Successful Strategies to Support Crop Research: Recommendations for Animal Agriculture

for

American Society of Animal Science
Innovate 2012

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Director of Science Policy

Agronomy, Crop, Soil Science Societies

Friday, October 5, 2012

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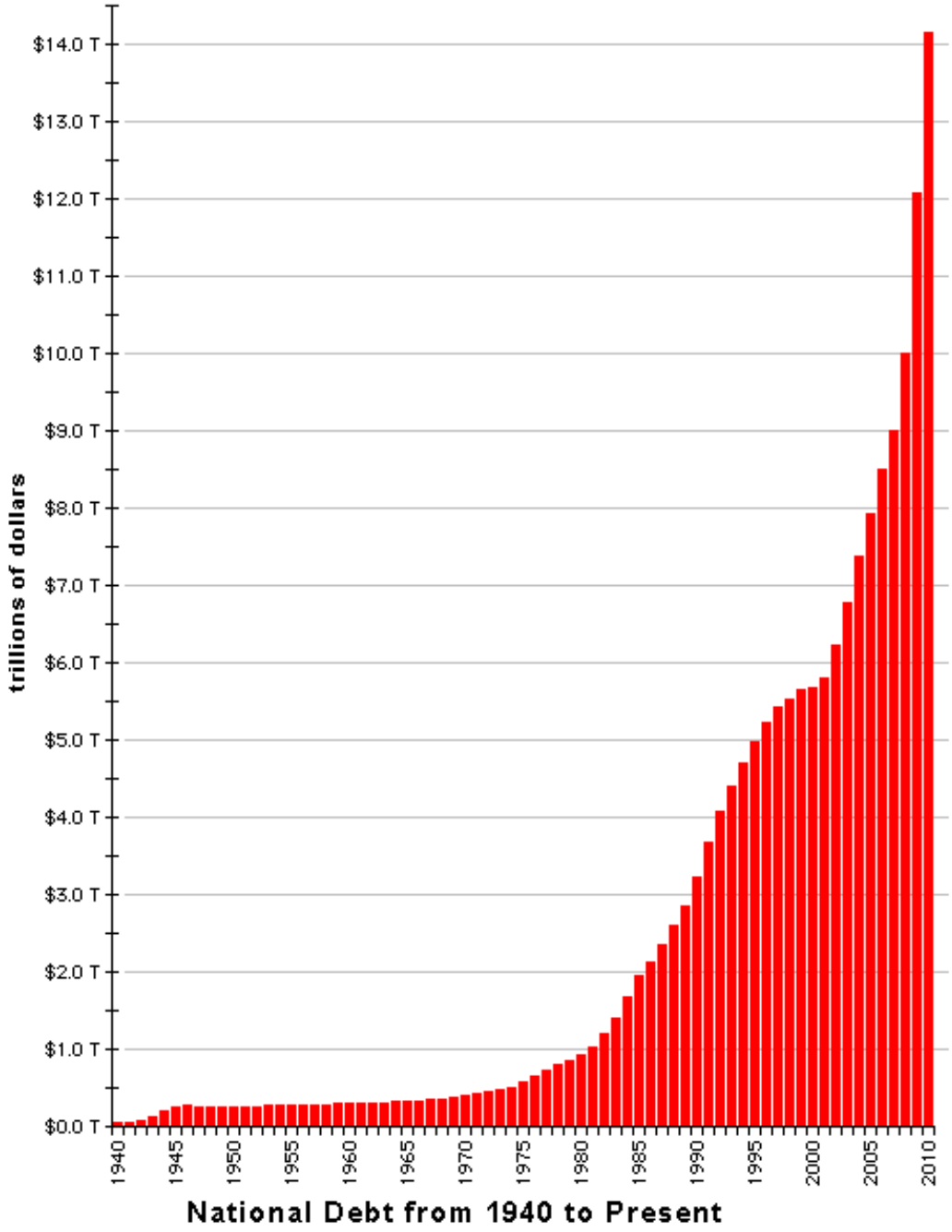
Setting the stage

- Budget cut blues
- Challenges working with Congress and implications for science
- ASA-CSSA-SSSA science policy program
- Myths and truths
- “All Politics is local”
- Communicating science
- An opportunity


$14.0 T
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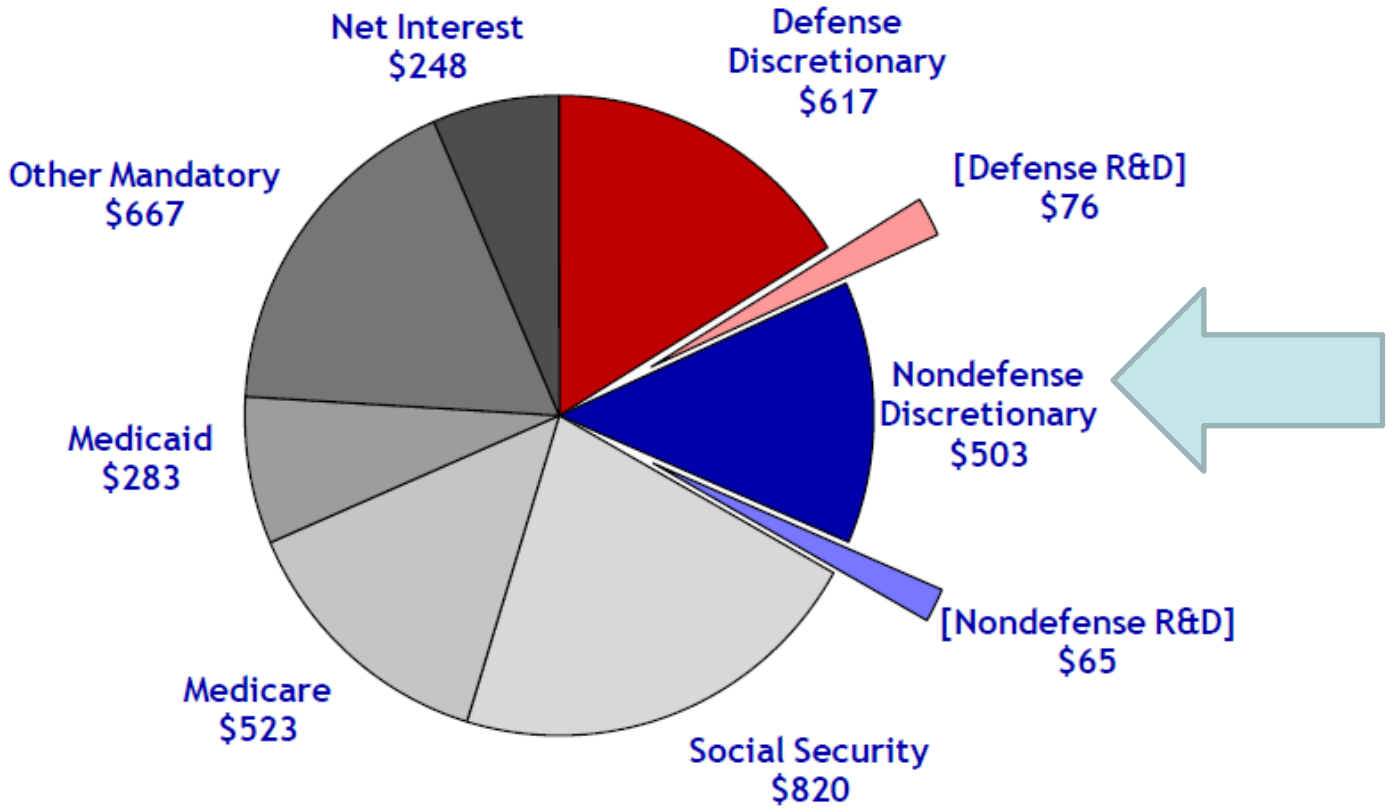
trillions of dollars
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
National Debt from 1940 to Present
Source: U.S. National Debt Clock

