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# Guide to FY2015 Research Funding at Environmental Protection Agency (EPA)

http://www.epa.gov/research/research-programs.htm

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This document provides succinct insights into the various EPA opportunities for University research funding, with special attention to changes anticipated in FY2015. More information is provided at the Central Desktop "Mission Agency Program Summaries" (MAPS) website, including the charts cited in the text below.

EPA has six integrated research programs to provide the scientific foundation, methods, and tools the Agency needs to fulfill its mission of protecting human health and the environment. For Universities, EPA's National Center for Environmental Research (NCER) has both single investigator (Science To Achieve Results - STAR) and Center efforts, but the amount of funding sent to Universities is relatively small – totals of $8M in basic and $38M in applied monies for FY2012. In FY 2015, the EPA is focusing research on the most critical issues facing the agency, ensuring the best scientific underpinning for regulatory actions and finding more sustainable solutions for environmental issues. Realignments include efforts to minimize the impacts of climate change, and developing effective, systems-based watershed management approaches and forward-looking national, regional and community level strategies for green infrastructure, chemical safety and other innovative alternative practices.

## Overview

http://www2.epa.gov/science-and-technology

The mission of EPA is to protect human health and the environment. Science at EPA provides the foundation for credible decision-making to safeguard human health and ecosystems from environmental pollutants.

## Office of Research and Development

http://www2.epa.gov/aboutepa/about-office-research-and-development-ord

The Office of Research and Development (ORD) is the scientific research arm of EPA. ORD has four integrated research programs that address EPA strategic goals, and two highly targeted research programs that focus on special responsibilities related to homeland security and human health risk assessment (see MAPS EPA Charts 3-6):

Air, Climate, and Energy (ACE) – adapt to changing climatic conditions and prevent harmful air pollution emissions

- Understanding the multi-pollutant nature of air pollutions
- Developing options on the most cost-effective approaches to reducing air pollution
- Informing strategies to adapt to and minimize the impacts of climate change on air and water quality
- Assessing human health and environmental impacts of energy production and use
- Understanding how to work within the social, behavioral, and economic conditions that influence the effectiveness of air quality and climate policies

Safe and Sustainable Water Resources (SSWR) – sustainable water infrastructure, safe drinking water delivery, storm water management, sustainable wastewater treatment and health aquatic systems

- Developing effective systems-based watershed management approaches
- Applying technological options to restore and protect bodies of water by providing information on effective identification, treatment, and management alternatives
- Developing and demonstrating new integrated approaches for water and wastewater treatment and resource recovery

Sustainable and Healthy Communities (SHC) – understand the balance between the three pillars of sustainability: environment, society and economy.

- Utilize systems analyses to consider the inextricable link between the natural environment and human well-being
- Incorporate proactive, preventative strategies that optimize management of multiple chemical, material, and energy streams
- Evaluate the implications of alternative policies and management actions
- Utilize indicators to measure results and track changes after decisions have been implemented

Chemical Safety for Survivability CSS) – transformative approaches to improve chemical risk assessments

- Developing the scientific knowledge, tools and models for integrated evaluation of chemical toxicity
- Improving methods for assessment and informing management for chemical safety and sustainability

- Targeting high-priority research needs for immediate and focused attention

Human Health Risk Assessment (HHRA) – health assessments for both specific chemicals and chemical mixtures

- Integrated Risk Information System (IRIS) health hazard and dose-response assessments
- Integrated Science Assessments (ISA) of criteria air pollutants
- Community risk and technical support for exposure and health assessments
- Methods, models, and approaches to modernize risk assessment

Homeland Security (HS) – remediating chemical, biological, or radiological contamination from weapons of mass destruction or other releases, and research on water/waste water treatment systems

- Securing and sustaining water systems
- Characterizing contamination and determining risks
- Remediating indoor and outdoor environments

Each research program has its own Strategic Research Action Plan (2012-2016) that outlines the research under way (for those documents see MAPS EPA or the EPA website http://www.epa.gov/research/research-programs.htm). The research is conducted by ORD's three national laboratories, four national centers, two offices, and extramural efforts administered by the National Center for Environmental Research (NCER) in ORD.

