



**Dave Carlon, President, National Association of  
Marine Laboratories**

**Terry Donaldson, Chair, Public Policy  
Committee, National Association of Marine  
Laboratories**

# NATIONAL ASSOCIATION OF MARINE LABORATORIES

**Annual Public Policy Meeting**

**March 24-25, 2022**



## **Briefing Book for NAML Public Policy Meeting**

**March 24-25, 2022**

**Washington, D.C.**

- Meeting Schedule
- Biographical Information on Speakers and Panelist
- Suggested Issues and Questions to Raise with Speakers and Panelists
- Statement from the White House Office of Science and Technology Policy on the Omnibus Appropriations Bill
- American Jobs Plan March 31, 2021
- FY 2023 OMB/OSTP R&D Priorities Memorandum, August 2021
- NAML Public Policy Statement
- NAML Policy Statement: Infrastructure
- NAML Policy Statement: Great Lakes Research and Education
- White House Fact Sheet on Great Lakes and Infrastructure Investment and Jobs Act, February 2022
- OMB Great Lakes Crosscut Report to Congress, November 2021

# NAML Public Policy Meeting Agenda 2022

## Public Policy Meeting Agenda

Thursday, March 24, 2022 (all times Eastern Daylight-Saving Time = EDT)

10:00 AM      **Opening Remarks**

- **Dave Carlon**, President, NAML
- **Terry Donaldson**, President-Elect NAML & Chair, NAML Public Policy Committee

10:15 AM      **Overview of the Federal Budget and Policy Environment & Briefing on NAML Public Policy Agenda**

- **Meg Thompson & Joel Widder**, Federal Science Partners

11:00 AM      **Break**

11:15 AM      **Federal R&D Budget Outlook – Infrastructure for Research and Education**

- **Joel R. Parriott**, Special Assistant for R&D Budget Analysis, Office of Science and Technology Policy, Executive Office of the President.

12:00 PM      **Break**

12:15 PM      **Infrastructure Challenges and Opportunities for Marine and Great Lakes Laboratories (Working Lunch)**

- **Peter McCartney**, Program Director, NSF Division of Biological Infrastructure
- **Steven Thur**, Director, National Centers for Coastal Ocean Sciences, NOAA
- **Shelby Walker**, Senior Advisor for Facilities, Directorate for Geosciences, NSF

1:45 PM      **Break**

2:00 PM      **Strengthening the Basic Research and Education Enterprise to Support Major International/Regional Public Policy Initiatives**

**Case Study: The Role of Science in Supporting Great Lakes Restoration**

- Moderator: **Robert Sterner**, Director, Large Lakes Observatory
- **Pierre Béland** – Canadian Chair & Commissioner, International Joint Commission
- **Stephen G. Galarneau**, Director of the Office of Great Lakes, Wisconsin Department of Natural Resources and Co-Chair, EPA Great Lakes Advisory Board
- **Frank Greenland**, Director of Watershed Programs, Northeast Ohio Regional Sewer District, Cleveland, Ohio
- **Elizabeth Henchey Malloy**, Section Supervisor; Science, Monitoring, Evaluation & Reporting, US EPA Great Lakes National Program Office
- **Kelli Paige**, CEO, Great Lakes Observing System (GLOS)

3:30 PM      **Break**

3:45 PM      **Panel discussion: Best Practices to Increase Diversity in the Marine Sciences**

- **Moderator: Billie Swalla**, Friday Harbor Laboratories, University of Washington
- **Vicki Ferrini**, Senior Research Scientist, Associate Director for Diversity, Equity, and Inclusion, Lamont-Doherty Earth Observatory, Columbia University
- **Catalina Martinez**, Regional Program Manager, NOAA Ocean Exploration
- **Onjalé Scott Price**, Chief Operating Officer, Mizar Imaging, Woods Hole; Co-Director, Woods Hole Diversity Advisory Committee

5:00 PM      **End of Day 1**

**Friday, March 25, 2022 (all times Eastern Daylight-Saving Time = EDT)**

10:00 AM      **The Plan for the Day**

- **Dave Carlon**, President, NAML
- **Terry Donaldson**, President-Elect NAML & Chair, NAML Public Policy Committee

10:15 AM      **Public Policy Collaboration with Like-Minded Organizations**

- **Derek Brockbank**, Executive Director, Coastal States Organization
- **Josie Quintrell**, Executive Director, IOOS Association
- **Rebecca Roth**, Executive Director, National Estuarine Research Reserve Association
- **Susan White**, President, Sea Grant Association

11:15 AM      **Effective Advocacy Strategies for Marine and Great Lakes Labs in the Current Budget and Policy Environment**

- **Honorable John Culberson** (R-TX), former Member of Congress and former Chairman of the House Commerce-Justice-Science Appropriations Subcommittee

12:15 PM      **Public Policy Meeting Ends**

1:00 PM      **NAML Membership Business Meeting** (this will be a Zoom meeting; a Zoom link will be sent to all NAML members)

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# NAML Membership Meeting Agenda

## Meeting convenes at 1 PM EDT via Zoom

- Approval of minutes of previous meeting ([Biennial Meeting Minutes](#))
  - NAML Bylaws Amendments ([Link to proposed amendments](#))
  - New Member Approval
    - Northland College, Mary Griggs Burke Center for Freshwater Innovation; NEAMGLL small lab; [link to application letter](#)
    - University of Wisconsin - Green Bay; NEAMGLL small lab; [link to application letter](#)
  - NAML Emeritus appointment for Robert Dickey (see nomination below)
  - Budget Report
  - Reports from committee chairs
    - Public Policy Committee
    - Education Committee
    - DEI Committee
  - Breakout Sessions for NEAMGLL, SAML, and WAML
  - New Business
    - Remind the membership of NAML education and lobbying activities
  - Adjournment
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## NAML Emeritus Nomination for Robert Dickey

We, the three most recent serving past-presidents of NAML, nominate Dr. Robert Dickey for the position of Emeritus Member in NAML. We make this nomination to recognize Bob's contributions to this organization during his tenure as both Chair of the Public Policy Committee and as NAML President 2020-2021. During that period, Bob navigated NAML successfully through the ongoing pandemic and guided the growth and stability of our association. It is worth noting that Bob also had to manage the rebuilding of the University of Texas Marine Science Institute (UTMSI), following the extensive damage it received from Hurricane Harvey, as part of his day job role as UTMSI Director, while serving in this leadership role for NAML. Bob has retired from the University of Texas effective January 15, 2022.

Nominated by:

- Bob Cowen, Chair of Nominating Committee & NAML President 2018-2019
  - Nancy Rabalais, NAML President 2014-2015
  - Mike De Luca, NAML President 2016-2017
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## **NAML Board of Directors**

Dave Carlon, President 2022-2023

Terry Donaldson, Vice-President/President-Elect 2022-2023

### *Ex Officio*

To be appointed, Treasurer, Ex Officio (non-voting)

To be appointed, Secretary, Ex Officio (non-voting)

### *Members-at-Large*

*Northeastern Association of Marine and Great Lakes Laboratories (NEAMGLL)*

Mike DeLuca, NEAMGLL President 2021-2022

Bob Sterner, NEAMGLL President-Elect 2021-2022

Josie Quintrell, NEAMGLL 2021-2022

Steve Evert, NEAMGLL Secretary 2022

*Southern Association of Marine Laboratories (SAML)*

Sue Ebanks, SAML President 2022-2023

Read Hendon, SAML President-Elect 2022-2023

Dave Eggleston, SAML Past President 2022-2023

Eric Milbrandt, SAML Treasurer 2022-2023

*Western Association of Marine Laboratories (WAML)*

John Heidelberg, WAML President-Elect (2022-2023)

Karina Nielsen, WAML Past President, 2022-2023

Bob Richmond, WAML Treasurer 2021-2022

Jeff Bowman, WAML Member-at-Large (2022-2024)

### **NAML Executive Director**

Lou Burnett

**Biographical Information for Speakers and Panelists**  
**NAML Public Policy Meeting**  
**March 2022**

**Joel Parriott** is Assistant Director for Federal R&D at the White House Office of Science and Technology Policy (OSTP). Prior to joining OSTP in December 2021 he served as the Deputy Executive Officer and Director of Public Policy at the American Astronomical Society (AAS). Joel brought to the AAS a decade of experience at the White House Office of Management and Budget (OMB), where he was responsible for overseeing the budgets and management initiatives for the National Science Foundation (NSF) and the Department of Energy's Office of Science (DOE/SC) and on behalf of the President. He also represented OMB on numerous National Science and Technology Council working groups and subcommittees under the Council's Committee on Science. Prior to his service at OMB, Joel was a senior program officer at the National Academies of Science, Engineering, and Medicine, where he staffed numerous high-level advisory committee studies on policy issues in physics and astronomy for NSF, DOE/SC, and NASA. Joel earned his doctorate in astronomy and astrophysics at the University of Michigan. He also holds a Certified Association Executive (CAE) designation from the American Society of Association Executives.

**Peter McCartney** has been a program director in the NSF Division of Biological Sciences since 2006, managing the Advances in Biological Informatics and Field Stations and Marine Labs programs. He has also participated in the management of numerous cross-cutting programs related to Cyberinfrastructure including Software Infrastructure for Sustained Innovation (SI2), Data Infrastructure Building Blocks (DIBBS), Cyber-enabled Discovery and Innovation (CDI) and DataNet. Prior to NSF he was Director of Informatics at the Global Institute for Sustainability at Arizona State University where he directed data management and software development projects in ecology, biodiversity, sustainability, and archaeology.

**Steven Thur** is Director of the National Centers for Coastal Ocean Science (NCCOS) at the National Oceanic and Atmospheric Administration (NOAA). In that capacity he oversees the work of approximately 260 staff in nine states and the operations of five marine laboratories with an annual budget of \$70 to \$80 million. NCCOS's mission is to deliver ecosystem science solutions for stewardship of the nation's ocean and coastal resources to sustain thriving coastal communities and economies. NCCOS's four priority research areas include marine spatial ecology, environmental stressors and their impacts, change along our coasts, and social science.

**Shelby Walker** is currently the senior advisor for facilities planning within the Directorate for Geosciences at the National Science Foundation (NSF). Prior to coming to NSF, Dr. Walker was the Director of Oregon Sea Grant, based at Oregon State University. Her previous federal service included serving as the strategic planning team lead for the Office of Policy, Planning and Evaluation within the Office of Oceanic and Atmospheric Research, NOAA, and as an associate program director for the Ocean Observatories Initiative within NSF. Dr. Walker earned her Ph. D. in Marine Science from the School of Marine Science at the College of William and

Mary, and held a post-doctoral fellowship with the Naval Research Laboratory in Washington, D.C. She is also a former Sea Grant John A. Knauss Fellow.

**Pierre Beland** is the Canadian Chair & Commissioner of the International Joint Commission. Dr. Beland is a scientist in environmental biology and toxicology, best known as an expert on the conservation of beluga whales. He was a founder and research scientist with the St. Lawrence National Institute of Ecotoxicology, an NGO dedicated to research and education on toxic compounds in estuarine ecosystems. Dr. Béland has published three books, numerous scientific and popular articles, has hosted a TV series on the environment, and participated in several documentary films. He served for ten years as a Commissioner for BAPE, the Quebec environmental assessment Board. He has chaired public hearings for various agencies such as Parks Canada, Fisheries and Oceans Canada, Quebec Energy Efficiency Agency, Telus. Previously he headed the Fisheries Ecology Research Center with the Department of Fisheries and Oceans Canada, and was a paleoecologist with the National Museum of Nature. From Sept 1995 to Sept 1998, Dr. Béland was one of three Canadian Commissioners (and Acting Chair) with the International Joint Commission.

**Kelli Paige** is the chief executive officer of the Great Lakes Observing System (GLOS), appointed as executive director in 2015. She has held several positions with GLOS since first joining the organization in 2009 including working with stakeholders, managing product development, and providing strategic direction for the data management and observing projects funded by GLOS. Kelli came to GLOS from The Nature Conservancy where she served as a Program Coordinator with the Ohio Chapter. She has also worked for the Washtenaw County Drain Commissioner and the Friends of the Chicago River. Kelli holds a BA in Public Policy from DePaul University and a MS in Resource Ecology and Management from the University of Michigan's School of Natural Resources and Environment.

**Frank Greenland** is Director of Watershed Programs for the Northeast Ohio Regional Sewer District in Cleveland, Ohio. Mr. Greenland has worked for the District since 1988. Formerly a planning manager, deputy director of engineering and construction, and director of capital programs, he now serves as the Director of Watershed Programs. He has been involved in a variety of wet-weather projects, including the District's \$3 billion Combined Sewer Overflow (CSO) Control Program (Project Clean Lake) and the development and implementation of the District's Regional Stormwater Management Program. A registered Professional Engineer, he earned his degree in Environmental Engineering Technology from the University of Dayton and Masters in Civil Engineering from Cleveland State University.

**Stephen Galarneau** is the Director of the Office of Great Waters – *Great Lakes & Mississippi River*, for the Wisconsin Department of Natural Resources (WDNR). His responsibilities include implementing the Great Lakes Restoration Initiative, navigation dredging projects, and Great Lakes and Mississippi River policy in Wisconsin. Steve has been appointed an alternate commissioner for the Great Lakes Commission, serves as a Council Member for the Wisconsin Coastal Management Program and represents WDNR as a trustee for the Fund for Lake Michigan. Steve is a member of the Great Lakes Dredging Team. Steve is Wisconsin's designee



on the Great Lakes Executive Committee, and has been appointed by the Governor to be the State's representative on the Upper Mississippi River Basin Association and is a board member of the UMRBA. Steve serves on the International Joint Commission Water Quality Board. Steve was appointed as Co-Chair of the Great Lakes Advisory Board. Steve graduated from the University of Wisconsin - Milwaukee in 1985 with a master's degree in biological sciences. His master's thesis focused on primary production in Lake Michigan. Steve has worked with WDNR for 29 years and has spent over 34 years working on water quality, sediment quality, rivers, and Great Lakes issues.

**Elizabeth Hinchey Malloy** is a Supervisory Physical Scientist in the *Science, Monitoring, Evaluation and Reporting* section in EPA's Great Lakes National Program Office in Chicago, IL. She and her team of Great Lakes scientists and program managers coordinate EPA's Great Lakes long-term monitoring programs, many of which use the largest science ship in the Great Lakes, the EPA R/V *Lake Guardian*. This team also helps EPA implement the Great Lakes Restoration Initiative and the U.S. – Canada Great Lakes Water Quality Agreement. Prior to working for EPA, she was a Great Lakes Extension Specialist with Illinois-Indiana Sea Grant and a post-doctoral research ecologist at the EPA Office of Research and Development Atlantic Coastal Environmental Sciences Division Laboratory. She is a benthic ecologist and has a Ph.D. and M.S. in Marine Science from the College of William & Mary, Virginia Institute of Marine Science and a B.S. in Biology from the University of Notre Dame.

**Catalina Martinez** is the Regional Program Manager for NOAA Ocean Exploration (OE) in Rhode Island. Ms. Martinez began her ocean science career with NOAA in 2002 helping to formalize and manage important regional NOAA partnerships and spent many years working on telepresence-enabled expeditions to explore little known and unknown ocean areas. Ms. Martinez also works on a variety of local, regional, and national efforts to mitigate the barriers to entry, persistence, and success for underrepresented and minoritized scholars into STEM fields. She's been honored with several awards for this work over the years, including the 2019 Women of Color in STEM Diversity Leadership in Government Award for demonstrating sustained leadership in creating a more diverse, equitable, and inclusive Federal workforce. Ms. Martinez recently completed a year-long assignment with NOAA's Office of Inclusion and Civil Rights, assisting with the expansion of their diversity, equity, and inclusion portfolio.

**Onjalé Scott Price** is Chief Operating Officer at Mizar Imaging, and Co-Chair of the Woods Hole Diversity Advisory Committee, Woods Hole, MA. She was elected in May 2021 to a seat on the Falmouth Select Board. As Co-Chair of the Woods Hole Diversity Advisory Committee she and her colleagues make recommendations as to how the 6 scientific institutions in Woods Hole can make the village a more diverse and more inclusive community. She has over 10 years of experience in supporting and leading efforts to make STEM more diverse, equitable and inclusive, and is the current Co-Director for the Woods Hole Partnership Education Program (PEP). PEP is a ten-week program designed primarily for college juniors and seniors from underrepresented groups in marine and ocean sciences who want to spend a summer gaining practical experience in marine and environmental science. Mrs. Scott Price has a BS in Civil

Engineering from Embry-Riddle Aeronautical University and an MBA from Western Governor's University.

**Vicki Ferrini** is a Senior Research Scientist at Columbia University's Lamont-Doherty Earth Observatory (LDEO) and Associate Director for Diversity, Equity, and Inclusion. Her research focuses on using mapping techniques to understand the processes that shape the seafloor in a variety of environments. She has participated in research expeditions around the world mapping shallow water and deep-sea environments using ships, boats, submersibles and towed platforms. Most of her work is in the field of geoinformatics and is focused on ensuring that high-quality marine geoscience research data are made available to the science community and to the public. She is the Head of the Seabed 2030 Regional Center for the Atlantic and Indian Oceans.

**Josie Quintrell** is the Executive Director of the IOOS Association. The IOOS Association is a non-profit organization that supports the US Integrated Ocean Observing System (US IOOS) to provide to quality and timely information about our oceans, coasts and Great Lakes. The Association works with the 11 IOOS Regional Associations and the Federal partners to create a national network that meets the diverse needs of user across the nation. IOOS Association is a national nonprofit organization established to advance U.S. IOOS and the national coastal observation information needs. Working with the 11 Regional Associations, U.S. IOOS Program Office, NOAA federal agencies, and other partners, the Association fosters communication across the program, strengthens intra-regional relationships, and promotes integration and coordination.

**Rebecca Roth** has been the executive director of the National Estuarine Research Reserve Association since 2010. She advances the mission of the 30-site reserve system by advocating for the shared interests of all reserves. She works with Congress and NOAA to support annual budget appropriations and legislative priorities that enhance the value of all reserves for their many partners and stakeholders. She also works closely with NOAA and other federal agencies to help shape regulations and policies to sustain healthy estuaries nationwide. A land use planner by training, Rebecca is a veteran coastal management and public administration professional with more than 30 years of experience. For 18 years, she worked for the California Coastal Commission, where she last served as Federal Programs Manager. She has been involved with the reserves since 1998 through her Coastal Commission work, which facilitated integrated coastal and ocean management among California's reserves, coastal programs, and marine sanctuaries. Rebecca grew up and lived near the Pacific Ocean in California for most of her life; she now resides in New England.

