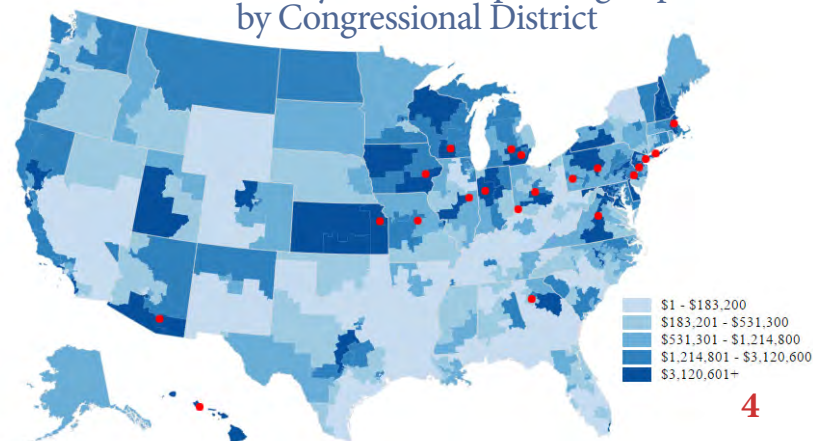
Membership

IRIS members

are drawn from just about every corner of the map. The original IRIS member universities were concentrated in the Midwest but we have since expanded and hope to add more members in other areas of the country.

Member

universities receive:

- **Interactive campus-level reports** that synthesize, summarize and provide visualizations of data
- Aggregate indicators of the **national impact** of university research
- A **seat at the table** to build future products and initiatives
- Secure access to **IRIS data for research** use by their students and faculty at no additional cost

This latest reporting showing where research trainees find employment after leaving Ohio State is extremely useful, particularly the statistic that about a third of them find their first positions in Ohio.

This belies some widely-held beliefs that all of our highly trained graduates leave the state. This is particularly useful data in demonstrating what Ohio State is doing to improve the talent pool in the state, which in turn can be very valuable in attracting companies to come to Ohio and elevate the overall economy. We can use these data not only for our industry attraction efforts, but also in demonstrating value to our state and federal delegations. Thanks to you and all of IRIS for this important work. We are proud to support these efforts.

—**Janet M Weisenberger**, Senior Assoc. Vice President for Research, Ohio State Univ.

IRIS Membership as of October 1, 2018

- Boston University
- Emory University
- Indiana University
- Johns Hopkins University
- Michigan State University
- New York University
- Northwestern University
- Ohio State University
- Oregon State University
- Pennsylvania State University
- Princeton University
- Rutgers University – New Brunswick
- Stony Brook University
- University of California – San Diego
- Texas A&M University
- University of Colorado, Boulder
- University of Illinois – Urbana Champaign
- University of Iowa
- University of Kansas
- University of Michigan
- University of Missouri
- University of Oregon
- University of Pennsylvania
- University of Pittsburgh
- University of Texas-Austin
- University of Utah
- University of Virginia
- University of Wisconsin – Madison
- Virginia Polytechnic Institute and State University
- Washington University – St. Louis
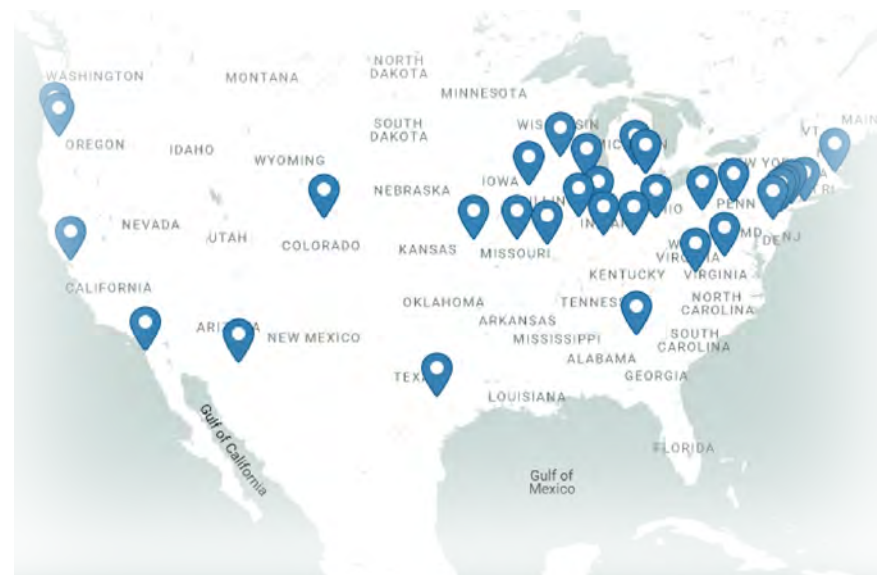
IRIS Reports