Composition of the Proposed FY 2013 Budget
Total Outlays = $3.8 trillion

outlays in billions of dollars

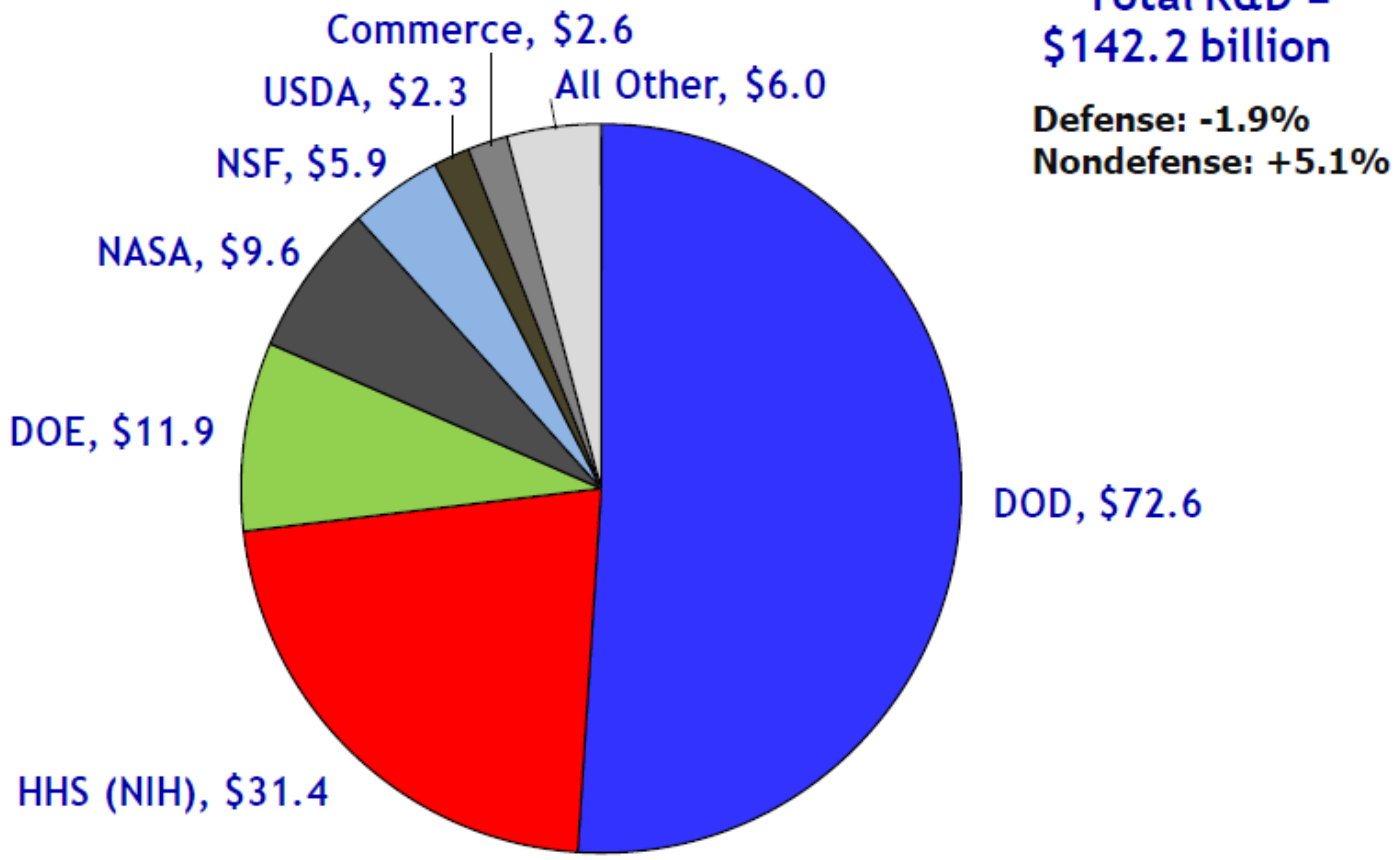


Source: *Budget of the United States Government FY 2013.*
Projected unified deficit is $901 billion.

