Increasing Public Access to U.S. Department of Energy R&D Results – Publications and Open Science

Brian A. Hitson, Director
Office of Scientific and Technical Information

U.S. DEPARTMENT OF ENERGY | Office of Science

Energy.gov/science

DOE Invests $15B per Year in R&D

U.S. DEPARTMENT OF ENERGY

R&D Funding

»

»

NATIONAL LABS

Ames
Argonne
Brookhaven
Fermi
Idaho
Los Alamos
Lawrence Berkeley
Lawrence Livermore
NETL
NREL
Oak Ridge
Pacific Northwest
Princeton
SLAC
Sandia
Savannah River
Thomas Jefferson

GRANTEES
TECHNOLOGY CENTERS
SITES

»

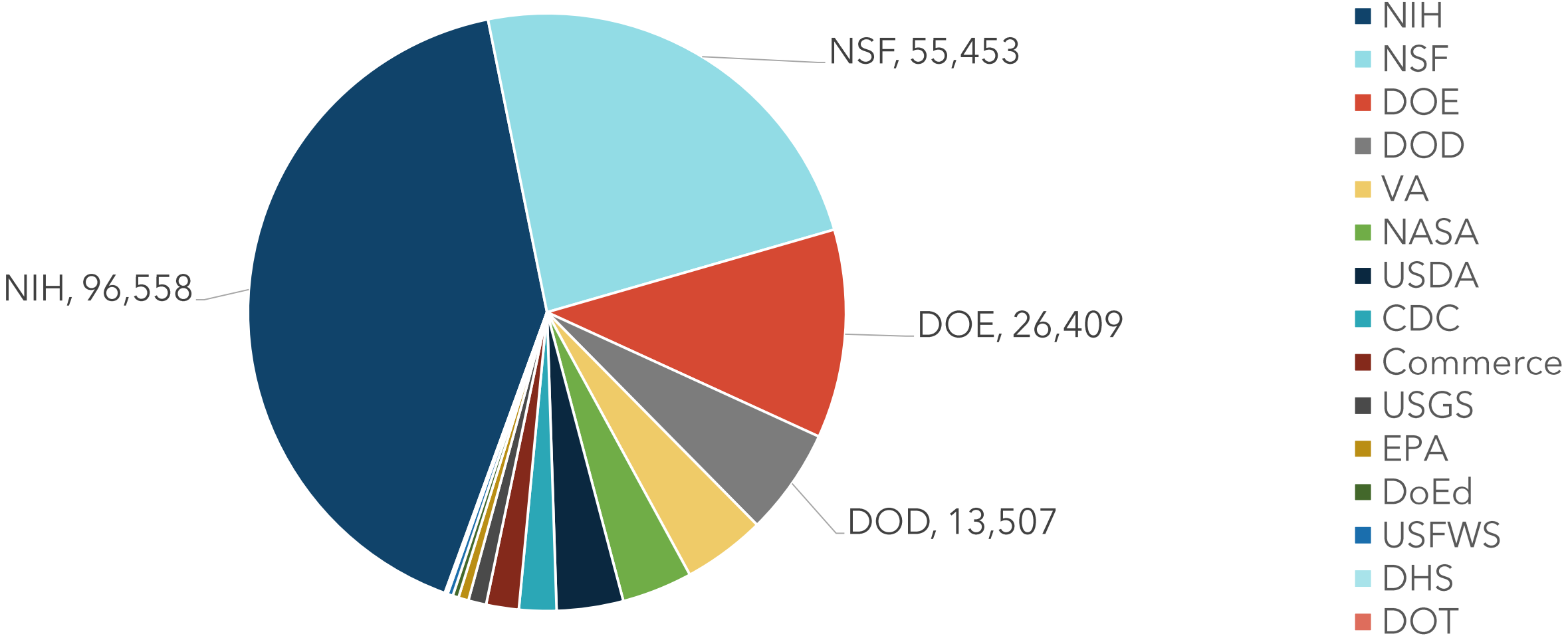
»

SCIENTIFIC & TECHNICAL INFORMATION (STI)

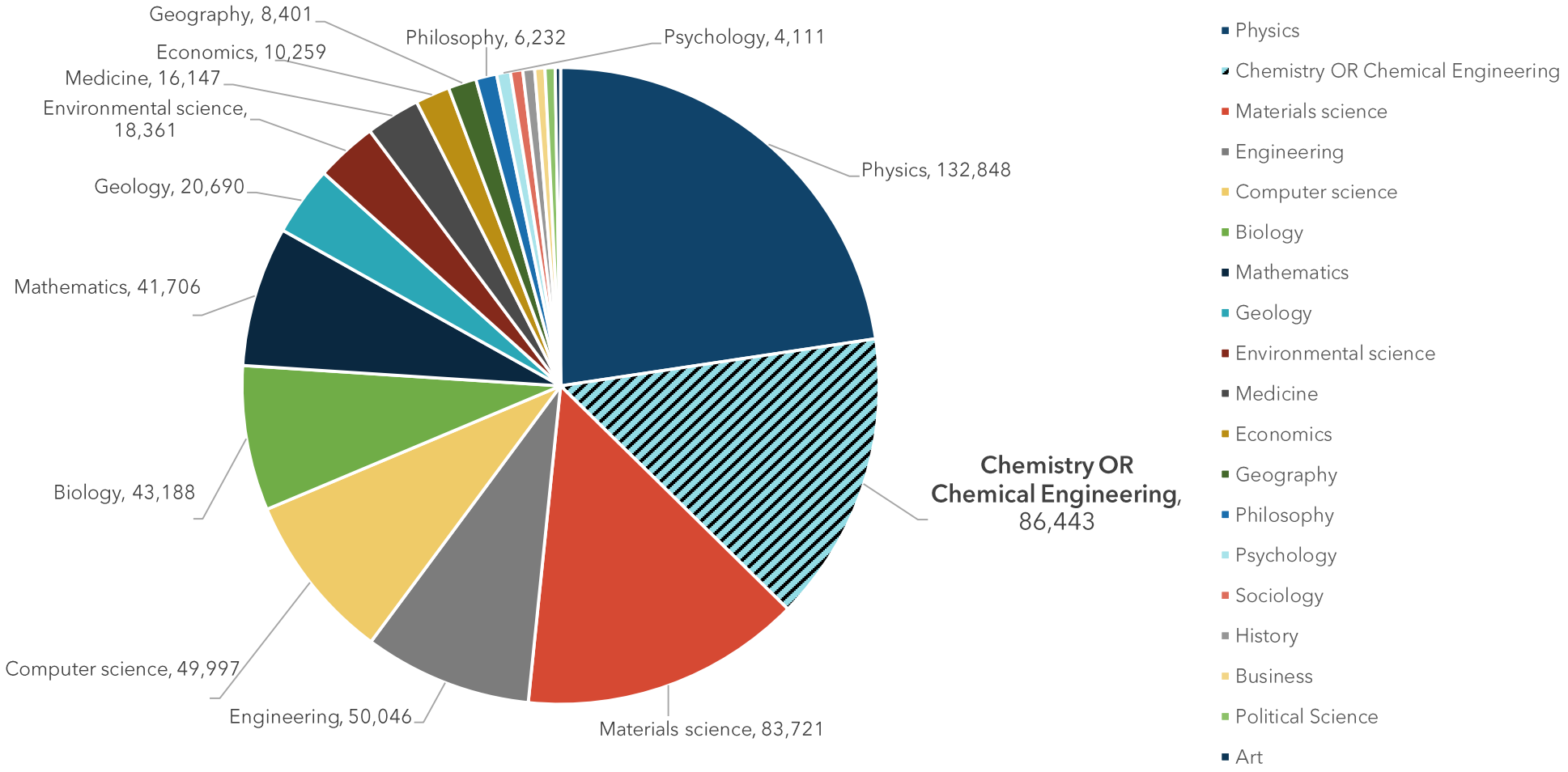
- Journal articles/accepted manuscripts
- Technical reports
- Conference papers
- Theses/dissertations
- Scientific and technical software
- Datasets
- Patents
- Workshop reports
- Videos

