Research Town Hall Meeting:
Federal R&D Funding Outlook for 2013 and Beyond

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Lewis-Burke Associates LLC
April 1, 2013
Lewis-Burke Associates LLC

- Began working with Boston University’s Office of Federal Relations last year.
- 23 professional staff members
- 18 registered lobbyists
- 23 clients, all nonprofits involved in research and/or education
  - 15 universities
  - 3 contractors running national research facilities
  - 6 national associations
Select Services

- Advanced intel on new programs or emerging agency themes.
- Strategic university-wide agenda development.
- Enhancing resources for researchers.
  - Information on new funding initiatives and prominent solicitations.
  - Support for post-docs and graduate students.
  - Thematic *deep dives* on federal funding.
- Coalition building.
- Program and project support at both political and policy levels.
- Positioning and profile enhancement.
Outline

- Budget Outlook for Federally-Funded Research
- Interagency Research Themes and Initiatives
- Specific Agency Activities and Directions
Budget Outlook for Federally-Funded Research
Short Term Picture

• Federal agencies implementation of sequestration.
  – Efforts to protect essential priorities.
• Finalization of FY 2013 federal funding – Mar 27, 2013.
  – Flat funding and continuing resolution for most agencies.
  – Full appropriations for NSF, NASA, DOD, DHS, USDA
• FY 2014 federal budget proposal and debate on FY 2014 federal funding with future spending caps.
• Undetermined path for mandatory spending reductions for healthcare, education, etc.
Sequester is Here... For How Long?

Source: Steve Sack, Star Tribune
Sequestration Being Implemented

- Broad agreement this is bad policy – Divergent views over what’s better.
- Biggest impact already occurring – affecting agency attitudes.
- Largest impact on future awards:
  - Many NIH institutes: Already have implemented lower pay-lines.
  - NSF: Delayed solicitations, fewer awards.
  - Large projects will be subject to reductions.
- New initiatives favored but also most susceptible to delay.
- Agency program managers are holding highly scored proposals in reserve if sequestration is reversed.
- Obligated funds protected.
• Universities have to adjust to relatively flat federal research budgets for coming years.
• Will be efforts to return to more *regular* order for spending in FY 2014 or 2015.
• R&D and basic research still a TOP priority on both sides of the aisle.
• New Initiatives still expected in the current environment.
• Public-private partnerships will remain the favored mechanism for large-scale efforts.
## Final FY 2013 Research Funding

<table>
<thead>
<tr>
<th>In billions of $</th>
<th>FY 2012 Enacted</th>
<th>FY 2013 Request</th>
<th>FY 2013 House (+/- FY12)</th>
<th>FY 2013 Senate (+/- FY12)</th>
<th>FY 2013 Enacted* (+/- FY12)</th>
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<tbody>
<tr>
<td>NIH</td>
<td>30.6</td>
<td>30.6</td>
<td>30.6 (=)</td>
<td>30.7 (+0.3%)</td>
<td>30.6 (=)</td>
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<tr>
<td>NSF</td>
<td>7.03</td>
<td>7.37</td>
<td>7.33 (+4.3%)</td>
<td>7.27 (+3.4%)</td>
<td>7.25 (+3.2%)</td>
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<td>DOE Science</td>
<td>4.87</td>
<td>4.99</td>
<td>4.82 (-1.0%)</td>
<td>4.91 (+0.7%)</td>
<td>4.86 (-0.2%)</td>
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<tr>
<td>NASA Science</td>
<td>5.07</td>
<td>4.91</td>
<td>5.10 (+0.4%)</td>
<td>5.00 (-1.4%)</td>
<td>5.05 (-0.8%)</td>
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<tr>
<td>DOD Basic Research</td>
<td>2.12</td>
<td>2.12</td>
<td>2.12 (=)</td>
<td>2.13 (+0.5%)</td>
<td>2.13 (+0.6%)</td>
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</table>

*FY 2013 levels do not account for sequestration*
Interagency Research Themes and Initiatives
Multi-agency research priorities for FY 2014:

- Innovation and Commercialization
- Advanced Manufacturing
- Big Data
- Materials Research
- Cybersecurity
- Drug Discovery, Development and Translation
- Neuroscience
- Environmental Sustainability and Climate
- International
- Graduate Education
- Mental Health and Gun Control
Innovation & Commercialization

• Administration sees innovation as key priority to support the U.S. economy.