Campus-level reports constructed from an individual university's data provide resources for use in research reports, as well as presentations to the public and other stakeholders. IRIS produces three reports for its member universities that can be customized to fit the needs of each institution. All are interactive to allow the greatest flexibility in selecting elements that are most relevant. IRIS provides a Spending Report, an Employee Profile Report, and a Vendor Profile Report. IRIS also produces a variety of reports with aggregated data from all or groups of universities to tell a bigger story. However, IRIS does not share specific member reports outside the member university.

How Members Use Reports

Externally-facing strategies: Most IRIS members use their reports as communication tools with external stakeholders, such as legislators and other policymakers, as part of their overall strategy of institutional analytics to tell their stories to demonstrate the value and impact of research on their campuses.

Internally-facing strategies: IRIS members also use their reports to make data-driven decisions around research administration issues on their campuses, and to connect to and learn from campus constituents who have an interest in understanding and leveraging their institution's social and economic impact.

Example: The University of Michigan and the University of Virginia were each approached by a local congressional representative requesting information on institutional impact on the state; IRIS reports were provided and were well received.

IRIS Timeline

IRIS provides a set of reports to its members each year, based on data universities submit in mid-October. These data are cleaned and enhanced, linked to Census datasets, and returned in the form of reports by the following February. A supplemental round of reporting is carried out in the spring for those members desiring an updated set of reports. Each spring IRIS releases a de-identified research dataset based on this October data submission, with a parallel release in the Federal Statistical Research Data Centers (FSRDC) in May. Usually in October, IRIS hosts a Data Summit and a Board of Directors meeting in Ann Arbor that brings together data providers, researchers, and decision makers in an effort to build and sustain a community of users.

* dates are approximate

Date	Event
October 15	deadline for member data submission to IRIS
October	IRIS Data Summit/Board of Directors Meeting
November 15	IRIS submission of data to U.S. Census Bureau
Feb/March	reports sent to members based on Oct data
April	IRIS research data release (VDE)
April 15	deadline for optional updated data submission to IRIS
May	IRIS data release in Research Data Center (RDC)
May 15	IRIS submission of data to Census Bureau
July/August	reports sent to members based on April data