**Derek Brockbank** is Executive Director of Coastal States Organization (CSO), which represents the nation's Coastal States, Territories, and Commonwealths on ocean, coastal, and Great Lakes issues. With two decades of experience in Washington DC on coastal adaptation policy and organizational development, Derek is connecting state coastal management programs with federal agencies and resources to address the greatest coastal challenges facing society. He previously served as executive director for the American Shore & Beach Preservation

Association (ASBPA), as campaign director for a coalition effort to restore the Mississippi River Delta, and working on climate adaptation policy at National Wildlife Federation. He went to University of Chicago, and grew up in New York City, getting his coastal education on the beaches of Long Island, and kayaking and fishing in Peconic Bay.

**Susan White** is the President of the Sea Grant Association, a non-profit organization dedicated to furthering the Sea Grant program concept. The SGA's members are the academic institutions that participate in the National Sea Grant College Program. SGA provides the mechanism for these institutions to coordinate their activities, set program priorities at both the regional and national level, and provide a unified voice for these institutions on issues of importance to the oceans, Great Lakes and coasts. Susan is the Executive Director for North Carolina Sea Grant, the Water Resources Research Institute for the University of North Carolina, and North Carolina Space Grant. All three programs provide targeted research, outreach and education projects to address critical issues in the state and within the region. Sea Grant, with funding from the National Oceanic and Atmospheric Administration, and WRRRI, with funding from the U.S. Geological Survey, focus on coastal, ocean and water resource topics for ecosystems and communities. Space Grant projects, with funding from the National Aeronautics and Space Administration, include partnerships with the aerospace industry. In fall 2017, White was named chair of the N.C. Sediment Control Commission by Gov. Roy Cooper. She previously was director of NOAA's Hollings Marine Laboratory in Charleston, S.C. Formerly the national research coordinator for NOAA's Estuarine Reserves Division and National Estuarine Research Reserve System, she has served on national and regional steering committees on topics including technology transfer, integrated drought monitoring and early warning, and climate's connections to health. White earned a doctorate from the University of Georgia and a bachelor's degree from Duke University.

**Honorable John Culberson** represented Houston's District 7 in the United States Congress from 2001-2019. He served on the House Appropriations Committee for 16 years chairing two subcommittees: Commerce, Justice and Science, (CJS); and Military Construction and Veterans Affairs. One of Mr. Culberson's top priorities on the Appropriations Committee was to restore NASA funding to Apollo-era levels. In his four years as CJS chairman, he increased overall NASA funding by 20%, increased Science funding by 27%, and increased Planetary Science funding by 100%. He is a strong supporter of NASA's partnership with commercial space providers to help American astronauts return to low-Earth orbit and the moon and beyond. In late 2019, NASA Administrator Jim Bridenstine awarded Mr. Culberson with NASA's Distinguished Public Service Medal. In early 2020, Mr. Culberson was appointed by The White House and Administrator Bridenstine to serve on the National Space Council's Users' Advisory Group to advise the President and Vice President on the future of America's space program. In 2019, John was appointed to the Board of Trustees of Dr. Robert Ballard's Ocean Exploration Trust, and to the Board of Trustees of the American Battlefield Trust. Mr. Culberson has a B.A. from Southern Methodist University and a J.D. from South Texas College of Law.

**Suggested Questions and Issues to Raise with Speakers and Panelists**  
**Organized by Session**  
**NAML Public Policy Meeting**  
**March 2022**

**Session: Federal R&D Budget Outlook – Infrastructure for Research and Education**

Question: About a year ago, when the American Jobs Plan was released, it said, “...our nation is falling behind its biggest competitors on research and development...” The plan proposed a \$180 billion investment in critical technologies and upgrades in America’s research infrastructure. There was to be a \$50 billion investment in NSF to create a new technology directorate and a \$40 billion investment in upgrading research infrastructure in laboratories across the country, including brick and mortar facilities and computing capabilities and networks.

Can you tell us how and why the proposed R&D appropriations package in the American Jobs Plan was pulled out of the Infrastructure Investment and Jobs Act?

It is our understanding that the White House decided to pursue its R&D investment via the Senate’s US Competitiveness and Innovation Act or the House’s America COMPETES legislation. Those are important bills but from a research perspective they are merely authorizations of appropriations. History tells us that actual science appropriations historically come in much lower than authorizations for research. If so, what does that mean for the Administration’s position about R&D funding?

What is the likelihood the research and research infrastructure components in the dormant Build Back Better Act will be resurrected?

And if it is resurrected, to what extent will the Administration advocate for research infrastructure that will create jobs and advance science in important areas related to climate and ocean and coastal resilience?

Question: In the [statement issued by OSTP](#) on March 11, 2022 regarding the omnibus appropriations for FY 2022, OSTP applauded the resources provided to NSF to establish the new technology directorate. The Administration had sought an increase of \$1.2 billion or 18% for which it proposed to spend over \$850 million to start the new technology directorate. Since NSF received much less than requested – instead of \$1.2 billion it got a \$250 million increase – what will be the impact on NSF’s core research programs with the startup of the new tech directorate?

Question: The administration proposed big increases in FY 2022 for NSF, NOAA, NASA Science programs and DOE basic and applied science programs – in part to increase the nation’s international competitiveness and in part to address the challenges of climate change. Only a

small part of that R&D agenda was actually enacted in the omnibus appropriations act for FY 2022. What can we expect the Administration to propose in FY 2023 and when can we expect to see the details of the Administration's R&D budget for FY 2023?

### **Session: Infrastructure Challenges and Opportunities for Marine and Great Lakes Laboratories**

Question: As you may know, last fall NAML issued a position paper outlining the importance of modernizing the aging infrastructure of marine and Great Lakes labs to increase capacity to support research and education – with a particular focus on attracting underrepresented groups into the ocean and coastal sciences. The importance of marine labs was called out in the America COMPETES legislation. Can you describe existing and planned opportunities that serve as a source of support that can help NAML labs meet their infrastructure needs?

The National Academies' report [Sea Change](#) was requested by NSF to help set priorities in the ocean sciences. The report included a [section](#) in which the community evaluated the cost and relevance of a full range of ocean and coastal facilities, vessels, laboratories, and observing systems. Marine labs came out in that evaluation as both highly relevant for addressing the key science questions in Sea Change and modest in cost when compared to other forms of marine and freshwater infrastructure. How has that finding been addressed in your programs?

Question for NSF Panelists: In [the statement issued by OSTP](#) on March 11, 2022 regarding the omnibus appropriations for FY 2022, OSTP applauded the resources provided to NSF to establish the new technology directorate. The Administration had sought an increase of \$1.2 billion or 18% for which it proposed to spend over \$850 million to start the new technology directorate. Since NSF received much less than requested – instead of \$1.2 billion it got a \$250 million increase – what will be the impact on NSF's core research programs with the startup of the new tech directorate?

Question for NOAA Panelist: Can you review the funding provided to NOAA via the Infrastructure Act and how might marine and freshwater labs participate in that funding?

### **Session: The Role of Science in Supporting Great Lakes Restoration**

Questions: As you may know, NAML has recently issued a position paper outlining the importance of investing in a research effort to better understand the environmentally induced changes now ongoing in the Great Lakes. The Infrastructure Act provides \$1 billion for Great Lakes restoration – this is on top of the \$300 million plus provided annually via the conventional annual appropriations process.

How could a research initiative involving the academic labs along the Great Lakes ensure a more effective investment in the \$1 billion GLRI program?

What are the most pressing issues with respect to the Great Lakes that a focused research effort could help address?

In what ways could NAML labs assist you and your respective entities in meeting your mission and restoration requirements?

What are some of the major ecosystem-related challenges that could be better met via a sustained research initiative?

What role, if any, can marine and freshwater labs play with respect to funding for GLRI? Are there opportunities for our labs to partner with EPA and other players in GLRI?

**Session: Successful Strategies to Improve Diversity in Marine and Freshwater Research and Education**

Question: NAML and its members are committed to attracting and retaining currently underrepresented groups into the ocean and coastal research enterprise. As you know we have established a DEI committee and have recently revised the NAML mission statement to emphasize this issue. Can you each provide us with some advice on how best to go about addressing this issue? Can you give us some sense of the “do’s and don’ts” we should be aware of?

Question: Can you highlight for us some of the most successful strategies you have come across to increase underrepresented groups in ocean and coastal research and education?

Question: Can you discuss some of the factors lab directors might not be aware of that implicitly discourage underrepresented groups from engaging in ocean and coastal research? What can lab directors do to be more aware of these factors?

**Session: Public Policy Collaboration with Like-Minded Organizations**

Question: What can NAML do to support your organization’s public policy agenda?

Question for IOOS, NEERA, and CSO Panelists: How do you expect to participate in NOAA’s expenditure of the funding it got in the infrastructure bill?

Question: What are the most pressing challenges facing your organization and/or members and how does that translate into your legislative agenda?

BRIEFING ROOM

# Statement from the White House Office of Science and Technology Policy on the Omnibus Appropriations Bill

MARCH 11, 2022 • PRESS RELEASES

“The passage of the bipartisan appropriations bill that is now headed to the President’s desk gives fresh momentum to the urgent science and technology priorities of the Biden-Harris Administration,” **said Dr. Alondra Nelson, who is performing the duties of Director of the White House Office of Science and Technology Policy (OSTP).** “From the creation of Advanced Research Projects Agency-Health (ARPA-H), a new agency to kindle bold research and innovation on cancer and other deadly diseases, to new funding for science at National Oceanic and Atmospheric Administration (NOAA) that advances actionable information on climate change, this spending bill charts a hopeful course to the future.”

“As our nation emerges from a pandemic that illustrated the life-saving importance of investment in biomedical and public health innovation, we are grateful to see a strong commitment to build on that success,” **said OSTP Deputy Director for Health and Life Sciences Dr. Carrie Wolinetz.** “Not only does the omnibus include \$1 billion in funding and related authorities to stand up President Biden’s proposed ARPA-H, but it provides significant investments in public health infrastructure and workforce, readying us to meet the social and scientific challenges of emerging variants and future biological threats. In addition, as we move forward with our Community Connected Health initiative, which marries telemedicine technology with community-based health delivery, we are delighted to see the critical extension of telehealth flexibilities included in the bill.”

“We are grateful to Congress for providing increases for the National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), the Department of Energy, the U.S. Geological Survey, the US Department of

Agriculture, and other science and technology agencies,” **said OSTP Principal Deputy Director for Policy Kei Koizumi.** “It is especially heartening to see NSF receive resources to establish a new directorate to support research for breakthrough technologies, for solutions to our challenges, for strengthening our global economic competitiveness, and to support a diverse and equitable STEM ecosystem across all of America.”

“With increases to the budgets of NOAA, NASA, and NSF, this omnibus will strengthen our efforts to confront the climate crisis with strong funding for climate research and mitigation,” **said OSTP Deputy Director for Climate and Environment Dr. Jane Lubchenco.** “The science that this bill will support will strengthen our resilience and better enable us to preserve the natural world so heavily impacted by the climate crisis.”

“Increases in funding for the Department of Energy’s game-changing research in clean energy technologies will increase the technology options for meeting our climate goals and increase our energy security” **said OSTP Deputy Director for Energy Dr. Sally Benson.** “The bill also marks a turning point, accelerating the development of fusion power by providing funding for the Milestone-Based Development Program that supports public-private partnerships to develop practical approaches for making electricity from fusion, the same process that powers the Sun.”

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BRIEFING ROOM

# FACT SHEET: The American Jobs Plan

MARCH 31, 2021 • STATEMENTS AND RELEASES

While the American Rescue Plan is changing the course of the pandemic and delivering relief for working families, this is no time to build back to the way things were. This is the moment to reimagine and rebuild a new economy. The American Jobs Plan is an investment in America that will create millions of good jobs, rebuild our country's infrastructure, and position the United States to out-compete China. Public domestic investment as a share of the economy has fallen by more than 40 percent since the 1960s. The American Jobs Plan will invest in America in a way we have not invested since we built the interstate highways and won the Space Race.

The United States of America is the wealthiest country in the world, yet we rank 13<sup>th</sup> when it comes to the overall quality of our infrastructure. After decades of disinvestment, our roads, bridges, and water systems are crumbling. Our electric grid is vulnerable to catastrophic outages. Too many lack access to affordable, high-speed Internet and to quality housing. The past year has led to job losses and threatened economic security, eroding more than 30 years of progress in women's labor force participation. It has unmasked the fragility of our caregiving infrastructure. And, our nation is falling behind its biggest competitors on research and development (R&D), manufacturing, and training. It has never been more important for us to invest in strengthening our infrastructure and competitiveness, and in creating the good-paying, union jobs of the future.

Like great projects of the past, the President's plan will unify and mobilize the country to meet the great challenges of our time: the climate crisis and the ambitions of an autocratic China. It will invest in Americans and deliver the jobs and opportunities they deserve. But unlike past major investments, the plan prioritizes addressing long-standing and persistent racial injustice. The plan targets 40 percent of the benefits of climate and clean

infrastructure investments to disadvantaged communities. And, the plan invests in rural communities and communities impacted by the market-based transition to clean energy. Specifically, President Biden's plan will:

**Fix highways, rebuild bridges, upgrade ports, airports and transit systems.** The President's plan will modernize 20,000 miles of highways, roads, and main-streets. It will fix the ten most economically significant bridges in the country in need of reconstruction. It also will repair the worst 10,000 smaller bridges, providing critical linkages to communities. And, it will replace thousands of buses and rail cars, repair hundreds of stations, renew airports, and expand transit and rail into new communities.

**Deliver clean drinking water, a renewed electric grid, and high-speed broadband to all Americans.** President Biden's plan will eliminate all lead pipes and service lines in our drinking water systems, improving the health of our country's children and communities of color. It will put hundreds of thousands of people to work laying thousands of miles of transmission lines and capping hundreds of thousands of orphan oil and gas wells and abandoned mines. And, it will bring affordable, reliable, high-speed broadband to every American, including the more than 35 percent of rural Americans who lack access to broadband at minimally acceptable speeds.

**Build, preserve, and retrofit more than two million homes and commercial buildings, modernize our nation's schools and child care facilities, and upgrade veterans' hospitals and federal buildings.** President Biden's plan will create good jobs building, rehabilitating, and retrofitting affordable, accessible, energy efficient, and resilient housing, commercial buildings, schools, and child care facilities all over the country, while also vastly improving our nation's federal facilities, especially those that serve veterans.

**Solidify the infrastructure of our care economy by creating jobs and raising wages and benefits for essential home care workers.** These workers – the majority of whom are women of color – have been underpaid and undervalued for too long. The President's plan makes substantial investments in the infrastructure of our care economy, starting by creating new and better jobs for caregiving workers. His plan will provide home and

community-based care for individuals who otherwise would need to wait as many as five years to get the services they badly need.

**Revitalize manufacturing, secure U.S. supply chains, invest in R&D, and train Americans for the jobs of the future.** President Biden's plan will ensure that the best, diverse minds in America are put to work creating the innovations of the future while creating hundreds of thousands of quality jobs today. Our workers will build and make things in every part of America, and they will be trained for well-paying, middle-class jobs.

**Create good-quality jobs that pay prevailing wages in safe and healthy workplaces while ensuring workers have a free and fair choice to organize, join a union, and bargain collectively with their employers.** By ensuring that American taxpayers' dollars benefit working families and their communities, and not multinational corporations or foreign governments, the plan will require that goods and materials are made in America and shipped on U.S.-flag, U.S.-crewed vessels. The plan also will ensure that Americans who have endured systemic discrimination and exclusion for generations finally have a fair shot at obtaining good paying jobs and being part of a union.

Alongside his American Jobs Plan, President Biden is releasing a Made in America Tax Plan to make sure corporations pay their fair share in taxes and encourage job creation at home. A recent study found that 91 Fortune 500 companies paid \$0 in federal taxes on U.S. income in 2018. Another study found that the average corporation paid just 8 percent in taxes. President Biden believes that profitable corporations should not be able to get away with paying little or no tax by shifting jobs and profits overseas. President Biden's plan will reward investment at home, stop profit shifting, and ensure other nations won't gain a competitive edge by becoming tax havens.

The President's American Jobs Plan is a historic public investment – consisting principally of one-time capital investments in our nation's productivity and long-term growth. It will invest about 1 percent of GDP per year over eight years to upgrade our nation's infrastructure, revitalize manufacturing, invest in basic research and science, shore up supply chains, and solidify our care infrastructure. These are investments that leading

economists agree will give Americans good jobs now and will pay off for future generations by leaving the country more competitive and our communities stronger. In total, the plan will invest about \$2 trillion this decade. If passed alongside President Biden's Made in America corporate tax plan, it will be fully paid for within the next 15 years and reduce deficits in the years after.

**BUILD WORLD-CLASS TRANSPORTATION INFRASTRUCTURE: FIX HIGHWAYS, REBUILD BRIDGES, AND UPGRADE PORTS, AIRPORTS AND TRANSIT SYSTEMS**

President Biden is calling on Congress to make a historic and overdue investment in our roads, bridges, rail, ports, airports, and transit systems. The President's plan will ensure that these investments produce good-quality jobs with strong labor standards, prevailing wages, and a free and fair choice to join a union and bargain collectively. These investments will advance racial equity by providing better jobs and better transportation options to underserved communities. These investments also will extend opportunities to small businesses to participate in the design, construction, and manufacturing of new infrastructure and component parts. President Biden's plan will deliver infrastructure Americans can trust, because it will be resilient to floods, fires, storms, and other threats, and not fragile in the face of these increasing risks. President Biden is calling on Congress to:

**Transform our crumbling transportation infrastructure:**

Decades of declining public investment has left our roads, bridges, rail, and transit systems in poor condition, with a trillion-dollar backlog of needed repairs. More than 35,000 people die in traffic crashes on U.S. roads each year, and millions more are seriously and often permanently injured. The United States has one of the highest traffic fatality rates in the industrialized world, double the rate in Canada and quadruple that in Europe. Across cities, suburbs, and rural areas, President Biden's plan will help parents get to work reliably and affordably, reduce the impacts of climate change for our kids, and make sure fewer families mourn the loss of a loved one to road crashes. His investments will use more sustainable and innovative materials, including cleaner steel and cement, and component parts Made in America

and shipped on U.S.-flag vessels with American crews under U.S. laws. And, his infrastructure investments will mitigate socio-economic disparities, advance racial equity, and promote affordable access to opportunity.