• Administration and federal agencies are exploring ways to reduce the barriers in the translation of research results into new products, industries, and jobs.

• Increased focus at federal agencies on:
  – Public-private partnerships (e.g. NNMI).
  – Innovation training (e.g. NSF I-Corps program).
  – Translational science/drug development (e.g. NCATS at NIH).
  – Support for proof of concept funding (e.g. NHLBI CAI; NSF AIR).
  – Efforts to support economic development and regional cluster (e.g. EDA i6 program).
  – Efforts to use low cost innovations to support change (e.g. USAID DIV).
Advanced Manufacturing Partnership (AMP) launched in June 2011.
DOD, DOE, NSF, DOC/NIST, and NASA all involved in the effort.
Advanced Manufacturing National Program Office (AMNPO) hosted by NIST to coordinate interagency efforts.
- White Paper/Roundtable opportunities for input.

Timeline:
- March 2012 – President Obama announced $1 billion proposed National Network for Manufacturing Innovation (NNMI).
- August 2012 – First NNMI pilot awarded to Ohio in Additive Manufacturing.
- March 2013 – Three new pilot competitions expected to be announced – two from DOD, one from DOE.
Big Data

- Obama Administration Big Data initiative launched March 2012.
  - Focus on new tools and techniques to manage vast and complex data sets.
  - NSF, NIH, DOD, and DOE are most engaged agencies.
  - Individual agency programs more predominant than interagency activities.
  - Joint NSF-NIH Big Data Competition.
    - First round was very competitive – 560 proposals submitted
- NIH Big Data to Knowledge initiative announced December 2012.
  - Data sharing and big data tools.
  - Enhance training in computational skills for biomedical researchers.
    - RFI out now with comments due March 15
  - New Centers of Excellence for Biomedical Big Data.
    - Request for Applications (RFA) expected in Spring.
    - Up to 15 investigator-initiated centers and between 2 and 5 NIH-directed centers through FY 2014 and FY 2015.
• Materials Genome Initiative launched in 2011 to integrate computational and experimental tools to speed material design.
  – NSF, DOE, DOD, and NIST main agencies involved.
  – More individual agency activities than new interagency programs.
  – Administration interest in data sharing/standards, computational training, commercialization.

• National Nanotechnology Initiative continues.
  – Focus on commercialization and founding of new industries.
  – Signature Initiatives in nanomanufacturing, sensors, solar energy, and nanoelectronics.

• DOD and DOE focus on replacement and recycling of critical rare materials.

• NSF Materials 2022 report on instrumentation funding.
  – Focus on funding for instrumentation development, professional instrumentation staff, Materials Discovery Centers.
Cybersecurity

- Emphasis on both research and training/workforce issues.
- Varying approaches on cyber legislation: piecemeal vs. comprehensive.
  - Narrower scope bills already underway re: research/workforce and information sharing.
- Majority of current federal funding to industry; federal government looking to leverage private sector expertise, but opportunities exist for universities—strong emphasis on public-private partnerships.
- In addition to producing research, universities can serve as conveners:
  - Honest brokers.
  - Ability to highlight proven models.
  - Bring industry and other stakeholders together to solve large cyber challenges.
- University funding (smaller scale) still available:
  - NIST NCCOE (NIST currently seeking industry partners—universities scale participation).
  - New NIST Centers of Excellence program (cyber among proposed foci).
  - Ongoing programs and initiatives at NSF, DOD, and DHS—primarily competitive.
Drug Discovery, Development and Translation

• Translational research remains priority for Administration – NIH and FDA grappling with reinventing clinical enterprise – Better, Faster, Cheaper
  – NCATS established and focused on science translation across diseases/illnesses.
  – Streamline development process; decrease development time and cost.
  – FDA drug approval process; improved use of science.
  – Increase drug pipeline.

