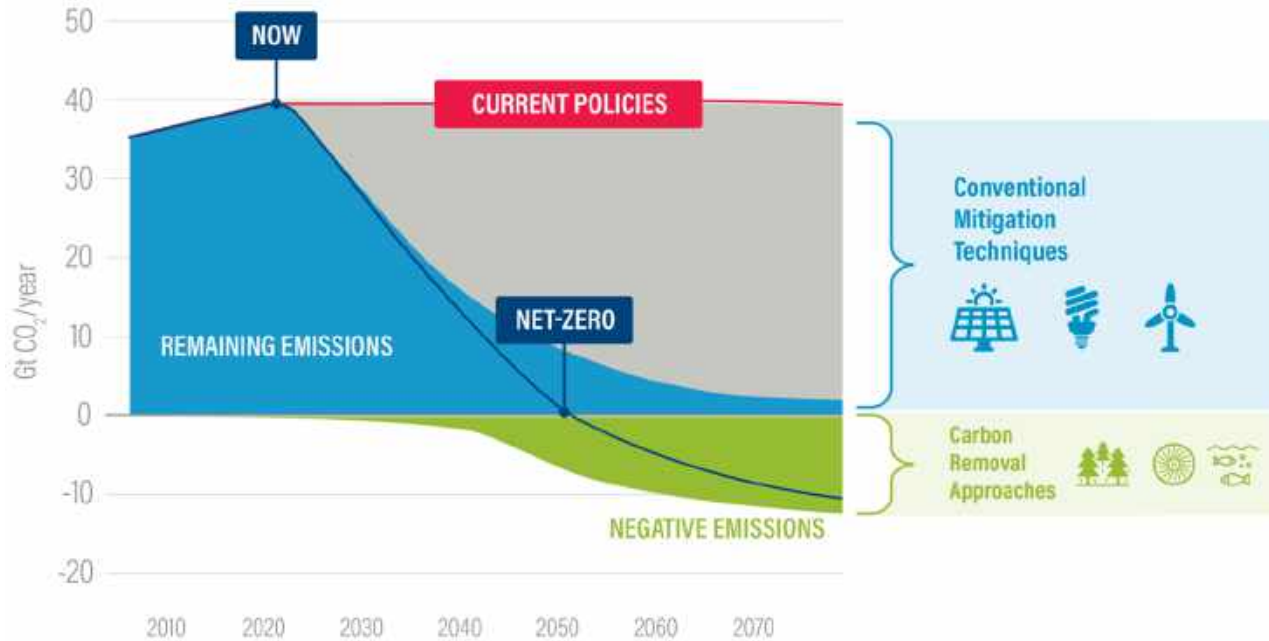


# An overview of new federal investments in marine Carbon Dioxide Removal (mCDR) research

Gabriella (Gabby) Kitch, PhD  
Carbon Dioxide Removal Program Lead  
NOAA Ocean Acidification Program



The Intergovernmental Panel on Climate Change states that manually removing CO<sub>2</sub> from the atmosphere through Negative Emissions Technologies (NETs) is critical to stabilizing climate change at 1.5 °C.



Source: Based on IPCC (2018) and CAT (2021).



