

Science Advice and Science Policy in the Obama Administration

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"Science is more essential for our prosperity, our security, our health, our environment, and our quality of life than it has ever been before."

President Obama, National Academy of Sciences, April 27, 2009

Challenges linked to S&T: Domestic

- economic recovery & growth: S&T as drivers (infotech, biotech, nanotech, greentech...?)
- health care: better outcomes for all at lower cost
- energy & climate : cleaner, safer energy supply (incl reduced oil imports & GHG emissions)
- other resources & environment: water, land use, coastal zones, toxics, biodiversity, sustainability
- national & homeland security: IED detection & disarming, cyber- & power-grid security, bio-defense, ensuring safety/reliability of shrinking US nuclear stockpile without nuclear testing

Challenges linked to S&T: Global

- combating preventable and pandemic disease
- transforming the global energy system & land-use practices to avoid unmanageable climate change
- deploying S&T for poverty eradication, development, & adapting to unavoidable climate change
- managing the competition for land & water among food, fiber, fuel, & ecosystem function
- maintaining the ecological integrity and productivity of the oceans
- reducing risks from nuclear & biological weapons

President Obama's views on the challenges

- They're interdisciplinary and interconnected
- S&T are not just germane to success but central.
- Success requires not only applying S&T to specific challenges but also nurturing the cross-cutting foundations of strength in S&T.
- Centrality means putting S&T in the center of what the federal government thinks, says, and does about these challenges – “Science in its rightful place.”
- Interconnectedness mean solutions require partnerships across: federal agencies; branches & levels of government; public, private, & philanthropic sectors; and nations.

Interconnectedness

- Human well-being depends equally on economic, environmental, and sociopolitical conditions.
 - True “development” and “growth” entail enhancing all three, or at least not advancing one in ways that seriously degrade the others.
- Poverty, ignorance, environmental degradation, and disease are linked in vicious circles of cause & effect.
 - These blights are most effectively attacked together. Often a key to addressing all at once is improving the status & opportunities of women & girls.

Interconnectedness (continued)

- Using better technology & management to reduce health-care costs while extending insurance coverage & improving outcomes has multiple economic as well as social benefits.
- The clean-energy revolution needed to improve air & water quality and limit climate-change risks will also bring high-quality jobs, spin off new products & businesses, and preserve economic competitiveness.

The centrality of S&T: What do we need?

- The Economy: innovation that yields better manufacturing techniques, better products & services, and (thus) high-quality, sustainable jobs...
- Health: new IT tools for medical records, doctor-doctor & doctor-patient interaction; better, cheaper diagnostics; faster vaccine development & production; cancer therapies that target only cancer cells...
- Energy: better batteries, cheaper photovoltaic cells, lower-impact biofuels, CO₂ capture & sequestration, safer nuclear fuel cycles, fusion...

What we need from S&T (continued)

- Climate Change: better monitoring in-situ & from space; better models on faster computers; regional disaggregation of impacts to support adaptation; better scientific communication for public understanding...
- National & Homeland Security: better detection of conventional & nuclear explosives and of clandestine weapons facilities; faster identification of & response to bio-threats; better defenses against cyber-threats ...

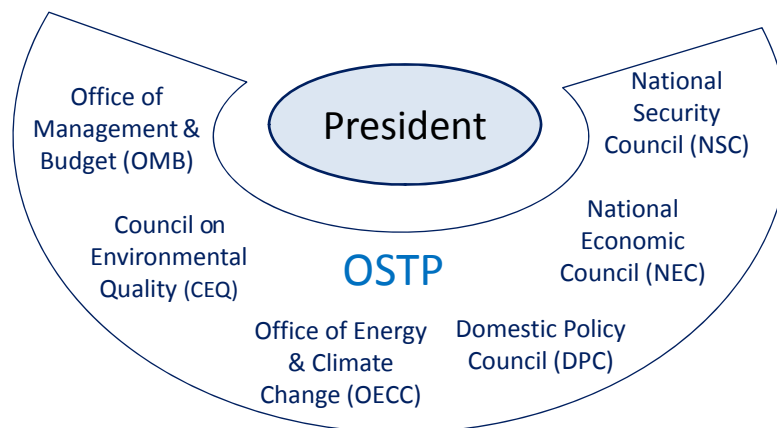
Cross-cutting foundations of strength in S&T