≈ 50,000 STI "products" per year

Journal Articles by Agency 2022



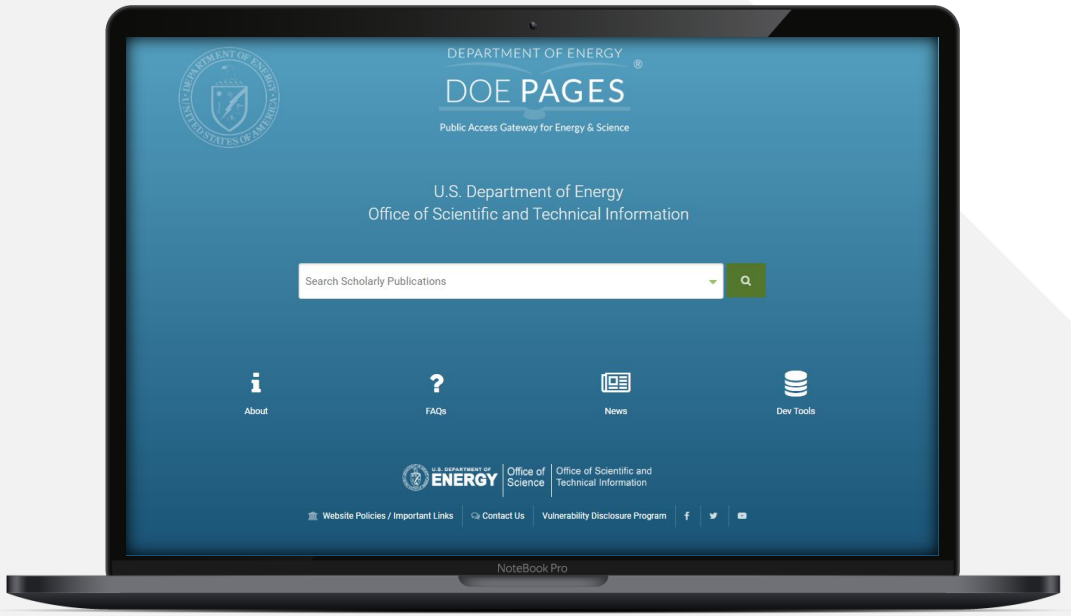
DOE is the Largest U.S. Funder of Research in Physical Sciences



The Office of Scientific and Technical Information (OSTI) is responsible for public access to DOE R&D Results

- Established in 1947 as part of Atomic Energy Commission
- "The Secretary, through OSTI, shall maintain within the Department publicly available collections of scientific and technical information resulting from research, development, demonstration, and commercial applications activities supported by the Department." (Energy Policy Act of 2005, P.L. 109-58, Section 982)

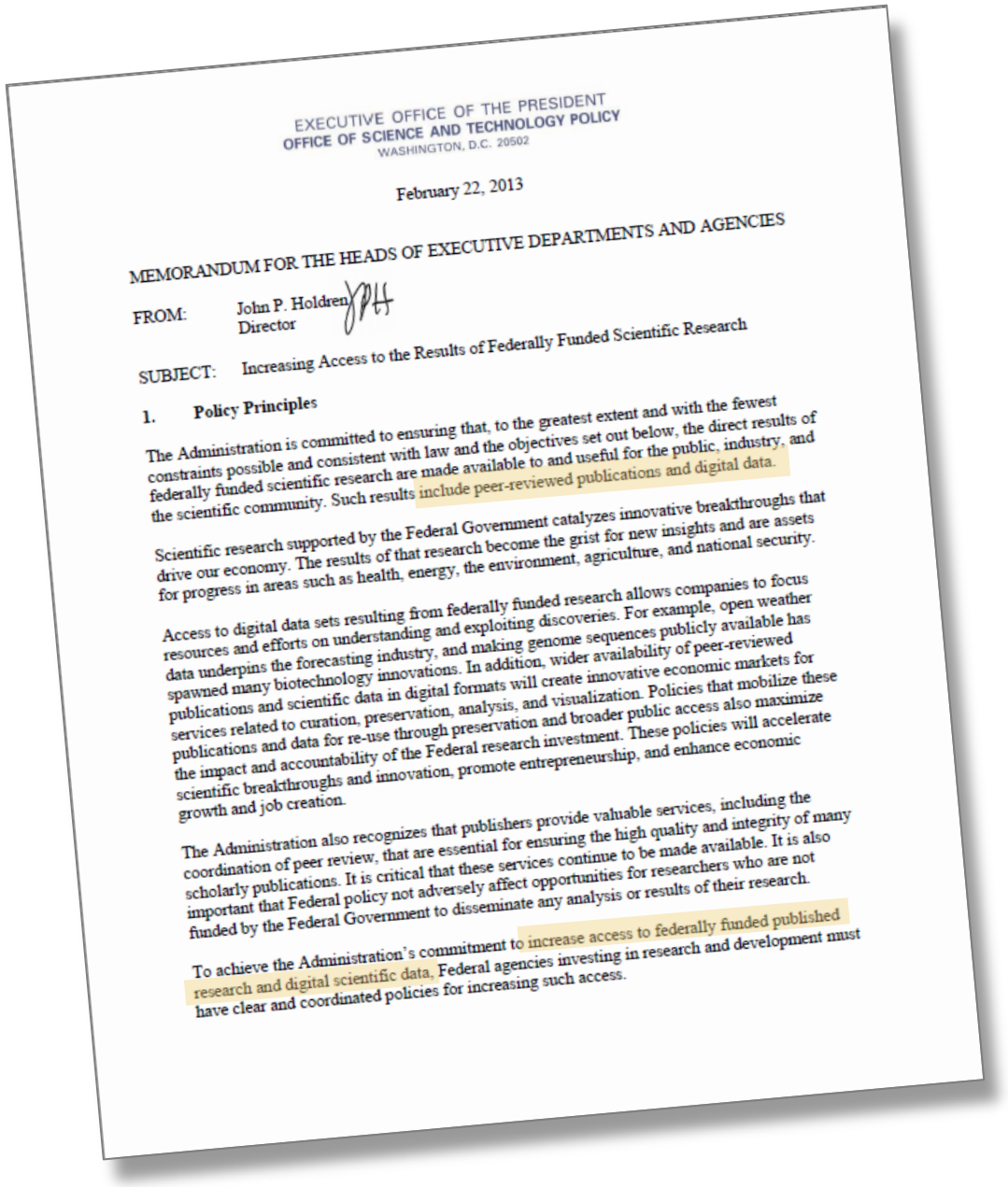
Search 3+ million Department of Energy research results



200K+ articles/manuscripts

OSTI Analogues

	National Library of Medicine (NIH)
	Defense Technical Information Center (DOD)
	National Agricultural Library (USDA)
	NASA STI Program (NASA)
	NSF-Public Access Repository (NSF) *(developed and operated by OSTI)*



EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20502

February 22, 2013

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: John P. Holdren
Director

SUBJECT: Increasing Access to the Results of Federally Funded Scientific Research

1. Policy Principles

The Administration is committed to ensuring that, to the greatest extent and with the fewest constraints possible and consistent with law and the objectives set out below, the direct results of federally funded scientific research are made available to and useful for the public, industry, and the scientific community. Such results include peer-reviewed publications and digital data.