**Science to Achieve Results (STAR) - Extramural Research Grants/Fellowships**
http://www.epa.gov/ncer/
The Science to Achieve Results program, administered by the National Center for Environmental Research (NCER), funds research grants and graduate fellowships in numerous environmental science and engineering disciplines through a competitive solicitation process and independent peer review. The program engages the nation's best scientists and engineers in targeted research that complements EPA's own intramural research program and those of other federal agency partners. (see MAPS EPA Charts 7-8)

All grant, fellowship, and/or SBIR contract research funding opportunities competed through the NCER site are done through specific solicitation announcements or Request for Applications (RFAs, www.epa.gov/ncer/rfa/). Any application submitted to NCER must be in response to an open solicitation. At present, STAR is focusing on the health effects of particulate matter, drinking water, water quality, global change, ecosystem assessment and restoration, human health risk assessment, endocrine disrupting chemicals, pollution prevention and new technologies, children's health, and socio-economic research.

All forms necessary for completing an application are noted in the announcement. Standard application forms and instructions in MS Word and PDF Formats are available in Forms/Standard Instructions and additional Quality Systems Guidance for STAR Grants.

The Peer Review Division (PRD) in NCER is charged with conducting rigorous External Peer Review of extramural research proposals submitted to NCER's Request for Applications (RFA).

**Research Partnerships / Centers**

http://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/outlinks.centers
NCER periodically establishes large research centers in specific areas of national concern. At present, these centers focus on children's health, hazardous substances, particulate matter, and estuarine and coastal monitoring (see MAPS EPA Charts 9-10).

**Education**
http://www.epa.gov/ncer/fellow/
NCER had STAR Graduate Fellowships, Greater Research Opportunities (GRO) Undergraduate Fellowships, Public Health Fellowships and AAAS Fellowships. (see MAPS EPA Chart 7) In FY2015 STAR and GRO are projected to be funded under the new Federal STEM education effort rather than by EPA

**Resources**
EPA E-mail alerts
http://www.epa.gov/ncer/listserv/.
NCER periodically sends out emails to its listserver subscribers announcing new grant and/or funding opportunities or distribute newsworthy items regarding NCER-funded research.

Mission Agency Program Summaries (MAPS)
The DC Office of Research Advancement has created Federal Mission Agency Program Summary (MAPS) websites to:

- Connect PIs with appropriate funding agency programs/program officers
- Assist in development of white papers/charts/elevator speeches

The Central Desktop MAPS site has:

- Under "Wiki" Tab - how to use the site
- Under "Files/Discussion" Tab select the appropriate left hand tabs
  Mission Agency (DHS, DOD, DOE, ED, EPA, NASA, NIST, NOAA, USDA and cross-agency programs in Adv Manuf, Sustainability, STEM education
  Guide to Agency Funding for FYXX
  Agency Research Program Charts
  Agency Planning Documents
  Program Officer Data sheets (with contact info, biosketch, program descriptive, personal pubs)
  Program Officer presentations (when available)
- Under "Database" Tab
  USC MAPS - table of all program officers / programmatic interest

Contact Natasha Walker (nlwalker@usc.edu) for username and password to gain access.

The Keyword Searchable MAPS Site has:
In addition to the more extensive Central Desktop site, there is a MAPS website that can be accessed using one's USC NetID and Password: http://web-app.usc.edu/web/ra_maps. At that website one can do keyword searches to locate the mission agency (DHS, DOD, DOE, ED, EPA, NASA, NIST, NOAA and USDA) programs and program officers associated with those keywords.

