

# Federal R&D: Overview, Update and Outlook

Matt Hourihan

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for the National Association of Graduate-Professional  
Students

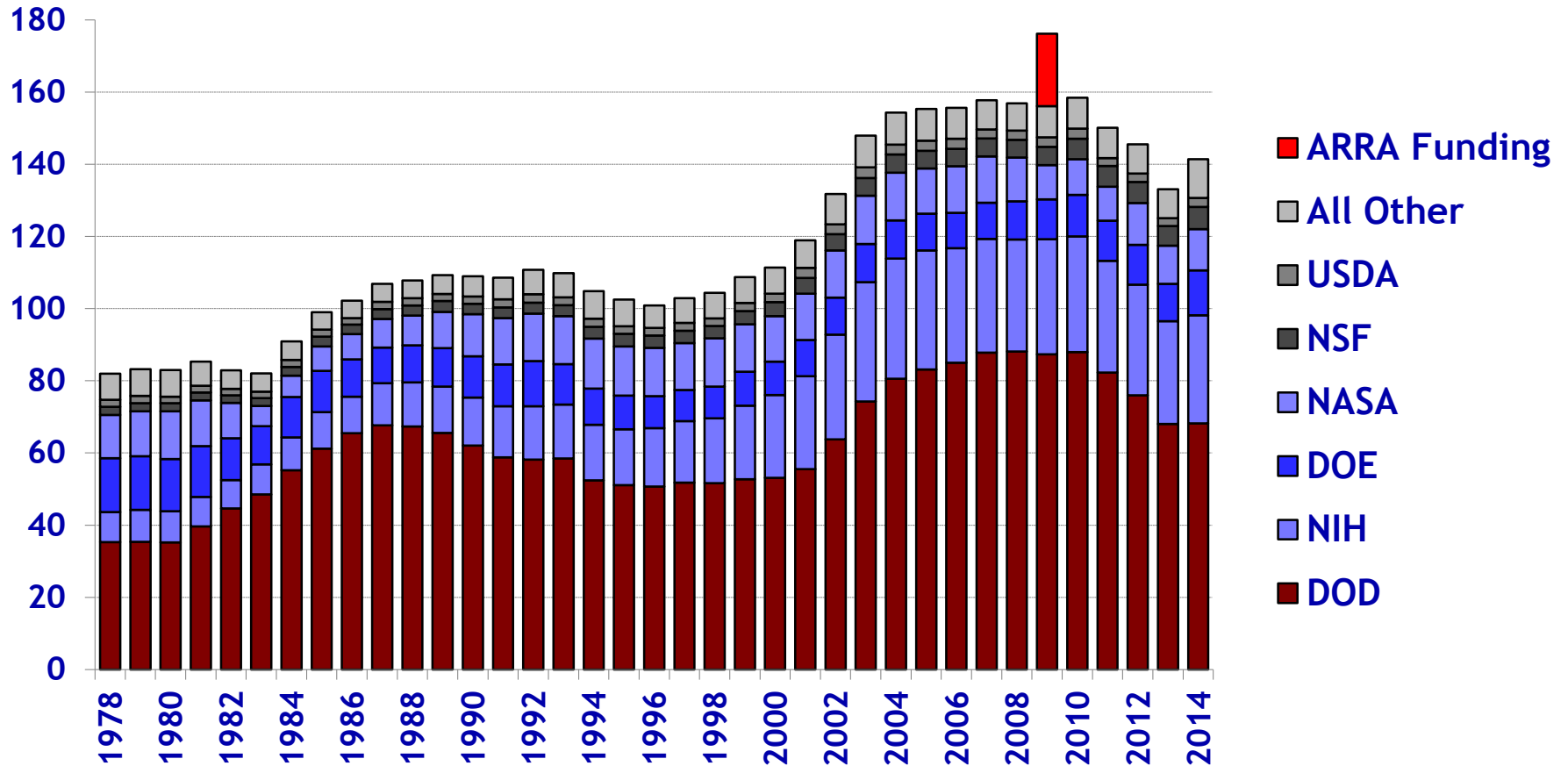
AAAS R&D Budget and Policy Program  
<http://www.aaas.org/spp/rd>

# Why (Public) R&D?

- Technology and innovation account for >50% of postwar growth in most developed countries
- Productivity growth
- Decentralized nature of modern innovation
  - Public-Private
  - STEM capacity
- Radical innovations (ideas, technologies, tools, methods)
  - It's all about risk, uncertainty, and time
  - Gov't as “de-risker,” expander of knowledge stock

# Trends in R&D by Agency

in billions of constant FY 2013 dollars



Source: AAAS Report: Research & Development series.