Scientific research supported by the Federal Government catalyzes innovative breakthroughs that drive our economy. The results of that research become the grist for new insights and are assets for progress in areas such as health, energy, the environment, agriculture, and national security.

Access to digital data sets resulting from federally funded research allows companies to focus resources and efforts on understanding and exploiting discoveries. For example, open weather data underpins the forecasting industry, and making genome sequences publicly available has spawned many biotechnology innovations. In addition, wider availability of peer-reviewed publications and scientific data in digital formats will create innovative economic markets for services related to curation, preservation, analysis, and visualization. Policies that mobilize these publications and data for re-use through preservation and broader public access also maximize the impact and accountability of the Federal research investment. These policies will accelerate scientific breakthroughs and innovation, promote entrepreneurship, and enhance economic growth and job creation.

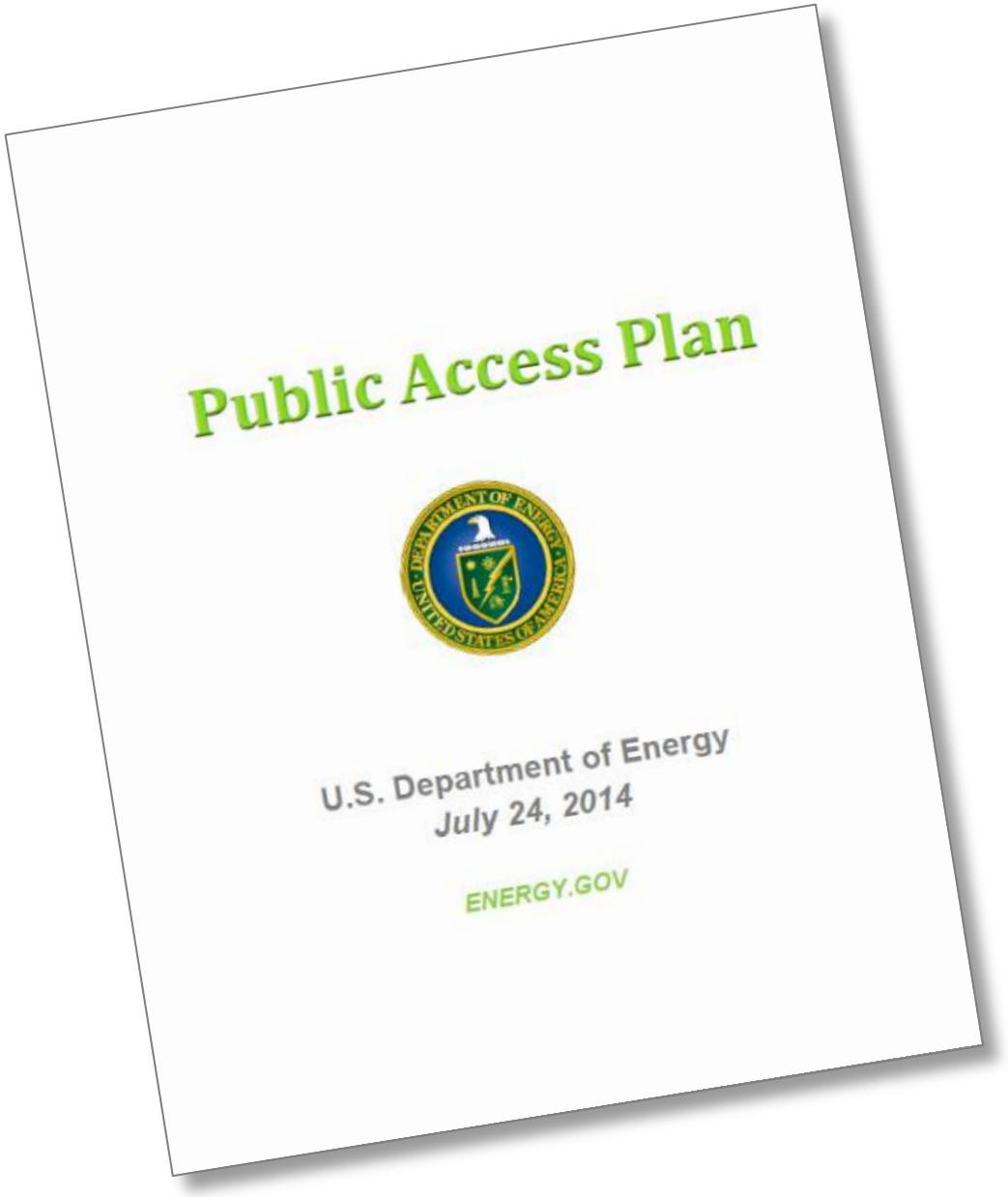
The Administration also recognizes that publishers provide valuable services, including the coordination of peer review, that are essential for ensuring the high quality and integrity of many scholarly publications. It is critical that these services continue to be made available. It is also important that Federal policy not adversely affect opportunities for researchers who are not funded by the Federal Government to disseminate any analysis or results of their research.

To achieve the Administration's commitment to increase access to federally funded published research and digital scientific data, Federal agencies investing in research and development must have clear and coordinated policies for increasing such access.

2013 OSTP Public Access Memo

Issued by OSTP Director John Holdren

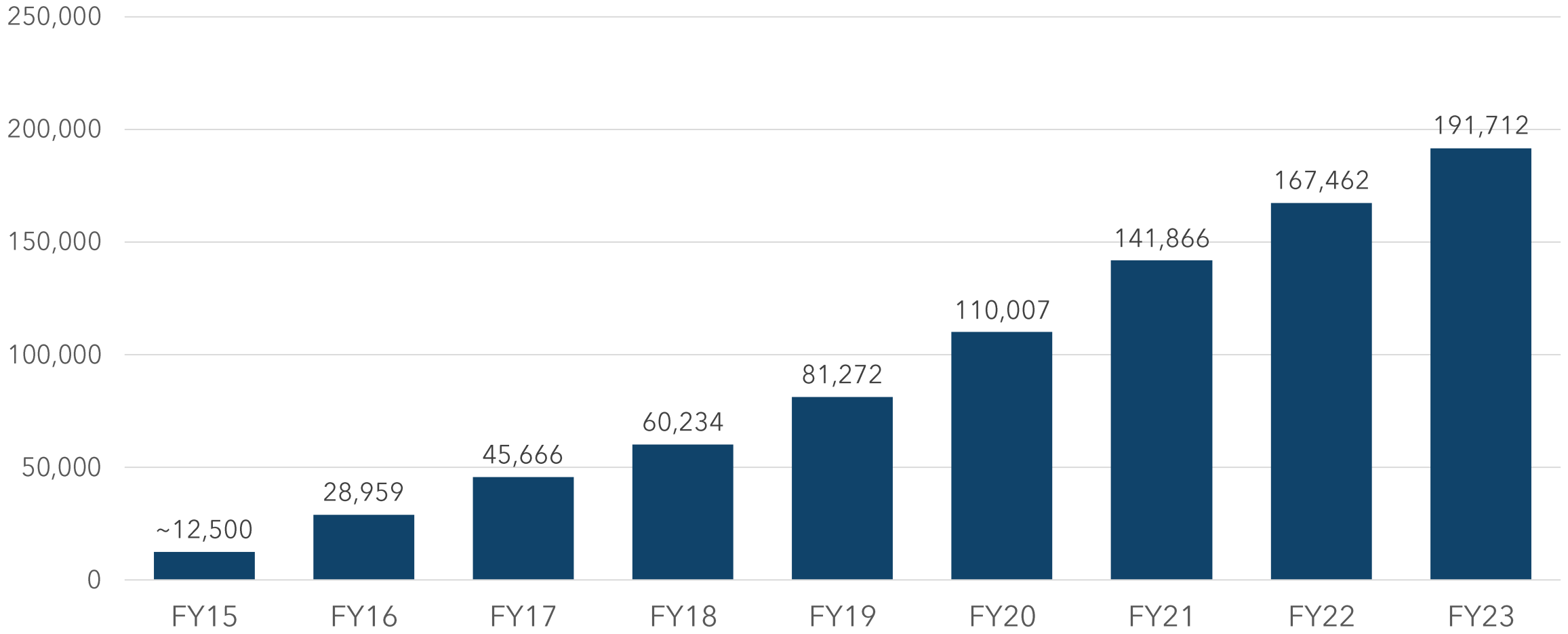
- directed agencies to develop Public Access plans to ensure that the results of federally funded scientific research are made publicly available, including **peer-reviewed publications** and **digital data**
- allowed for a **1-year embargo** of peer-reviewed articles after publication



