The Federal R&D Budget Process 101

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November 21, 2019
For the CRA/CCC Leadership in Science Policy Institute
AAAS R&D Budget and Policy Program
http://www.aaas.org/rd
The Budget Process at a Glance

Executive Branch

White House
- OMB
- OSTP

Legislative Branch

Budget Committees

February Budget Request

Appropriations Committees & Subcommittees

SPENDING BILLS (x12)

- Timeline is 18 months or more from the start of agency planning to completion of appropriations and start of the fiscal year on October 1, however...
- Congress hasn’t gotten appropriations finished on time since 1996
Agencies in the Budget Process

Executive Branch

- Agency planning generally kicks off 18+ months in advance
  - Strategic goals? New initiatives? Program changes? Resource needs?

- Ingredients include:
  - Agency head and staff judgment
  - **External input** from advisory or review committees, workshops, stakeholder RFIs, National Academies decadal surveys, Congress, etc.
  - **Incrementalism**: last year’s budget influences next year’s

Rough Timeframe: February-August
The White House in the Budget Process

Executive Branch

- **OMB** = Office of Management and Budget
  - Spring: Guidance memo to agencies
  - Fall: Review of agency budget submissions, followed by “passbacks” and appeals
  - OMB’s job is to **constrain spending**
  - Translates high-level priorities into concrete activities

- **OSTP** = Office of Science and Technology Policy
  - Summer: joint memo with OMB outlining broad S&T priority areas for investment
  - Advice (PCAST)
  - Coordination (NSTC)

**Things must wrap in January**

**Review Timeframe:**
September-January
Composition of the Proposed FY 2020 Budget
Total Outlays = $4.7 trillion

outlays in billions of dollars

- Defense Discretionary: $662
- Nondefense Discretionary: $630
- Net Interest: $479
- Other Mandatory: $642
- Medicaid: $418
- Medicare: $679
- Social Security: $1,102
- [Defense R&D]: $64
- [Nondefense R&D]: $70
- Other Mandatory: $642

Source: Budget of the United States Government FY 2020. Projected deficit is $1.1 trillion. © AAAS 2019
Total Requested R&D by Agency, FY 2020

budget authority in billions of dollars

- DOD, $67.7
- HHS (NIH), $33.7
- DOE, $14.7
- NASA, $11.3
- NSF, $5.7
- USDA, $2.5
- Commerce, $1.7
- All Other, $4.9

Total R&D = $142.2 billion (estimated budget authority)

Source: OMB R&D data and supplements, agency budget justifications, and other agency documents and data. R&D includes conduct of R&D and R&D facilities. © 2019 AAAS
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- Agencies

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- Budget Committees
- Budget Resolution
- Appropriations Committees & Subcommittees
- SPENDING BILLS (x12)

- Congress has the **Power of the Purse**
- Does the President’s Budget even matter? Yes and no...

**February Budget Request**

**Rough Appropriations Timeframe: May-Sept.**
- **Budget Resolution** caps overall discretionary spending ($1.3 trillion in FY20)
This spending cap limits the size of **individual bills** (ranging from $5 billion to $700 billion)
The size of individual bills limits changes to individual agencies, offices, programs.
Discretionary Appropriations by Senate Subcommittee, FY 2019

Budget authority in billions of dollars

- Defense, $675.0
- Transportation/HUD, $71.4
- Labor/HHS, $181.2
- Commerce, Justice, Science, $63.0
- Energy & Water, $43.8
- Agriculture, $23.2
- Interior & Environment, $35.9
- Homeland Security, $55.2
- Legislative Branch, $4.8
- Military Construction/VA, $98.0

Appropriations subject to spending caps only. Source: CBO data. © 2018 AAAS
Committees and Cardinals

The Basic Process

- Subcommittee → Committee → Floor → Conference committee → President’s desk
  - Bills AND reports

- Subcommittee chairs (a.k.a. the “Cardinals”) are responsible for producing “Chair’s mark”: initial bill for each subcommittee

- Key: Getting a bill that can PASS (well duh)
  - Incrementalism; universalism
  - Hearings, “Dear Colleagues,” Member Days, etc
What factors influence science appropriations?

- “All politics is local.”

- Personal legislator interest

- Public interest
  - “We don’t earmark NSF because no one else earmarks NSF.” – Anonymous staffer quoted by Savage, LSQ 1991

- Ideology and party preferences
  - But: “There is no such thing as a fiscal conservative when it comes to his district or subcommittee” – David Stockman (Reagan’s OMB chief)
Tradeoffs: Balancing basic research and facilities, labs, tech portfolio, NNSA; also Army Corps, Bureau of Reclamation

NNSA funding has been priority of late

Office of Science: as basic science arm, generally supported in more bipartisan fashion
  - National labs help

Technology programs: Congress tends to fund when funding is available, but can also be first on the chopping block
  - Some value innovation programs more than others
  - Regional energy politics and economics
How to balance many different missions and public interest goals?