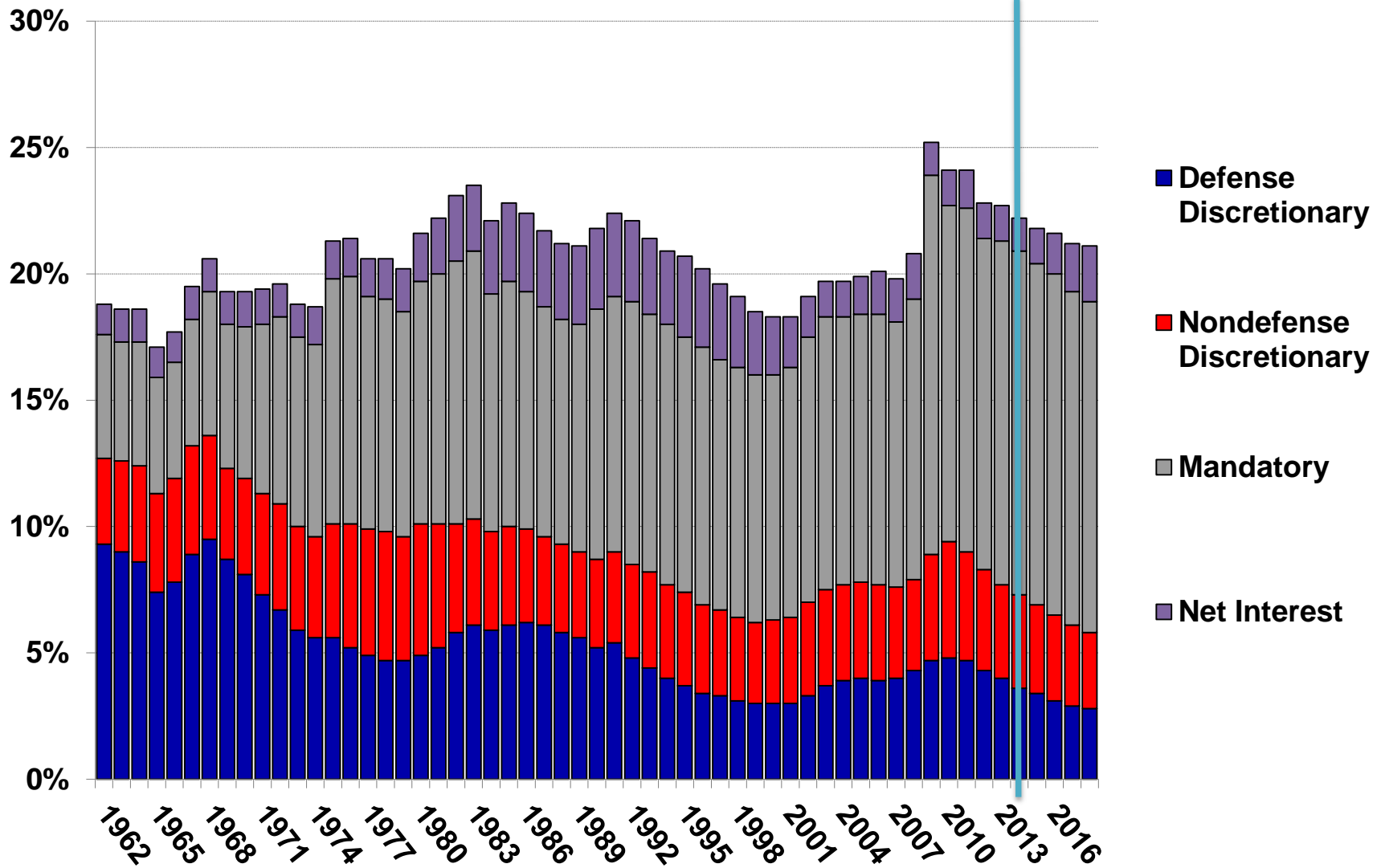
FY 2013 and FY 2014 figures are latest estimates.