• Ongoing academia, pharma, and federal partnerships
  – Development of multi-CTSA initiatives to increase national capacity for clinical and translational research
  – NIH/FDA partnership to foster career paths in regulatory science.
  – NIH-FDA-DARPA regulatory science partnership (organs on a chip).
  – FDA announces public-private partnership to promote medical device regulatory science.
  – DARPA looking at nanotherapeutics.
Neuroscience

- Large scale interagency process underway with 2013 and 2014 money (BAM – *NY Times*).
  - Public-private partnership with international partners.
- Final interagency report (5-10 key areas of research) expected in June.
- Lots of input: Carlos Pena (FDA) managing with Phil Rubin (OSTP).
  - Representatives from: USDA, DOC, DOD, ED, HHS, DOE, DOJ, VA, EPA, NSF, NASA, ODNI, OMB, and OSTP.
- DOD/DARPA’s role – practical systems to help the warfighter by preventing and repairing injury, and through accelerated learning.
Environmental Sustainability & Climate

• Administration remains focused on development of clean energy technologies to spur economic growth; limited dollars will be allocated to a few large programs.

• Congressional Republicans largely opposed to funding for climate change initiatives; however, resurgence of interest in climate change policies (cap and trade/carbon tax) following SOTU.

• NSF is leading on sustainability research activities through it’s Science, Engineering and Education for Sustainability (SEES) initiative:
  – Very interdisciplinary, social science seen as a major component.
  – Becoming increasingly interagency.
  – Interested in projects that look at issues from end-to-end and are scalable.
  – Expect SEES to continue to be prioritized for the next several years – originally seen as a 5 year initiative, NSF now talking about it with a 10 year lifespan.

• DOD increasingly interested and investing in renewable energy technologies to enhance energy security and stabilize budgeting.
Agencies have mixed views on value of international collaboration amidst budget constraints.

- NSF and DOD – Globalization an opportunity to leverage limited dollars.
- Agencies looking for low-cost ways to promote collaboration (e.g. NSF role in Global Research Council).

Science diplomacy forced to back burner as foreign policy focus has shifted to unforeseen areas (Mali, Egypt, Iran, etc.).

- Administration’s planned pivot to Asia Pacific and Latin America complicated by events in Africa and Middle East.

USAID and State Department – Use of science, technology, and innovation to modernize global development a top priority.

- USAID programs including HESN, Development Innovation Ventures, and Grand Challenges for Development continue to provide opportunities.
- USAID has expanded PEER program to include NIH.
Graduate Education

- New thinking on graduate education throughout federal agencies.
- General themes:
  - Preparation for alternate careers
  - Diversity
  - Interdisciplinary skills
  - Industrial and international experience
  - Ability to address social issues
  - Sustainability/retention
- NIH has new Biomedical Research Workforce and Diversity Initiatives.
  - Awards for innovative approaches to enhance traditional graduate training.
  - New Building Infrastructure Leading to Diversity program to support mentoring and scholarships.
  - Big Data to Knowledge initiative looking at interdisciplinary training.
- NSF in rethinking stage for 2013 – New GROW program to support international experiences for fellows; potential for additional changes and new models.
Mental Health & Gun Control

- Newtown, CT tragedy a national forcing event for action on mental health.
- White House Executive Order; State of the Union; Congressional Legislation.
  - Research:
    - CDC conduct research on causes/prevention of gun violence.
    - Seek innovative technologies to advance gun safety.
    - NIH/CDC restriction on funding for research incorporating firearm issues.
    - OSTP interagency working group on neuroscience.
    - Finalizing mental health parity legislation.
    - NAS study on impact of violent video games.
  - Workforce training:
    - Members of Congress seeking data.
    - Training for active shooter situations.
    - Hiring incentives for schools in need of mental health professionals.
Specific Agency Activities and Directions
National Science Foundation

• Focus on interdisciplinary “OneNSF” initiatives aligned with Obama Administration Priorities:
  – Big Data and Cyberinfrastructure Framework for the 21st century (CIF21)
  – National Robotics Initiative (NRI)
  – Advanced Manufacturing, including Materials Genome Initiative
  – Secure and Trustworthy Cyberspace (SaTC)
  – Science, Engineering, and Education for Sustainability (SEES)
  – Expeditions in Education (E²) – focus on undergraduate education
  – Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE)

• New Leadership:
  – NSF Director Subra Suresh stepped down in March
  – New leaders in Mathematical and Physical Sciences, Geosciences, and Engineering

• Policy issues:
  – Open access
  – Administrative burdens on researchers
  – High staff turnover
Department of Defense