- the institutions that do most basic research
 - research universities, national labs, nonprofits
- other key infrastructure
 - IT/broadband, high-speed computing, energy, transportation, space technology
- science, technology, engineering, & math (STEM) education
- economic & policy conditions conducive to entrepreneurship, innovation, partnerships
 - IPR, financing, tax policy, export policy, immigration policy, transparency & predictability in regulation

The federal support infrastructure for ST&I

- Congress
 - S&T authorizing & appropriations committees
- S&T-rich cabinet departments & their agencies
 - Defense (with DARPA), HHS (w NIH, FDA, CDC), Energy (w ARPA-E), Commerce (w NOAA, NIST), Interior (w USGS), Agriculture (w NIFA), State/OES
- Free-standing S&T-rich agencies
 - NSF, NASA, EPA, FCC, SBA
- Executive Office of the President (EOP)
 - OSTP and OMB, OECC, NEC, DPC, NSC, CEQ

The Office of Science and Technology (OSTP) is part of the EOP



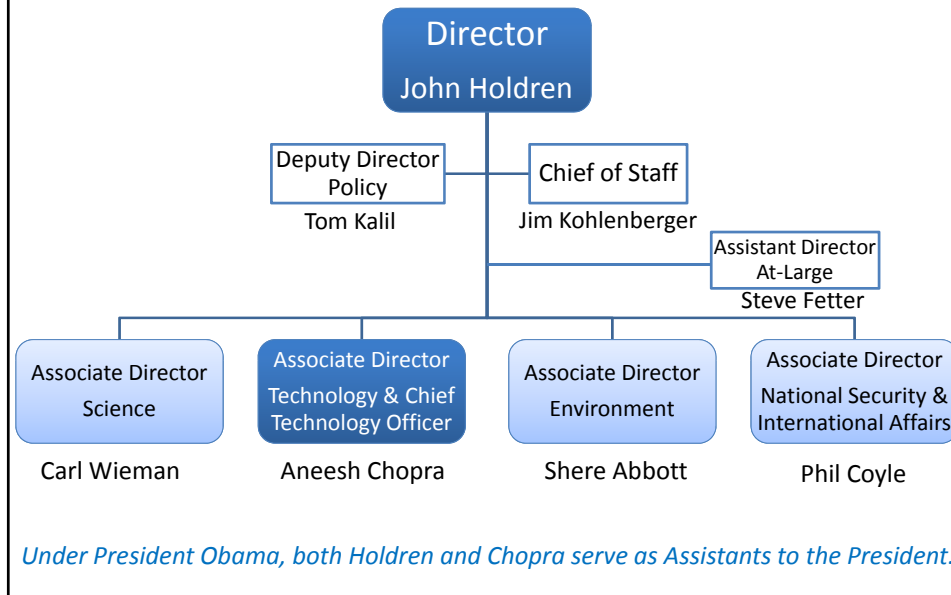
Responsibilities of OSTP and the S&T Advisor

- Policy for science and technology
 - Analysis, recommendations, & coordination with other White House offices on R&D budgets & related policies, S&T education and workforce issues, interagency S&T initiatives, broadband, open government, scientific integrity...
- Science and technology for policy
 - Independent advice for the President about S&T germane to all policy issues with which he is concerned

Organization of OSTP and its affiliates

- The S&T Advisor is both...
 - Assistant to the President for S&T (not subject to Senate confirmation) and
 - the Senate-confirmed Director of OSTP
- Office of Science and Technology Policy has...
 - 4 Associate Directors (Science, Technology-CTO, Environment, National Security & International Affairs, all subject to Senate confirmation)
 - Staff of about 100: 70+ technical, of whom 2/3 are detailed from other agencies; budget ~\$7M

OSTP organization (continued)



OSTP-managed entities

- National Science & Technology Council (NSTC)
 - Deputy secretaries & undersecretaries of cabinet departments with S&T missions, plus heads of NSF, NIH, NASA, NOAA, NIST, EPA, USGS, CDC
 - Nominally chaired by the President; chaired in practice by the OSTP Director / Science Advisor; administered by OSTP
- President's Council of Advisors on Science and Technology (PCAST)
 - Co-Chairs Holdren and Lander
 - 18 other members from academia, industry, NGOs

Indicators of the Administration's priority on S&T: Presidential appointments

- Five Nobel Laureates in science
 - Energy Secretary Chu, OSTP Associate Director for Science Wieman, NCI Director Varmus, PCAST Members Molina and Zewail
- Another 25+ members of the NAS, NAE, IOM, and American Academy of Arts & Sciences
 - Including heads of NIH, NOAA, USGS, FDA, NIFA
- A CTO (Chopra) and a CIO (Kundra) in the White House for the first time
- An engineer running EPA (Lisa Jackson)

ST&I have never been so prominent in leadership positions.