Total R&D by Agency, FY 2013

budget authority in billions of dollars

1.61%



Total R&D = $142.2 billion

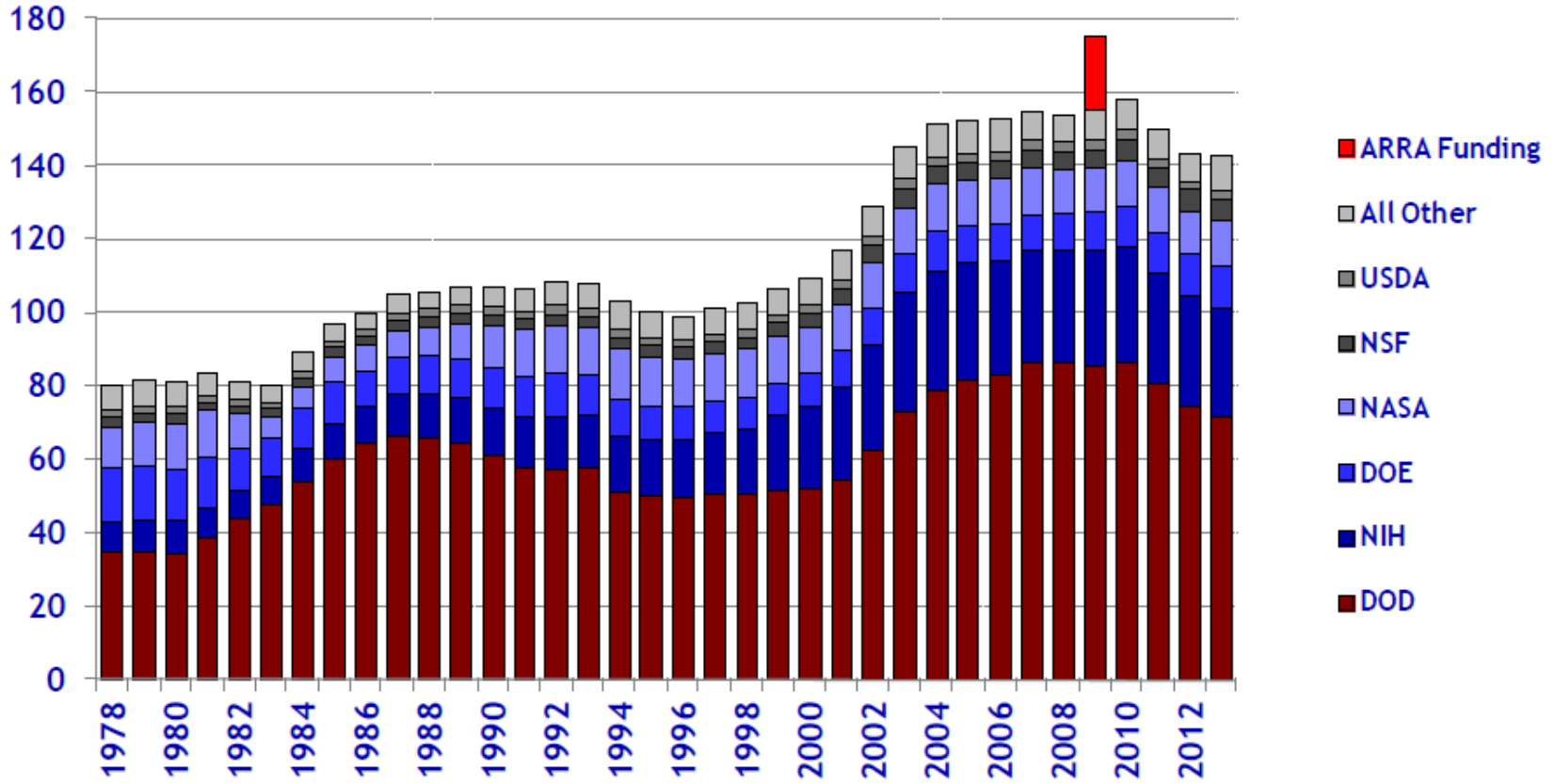
Defense: -1.9%
Nondefense: +5.1%

Source: OMB R&D data, agency budget justifications, and other agency documents.
R&D includes conduct of R&D and R&D facilities.

AAAS

Trends in R&D by Agency

in billions of constant FY 2012 dollars



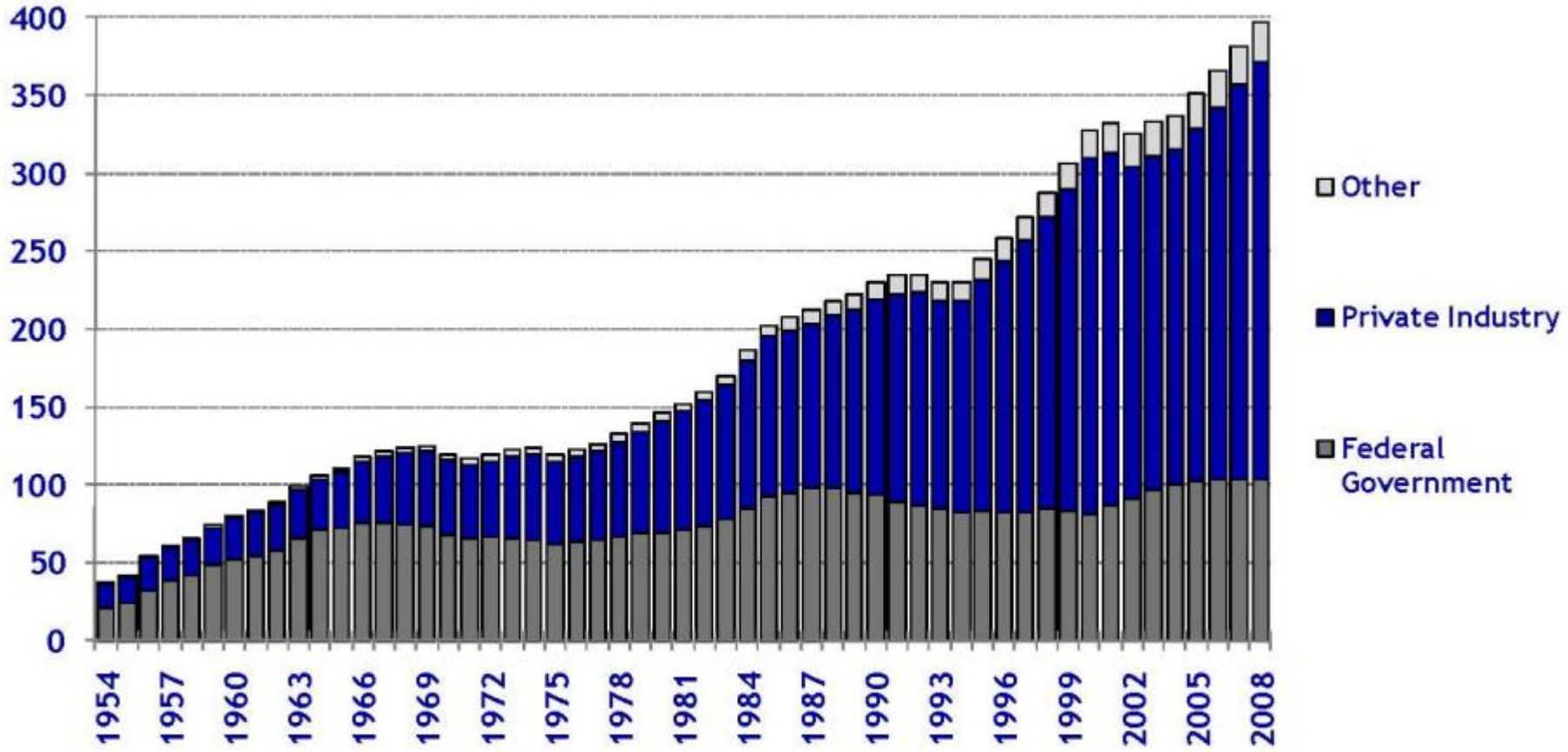
Source: *AAAS Report: Research & Development* series.
FY 2012 and FY 2013 figures are latest estimates.
1976-1994 figures are NSF data on obligations in the Federal Funds survey.