2014 DOE Public Access Plan

- Publications Model
  - Author submission of accepted manuscripts to DOE within 12 months of publication
  - Government purpose license
  - Voluntary participation of publishers
  - DOE PAGES® as agency repository
- Data Management Plan (DMP) requirements

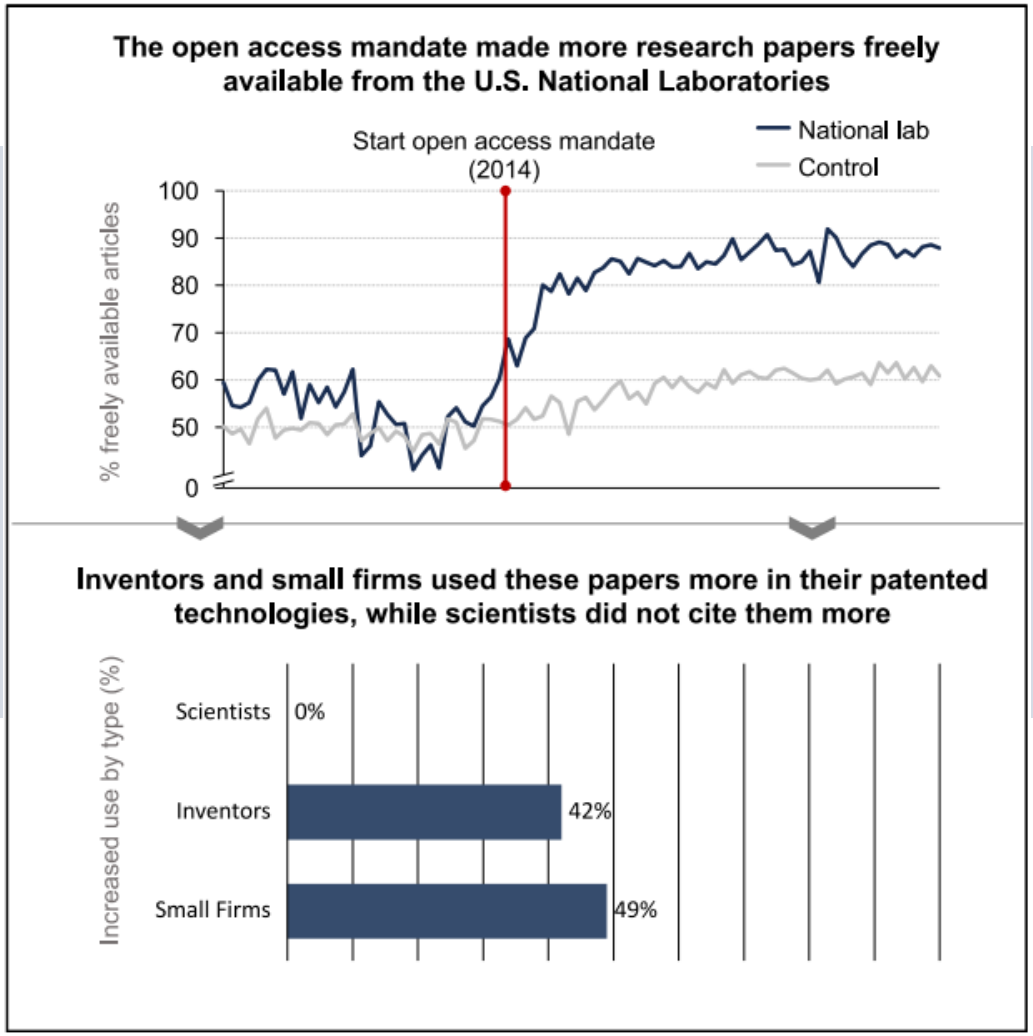
Implementation Progress: DOE PAGES Publications

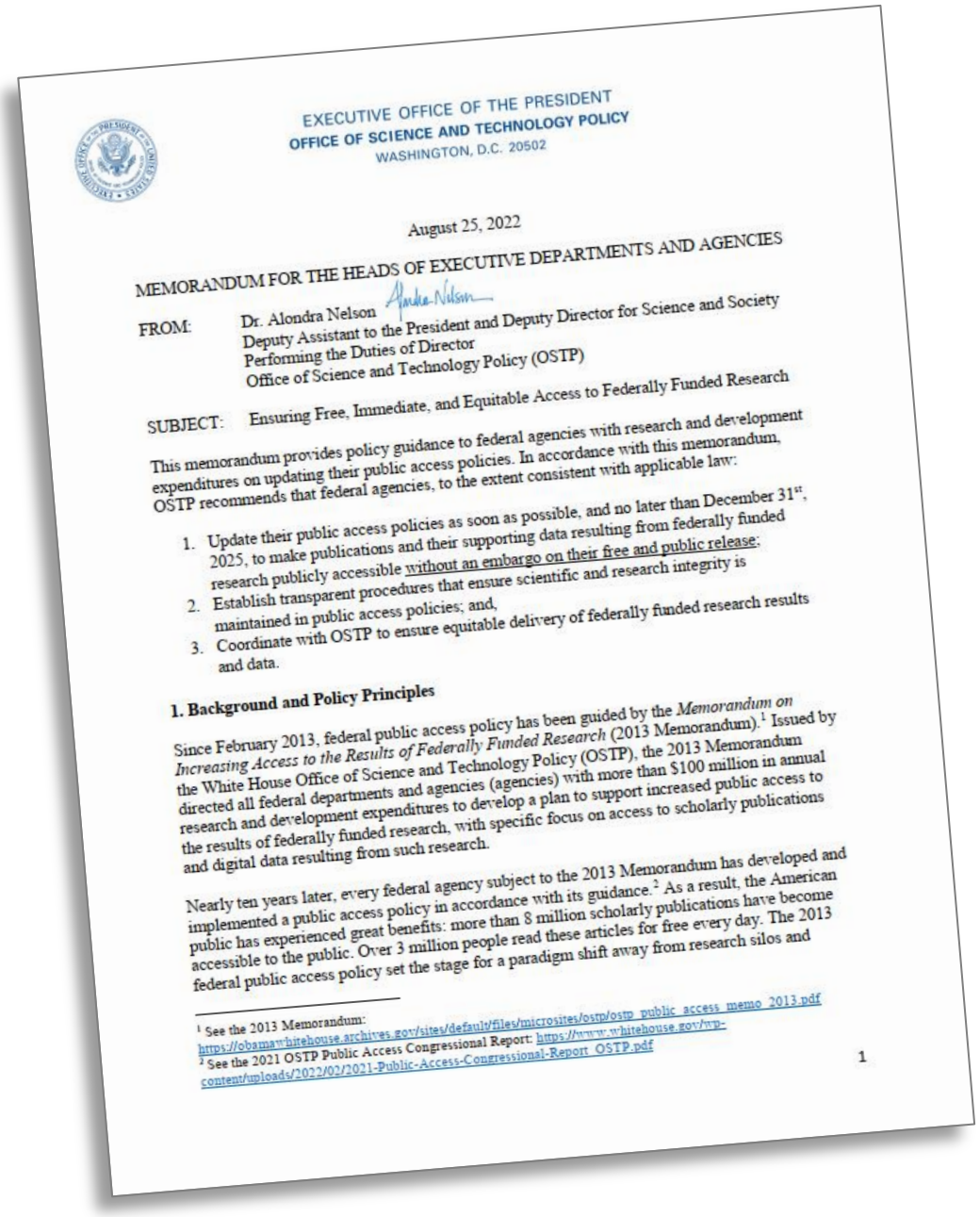


An Impact of Public Access

An example of the impact of open access mandates on scientific research and technological development in the U.S.