The President with the first 7 NAS members appointed in his Administration



NAS Board Room, 27 April 2009

Indicators of priority: speeches & events

Highlighting ST&I in...

- Speeches throughout the campaign for the Presidency, then Inaugural Address and speeches at: 2009 annual meeting of the NAS, Cairo Egypt, Albany NY, MIT, 2010 State of the Union, Kennedy Space Center...
- White House events with nat'l middle-school and high-school science & math winners, National Medal of Science and National Medals of Technology & Innovation winners, groups of US astronauts (on 7 occasions), US Nobel Prize winners, math & science teaching award winners, PECASE winners.

No president has ever talked as much about ST&I.

With middle-school "Mathletes" in the Oval Office



Indicators of priority: PCAST studies

Studies requested by President Obama from PCAST:

- Science of H1N1 influenza
- National Nanotechnology Initiative (NNI) Review
- Building capability for future influenza response
- Health IT for better outcomes at lower cost
- Improving K-12 STEM education
- Accelerating energy-technology innovation
- Advanced manufacturing
- Networking & Information Technology R&D Review
- Biodiversity & ecosystem management for sustainability

PCAST has never been asked to do so much so soon.

The President and his PCAST



Pres Obama meeting with his Council of Advisors on Science & Technology 3-12-10

Obama initiatives in S&T

Investments in S&T

- Science got a huge boost in the stimulus/recovery package (American Recovery & Reinvestment Act -- ARRA) and the FY2009 / FY2010 budgets, giving 2009-10 the highest federal research spending ever.
- Total ARRA funds for S&T, including IT & transportation infrastructure, applied energy technology, space exploration, exceed \$100 billion.
- Investment goals announced last year: double budgets of basic science agencies in 10 yr; make Research & Experimentation Tax Credit permanent: lift public + private investment in R&D to $\geq 3\%$ of GDP.

Initiatives: investments continue*

The President's FY2011 ST&I budget proposals

- All federal R&D reaches \$147.7 billion.
- Nondefense R&D = \$66.0 billion, up 4.8% in real terms.
- All research (basic + applied) grows 4.5% real.
- NASA R&D = \$11.0 billion, up 17% real.
- NIH = \$32.1 billion, up 2.0% real.
- Basic research = \$33.0 billion, up 3.3% real.
- DOD basic research reaches \$2.0 billion, up 8.0% real.
- NSF, DOE Science, NIST labs on track to double 2007-17.

*** If Congress will agree.**

Initiatives: energy & environment

- \$80 billion for clean & efficient energy in ARRA
- creation of ARPA-E (\$400M in 2009-10, \$300M proposed for 2011), energy-innovation hubs
- first-ever fuel-economy/CO₂ tailpipe standards
- strengthened bilateral partnerships on energy & climate change w China, India, Russia...
- US Global Change Research Program revived, with \$2.56 billion proposed for FY2011 (19.4% real increase).
- Inter-agency task force led by OSTP, CEQ, NOAA on coordination of government's adaptation activities
- New National Oceans Policy & National Oceans Council

President Obama signing the National Oceans Policy Executive Order (19 July 2010)



E.O. 13547 & Final Recommendations

- Establishes our Nation's first ever *National Policy for Stewardship of the Ocean, our Coasts, and the Great Lakes*
- Creates an interagency **National Ocean Council** to provide sustained, high-level, and coordinated attention to advance the National Policy
- Prioritizes **9 categories for action** that seek to address the most pressing challenges facing the ocean, our coasts, and the Great Lakes
- Establishes **a flexible framework for effective coastal and marine spatial planning** to address conservation, economic activity, user conflict, and sustainable use of ecosystem services