- NSF: many continue to value basic research
  - Universities, industry advocacy
  - Disciplinary fights?

- NASA: science and exploration missions
  - Again: labs and research centers help
  - Balancing the science portfolio?

- NOAA and NIST: some program elements more controversial than others
  - NOAA: climate research funding source of dispute; but legislators often support locally-relevant research funding, including Sea Grant
  - NIST: lab programs have been supported for competitiveness; industrial innovation and manufacturing programs a target

**Commerce, Justice, Science Subcommittee**

<table>
<thead>
<tr>
<th></th>
<th>House</th>
<th>Senate</th>
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<tbody>
<tr>
<td>Chair</td>
<td>Jose Serrano (D-NY)</td>
<td>Jerry Moran (R-KS)</td>
</tr>
<tr>
<td>Ranking Member</td>
<td>Robert Aderholt (R-AL)</td>
<td>Jeanne Shaheen (D-NH)</td>
</tr>
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</table>

Based on House committee report. © 2018 AAAS
In this bill: deep divisions over public health programs, education, labor...

But everybody loves NIH!
- We have now had 4 years (and counting) of multibillion dollar increases
- Alzheimer’s, cancer, neuroscience, opioids among recent priorities
- Congress has protected NIH awardees from indirect cost changes, salary cap changes

Other programs also have their supporters: public health and preparedness matter to lots of people (BioShield, BARDA, CDC, etc)
- Gun violence research?

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<tr>
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<td>Rosa DeLauro (D-CT)</td>
<td>Roy Blunt (R-MO)</td>
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<tr>
<td>Ranking Member</td>
<td>Tom Cole (R-OK)</td>
<td>Patty Murray (D-WA)</td>
</tr>
</tbody>
</table>

FY 2019 House Labor-HHS Bill Composition

- Labor, $12.1
- NIH, $38.3
- Education, $70.9
- Other HHS, $50.9
- Other, $15.0

Based on House committee report. © 2018 AAAS
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- NSF
- NASA
- NIH

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"Please don’t veto us!"
Other Legislative Appropriations Tools

- Continuing Resolutions: often necessary to avoid a shutdown October 1
  - ...with depressing regularity
  - Length can vary, from a day to a year
  - Uncertainty? New starts? Spending slowdowns?

- Omnibus (multi-bill package)
  - Or minibus, or megabus, or cromnibus, or...

- Supplementals
  - i.e. Zika, Ebola, Hurricanes
  - Also war funding
  - Not subject to spending caps
The Current Appropriations Cycle Goes Ever On...

- House: 10 of 12 through floor
- Senate: 4 of 12 through floor

- House and Senate still need to:
  - Agree on size of each bill
  - Conference to resolve differences

- **Continuing Resolution** signed into law, keeps the lights on until November 21

- Another CR is likely...but for how long?
  - Mid-December?

- Major issues:
  - Border wall
  - Impeachment?
  - Abortion funding

*(Image source: Wall Street Journal)*
Select Science & Tech Programs in FY 2020 Appropriations So Far

*Estimated percentage change from FY 2019, nominal dollars

- Defense Research
- NIH
- NSF
- Energy: Office of Science
- NASA
- Agriculture
- US Geo. Survey
- EPA Science & Tech
- NOAA Research
- VA Research

**Includes ARS, NIFA, ERS, NASS.

Senate figures (except NIH) refer to mix of committee- and floor-approved funding. Most House figures have been approved on floor. | AAAS 11.5.19
Department of Energy Appropriations

SPENDING BILL: Energy & Water
STATUS: Not yet taken up by House or Senate
Last Update: May 22, 2017

Federal R&D funding in Congress is allocated via several spending bills, authored by the appropriations subcommittees. Current AAAS estimates of R&D by select spending bill and subcommittee are shown below.

Last Updated: May 22, 2017

R&D in FY 2018 Budget and Appropriations

The President’s budget request are displayed below. House and Senate estimates will be added once all are passed. Mouse over for more info, or use the tabs above for views appropriate by agency or by Congressional subcommittee and spending bill.

Federal R&D Total Estimates*

R&D Budget by Decisionmaker*
For more info...

mhouriha@aaas.org
202-326-6607
http://www.aaas.org/rd
The Federal Budget Cycle

<table>
<thead>
<tr>
<th>FY 2020</th>
<th>Phase 4: Spend the Fiscal Year Budget</th>
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<tbody>
<tr>
<td>FY 2021</td>
<td>Phase 2: OMB Review</td>
</tr>
<tr>
<td>FY 2022</td>
<td>Phase 1: Planning within Agency w/ OMB and OSTP oversight</td>
</tr>
</tbody>
</table>

- Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
- FY 2020 | FY 2021 | FY 2022 |

Gov’t is usually working on 3 budgets at a time (though presidential transitions complicate things)
The Budget Resolution

- Established by the 1974 Congressional Budget and Impoundment Control Act
  - Intended to reassert, and broaden, legislative control over the budget
  - Also created the House and Senate budget committees, which write the Resolution

- Overall framework:
  - Revenue, deficit, and total spending targets
  - Typically includes programmatic recommendations
  - **Key for science spending**: discretionary spending limit to govern appropriations

- Isn’t law and can’t change law, but can set up reconciliation process (i.e. tax reform)

- Best seen as a **political document** as much as a governing document
  - Partly because it isn’t always adopted...