Research Using IRIS UMETRICS Data

UMETRICS data are useful

for analyzing the social and economic effects of research investments, the scientific production function, the career outcomes and earnings of doctoral students and trainees, questions pertaining to science and engineering workforce and the STEM pipeline among many other possible topics.
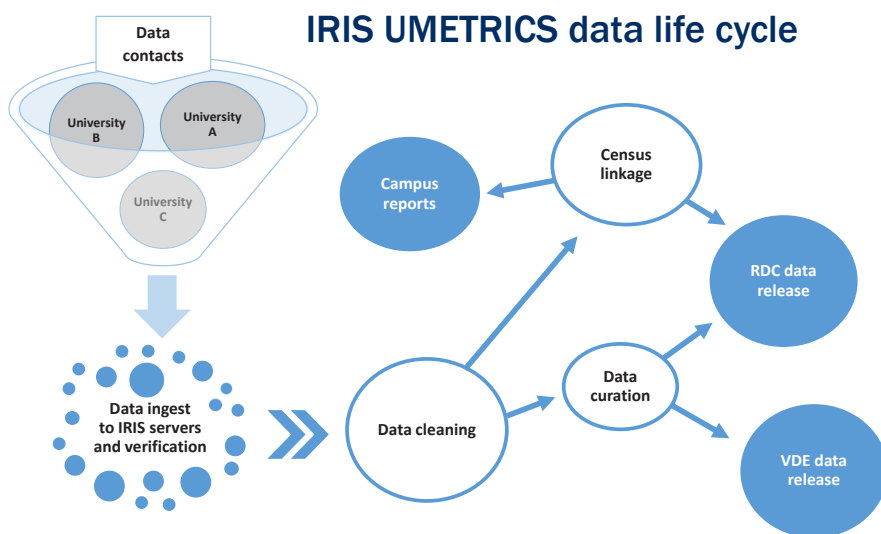
THE 2018 IRIS DATA RELEASE INCLUDES

200 years of annual data from 26 IRIS member universities

Transaction records from grants totaling **$27 billion**

Read more: http://iris.isr.umich.edu/research-data/

Researchers

can access de-identified secondary data produced by IRIS through the secure Virtual Data Enclave (VDE) and Census linked data are available in the Federal Statistical Research Data Center (FSRDC) system. The second annual research data release was made available in March and May of 2018 (respectively). The 2018 dataset includes transactions from about 300,000 unique federal and non-federal awards including wage payments to 480,000 individuals as well as transactions to organizations and individuals for goods and services totaling $27.2 billion.

IRIS UMETRICS data life cycle

Recent Research Topics

- determine how research experience shapes the career pathways of students
- examine how federally funded research yields safer and more secure food systems
- analyze gender differences in graduate studies and early career pathways within STEM fields
- explore the way scientific knowledge is translated into society by the public service activities of faculty
- measure how university vendors produce additional innovations and contribute to regional growth

IRIS Research Grants, thanks

to generous funding from the Alfred P. Sloan Foundation, fund researchers who will use IRIS data to address questions about the social and economic returns to investments in research. IRIS seeks to enable fundamental research on the results of public and private investments that support discovery, innovation, and education on the campuses of U.S. universities.

The first cohort of awardees were announced in January of 2018. They attended a three-day Data Camp in March that introduced them to IRIS data, the VDE environment, and confidentiality practices and disclosure procedures for working with the dataset. Sessions were a mix of trainings provided by IRIS staff and invited talks by researchers, who highlighted work that has been published recently or is currently underway with the IRIS research dataset.

Two more rounds of awards will be granted. A second cohort of award recipients will be announced in January 2019.

2018 IRIS Researcher Award Recipients

Douglas Guilbeault
Annenberg School for Communication
University of Pennsylvania

Charu Gupta
Wharton School of Business
University of Pennsylvania

Elan Segarra
Department of Economics
University of Wisconsin-Madison

Jason Coupet
School of Public and International Affairs
North Carolina State University

Jonathon Mote
Organizational Sciences & Communication
George Washington University

Lisa Cook
Economics and International Relations
Michigan State University
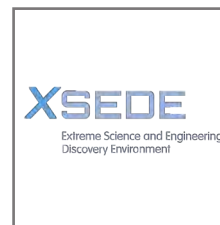
Exploring Impact

UMETRICS
IRIS reports are being used by our members to demonstrate impact and value of research with a variety of stakeholders.
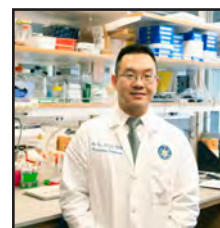
Clinical and Translational Science Award
UMETRICS data can support low burden, sustainable, and systematic examination of the scientific and career outcomes of CTSA funding in this pilot project.
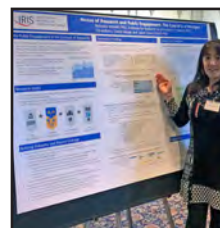
XSEDE
A pilot IRIS report will provide an analysis of the scientific effects of the access to high performance computing resources.