National Ocean Council

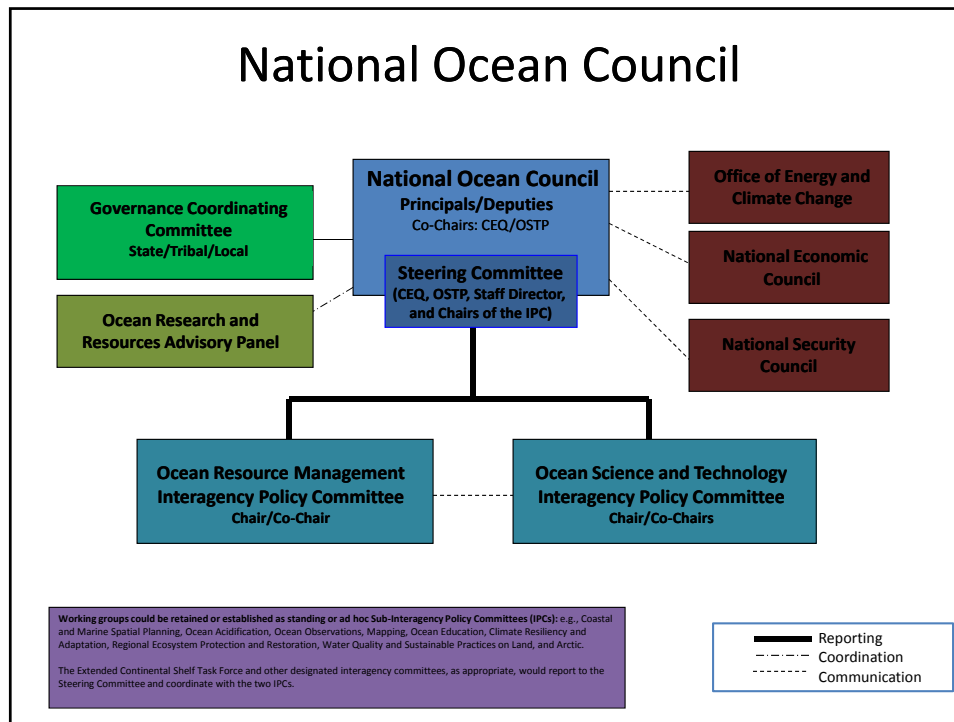
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Nine Priority Objectives

- Four priority objectives to improve the way we do business:
 - ✓ Ecosystem-based management
 - ✓ Coastal and marine spatial planning
 - ✓ Inform decisions and improve understanding
 - ✓ Coordinate and support
- Five areas of special focus:
 - ✓ Resiliency/adaptation to climate change and ocean acidification
 - ✓ Regional ecosystem protection and restoration
 - ✓ Water quality and sustainable practices on land
 - ✓ Changing conditions in the Arctic Ocean
 - ✓ Ocean, coastal, and Great Lakes observations and infrastructure

National Ocean Council

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The President's American Innovation Strategy

- Invest in the building blocks of innovation
 - boost science & math (STEM) education
 - restore leadership in fundamental research
 - strengthen S&T infrastructure
 - develop an advanced IT “ecosystem”
- Promote competitive markets to spur innovation
 - support capital markets that fund innovation
 - encourage innovation-based entrepreneurship
 - boost public-sector & community innovation
 - promote American exports

The American Innovation Strategy (continued)

- Catalyze breakthroughs for national priorities where market failures call for gov't help
 - unleash a clean-energy revolution
 - support advanced-vehicle technology
 - drive breakthroughs in health IT
 - address other major challenges with “public goods” and “externality” dimensions
- These efforts include increased support for...
 - scientists & engineers early in their careers
 - commercializing university research
 - multidisciplinary & high-risk/high-return research

STEM-education initiatives

- Increased collaboration of White House (OSTP, DPC) with Dept of Education & NSF, HHS, DoD, DOE, NASA
- New national goals: moving American kids from middle to top of international rankings on science & math tests, increasing American proportion of college graduates to first in the world by 2020.
- \$4.4 billion “Race to the Top” in the ARRA includes preference to states whose proposals emphasize innovation in STEM education.
- “Educate to Innovate” program (11-09) for K-12 STEM education w \$500+ million in private-sector & philanthropic support; “Change the Equation” added 9-10

Initiatives on principles & procedures

- Stem-cell guidelines
 - expanding stem-cell lines that can be used with federal support while respecting ethical boundaries
- Reporting procedures for Federal grants
 - streamlined and made consistent across agencies
- Scientific integrity principles*
 - ensuring openness, transparency, reliance on peer-reviewed science across Federal agencies
- Open government
 - expanded access to databases at every agency