1976-1994 figures are NSF data on obligations in the Federal Funds survey.

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# Federal Spending as a Percent of GDP, 1962 - 2018

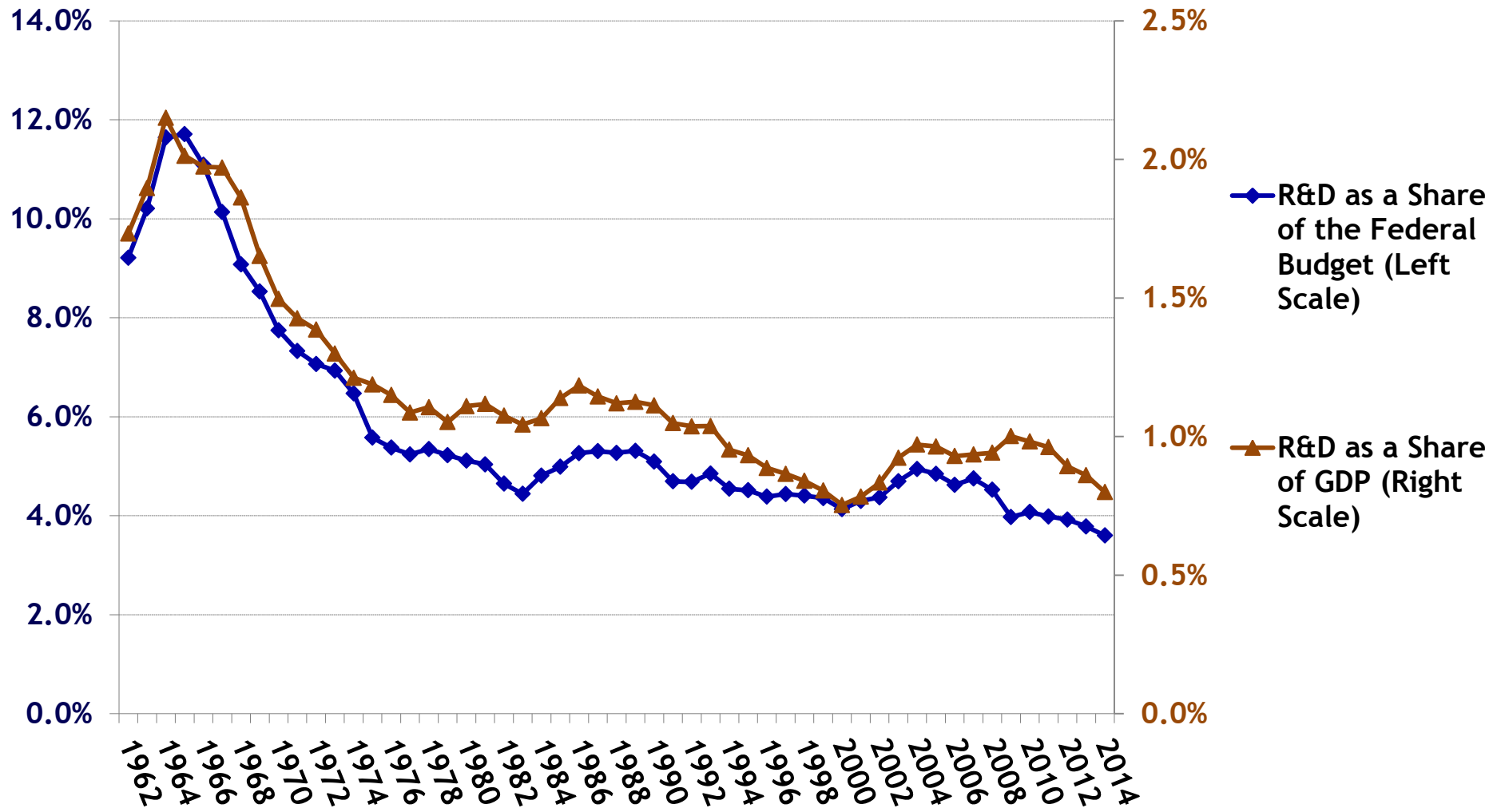


Source: Budget of the U.S. Government FY 2014.  
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# Federal R&D in the Budget and the Economy