The President's plan invests an additional \$621 billion in transportation infrastructure and resilience. It will:

- **Repair American roads and bridges.** One in five miles, or 173,000 total miles, of our highways and major roads are in poor condition, as well as 45,000 bridges. Delays caused by traffic congestion alone cost over \$160 billion per year, and motorists are forced to pay over \$1,000 every year in wasted time and fuel. The President is proposing a total increase of \$115 billion to modernize the bridges, highways, roads, and main streets that are in most critical need of repair. This includes funding to improve air quality, limit greenhouse gas emissions, and reduce congestion. His plan will modernize 20,000 miles of highways, roads, and main streets, not only “fixing them first” but “fixing them right,” with safety, resilience, and all users in mind. It will fix the most economically significant large bridges in the country in need of reconstruction, and it will repair the worst 10,000 smaller bridges, including bridges that provide critical connections to rural and tribal communities. The plan includes \$20 billion to improve road safety for all users, including increases to existing safety programs and a new Safe Streets for All program to fund state and local “vision zero” plans and other improvements to reduce crashes and fatalities, especially for cyclists and pedestrians.
- **Modernize public transit.** Households that take public transportation to work have twice the commute time, and households of color are twice as likely to take public transportation. Our current transit infrastructure is inadequate – the Department of Transportation estimates a repair backlog of over \$105 billion, representing more than 24,000 buses, 5,000 rail cars, 200 stations, and thousands of miles of track, signals, and power systems in need of replacement. This translates to service delays and disruptions that leave riders stranded and discourage transit use. President Biden is calling on Congress to invest \$85 billion to modernize existing transit and help agencies expand their systems to meet rider demand. This investment will double federal funding for public transit, spend down the repair backlog, and bring bus, bus rapid transit, and rail

service to communities and neighborhoods across the country. It will ultimately reduce traffic congestion for everyone.

- **Invest in reliable passenger and freight rail service.** The nation's rail networks have the potential to offer safe, reliable, efficient, and climate-friendly alternatives for moving people and freight. However, unlike highways and transit, rail lacks a multi-year funding stream to address deferred maintenance, enhance existing corridors, and build new lines in high-potential locations. There are currently projects just waiting to be funded that will give millions more Americans reliable and fast inter-city train service. President Biden is calling on Congress to invest \$80 billion to address Amtrak's repair backlog; modernize the high traffic Northeast Corridor; improve existing corridors and connect new city pairs; and enhance grant and loan programs that support passenger and freight rail safety, efficiency, and electrification.
- **Create good jobs electrifying vehicles.** U.S. market share of plug-in electric vehicle (EV) sales is only one-third the size of the Chinese EV market. The President believes that must change. He is proposing a \$174 billion investment to win the EV market. His plan will enable automakers to spur domestic supply chains from raw materials to parts, retool factories to compete globally, and support American workers to make batteries and EVs. It will give consumers point of sale rebates and tax incentives to buy American-made EVs, while ensuring that these vehicles are affordable for all families and manufactured by workers with good jobs. It will establish grant and incentive programs for state and local governments and the private sector to build a national network of 500,000 EV chargers by 2030, while promoting strong labor, training, and installation standards. His plan also will replace 50,000 diesel transit vehicles and electrify at least 20 percent of our yellow school bus fleet through a new Clean Buses for Kids Program at the Environmental Protection Agency, with support from the Department of Energy. These investments will set us on a path to 100 percent clean buses, while ensuring that the American workforce is trained to operate and maintain this 21<sup>st</sup> century infrastructure. Finally, it will utilize the vast tools of federal procurement to electrify the federal fleet, including the United States Postal Service.

- **Improve ports, waterways, and airports.** The United States built modern aviation, but our airports lag far behind our competitors. According to some rankings, no U.S. airports rank in the top 25 of airports worldwide. Our ports and waterways need repair and reimagination too. President Biden is calling on Congress to invest \$25 billion in our airports, including funding for the Airport Improvement Program, upgrades to FAA assets that ensure safe and efficient air travel, and a new program to support terminal renovations and multimodal connections for affordable, convenient, car-free access to air travel. President Biden is calling on Congress to invest an additional \$17 billion in inland waterways, coastal ports, land ports of entry, and ferries, which are all essential to our nation’s freight. This includes a Healthy Ports program to mitigate the cumulative impacts of air pollution on neighborhoods near ports, often communities of color. These investments will position the United States as a global leader in clean freight and aviation.
- **Redress historic inequities and build the future of transportation infrastructure.** The President’s plan for transportation is not just ambitious in scale, it is designed with equity in mind and to set up America for the future. Too often, past transportation investments divided communities – like the Claiborne Expressway in New Orleans or I-81 in Syracuse – or it left out the people most in need of affordable transportation options. The President’s plan includes \$20 billion for a new program that will reconnect neighborhoods cut off by historic investments and ensure new projects increase opportunity, advance racial equity and environmental justice, and promote affordable access. The President’s plan will inspire basic research, like advanced pavements that recycle carbon dioxide, and “future proof” investments that will last decades to leave coming generations with a safe, equitable, and sustainable transportation system. And, the President’s plan will accelerate transformative investments, from pre-development through construction, turning “shovel worthy” ideas into “shovel ready” projects. This includes \$25 billion for a dedicated fund to support ambitious projects that have tangible benefits to the regional or national economy but are too large or complex for existing funding programs.
- **Invest resources wisely to deliver infrastructure projects that**

**produce real results.** America lags its peers – including Canada, the U.K., and Australia – in the on-time and on-budget delivery of infrastructure, and is falling behind countries like China on overall investment. Delivering this historic investment will require partnership across government, unions, and industry, to produce meaningful outcomes for the American people – reliable transportation, safe water, affordable housing, healthy schools, clean electricity, and broadband for all. When President Biden managed the implementation of the Recovery Act, he insisted on the strongest possible accountability and transparency measures to ensure public dollars were invested efficiently and effectively. When Congress enacts the American Jobs Plan, the President will bring the best practices from the Recovery Act and models from around the world to break down barriers and drive implementation of infrastructure investments across all levels of government to realize the President’s vision of safe, reliable, and resilient infrastructure. Critically, in order to achieve the best outcomes on cost and performance for the American people, the Administration will support the state, local, and tribal governments delivering these projects through world-class training, technical assistance, and procurement best practices. In addition, the President’s plan will use smart, coordinated infrastructure permitting to expedite federal decisions while prioritizing stakeholder engagement, community consultation, and maximizing equity, health, and environmental benefits.

### **Make our infrastructure more resilient:**

Millions of Americans feel the effects of climate change each year when their roads wash out, airport power goes down, or schools get flooded. Last year alone, the United States faced 22 extreme weather and climate-related disaster events with losses exceeding \$1 billion each – a cumulative price tag of nearly \$100 billion. Chronic underinvestment in resilience has harmed American transportation infrastructure, disrupting service, making travel conditions unsafe, causing severe damage, and increasing maintenance and operating costs.

In 2020, the United States endured 22 separate billion-dollar weather and climate disasters, costing \$95 billion in damages to homes, businesses, and



public infrastructure. In Louisiana, Hurricane Laura caused \$19 billion of damage, resulting in broken water systems and a severely damaged electrical grid that impeded a quick recovery. Building back better requires that the investments in this historic plan make our infrastructure more resilient in the face of increasingly severe floods, wildfires, hurricanes, and other risks. Every dollar spent on rebuilding our infrastructure during the Biden administration will be used to prevent, reduce, and withstand the impacts of the climate crisis. Additionally, the President is calling for \$50 billion in dedicated investments to improve infrastructure resilience and:

- **Safeguard critical infrastructure and services, and defend vulnerable communities.** People of color and low-income people are more likely to live in areas most vulnerable to flooding and other climate change-related weather events. They also are less likely to have the funds to prepare for and recover from extreme weather events. In the wake of Hurricane Harvey, Black and Hispanic residents were twice as likely as white residents to report experiencing an income shock with no recovery support. President Biden's plan increases resilience in the most essential services, including the electric grid; food systems; urban infrastructure; community health and hospitals; and our roads, rail, and other transportation assets. His plan also targets investments to support infrastructure in those communities most vulnerable physically and financially to climate-driven disasters and to build back above existing codes and standards. The President's plan will invest in vulnerable communities through a range of programs, including FEMA's Building Resilient Infrastructure and Communities program, HUD's Community Development Block Grant program, new initiatives at the Department of Transportation, a bipartisan tax credit to provide incentives to low- and middle-income families and to small businesses to invest in disaster resilience, and transition and relocation assistance to support community-led transitions for the most vulnerable tribal communities.
- **Maximize the resilience of land and water resources to protect communities and the environment.** President Biden's plan will protect and, where necessary, restore nature-based infrastructure – our lands, forests, wetlands, watersheds, and coastal and ocean resources. Families and businesses throughout the United States rely on this infrastructure for their lives and livelihoods. President Biden is calling on Congress to

invest in protection from extreme wildfires, coastal resilience to sea-level rise and hurricanes, support for agricultural resources management and climate-smart technologies, and the protection and restoration of major land and water resources like Florida's Everglades and the Great Lakes. Additionally, the President's plan provides funding for the western drought crisis by investing in water efficiency and recycling programs, Tribal Water Settlements, and dam safety. President Biden's plan will empower local leaders to shape these restoration and resilience project funds in line with the Outdoor Restoration Force Act.

### **REBUILD CLEAN DRINKING WATER INFRASTRUCTURE, A RENEWED ELECTRIC GRID, AND HIGH-SPEED BROADBAND TO ALL AMERICANS**

Too many American families drink polluted water, lack access to affordable, high-speed internet, or experience power outages too often – all while paying more for those services. President Biden's plan invests in the infrastructure necessary to finally deliver the water, broadband, and electricity service that Americans deserve. Specifically, his plan will:

#### **Ensure clean, safe drinking water is a right in all communities:**

Across the country, pipes and treatment plants are aging and polluted drinking water is endangering public health. An estimated six to ten million homes still receive drinking water through lead pipes and service lines. The President's investments in improving water infrastructure and replacing lead service lines will create good jobs, including union and prevailing wage jobs. President Biden's plan invests \$111 billion to:

- **Replace 100 percent of the nation's lead pipes and service lines.** According to the CDC, there is no safe level of lead exposure for children. Lead can slow development and cause learning, behavior, and hearing problems in children, as well as lasting kidney and brain damage. President Biden believes that no American family should still be receiving drinking water through lead pipes and service lines. To eliminate all lead pipes and service lines in the country, he is calling on Congress to invest \$45 billion in the Environmental Protection Agency's Drinking Water State Revolving Fund and in Water Infrastructure

Improvements for the Nation Act (WIIN) grants. In addition to reducing lead exposure in homes, this investment also will reduce lead exposure in 400,000 schools and childcare facilities.

- **Upgrade and modernize America’s drinking water, wastewater, and stormwater systems, tackle new contaminants, and support clean water infrastructure across rural America.** Aging water systems threaten public health in thousands of communities nationwide. President Biden will modernize these systems by scaling up existing, successful programs, including by providing \$56 billion in grants and low-cost flexible loans to states, Tribes, territories, and disadvantaged communities across the country. President Biden’s plan also provides \$10 billion in funding to monitor and remediate PFAS (per- and polyfluoroalkyl substances) in drinking water and to invest in rural small water systems and household well and wastewater systems, including drainage fields.

### **Revitalize America’s digital infrastructure:**

Generations ago, the federal government recognized that without affordable access to electricity, Americans couldn’t fully participate in modern society and the modern economy. With the 1936 Rural Electrification Act, the federal government made a historic investment in bringing electricity to nearly every home and farm in America, and millions of families and our economy reaped the benefits. Broadband internet is the new electricity. It is necessary for Americans to do their jobs, to participate equally in school learning, health care, and to stay connected. Yet, by one definition, more than 30 million Americans live in areas where there is no broadband infrastructure that provides minimally acceptable speeds. Americans in rural areas and on tribal lands particularly lack adequate access. And, in part because the United States has some of the highest broadband prices among OECD countries, millions of Americans can’t use broadband internet even if the infrastructure exists where they live. In urban areas as well, there is a stark digital divide: a much higher percentage of White families use home broadband internet than Black or Latino families. The last year made painfully clear the cost of these disparities, particularly for students who struggled to connect while learning remotely, compounding learning loss and social isolation for those students.

The President believes we can bring affordable, reliable, high-speed broadband to every American through a historic investment of \$100 billion. That investment will:

- **Build high-speed broadband infrastructure to reach 100 percent coverage.** The President’s plan prioritizes building “future proof” broadband infrastructure in unserved and underserved areas so that we finally reach 100 percent high-speed broadband coverage. It also prioritizes support for broadband networks owned, operated by, or affiliated with local governments, non-profits, and co-operatives – providers with less pressure to turn profits and with a commitment to serving entire communities. Moreover, it ensures funds are set aside for infrastructure on tribal lands and that tribal nations are consulted in program administration. Along the way, it will create good-paying jobs with labor protections and the right to organize and bargain collectively.
- **Promote transparency and competition.** President Biden’s plan will promote price transparency and competition among internet providers, including by lifting barriers that prevent municipally-owned or affiliated providers and rural electric co-ops from competing on an even playing field with private providers, and requiring internet providers to clearly disclose the prices they charge.
- **Reduce the cost of broadband internet service and promote more widespread adoption.** President Biden believes that building out broadband infrastructure isn’t enough. We also must ensure that every American who wants to can afford high-quality and reliable broadband internet. While the President recognizes that individual subsidies to cover internet costs may be needed in the short term, he believes continually providing subsidies to cover the cost of overpriced internet service is not the right long-term solution for consumers or taxpayers. Americans pay too much for the internet – much more than people in many other countries – and the President is committed to working with Congress to find a solution to reduce internet prices for all Americans, increase adoption in both rural and urban areas, hold providers accountable, and save taxpayer money.

## **Reenergize America's power infrastructure:**

As the recent Texas power outages demonstrated, our aging electric grid needs urgent modernization. A Department of Energy study found that power outages cost the U.S. economy up to \$70 billion annually. The President's plan will create a more resilient grid, lower energy bills for middle class Americans, improve air quality and public health outcomes, and create good jobs, with a choice to join a union, on the path to achieving 100 percent carbon-free electricity by 2035. President Biden is calling on Congress to invest \$100 billion to:

- **Build a more resilient electric transmission system.** Through investments in the grid, we can move cheaper, cleaner electricity to where it is needed most. This starts with the creation of a targeted investment tax credit that incentivizes the buildout of at least 20 gigawatts of high-voltage capacity power lines and mobilizes tens of billions in private capital off the sidelines – right away. In addition, President Biden's plan will establish a new Grid Deployment Authority at the Department of Energy that allows for better leverage of existing rights-of-way – along roads and railways – and supports creative financing tools to spur additional high priority, high-voltage transmission lines. These efforts will create good-paying jobs for union laborers, line workers, and electricians, in addition to creating demand for American-made building materials and parts.
- **Spur jobs modernizing power generation and delivering clean electricity.** President Biden is proposing a ten-year extension and phase down of an expanded direct-pay investment tax credit and production tax credit for clean energy generation and storage. These credits will be paired with strong labor standards to ensure the jobs created are good-quality jobs with a free and fair choice to join a union and bargain collectively. President Biden's plan will mobilize private investment to modernize our power sector. It also will support state, local, and tribal governments choosing to accelerate this modernization through complementary policies – like clean energy block grants that can be used to support clean energy, worker empowerment, and environmental justice. And, it will use the federal government's incredible purchasing power to drive clean energy deployment across the market by purchasing

24/7 clean power for federal buildings. To ensure that we fully take advantage of the opportunity that modernizing our power sector presents, President Biden will establish an Energy Efficiency and Clean Electricity Standard (EECES) aimed at cutting electricity bills and electricity pollution, increasing competition in the market, incentivizing more efficient use of existing infrastructure, and continuing to leverage the carbon pollution-free energy provided by existing sources like nuclear and hydropower. All of this will be done while ensuring those facilities meet robust and rigorous standards for worker, public, and environmental safety as well as environmental justice – and all while moving toward 100 percent carbon-pollution free power by 2035.

- **Put the energy industry to work plugging orphan oil and gas wells and cleaning up abandoned mines.** Hundreds of thousands of former orphan oil and gas wells and abandoned mines pose serious safety hazards, while also causing ongoing air, water, and other environmental damage. Many of these old wells and mines are located in rural communities that have suffered from years of disinvestment. President Biden’s plan includes an immediate up-front investment of \$16 billion that will put hundreds of thousands to work in union jobs plugging oil and gas wells and restoring and reclaiming abandoned coal, hardrock, and uranium mines. In addition to creating good jobs in hard-hit communities, this investment will reduce the methane and brine that leaks from these wells, just as we invest in reducing leaks from other sources like aging pipes and distribution systems.
- **Remediate and redevelop idle real property, and spur the buildout of critical physical, social, and civic infrastructure in distressed and disadvantaged communities.** In thousands of rural and urban communities around the country, hundreds of thousands of former industrial and energy sites are now idle – sources of blight and pollution. Through a \$5 billion investment in the remediation and redevelopment of these Brownfield and Superfund sites, as well as related economic and workforce development, President Biden’s plan will turn this idle real property into new hubs of economic growth and job creation. But it’s not enough to redevelop old infrastructure. President Biden’s plan also will bring these communities new critical physical, social, and civic infrastructure. This means investing in the Economic Development

Agency's Public Works program (while lifting the cap of \$3 million on projects) and in "Main Street" revitalization efforts through HUD and USDA. President Biden's plan also will spur targeted sustainable, economic development efforts through the Appalachian Regional Commission's POWER grant program, Department of Energy retooling grants for idled factories (through the Section 132 program), and dedicated funding to support community-driven environmental justice efforts – such as capacity and project grants to address legacy pollution and the cumulative impacts experienced by frontline and fenceline communities.