Trends in science funding

- **Decades-long decline or flat federal funding for our sciences**
- **Declining success rates**
  - **FY 2010-USDA AFRI funding rate is 26%** (403 awards out of 1,571 proposals)
  - **FY 2011-NIH funding rate is 18%** (8,765 awards out of 49,592 proposals)
  - **FY 2011-NSF BIO funding rate is 18%** (1,309 awards out of 7,438 proposals)
  - **FY 2011-NSF EHR funding rate is 17%** (807 awards out of 4,660 awards

National R&D Funding by Source

outlays in billions of constant 2008 dollars



Source: NSF, Division of Science Resources Statistics, National Patterns of R&D Resources (NSF 08-318)

2008 figures are preliminary.

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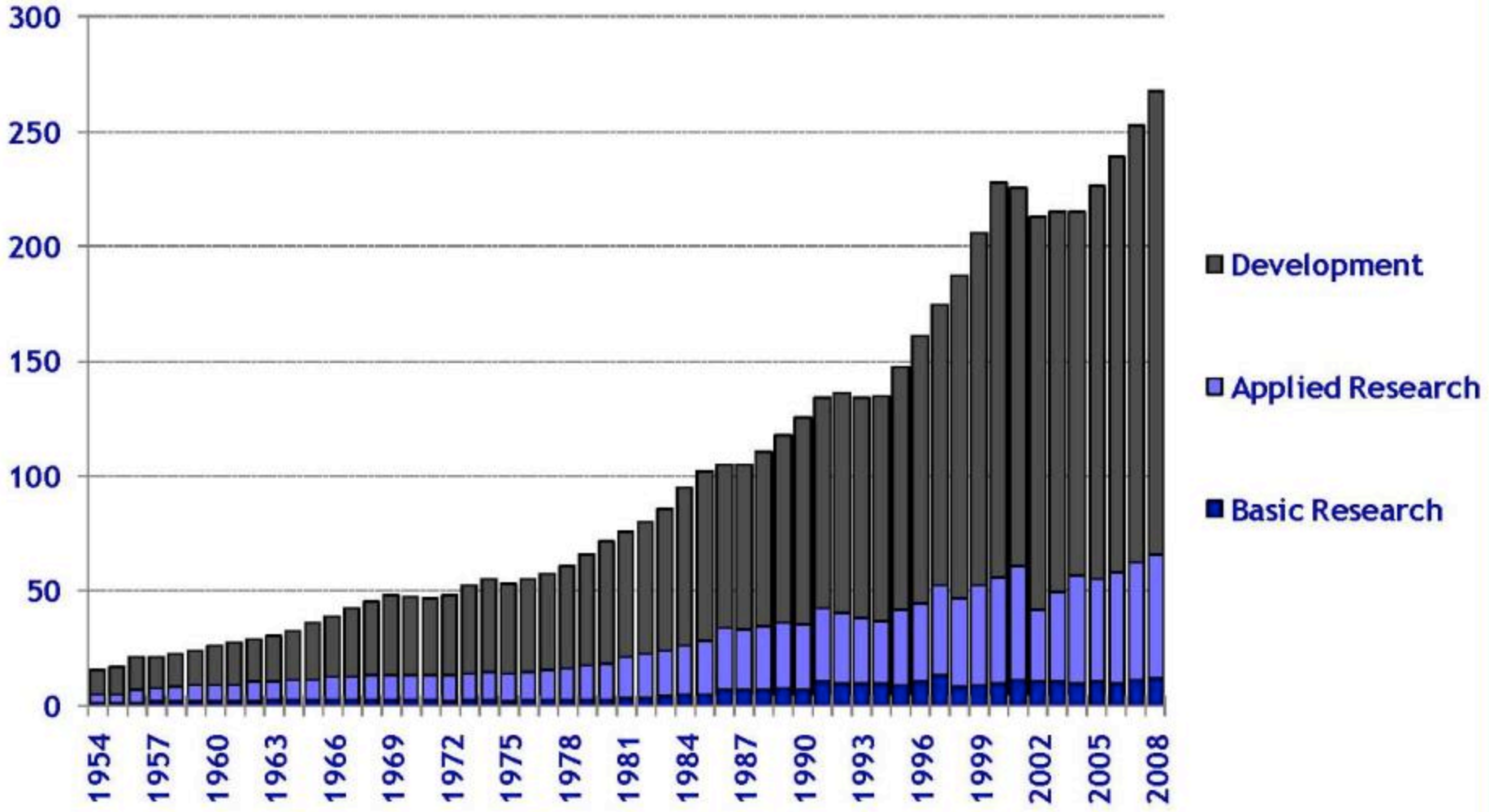
Character of Industrial R&D

outlays in billions of constant 2008 dollars



Source: NSF, Division of Science Resources Statistics,
National Patterns of R&D Resources (NSF 08-318)
2008 figures are preliminary.

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Sequestration

What could sequestration mean for you?

- Jan 2, 2013: Sequestration
  = 8.2% cut to science budgets

- Total loss of $12.5 billion in federally funded R&D

- Loss of 200,000 R&D jobs

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Sequestration impacts…

- National Science Foundation = **$456 million budget cut resulting in:**

  – **22,000 fewer people** supported, including **3,500 grad. students** supported by research fellowships

  – **1,500 fewer grants = success rates dropping** as low as **16%**

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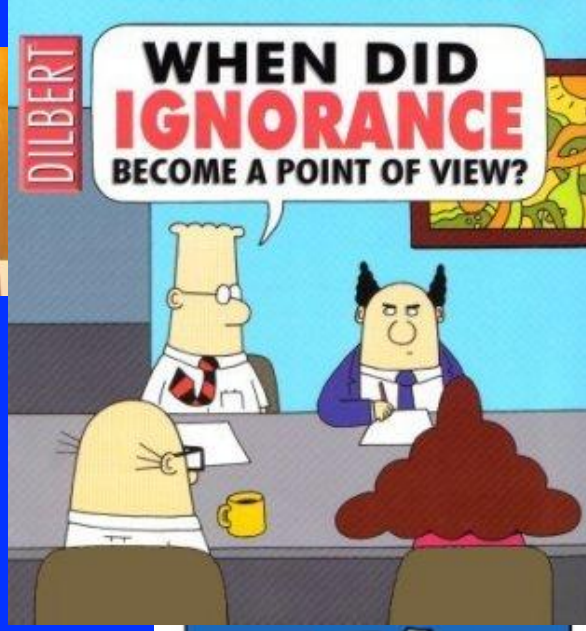
Sequestration impacts…