Student Outcomes
An educational pilot project with the U.S. Census Bureau and two IRIS universities to link student outcomes information to Census data.

Federal Advisory Committee Act (FACA)
IRIS is producing an impact report focusing on faculty service to the Federal Advisory Commission in this pilot project.

IRIS Infrastructure
IRIS Ann Arbor Staff

Ann Arbor Leadership Team

Jason Owen-Smith
Executive Director
Jason manages the activities of IRIS and is the liaison with future and current Member Institutions. He is an ex officio member of the IRIS Board of Directors.

Nancy Calvin-Naylor
Managing Director
Nancy handles the day-to-day operations of IRIS, including human resources, financial oversight, and management of internal systems and processes. She helps to set strategic goals and priorities for IRIS.

Kevin Bjorne
Technical Director
Kevin oversees IRIS technical operations, working closely with member universities, IRIS staff, and partners like the federal government to provide accurate and meaningful products for IRIS members.

Administrative Team: Nancy Calvin-Naylor team leader

Karen Woollams
Research Coordinator
Karen provides pre and post-award grant administration and can help with IRIS memberships, member invoicing, contracts, etc.

Evalyn Yanna
Administrative Assistant
Evalyn does all of the meeting scheduling and event planning, as well as the day to day activities to keep the office running smoothly.

Ann Arbor Research Team: Jason Owen-Smith team leader

Jinseok Kim
Research Assistant Professor
Jinseok's work focuses on understanding the human interaction patterns extracted from large-scale data generated from diverse information and communication technologies.

Jake Fisher
Research Investigator
Jake develops and tests network diffusion models, to understand how ideas, innovations, and information spreading through a group of people help to create and maintain a common culture over time.

Technical Team: Kevin Bjorne team leader

Amy Butchart
Lead Programmer
Amy collaborates and coordinates with data curators, researchers, and analysts at federal agencies and at IRIS member institutions.

Najla August
Lead Developer
Najla is a data visualization expert, applications developer and is skilled in a variety of programming platforms and languages.

Natsuko Nicholls
Research Manager
Natsuko manages, documents, and analyzes IRIS datasets and directs data support for researchers who use de-identified IRIS data in the VDE.

Beth Uberseder
Research Support Specialist
Beth works to help create a strong community of IRIS researchers and provides support to researchers accessing IRIS datasets.

Rob Truex
Data Manager
Rob cleans, maintains and integrates large administrative data sets for IRIS and helps ensure the robustness of the IRIS data system.

Lia Chen
Web Developer
Lia designs and develops interactive data visualizations and components in the web portal and troubleshoots IRIS web apps.

Governance

IRIS member universities elect the IRIS Board of Directors. They appoint several at-large members, a Scientific Advisory Board and a Policy and Outreach Advisory Board. In addition to the six elected representatives of the IRIS membership, The University of Michigan (as host institution) named one representative to the board.

The Board oversees the management of the affairs, business, and activities of IRIS, and establishes policies and directives governing business and programs of IRIS.

Board of Directors

Mary Sue Coleman
President, Association of American Universities (at-large member)

Kimberly Espy
Provost and Vice President for Academic Affairs, University of Texas-San Antonio
Term: April 1, 2017-March 31, 2020

Kimberly Griffin
Director for Electronic Research Administration, Northwestern University
Term: April 1, 2017-March 31, 2021

James Hilton
Vice Provost for Academic Innovation, University Librarian & Dean of Libraries, Univ of Michigan
Term: April 1, 2017-

Daniel Reed
Senior Vice President for Academic Affairs, University of Utah
Term: April 1, 2017-March 31, 2020