- **Build next generation industries in distressed communities.** President Biden believes that the market-based shift toward clean energy presents enormous opportunities for the development of new markets and new industries. For example, by pairing an investment in 15 decarbonized hydrogen demonstration projects in distressed communities with a new production tax credit, we can spur capital-project retrofits and installations that bolster and decarbonize our industry. The President's plan also will establish ten pioneer facilities that demonstrate carbon capture retrofits for large steel, cement, and chemical production facilities, all while ensuring that overburdened communities are protected from increases in cumulative pollution. In addition, in line with the bipartisan SCALE Act, his plan will support large-scale sequestration efforts that leverage the best science and prioritize community engagement. And to accelerate responsible carbon capture deployment and ensure permanent storage, President Biden's plan reforms and expands the bipartisan Section 45Q tax credit, making it direct pay and easier to use for hard-to-decarbonize industrial applications, direct air capture, and retrofits of existing power plants.
- **Mobilize the next generation of conservation and resilience workers.** This \$10 billion investment will put a new, diverse generation of Americans to work conserving our public lands and waters, bolstering community resilience, and advancing environmental justice through a new Civilian Climate Corps, all while placing good-paying union jobs within reach for more Americans.

## **BUILD, PRESERVE, AND RETROFIT MORE THAN TWO MILLION**

**HOMES AND COMMERCIAL BUILDINGS; MODERNIZE OUR NATION'S SCHOOLS, COMMUNITY COLLEGES, AND EARLY LEARNING FACILITIES; AND UPGRADE VETERANS' HOSPITALS AND FEDERAL BUILDINGS**

There is a severe shortage of affordable housing options in America, and the American Society of Civil Engineers gives our school infrastructure a “D+.” President Biden believes we must invest in building and upgrading modern, resilient, and energy-efficient homes and buildings, including our nation’s schools, early learning facilities, veterans’ hospitals and other federal buildings, and in the process, employ American workers in jobs with good wages and benefits. President Biden’s plan will:

**Build, preserve, and retrofit more than two million homes and commercial buildings to address the affordable housing crisis:**

There is a severe shortage of affordable housing options in America. Millions of families pay more than half their income on rent, and home energy costs are a significant concern for American renters as well. And, across the country, people are struggling to purchase their first home.

The President’s plan invests \$213 billion to produce, preserve, and retrofit more than two million affordable and sustainable places to live. It pairs this investment with an innovative new approach to eliminate state and local exclusionary zoning laws, which drive up the cost of construction and keep families from moving to neighborhoods with more opportunities for them and their kids. The President’s plan will help address the growing cost of rent and create jobs that pay prevailing wages, including through project labor agreements with a free and fair choice to join a union and bargain collectively.

President Biden is calling on Congress to:

- **Produce, preserve, and retrofit more than a million affordable, resilient, accessible, energy efficient, and electrified housing units.** Through targeted tax credits, formula funding, grants, and project-based rental assistance, President Biden’s plan will extend affordable



housing rental opportunities to underserved communities nationwide, including rural and tribal areas.

- **Build and rehabilitate more than 500,000 homes for low- and middle-income homebuyers.** President Biden is calling on Congress to take immediate steps to spur the construction and rehabilitation of homes for underserved communities. Specifically, he is calling on Congress to pass the innovative, bipartisan Neighborhood Homes Investment Act (NHIA). Offering \$20 billion worth of NHIA tax credits over the next five years will result in approximately 500,000 homes built or rehabilitated, creating a pathway for more families to buy a home and start building wealth.
- **Eliminate exclusionary zoning and harmful land use policies.** For decades, exclusionary zoning laws – like minimum lot sizes, mandatory parking requirements, and prohibitions on multifamily housing – have inflated housing and construction costs and locked families out of areas with more opportunities. President Biden is calling on Congress to enact an innovative, new competitive grant program that awards flexible and attractive funding to jurisdictions that take concrete steps to eliminate such needless barriers to producing affordable housing.
- **Address longstanding public housing capital needs.** Years of disinvestment have left our public housing in disrepair. President Biden is calling on Congress to invest \$40 billion to improve the infrastructure of the public housing system in America. This funding will address critical life-safety concerns, mitigate imminent hazards to residents, and undertake energy efficiency measures which will significantly reduce ongoing operating expenses. These improvements will disproportionately benefit women, people of color, and people with disabilities.
- **Put union building trade workers to work upgrading homes and businesses to save families money.** President Biden’s plan will upgrade homes through block grant programs, the Weatherization Assistance Program, and by extending and expanding home and commercial efficiency tax credits. President Biden’s plan also will establish a \$27 billion Clean Energy and Sustainability Accelerator to mobilize private investment into distributed energy resources; retrofits of residential,

commercial and municipal buildings; and clean transportation. These investments have a particular focus on disadvantaged communities that have not yet benefited from clean energy investments.

### **Modernize our nation's schools and early learning facilities:**

Too many students attend schools and child care centers that are run-down, unsafe, and pose health risks. These conditions are dangerous for our kids and exist disproportionately in schools with a high percentage of low-income students and students of color. And even before COVID-19, 43 percent of parents reported struggling to find an adequate child care facility for their children. President Biden is calling on Congress to:

- **Modernize our public schools.** President Biden believes we can't close the opportunity gap if low-income kids go to schools in buildings that undermine health and safety, while wealthier students get access to safe buildings with labs and technology that prepare them for the jobs of the future. The President's plan invests \$100 billion to upgrade and build new public schools, through \$50 billion in direct grants and an additional \$50 billion leveraged through bonds. These funds will first go toward making sure our schools are safe and healthy places of learning for our kids and work for teachers and other education professionals, for example by improving indoor air quality and ventilation. As we make our schools safer, we also will invest in cutting-edge, energy-efficient and electrified, resilient, and innovative school buildings with technology and labs that will help our educators prepare students to be productive workers and valued students. Under the President's plan, better operating school facilities will reduce their greenhouse gas emissions and also will become environments of community resilience with green space, clean air, and safe places to gather, especially during emergencies. Funds also will be provided to improve our school kitchens, so they can be used to better prepare nutritious meals for our students and go green by reducing or eliminating the use of paper plates and other disposable materials.
- **Investing in community college infrastructure.** Investing in community college facilities and technology helps protect the health and safety of students and faculty, address education deserts (particularly for

rural communities), grow local economies, improve energy efficiency and resilience, and narrow funding inequities in the short-term, as we rebuild our higher education finance system for the long-run. President Biden is calling on Congress to invest \$12 billion to address these needs. States will be responsible for using the dollars to address both existing physical and technological infrastructure needs at community colleges and identifying strategies to address access to community college in education deserts.

- **Upgrade child care facilities and build new supply in high need areas.** Lack of access to child care makes it harder for parents, especially mothers, to fully participate in the workforce. In areas with the greatest shortage of child care slots, women’s labor force participation is about three percentage points less than in areas with a high capacity of child care slots, hurting families and hindering U.S. growth and competitiveness. President Biden is calling on Congress to provide \$25 billion to help upgrade child care facilities and increase the supply of child care in areas that need it most. Funding would be provided through a Child Care Growth and Innovation Fund for states to build a supply of infant and toddler care in high-need areas. President Biden also is calling for an expanded tax credit to encourage businesses to build child care facilities at places of work. Employers will receive 50 percent of the first \$1 million of construction costs per facility so that employees can enjoy the peace of mind and convenience that comes with on-site child care. These investments will provide safe, accessible, energy efficient, high-quality learning environments for providers to teach and care for children. Public investments in schools and childcare improves children’s outcomes—the foundation for future productivity gains. In classrooms with poor ventilation, for example, student absences are 10 to 20 percent higher.

### **Upgrade VA hospitals and federal buildings:**

The federal government operates office buildings, courthouses, and other facilities in every state, where millions of workers serve the public from outdated, inefficient, and sometimes unsafe working conditions. While the median age of U.S. private sector hospitals is roughly 11 years, the Veterans Affairs’ hospital portfolio has a median age of 58. The President believes our

veterans deserve state-of-the-art hospitals and care. President Biden's plan provides \$18 billion for the modernization of Veterans Affairs hospitals and clinics. President Biden's plan also invests \$10 billion in the modernization, sustainability, and resilience of federal buildings, including through a bipartisan Federal Capital Revolving Fund to support investment in a major purchase, construction or renovation of Federal facilities. And, President Biden's plan utilizes the vast tools of federal procurement to purchase low carbon materials for construction and clean power for these newly constructed VA hospitals and federal buildings.

**SOLIDIFY THE INFRASTRUCTURE OF OUR CARE ECONOMY BY  
CREATING JOBS AND RAISING WAGES AND BENEFITS FOR  
ESSENTIAL HOME CARE WORKERS**

Even before COVID-19, our country was in the midst of a caregiving crisis. In addition to caring for children, families feel the financial burden of caring for aging relatives and family members with disabilities, and there is a financial strain for people with disabilities living independently to ensure that they are getting care in their homes. At the same time, hundreds of thousands of people who need better care are unable to access it, even though they qualify under Medicaid. In fact, it can take years for these individuals to get the services they badly need. Aging relatives and people with disabilities deserve better. They deserve high-quality services and support that meet their unique needs and personal choices.

Caregivers – who are disproportionately women of color – have been underpaid and undervalued for far too long. Wages for essential home care workers are approximately \$12 per hour, putting them among the lowest paid workers in our economy. In fact, one in six workers in this sector live in poverty. President Biden is calling on Congress to make substantial investments in the infrastructure of care in our country. Specifically, he is calling on Congress to put \$400 billion toward expanding access to quality, affordable home- or community-based care for aging relatives and people with disabilities. These investments will help hundreds of thousands of Americans finally obtain the long-term services and support they need, while creating new jobs and offering caregiving workers a long-overdue raise, stronger benefits, and an opportunity to organize or join a union and collectively bargain. Research shows that increasing the pay of direct care workers greatly enhances workers' financial security, improves

productivity, and increases the quality of care offered. Another [study](#) showed that increased pay for care workers prevented deaths, reduced the number of health violations, and lowered the cost of preventative care.

President Biden's plan will:

- **Expand access to long-term care services under Medicaid.** President Biden believes more people should have the opportunity to receive care at home, in a supportive community, or from a loved one. President Biden's plan will expand access to home and community-based services (HCBS) and extend the longstanding Money Follows the Person program that supports innovations in the delivery of long-term care.
- **Put in place an infrastructure to create good middle-class jobs with a free and fair choice to join a union.** The HCBS expansion under Medicaid can support well-paying caregiving jobs that include benefits and the ability to collectively bargain, building state infrastructure to improve the quality of services and to support workers. This will improve wages and quality of life for essential home health workers and yield significant economic benefits for low-income communities and communities of color.

### **INVEST IN R&D, REVITALIZE MANUFACTURING AND SMALL BUSINESSES, AND TRAIN AMERICANS FOR THE JOBS OF THE FUTURE**

Half the jobs in our high growth, high wage sectors are concentrated in just 41 counties, locking millions of Americans out of a shot at a middle-class job. President Biden believes that, even in the face of automation and globalization, America can and must retain well-paid union jobs and create more of them all across the country. U.S. manufacturing was the Arsenal of Democracy in World War II and must be part of the Arsenal of American Prosperity today, helping fuel an economic recovery for working families. From the invention of the semiconductor to the creation of the Internet, new engines of economic growth have emerged due to public investments that support research, commercialization, and strong supply chains. President Biden is calling on Congress to make smart investments in research and development, manufacturing and regional economic development, and in

workforce development to give our workers and companies the tools and training they need to compete on the global stage. Specifically, President Biden is calling on Congress to:

**Invest in R&D and the technologies of the future:**

Public investments in R&D lay the foundation for the future breakthroughs that over time yield new businesses, new jobs, and more exports. However, we need more investment if we want to maintain our economic edge in today's global economy. We are one of the few major economies whose public investments in research and development have declined as a percent of GDP in the past 25 years. Countries like China are investing aggressively in R&D, and China now ranks number two in the world in R&D expenditures. In addition, barriers to careers in high-innovation sectors remain significant. We must do more to improve access to the higher wage sectors of our economy. In order to win the 21<sup>st</sup> century economy, President Biden believes America must get back to investing in the researchers, laboratories, and universities across our nation. But this time, we must do so with a commitment to lifting up workers and regions who were left out of past investments. He is calling on Congress to make an \$180 billion investment that will:

- **Advance U.S. leadership in critical technologies and upgrade America's research infrastructure.** U.S. leadership in new technologies—from artificial intelligence to biotechnology to computing—is critical to both our future economic competitiveness and our national security. Based on bipartisan proposals, President Biden is calling on Congress to invest \$50 billion in the National Science Foundation (NSF), creating a technology directorate that will collaborate with and build on existing programs across the government. It will focus on fields like semiconductors and advanced computing, advanced communications technology, advanced energy technologies, and biotechnology. He also is calling on Congress to provide \$30 billion in additional funding for R&D that spurs innovation and job creation, including in rural areas. His plan also will invest \$40 billion in upgrading research infrastructure in laboratories across the country, including brick-and-mortar facilities and computing capabilities and networks. These funds would be allocated across the federal R&D agencies,

including at the Department of Energy. Half of those funds will be reserved for Historically Black College and Universities (HBCUs) and other Minority Serving Institutions, including the creation of a new national lab focused on climate that will be affiliated with an HBCU.

- **Establish the United States as a leader in climate science, innovation, and R&D.** The President is calling on Congress to invest \$35 billion in the full range of solutions needed to achieve technology breakthroughs that address the climate crisis and position America as the global leader in clean energy technology and clean energy jobs. This includes launching ARPA-C to develop new methods for reducing emissions and building climate resilience, as well as expanding across-the-board funding for climate research. In addition to a \$5 billion increase in funding for other climate-focused research, his plan will invest \$15 billion in demonstration projects for climate R&D priorities, including utility-scale energy storage, carbon capture and storage, hydrogen, advanced nuclear, rare earth element separations, floating offshore wind, biofuel/bioproducts, quantum computing, and electric vehicles, as well as strengthening U.S. technological leadership in these areas in global markets.
- **Eliminate racial and gender inequities in research and development and science, technology, engineering, and math.** Discrimination leads to less innovation: one study found that innovation in the United States will quadruple if women, people of color, and children from low-income families invented at the rate of groups who are not held back by discrimination and structural barriers. Persistent inequities in access to R&D dollars and to careers in innovation industries prevents the U.S. economy from reaching its full potential. President Biden is calling on Congress to make a \$10 billion R&D investment at HBCUs and other MSIs. He also is calling on Congress to invest \$15 billion in creating up to 200 centers of excellence that serve as research incubators at HBCUs and other MSIs to provide graduate fellowships and other opportunities for underserved populations, including through pre-college programs.

**Retool and revitalize American manufacturers and small businesses:**

The U.S. manufacturing sector accounts for 70 percent of business R&D expenditure, 30 percent of productivity growth, and 60 percent of exports.

Manufacturing is a critical node that helps convert research and innovation into sustained economic growth. Workers on the factory floor work hand-in-hand with engineers and scientists to sharpen and maintain our competitive edge. While manufacturing jobs have been a ladder to middle-class life, we have let our industrial heartland be hollowed out, with quality jobs moving abroad or to regions with lower wages and fewer protections for workers. President Biden is calling on Congress to invest \$300 billion in order to:

- **Strengthen manufacturing supply chains for critical goods.** President Biden believes we must produce, here at home, the technologies and goods that meet today's challenges and seize tomorrow's opportunities. President Biden is calling on Congress to invest \$50 billion to create a new office at the Department of Commerce dedicated to monitoring domestic industrial capacity and funding investments to support production of critical goods. The President also is calling on Congress to invest \$50 billion in semiconductor manufacturing and research, as called for in the bipartisan CHIPS Act.
- **Protect Americans from future pandemics.** This funding provides \$30 billion over 4 years to create U.S. jobs and prevent the severe job losses caused by pandemics through major new investments in medical countermeasures manufacturing; research and development; and related biopreparedness and biosecurity. This includes investments to shore up our nation's strategic national stockpile; accelerate the timeline to research, develop and field tests and therapeutics for emerging and future outbreaks; accelerate response time by developing prototype vaccines through Phase I and II trials, test technologies for the rapid scaling of vaccine production, and ensure sufficient production capacity in an emergency; enhance U.S. infrastructure for biopreparedness and investments in biosafety and biosecurity; train personnel for epidemic and pandemic response; and onshore active pharmaceutical ingredients. COVID-19 has claimed over 500,000 American lives and cost trillions of dollars, demonstrating the devastating and increasing risk of pandemics and other biological threats. Over the past two decades, outbreaks of SARS, Ebola, influenza, Zika and others have cost billions in lost productivity. The risk of catastrophic biological threats is increasing due to our interconnected world, heightened risk of spillover from animals to humans, ease of making and modifying pandemic agents, and an eroding



norm against the development and use of biological weapons. The American Rescue Plan serves as an initial investment of \$10 billion. With this new major investment in preventing future pandemics, the United States will build on the momentum from the American Rescue Plan, bolster scientific leadership, create jobs, markedly decrease the time from discovering a new threat to putting shots in arms, and prevent future biological catastrophes.

- **Jumpstart clean energy manufacturing through federal procurement.** The federal government spends more than a half-a-trillion dollars buying goods and services each year. As a result, it has the ability to be a first-mover in markets. This incredible purchasing power can be used to drive innovation and clean energy production, as well as to support high quality jobs. To meet the President's goals of achieving net-zero emissions by 2050, the United States will need more electric vehicles, charging ports, and electric heat pumps for residential heating and commercial buildings. The President is calling on Congress to enable the manufacture of those cars, ports, pumps, and clean materials, as well as critical technologies like advanced nuclear reactors and fuel, here at home through a \$46 billion investment in federal buying power, creating good-paying jobs and reinvigorating local economies, especially in rural areas.
- **Make it in ALL of America.** The President believes we must build social infrastructure to support innovation and productivity across the country. He is calling on Congress to invest \$20 billion in regional innovation hubs and a Community Revitalization Fund. At least ten regional innovation hubs will leverage private investment to fuel technology development, link urban and rural economies, and create new businesses in regions beyond the current handful of high-growth centers. The Community Revitalization Fund will support innovative, community-led redevelopment projects that can spark new economic activity, provide services and amenities, build community wealth, and close the current gaps in access to the innovation economy for communities of color and rural communities that have suffered from years of disinvestment. And, President Biden is calling on Congress to invest \$14 billion in NIST to bring together industry, academia, and government to advance technologies and capabilities critical to future competitiveness. He is

calling on Congress to quadruple support for the Manufacturing Extensions Partnership –increasing the involvement of minority-owned and rurally-located small- and-medium-sized enterprises in technological advancement.

