Biological and Environmental Research

BER Advisory Committee (BERAC)
Fall Meeting
October 13, 2022

Gary Geernaert

Acting Associate Director

Office of Science, BER

DOE SC Organization Chart

Dr. Asmeret Berhe
Office of Science Director
Confirmed May 10, 2022
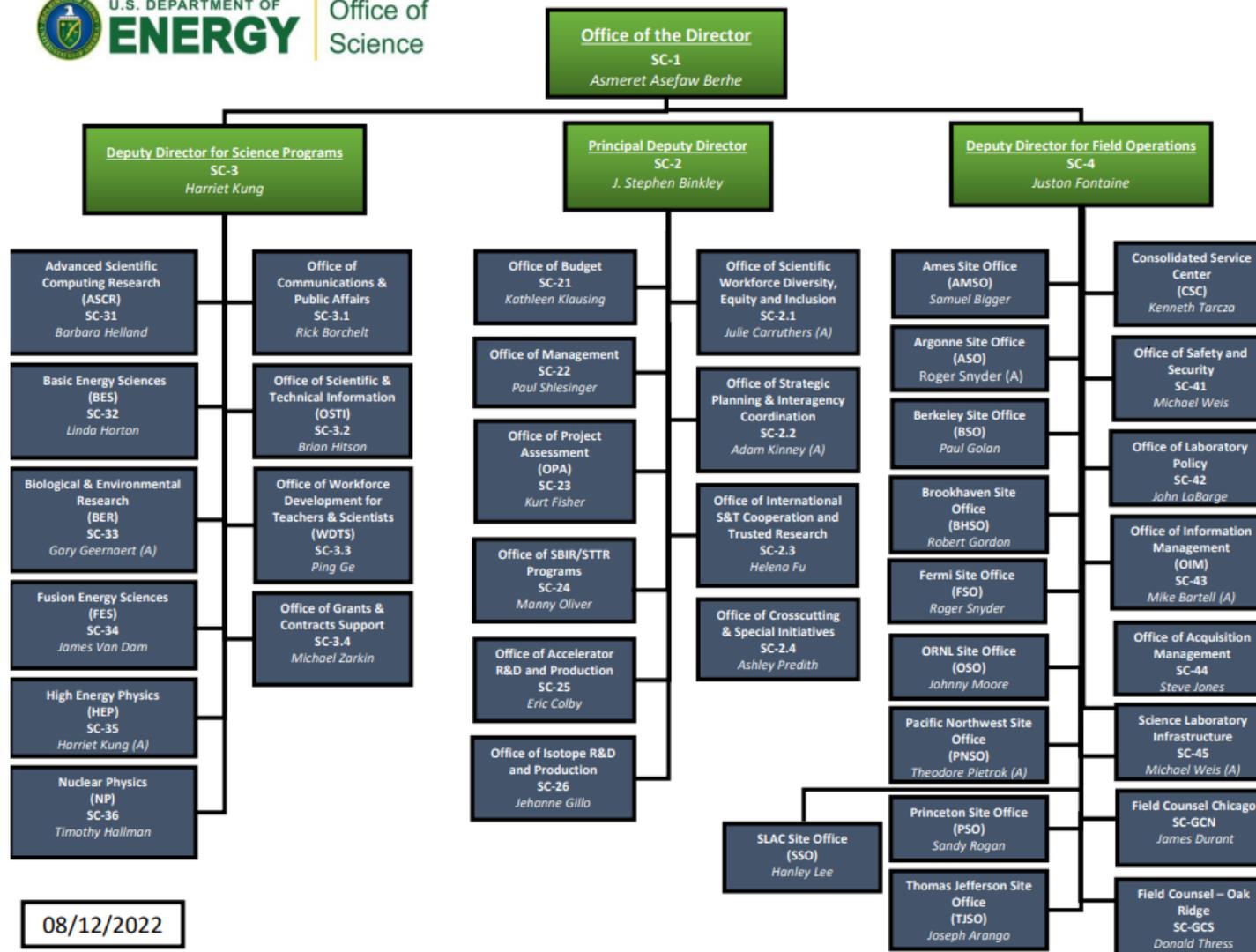
DOE BER Organization Chart