Chart numbers in the text above reference a file in the MAPS Central Desktop *Agency Research Program Charts* folder

**Assistance in Locating Funding and Preparing Proposals**

Dr. James S. Murday DC Office of Research Advancement
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Table 1: 2010 / 2012 EPA funding ($M) for Basic and Applied Research

| | 2010 | | 2012 | |
|---|---|---|---|---|
| | **Basic** | **Applied** | **Basic** | **Applied** |
| Total at Universities | 8 | 38 | 8 | 38 |
| NSF does not provide discipline breakouts for EPA funding at Universities | | | | |
| **Total for EPA** | **87** | **399** | **89** | **404** |
| **Physical Sciences** | **4** | **10** | **4** | **10** |
| Astronomy | 0 | 0 | | |
| Chemistry | 3 | 8 | | |
| Physics | 0 | 0 | | |
| Other | 1 | 1 | | |
| **Environmental Sciences** | **13** | **164** | **13** | **166** |
| Atmospheric | 0 | 57 | | |
| Geological | 1 | 3 | | |
| Oceanology | 7 | 14 | | |
| Other | 5 | 90 | | |
| **Mathematics and Computer** | **3** | **8** | **3** | **9** |
| Computer Sciences | 1 | 5 | | |
| Mathematics | 2 | 3 | | |
| Other | | | | |
| **Engineering** | **3** | **56** | **3** | **57** |
| Aeronautical | 0 | 0 | | |
| Astronautical | 0 | 0 | | |
| Chemical | 2 | 21 | | |
| Civil | 0 | 2 | | |
| Electrical | 0 | 0 | | |
| Mechanical | 0 | 1 | | |
| Metal/Materials | 0 | 1 | | |
| Other | 2 | 32 | | |
| **Life Sciences** | **64** | **157** | **65** | **159** |
| Agriculture | | | | |
| Biological | 46 | 109 | | |
| Environmental | 18 | 44 | | |
| Medical | | | | |
| Other | | 4 | | |
| **Psychological** | **0** | **0** | **0** | **0** |
| **Social Sciences** | **0** | **2** | **0** | **2** |
| **Other Sciences** | **0** | **0** | **0** | **0** |

From NSF "Federal Funds for Research and Development: FY2010-2012" in NSF 13-326, July 2013

| | | |
|---|---|---|
| Basic | 2010 | Table 27, 31 and 34-37 |
| Applied Research | 2010 | Tables 38, 42 and 45-48 |
| Basic | 2012 | Table 29, 33 and 67 |
| Applied Research | 2012 | Table 40, 44 and 75 |

Table 2: EPA Budget ($M) for FY13 (actual), FY14 (estimated) and FY15 (requested)

| | | FY2013 (actual) | FY2014 (est) | FY2015 (req) |
|---|---|---|---|---|
| Science and Technology Total | | 740 | 759 | 764 |
| Research: Air, Climate and Energy | | 87 | 91 | 102 |
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| Research: Safe & Sustainable Water Resources | | 106 | 111 | 114 |
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| Research: Sustainable and Healthy Communities | | 155 | 155 | 144 |
| | | | | |
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| Research: Chemical Safety and Sustainability | | 89 | 91 | 99 |
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**Appendix 1: New project or significant change for FY2015**

**Air, Climate, and Energy (ACE) Research Centers**
EPA website projects a RFA to open in Spring 2014

**Research: Air Climate and Energy** **From $91M in FY2014 to $102M**
Of the increase $4M reflects support for hydraulic fracturing within the ACE research program to address the potential impacts of hydraulic fracturing (HF) on air quality as part of the interagency effort with DOE and DOI.

**Res: Safe and Sustainable Water Resources** **From $111M in FY2014 to $114M**
$4M will address the potential impacts of hydraulic fracturing on water quality and aquatic ecosystems, as part of the interagency effort with DOE and DOI. This study is separate and distinct from current research to study the potential impacts of hydraulic fracturing on drinking water.

