UMETRICS @ Institute for Research on Innovation & Science (IRIS)

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Background

In 2012, our society invested $209 in academic research for every man, woman, and child in the US

- We make those investments to develop human knowledge and to improve quality of life and well being.

- How do we understand and improve those effects?
Competing Budgetary Priorities

"I think you should be more explicit here in step two."

\[
\begin{align*}
\text{Then a miracle occurs...} & \quad \frac{203}{113} \cdot \frac{6.24}{2K} \cdot \frac{345}{75} \\
\text{or} & \quad \frac{3.0651}{10} \cdot \frac{4.0}{10} = \frac{15}{10}
\end{align*}
\]
Background

- Recession & Stimulus
- Federal **STAR METRICS** (Level 1) Program
- **CIC/UMETRICS** Pilot Project
- **Institute for Research on Innovation and Science (IRIS)**
  - Founded 01/01/2015
  - Core facility at University of Michigan
  - 3 years seed funding for infrastructure from Sloan & Kauffman
  - 25 member institutions
UMETRICS

• is a CIC initiative to create independent statistical evidence about the value of university research
• provides valuable information for outreach to Federal, State, and Local constituents
• integrates university administrative data with restricted U.S. Census Bureau data and many other resources
The Institute for Research on Innovation & Science (IRIS) is a new, IRB-approved platform to make UMETRICS a trusted and permanent national data resource for the academic community. It is member-driven, created by and for universities and researchers.
24 Universities
$14.9 Billion in 2012 R&D
~11,000 2012 Doctoral Grants
Framework

Science Investments

Universities

Discovery Learning Dissemination

Fund

Knowledge, People, Skills

Hiring, Spending

Jobs Stimulus

Innovation Entrepreneurship Economic Growth Public Health Food Safety Security Rational Policy ...

**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

**Partners:** Approved partners receive data from IRIS which they improve and make accessible through their own secure systems
UMETRICS currently provides

Independent statistical evidence about national, regional & local economic impact

$1.949 Billion in Direct Cost Vendor Purchases from 9 CIC Universities, Q3 2012-Q4 2014
Evidence of regional economic impact
UMETRICS currently provides independent statistical evidence about academic workforce composition.

75,375 employees by type, 9 CIC Universities, Q3 2012-Q4 2014

- Faculty: 12,499
- Staff: 20,144
- Post-Doc: 6,974
- Grad: 17,646
- Undergrad: 18,112
This report documents current Federal research funding and expenditures at U-State University. The report is based on UMETRICS data from U-State University. These are actual financial and payroll records for the University from 2011 Q2 - 2014 Q1.

Individuals Employed by Federal Research Funding

Between the second quarter of 2011 and the first quarter of 2014, Federal research awards supported a yearly average of 6,658 individuals at U-State. Students constituted an average of 61% of individuals supported by federal research funding every year, while faculty employees comprise an average of 15%.

Organization of the Scientific Workforce

Between 2011 Q2 - 2014 Q1, students at U-State University constituted over 70% of the research workforce supported by NSF awards and over 58% of employees supported by awards from NIH. Postgraduate researchers comprise 11%, 5%, 7%, and 8% of the employees on awards from NIH, NSF, DOE, and DOD, respectively.

Breakdown of employment patterns on Federal research awards to U-State University, aggregated across 2011 Q2 - 2014 Q1

National Distribution of Research-Related Expenditures

The production of science requires the purchase of scientific equipment and technology as well as collaboration with private/public research organizations. University research expenditures exceeded $211 million from 2011 Q2 - 2014 Q1 and included transactions with vendors in almost 850 US counties.

Total vendor & subaward expenditures on Federal research awards to U-State University, aggregated across 2011 Q2 - 2014 Q1

Regional Distribution of Research-Related Expenditures

Between 2011 Q2 - 2014 Q1, U-State University research generated over $24 million in expenditures in Indiana counties alone.

Federal research award expenditures on vendors & subawards in Indiana counties, aggregated across 2011 Q2 - 2014 Q1

For more information about UMETRICS as well as methodology and data sources, visit www.cic.net/projects/umetrics
UMETRICES Currently provides

Independent statistical evidence about academic research collaborations

Networks provide insights into conditions of training and their relationship to career outcomes

Links to academic outputs (publications, patents, grant information) inform innovation
25 Institutions on board now

Goal is 150 in 3-5 years
• Micro data on 93% of Fed R&D Exp
• Links to scientific, economic, and social outcomes
• A permanent, independent resource

Seed Funding for IRIS infrastructure:
Census Links

➢ Census data contains information on (essentially) the population of organizations that employ people and the population of people who are employed in the US

➢ **Preliminary** findings rigorously screened to protect privacy

➢ More Census work remains to be done to validate

➢ No burden on universities – work all done at Census

Work done by Nikolas Zolas, Catherine Buffington, Nathan Goldschlag & Julia Lane
### Where do research employees get their next jobs?

Over three years (2010 – 2012) just over 59% get jobs in industry, just under 33% get jobs in academia.
One year after leaving IRIS University, employees funded on research awards between 2002 and 2012 were subsequently employed by firms nationwide; their top employment destinations were Florida and Mississippi.

One year after leaving the university, 47% of these research-experienced employees found employment in Florida.
Future directions might include

- Effects of different funding arrangements
- Effects of different laboratory/team structures
- Effects of scientific productivity (E.g. pubs/patents)
- Differences by gender, race, ethnicity
- Longer term career trajectories
- Your interests, questions?
Envisioning the Future of the Research Enterprise

The Institute for Research on Innovation & Science (IRIS) is the global source for data to support fundamental research on the results of public and private investments in discovery, innovation, and education. It provides credible data and rigorous findings about the productivity and public value of the research enterprise to inform effective policy-making, support outreach, aid in research management, and expand the state of knowledge.

Learn More

http://iris.isr.umich.edu
Thank You