Associate Director Office Staff

Mike Riches
Sr. Technical Advisor

Tristram West
Sr. Technical Advisor

Joseph Graber
Sr. Technical Advisor

Office of Biological & Environmental Research

Gerald Geernaert
Acting Associate Director

Support Team

Leslie Madison
Program Analyst

Vacant
Program Support
Specialist (Contractor)

Kate Garmer
Business Analyst (Contractor)

Lauren Brunk
Management Analyst (Contractor)

Biological Systems Science Division

Todd Anderson, Director
Meredith Rutledge, Scientific Program Specialist

Earth and Environmental Systems Sciences Division

Daniel Stover, Acting Director
Andrew Flatness, Scientific Program Specialist
Olga Tweedy AAAS Fellow

Foundational Genomics Research
Catherine Ronning
Pablo Rabinowicz
Dawn Adin
Shing Kwok
Resham Kulkarni
Elizabeth White
Kim Hixson***

Computational Biosciences
Ramana Madupu
Resham Kulkarni

JGI Scientific User Facility
Ramana Madupu

Biomolecular Characterization & Imaging Science
Amy Swain
Paul Sammak

Bioenergy Research Centers
Shing Kwok

Human Subjects
Elizabeth White

Environmental Genomics
Catherine Ronning
Boris Wawrik
Dawn Adin

Atmospheric System Research
Shaima Nasiri
Jeff Stehr

Environmental System Science
Daniel Stover
Paul Bayer
Jennifer Arrigo**
Brian Benscoter
Beth Drewniak***

Michael Kuperberg*

Earth & Environmental Systems Modeling
Renu Joseph
Bob Vallario
Xujing Davis

ARM Scientific User Facility
Sally McFarlane

EMSL Scientific User Facility
Paul Bayer

Information & Data Management
Justin Hnilo

* On assignment to OSTP

** On 50% assignment to S-4

*** 50% Laboratory Detailee

October 2022

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BER Staff

BER Staff Changes

Dr. Sharlene Weatherwax
Retired June 30, 2022

BER Staff Changes

Completed AAAS Fellowships:

Dr. Aaron Grade

Dr. Wayne Kontur

New arrivals!

Dr. Beth Drewniak

On detail to BER from ANL

Dr. Kim Hixson

On detail to BER from PNNL

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BERAC Researchers Recognized
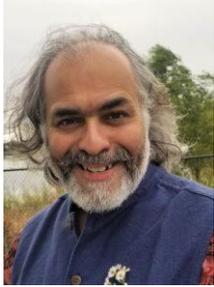
Dr. Dev Niyogi
2023 The Helmut E. Landsberg Award from AMS

Dr. Gerald Meehl
2023 The Sverdrup Gold Medal from AMS

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BER Researchers Recognized

2021 Ernest Orlando Lawrence Memorial Award

Secretarial award, recognizing mid-career U.S. scientists and engineers for exceptional scientific, technical, and engineering achievements related to the broad missions of the U.S. Department of Energy and its programs.

Dr. Jennifer Pett-Ridge

Lawrence Livermore National Laboratory and University of California, Merced

"For pioneering work in quantitative microbial ecology and leadership in developing and applying isotopic tools that help us discover and quantify how changing climate shapes the roles of microorganisms and plants in environmental biogeochemical cycles."

BER Staff & Researchers Recognized

Dr. Shaima Nasiri, DOE
2023 Fellow, American Meteorological Society

Dr. Jiwen Fan, PNNL
2023 Fellow, American Meteorological Society

Dr. Stan D. Wullschleger, ORNL
2022 Commitment to Human Diversity in Ecology Award from ESA

Dr. Rodrigo Vargas, University of Delaware
2022 Piers J. Sellers Global Environmental Change Mid-Career Award from AGU

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2022 Early Career Research Program (ECRP)
BER Focus Areas

(1) Systems biology and biosystems design of bioenergy-relevant microbes to enable production of next-generation biofuels, bioproducts, and biomaterials
Technical Contact: Pablo Rabinowicz

➢ Applications are requested for systems biology research to advance the development of emerging eukaryote or prokaryote model microorganisms and/or microbial communities relevant for the production of biofuels, bioproducts, and/or biomaterials by converting lignocellulosic biomass, upcycling synthetic (petroleum-derived) polymers, or as a byproduct of photosynthesis.