- USDA = **$189 million budget cut**
  - National Institute of Food and Agriculture = **$58 million cut**
  - Agriculture and Food Research Initiative = loss of **$21 million**
  - Agriculture Research Service = cut of **$91 million; lab closures** and layoffs

Congress



- Limited understanding of role and importance of science
- Rapid staff turnover
- Urban representation and focus growing, esp. in House
- Tea Party

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Certain Segments Are Voting

But their action stops at the polls

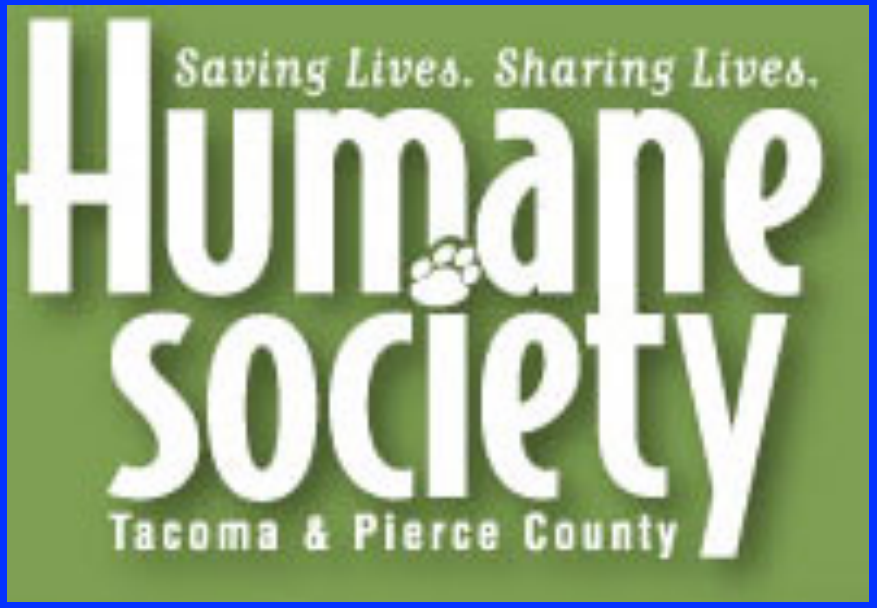
- 42% turnout (of eligible voters) in 2010 midterm elections
  - 1.2 percentage points higher than 2006 elections
  - Increase spurred by anger over recession
  - New Republican 'Tea-party' influenced turnout in some states.

Silence = consent

“We do not have government of the majority. We have government of the majority who participate.”

Thomas Jefferson

Special interests rule



Perfect storm against science

U.S. is losing its competitive edge

- competitiveness and innovation suffering
- Economic growth consequences
- Job losses to other countries

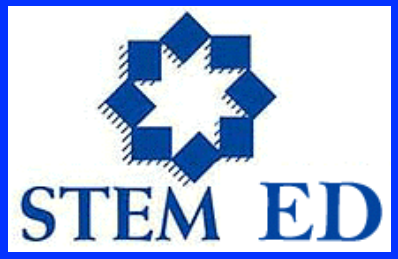
Opportunity, not a Challenge

Agronomy, Crop, Soil Science Societies Science Policy Office

- Congressional Science Fellow (1986)
- Director of Science Policy (1994)
- Director of Government Affairs (2012)
- Science Policy Associate (2012)
- Administrative Assistant (2012)
- Science Policy Intern (2001)

ASA-CSSA-SSSA priorities

- Funding for research and education
- Legislation and regulations
  - STEM and workforce
  - Farm Bill
  - Clean Water Act
    - Chesapeake Bay TMDL
    - Mississippi River Basin
    - Great Lakes



ASA-CSSA-SSSA activities

- Congressional Visits Days
- Congressional Soils Caucus
- Congressional Educational Briefings
- Coalitions

Congressional Visits Day

Agriculture and Food Research Initiative (AFRI)

The **Agriculture and Food Research Initiative (AFRI),** established in the Food, Conservation, and Energy Act of 2008, is **a competitive grants program authorized at $700 million annually, for research, extension, and education in support of our nation's food and agricultural systems.** This unique program takes research and innovation beyond the development phase, into implementation through contemporary education and extension programs.

About the Agriculture and Food Research Initiative

AFRI is the largest competitive grants programs administered by USDA's National Institute of Food and Agriculture (NIFA). AFRI supports research in three ways:

- Under its **foundational program,** it supports basic science in 1) animal and plant health, production and products; 2) food safety, nutrition and health; 3) renewable energy, natural resources, and the environment; 4) agriculture systems and technology; 5) agriculture economics and rural communities.
- With its **societal challenge areas,** AFRI integrates basic and applied research with deliberate education and extension components to tackle specific topics of national importance.
- Via the **NIFA Fellows program,** outstanding pre- and post-doctoral students in the agricultural, food, and natural resource sciences within NIFA's challenge areas receive support through well-developed and highly interactive mentoring and training activities to achieve their maximum potential.

The AFRI Coalition urges you to support AFRI funding at $325 million in FY 2013.

The return on investment of agricultural, food, nutrition, and natural resource research and development is $20 or more to the U.S. economy for every dollar spent.[1]

[1]Fuglie, Keith O., and Paul W. Heisey. Economic Returns to Public Agricultural Research. EB-10, U.S. Dept. of Agriculture, Economic Research Service. September 2007.