**Res: Sustainable and Healthy Communities** **From $155M in FY2014 to $144M**
$3M will go to ongoing research to develop models, databases, metrics and other decision-support tools that will empower communities to make decisions regarding sustainable approaches to environmental protection. These additional funds will allow EPA to improve its scientific understanding of ecosystem goods and services, contaminated sites, multimedia pollutants within environmental justice communities, and the beneficial use of sustainable materials. This improved understanding will allow the agency to increase its capacity to provide community based decision support tools.

**Res: Chemical Safety and Sustainability** **From $91M in FY2014 to $99M**
$3M of the increase will accelerate the EPA's expansion of the risk-based prioritization effort for application to TSCA chemicals, across toxicological endpoints and exposure scenarios beyond those used with endocrine disruptors. Specifically, these funds would be used to: (1) model and generate exposure data; (2) evaluate background exposure levels and biological relevance of environmental exposures; and (3) translate for fit-for-purpose risk-based prioritization. This effort supports the agency's priority of taking action on toxics and chemical safety.

$2M of the increase will support the EPA's research to: enhance its high throughput chemical testing schemes by developing biology based approaches to evaluate human and ecological health effects of emerging contaminants and engineered nanomaterials; and improve efficiency of models for evaluation of chemicals with little extant data.

**Education** **Decrease by $11M from FY2014**
Funding for the EPA's Science to Achieve Results (STAR) and the Greater Research Opportunities (GRO) fellowship programs will be consolidated as part of a comprehensive reorganization to facilitate a cohesive national strategy of STEM education programs.

**Appendix 2: Illustration (abbreviated) of an EPA program manager data sheet**

**Dr. Nora F. Savage**
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**Biosketch:**
Nora Savage is an environmental engineer with the Environmental Protection Agency (EPA) in Washington, DC in the Office of Research and Development. Her focus areas include nanotechnology, pollution prevention and life cycle approaches for emerging technologies. She is one of the Agency representatives on the Nanoscale Science, Engineering and Technology subcommittee of the National Science and Technology Council that implements the activities and strategies of the National Nanotechnology Initiative. Currently, she serves as the lead for the EPA's internal effort to develop a nanotechnology research strategy. Her primary responsibility in this role involves developing opportunities to enable the EPA to continue to protect human health and the environment in a proactive way as nanotechnology and engineered nanomaterials continue to develop and evolve.

Education:
Postdoc, Civil Engineering, Howard University (2001)
PhD, Environmental Science, University of Wisconsin-Madison (2000)
MS, Environmental Science, University of Wisconsin-Madison (1995)
MS, Environmental Engineering, University of Wisconsin-Madison (1995)
BS, Chemical Engineering, Prairie View A&M University (1992)

**Program:**
EPA/NSF Networks for Characterizing Chemical Life Cycle (NCCLCs) NSF 13-524
This solicitation is jointly sponsored by the U.S. Environmental Protection Agency (EPA) and the U.S. National Science Foundation (NSF) Division of Chemistry (CHE) to encourage synergy and enhance cooperation in examining the life cycles of synthetic chemicals and materials as they relate to their manufacture, use, transport, and disposal or recycle. The Networks for Characterizing Chemical Life Cycle (NCCLCs) will promote development of trans-disciplinary, systems- and molecular-level understanding of the life cycle of important (relevant) synthetic chemicals and materials (including nanomaterials) as these distribute and are potentially altered through use in society and interaction with the built and natural environments.