*** Presidential Memo 3-09-09 (additional guidelines 12-10)**

The screenshot shows the White House Open Government Initiative website. At the top, there is a navigation bar with links for 'BLOG', 'PHOTOS & VIDEO', 'BRIEFING ROOM', 'ISSUES', 'the ADMINISTRATION', 'the WHITE HOUSE', and 'our GOVERNMENT'. Below this is a search bar and a 'Search' button. The main heading is 'Open Government Initiative' with the tagline 'TRANSPARENCY + PARTICIPATION + COLLABORATION'. A quote from President Obama is featured: 'My Administration is committed to creating an unprecedented level of openness in Government. We will work together to ensure the public trust and establish a system of transparency, public participation, and collaboration. Openness will strengthen our democracy and promote efficiency and effectiveness in Government.' Below the quote is a 'PARTICIPATE NOW' section with two links: 'Change the Game in Cybersecurity' and 'Apps for Healthy Kids'. To the left, there is a 'LATEST BLOG POSTS' section with a post from June 18, 2010, about ending lobbyist appointments. On the right, there is a 'OPEN GOVERNMENT DASHBOARD' with a 'More Information' button.

An Official Web Site of the United States Government Sunday, June 27, 2010 Text: [Icons] Share [Icon]

DATA.GOV
EMPOWERING PEOPLE

HOME DATA TOOLS COMMUNITY METRICS DIALOGUE

Data.gov Catalogs

Use the Data.gov catalog below to access U.S. Federal Executive Branch datasets. Click on the name of a dataset to view additional metadata for that dataset. By accessing the data catalogs, you agree to the [Data Policy](#). Data.gov offers data in three ways: through the "raw" data catalog, using tools and through the goodata catalog. The "Raw" Data Catalog provides an instant download of machine readable, platform-independent datasets while the Tools Catalog provides hyperlinks which may lead to agency tools or agency web pages that allow you to mine datasets.

TOOL CATALOG "RAW" DATA CATALOG GEODATA CATALOG

Search "raw" data by keywords

Search "raw" data by file type
 XML CSV/Text KML/KMZ Shapefile RDF Other

Search "raw" data by single/multiple category
 All Categories
 Agriculture
 Arts, Recreation, and Travel
 Banking, Finance, and Insurance

Search "raw" data by single/multiple agency
 All Agencies
 Agency for Healthcare Research and Quality (HHS/AHRQ)
 Agricultural Research Service (USDA/ARS)
 Antitrust Division (DOJ/ATR)

Page 1 of 62 (1,547 records) Results per page: 25 | 50 | 100

Name (click for metadata and to rate dataset)	Rating	Agency	XML	CSV/TXT	KML/KMZ	Shapefile	RDF	Other
Formal Enforcement Actions Fiscal Year 2009 The annual data tables contained in this document provide summary statistics on the civil enforcement activities of the United States Trustee Program. These tables summa...	★ ★ ★ ★ ★ (11 votes)	DOJ/USTP						
Informal Enforcement Actions Fiscal Year 2009 The annual data tables contained in this document provide summary statistics on the civil enforcement activities of the United States Trustee Program. These tables summa...	★ ★ ★ ★ ★ (5 votes)	DOJ/USTP						

Partnerships: working w the private sector

- Firms fund 67% of US R&D, perform 72%.
- Pres Obama has proposed to make the Research & Experimentation tax credit permanent.
- Recovery Act has helped start & grow clean-energy businesses across the country.
- Small Business Innovation Research (SBIR) initiative provides funding from diverse agencies for many avenues of innovation.
- Small business lending bill (signed 9-27-10) increases loans & cuts taxes for entrepreneurs.
- DOE's energy-innovation hubs link national labs, universities, and industry.

Harnessing private innovation: prizes and challenges

- Prizes & challenges harness the ingenuity that lurks in individuals, schools, firms all across the society.
- Sponsors/organizers set an ambitious goal without prescribing the best means to achieve it, pay only for results.
- The Administration's new challenge.gov website provides 1-stop shopping for innovators looking for opportunities.

Prizes and challenges (continued)

- The recent Progressive Insurance / DOE Automotive X-Prize illustrates the leverage in this approach.
 - \$10M in prizes for super-fuel-efficient passenger vehicles (over 100 miles per gallon of gasoline equivalent) called forth \$100M+ in investments in innovation by competitors.
 - Winning designs achieved up to 200 MPGe.