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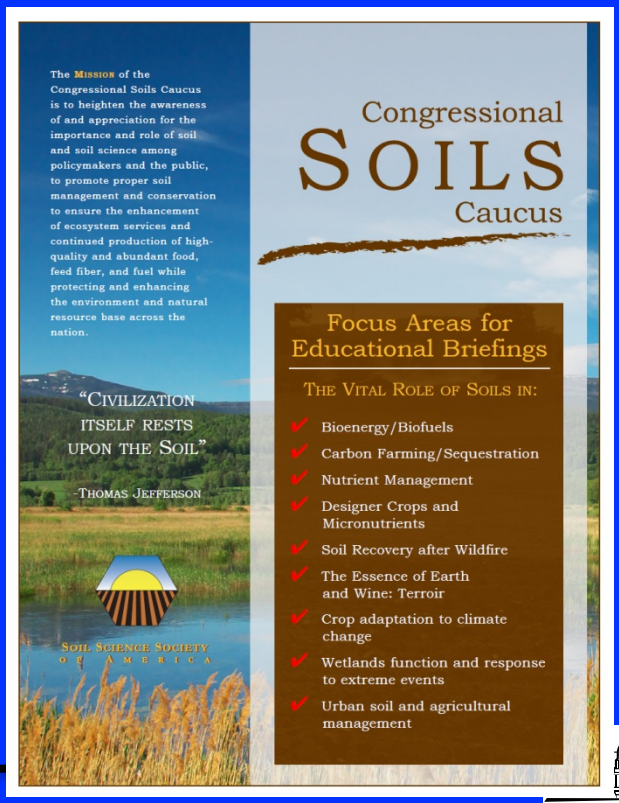
Congressional Soils Caucus



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Congressional educational briefings

Nutrient Management & the Chesapeake Bay Experience: Economic and Environmental Considerations

The Chesapeake Bay is America's largest estuary, covering part of six states (New York, Pennsylvania, Maryland, West Virginia, Delaware, and Virginia) and the District of Columbia. With over 150 rivers and streams draining into the Bay, it has become degraded by nutrients and sediments from agricultural, urban and suburban runoff, wastewater, and other sources.

Federal, state and local initiatives to reduce nutrient and sediment pollution in the Chesapeake Bay have been debated for decades. The 1983 Chesapeake Bay Program set nutrient and sediment reduction goals, and developed strategies for reduction. On December 29, 2010, the U.S. Environmental Protection Agency established the Chesapeake Bay Total Maximum Daily Load (TMDL). The TMDL requires states in the watershed to develop Watershed Implementation Plans (WIPs) for achieving target reductions from agriculture and other sources. One key tool employed by producers to help achieve these water quality goals is nutrient management planning.

A **Nutrient Management Plan (NMP)** *defines the nutrient needs of crops, and how best to provide the amount, source, placement and timing of nutrient applications to maximize plant uptake, and improve yield.*

Nutrient planning and management practices have private and public benefits.

- **Farmers** benefit by using NMPs to estimate nutrient needs based on yield goals, while minimizing environmental risk. In addition, they experience input cost-savings and/or production increases that result from greater nutrient use efficiency
- **Consumers** benefit through the high yields achieved in crop production, which result in lower costs at the supermarket.
- The **environmental** benefits include water quality and other environmental improvements.

The composition of public and private benefits varies greatly between practices, farm types, and locations.

Examples

- No-till planting often has significant private benefits including reduced labor and energy, but is not suited to all farms.
- Stream bank fencing and riparian buffers offer high public benefits but little to no private benefits.

New and Improved Ideas?

Historically, the concept of nutrient management was very simple. Producers estimated the nutrients needed by the crop by subtracting the amount of nutrients available in the soil (obtained through soil sampling and testing) from optimal level of nutrients needed to obtain yield goals (obtained from crop response data). They then applied the nutrients needed through the application of either manure or fertilizer.

Today, however, in addition to this simple calculation of nutrient requirement, producers and Certified Crop Advisors (CCAs) take into consideration many more factors when developing NMPs that account for areas sensitive to soil erosion, soil characteristics, potential for nutrient loss (using nitrogen leaching indices and models such as the "Phosphorus-Index", and the Revised Universal Soil Loss Equation (RUSLE2)), crop rotations, and tillage practices.

Crops absorb nutrients from the soil such as nitrogen (N) and phosphorus (P). Nitrogen is abundant in animal manure, ammonium fertilizer, crop residues, and plant roots. Phosphorus is found in human waste and livestock manure and in the form of "rock phosphate."

CERTIFIED CROP ADVISER

Soil, Manure, and Plant Tests

Geographic Information

Best Management Practices

On Site Evaluation

Planning Software

Nutrients

What is a Certified Crop Advisor?

A Certified Crop Adviser (CCA) is a certified professional who provides crop management recommendations to farmers based on industry standards that accomplish environmental stewardship objectives.

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Coalitions

- Agriculture and Food Research Initiative (AFRI) Coalition

- Friends of Agricultural Research Service
- NCFAR
- CNSF
- ESC
- USGS Coalition

NATIONAL C-FAR

CNSF
COALITION FOR NATIONAL SCIENCE FUNDING

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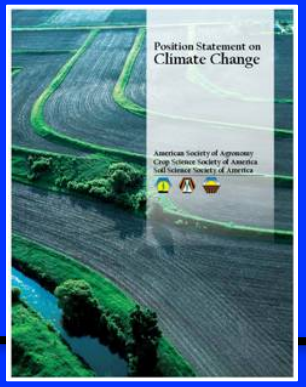
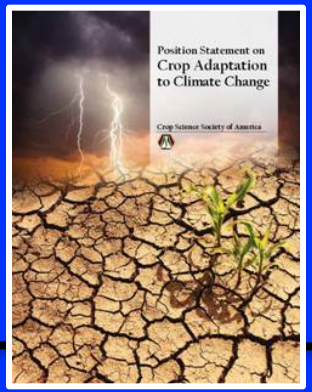
Science policy tools

- Position statements
  - Nutrient Management
  - Climate Change
  - Crop Adaptation to Climate Change
  - Biofuels (on going)
  - Nitrogen Recommendations (on going)


Soil Science Society of America

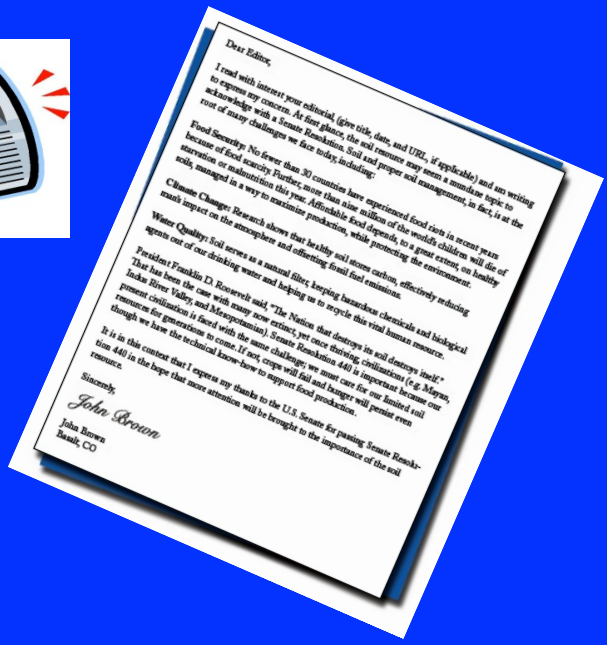
Agricultural Nutrient Management and Environmental Quality
Position of the Soil Science Society of America





Science policy tools…

- Letters to the editor
- Op-Eds
- Newsletters
- Facebook
- Twitter
- Press releases


Dear Editor,

I read with interest your editorial, [give title, date, and URL, if applicable] and am writing to express my concern. At first glance, the soil resource may seem a mundane topic to acknowledge with a Senate Resolution. Soil and proper soil management, in fact, is at the root of many challenges we face today, including:

Food Security: No fewer than 30 countries have experienced food riots in recent years because of food scarcity. Further, more than nine million of the world's children will die of starvation or malnutrition this year. Affordable food depends, to a great extent, on healthy soils, managed in a way to maximize production, while protecting the environment.