(2) Environmental Process Research in Urban-Influenced Coastal Systems
Technical Contact: Jennifer Arrigo and Daniel Stover

➢ Applications are sought within the scope of the ESS program that will improve fundamental understanding of ecological and hydro-biogeochemical processes in urban influenced coastal systems.

2022 Early Career Research Program (ECRP)
BER Selectees
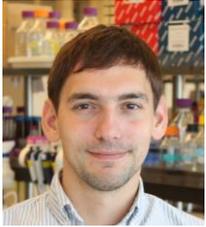
PI Name	Institution	Research Area	Proposal Title
Itay Budin	UCSD, La Jolla	Biological Systems Science	Synthetic membrane biology in microbial cell factories
Jorge Villa	University of Louisiana, Lafayette*	Environmental Systems Science	Assessing greenhouse gas structural and functional resilience of freshwater coastal wetlands subject to persistent saltwater intrusion events
Emily Graham	PNNL	Environmental Systems Science	Urban Resilience across the Terrestrial-Aquatic Continuum: Mechanisms to Mass Balance
Elizabeth Herndon	ORNL	Environmental Systems Science	Biogeochemical controls on phosphorus cycling in urban-influenced coastal ecosystems
Mimi Yung	LLNL	Biological Systems Science	Investigation of Encapsulin Nanocompartment Systems as a Scaffold for Biomaterials Synthesis in *Rhodococcus jostii*

Budget: Duration and Number of Continuing Resolutions

Duration and Number of Continuing Resolutions Each Fiscal Year

Reproduced from: GAO-18-368T, GAO Analysis of Congressional Research Service data.
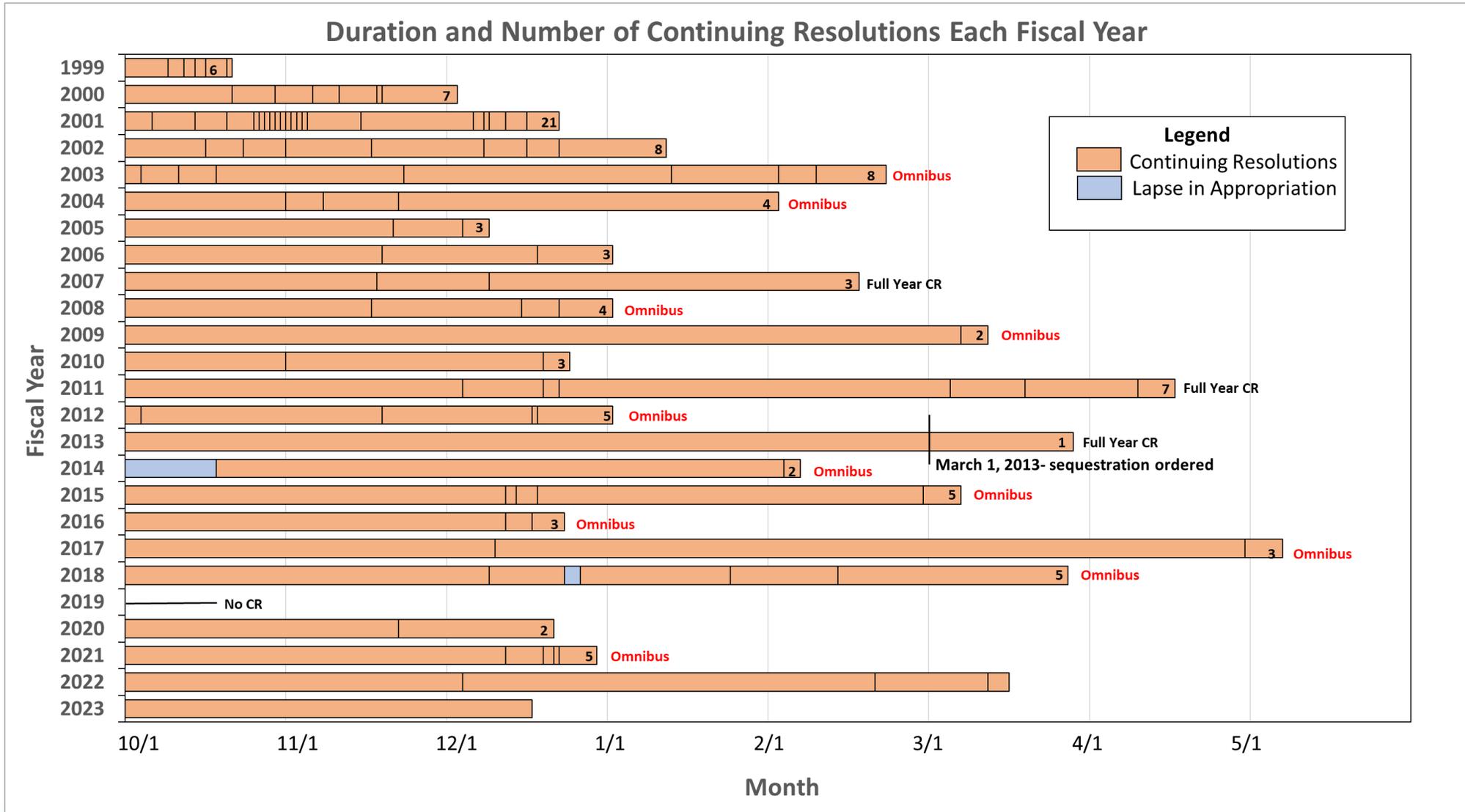
BER FY 2023 President's Request