Automotive X-Prize awards, September 16, 2010



Partnerships: International ST&I cooperation

- Reviving & strengthening the high-level Joint Commission Meetings on S&T cooperation with China, India, Brazil, Japan, S Korea, Russia
- Convening the Multilateral Economic Forum & bilateral S&Eds w strong innovation focus
- Pursuing increased internat'l cooperation in space
- Streamlining the visa procedures that apply to visiting scientists & technologists
- S&T as a centerpiece of Cairo speech (Science Envoys, centers of excellence) & USAID strategy

Science Envoys: the 1st two cohorts

Bruce Alberts



Rita Colwell

Elias Zerhouni



Gebisa Ejeta

Ahmed Zewail



Alice Gast

http://www.america.gov/science_envoys.html

Priorities identified in the 1st round of envoy visits

- Global S&T knowledge-sharing initiative
 - Expand broadband access
 - Electronic libraries
 - Global e-Learning resources for students and teachers
 - Tools for mentoring and collaboration
- Enhance USG coordination, awareness
- Promote academic exchange and sustain collaborations
- Promote centers/networks of excellence

OSTP will sponsor a conference at NAS in spring 2011 on ways to enhance international S&T engagement.

Ongoing expansion of global engagement

- Centers of Excellence being developed in water, climate change, energy
- OSTP and NSC leading a “Global Engagement” policy committee
- State Department allocated 12 new science-officer positions in regional embassies
- New NSTC Subcommittee on International S&T

The screenshot shows the official website of the Office of Science and Technology Policy (OSTP) at the White House. The page is titled "Global Science Diplomacy" and features a quote from President Obama: "My administration is ramping up participation in—and our commitment to—international science and technology cooperation across the many areas where it is clearly in our interest to do so." - President Obama at the National Academy of Sciences, April 27, 2009. Below the quote is a photograph of President Obama speaking at a podium. The page also includes a sidebar with "DIVISIONS" such as Science, Technology, Energy & Environment, National Security & International Affairs, and Global Science Diplomacy. A "Related Blog Post" section lists several reports and documents, including "One Year of Activities: A Fact Sheet" and "OSTP Director John P. Holdren's Remarks".

The way ahead on climate change

The administration's strategy

- Promote recognition that problem is real and early action is preferable to waiting
 - The longer we wait, the bigger the damage from climate change & the more rapid the emissions reductions needed to stabilize.
 - Prudent early action likely to be cheaper than inaction or delay.
 - We can reduce costly and risky oil imports and dangerous air pollution with the same measures we employ to reduce climate-disrupting emissions.
 - The needed surge of innovation in clean-energy technologies and energy efficiency will create new businesses & new jobs and help drive economic recovery & growth, maintain global competitiveness.

Administration strategy (continued)

- Make climate change mitigation & adaptation a priority for initiatives in departments & agencies, employing existing authorities.
- Continue to strengthen USGCRP & other interagency efforts.
- Work with the new Congress on initiatives for accelerating the transition to cleaner & more efficient energy options that bring multiple economic, environmental, & security benefits.
- Work with other major emitting countries to build technology cooperation and individual & joint climate policies for mitigation and adaptation.

Guidance to agencies

- Executive Order on Federal Leadership in Environmental, Energy, & Economic Performance (10-09)
 - “to establish an integrated strategy towards sustainability in the Federal Government and to make reduction of greenhouse gas emissions a priority...”
 - designation of agency senior sustainability officers
 - sustainable buildings & acquisition policies
 - targets for GHG reductions in Federal agencies (28% reduction by 2020)
- OMB/OSTP budget letter to agencies (7-21-10)
 - Calls for priority on understanding, mitigating, & adapting to climate change, and for support for new National Climate Assessment covering these bases.

Strengthening broad interagency efforts

- The “Green Cabinet”
 - Secs of Energy, Interior, Agriculture, Transportation, HUD, Labor; Administrators of EPA & SBA; CEQ Chair; OSTP Director; OECC Director (Chair)
- National Science & Technology Council (NSTC)
 - Committee on Environment and Natural Resources (CENR) – chaired by Abbott, Lubchenco, Anastas – being repurposed as Committee on Environment, Natural Resources, and Sustainability.
- Climate-Change Adaptation Task Force
 - Co-chaired by OSTP, CEQ, NOAA, with senior representation from all relevant agencies
- The US Global Change Research Program

The US Global Change Research Program

- 13 participating Federal departments & agencies
- Administered by the USGCRP subcommittee of the NSTC’s CENR
- We are engaged in broadening and strengthening USGCRP’s:
 - Science: aerosols, precipitation, ice, paleoclimate, regional climate prediction
 - Adaptation: accounting for system effects, economics, behavior, governance issues
 - Integrated Assessment: engaging & meeting the needs of diverse regions, sectors
- 2011 proposed budget = \$2.6B, up 19% real

The linchpin of progress in S&T policy: a committed President