Outlays as share of total, 1962 - 2014



Source: *Budget of the United States Government, FY 2014*. FY 2013 data do not reflect sequestration. FY 2014 is the President's request.  
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# Admin FY 2014 R&D Priorities

- Clear shift from D to R
  - And from Defense to Nondefense
- Science
  - NSF, Dept. of Energy SC
  - Agriculture, neuroscience, big data, defense science
  - Webb Telescope
- Innovation
  - Advanced manufacturing initiatives across the board
  - Translational Medicine (NIH)
  - Space Technology (NASA)



BY IVAN SEMENIUK, MEREDITH WADMAN, SUSAN YOUNG, ERIC HAND, EUGENIE SAMUEL REICH & RICHARD MONASTERSKY

It's not every day you have robots running through your house," Barack Obama quipped last week at the White House science fair, a showcase for student exhibitors that also gave the US president a chance to reiterate a favourite theme. Science and technology, he said, "is what's going to make a difference in this country, over the long haul".

Obama would clearly like to see many more robots, as well as researchers and engineers, running around in the future, a wish reflected in his budget request for fiscal year 2013, released on 13 February. The document's message is one of big ambitions with fewer resources.

A year ago, Obama proposed bold increases for science agencies, but a Congress intent on curbing government spending refused to back many of them. This time, the White House has scaled back in several areas but boosted overall funding for non-defence research and development by 5%, pushing it up to US\$64.9 billion.

"Overall, the budget sustains an upward trend," says John Holdren, director of the White House Office of Science and Technology Policy in Washington DC. "Because of fiscal restraints, it's not at the rate we preferred."

With an election coming this November, House Republicans are unlikely to be generous with the president's request. As in previous years, Congress could delay action on the budget, especially if it decides to wait for voters to weigh in on Obama's presidency before making its decision. And the spectre of a severe across-the-board cut dangles over the government because of an act introduced last year that aims to chop \$1.2 trillion from spending, starting in January 2013.

Here is an overview of what the president's request would mean in key science domains (see "Tough decisions").

**BIO-MEDICINE AND PUBLIC HEALTH**  
The National Institutes of Health (NIH) in Bethesda, Maryland, by far the largest US research agency, sees its budget held level at \$30.7 billion — a far cry from the \$1-billion increase Obama proposed a year ago. Despite the ceiling, Lawrence Tabak, the NIH's

Barack Obama aims high with an air cannon at this year's science fair at the White House.

**US BUDGET**

## Obama shoots for science increase


*US president wants to make room for research to grow in 2013 — but faces an uphill battle.*

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# Admin FY 2014 R&D Priorities (Cont)

- Clean Energy
  - Renewable/efficiency technology offices, ARPA-E
  - But not so much for nuclear
- Homeland Security
  - Biodefense facility
- National Nuclear Security Administration (New START)
- STEM Education Reorganization



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# Admin FY 2014 R&D Priorities (Cont)

- The biggie for R&D: Returning discretionary spending to pre-sequester levels
  - Every agency would receive major increases above FY13