(Dollars in thousands)

BER FY 2021 and Fy 2022 Appropriations and FY 2023 President's Request	FY 2021 Enacted	FY 2022 Enacted	FY 2023 President's Request	FY 2023 House Mark	FY 2023 Senate Mark
Biological and Environmental Research					
Genomic Science	$277,574	$275,500	$338,185		
Biomolecular Characterization and Imaging Science	$45,000	$45,000	$45,000		
Biological Systems Facilities & Infrastructure	$80,000	$84,500	$85,000		
Total, Biological Systems Science	**$402,574**	**$405,000**	**$468,185**	**$460,000**	**$468,685**
Atmospheric System Research	$36,000	$36,000	$39,000		
Environmental System Sciences	$87,777	$114,000	$127,500		
Earth and Environmental Systems Modeling	$100,674	$105,000	$118,000		
Earth and Environmental Systems Sciences Facilities and Infrastructure	$125,975	$155,000	$151,000		
Sciences	**$350,426**	**$410,000**	**$435,500**	**$445,000**	**$445,000**
Total, Biological and Environmental Research	**$753,000**	**$815,000**	**$903,685**	**$905,000**	**$913,685**
SBIR/STTR funding:					
FY 2021 Enacted: SBIR $23,850,000 and STTR $3,352,000					
FY 2022 Enacted: SBIR $25,184,000 and STTR $3,545,000					
FY 2023 Request: SBIR $28,054,000 and STTR $3,945,000					

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Input into FY22 and FY23 Research Initiatives

Executive Order Tackling the Climate Crisis at Home and Abroad (EO 14008): January 27, 2021
- Section 223 of EO 14008 established the Justice40 Initiative, which directs 40% of the overall benefits of certain Federal investments to flow to disadvantaged communities (DACs).

Executive Order on Advancing Biotechnology and Biomanufacturing Innovation for a Sustainable, Safe, and Secure American Bioeconomy (EO 14081): September 12, 2022.
- Intended to accelerate biotechnology innovation and grow America's bioeconomy across multiple sectors, including a range of industries, including health, agriculture, and energy.