Climate Change: Research shows that healthy soil stores carbon, effectively reducing trash impact on the atmosphere and enhancing small food emissions.

Water Quality: Soil serves as a natural filter, keeping hazardous chemicals and biological agents out of our drinking water and helping us to recycle this vital human resource.

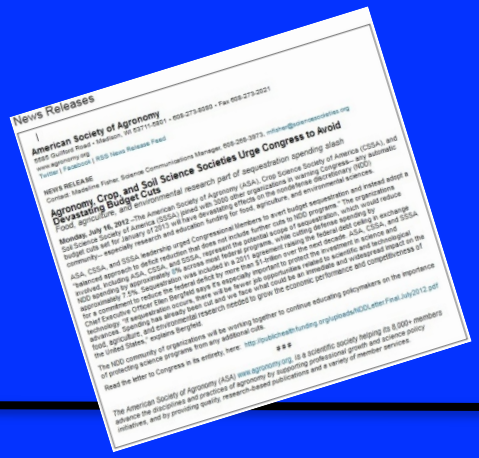
President Franklin D. Roosevelt said, "The Nation that destroys its soil destroys itself." That has been the case with many now extinct, yet once thriving, civilizations (e.g. Mayan, Indus River Valley, and Mesopotamia). Senate Resolution 440 is important because our present civilization is faced with the same challenges we must care for our limited soil resources for generations to come. If not, crops will fail and hunger will persist even though we have the technical know-how to support food production.

It is in this context that I express my thanks to the U.S. Senate for passing Senate Resolution 440 in the hope that more attention will be brought to the importance of the soil resource.

Sincerely,

John Brown

John Brown
Isaak, CO


News Releases

American Society of Agronomy

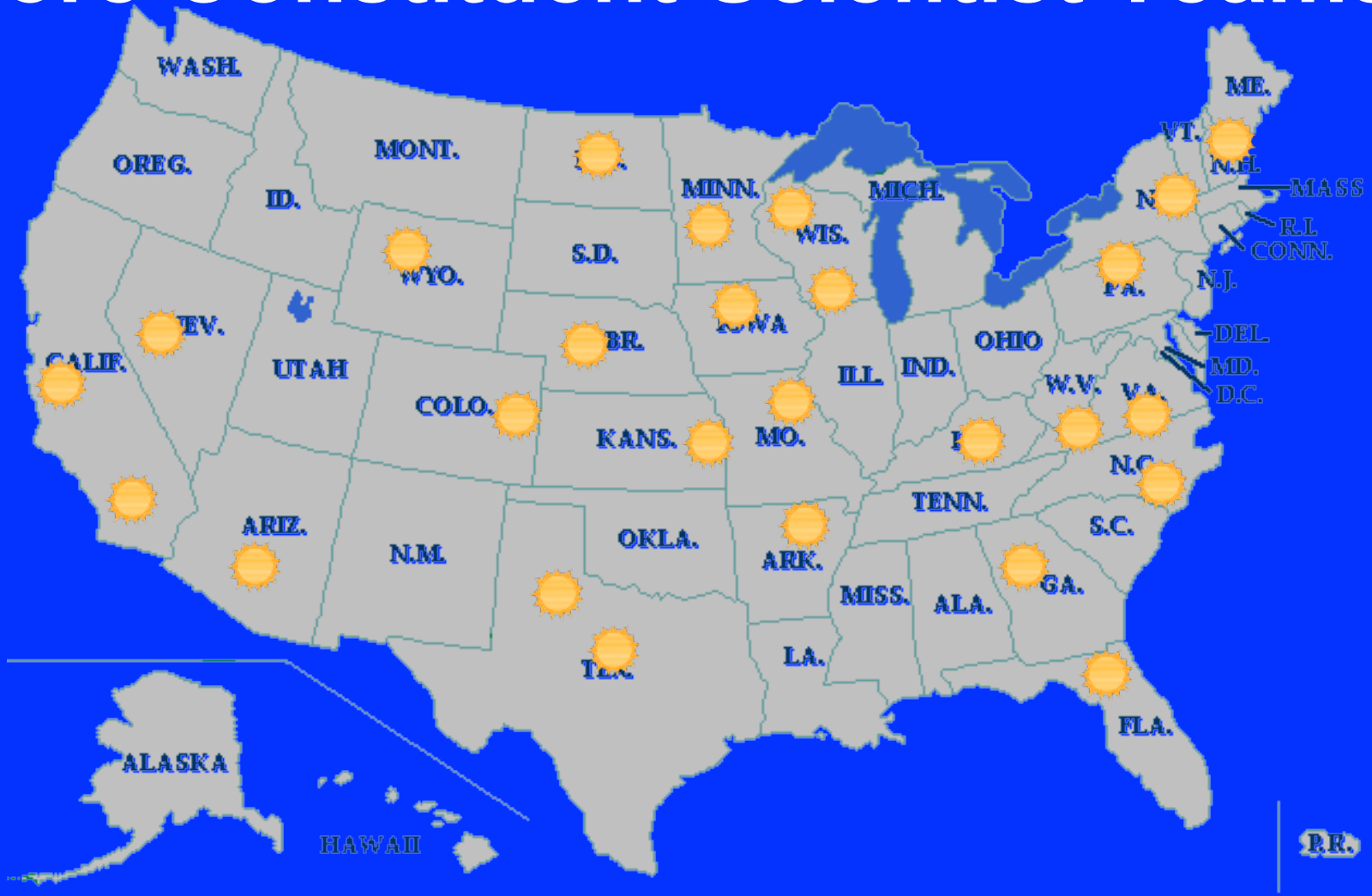
Agronomy, Crop, and Soil Science Societies Urge Congress to Avoid Devastating Budget Cuts

Science policy tools…

Core Constituent Scientist Teams

- Congressional Visits Day alumni (>100)
  - Each alum recruited 2 scientists (one grad student)
- 26 CCSTs established
- Goal of 40 CCSTs by Dec 2012

Core Constituent Scientist Teams



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Two to six times per year contact Congress!