Neil Sharkey
Vice President for Research, Pennsylvania State University
Term: April 1, 2017- March 31, 2019

Rodolfo Torres
Associate Vice Chancellor for Research, University of Kansas
Term: April 1, 2018- March 31, 2021

Caroline Whitacre
Senior Vice President for Research Emerita, Ohio State University
Term: April 1, 2017- March 31, 2019

Scientific Advisory Board

Erica Fuchs
Professor, Department of Engineering and Public Policy, Carnegie Mellon University

Kaye Husbands Fealing
Chair and Professor, School of Public Policy, Georgia Inst of Technology

Ron Jarmin (IRIS Co-PI)
Associate Director for Economic Programs, and Performing the Non-Exclusive Functions and Duties of the Director, U.S. Census Bureau

Julia Lane (IRIS Co-PI)
Professor, Wagner School; Center for Urban Science and Progress, Provostial Fellow, New York University

Erin Leahey
Professor of Sociology, University of Arizona

Christopher Liu
Assistant Professor, Strategic Management, University of Toronto

Andrew McCallum
Professor, Dept of Computer Science, Univ of Massachusetts Amherst

Walter "Woody" Powell
Professor of Sociology, Stanford University

Paula Stephan
Professor of Economics, Georgia State University

Bruce Weinberg (IRIS Co-PI)
Professor of Economics, Ohio State University

Selected Publications

Selected research papers and books using IRIS data:

Wrapping it up in a person: Examining employment and earnings outcomes for Ph.D. recipients

The December 15, 2015 issue of Science featured a research report from matching UMETRICS and U.S. Census Bureau data. The analysis covers 2010–2012 earnings and placement outcomes of students who received doctorates in 2009–2011. Key findings include that almost 40% of supported doctorate recipients both federally and nonfederally funded, entered industry and they were much more likely to get jobs at large and high-wage establishments in high-tech and professional service industries than the rest of the U.S. workforce.

Zolas, N., Goldschlag, N., Jarmin, R., Stephan, P., Smith, J. O.-, Rosen, R. F., … Lane, J. I. (2015). Wrapping it up in a person: Examining employment and earnings outcomes for Ph.D. recipients. Science, 350(6266), 1367–1371.

Measuring the Economic Value of Research: The Case of Food Safety

The book co-edited by IRIS Co-PI Julia Lane and colleagues uses "big data," including IRIS/UMETRICS data, to trace federal food safety investments through individual university researchers to show economic outcomes. What is the impact of federal research spending? It is a public policy question with huge economic ramifications. The authors apply new "big data" techniques to the area of food safety research, and show connections between university laboratories, agriculture and food industry sectors, and federal science investments.

Measuring the Economic Value of Research: The Case of Food Safety, Kaye Husbands Fealing, Julia I. Lane, John L. King, and Stanley R. Johnson (editors), Cambridge University Press, December 2017. ISBN: 9781316612415
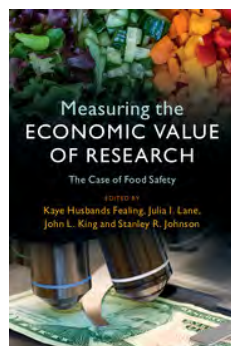
STEM Training and Early Career Outcomes of Female and Male Graduate Students: Evidence from UMETRICS Data Linked to the 2010 Census

IRIS data shows young women in STEM fields earn up to one-third less than men. One year after they graduate, women with Ph.D.s in science and engineering fields earn 31 percent less than do men, according to this study using IRIS data. The pay gap dropped to 11 percent when researchers took into account that women tended to graduate with degrees in fields that generally pay less than fields in which men got their degrees.