- DOD science and technology programs remain a priority despite funding constraints.
  - New grants could be delayed until FY 2014 and beyond to minimize impact of sequestration; seeking “disruptive technologies.”
  - Air Force and Navy likely long-term funding winners.
- Defense Strategic Guidance will still guide policy decisions; increased reliance on technology to offset budget reductions budgets and total troop size.
  - Cybersecurity and autonomy will remain emphases regardless of ASD-R&E. Maintaining technological workforce a major concern (particularly cyber); other priorities include big data, manufacturing, energy, and counter-WMD.
  - Social sciences being incorporated across BAAs; funding for Minerva uncertain given leadership changes.
DOD: Service Branch Research Offices

• Army Research Office:
  – Continues strong focus around broad basic research topics including physics, materials, computing, engineering, life sciences, and environmental sciences.
  – Emphasis remains around broad scientific areas, but ARO is aligned with crosscutting DOD priorities like big data, manufacturing, and materials.

• Office of Naval Research:
  – Leading funder of basic research across service branches.
  – Priorities include sensors/communications, energy, and portable weapons.

• Air Force Office of Scientific Research:
  – Recent realignment under five new thrust areas reflects increasing interdisciplinary approach to funding research.
  – Priorities include cyber/information science, materials, alternative energy, and communications.
DOD: Other Research Entities

- **DARPA:**
  - Focused on game-changing R&D around threats of the future; program managers enjoy broad autonomy in funding projects.
  - Cyber/cloud computing, big data, and health/biological research top priorities under new Director Prabhakar.
- **DTRA:**
  - Basic and applied research on bio/chemical/nuclear/information sciences geared towards countering weapons of mass destruction.
  - Small, but underutilized research opportunity for universities.
- **TARDEC:**
  - R&D focused on tank and automotive technology; universities can engage through BAAs, CRADAs, and regular programs.
  - Electronics, energy/fuel use, robotics, communications, and materials are core focus areas.
National Aeronautics and Space Administration

• Administration support for Science and Space Technology.
  – Discussions about future of Planetary science and flagship missions.
  – Earth Science “protected” by Administration; climate research a partisan issue in Congress.
  – JWST continues to be major priority within Science Mission Directorate; no new wedges for Astrophysics until JWST is completed.
  – PI-led missions (i.e., Venture Class, Discovery, Explorer) are a high priority.

• Support grows for new Space Technology Mission Directorate.
  – $573 million in FY 2012; in FY 2013, House proposed $632 million and Senate proposed $651 million
  – Future advanced space systems concepts and enabling technology.
  – Across the Technology-Readiness-Level spectrum.

• Top priority science decadal missions putting pressure on smaller programs.

• NASA Human Space Flight program is in flux
  – Dispute about next destination (asteroid?).
• DHS continues to be an Administration priority; border security, cyber defense, disaster resiliency, immigration enforcement, and terrorist prevention remain the central agency foci.

• The S&T Directorate’s (R&D arm) top foci are:
  – Chemical, Biological, Radiological, Nuclear, and Explosives Defense
  – Disaster Resilience
  – First Responders
  – Cybersecurity

• DHS trying to shift its R&D focus to more field-ready technologies that can be easily adapted for DHS-specific purposes.
  – Universities able to participate in funding projects; existing industry partnerships, especially in areas like cyber, will be key to successfully obtaining research funds.

• Despite recent Congressional support, future DHS S&T funding remains uncertain and could be a target.
Department of Transportation

- Urban and smart infrastructure a focus area for Administration for the next 4 years. The Administration’s approach and investments to support domestic infrastructure development include:
  - Efforts to improve resilience, monitoring, and other “smart” features embedded in university research.
  - Improving transportation and infrastructure resources is linked to economic growth.
  - Providing access to jobs, revenue, health care, and education.
- Infrastructure renewal emphasized with renewed interest expected as transportation reauthorization bill expires in 2014.
  - University Transportation Centers (UTC) program underwent significant changes in this bill; remains DOT’s flagship university research program.
- DOT’s strategic goals: safety, state of good repair, economic competitiveness, livable communities, and environmental sustainability – permeate DOT’s research portfolio.
  - Much of the research funding flows through state agencies; opportunities for partnership.
• Translational research still emphasized; big projects highlighted.
  – Concerns over diverting funds from basic research.