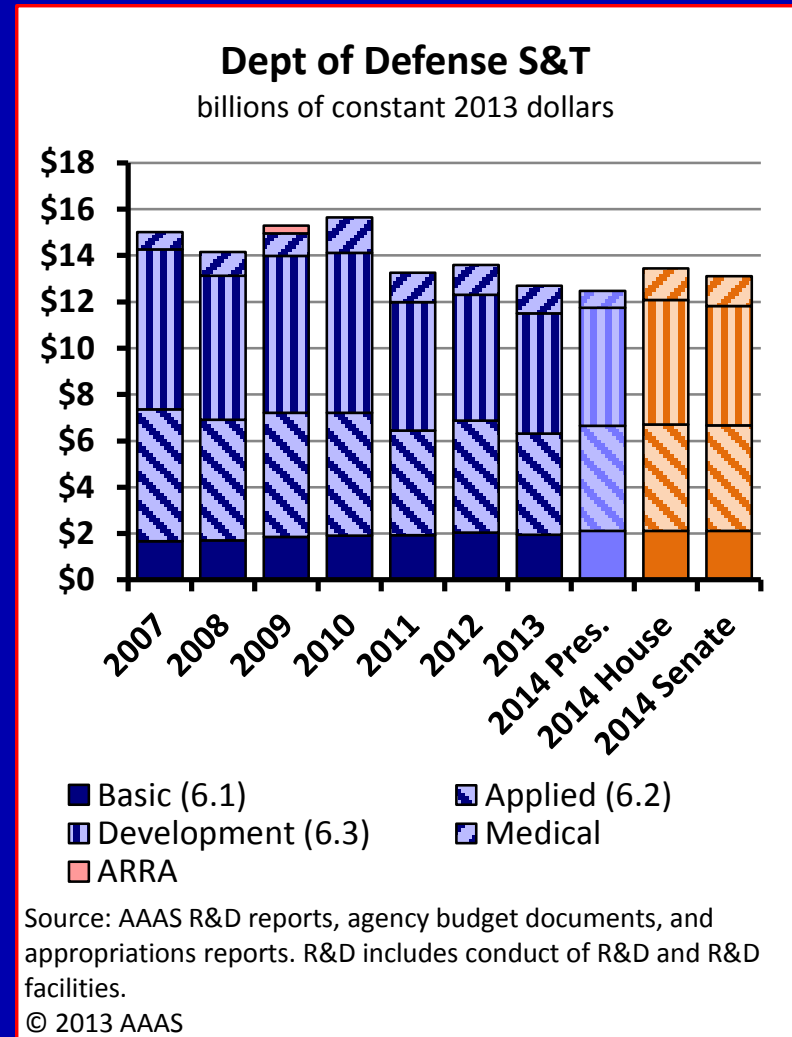
# Congress: Where Are We?

- Of 12 appropriations bills:
  - Four through House, none through Senate
- Fiscal year + debt ceiling
- Two discretionary budget caps:
  - President and Senate: \$1.06 trillion...
  - House (and current law): \$967 billion
- R&D appropriations decisions so far (mostly) reflect these differences
  - But does any of it matter?



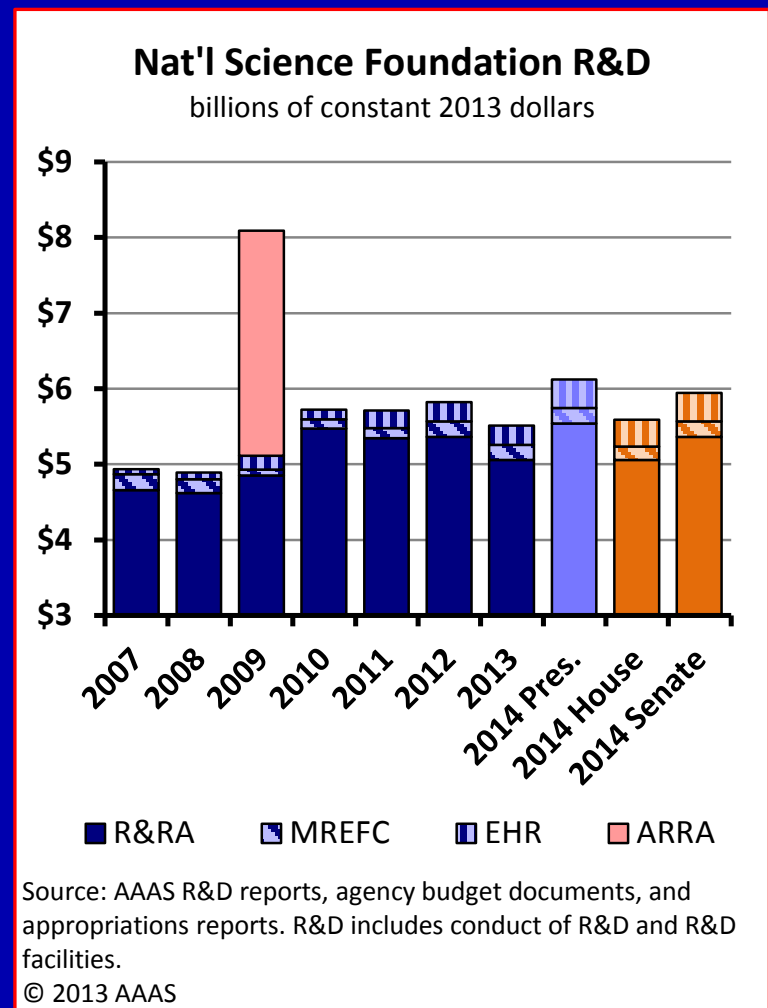
# Congress So Far

- Areas of (rough) agreement:
  - Defense (including DOE), Homeland Security, Veterans-related R&D
  - STEM reorganization: “no thanks, for now”
  - Planetary science
  - USDA