**Rough Timeframe:** March-April (LOL)
Beyond This Fall

- Next year, much more limited cap space: less than 1% increase for defense and nondefense
  - Also, an election year...

- 2021: No more caps
  - Though “how much to spend” doesn’t stop being a major political question!
  - Budget resolution and debt ceiling return

- Fiscal future: aging population, rising healthcare costs, and insufficient revenues mean...growing deficits, rising interest payments, and declining discretionary spending
  - And THAT could all mean stagnating science funding for some years to come
  - Or fiscal blowback (again)?
### CBO's Baseline Projections of Outlays and Revenues, Compared With Actual Values 25 and 50 Years Ago

<table>
<thead>
<tr>
<th>Year</th>
<th>Social Security</th>
<th>Major Health Care Programs</th>
<th>Other</th>
<th>Net Interest</th>
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<td>1994</td>
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<tr>
<td>2019</td>
<td>4.9</td>
<td>5.3</td>
<td>2.6</td>
<td>1.8</td>
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<tr>
<td>2029</td>
<td>5.9</td>
<td>6.6</td>
<td>2.3</td>
<td>2.6</td>
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<table>
<thead>
<tr>
<th>Year</th>
<th>Net Interest</th>
<th>Defense</th>
<th>Nondefense</th>
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<tbody>
<tr>
<td>1969</td>
<td>1.3</td>
<td>8.4</td>
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<tr>
<th>Year</th>
<th>Total Outlays</th>
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Source: Congressional Budget Office.

In 2028, October 1 (the first day of fiscal year 2029) falls on a weekend, so certain payments that are due on that date will instead be made in September, thus boosting outlays in fiscal year 2028 and reducing them in 2029. Such shifts affect projections of outlays for the major health care programs, other mandatory outlays, defense discretionary outlays, total outlays, and the deficit. A similar shift boosted outlays in those categories in 1994. The data presented here have been adjusted to exclude the effects of those timing shifts.

a. Consists of outlays for Medicare (net of premiums and other offsetting receipts), Medicaid, and the Children's Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.
Estimated R&D Appropriations by Senate Subcommittee, FY 2019

- Defense, $64.4
- Military Construction/VA, $1.5
- Transportation/HUD, $1.1
- Commerce, Justice, Science, $20.3
- Labor/HHS, $39.2
- Energy & Water, $18.3
- Agriculture, $2.9
- Interior & Environment, $2.0
- Homeland Security, $0.7

Budget authority in billions of dollars

Estimates based on appropriations and agency data. © 2018 AAAS
Science & Tech Agencies in the Trump Administration's Budgets
Proposed year-over-year changes, nominal dollars

*Includes renewables, efficiency, nuclear, fossil, grid research, cybersecurity, ARPA-E. | AAAS
Science Agency Budget Increases Since January 2017

Percent change from FY 2016 - FY 2019, nominal dollars

*Nuclear, fossil, renewables, efficiency, grid, ARPA-E.
Source: agency budget documents and appropriations. Note: inflation is 3.3% over this time. | AAAS 2018
Limits on **Nondefense Spending**

Billions of constant 2019 dollars

*Current caps last through 2021. Based on past and current budget resolutions, the Budget Control Act and subsequent legislation, and the FY20 request.*

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Limits on Nondefense Spending

Billions of constant 2019 dollars

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Federal S&T Spending Since FY 2010

Percent change from FY10 levels, constant dollars

- Discretionary Caps
- DOE Science
- NIH
- DOE Tech Programs*
- NSF
- NASA
- DOD S&T
- USDA R&D (est.)

*Includes OE, EERE, Fossil, Nuclear, Cybersecurity, ARPA-E.

Based on AAAS analyses of historical OMB, agency, and appropriations data. © 2018 AAAS
R&D as a Share of GDP by Funder

Source: National Science Foundation, *National Patterns of R&D Resources* series. © 2019 AAAS
Federal Research Funding by Discipline as a Share of GDP, 1970-2017

Source: National Science Foundation, Federal Funds for Research and Development series. GDP figures are from OMB. © 2019 AAAS
National R&D Intensity
Gross R&D investment as a percent of GDP

Source: OECD, Main Science and Technology Indicators, August 2019. © 2019 AAAS