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APRIL 20, 2021

## FACT SHEET: President Biden to Catalyze Global Climate Action through the Major Economies Forum on Energy and Climate

**U.S. INNOVATION  
TO MEET 2050  
CLIMATE GOALS**

ASSESSING INITIAL R&D  
OPPORTUNITIES

NOVEMBER 2021

Executive Order 14008 of January 27, 2021

## Tackling the Climate Crisis at Home and Abroad

## OCEAN CLIMATE ACTION PLAN

A REPORT BY THE OCEAN POLICY COMMITTEE  
MARCH 2023



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 Lander*  
DIRECTOR

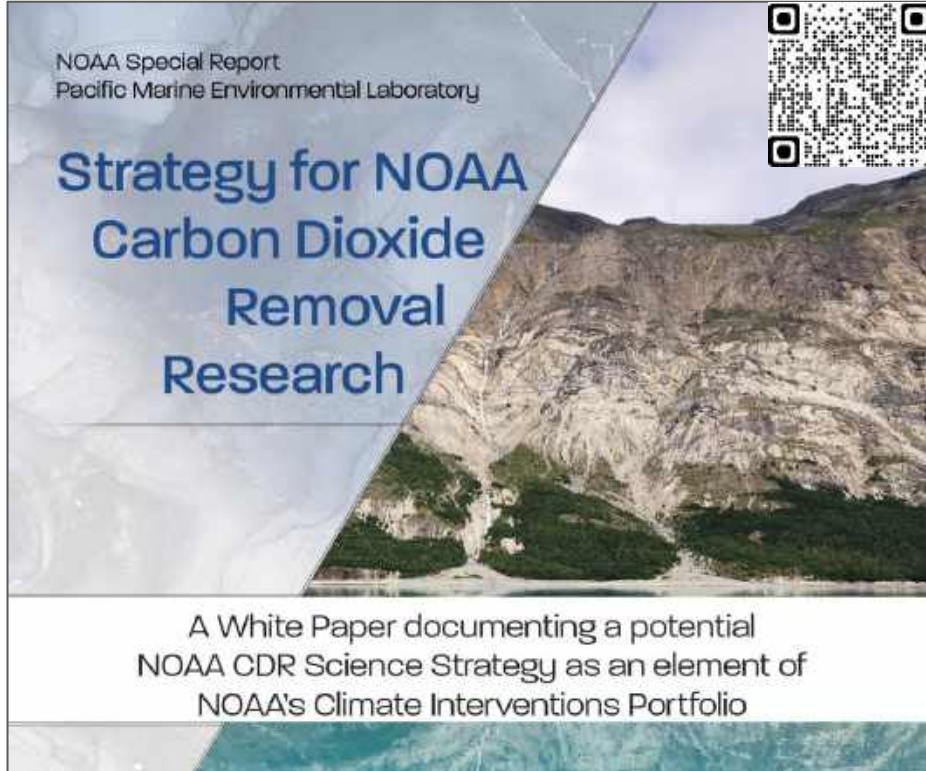
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# NOAA and Carbon Dioxide Removal



## Key NOAA assets

### Observing Networks

Global and local ocean and atmospheric observing; tech development

### Modeling, Scaling, and Projection of CDR Pathways

Earth system and process study models

### Environmental Impacts

Ecosystem system monitoring, ecosystem modeling, laboratory research

### Decision Support

Data management, marine spatial planning, aquaculture research, collaborative and conservation research

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The National Oceanographic Partnership Program (NOPP) facilitates partnerships between federal agencies, academia, and industry to advance ocean science research and education. Through this collaboration, federal agencies can leverage resources to invest in priorities that fall between agency missions or that are too large for any single agency to support.

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# Electrochemical Acid Sequestration to Ease Ocean Acidification (EASE-OA)

## Research partners

W

UNIVERSITY of WASHINGTON



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A screenshot of the ebb carbon website. At the top left is the "ebb carbon" logo. To the right are navigation links: "Solution", "Sites", "News", "Partnerships", "About", and "Contact". Below this is a red banner for the "Sequim Pacific Northwest National Laboratory" site. It includes a map of the Pacific Northwest, a table with columns for "LOCATION", "CAPACITY", and "STATUS", and a "Sequim Bay, WA" location pin. The table shows "Sequim Bay, WA" with a capacity of "100 tons CO<sub>2</sub>/year" and a status of "Active 2023".

### Collaborating on ocean CO<sub>2</sub> removal

Ebb Carbon is operating a 100 ton/year ocean carbon dioxide removal (CDR) system at the marine labs at the U.S. Department of Energy's Pacific Northwest National Laboratory (PNNL) in Sequim, Washington.

This is a unique deployment with public, private, academic and philanthropic partners that is designed to advance the field of ocean CDR and ensure that future ocean CDR deployments are safe, responsible, and science-driven.



### Advancing the science

Working with scientists from PNNL, National Oceanic and Atmospheric Administration (NOAA),

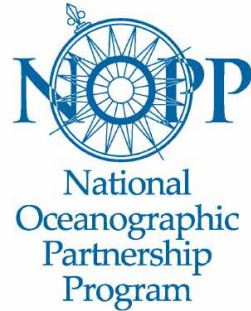
## With funding from



# Funding partners and amount

\$24.3M fundraised by interagency and philanthropic partners

This includes NOAA funding received from the Inflation Reduction Act



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# The Inflation Reduction Act and mCDR

Announced Sept. 7

Today, the Department of Commerce and NOAA announced \$24 million for projects that will tackle the climate crisis by researching marine carbon dioxide removal strategies, as part of President Biden's Investing in America agenda. \$14 million from the Inflation Reduction Act (IRA), the largest climate investment in history, will go toward 10 projects that examine how effectively and safely strategies like enhancing ocean alkalinity or sinking seaweed remove carbon from the atmosphere.