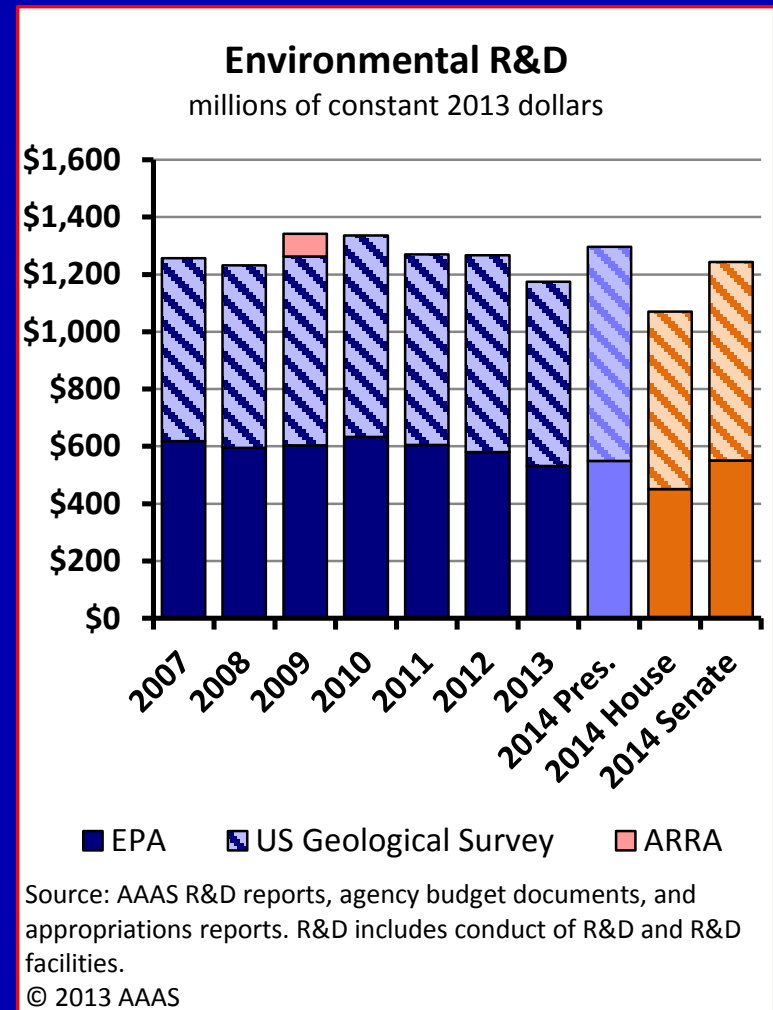
# Congress So Far (Cont)

- Rough agreement in priorities but divergent funding anyway
  - NSF
    - Social sciences...?
  - NASA exploration and technology: asteroids??
  - DOE Office of Science
    - Fusion? BER?
  - NIST