• Award trends:
  – Milestone-driven, collaborative “U” award mechanism utilized more.
  – Special consideration for first-time applicants continues; new concerns over achieving second grants.
  – Some institutes are decreasing use of program project grants (P01).

• NIH structure and policies:
  – NCATS finding its feet, but has no funding for new activities.
  – NIDA-NIAAA merger cancelled; functional integration being pursued.
  – Peer review process under scrutiny to increase innovative projects and improve diversity of grantees.
  – OMB grant reform to have minimal effect on NIH grant processes.
• Microbiome project has been successful and now will transfer from Common Fund support to more targeted projects at Ics.
• NCI Provocative Questions Project funds game-changing scientific questions; NCI Center for Global Health a continued priority.
• NINDS planning project has identified priority research in stroke prevention, treatment, and recovery; developing new Stroke Trials Network.
• NIAID initiative to support human immunology project consortium, HIV vaccine research.
• NHGRI continuing technology development, advances in personalized/genomic medicine.
Infectious Disease Research

- NIH often features infectious disease research as yielding potentially promising results: universal flu vaccine, HIV/AIDS vaccine.

- NIAID looking to augment RCEs with translational research centers focused on countermeasure development; emphasize broad spectrum technologies and platforms with multi-use potential.

- DOD supports research to develop medical solutions to protect military; partners with HHS, DHS.

- International collaborations and opportunities in AIDS, hepatitis, and other areas; multiple partners often needed to acquire federal support.
Cancer Research

- Cancer viewed as leading effort to streamline clinical trials system; NCATS seeking to have a role.
- NCI priorities include: Provocative Questions initiative, global cancer research, cancer genomics, Frederick National Lab for Cancer Research.
- Increased interest on cancer’s interaction with other diseases and conditions, such as obesity, diabetes and disability.
- NCI Director Varmus’ focus on sustaining same level of new grants despite cuts could affect support for centers, other NCI activities.
Patient-Centered Outcomes Research Institute

- Assists patients, caregivers and providers in making informed evidence-based decisions about health care through clinical effectiveness research.
  - Research should answer questions that matter to the patient and caregiver.
  - Patients are part of the research team.
- Funded research supports PCORI’s *National Priorities for Research* and its *Research Agenda*.
  - Assessment of Prevention, Diagnosis, and Treatment
  - Improving Healthcare Systems
  - Communication and Dissemination Research
  - Addressing Disparities
  - Accelerating PCOR and Methodological Research
- Two “complementary” paths:
  - Supports three broad funding cycles a year.
  - Will support targeted funding for five topics in 2013.
• Energy research central to driving Administration policy goals (energy security and independence, climate change, advanced manufacturing, sustainability).
  – Energy Innovation Hubs remain hallmark of Administration and combine numerous disciplines across the public-private spectrum; 5 of 8 proposed hubs have been funded to date.
  – ARPA-E’s high-risk, high-reward research remains popular with members of both parties.
• Transitioning leadership leaves DOE without a forceful advocate.
• Challenges to DOE’s research portfolio remain:
  – EERE’s applied research portfolio under scrutiny as duplicative of private-sector.
  – Traditional Office of Science programs pinched as emphasis moves toward Hubs, EERE, and ARPA-E.
  – National labs competing with one another to remain relevant as budgets tighten.
U.S. Department of Agriculture

- USDA’s core mission (food and nutrition) a high priority for Administration.
  - Priorities include: childhood obesity prevention (First Lady), climate change, food safety, global food security, and sustainable bioenergy.
  - PCAST ag research report (December 2012) calls for a rebalancing of intramural (ARS) and extramural (AFRI) research within USDA; increased funding for AFRI.
- USDA leadership is engaged in research.
  - Secretary Vilsack is staying for Obama’s second term; met with PCAST in advance of its report on ag research
  - New NIFA Director, Sonny Ramaswamy, is eager and cooperative; well-liked by Hill.
- AFRI has good support in Congress, despite the fiscal climate.
  - 2012 House and Senate Farm Bills maintained AFRI’s authorization level at same level as 2008 Farm Bill ($700 million).
  - AFRI maintained level funding for FY 2012 at $264.5 million; both House and Senate proposed increases to AFRI for FY 2013 ($276.5 million and $298 million, respectively).
  - Hard choices for Members of Congress (e.g. Do we feed children (SNAP) or support research?).
Education Research