- **Increase access to capital for domestic manufacturers.** America’s manufacturing industry needs to innovate, adapt, and scale to win the industries of the future. President Biden is calling on Congress to invest more than \$52 billion in domestic manufacturers. The President is calling on Congress to invest in existing capital access programs with a proven track record of success, with a focus on supporting rural manufacturing and clean energy. The President’s plan also includes specific supports for modernizing supply chains, including in the auto sector, like extending the 48C tax credit program. He also will call for the creation of a new financing program to support debt and equity investments for manufacturing to strengthen the resilience of America’s supply chains.
- **Create a national network of small business incubators and innovation hubs.** Almost all manufacturers (98 percent) are small- and medium-sized firms. Furthermore, small business ownership is a cornerstone of job creation and wealth building. However, even before the pandemic, many entrepreneurs struggled to compete in a system that is so often tilted in favor of large corporations and wealthy individuals. President Biden is calling on Congress to invest \$31 billion in programs that give small businesses access to credit, venture capital, and R&D dollars. The proposal includes funding for community-based small business incubators and innovation hubs to support the growth of entrepreneurship in communities of color and underserved communities.
- **Partner with rural and Tribal communities to create jobs and economic growth in rural America.** Today, despite the fact that rural and Tribal communities across the country are asset-rich, more than 8 in 10 persistent poverty counties fall outside of a metropolitan area. President Biden’s plan invests in rural and Tribal communities, including by providing 100 percent broadband coverage, rebuilding crumbling infrastructure like roads, bridges, and water systems, providing research

and development funding to land grant universities, and positioning the U.S. agricultural sector to lead the shift to net-zero emissions while providing new economic opportunities for farmers. President Biden also is proposing to transform the way the federal government partners with rural and Tribal communities to create jobs and spur inclusive economic growth. Rural communities often don't have the same budget as big cities to hire staff needed to navigate and access federal programs. On top of that, they have to navigate a myriad of programs all with different purposes and requirements. As part of his plan to ensure that all communities recover – regardless of geography – President Biden is proposing a \$5 billion for a new Rural Partnership Program to help rural regions, including Tribal Nations, build on their unique assets and realize their vision for inclusive community and economic development. This program will empower rural regions by supporting locally-led planning and capacity building efforts, and providing flexible funding to meet critical needs.

### **Invest in Workforce Development:**

As more Americans rejoin the workforce or seek out new opportunities in a changing economy, there is a greater need for skills development opportunities for workers of all kind. In order to ensure workers have ready access to the skills they will need to succeed, and to improve racial and gender equity, President Biden is calling on Congress to invest \$100 billion in proven workforce development programs targeted at underserved groups and getting our students on paths to careers before they graduate from high school. His plan will:

- **Pair job creation efforts with next generation training programs.** President Biden is calling on Congress to invest in evidence-based approaches to supporting workers. This includes wraparound services, income supports, counseling, and case management, paired with high-quality training and effective partnerships between educational institutions, unions, and employers. Specifically, he is calling for a \$40 billion investment in a new Dislocated Workers Program and sector-based training. This funding will ensure comprehensive services for workers, who have lost jobs through no fault of their own, to gain new skills and to get career services they need with in-demand jobs.

Sector-based training programs will be focused on growing, high demand sectors such as clean energy, manufacturing, and caregiving, helping workers of all kinds to find good-quality jobs in an ever-changing economy.

- **Target workforce development opportunities in underserved communities.** Structural racism and persistent economic inequities have undermined opportunity for millions of workers. All of the investments in workforce training will prioritize underserved communities and communities hit hard by a transforming economy. President Biden also will call upon Congress to ensure that new jobs created in clean energy, manufacturing, and infrastructure are open and accessible to women and people of color. President Biden is calling on Congress to also specifically target funding to workers facing some of the greatest challenges, with a \$12 billion investment. This includes \$5 billion over eight years in support of evidence-based community violence prevention programs. He is calling on Congress to invest in job training for formerly incarcerated individuals and justice-involved youth and in improving public safety. He also is calling on Congress to tackle long-term unemployment and underemployment through a new subsidized jobs program. And, he is calling on Congress to eliminate sub-minimum wage provisions in section 14(c) of the Fair Labor Standards Act and expand access to competitive, integrated employment opportunities and fair wages for workers with disabilities.
- **Build the capacity of the existing workforce development and worker protection systems.** The United States has underinvested in the workforce development system for decades. In fact, we currently spend just one-fifth of the average that other advanced economies spend on workforce and labor market programs. This lack of investment impacts all of us: better educated workers create spillover effects for other workers and lack of employment has negative social impacts on communities. President Biden is calling on Congress to invest a combined \$48 billion in American workforce development infrastructure and worker protection. This includes registered apprenticeships and pre-apprenticeships, creating one to two million new registered apprenticeships slots, and strengthening the pipeline for more women and people of color to access these opportunities through

successful pre-apprenticeship programs such as the Women in Apprenticeships in Non-Traditional Occupations. This will ensure these underserved groups have greater access to new infrastructure jobs. These investments include the creation of career pathway programs in middle and high schools, prioritizing increased access to computer science and high-quality career and technical programs that connect underrepresented students to STEM and in-demand sectors through partnerships with both institutions of higher education and employers. The President's plan also will support community college partnerships that build capacity to deliver job training programs based on in-demand skills. His plan will better tailor services to workers' job seeking and career development needs through investments in Expanded Career Services and the Title II adult literacy program. The President's plan includes funding to strengthen the capacity of our labor enforcement agencies to protect against discrimination, protect wages and benefits, enforce health and safety safeguards, strengthen health care and pensions plans, and promote union organizing and collective bargaining.

**CREATE GOOD-QUALITY JOBS THAT PAY PREVAILING WAGES IN SAFE AND HEALTHY WORKPLACES WHILE ENSURING WORKERS HAVE A FREE AND FAIR CHOICE TO ORGANIZE, JOIN A UNION, AND BARGAIN COLLECTIVELY WITH THEIR EMPLOYERS**

As America works to recover from the devastating challenges of a deadly pandemic, an economic crisis, and a reckoning on race that reveals deep disparities, we need to summon a new wave of worker power to create an economy that works for everyone. We owe it not only to those who have put in a lifetime of work, but to the next generation of workers who have only known an America of rising inequality and shrinking opportunity. This is especially important for workers of color and for women, who have endured discrimination and systematic exclusion from economic opportunities for generations. All of us deserve to enjoy America's promise in full – and our nation's leaders have a responsibility to overcome racial, gender, and other inequalities to make it happen. To that end, the President is calling on Congress to create new, good-quality union jobs for American workers by leveraging their grit and ingenuity to address the climate crisis and build a

sustainable infrastructure. Increased unionization can also impact our economic growth overall by improving productivity. President Biden's plan will:

- **Empower Workers.** President Biden is calling on Congress to update the social contract that provides workers with a fair shot to get ahead, overcome racial and other inequalities that have been barriers for too many Americans, expand the middle class, and strengthen communities. He is calling on Congress to ensure all workers have a free and fair choice to join a union by passing the Protecting the Right to Organize (PRO) Act, and guarantee union and bargaining rights for public service workers. His plan also ensures domestic workers receive the legal benefits and protections they deserve and tackles pay inequities based on gender.
- **Create good jobs.** The President's plan demands that employers benefitting from these investments follow strong labor standards and remain neutral when their employees seek to organize a union and bargain collectively. He is asking Congress to tie federal investments in clean energy and infrastructure to prevailing wages and require transportation investments to meet existing transit labor protections. He also is calling for investments tied to Project Labor, Community Workforce, local hire, and registered apprenticeships and other labor or labor-management training programs so that federal investments support good jobs and pathways to the middle class. Finally, he is asking Congress to include a commitment to increasing American jobs through Buy America and Ship American provisions.
- **Protect workers.** President Biden is calling on Congress to provide the federal government with the tools it needs to ensure employers are providing workers with good jobs – including jobs with fair and equal pay, safe and healthy workplaces, and workplaces free from racial, gender, and other forms of discrimination and harassment. In addition to a \$10 billion investment in enforcement as part of the plan's workforce proposals, the President is calling for increased penalties when employers violate workplace safety and health rules.

## **THE MADE IN AMERICA TAX PLAN**

Alongside the American Jobs Plan, the President is proposing to fix the corporate tax code so that it incentivizes job creation and investment here in the United States, stops unfair and wasteful profit shifting to tax havens, and ensures that large corporations are paying their fair share.

The 2017 tax law only made an unfair system worse. A recent independent study found that 91 Fortune 500 companies paid \$0 in federal corporate taxes on U.S. income in 2018. In fact, according to recent analysis by the Joint Committee on Taxation, the 2017 tax bill cut the average rate that corporations paid in half from 16 percent to less than 8 percent in 2018. A number of the provisions in the 2017 law also created new incentives to shift profits and jobs overseas. President Biden's reform will reverse this damage and fundamentally reform the way the tax code treats the largest corporations.

President Biden's reform will also make the United States a leader again in the world and help bring an end to the race-to-the-bottom on corporate tax rates that allows countries to gain a competitive advantage by becoming tax havens. This is a generational opportunity to fundamentally shift how countries around the world tax corporations so that big corporations can't escape or eliminate the taxes they owe by offshoring jobs and profits from the United States.

Together these corporate tax changes will raise over \$2 trillion over the next 15 years and more than pay for the mostly one-time investments in the American Jobs Plan and then reduce deficits on a permanent basis:

- **Set the Corporate Tax Rate at 28 percent.** The President's tax plan will ensure that corporations pay their fair share of taxes by increasing the corporate tax rate to 28 percent. His plan will return corporate tax revenue as a share of the economy to around its 21<sup>st</sup> century average from before the 2017 tax law and well below where it stood before the 1980s. This will help fund critical investments in infrastructure, clean energy, R&D, and more to maintain the competitiveness of the United States and grow the economy.
- **Discourage Offshoring by Strengthening the Global Minimum Tax for U.S. Multinational Corporations.** Right now, the tax code rewards U.S.

multinational corporations that shift profits and jobs overseas with a tax exemption for the first ten percent return on foreign assets, and the rest is taxed at half the domestic tax rate. Moreover, the 2017 tax law allows companies to use the taxes they pay in high-tax countries to shield profits in tax havens, encouraging offshoring of jobs. The President's tax reform proposal will increase the minimum tax on U.S. corporations to 21 percent and calculate it on a country-by-country basis so it hits profits in tax havens. It will also eliminate the rule that allows U.S. companies to pay zero taxes on the first 10 percent of return when they locate investments in foreign countries. By creating incentives for investment here in the United States, we can reward companies that help to grow the U.S. economy and create a more level playing field between domestic companies and multinationals.

- **End the Race to the Bottom Around the World.** The United States can lead the world to end the race to the bottom on corporate tax rates. A minimum tax on U.S. corporations alone is insufficient. That can still allow foreign corporations to strip profits out of the United States, and U.S. corporations can potentially escape U.S. tax by inverting and switching their headquarters to foreign countries. This practice must end. President Biden is also proposing to encourage other countries to adopt strong minimum taxes on corporations, just like the United States, so that foreign corporations aren't advantaged and foreign countries can't try to get a competitive edge by serving as tax havens. This plan also denies deductions to foreign corporations on payments that could allow them to strip profits out of the United States if they are based in a country that does not adopt a strong minimum tax. It further replaces an ineffective provision in the 2017 tax law that tried to stop foreign corporations from stripping profits out of the United States. The United States is now seeking a global agreement on a strong minimum tax through multilateral negotiations. This provision makes our commitment to a global minimum tax clear. The time has come to level the playing field and no longer allow countries to gain a competitive edge by slashing corporate tax rates.
- **Prevent U.S. Corporations from inverting or claiming tax havens as their residence.** Under current law, U.S. corporations can acquire or merge with a foreign company to avoid U.S. taxes by claiming to be a



foreign company, even though their place of management and operations are in the United States. President Biden is proposing to make it harder for U.S. corporations to invert. This will backstop the other reforms which should address the incentive to do so in the first place.

- **Deny Companies Expense Deductions for Offshoring Jobs and Credit Expenses for Onshoring.** President Biden’s reform proposal will also make sure that companies can no longer write off expenses that come from offshoring jobs. This is a matter of fairness. U.S. taxpayers shouldn’t subsidize companies shipping jobs abroad. Instead, President Biden is also proposing to provide a tax credit to support onshoring jobs.
- **Eliminate a Loophole for Intellectual Property that Encourages Offshoring Jobs and Invest in Effective R&D Incentives.** The President’s ambitious reform of the tax code also includes reforming the way it promotes research and development. This starts with a complete elimination of the tax incentives in the Trump tax law for “Foreign Derived Intangible Income” (FDII), which gave corporations a tax break for shifting assets abroad and is ineffective at encouraging corporations to invest in R&D. All of the revenue from repealing the FDII deduction will be used to expand more effective R&D investment incentives.
- **Enact A Minimum Tax on Large Corporations’ Book Income.** The President’s tax reform will also ensure that large, profitable corporations cannot exploit loopholes in the tax code to get by without paying U.S. corporate taxes. A 15 percent minimum tax on the income corporations use to report their profits to investors—known as “book income”—will backstop the tax plan’s other ambitious reforms and apply only to the very largest corporations.
- **Eliminate Tax Preferences for Fossil Fuels and Make Sure Polluting Industries Pay for Environmental Clean Up.** The current tax code includes billions of dollars in subsidies, loopholes, and special foreign tax credits for the fossil fuel industry. As part of the President’s commitment to put the country on a path to net-zero emissions by 2050, his tax reform proposal will eliminate all these special preferences. The President is also proposing to restore payments from polluters into the Superfund Trust Fund so that polluting industries help fairly cover the cost of cleanups.

- **Ramping Up Enforcement Against Corporations.** All of these measures will make it much harder for the largest corporations to avoid or evade taxes by eliminating parts of the tax code that are too easily abused. This will be paired with an investment in enforcement to make sure corporations pay their fair share. Typical workers' wages are reported to the IRS and their employer withholds, so they pay all the taxes they owe. By contrast, large corporations have at their disposal loopholes they exploit to avoid or evade tax liabilities, and an army of high-paid tax advisors and accountants who help them get away with this. At the same time, an under-funded IRS lacks the capacity to scrutinize these suspect tax maneuvers: A decade ago, essentially all large corporations were audited annually by the IRS; today, audit rates are less than 50 percent. This plan will reverse these trends, and make sure that the Internal Revenue Service has the resources it needs to effectively enforce the tax laws against corporations. This will be paired with a broader enforcement initiative to be announced in the coming weeks that will address tax evasion among corporations and high-income Americans.

These are key steps toward a fairer tax code that encourages investment in the United States, stops shifting of jobs and profits abroad, and makes sure that corporations pay their fair share. The President looks forward to working with Congress, and will be putting forward additional ideas in the coming weeks for reforming our tax code so that it rewards work and not wealth, and makes sure the highest income individuals pay their fair share.

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



M-21-32

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: SHALANDA D. YOUNG *Shalanda D. Young*  
ACTING DIRECTOR  
OFFICE OF MANAGEMENT AND BUDGET

DR. ERIC S. LANDER *Eric S. Lander*  
DIRECTOR  
OFFICE OF SCIENCE AND TECHNOLOGY POLICY

SUBJECT: Multi-Agency Research and Development Priorities for the FY 2023 Budget

This moment in American history, as we face unprecedented challenges but also unprecedented opportunities, is a moment for the Federal Government to take action to refresh and reinvigorate our Nation's science and technology enterprise with the aim of harnessing the full power of science and technology on behalf of the American people. Scientific discovery, technological breakthroughs, and innovation are the engines for expanding the frontiers of human knowledge and are vital for responding to the challenges and opportunities of the 21st century.

Federal funding for research and development (R&D) is essential to maximize the benefits of science and technology to tackle the climate crisis and advance health, prosperity, security, environmental quality, equity, and justice for all Americans. Simply supporting R&D is not sufficient; however, Federal agencies should ensure that the R&D results are made widely available to other scientists, to the public to facilitate understanding and decisions, and to innovators and entrepreneurs who can translate them into the businesses and products that will improve all of our lives. And, as we seek to make our supply chains more resilient, R&D investments should create more than just cutting-edge technology; they should also create products that are made in the United States by U.S. workers.

This memorandum outlines the Administration's multi-agency R&D priorities for formulating fiscal year (FY) 2023 Budget submissions to the Office of Management and Budget (OMB). The priorities covered in this memo require continued investments in R&D; science, technology, engineering, and mathematics (STEM) education and engagement; STEM workforce development; technology transfer and commercialization; and research infrastructure, with emphasis on Historically Black Colleges and Universities, other Minority Serving Institutions, and disadvantaged communities who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality. These priorities should be addressed within the FY 2023 Budget guidance levels provided by OMB.

Agency budget submissions should note when they address the priorities described below. Agencies engaged in complementary activities should consult with each other during the budget planning process to coordinate resources, maximize impact, and avoid unnecessary duplication, and they should include summaries of these discussions in their OMB budget submissions.

### **Multi-Agency R&D Priorities**

In the FY 2023 Budget, agencies should balance priorities to ensure that resources are allocated for agency-specific, mission-driven R&D, including fundamental research, while at the same time focusing resources, where appropriate, on the following multi-agency R&D activities that cannot be addressed solely by a single agency.

**Pandemic readiness and prevention.** COVID-19 has claimed more than 600,000 lives in America and cost trillions of dollars, demonstrating the devastating effects of pandemics. As the Nation emerges from this historic event, it is more important than ever not to become complacent in ensuring readiness to meet the challenge of the next emerging pandemic. Agencies should continue to build upon previous R&D investments in early warning systems, diagnostics, therapies, and vaccine development and manufacturing to prevent and respond to pandemic and other biological threats, both domestically and globally. Priority areas include: accelerating vaccine design, testing, production, distribution, and administration, with an emphasis on scalable platform modulators; rapidly developed, easy to use, and affordable diagnostic technologies; antiviral therapeutics, including protein inhibitors, neutralizing antibodies, and immune modulators; and data and technology investments to support early warning and real-time monitoring, including genomic sequencing, viral variant tracking, and environmental surveillance. Agencies should leverage these investments across the U.S. Government to strengthen the public health system, with special attention to rural areas, underserved communities, and veterans and military health systems. Agencies should build the data infrastructure, manufacturing and delivery capabilities, and workforce needed to support rapid and scalable public health response—both domestically and globally, and funding the fundamental science and critical technologies needed to fulfill the Administration’s goals in pandemic readiness.