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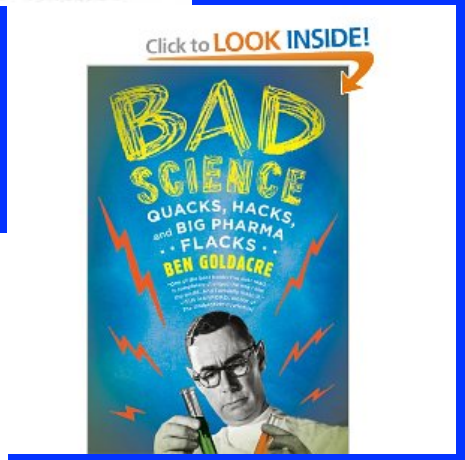
Take Action!

Why scientists don't advocate

- Scientists believe that science should stand for itself

- Scientists compromise their integrity



- It's illegal for scientific societies and scientists

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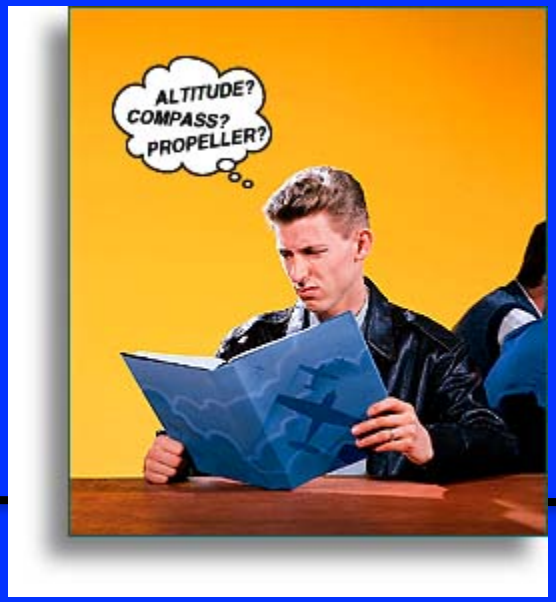
Why scientists don't advocate..

- Congress isn't interested in what I have to say

- Congress doesn't understand science

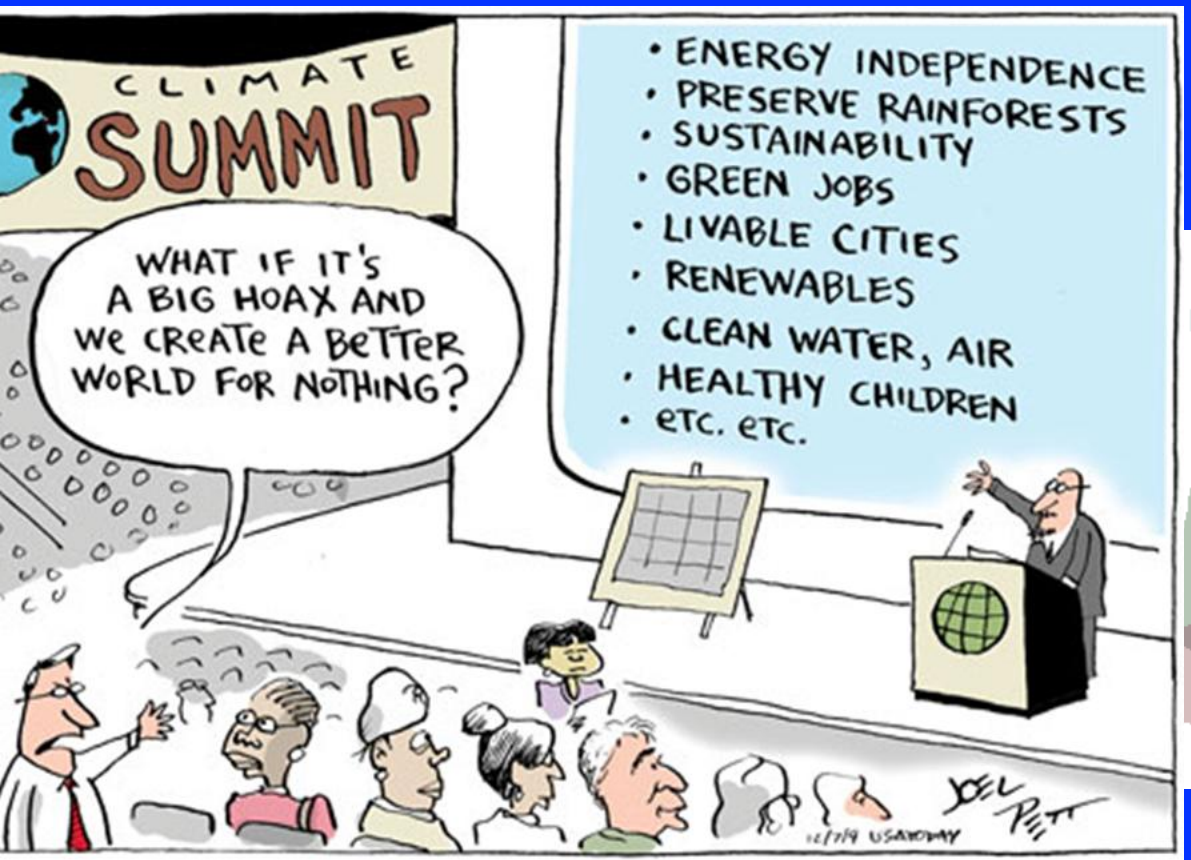


“All Politics Is Local”

You each have a congressional delegation

- Representative
  - Tom Latham (R-4)
- Senators
  - Charles Grassley (R)
  - Tom Harkin (D)

Science communication



Communicating science…

- Speaking the language

- Knowing your audience

- Knowing the process

Communicating science…

- Send an email
- Make a phone call
- Conduct a Congressional visit
  - –Washington, D.C.
  - –District/State

Take Action!!!

Make clear you're not going away!

Develop relationship with your Congressional delegation

Opportunities for Animal Science

- Participate in Spring 2013 Congressional Visits Day

- Place ASAS intern in our DC policy office

A story worth telling…

- Societies advocated for inclusion agronomist, crop, soil scientist in BRDTAC
- Both House and Senate had provision included in their versions
- Last minute in Senate, pro dropped
- Four constituent scientist calls in 2 hours
- Scientific credibility

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Questions?

- *Interested in getting involved?*

Contact Info:

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