iScience





EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20502

August 25, 2022

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: Dr. Alondra Nelson
Deputy Assistant to the President and Deputy Director for Science and Society
Performing the Duties of Director
Office of Science and Technology Policy (OSTP)

SUBJECT: Ensuring Free, Immediate, and Equitable Access to Federally Funded Research

This memorandum provides policy guidance to federal agencies with research and development expenditures on updating their public access policies. In accordance with this memorandum, OSTP recommends that federal agencies, to the extent consistent with applicable law:

1. Update their public access policies as soon as possible, and no later than December 31st, 2025, to make publications and their supporting data resulting from federally funded research publicly accessible without an embargo on their free and public release;
2. Establish transparent procedures that ensure scientific and research integrity is maintained in public access policies; and,
3. Coordinate with OSTP to ensure equitable delivery of federally funded research results and data.

1. Background and Policy Principles

Since February 2013, federal public access policy has been guided by the *Memorandum on Increasing Access to the Results of Federally Funded Research* (2013 Memorandum).[1] Issued by the White House Office of Science and Technology Policy (OSTP), the 2013 Memorandum directed all federal departments and agencies (agencies) with more than $100 million in annual research and development expenditures to develop a plan to support increased public access to the results of federally funded research, with specific focus on access to scholarly publications and digital data resulting from such research.

Nearly ten years later, every federal agency subject to the 2013 Memorandum has developed and implemented a public access policy in accordance with its guidance.[2] As a result, the American public has experienced great benefits: more than 8 million scholarly publications have become accessible to the public. Over 3 million people read these articles for free every day. The 2013 federal public access policy set the stage for a paradigm shift away from research silos and

[1] See the 2013 Memorandum: https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf
[2] See the 2021 OSTP Public Access Congressional Report: https://www.whitehouse.gov/wp-content/uploads/2022/02/2021-Public-Access-Congressional-Report_OSTP.pdf

1

August 2022 Nelson Memo

- No embargo – immediate access to publications
- Use/re-use; machine readability
- Immediate access to displayed or underlying data
- Persistent identifiers

Process for Developing DOE's Public Access Plan – February 2023

Intra-Agency Coordination

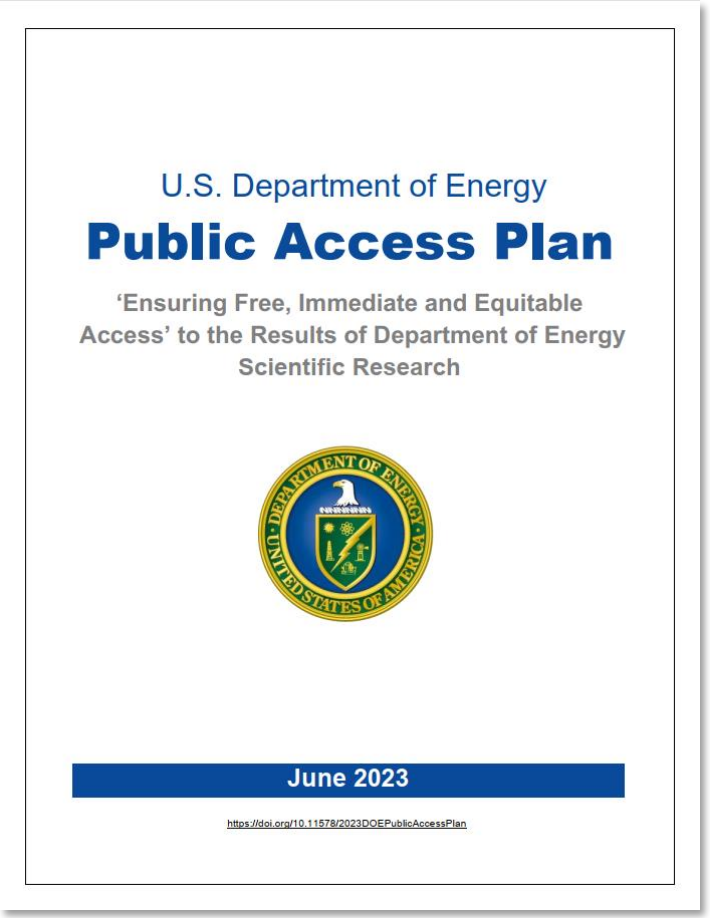
- DOE-wide participation, led by Office of Science (SC)
- Coordinated with DOE and SC Working Groups on Digital Data
- DOE researcher community input through Labs' STI managers

Interagency Coordination

- OSTP Subcommittee on Open Science (SOS); SC co-chairs three SOS working groups
- Persistent Identifier Services partners from 12 agencies

External Community Engagement

- Professional societies
- Publishers
- Libraries
- Comments@osti.gov



https://www.energy.gov/doe-public-access-plan

Publications

Emphasize author deposits of accepted manuscripts into DOE PAGES ("green OA")

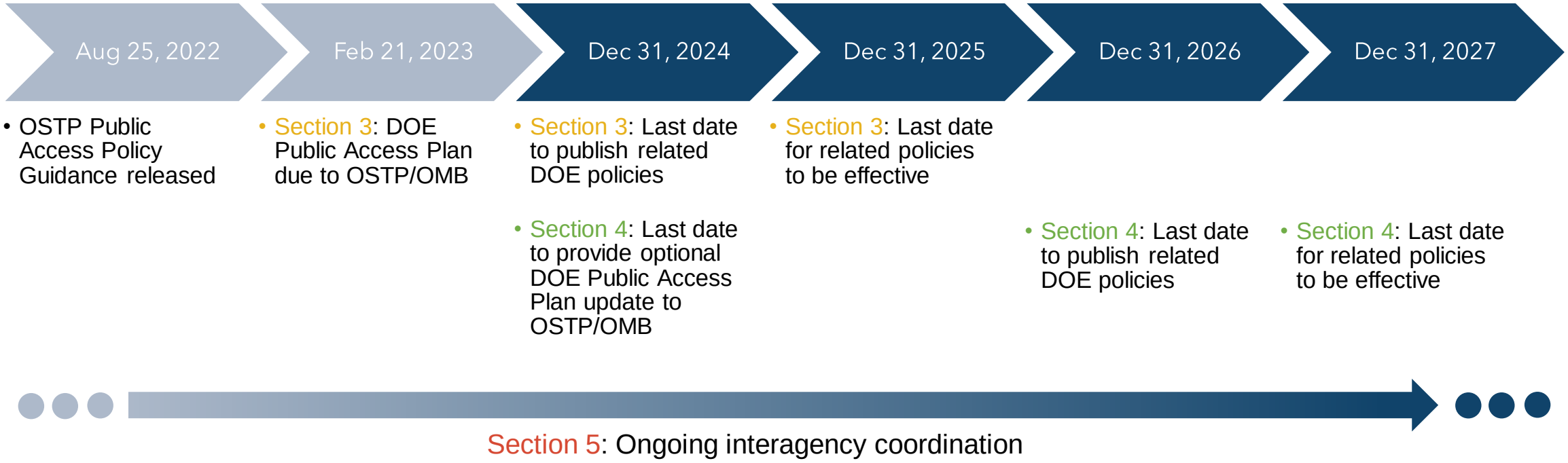
Allow "reasonable" open access fees ("gold OA") and monitor over time