**Tackling climate change.** The United States and the world face a profound climate crisis with a narrow moment to pursue action to avoid the most catastrophic impacts and to seize the opportunities that tackling climate change presents. This crisis is interconnected with the staggering levels of biodiversity loss occurring across the globe because climate change is exacerbating the impacts that other drivers are having on biodiversity. The President has directed a whole-of-Government approach to reduce climate pollution in every sector of the economy, increase resilience to the impacts of climate change, and protect public health, while creating good-paying jobs that provide a free and fair chance to join a union and collectively bargain. Agencies should identify and prioritize R&D investments that advance understanding of climate change and the development of mitigation and adaptation solutions. Priorities include:

**Climate science:** Advancing climate science to improve understanding of Earth’s changing climate and changes that pose the greatest risk to society. This includes: facilitating public access to climate-related information that will assist Federal, State, local, and Tribal governments in climate planning and resilience activities, coupled with capacity building and training to increase access to and support the use of data, information, and climate services; research to advance understanding of the societal and economic impacts of climate change (e.g., human and ecosystem health, wildlife and fisheries); improving observational networks to create carbon inventories and baselines; improving modeling capabilities for local-scale, regional climate and related extreme weather events; and disaster attribution science, including in potential tipping points in physical, natural, and human systems.

Innovation in clean-energy technologies and infrastructure: Spurring innovation, commercialization, and deployment of clean energy and climate technologies, including those to lower the cost and decrease emissions in the power, buildings, transportation, industrial, and agricultural sectors; supporting achievement of a 50-52 percent reduction from 2005 levels in economy-wide net greenhouse gas pollution in 2030 and carbon pollution free electricity by 2035. Investments should include R&D, demonstration, and deployment to support the scale-up and transition to operations of emerging clean energy and other emissions mitigation enabling technologies, such as utility-scale energy storage and other zero-carbon grid resilience technologies; carbon capture, utilization and storage; clean hydrogen; advanced nuclear power; rare earth element separations; floating offshore wind; and sustainable biofuels/bioproducts. Agencies should support interdisciplinary research, including research in the humanities and social sciences, to ensure that our climate innovation efforts are connected to and reflective of our broad societal goals and incorporate the views of affected communities and stakeholders, including the views of historically marginalized and overburdened communities. In addition, agency budget submissions should include provisions to prioritize the procurement of promising innovative climate technologies exiting the Federal R&D pipeline to increase their marketability.

Climate adaptation and resilience: Increasing adaptation and resilience, including through integration of physical, natural, and social sciences. In addition, agencies should inform resilience efforts by prioritizing efforts to connect science and decision making through meaningful engagement with climate information users, including through the application of user-friendly climate tools and services, as well as science-based risk communication and citizen and community science programs. A focus within these R&D efforts should be more proactive and accessible engagement mechanisms for disadvantaged communities that are historically underserved, marginalized, and adversely affected by persistent poverty and inequality, in order to co-create resilient solutions that are more just, inclusive, and equitable. These investments should advance economic and environmental justice, equity, and public health through reduced vulnerability to climate impacts.

Nature-based climate solutions for mitigation and adaptation: Pursuing nature-based climate solutions, including protecting and restoring terrestrial, coastal, and ocean ecosystems to provide carbon sequestration and storage and to enhance ecosystem and human community resilience.

Monitoring and measurement: Measuring and monitoring the greenhouse gas emission reduction benefits of climate investments are imperative to continue identifying and implementing effective climate solutions. Agencies should prioritize investments to measure and monitor greenhouse gas pollution reductions, including to assess the causal effectiveness of Federal programs.

**Catalyze research and innovation in critical and emerging technologies.** Agencies should collaborate to promote world-leading research and innovation boosting American industries and quality American jobs in critical and emerging technologies, including artificial intelligence (AI), quantum information science (QIS), advanced communications technologies, microelectronics, high-performance computing, biotechnology, robotics, and space technologies. Agencies should coordinate to leverage these technologies to ensure the sharing and use of the vast troves of Federal Government datasets to enable large-scale data analysis, and high-fidelity, high-resolution modeling and simulation to address critical challenges in public health, climate science, and disaster resilience. Agencies should actively pursue public-private partnerships, as allowable, that will expedite American leadership in these technologies to grow our inclusive 21st-

century digital economy. Within the area of AI, agencies should prioritize fundamental and translational AI research consistent with the Administration's priorities for robust, safe, secure, and privacy-preserving machine learning. Within the area of QIS, agencies should prioritize programs to deliberately address the hardest scientific and engineering problems facing the field.

**Innovation for equity.** The President has implemented a whole-of-Government equity agenda. Federal agencies should prioritize R&D investments in programs with strong potential to advance equity for all, including people of color and others who have been historically disadvantaged, marginalized, and adversely affected by persistent poverty and inequality. As part of this focus, agencies should consider programs and initiatives, including community-level capacity building and training that expand equitable inclusion in Federal science and technology programs and the use of scientific and technological innovation to advance equitable outcomes. For example, open science and other participatory modes of research, such as community-based datahubs that give citizens access to information and data, as well as community-engaged research that respectfully provides opportunities for the participation in science and technology of those historically excluded from the scientific enterprise. Public participation in science is critical for the health of the nation and leads to more innovative research of all kinds, including research that addresses the needs of diverse communities. One particularly important area of investment innovation is research for health equity. America remains plagued by wide health disparities, due in no small part to social determinants of health, and underscored by racial inequities, such as access to care and disparate medical treatment. Investments in science and technology, including implementing high-quality virtual healthcare through telehealth solutions, provide opportunities to move us toward health equity. But barriers to widespread use and adoption of such technologies remain. Relevant agencies should develop data infrastructure that facilitates identification of inequities across sectors at scale, especially in underserved rural and urban communities, including through data linkage across Federal agencies, creation of interoperable data systems, and efforts to make data more available to the public, while preserving privacy and upholding ethical principles. This includes a focus on the underutilized, inaccessible, or missing data needed to measure and promote equity. Finally, agencies should also take steps to improve diversity and equity in the research workforce.

**National security and economic resilience.** Agencies' plans and budgets should support the research, development, and application of technologies that protect American security and strengthen our economic resilience. Investments in security should prioritize the reduction of catastrophic biological, nuclear, and cyber risks, including investments in technologies supporting: biosecurity and biosafety; nuclear nonproliferation, arms control and treaty verification, measures that lower the risk of nuclear accidents and miscalculation, and measures that enhance strategic stability; and new capabilities for defending critical infrastructure and sensitive networks against cyberattacks and supply chain attacks, including improved authentication mechanisms, zero-trust architectures, and better intrusion detection capabilities. Investments in economic resilience should emphasize technologies that ensure safe, clean, and reliable access to critical products, materials and minerals, including new manufacturing and biomanufacturing processes that can cost-effectively produce key goods on demand.

### **Other R&D Program Guidance**

Science is a tool that should be available to every American. More inclusive engagement in science benefits the American people, the environment, and the economy. The American public must be both knowledgeable about and involved in science research and its products, thereby fostering trust. To build a trustworthy and engaged U.S. science and technology (S&T) enterprise, agencies should prioritize making Federally funded R&D: open to the public in a findable, accessible, interoperable, and reusable way; more rigorous, reproducible, and transparent; safe and secure; grounded in assessment of ethical, legal, and societal implications; and free from improper political interference—all while minimizing administrative burden. In addition, cultivating a

research environment composed of people from diverse backgrounds will bring the U.S. S&T enterprise closer to each community.

Moreover, Federally funded R&D can be an important pillar of rebuilding U.S.-based supply chains, seeding the market with cutting-edge new technologies and providing a comparative advantage for our companies and workers. For decades, though, many new products have been invented and innovated in the United States, but ultimately manufactured at scale elsewhere. The Biden-Harris Administration is committed to ensuring that the practice of “invent it here; make it there” is replaced with “invent it here; make it here.” Federally funded R&D investments should therefore promote domestic manufacturing, job creation, and economic prosperity in the United States, including in communities historically underserved, marginalized, and adversely affected by persistent poverty and inequality.

### **STEM Education and Engagement Guidance**

The engagement and motivation of our country’s students in STEM, the instructional and institutional environments for STEM learning, and the training and talent development for our future STEM workforce are considerations that Federal agencies should make when formulating their FY 2023 budgets. Agencies should develop measurable strategies to promote diversity, inclusion, equity, and accessibility across all R&D focus areas, while building supportive STEM education and engagement ecosystems; this goal would be accomplished by identifying and showcasing Models of Equitable STEM Excellence – a new initiative to highlight successful large-scale practices to improve diversity, inclusion, equity, and accessibility in STEM while reducing barriers for STEM learners and workers. Specifically, agencies should consider new opportunities such as increasing the participation of families in STEM outreach and engagement, especially those underserved and underrepresented in STEM, and expanding training and hiring opportunities for STEM learners. These efforts could include informal learners, interested members of the general public, and smaller institutions that might need to combine infrastructure support with STEM R&D funding to be effective. Investments should enhance the instructional, organizational, and institutional environments for STEM learning, including at Federal and Federally funded institutions, as well as in formal and informal learning communities, such as nonprofit STEM programs.



**NATIONAL ASSOCIATION OF MARINE LABORATORIES**  
**FY 2021 PUBLIC POLICY AGENDA**  
**April 2021**

**The National Association of Marine Laboratories (NAML) was established in 1989 to support the vital role of Marine and Great Lakes Laboratories in the Nation's Ocean and Coastal Enterprise** -- This network of place-based marine and Great Lakes laboratories is a unique and valuable national asset. The geographic reach of this network includes estuaries, the coastal zone, the Great Lakes and inland watersheds, the global ocean including polar regions, and the sea floor. NAML labs connect scientists, students, public and civic leaders with leading edge science, environmental and coastal intelligence and professional training that contributes to the understanding, management, and stewardship of our ocean, coastal zones and Great Lakes.

The intersection of ocean, coastal zone and Great Lakes natural resources and U.S. economic activity is complex and highly interdependent. The U.S. depends on healthy marine and freshwater resources, yet many human activities and natural events impact these resources, thereby jeopardizing jobs, wages, our gross domestic product, human health, and well-being. NAML labs operate on the frontline of a rapidly changing environment providing coastal intelligence, comprised of both human socioeconomics and the natural aquatic world to better manage and sustain the full spectrum of marine and Great Lakes resources.

Marine and Great Lakes science laboratories play pivotal roles in the national priorities identified in the [Memorandum on Ocean Mapping of the United States Exclusive Economic Zone and the Shoreline and Nearshore of Alaska](#), and in national assessments on [Science and Technology for America's Oceans: A Decadal Vision; Sea Change: 2015-2025 Decadal Survey of Ocean Sciences](#), and [Enhancing the Value and Sustainability of Field Stations and Marine Laboratories in the 21st Century](#). These documents emphasize the need to understand the ocean in the earth system, promote the blue economy, advance monitoring and predictive modeling capabilities. NAML laboratories bring a high degree of relevance to these critical efforts at lower cost, higher return on investment and with the important benefit of training future generations of the marine science and policy workforce.

**The Importance of Oceans, Coasts, and Great Lakes to National, Economic, and Environmental Security** -- The ocean, our coasts, and the Great Lakes are among the United States' most treasured resources. They are an integral part of our national identity and our Nation's future. The ocean covers 71% of the Earth's surface and hundreds of millions of people rely on a viable ocean. A healthy, productive, and resilient ocean is inextricably linked to Earth's climate and weather patterns and contributes significantly to our quality of life. The ocean provides and creates jobs, gives mobility to our national commerce and Armed Forces, helps feed our Nation, secures our borders, fuels our economy, and provides places for recreation and solace. Understanding the physical, chemical, biological, and geological changes in the ocean is vital to the survival and prosperity of humanity.

In the United States, the ocean and its wealth of natural resources have played a critical role in fueling American prosperity and energy independence, protecting our country, generating over 3 million jobs, sustaining industries, and contributing to 2% of the nation's gross domestic product. Our coastal ports and ocean transport systems are the engines of world trade, facilitating a thriving U.S. economy through the maritime enterprise. The biological diversity and productivity of the ocean sustains the health of coastal communities and promotes a vibrant national economy. At the same time, coastal communities that drive the ocean economy are also vulnerable to events such as hurricanes, tsunamis, sea level rise, floods, over-development and surging coastal population growth. Many of these stressors to our oceans and coastal zones, and by extension the services they provide, are evidenced by human observations of changing coastlines and ecosystems, navigation routes, water quality, species diversity, the timing and occurrence of pathogen outbreaks, the rising burden of marine debris, and flat-lined or declining populations of commercially and ecologically important marine species.

*The National Association of Marine Laboratories (NAML) is a nonprofit organization representing the ocean, coastal and Great Lakes interests of member laboratories that employ thousands of scientists, engineers and professionals nationwide. NAML labs conduct high quality research and education in the natural and social sciences and translate that science to improve decision-making on important issues facing local, state, regional, national and international entities.*





The ocean science and technology (S&T) enterprise -- through its use and support of marine and Great Lakes laboratories -- can provide the knowledge and the education and training needed to address these and other important and complex challenges while also providing fact-based information for decision makers that will ultimately strengthen our Nation and its communities.

**NAML Research and Education Priorities for FY 2021** -- To support the vital role of marine and Great Lakes laboratories in the ocean S&T enterprise, NAML requests that our Nation's Leaders fully fund the Federal Government's investment in extramural, merit-based, competitive research, infrastructure, observing and education programs at NSF, NOAA, NASA, EPA, DOI, USGS, and other ocean, coastal and Great Lakes related agencies. Investments through these agencies are essential for the development of knowledge, a diverse workforce, an ocean-literate society, and the technological innovations needed to power the Nation's economy, improve human health, and sustain a strong national defense and vibrant society. NAML urges expanded support for these extramural programs that support research, infrastructure, observations, and education. Examples of what they address include:

- The U.S currently imports 90% of its seafood - U.S.-based aquaculture is needed to address this imbalance, to advance seafood security and to expand opportunities for economic growth;
- The ocean is changing – we must understand the impacts and causative factors of shifting environmental regimes such as sea level rise, harmful algal blooms, hypoxia, and ocean acidification to improve coastal resilience and inform risk management of critical defense, transportation, civic and business infrastructure along U.S. coastlines;
- The ocean holds vast renewable and nonrenewable resources - ocean exploration, research, and technology development are needed to advance national security, commerce and domestic energy independence;
- Technology is the great enabler – big data, sustained ocean observations, predictive ecosystem models, “omics” are all needed for comprehensive understanding of ecosystems fueling adaptive management strategies to sustain the social-economic productivity of U.S. exclusive economic zones;
- Marine infrastructure is vital - ships, autonomous vehicles, laboratory refurbishment, data analysis, observational capabilities, and instrumentation development combine to understand the complex four-dimensional ocean; and
- STEM is the foundation – biological, chemical, geological and physical marine sciences, ocean engineering and marine policy education and training is key to long-term advancement of human and environment health and social-economic objectives.

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**National Association of Marine Laboratories**  
**Position Paper: Marine and Great Lakes Laboratory Infrastructure**  
**October 2021**

**Issue:** Modernizing and enhancing the aging infrastructure of marine and Great Lakes laboratories to increase capacity to support research, education and training, extension and outreach, local economic growth and resilience, and opportunities for currently underrepresented groups of researchers and students.

**Background:** Many U.S. marine and Great Lakes laboratories in this country as well as in the Caribbean, Micronesia, and elsewhere were established 50 to 100 years ago during various periods of scientific and educational expansions. Funding for the original infrastructure came from many sources including universities, private donations, and foundations. Marine and Great Lakes laboratory infrastructure is often more complex than that of regular campus facilities. Such facilities may include not just laboratory buildings, teaching facilities, housing, and dining areas (with associated roads, water, electricity, and sewer requirements), but also docks, boats (small and large), underwater operational equipment (monitoring equipment, SCUBA, ROVs, etc.) and reliable systems to continuously deliver seawater and/or freshwater to tanks in shore-based facilities. Many laboratories are co-located with other state, local, and federal facilities which stimulates innovation and partnerships along with valuable education and training opportunities for all partners.

**Justification:** Acquiring funding to maintain and replace aging laboratory infrastructure is a persistent challenge. For marine and Great Lakes labs, this challenge is exacerbated by the high cost of unique infrastructure elements such as boats, instrumentation (both surface and subsurface), docks, and related equipment. Universities and other owners of these facilities may expect them to be self-sustaining via user fees but creating reserve funds of sufficient size to cover depreciation would necessitate charging fees that would be unacceptably high. Funding to build and maintain these infrastructure elements in recent decades have come from private foundations or the U.S. government, but these opportunities are limited. In addition, relatively predictable but modest funding sources such as the Field Stations and Marine Labs program at NSF now require that grant requests focus on novel purposes, i.e., not generally for replacement or repair of aging facilities. With universities unable or unwilling to provide funds for such basic needs, and private donors generally being less interested in requests for funds for “unglamorous” work like replacing septic pipes or lab roofs, the consequence is that there are few sources of funding to keep marine and Great Lakes labs operational.

**NAML Recommendation:** NAML recommends significant expansion of existing NSF and NOAA research infrastructure programs, such as Capacity: Biological Field Stations and Marine Laboratories (FSML), Major Research Instrumentation, Mid-Scale Infrastructure, Academic Research Infrastructure, Commercial Engagement through Ocean Technology, the National Ocean Partnership Program, and other relevant programs to include projects aimed at major infrastructure repair and replacement at marine and Great Lakes laboratories. This expansion should include items like piers, docks, upgrades for coastal research vessels, underwater operational equipment, and both seawater and freshwater systems that connect to free-standing shore-based facilities as well as wet and dry laboratory spaces. The new scope should also consider support for bringing facilities up to code where appropriate along with increasing the resilience of these highly vulnerable facilities to increased sea level rise, and storm frequency and intensity.

**About NAML:** The National Association of Marine Laboratories (NAML) is a network of place-based marine and Great Lakes laboratories (<https://www.naml.org>). NAML’s geographic network includes estuaries, the coastal zone, the Great Lakes and inland watersheds, the global ocean including polar regions, and the sea floor. NAML labs provide scientists, students, public, and civic leaders with leading edge science, environmental and coastal intelligence, and professional training that contributes to the understanding, management, and stewardship of our ocean, coastal zones and Great Lakes. The research, observational, and educational activities of NAML contribute to the nation’s economic, environmental, and national security.