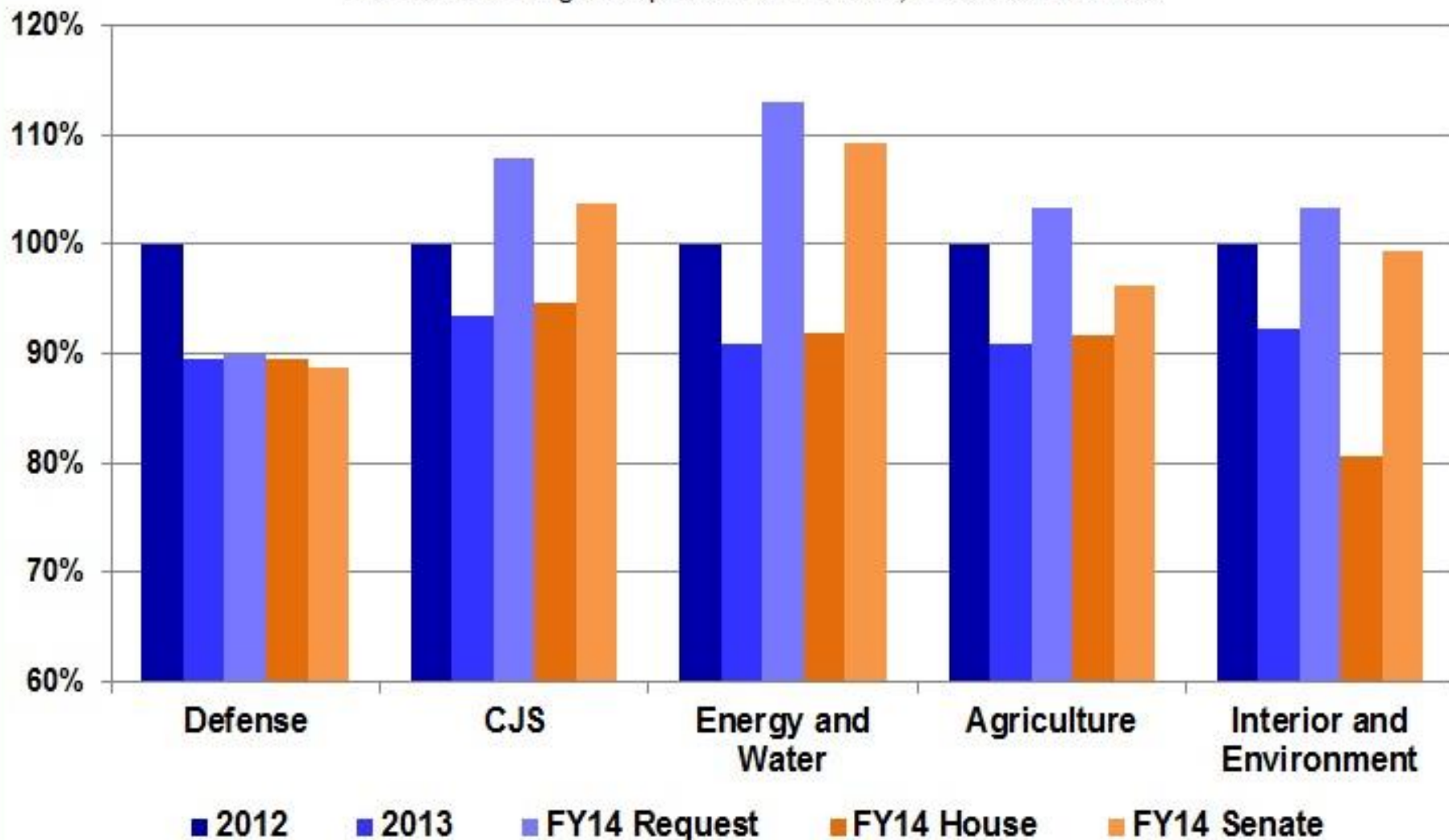
# Congress So Far (Cont)

- Areas of complete divergence in priorities
  - Clean energy R&D
  - Natural resources and environmental science
    - EPA, USGS
- Unknown: NIH, but House Labor-HHS bill will be much smaller



# FY 2014 R&D Appropriations by Spending Bill

Estimated funding as a percent of FY 2012, in constant dollars



CJS = Commerce, Justice, Science bill (includes NSF, NASA, Dept. of Commerce). FY 2012 = 100%. Source: AAAS analyses of agency budget documents and appropriations bills and reports. FY 2013 figures are current estimates. R&D includes conduct of R&D and R&D facilities.

# Big Picture / Looking Ahead

- The clock is ticking
  - Analysts: a mix of taxes and spending cuts
  - But hardline politics has led to complete and utter fiscal failure
- Almost certainly heading for a continuing resolution
  - FY13 funding minus ~2%?
- The debt ceiling situation is scary
- FY 2015 planning also murky

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[www.aaas.org/spp/rd/](http://www.aaas.org/spp/rd/)

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