An additional \$10 million in funding, provided by NOAA's appropriation for the [National Oceanographic Partnership Program](#); NOAA's [Ocean Acidification Program](#); NOAA's [Global Ocean Monitoring and Observing Program](#); the Department of Energy's (DOE's) [Office of Fossil Energy and Carbon Management](#); DOE's [Water Power Technologies Office](#); the [Office of Naval Research](#); the [U.S. National Science Foundation](#) and the [ClimateWorks Foundation](#)  will support seven more marine carbon dioxide removal research projects.

"As part of the Biden-Harris Administration's commitment to addressing the climate crisis and making our country more climate resilient, we need to understand all of the tools available to us," said Secretary of Commerce Gina Raimondo. "Making smart investments in America is a key pillar of Bidenomics, and this funding will support critical research to help us develop new and innovative solutions to pressing climate challenges."

<https://oceanacidification.noaa.gov/fy23-nopp-mcdr-awards/>

<https://ioos.noaa.gov/about/governance-and-management/inflation-reduction-act/>

Press release



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# The Notice of Funding Opportunity

View the full NOFO here: <https://www.grants.gov/web/grants/view-opportunity.html?oppld=344632> or scan the QR code.



- 7 main priorities that range from research on co-benefits, field deployments, modeling to community engagement
- These priorities were formulated to answer questions regarding:
  - various aspects of marine carbon dioxide removal approaches
  - risks and co-benefits including ocean acidification mitigation,
  - and science needed to build regulatory frameworks for testing and scaling of marine carbon dioxide removal
- Co-developed by all funding partners
- For those testing a mCDR method, we required monitoring, reporting and verification plans

The National Oceanographic Partnership Program (NOPP) facilitates partnerships between federal agencies, academia, and industry to advance ocean science research and education.

