AN INTRODUCTION TO U.S. SCIENCE & TECHNOLOGY POLICY

Advocating for Science in an Era of Extreme Political Polarization & Alternative Facts

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“There are two things you don’t want to see being made -- sausage and legislation.”

OTTO VON BISMARCK
Chancellor of Germany from 1871 – 1890
Welcome to Washington!!!
“In a real sausage plant, everybody is on the same team, trying to produce bratwurst or knockwurst. In the legislative sausage factory, at least half the people don’t want to make sausage. Or they want to make a different kind. For the last few years, Republicans have said, ‘We won’t make sausage unless we control the recipe.’ ”

--Alan Rosenthal, Professor of Public Policy, Rutgers University, New York Times, “If Only Laws Were Like Sausages,” December 4, 2010
Legislative Productivity:

- 112th Congress (2011-2012): 284 Public Laws
- 80th Congress (1947-1948): 906 Public Laws
- 113th = 296  114th = 329  115th = 443
Number of Swing Districts at 20-year Low

Source: Nate Silver

*Alt. Source - Cook Political Rpt. says # of swing districts down from 164 in 1996 to 72 in 2016
Increasingly Polarized Public

Democrats and Republicans More Ideologically Divided than in the Past

Distribution of Democrats and Republicans on a 10-item scale of political values

1994

MEDIAN Democrat

MEDIAN Republican

Consistently liberal

Consistently conservative

2004

MEDIAN Democrat

MEDIAN Republican

Consistently liberal

Consistently conservative

2014

MEDIAN Democrat

MEDIAN Republican

Consistently liberal

Consistently conservative

Source: 2014 Political Polarization in the American Public
Notes: Ideological consistency based on a scale of 10 political values questions (see Appendix A). The blue area in this chart represents the ideological distribution of Democrats; the red area of Republicans. The overlap of these two distributions is shaded purple. Republicans include Republican-leaning independents; Democrats include Democratic-leaning independents (see Appendix B).
Growing Urban-Rural Political/Culture Divide
Vote by County – 2016 Presidential Election

[Map of the United States showing vote distribution by county in the 2016 Presidential Election.]
### Whole Foods vs. Cracker Barrel Indicator

<table>
<thead>
<tr>
<th>Election Year</th>
<th>Election Winner</th>
<th>Whole Foods %</th>
<th>Cracker Barrel %</th>
<th>Culture Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>Clinton (D)</td>
<td>59%</td>
<td>40%</td>
<td>19%</td>
</tr>
<tr>
<td>1996</td>
<td>Clinton (D)</td>
<td>64%</td>
<td>41%</td>
<td>23%</td>
</tr>
<tr>
<td>2000</td>
<td>Bush (R)</td>
<td>44%</td>
<td>75%</td>
<td>31%</td>
</tr>
<tr>
<td>2004</td>
<td>Bush (R)</td>
<td>40%</td>
<td>79%</td>
<td>39%</td>
</tr>
<tr>
<td>2008</td>
<td>Obama (D)</td>
<td>78%</td>
<td>35%</td>
<td>43%</td>
</tr>
<tr>
<td>2012</td>
<td>Obama (D)</td>
<td>75%</td>
<td>29%</td>
<td>46%</td>
</tr>
</tbody>
</table>

SOURCE: David Wasserman, Cook Political Report
Top Fake News Of 2016
Two Cultures: Politicians & Scientists

“I double majored in history and English and then went to Harvard law. How about you?”
## Defining the Cultural Divide

<table>
<thead>
<tr>
<th>Scientists</th>
<th>Politicians/Policymakers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numbers</td>
<td>Words</td>
</tr>
<tr>
<td>Quantitative</td>
<td>Qualitative</td>
</tr>
<tr>
<td>Objective</td>
<td>Subjective</td>
</tr>
<tr>
<td>Specialists</td>
<td>Generalists</td>
</tr>
<tr>
<td>Facts/evidence</td>
<td>Public opinion</td>
</tr>
<tr>
<td>Hate to make promises</td>
<td>Love to make promises</td>
</tr>
<tr>
<td>Technical</td>
<td>Political</td>
</tr>
<tr>
<td>Ask why</td>
<td>Ask why they should care</td>
</tr>
<tr>
<td>Money = research</td>
<td>Money = getting re-elected</td>
</tr>
<tr>
<td>Think long term</td>
<td>Think short term</td>
</tr>
<tr>
<td>Science page</td>
<td>Front page</td>
</tr>
</tbody>
</table>
What is “Science Policy”

“National science policy” refers to the set of federal rules, regulations, methods, practices, guidelines under which scientific research is conducted.