Maximize re-use rights to scholarly publications under existing copyright law and "rights in data" clauses

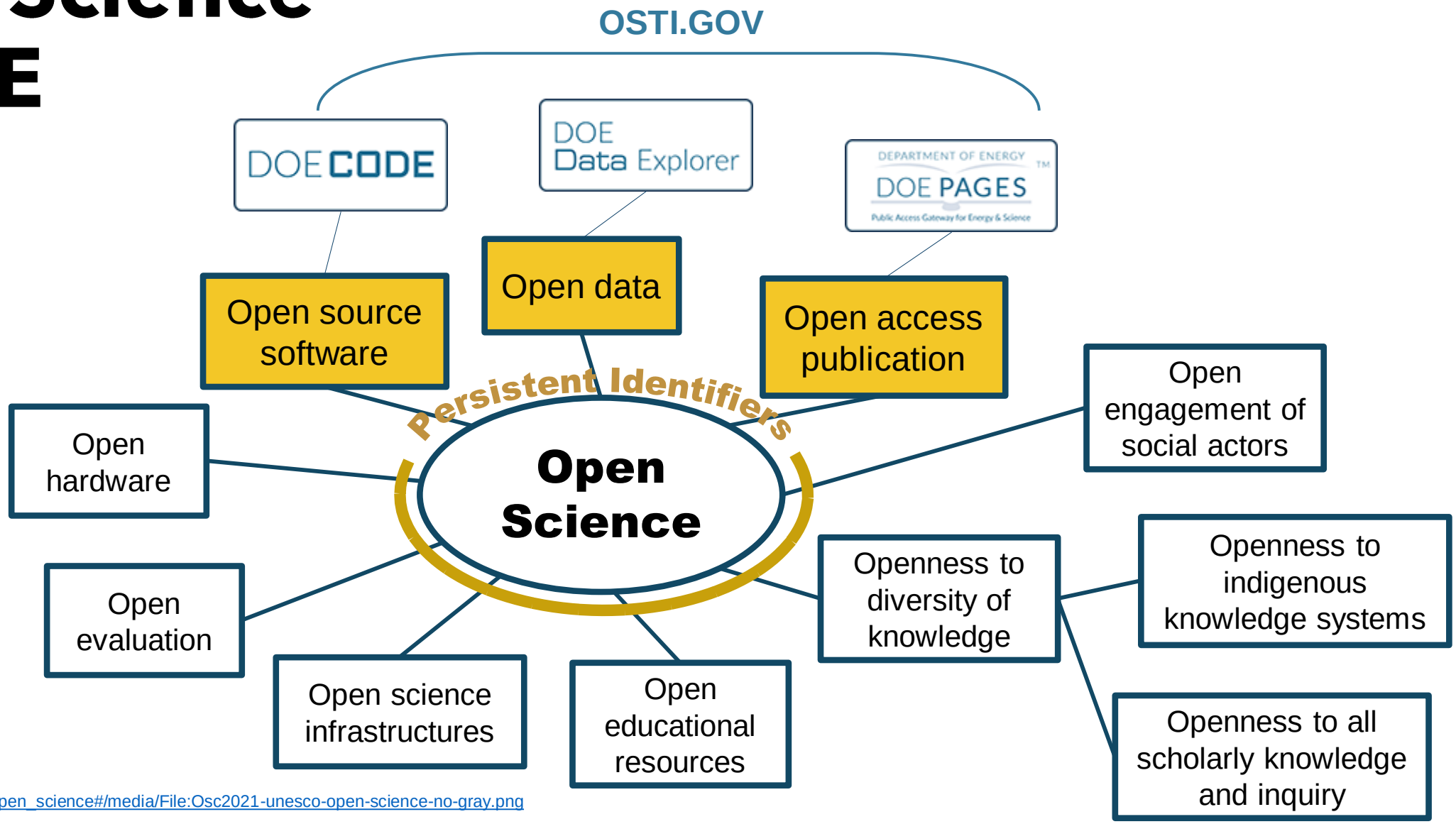
Implementation Timeline

2022 OSTP Public Access Memo Section Descriptions

Section 3: Publications & Data | Section 4: PIDs to Ensure Research & Scientific Integrity | Section 5: Interagency Coordination



Open Science in DOE



https://en.wikipedia.org/wiki/Open_science#/media/File:Osc2021-unesco-open-science-no-gray.png

Persistent Identifiers (PIDs)

"A digital identifier that is globally unique, persistent, machine resolvable and processable, and has an associated metadata schema."

PIDs for Research Outputs	PIDs for Researchers	PIDs for R&D Awards
Need to collect metadata associated with publications and data.	Agencies need to instruct researchers to obtain a PID for themselves.	Agencies to assign unique digital persistent identifiers to R&D awards and intramural research protocols.

Beyond Publications to 'Open Science'