## National Association of Marine Laboratories

### Position Paper: The Need for a Strategic and Sustained Federal Investment in Basic Research and Education in Support of the Great Lakes Ecosystem February 2022

***NAML believes it is essential that a sustained and strategic investment be made by the National Science Foundation (NSF) and other relevant federal agencies in fundamental science and engineering research and education associated with the Great Lakes ecosystem. Substantially enhanced investments will soon be made in the restoration of the Great Lakes. Such an investment can benefit greatly via a greater understanding of the fundamental science and engineering that underpins this vast ecosystem. NAML further recommends that NSF and other relevant federal agencies support a rigorous national workshop, a National Academies report, or other similar exercises that seek to integrate ongoing and planned restoration activities of the mission-oriented agencies with a strategic set of fundamental research, education, and related infrastructure priorities.***

#### The Importance of the Great Lakes Region

The Great Lakes region is home to over 34 million people, with approximately two thirds of them in the U.S. and one third in Canada. The Great Lakes region includes eight states -- Minnesota, Wisconsin, Illinois, Indiana, Michigan, New York, Ohio, and Pennsylvania -- and two Canadian provinces -- Ontario and Quebec. The region supports an economy of approximately \$3.5 trillion, including that of Chicago, the third largest economy in the U.S., and Toronto, the largest metropolitan economy of Canada. It is estimated that 25.8 million jobs—worth more than \$1.3 trillion in wages and spanning countless industries, including 7% of all American farm production -- are directly supported by the region. In total, the Great Lakes account for 84% of North America's surface fresh water and contain about 21% of the world's supply. The Great Lakes are home to more than 175 species of fish, which contribute to the region's vibrant commercial and recreational fishing industries. There are over 10,500 miles of Great Lakes coastline in the U.S. and Canada, which is more than twice the length of the Atlantic, Gulf and Pacific coastlines of the lower 48 U.S. states combined.

According to the Office of Coastal Management at the National Oceanic and Atmospheric Administration (NOAA), for every dollar invested in Great Lakes protection, the return on investment is \$3.35, or 335%. Furthermore, for every \$1 million invested in Great Lakes restoration and protection, 16 jobs are created. The economic, human, and ecosystem health of the binational region relies on effective management of the Great Lakes for clean drinking water, healthy fish and wildlife, safe beaches and boating, a vibrant economy of innovative waterfront cities and companies, modern shipping and ports, and sustainable rural agriculture and forestry. Although annual expenditures on Great Lakes research and monitoring that support effective management approach \$250 million, investments in fundamental research, research vessels, and related infrastructure necessary to understand and manage the Great Lakes ecosystem have not kept up with the needs of this region or the rapid advances in technology.

## Recent Developments - the Need for a Fundamental Research Agenda for the Great Lakes Ecosystem

The importance of a robust fundamental research and education investment becomes even more important because of recent infrastructure and public policy decisions made in the U.S. with respect to the Great Lakes ecosystem. These developments include the following.

1. *The Great Lakes Restoration Initiative (GLRI)*
2. *U.S. Geological Survey Great Lakes Science Forum – Summary of Remaining Data and Science Needs and Next Steps*
3. *International Joint Commission (IJC)*
4. *Smart Great Lakes Initiative (SGLi)*

**1. The Great Lakes Restoration Initiative (GLRI):** GLRI was launched in 2010 as a non-regulatory program to accelerate efforts to protect and restore the largest system of fresh surface water in the world and provide additional resources to make progress toward the most critical long-term goals for this important ecosystem. Since FY 2010, Congress has provided approximately \$3.8 billion to date for GLRI activities. Moreover, in the recently enacted *Infrastructure Investment and Jobs Act*, an additional \$1 billion in new funding was appropriated for GLRI. This is supplemental funding to GLRI over five years and is in addition to the approximately \$330 million in yearly funding the program receives through the annual appropriations process.

Through a collaborative planning process involving relevant federal, state and local agencies, tribes, and other non-federal stakeholders, GLRI has developed and is executing a [strategic plan](#) for the years 2020 to 2024 and the plan includes **several focal areas**.

- Toxic Substances and Areas of Concern
- Invasive Species
- Nonpoint Source Pollution Impacts on Nearshore Health
- Habitats and Species
- Foundations for Future Restoration Actions

**2. U.S. Geological Survey Great Lakes Science Forum – Summary of Remaining Data and Science Needs and Next Steps:** In 2021, in response to a request from the House Appropriations Committee, the USGS produced a [report](#) on Great Lakes Science which proposed an increase of funding to address known gaps in data describing and understanding of such areas as winter processes, nearshore ecosystems, groundwater discharge, tributary flow, and environmental socioeconomics. **Specifically, the USGS report called for:**

- Expanded data collection or monitoring to provide basic ecosystem, social, and public health data, enabling management of the Great Lakes system and development of test models and decision support tools.
- New science and advanced technologies (for example, sensors and high-performance computing capability) for improved understanding of critical threats, such as harmful algae blooms and high-water levels.

**3. International Joint Commission (IJC):** The IJC was created by the U.S. and Canada in recognition that each country is affected by the other's actions in lake and river systems along the border. The IJC is guided by the Boundary Waters Treaty, signed by Canada and the United States in 1909. The treaty provides general principles, rather than detailed prescriptions, for preventing and resolving disputes over waters shared between the two countries and for settling other transboundary issues. The specific application of these principles is decided on a case-by-case basis. The IJC has two main responsibilities:

approving projects that affect water levels and flows across the boundary and investigating transboundary issues and recommending solutions. The IJC's recommendations and decisions consider the needs of a wide range of water uses, including drinking water, commercial shipping, hydroelectric power generation, agriculture, ecosystem health, industry, fishing, recreational boating, and shoreline property.

As of January 2022, the IJC is nearing completion of a comprehensive decadal science plan for a binational program of Great Lakes research. **The need for the plan is tied to the following developments:**

- Large scale changes in the Great Lakes ecosystem over a period of less than 20 years.
- Potentially far-reaching impacts of ongoing change, both known and unknown.
- Uncertainty driven by our current lack of understanding or quantification of many principal drivers and processes involved in these changes.
- Significant past, ongoing, and future investment deemed necessary to restore the Great Lakes and fulfill the promise of the Great Lakes Water Quality Agreement (GLWQA); and
- Lack of a contemporary, comprehensive science plan for the Great Lakes that is also broad in scope and perspective.

**4. Smart Great Lakes Initiative (SGLi):** In 2019, the idea to create a **common strategy** for using data to make decisions, or *Smart Great Lakes*, was developed by members of the Great Lakes Observing System, Cleveland Water Alliance, and the Council for the Great Lakes Region. The Smart Great Lakes Initiative (SGLi) is a consortium that convenes private industry, state, provincial and federal governments, academic institutions, and non-profit partners in Canada and the U.S. to lead the development and application of advanced data collection, analytics, and decision-support systems across the Great Lakes. SGLi seeks to improve awareness and response to changes in the Great Lakes, guide, support, and apply technological innovation in Great Lakes, sensing and data science and inform critical decision-making across political borders. As threats and pressures from climate change, invasive species, pollution, and urbanization continue to mount in the Great Lakes region, challenges to region-wide management continue in parallel. Comprehensive and sustainable management relies on critical information infrastructure, including accurate and resilient observing systems, cutting-edge science and research, analysis-ready data and information accessibility, and tools to equip decision-makers with current and relevant information. Capitalizing on the emergence and application of new technologies and partnerships is critical to keep pace with mounting pressures, challenges, and threats to the Great Lakes. SGLi's [Common Strategy for Smart Great Lakes](#) contains a set of goals and objectives designed to realize a vision of advancing technology applications that improve understanding, management, and use of the Great Lakes. **The initial goals of this common strategy include the following.**

- Development of novel and interdisciplinary research;
- Support of science, innovation, and technology that improve our ability to identify, assess, and respond to stressors and change; and
- Development of research infrastructure, including resilient and adaptable observing systems, in support of a swimmable, drinkable, fishable, and equitable future.

**Summary:** Restoration of the Great Lakes is complex, changing, and expensive, with the investment to restore the Great Lakes estimated to be more than tens of billions of U.S. dollars. The above listed four initiatives are promising, but also illustrate the complexity of issues and potential solutions. Restoring an ecosystem with the immense scale of the Great Lakes will require a solid scientific understanding of complex ecosystem interactions so that the appropriate evaluation of restoration costs versus benefits can be made. The complex attributes and demands of the Great Lakes ecosystem along with the speed with which climatic changes are taking place in this ecosystem present significant opportunities and challenges for the research enterprise, challenges that ultimately affect the management of this unique ecosystem. Realizing the vision for Smart Great Lakes requires significant advances in basic research and training. The research enterprise in the Great Lakes must be strengthened to meet the immense challenges presented by these vast, complex, and changing lakes. Research has been driven by reacting to crises, rather than being built upon a comprehensive strategy for fundamental understanding. There are important questions that remain to be answered. For example, how do we best combat invasive pest species, whose effects can fundamentally alter how these systems function? How do multiple nutrients combine to affect water quality and how can these be most effectively managed? Are the Great Lakes a source or a sink for atmospheric carbon? A key requirement for answering questions like these is federal support for understanding the *fundamental* processes that operate across the entire Great Lakes system. It is only by understanding these basic processes, that we can predict how this system will respond to a changing climate. Additionally, the scientific and technical workforce needed for such research and restoration activities must be adequately developed by our academic enterprise, including the outreach necessary to achieve objectives related to diversity, equity, and inclusion.

#### NAML Position Regarding Investing in Long Term Health of the Great Lakes

***Given A. the importance of the Great Lakes ecosystem to the economic and environmental health of both the U.S. and Canada, B. the significant forthcoming expansion in Great Lakes restoration, and C. the multiple mission-oriented and international science plans for the Great Lakes ecosystem; it is essential that a sustained and strategic investment be made by the National Science Foundation (NSF) and other relevant federal agencies in the fundamental science and engineering research and education enterprise that underpins our understanding of the Great Lakes ecosystem. NAML therefore recommends that NSF and other relevant federal agencies support a rigorous national workshop, a National Academies report, or other similar exercises that seek to integrate ongoing and planned restoration activities of the mission-oriented agencies with a strategic set of fundamental research, education, and related infrastructure priorities. These activities should provide an estimate for the level of investment necessary to support these priorities.***

**About NAML:** The National Association of Marine Laboratories (NAML) is a network of place-based marine and Great Lakes laboratories (<https://www.naml.org>). The geographic network of NAML includes estuaries, the coastal zone, the Great Lakes and inland watersheds, the global ocean including polar regions, and the sea floor. NAML labs provide scientists, students, public, and civic leaders with leading edge science, environmental and coastal intelligence, and professional training that contributes to the understanding, management, and stewardship of our ocean, coastal zones and Great Lakes. The research, observational, and educational activities of NAML contribute to the nation's economic, environmental, and national security.



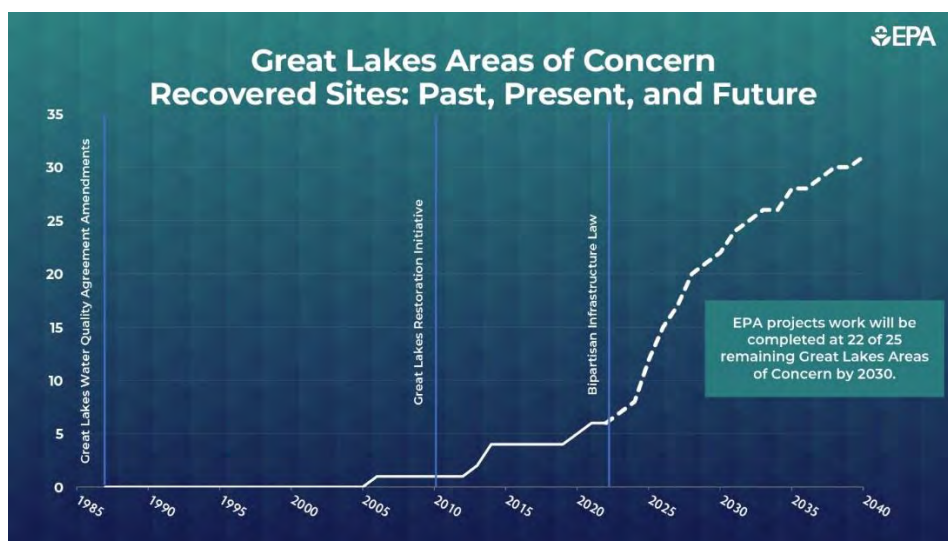
**\*\*EMBARGOED UNTIL 5:00 AM ET THURSDAY, FEBRUARY 17, 2022\*\***

**President Biden, EPA Announce \$1 Billion Investment from the Bipartisan Infrastructure Law Will Significantly Accelerate Cleanup and Restoration of Great Lakes**  
*EPA Projects Work to Be Completed at 22 of 25 Remaining Great Lakes “Areas of Concern” by 2030*

**WASHINGTON, DC** (Feb. 17, 2021) – Today, President Biden and U.S. Environmental Protection Agency Administrator Michael S. Regan announced that as a direct result of the Bipartisan Infrastructure Law, EPA will make significant progress in the clean-up and restoration of the Great Lakes most environmentally degraded sites, securing clean water and a better environment for millions of Americans in the Great Lakes region. The agency will use the bulk of the \$1 billion investment in the Great Lakes from the Bipartisan Infrastructure Law to clean up and restore severely degraded sites, known as “Areas of Concern” or AOCs. This will allow for a major acceleration of progress that will deliver significant environmental, economic, health, and recreational benefits for communities throughout the Great Lakes region.

“The Great Lakes are a vital economic engine and an irreplaceable environmental wonder, supplying drinking water for more than 40 million people, supporting nearly 1.5 million jobs, and sustaining life for thousands of species. Through the investments from President Biden’s Bipartisan Infrastructure Deal, we will make unprecedented progress in our efforts to restore and protect the waters and the communities of the Great Lakes basin,” said EPA Administrator Michael S. Regan. “Building a better America means investing in our natural resources and the communities they support.”

White House Senior Advisor and Infrastructure Implementation Coordinator Mitch Landrieu said, “With this investment, President Biden is delivering major environmental, public health, and economic wins for the Great Lakes region. Building a better America requires us to confront legacy pollution and clean up the environment – ensuring our kids drink clean water and creating good-paying jobs in the process. We know that cleaning up these waterways and improving the health of the Great Lakes will also create great economic opportunities for communities across the eight-state region and beyond.”



In 2018, an independent economic study from the Great Lakes Commission and the University of Michigan found that every GLRI dollar spent produces an additional \$3.35 of economic activity. For older industrial cities, including AOCs such as Buffalo and Detroit, the study found

that there may be more than \$4 in additional economic activity for each federal dollar spent. A 2020 analysis of the Great Lakes determined that the region supports more than 1.3 million jobs, generating \$82 billion in wages annually.

EPA projects that the Bipartisan Infrastructure Law funding, combined with funds from annual Great Lakes Restoration Initiative appropriations and funding from other sources, will, between now and the end of 2030, enable the Agency and its partners to bring work to completion across 22 of the 25 remaining AOCs, with Bipartisan Infrastructure Law funding directly supporting 11 of these sites. In sum this will leave only three of the original 31 U.S. AOCs with work remaining, with those sites also benefiting from Bipartisan Infrastructure Law funding. In the coming months, EPA will release more detailed information on implementation of the Bipartisan Infrastructure Law funding for the Great Lakes.

EPA will award this funding in accordance with the Biden Administration's Justice40 Initiative, which promises to deliver at least 40 percent of the overall benefits from key federal investments to underserved communities. The effort also supports President Biden's America the Beautiful initiative, which includes commitments to honor the nation's conservation traditions, private property rights, the sovereignty of Tribal Nations, and the values and priorities of local communities.

Great Lakes AOCs where work is expected to be completed by 2030 include: Waukegan, IL; Grand Calumet River, IN; Clinton River, MI; Detroit River, MI; Manistique River, MI; Muskegon Lake, MI; River Raisin, MI; Rouge River, MI; St. Clair River, MI; St. Marys River, MI; Torch Lake, MI; St. Louis River, MN/WI; Black River, OH; Cuyahoga River, OH; Maumee, OH; Buffalo River, NY; Eighteenmile, NY; Rochester Embayment, NY; Niagara River, NY; Fox River, WI; Milwaukee Estuary, WI; and Sheboygan, WI.

In addition to support from the Bipartisan Infrastructure Law directed toward cleaning up the AOCs, EPA will continue the agency's work to address other key issues such as addressing harmful algal blooms, nutrient reduction activities, protecting against invasive species, and monitoring the health of the Great Lakes. EPA anticipates additional resources could be available for these and other priorities because of the infusion of resources from the Bipartisan Infrastructure Law.

In 1987, the Great Lakes Water Quality Agreement designated 43 sites in the United States and Canada with significant environmental degradation as AOCs in need of restoration. Thirty-one of these sites were in the United States. For more than two decades, plans were drafted to address the contamination but, in the absence of significant funding to undertake the work, there was little progress. In 2010, the Great Lakes Restoration Initiative was implemented and generated the largest ever federal investment in the Great Lakes. Over the last 16 years, EPA has been able to delist six AOCs and complete the necessary management actions at eleven additional AOCs.

The Bipartisan Infrastructure Law is a once-in-a-generation investment that will create millions of jobs modernizing our infrastructure, turn the climate crisis into an opportunity, and put us on a path to win the economic competition for the 21st century.

To see the full list of Areas of Concerns and anticipated work completion and delisting dates please visit: [\(LINK\)](#).

###



# GREAT LAKES RESTORATION CROSSCUT

Report to Congress

Office of Management and Budget

November 2021

# The Great Lakes Watershed



## **2021 Great Lakes Restoration Crosscut**

*This report represents an accounting of Federal funding for Great Lakes restoration activities. This report is provided to Congress in response to Section 738 of the Financial Services and General Government Appropriations Act, 2014 (Division E of Public Law 113-76).*

The Fiscal Year (FY) 2022 Budget continues the Administration's commitment to the restoration of the Great Lakes ecosystem by requesting more than \$1 billion for priority programs and projects in the Great Lakes watershed. Funding will support a number of critical restoration activities, including projects for aquatic invasive species including Asian carp, toxics and contaminated sediments, nonpoint source pollution, and habitat protection and restoration.