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FY2022 Initiatives

- **Urban Integrated Field Laboratories (IFL)** – FOA released March 23, 2022. Selections were made for development of three Urban IFLs in Baltimore, Chicago, and the Texas Gulf Coast, including 3 national labs and 17 academic institutions of which 10 are MSIs.

- **Reaching a New Energy Sciences Workforce (RENEW)** – FOA released May 25, 2022. RENEW grants target building capacity in climate and environmental science-relevant programs, particularly at Historically Black Colleges and Universities (HBCUs) and minority- serving institutions (MSIs).

- **Research Development And Partnership Pilot (RDPP)** – FOA released February 23,2022. RDPP grants will broaden and diversify institutional representation in the Earth and Environmental Systems Sciences Division (EESSD) portfolio with institutions that have limited familiarity and/or engagement with EESSD supported efforts.

- **National Virtual Climate Laboratory (NVCL).** Will serve as a one stop portal to advance access to climate science from the DOE National Laboratories. NVCL will expand unified access to climate science to MSIs and HBCUs, connecting frontline communities with the key climate science capabilities and workforce training opportunities at the DOE national laboratories.

FY2023 Initiatives

- **Energy Earthshots -** Support both small group awards and larger center awards through the Energy Earthshot Research Centers.

- **Reaching a New Energy Sciences Workforce (RENEW) -** Provide opportunities for students and academic institutions not currently well represented in the U.S. S&T ecosystem.

- **Funding for Accelerated, Inclusive Research (FAIR) -** Target efforts to increase participation and retention of individuals from underrepresented groups in SC research activities.

- **Accelerate Innovations in Emerging Technologies (Accelerate) -** Support scientific research to accelerate the transition of science advances to energy technologies.

- **Biopreparedness Research Virtual Environment (BRaVE) -** Provide the cyber infrastructure, computational platforms, and next generation experimental research capabilities within a single portal allowing distributed networks of scientists to work together on multidisciplinary research priorities and/or national emergency challenges.

- ***Climate Resilience Center -*** *Facilitating translations of BER investments in foundational climate research into actionable solutions for impacted communities and addressing Administration priorities involving climate solutions and environmental justice.*

Administration Priorities for FY2024

- Preparing for and preventing pandemics
- Reducing the death rate from cancer by half
- **Tackling Climate Change**
  - **Climate science**
  - **Innovation in clean-energy technologies and infrastructure**
  - **Climate adaptation and resilience**
  - **Nature-based climate solutions for mitigation and adaptation**
  - **Greenhouse gas monitoring**
- **Advancing National Security and Technological Competitiveness**
  - **Critical and emerging technologies (AI and QIS)**
- **Innovating for equity**
  - **Innovative funding mechanisms and programs**
- Cultivating equitable STEM education
- Promoting open science and community-engaged R&D

EXECUTIVE OFFICE OF THE PRESIDENT
WASHINGTON, D.C. 20503

July 22, 2022

M-22-15

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: SHALANDA D. YOUNG
          DIRECTOR
          OFFICE OF MANAGEMENT AND BUDGET

          DR. ALONDRA NELSON
          DEPUTY ASSISTANT TO THE PRESIDENT
          PERFORMING THE DUTIES OF THE DIRECTOR
          OFFICE OF SCIENCE AND TECHNOLOGY POLICY

SUBJECT: Multi-Agency Research and Development Priorities for the FY 2024 Budget

The United States has long enjoyed broad bipartisan support for Federal investment in science and technology. This ongoing support helps to ensure American leadership in discovery, cures, and solutions for decades to come. The Biden-Harris Administration will continue to propose investments that will define America's next generation of global leadership in innovation, while infusing the work of government with greater equity, and the scientific research and technologies being developed with more durable benefit for all.