**Total Number of Projects**

**17**

**Unique Institutions**

**47**

**Unique Principal Investigators**

**79**

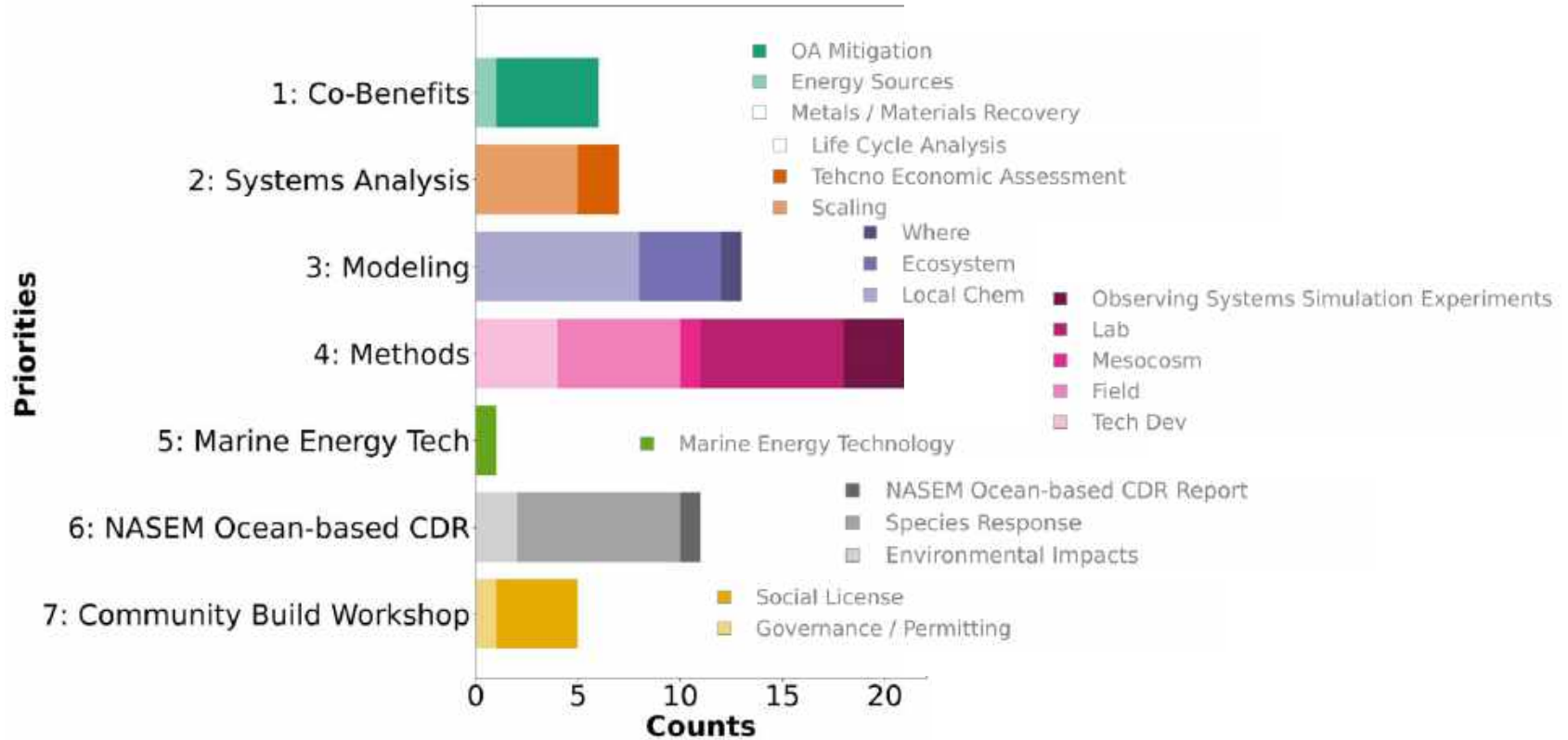
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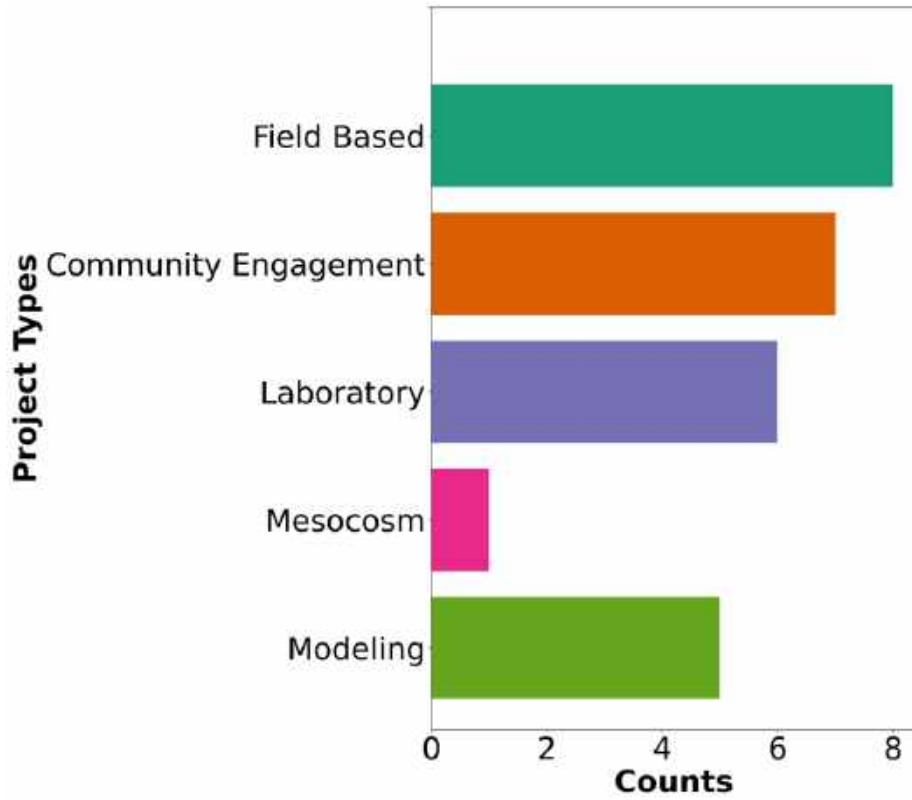
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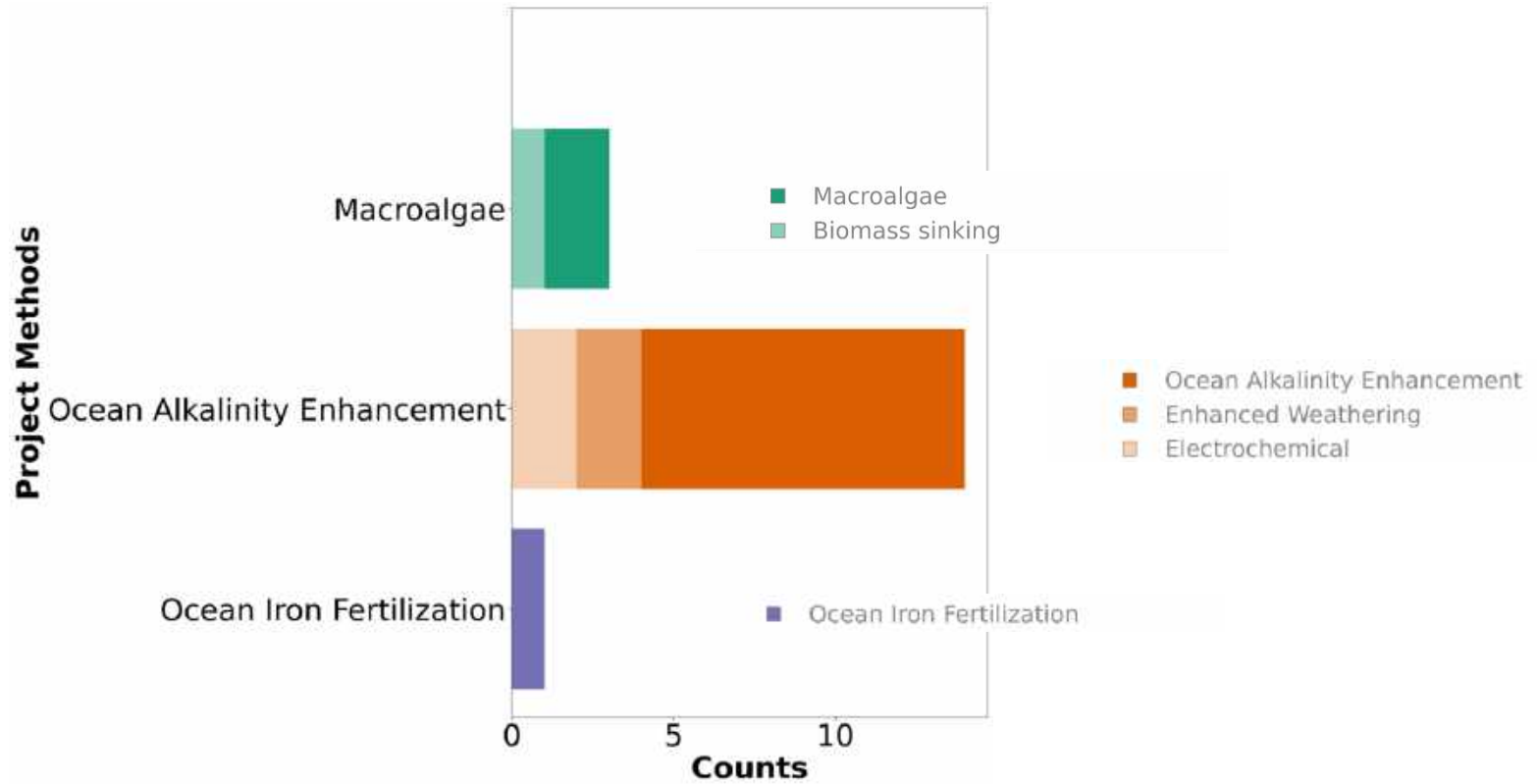
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Data visualization thanks to Dr. Kalina Grabb, OAP





# Continued interagency coordination

- NOAA will continue to lead coordination for the NOPP PIs and funding partners
- Other agencies will also manage some awards such as:
  - U.S. National Science Foundation
  - Office of Naval Research
  - ClimateWorks Foundation
- NOAA will continue to engage with the EPA to discuss permitting pathways
  - If you have questions on permitting for mCDR research, please contact Sena McCrory ([mccrory.sena@epa.gov](mailto:mccrory.sena@epa.gov) )



# Other funding opportunities

## Department of Energy's Water Power Technologies Office

- Power at Sea Prize
  - Scope: awards graduate students, small businesses, and startups developing or envisioning technologies that deliver power from the ocean.
  - Includes mCDR technologies
  - <https://www.energy.gov/eere/water/powering-blue-economy-power-sea>

## Department of Energy's Office of Fossil Energy and Carbon Management

- Notice of Intent for Carbon Negative Shot Pilots
  - Includes and Area of Interest for marine CDR pilots
  - DE-FOA-0003081 for more information
- Carbon Utilization Procurement Grants
  - Includes language about products derived from the ocean
  - DE-FOA-0002829 for more information