This crosscut presents information on Federal funding from FY 2017 through the FY 2022 President's Budget for Great Lakes restoration work in the following formats:

- Total Federal funding by agency, including national and Great Lakes programs and projects;
- Agency allocations of the Great Lakes Restoration Initiative;
- Agency funding for national programs;
- Agency funding for Great Lakes Programs; and
- Agency funding for Great Lakes projects.

It is important to note that for national programs, in many instances the numbers shown for FY 2021 and FY 2022 are extrapolated either from past funding provided to the region, or by using a percentage of land in the Great Lakes basin relative to the rest of the State. The funding ultimately provided to the Great Lakes basin through national programs may differ from these estimates.

A few other funding notes are necessary. All Federal agency dollars are reported in millions; programs and projects that have not received at least \$500,000 in funding over the period of FY 2017 to FY 2022 are excluded, and rounding errors may occur.

**Table 1--Federal Agency Totals**

(Budget authority in millions) <sup>1,2</sup>	FY 2017 Enacted	FY 2018 Enacted	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Enacted	FY 2022 Budget
Great Lakes Restoration Initiative	300	300	300	320	330	340
Department of Agriculture	251	301	338	275	250	263
Department of the Army	33	77	31	25	43	22
Department of Commerce	41	44	47	49	49	56
Department of Homeland Security <sup>3</sup>	0	0	0	0	0	0
Department of the Interior	70	69	72	96	98	110
Department of State	27	35	39	49	49	49
Department of Transportation <sup>4</sup>	0	0	0	0	0	0
Environmental Protection Agency	198	238	228	233	209	233
<b>Total, All Agencies</b>	<b>920</b>	<b>1,064</b>	<b>1,055</b>	<b>1,047</b>	<b>1,028</b>	<b>1,073</b>

<sup>1</sup> In all tables, funding amounts are rounded to the nearest million. Rounding errors may result.

<sup>2</sup> All tables exclude programs and projects that have received or requested less than \$500,000 across FYs 2017-2022.

<sup>3</sup> Though DHS has included funds in past reports and Coast Guard receives some funding through the GLRI, this year the agency has no individual programs to report that fall within the scope of the crosscut.

<sup>4</sup> While DOT does not make any direct programmatic funding contributions to Great Lakes Restoration, States use DOT funds for a variety of environmental mitigation activities that have undoubtedly contributed to restoration efforts. DOT is reporting \$0 for FY 2017, FY 2018, FY 2019, FY 2020 and FY 2021 to reflect that DOT has not received, awarded or obligated funding to directly restore the Great Lakes Watershed, and while States continue to use DOT funds that may contribute to restoration efforts (e.g., a State may use FHWA funding to clean up an area located within the Great Lakes watershed in order to construct a new bridge), DOT does not currently track the amount of DOT funding used for such activities.

**Table 2--Great Lakes Restoration Initiative, Agency Allocations**

(Budget authority in millions)	FY 2017 Enacted	FY 2018 Enacted	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Enacted	FY 2022 Budget
<b>Department of Agriculture</b>	<b>35</b>	<b>37</b>	<b>34</b>	<b>34</b>	<b>35</b>	<b>38</b>
Animal and Plant Health Inspection Service	1	1	1	1	1	2
Natural Resources Conservation Service	22	25	21	22	22	25
U.S. Forest Service	11	10	12	10	11	11
<b>Department of the Army</b>	<b>60</b>	<b>29</b>	<b>60</b>	<b>34</b>	<b>48</b>	<b>9</b>
Army Corps of Engineers	60	29	60	34	48	9
<b>Department of Commerce</b>	<b>12</b>	<b>24</b>	<b>17</b>	<b>29</b>	<b>12</b>	<b>11</b>
National Oceanic and Atmospheric Administration	12	24	17	29	12	11
<b>Department of Health and Human Services</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
Agency for Toxic Substances and Disease Registry and Center for Disease Control	1	1	1	0	0	0
<b>Department of Homeland Security</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>
Coast Guard	2	1	2	1	1	1
<b>Department of the Interior</b>	<b>84</b>	<b>90</b>	<b>79</b>	<b>88</b>	<b>91</b>	<b>55</b>
Bureau of Indian Affairs	11	12	10	16	16	15
Fish and Wildlife Service	42	52	46	51	53	29
U.S. Geological Survey	27	21	20	17	18	7
National Park Service	4	5	4	4	5	5
<b>Department of State</b>	<b>6</b>	<b>5</b>	<b>10</b>	<b>9</b>	<b>1</b>	<b>2</b>
Great Lakes Fishery Commission	6	5	10	9	1	2
<b>Department of Transportation</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>8</b>	<b>1</b>
Maritime Administration	1	1	1	6	8	1
<b>Environmental Protection Agency</b>	<b>103</b>	<b>113</b>	<b>97</b>	<b>121</b>	<b>134</b>	<b>134</b>
<b>Multiple Agencies<sup>1</sup></b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>88</b>
<b>Total, All Agencies</b>	<b>300</b>	<b>300</b>	<b>300</b>	<b>320</b>	<b>330</b>	<b>340</b>

<sup>1</sup> Agency GLRI allocations for portions of the funding for GLRI Focus Area activities are still being determined for FY 2022 as of the date of this information request.

**Table 3--Department of Agriculture, National Programs**

(Budget authority in millions)	FY 2017 Actual	FY 2018 Actual	FY 2019 Actual	FY 2020 Actual	FY 2021 Enacted	FY 2022 Budget
<b>Natural Resources Conservation Service</b>						
Conservation Operations	22	21	21	19	16	16
Conservation Reserve Program	5	5	5	6	4	4
Conservation Stewardship Program <sup>1</sup>	29	27	69	49	32	32
Environmental Quality Incentives Program	76	91	93	72	54	54
Wetlands Reserve Program	2	2	1	0	6	6
Agricultural Conservation Easement Program	13	8	13	15	9	9
<b>Total, NRCS</b>	<b>147</b>	<b>154</b>	<b>202</b>	<b>161</b>	<b>121</b>	<b>121</b>
<b>Agricultural Research Service</b>						
Water Availability and Water Management	2	2	3	3	3	3
Sustainable Agricultural Systems Research <sup>2</sup>	1	1	1	1	1	1
<b>Total, ARS</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>
<b>Farm Service Agency</b>						
Conservation Reserve Program	47	42	43	43	46	46
<b>Total, FSA</b>	<b>47</b>	<b>42</b>	<b>43</b>	<b>43</b>	<b>46</b>	<b>46</b>
<b>National Institute of Food and Agriculture</b>						
Hatch	1	1	1	1	1	1
Agriculture and Food Research Initiative Grants	2	2	2	2	3	5
<b>Total, NIFA</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>6</b>
<b>Rural Development</b>						
Water / Wastewater Loans and Grants <sup>3</sup>	46	97	82	61	72	72
<b>Total, RD</b>	<b>46</b>	<b>97</b>	<b>82</b>	<b>61</b>	<b>72</b>	<b>72</b>
<b>Forest Service</b>						
Land and Water Conservation Fund: Forest Legacy <sup>4</sup>	0	0	2	0	0	11
Working Forest Lands <sup>5</sup>	3	1	1	1	1	1
Knutsen-Vandenberg Fund	1	1	1	1	1	1
National Forest System <sup>6</sup>	1	1	1	1	1	1
<b>Total, FS</b>	<b>5</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>14</b>
<b>Total, USDA</b>	<b>251</b>	<b>301</b>	<b>338</b>	<b>275</b>	<b>250</b>	<b>263</b>

<sup>1</sup> In FY 2019, all CStP contracts were obligated to the full extent of the contract. Previously, contracts were only obligated for the current year.

<sup>2</sup> In FY 2019, National Program Agricultural System Competitiveness & Sustainability was renamed Sustainable Agricultural Systems Research.

<sup>3</sup> The Rural Utilities Service's Water and Environmental Programs does not receive an appropriation, earmark, set aside, or any other form of funding specific to the Great Lakes Watershed (Watershed). WEP may obligate loans and/or grants that benefit borrowers who are located within the Watershed, but the Agency does not have policies or procedures that identify or direct the use of monies for said purpose. As such, WEP is reporting awards that were made in the Watershed whether or not they had a direct impact on assisting with cleanup. Absent

guidance, WEP estimated what areas/counties might be considered part of the Watershed. FYs 16-18 include loan BA and Grant. In FY19, the program carried a negative subsidy rate, so figures only reflect grant. The subsidy rate is positive for FY20, so loan BA and grant are counted; however, the majority of obligations occur in August and September. Therefore, the FY20 is not reflective of the total projected obligations.

<sup>4</sup> For FY 2020, no appropriations were provided for Forest Legacy.

<sup>5</sup> For FY 2021, amount only includes projected Forest Stewardship Program funding. It does not include Landscape Scale Restoration projects since those are competitive projects and will be awarded after funds are appropriated and projects reviewed.

<sup>6</sup> National Forest System funding includes the following programs: Forest Products (NFTM), Vegetation and Watershed Management (NFVW), and Wildlife and Fisheries Habitat Management (NFWF)

**Table 4--Department of the Army, National Programs**

(Budget authority in millions)	FY 2017 Enacted	FY 2018 Enacted	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Enacted <sup>2</sup>	FY 2022 Budget
<b>Army Corps of Engineers</b>						
Continuing Authorities Program (CAP)	0	3	2	1	6	4
<b>Total, Department of the Army</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>6</b>	<b>4</b>

<sup>1</sup> Enacted amounts represent the final allocation of funds in the Great Lakes watershed for CAP Sections 204, 206, and 1135. The Budget amount represents the nationwide total for these Sections since the portion for Great Lakes is unknown.

<sup>2</sup> The FY 2021 funding is for CAP Section 304, Beneficial Use of Dredged Material at Ashtabula, OH.

**Table 5--Department of the Army, Great Lakes Programs**

(Budget authority in millions)	FY 2017 Enacted	FY 2018 Enacted	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Enacted	FY 2022 Budget
<b>Army Corps of Engineers</b>						
Great Lakes Tributary Model	1	0	0	0	0	0
Surveillance of Northern Boundary Waters	6	6	5	6	6	5
<b>Total, Department of the Army</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>6</b>	<b>6</b>	<b>5</b>

**Table 6--Department of the Army, Great Lakes Projects**

(Budget authority in millions)	FY 2017 Enacted	FY 2018 Enacted	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Enacted	FY 2022 Budget
<b>Army Corps of Engineers</b>						
Chicago Sanitary & Ship Canal Dispersal Barriers	12	17	19	14	29	13
Indiana Shoreline Erosion	2	3	3	3	0	0
Interbasin Control Great Lakes, Mississippi River, Aquatic Nuisance Species <sup>1</sup>	3	2	0	0	0	0
Presque Isle Peninsula	2	2	2	1	2	0
McCook and Thornton Reservoirs <sup>2</sup>	7	44	0	0	0	0
<b>Total, Department of the Army</b>	<b>26</b>	<b>68</b>	<b>24</b>	<b>18</b>	<b>31</b>	<b>13</b>

<sup>1</sup> This project was funded at \$200,000 in FY 2019, \$315,000 in FY 2020, and \$335,000 in FY 2021, which rounds to zero for purposes of this report.

<sup>2</sup> This project was funded to completion in FY 2018 pursuant to a Section 1043 of the Water Resources Reform and Development Act agreement with the non-Federal sponsor.

**Table 7--Department of the Army, Great Lakes Projects-- Detail**

(Budget authority in millions)	FY 2022 Budget	Description	Status	Authorized Funding Level (\$M)
<b>Army Corps of Engineers</b>				
Chicago Sanitary & Ship Canal Dispersal Barriers	13	System of electric barriers to deter movement of aquatic nuisance fish species between the Illinois River and Lake Michigan.	Three barriers are constructed and operational: Demonstration barrier, Barrier IIA and Barrier IIB. All construction activities for Permanent Barrier I have been completed. Performance verification and safety testing will be completed in the second quarter of FY 2021, which is a prerequisite for the full-time operation scheduled to occur by the end of FY 2021. The FY 2022 funds will be used for operation and maintenance of the entire electric dispersal barriers system.	no limit
<b>Total, Department of the Army</b>	<b>13</b>			



**Table 8--Department of Commerce, National Programs**

(Budget authority in millions)	FY 2017 Enacted	FY 2018 Enacted	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Enacted	FY 2022 Budget
<b>National Oceanic and Atmospheric Administration</b>						
Coastal Zone Management Grants	13	14	15	15	15	21
Title IX Grants ( <i>Newly reported for FY19/FY20</i> ) <sup>1</sup>	0	0	3	1	1	1
National Center for Coastal Ocean Science External Competitive Research <sup>2</sup>	0	1	1	1	1	1
Coastal Science, Assessment, Response and Restoration	2	1	2	1	1	1
National Estuarine Research Reserves	1	1	2	2	2	2
Marine and Aviation Ops charter vessel for Algal Bloom projects	0	0	0	0	0	0
Sea Grant	12	12	12	15	15	15
National Marine Sanctuaries	2	2	3	3	3	4
<b>Total, Department of Commerce</b>	<b>30</b>	<b>33</b>	<b>36</b>	<b>38</b>	<b>38</b>	<b>45</b>

<sup>1</sup> Funding in FY 2021 and 2022 is estimated based on FY20 actuals. Actual amounts will vary based on the annual review process.

<sup>2</sup> FY 2021 and 2022 funding is an estimate based on historical trends. Actual funding amounts will be determined based on final appropriations as well as the number and quality of proposals received.

**Table 9--Department of Commerce, Great Lakes Programs**

(Budget authority in millions)	FY 2017 Enacted	FY 2018 Enacted	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Enacted	FY 2022 Budget
<b>National Oceanic and Atmospheric Administration</b>						
Great Lakes Environmental Research Laboratory	11	11	11	11	11	11
<b>Total, Department of Commerce</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>

**Table 10--Department of the Interior, National Programs**

(Budget authority in millions)	FY 2017 Enacted	FY 2018 Enacted	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Enacted	FY 2022 Budget
<b>U.S. Geological Survey</b>						
Ecosystems/Status and Trends Program	3	3	3	2	0	0
Ecosystems/Fisheries Program	4	4	4	7	0	0
Ecosystems/Environments Program	1	1	1	1	0	0
Ecosystems/Invasive Species Program (Asian Carp)	4	4	6	8	0	0
Ecosystems/Species Management Research	0	0	0	0	11	11
Ecosystems/ Land Management Research	0	0	0	0	1	1
Ecosystems/Biological Threats Research Program (Asian Carp)	0	0	0	0	8	8
Ecosystems/ Climate Adaptation Science Center	0	0	0	0	1	3
Ecosystems/Environmental Health	0	0	0	0	1	1
Energy, Minerals & Environmental Health	0	0	1	1	0	0
Land Resources/NRCASC	0	0	0	4	0	0
Water Availability and Use Science Program	1	1	1	0	0	0
Groundwater and Streamflow Information Program	3	3	3	3	3	3
National Water Quality Program	2	2	2	2	2	1
Water Resources Availability Program	0	0	0	0	0	0
Water Observing Systems Program	0	0	0	0	0	0
National Cooperative Geologic Mapping Program	1	1	1	1	5	5
National Geospatial Program	0	0	0	5	5	5
<b>Fish and Wildlife Service</b>						
Clean Vessel Grant Program	1	1	1	1	1	1
Coastal Wetlands Grant Program	2	2	2	2	2	2
Ecological Services	10	10	10	10	11	13
Fire Management/Roads	2	2	2	2	2	2
Fish and Wildlife Management	4	4	4	4	4	4
Fish Hatcheries	4	4	4	5	5	7
Aquatic Invasive Species (Asian Carp)	6	6	6	15	13	13
Law Enforcement	2	2	2	2	2	2
National Wildlife Refuge System	12	12	12	13	14	17
<b>National Park Service</b>						
Competitive Park Projects (Water Management Plans)	1	0	0	0	0	0
Operating Program	5	5	5	5	6	9
Vital Sign Water Quality Monitoring	0	1	1	1	1	1
<b>Total, Department of the Interior</b>	<b>68</b>	<b>67</b>	<b>71</b>	<b>94</b>	<b>95</b>	<b>107</b>

**Table 11--Department of the Interior, Great Lakes Programs**

(Budget authority in millions)	FY 2017 Enacted	FY 2018 Enacted	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Enacted	FY 2022 Budget
<b>Fish and Wildlife Service</b>						
Great Lakes Consent Decree	1	1	1	1	2	2
Great Lakes Fish and Wildlife Restoration	0	0	0	1	1	1
<b>Total, Department of the Interior</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>3</b>

**Table 12--Department of State, Great Lakes Programs**

(Budget authority in millions)	FY 2017 Enacted	FY 2018 Enacted	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Enacted	FY 2022 Budget
<b>Great Lakes Fishery Commission</b>	25	33	37	47	47	47
<b>International Joint Commission</b>	2	2	2	2	2	2
<b>Total, Department of State</b>	<b>27</b>	<b>35</b>	<b>39</b>	<b>49</b>	<b>49</b>	<b>49</b>

**Table 13--Environmental Protection Agency, National Programs**

(Budget authority in millions)	FY 2017 Enacted	FY 2018 Enacted	FY 2019 Enacted	FY 2020 Enacted	FY 2021 Enacted	FY 2022 Budget
Clean Water State Revolving Fund <sup>1</sup>	155	188	186	186	186	210
Section 105 Clean Air Grants <sup>1</sup>	1	1	1	1	1	1
Section 106 Clean Water Grants <sup>1</sup>	16	15	16	16	16	16
Section 319 Nonpoint Source Grants <sup>1</sup>	3	4	5	0	5	5
Superfund Remedial <sup>2</sup>	21	29	19	30	TBD	TBD
Wetlands State Grants <sup>1</sup>	2	1	1	0	1	1
<b>Total, Environmental Protection Agency</b>	<b>198</b>	<b>238</b>	<b>228</b>	<b>233</b>	<b>209</b>	<b>233</b>

<sup>1</sup> Obligation data does not signify investment or disinvestment trends in cleanups in the Great Lakes Watershed, but rather annual resource use at individual sites

<sup>2</sup> FY 2021 and FY 2022 data are not provided as they are enforcement confidential and do not reflect "approved" plans.