Federal funding for research and development (R&D) is essential to maximize the benefits of science and technology that advance health, tackle the climate crisis, and bring prosperity, security, environmental quality, and justice for all Americans. In addition to supporting R&D, agencies should make use of research results to carry out their own missions and ensure that the results of Federally funded research are made widely available to the public to facilitate understanding, participation, and inclusive decision-making; to other scientists to promote the exchange of ideas that is key to the advancement of knowledge; and, to innovators and entrepreneurs in every region of the United States, who will translate the research into world-leading businesses employing American workers. Equity should be the touchstone for all of these investments, including a deliberate emphasis on Historically Black Colleges and Universities, Tribal Colleges and Universities, Minority Serving Institutions, rural communities, and other disadvantaged communities that have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality. And, as we seek to make our supply chains more resilient, these R&D investments should protect intellectual property developed in the United States and help create products that are made by U.S. workers.

This memorandum outlines the Administration's multi-agency R&D priorities for formulating fiscal year (FY) 2024 Budget submissions to the Office of Management and Budget (OMB). The priorities covered in this memo will require Federal investments in R&D; actionable and equitable measurement of program outcomes; science, technology, engineering, and mathematics (STEM) education, engagement, and workforce development; research infrastructure; public access to Federally funded research; and, technology transfer and commercialization. These priorities should be addressed within