OSTI.GOV / Journal Article: Association mapping by aerial drone reveals 213 genetic associations for Sorghum bicolor biomass traits under drought
Association mapping by aerial drone reveals 213 genetic associations for Sorghum bicolor biomass traits under drought
Full Record
References (46)
Cited by (5)
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Impact Factor: 3.501
Citation Impact by Journal: 0.99
Citation Impact by Field: 1.0211
% Rank by Field / Year: 73.2952
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Abstract
BACKGROUND: Sorghum bicolor is the fifth most commonly grown cereal worldw
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Authors: Spindel, Jennifer E.; Dahlberg, Jeffery; Colgan, Matthew; Hollings
Staggenborg, Scott H.; Hutmacher, Robert; Jansson, Christer; Vo
Publication Date: 2018-09-17
Research Org.: Pacific Northwest National Lab. (PNNL), Richland, WA (United Stat
(LBNL), Berkeley, CA (United States)
Sponsoring Org.: USDOE Advanced Research Projects Agency - Energy (ARPA-E); US
and Environmental Research (BER)
OSTI Identifier: 1618569
Alternate Identifier(s): OSTI ID: 1489292; OSTI ID: 1559146
Report Number(s): PNNL-SA-131382
Journal ID: ISSN 1471-2164; 679; PII: 5055
Grant/Contract Number: 14/CJ000/09/02; AC02-05CH1123; AC05-76RL01830; AC02-05CH
Resource Type: Journal Article: Published Article
BMC Genomics
RESEARCH ARTICLE
Open Access
Association mapping by aerial drone reveals 213 genetic associations for Sorghum bicolor biomass traits under drought
Jennifer E. Spindel, Jeffery Dahlberg, Matthew Colgan, Joy Hollingsworth, Julie Sievert, Scott H. Staggenborg, Robert Hutmacher, Christer Jansson and John P. Vogel
Abstract
Background: Sorghum bicolor is the fifth most commonly grown cereal worldwide and is remarkable for its drought and abiotic stress tolerance. For these reasons and the large size of biomass varieties, it has been proposed as a bioenergy crop. However, little is known about the genes underlying sorghum's abiotic stress tolerance and biomass yield.
Results: To uncover the genetic basis of drought tolerance in sorghum at a genome-wide level, we undertook a high-density phenomics genome wide association study (GWAS) in which 648 diverse sorghum lines were phenotyped at two locations in California once per week by drone over the course of a growing season. Biomass, height, and leaf area were measured by drone for individual field plots, subjected to two drought treatments and a well-watered control. The resulting dataset of ~ 171,000 phenotypic data-points was analyzed along with 183,989 genotype by sequence markers to reveal 213 high-quality, replicated, and conserved GWAS associations.
Conclusions: The genomic intervals defined by the associations include many strong candidate genes, including those encoding heat shock proteins, antifreeze proteins, and other domains recognized as important to plant stress responses. The markers identified by our study can be used for marker assisted selection for drought tolerance and biomass. In addition, our results are a significant step toward identifying specific sorghum genes controlling drought tolerance and biomass yield.
Keywords: Sorghum, GWAS, Drought, Drone, Phenomics, Biomass
Background