**Illustrative Papers Reflecting Personal Research Interests:**
An assessment of the fate of metal oxide nanomaterials in porous media
Loux Nicholas T.; Savage Nora
WATER AIR AND SOIL POLLUTION 194(1-4), 227-241 OCT 2008

Nanotechnology applications and implications research supported by the US Environmental Protection Agency STAR grants program
Savage Nora; Thomas Treye A.; Duncan Jeremiah S.
JOURNAL OF ENVIRONMENTAL MONITORING 9(10), 1046-1054 2007

**Appendix 3: Acronym glossary**

Agency specific

| | |
|---|---|
| ACE | Air, Climate and Energy (Research Program in ORD) |
| CAA | Clean Air Act |
| CSS | Chemical Safety and Sustainability (Research Program in ORD) |
| CWA | Federal Water Pollution Control Act (known as Clean Water Act) |
| EISA | Energy Independence and Security Act |
| GRO | Greater Research Opportunities (undergraduate fellowships in NCER) |
| HF | Hydraulic Fracture |
| HHRA | Human Health Risk Assessment (interface Research Program in ORD) |
| HS | Homeland Security (Research Program in ORD) |
| IRIS | Integrated Risk Information System (program in HHRA) |
| ISA | Integrated Science Assessments (criteria for pollutants under Clean Air Act) |
| NAAQS | National Ambient Air Quality Standards |
| NCCLC | Networks for Characterizing Chemical Life Cycle (NSF/EPA Program) |
| NCCT | National Center for Computational Toxicology (in ORD) |
| NCEA | National Center for Environmental Assessment (in ORD) |
| NCER | National Center for Environmental Research (in ORD) |
| NERT | National Exposure Research Laboratory (in ORD) |
| NHEERL | National Health and Environmental Effects Research Laboratory (in ORD) |
| NHSRC | National Homeland Security Research Center (in ORD) |
| NRMRL | National Risk Management Research Laboratory (in ORD) |
| ORD | Office of Research and Development |
| PRD | Peer Review Division (in NCER) |
| SDWA | Safe Drinking Water Act |
| SHC | Sustainable and Healthy Communities (Research Program in ORD) |
| SSWR | Safe and Sustainable Water Resources (Research Program in ORD) |
| STAR | Science to Achieve Results (extramural program in NCER) |

General

| | |
|---|---|
| BAA | Broad Agency Announcement |
| CFDA | Catalog of Federal Domestic Assistance Number |
| CMOS | Complementary Metal Oxide Semiconductor (electronics) |
| DHS | Department of Homeland Security |
| DOC | Department of Commerce |
| DOD | Department of Defense |
| DOE | Department of Energy |
| DoEd | Department of Education (alternative) |
| DoI | Department of Interior |
| ED | Department of Education |
| EPA | Environmental Protection Agency |
| FDA | Food and Drug Administration |
| FFO | Federal Funding Opportunity |
| FFDRC | Federally Funded Research and Development Center |
| FY | Fiscal Year |
| HTM | Hierarchical Temporal Memory |
| IHE | Institutions of Higher Education |
| IMI | Institute for Manufacturing Innovation |
| MAPS | Mission Agency Program Summary (provided by USC Res. Adv.) |

| | |
|---|---|
| MEMS/NEMS | Micro- Nano-ElectroMechanical Systems |
| MRL | Manufacturing Readiness Level |
| NASA | National Aeronautics and Space Administration |
| NDI/E | Non-Destructive Inspection/Evaluation |
| NIST | National Institute for Standards and Technology (in DOC) |
| NNMI | National Network for Manufacturing Innovation |
| NOAA | National Oceanic and Atmospheric Administration (in DOC) |
| NRI | Nanoelectronics Research Initiative |
| NSF | National Science Foundation |
| NTIA | National Telecommunications and Information Administration |
| OMB | Office of Management and Budget |
| OPM | Office of Personnel Management |
| PBR | President's Budget Request (submitted to Congress) |
| PCAST | President's Council of Advisors on Science and Technology |
| PTSD | Post-traumatic Stress Syndrome |
| RDT&E | Research, Development, Test and Evaluation |
| RF | Radio-frequency |
| RFA | Request for Application |
| SBIR | Small Business Innovative Research |
| S&T | Science and Technology |
| STEM | Science, Technology, Engineering and Mathematics (education) |
| TBA | To be announced |
| TBI | Traumatic Brain Injury |
| TRL | Technology Readiness Level |
| USDA | US Department of Agriculture |