-- Beyond Sputnik: National Science Policy in the 21st Century
Science Policy vs. Science for Policy

▪ “Policy for Science” – decision making about how to fund or structure the systematic pursuit of knowledge

▪ “Science for Policy” – the use of knowledge to assist or improve decision making

▪ Grey area between policy for science & science for policy
The Difference Between Science & Science Policy

Phillip A. Griffiths, "Science and the Public Interest," The Bridge, Fall 1993.

➢ While science is ideally value-free and objective...science policy deals with the effect of science and technology on society and considers how they can best serve the public. As such, it is highly visible, value-laden, and open to public debate.

➢ The subjective nature of science policy often makes it impossible to prove whether a specific policy is "right" or "wrong." Moreover, the evaluation of science policy outcomes is often driven by ideology as opposed to provable facts.

➢ This has led many in the scientific community to shy away from engagement in the policy process despite the impact is has upon their ability to conduct science.
The Role of Science in the Formation of Policy

- Science is only one input into the policy-making process. Many other factors such as economics, ethics, budgetary trade offs, and public opinion must and will be factored into final policy decisions.

- Science is not policy-prescriptive.

- While it is important to ensure that policymakers are informed by science, it is important to keep politics out of science.
“Science can be effective in the national welfare only as a member of a team, whether the conditions be peace or war. But without scientific progress no amount of achievement in other directions can insure our health, prosperity, and security as a nation in the modern world.”

Science - The Endless Frontier, July 1945
A History Lesson in U.S. S&T Policy: Vannevar Bush & Harley Kilgore
Historical Considerations: The Bush-Kilgore Debate

Issues in the Creation of the NSF

• Merit vs. Geographical Diversity
• Who Appoints the NSF Director
• Fundamental vs. Applied Research
• Who Owns the Intellectual Property
• Social Science Research
WHY UNDERSTANDING & ENGAGING IN SCIENCE POLICY MATTERS

“Along with ‘Antimatter,’ and ‘Dark Matter,’ we’ve recently discovered the existence of ‘Doesn’t Matter,’ which appears to have no effect on the universe whatsoever.”
MANY POLICYMAKERS DO NOT UNDERSTAND SCIENCE
Congress Profile

- Less than 5 percent of the 116th Congress have backgrounds in science or engineering.
- There are 1.5 physicists, 1 mathematician, 1 chemist, and 1 animal scientist in the 116th Congress (all in the House).
- There are 11 engineers, 16 physicians, 5 dentists, 3 veterinarians and 2 nurses in the 116th Congress.
- 214 have law degrees in the 116th Congress.
- In the 116th Congress, 17 members have no educational degree beyond a high school diploma and 6 have only associates degrees. Only 25 have doctoral degrees in any field.
- Good news: more STEM interested Freshman (e.g. Haley Stevens, D-MI).
Four Key Points to Remember for Effective Advocacy

1) All politics is local
2) All politics is personal
3) Data is good, but stories are better
4) The language you speak matters
5) While maps are good, tour guides are better
All Politics is Personal

For more examples, see the “Why University Research Matters” at: www.aau.edu.
Federal funded scientific research helps soldiers in the field.
Tell me a fact, and I’ll learn. Tell me a truth, and I’ll believe, but tell me a story and it will live in my heart forever.

--Indian Proverb
Language Matters: Overcoming the Curse of Knowledge

"IN LAYMAN'S TERMS? I'M AFRAID I DON'T KNOW ANY LAYMAN'S TERMS."
While Maps are Good, Tour Guides are Even Better!!!

1. University federal relations officer

2. Scientific society government relations office

3. Congressional Staff
   - Personal Staff
   - Committee Staff
   - Local Staff
Why Effective Advocacy is Critical for the Research Community Right Now

1) Pressure on discretionary spending means potential cuts for key science agencies and programs...

2) ...and to thank Congress for recent funding increases.

3) Questions will be asked concerning if funding for science is being well spent.

4) Many in Congress are not familiar with science...

5) ...and graduate education.

6) To prevent laws and regulations that can harm scientists’ ability to efficiently and effectively conduct science.

7) To help inform and shape public policy based upon evidence and scientific -- as opposed to alternative -- facts.
Thank you for your attention...
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ESEP: www.science-engage.org

Beyond Sputnik: www.sciencepolicy.us