Buffington, Catherine, Benjamin Cerf, Christina Jones and Bruce A. Weinberg. 2016. "STEM Training and Early Career Outcomes of Female and Male Graduate Students: Evidence from UMETRICS Data Linked to the 2010 Census." American Economic Review, 106(5): 333-38.
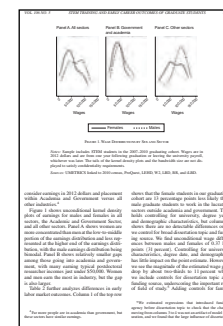
Research Universities and the Public Good: Discovery for an Uncertain Future

Countering recent arguments that we should "unbundle" or "disrupt" higher education, Jason Owen-Smith argues that research universities are valuable gems that deserve support. While they are complex and costly, their enduring value is threefold: they simultaneously act as sources of new knowledge, anchors for regional and national communities, and hubs that connect disparate parts of society. These distinctive features allow them, more than any other institution, to innovate in response to new problems and opportunities. Presenting numerous case studies that show how research universities play these three roles and why they matter, this book offers a fresh and stirring defense of the research university.

Research Universities and the Public Good: Discovery for an Uncertain Future, Jason Owen-Smith, Stanford University Press, 2018. ISBN: 9781503601949
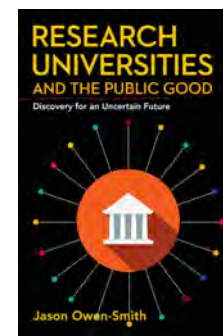
Upcoming Events

Data Submission Deadline: October 15, 2018

IRIS Researcher Awards announced: January 2019

IRIS Data Camp: March 11-13, 2019

Financial Report
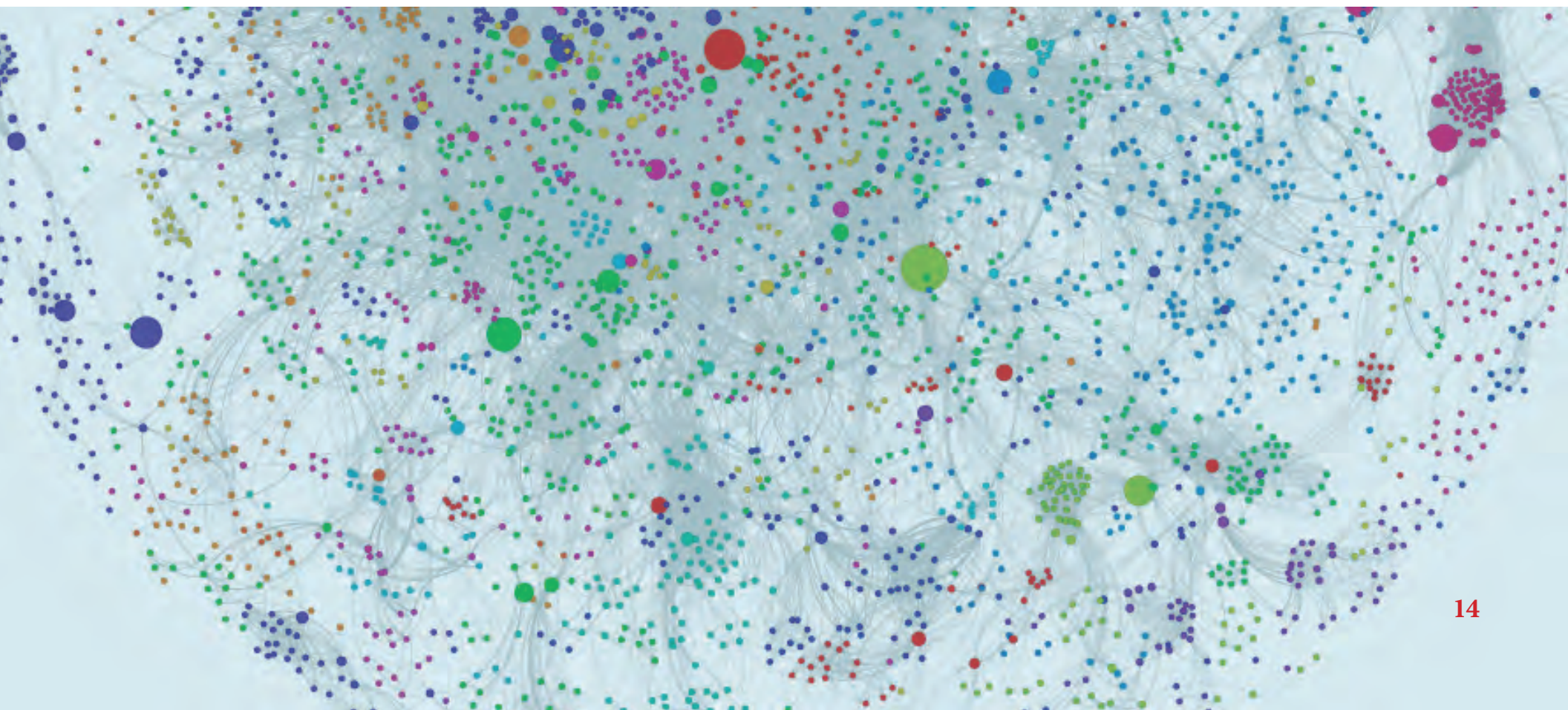
IRIS Financial Report: October 2018