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Data-Focused Activities Across BER
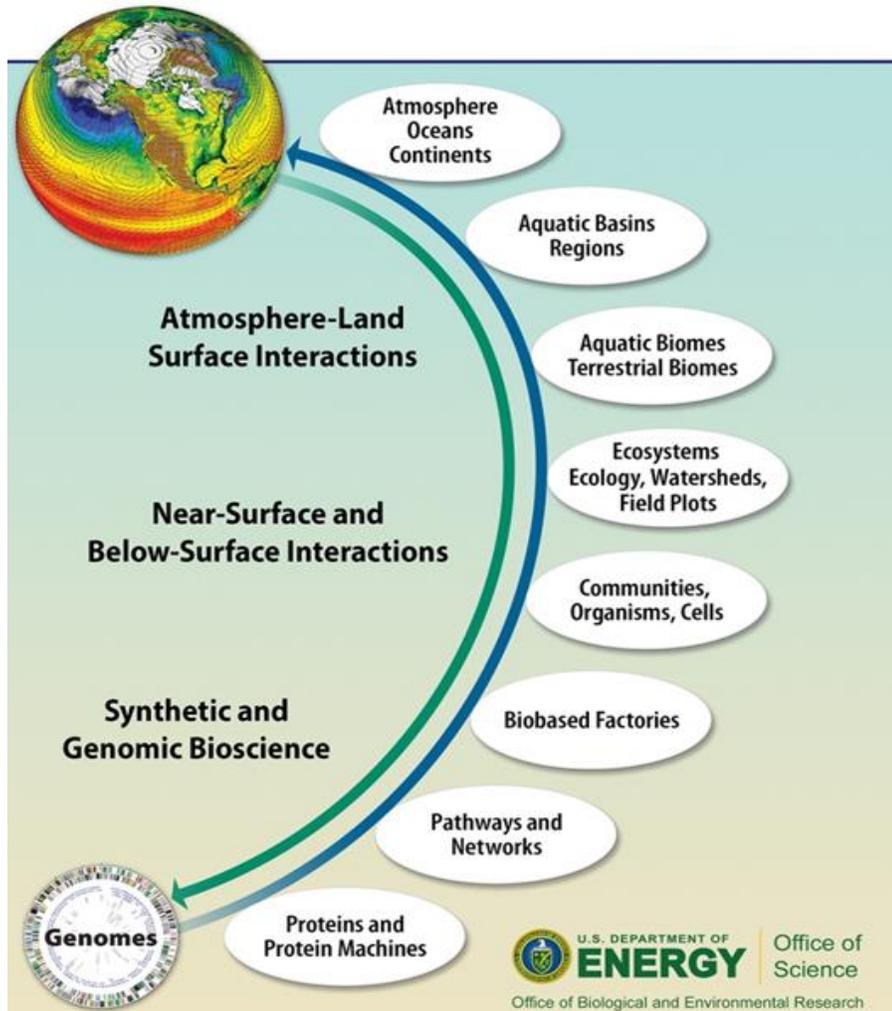
Data-related recommendations from BERAC & workshop resulting in new charge
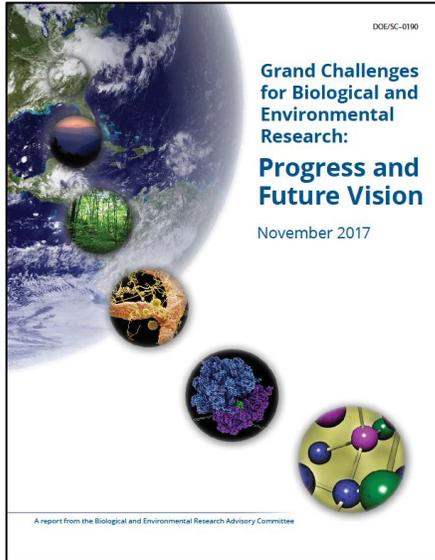
"Prioritize building and maintaining an integrated facility for long-term data storage, archiving, and data analysis." 2017
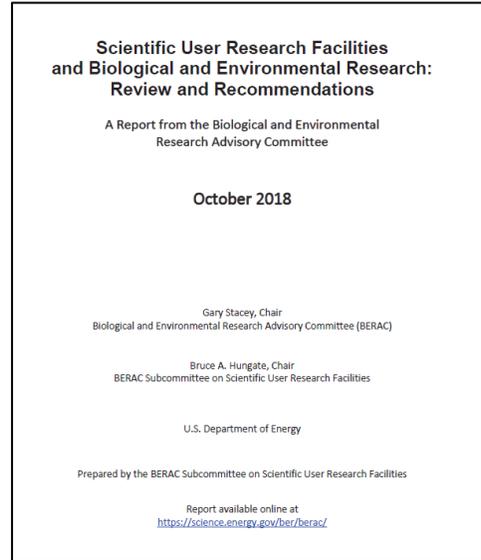
"Develop an infrastructure strategy that addresses data analysis and storage needs." 2018
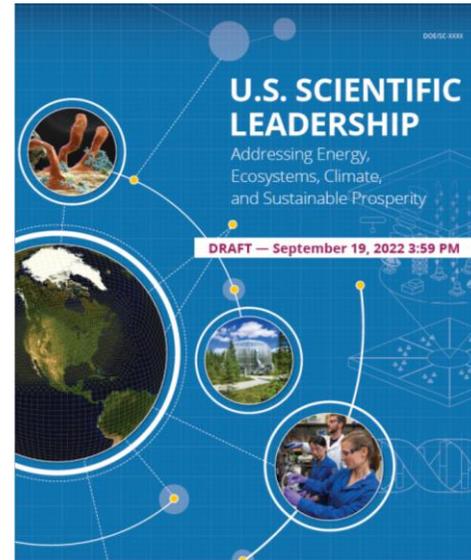
"Promote greater integration across user facilities—including support for data management and analysis—to enable researchers to easily schedule and use different infrastructure capabilities." 2022
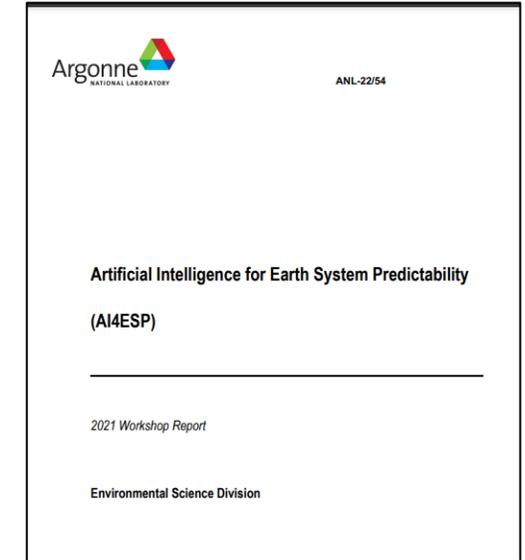
"Need to create a radically different approach for future AI-enabled Earth system modeling and observational efforts that will enable and foster collaborations across disciplines and institutions." 2022

Thank you!