- Obama Administration interested in getting education research to the practitioners.
- Advanced Research Policy Agency-Education (ARPA-ED)
  - FY 2012 Budget Request; no funding yet/not yet authorized.
  - Funded projects would address specific identified problems in education (e.g. digital tutors as effective personal tutors; courses that improve as more students use them; educational software as compelling as video games).
- Institute of Education Sciences (IES)
  - Sustained funding levels
  - Emerging foci – Research-Practitioner Partnerships; Researcher and Policymaker Training; evaluation of programs (RttT); statewide longitudinal data systems and how to use them.
  - Possible new R&D Center for education research, contracting opportunities.
- Investing in Innovation (i3) and Race to the Top (RttT)
  - Not yet authorized, but a priority for the Administration.
  - LEA must lead or be a close partner.
  - Focus on Administration policy priorities – STEM, Early Learning, Higher Education/ College Cost/ Completion
• Despite White House support for cultural agencies, not a priority in this fiscal environment.

• National Endowment for the Humanities (NEH)
  – University audience: humanities faculty
  – Funding for: Fellowships/Seminars, Challenge Grants, Digital Humanities
    • *We the People* (focus on U.S. culture and history) remains popular with Congress.

• National Endowment for the Arts (NEA)
  – University audience: arts, music, dance, literature, design, theater, film, and digital art; not research; grants to institutions, not individuals.
  – Funding for: *Art Works, Challenge America, Our Town*
  – New Chairman may have new priorities
  – Current effort to partner with other agencies (e.g. Arts and Human Development with HHS).

• Institute for Museum and Library Studies (IMLS)
  – University audience: grants for library/museum operations; not research
  – Funding for: Training for librarians; develop programs to serve middle/high school students (e.g. technology access)
  – Like NEH, support for digital efforts (e.g. *Digging into Data Challenge* – computationally intensive research in the humanities and social sciences.)
HRSA & Health Professions Training

- HRSA funding for universities is primarily for training, not research.
- Provides support for training, technical assistance, direct financial assistance to state and local healthcare entities (e.g. for HIV/AIDS or emergency services for children), and very targeted research activities.
- Funding is disbursed thematically through bureaus/offices:
  - Bureau of Health Professions; Bureau of Primary Health Care; Bureau of Maternal and Child Health; Office of Rural Health; Office of Women’s Health.
- Funds provided for:
  - Health Professions (Title VII/VIII programs) – Includes loans/scholarships to students and on-campus training programs covering nursing, geriatrics, public health, dentistry, mental and behavioral health, and other health professions.
  - Health Centers – HRSA’s signature program, funds 1,100+ community-based health centers (e.g. FQHCs).
• Funding for universities provided for information and data dissemination; policy development; grants (service-focused rather than research).
• SAMHSA as resource for data collection.
• Strategic Plan -> Eight strategic initiatives framing all SAMHSA activities:
  1. Prevention  
  2. trauma and justice  
  3. military families  
  4. recovery support  
  5. health reform  
  6. health information technology  
  7. data outcomes and quality  
  8. public awareness and support
• Largest programs are state block grants.
• SAMHSA participating in implementation of Gun Violence Reduction Executive Actions and leading National Dialogue on Mental Health activities (mostly PR).
Questions?
Back Up Slides
Judging from the Past

- Prior Deficit Reduction Legislation – Balance of Spending Cuts vs. Revenue Increases.

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<th>Year of Deficit Reduction Legislation</th>
<th>Spending Cuts (Percent of Deficit Reduction)</th>
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<td>1983</td>
<td>37%</td>
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<tr>
<td>1984</td>
<td>18%</td>
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<tr>
<td>1987</td>
<td>61%</td>
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<tr>
<td>1990</td>
<td>67%</td>
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<tr>
<td>1993</td>
<td>44%</td>
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- Legislation passed under “divided” government.

* Source: CBO, CRS
Trends in Discretionary Spending

*Source: AAAS*
Trends in Research by Agency
in billions of constant FY 2010 dollars

* Source: AAAS