The plant and agricultural research community faces a grave challenge: in a mere three decades, we must reinvent agriculture to feed a growing global population, in an environmentally sustainable manner, while dealing with a projected increase in drought events [1–3]. Sorghum [Sorghum bicolor (L.) Moench] could be bred to help address these challenges. Sorghum is the fifth most commonly grown cereal crop worldwide, and over half a billion people rely on it as a daily food staple. It is already essential to food security, as it can grow across a wide range of marginal climates, including regions too hot and dry to grow rice, corn, or wheat. Sorghum has also generated interest in recent years as a bioenergy crop because it can produce exceptionally large biomass yields on marginal lands with limited inputs [4–6].
In order to efficiently develop sorghum biomass varieties, several important research questions must be addressed. First, we must understand the genetic underpinnings of terminal biomass in sorghum and identify specific genes or genetic regions that can be targeted for breeding and engineering efforts. Second, if bioenergy crops are to be compatible with environmental stewardship and increased food production they cannot compete with food crops for productive croplands – they must be grown on underutilized,
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Full list of author information is available at the end of the article
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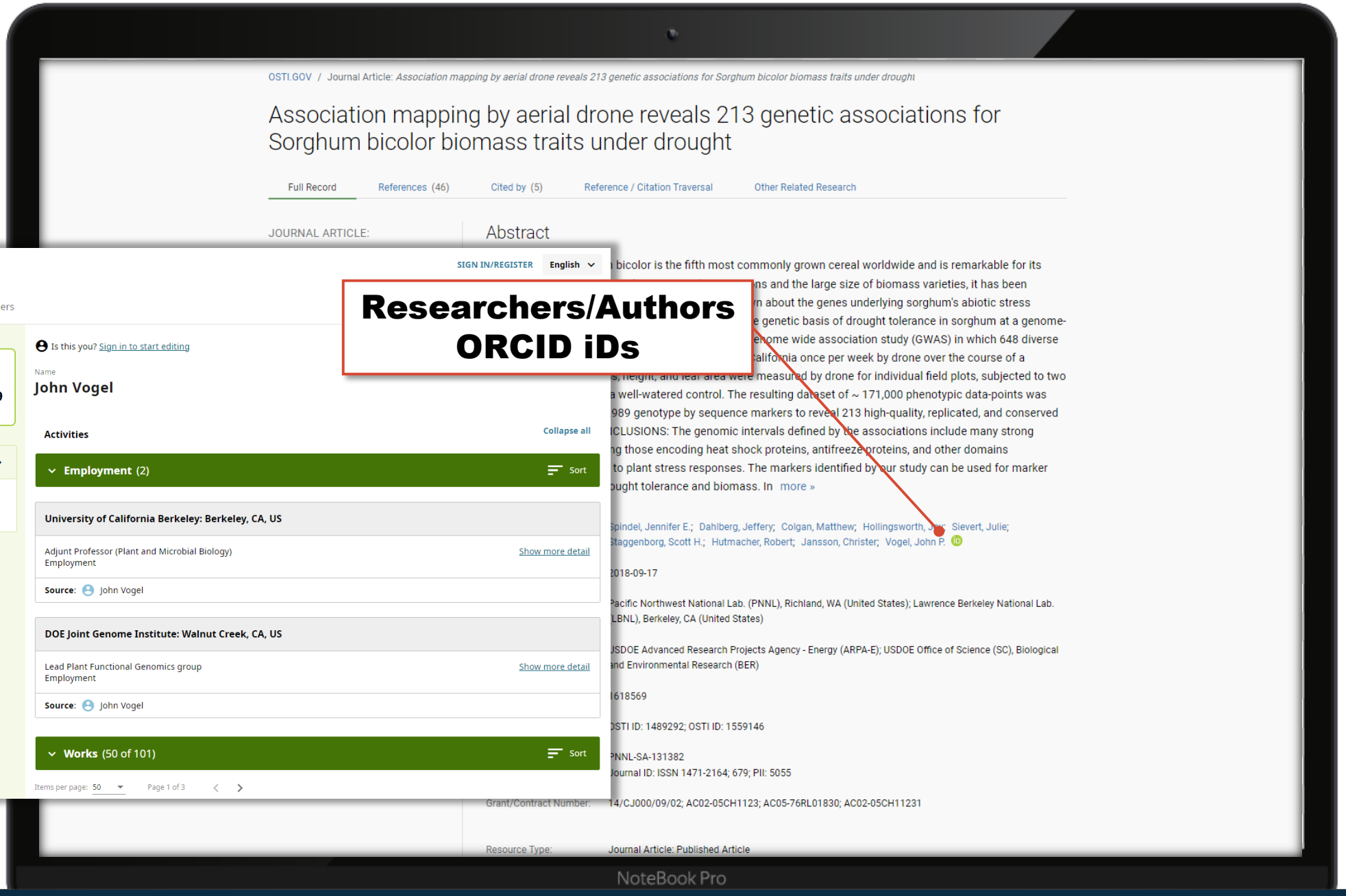
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USDOE Advanced Research Projects Agency - Energy (ARPA-E); USDOE Office of Science (SC), Biological and Environmental Research (BER)
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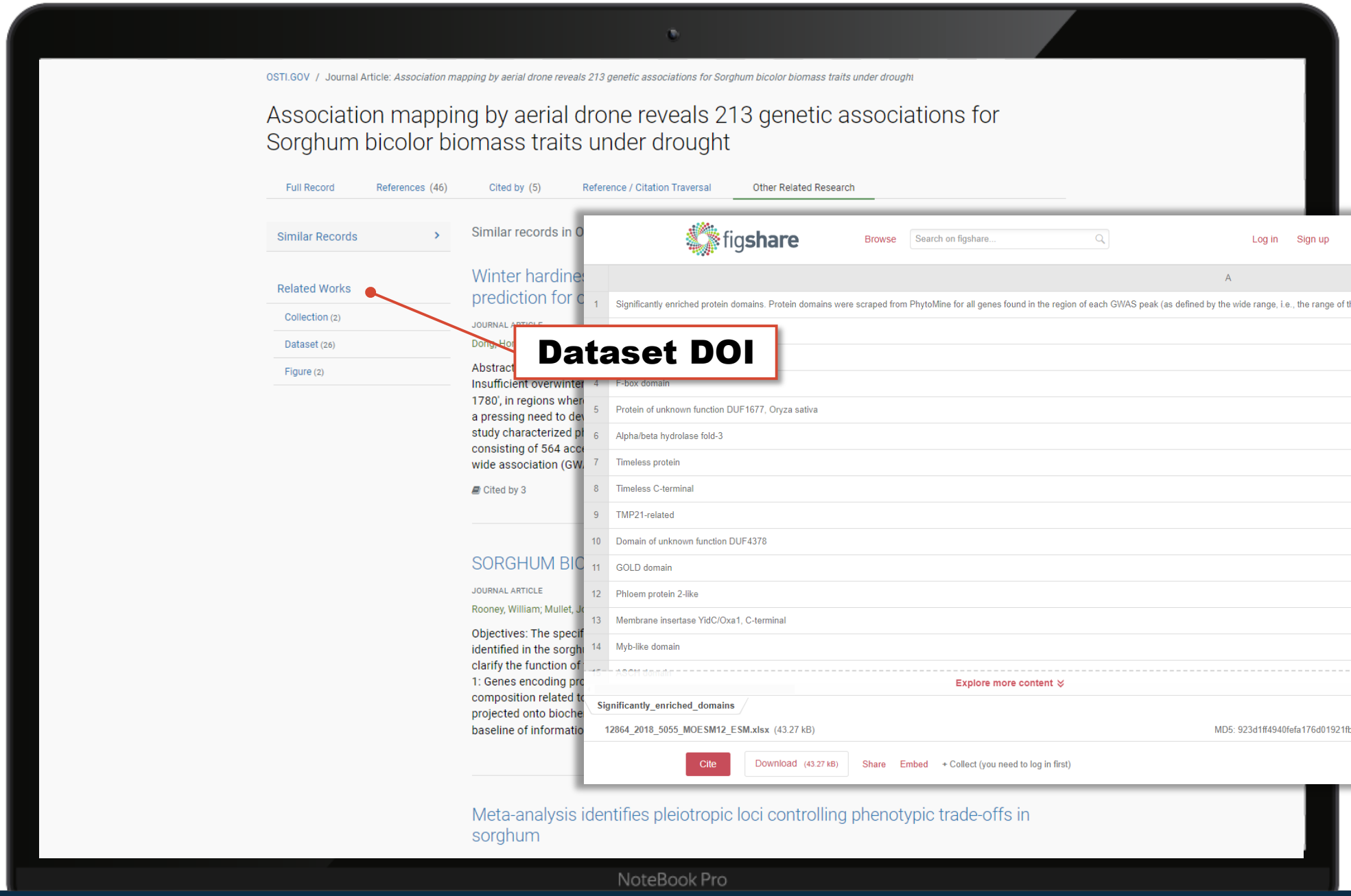
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Significantly enriched protein domains. Protein domains were scraped from PhytoMine for all genes found in the region of each GWAS peak (as defined by the wide range, i.e., the range of the union of all SNP
F-box domain
Protein of unknown function DUF1677, Oryza sativa
Alpha/beta hydrolase fold-3
Timeless protein
Timeless C-terminal
TMP21-related
Domain of unknown function DUF4378
GOLD domain
Phloem protein 2-like
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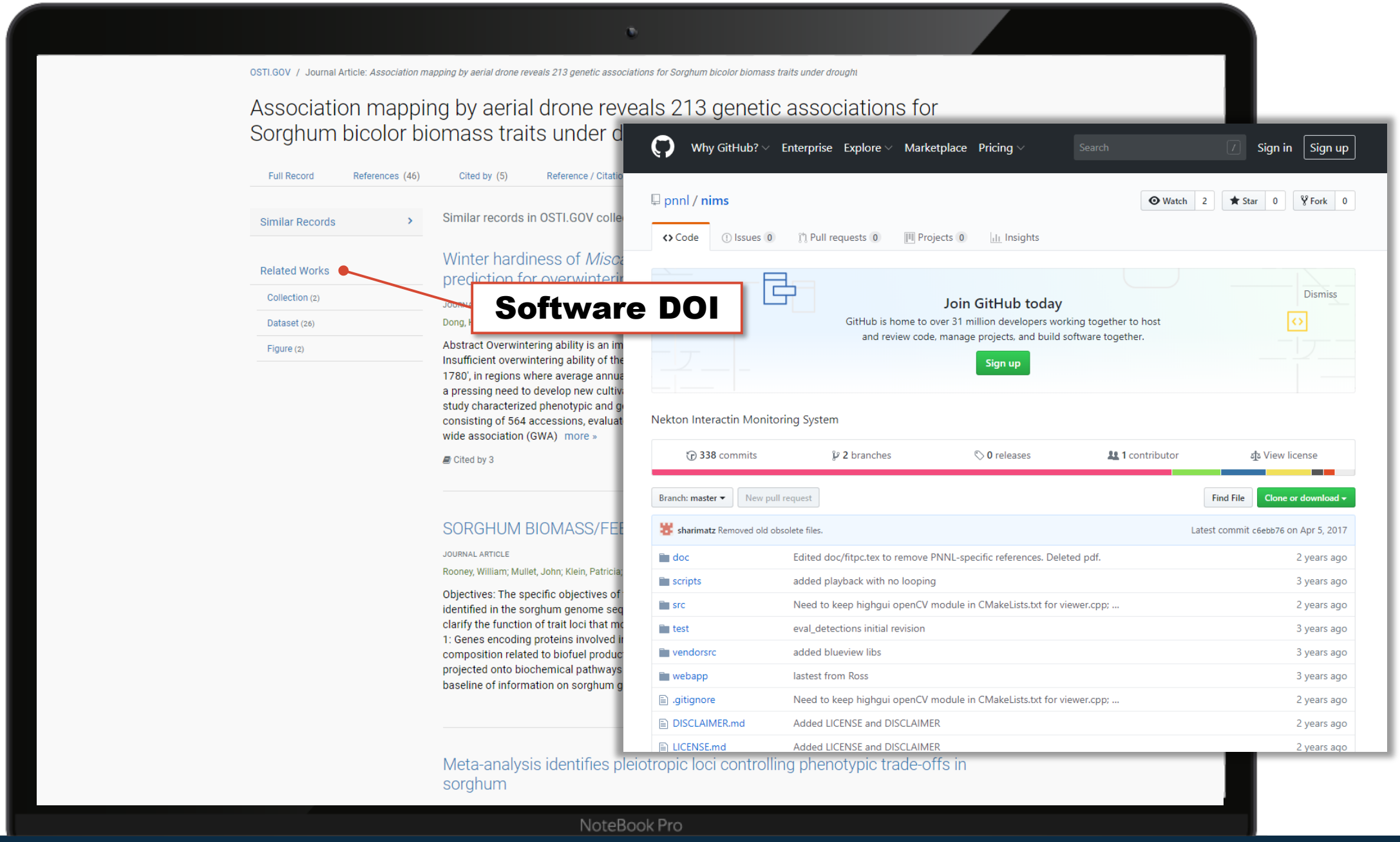
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SORGHUM BIOMASS/FEE
JOURNAL ARTICLE
Rooney, William; Mullet, John; Klein, Patricia;
Objectives: The specific objectives of
identified in the sorghum genome seq
clarify the function of trait loci that mo
1: Genes encoding proteins involved i
composition related to biofuel produc
projected onto biochemical pathways
baseline of information on sorghum g
Meta-analysis identifies pleiotropic loci controlling phenotypic trade-offs in sorghum
Software DOI
Why GitHub?
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sharimatz Removed old obsolete files.
Latest commit c6ebb76 on Apr 5, 2017
doc Edited doc/fitpc.tex to remove PNNL-specific references. Deleted pdf. 2 years ago
scripts added playback with no looping 3 years ago
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webapp lastest from Ross 3 years ago
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Questions?

Brian A. Hitson, hitsonb@osti.gov