	Actual			Projected	
	FY16 Actual	FY17 Actual	FY18 Actual	FY19 Projection	FY20 Projection
Beginning Balance (Overdraft)	(200,867)	(77,730)	353,747	890,108	583,780
REVENUE					
Sponsored Projects: federal and non-federal	756,418	1,442,761	1,452,070	1,746,469	1,025,449
Membership Revenue	525,000	654,167	1,200,000	1,025,000	1,275,000
Less: Indirect Cost on Sponsored projects	(161,753)	(217,016)	(345,640)	(825,390)	(503,755)
TOTAL SOURCES	1,119,665	1,879,912	2,306,430	1,946,079	1,796,694
COSTS					
Personnel	536,718	990,149	1,517,044	1,657,376	1,783,330
Operations	44,121	23,592	41,156	43,000	43,000
Travel/Events	37,113	36,082	33,363	40,000	40,000
Nodes and Partners	313,524	364,295	171,603	313,032	290,000
Researcher Grants--Sloan			8,101	160,000	160,000
Consulting	38,711	53,100	32,606	19,000	12,000
Reserves				20,000	20,000
Start-up	26,341	8,692			
Total Non-Salary Uses	804,469	860,457	618,076	964,564	904,500
TOTAL COSTS	996,528	1,475,910	1,770,069	2,252,408	2,348,330
NET CHANGE	123,137	404,002	536,361	(306,329)	(551,636)
Ending Balance (Overdraft)	(77,730)	326,272	890,108	583,780	32,143

IRIS is in good financial health. Seed funding from the Sloan and Kauffman Foundations that supported operations during our initial three years have been expended. FY 19 will represent the first year when we are fully supported by membership contributions and sponsored projects for specific research projects using IRIS data. Membership growth, accidents of timing and multi-year payments of invoices, and increases in sponsored projects mean that we ran a substantial surplus in FY 18. We anticipate those funds will be spent in the upcoming 1-2 years. We will be nearly revenue neutral by FY 20.

The IRIS staff at the University of Michigan now includes 13.5 FTE staff including a half time faculty Executive Director. Staff work in five functional areas: membership development and support, data & systems, software/report development, VDE research support, and sponsored project research performance.

We anticipate continued membership growth in FY 19 and have multiple new proposals submitted to federal agencies including USDA and NSF. Increasing subcontract costs, plans to further expand personnel to enable new report development and increase research support for approved projects accessing data through the virtual data enclave along with Sloan Foundation funded pilot grants for external researchers contribute to our projected costs. We project a steady state by FY 20. Increased membership or access to other sources of operational funds may enable reductions in individual campus membership rates in the upcoming years.

IRIS INSTITUTE FOR RESEARCH ON INNOVATION & SCIENCE