



# U.S. Department of Energy

## Categorical Exclusion Determination Form

Submit by E-mail

Proposed Action Title: Sensing Exports of Anthropogenic Carbon through Ocean Observation Program - SEA-CO2  
(FOA No. DE-FOA-0002989)

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): AK, AZ, CA, CO, CT, FL, HI, MA, ME, MI, NJ, NY, PA, RI, SC, TX, UT, VA, WA

Proposed Action Description:

FIRST AMENDED PROGRAMMATIC NEPA DETERMINATION (See attached original Programmatic Determination, dated February 14, 2024). The Sensing Exports of Anthropogenic Carbon through Ocean Observation (SEA-CO2) program seeks to accelerate the development of the marine carbon dioxide removal (mCDR) carbon capture industry through the advancement of scalable Measurement, Reporting and Validation (MRV) technologies. Specifically, SEA CO2 projects will advance new approaches to chemical oceanographic sensing, modeling, and data characterization by developing innovative MRV technologies and models that will allow for persistent, scaled sensing and characterization to inform a data-driven marine carbon accounting framework. If successful, the SEA CO2 program will enable MRV technology innovations to ensure that the quantity and quality of emission removals are correctly valued in carbon markets, which will support accelerated adoption of mCDR to remove historic future CO2 emissions.

This First Amended Determination covers 5 of the 11 projects (listed in Attachment A) which fit within the class of actions identified under the DOE Categorical Exclusions identified below. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements. GE Global Research has not confirmed that all necessary permits and approvals applicable to its proposed actions have been obtained and is prohibited from commencing project work at Milestone 3.1 and subsequent milestones until it is confirmed that all such permits and approvals have been obtained. Per the terms of the award, a permits certification and, if necessary, an amended NEPA determination, are required prior to the conduct of applicable project work by GE. None of the 5 projects (see Attachment A) have identified exact field testing locations and are prohibited from commencing applicable project work until such locations are identified and written confirmation is provided to ARPA-E.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

B3.15 - Small-scale indoor research and development projects using nanoscale materials

B3.16 - Research activities in aquatic environments

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D.

To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal.

The proposal has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: **GEOFFREY GOODE** Digitally signed by GEOFFREY GOODE  
Date: 2024.02.26 17:01:48 -05'00'

Date Determined:

**Attachment A: Projects in the SEA CO2 (FOA No. DE-FOA-0002989) Program**

<b>Prime Recipient (Control No.)</b>	<b>Project Title</b>	<b>Categorical Exclusion</b>
<b>University of Colorado – Boulder (2989-1522)</b>	<b>SLEUTH: Spectroscopy of Oceanic Liquid Environments Using Towed Optical Sensor Heads</b>	<b>A9, B3.6, B3.16</b>
<b>University of Utah (2989-1528)</b>	<b>SEAFloor Self-sustaining CO2 Assessment Probe Edge (SEASCAPE)</b>	<b>A9, B3.6, B3.16</b>
<b>Woods Hole Oceanographic Institution (2989-1503)</b>	<b>Quantification of Atmospheric Carbon Dioxide Removal Using an Autonomous Ocean Sensor that Measures Sinking Particulate Carbon Flux</b>	<b>A9, B3.6, B3.16</b>
<b>Woods Hole Oceanographic Institution (2989-1505)</b>	<b>Scalable, Multiparameter Chip-Size Carbon Sensors</b>	<b>A9, B3.6, B3.16</b>
<b>GE Global Research (2989-1534)</b>	<b>Spatially Resolved Multi-Parameter Sensing of Ocean Carbon Dynamics Utilizing Fiber Optic Time-Of-Flight Sensors</b>	<b>A9, B3.6, B3.16</b>
atdepth MRV (2989-1527)	A Scalable, Integrated, Real-Time, GPU-Based Modeling System to Enable MRV for mCDR	A9
Bigelow Laboratory for Oceanic Sciences (2989-1519)	Monitoring, Reporting and Verification of Zooplankton-Mediated Export Pathways for Carbon Sequestration	A9
[C]Worthy (2989-1540)	Computational Systems for Tracking Ocean Carbon (C-Star)	A9
Pacific Northwest National Laboratory (2989-1501)	Integrated Experimental and Modeling Assessment of Ocean Alkalinity Enhancement for Scalable Marine Carbon Dioxide Removal	A9, B3.6
University of Pittsburgh (2989-1550)	Hybrid Distributed pH, CO2, Temperature, and Acoustic Sensing for Monitoring and Verification of Marine Carbon Dioxide Removal Applications	A9, B3.6, B3.15
University of Texas at Austin (2989-1514)	Acoustic Methods for mCDR based on Blue Carbon Burial in Seagrass Meadows	A9, B3.6, B3.16

**Bold text indicates the 5 projects included in the First Amended CX.**



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Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): AK, AZ, CA, CO, CT, MA, ME, PA, TX, VA, WA

Proposed Action Description:

The Sensing Exports of Anthropogenic Carbon through Ocean Observation (SEA-CO2) program seeks to accelerate the development of the marine carbon dioxide removal (mCDR) carbon capture industry through the advancement of scalable Measurement, Reporting and Validation (MRV) technologies. Specifically, SEA-CO2 projects will advance new approaches to chemical oceanographic sensing, modeling, and data characterization by developing innovative MRV technologies and models that will allow for persistent, scaled sensing and characterization to inform a data-driven marine carbon accounting framework. If successful, the SEA-CO2 program will enable MRV technology innovations to ensure that the quantity and quality of emission removals are correctly valued in carbon markets, which will support accelerated adoption of mCDR to remove historic and future carbon dioxide emissions.

The SEA-CO2 program is composed of 11 small-scale research and development projects that will be conducted by universities, non-profit and for-profit entities, small businesses, and federal laboratories. This Determination covers 6 of the 11 projects (listed in Attachment A). The 6 projects fit within the class of actions identified under the DOE Categorical Exclusions identified below. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, state, and local regulatory requirements.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

B3.15 - Small-scale indoor research and development projects using nanoscale materials

B3.16 - Research activities in aquatic environments

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D.

To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal.

The proposal has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: **GEOFFREY GOODE** Digitally signed by GEOFFREY GOODE  
Date: 2024.02.14 16:30:11 -05'00'

Date Determined:

**Attachment A: Projects in the SEA CO2 (FOA No. DE-FOA-0002989) Program**

Prime Recipient (Control No.)	Project Title	Categorical Exclusion
atdepth MRV (2989-1527)	A Scalable, Integrated, Real-Time, GPU-Based Modeling System to Enable MRV for mCDR	A9
Bigelow Laboratory for Oceanic Sciences (2989-1519)	Monitoring, Reporting and Verification of Zooplankton-Mediated Export Pathways for Carbon Sequestration	A9
[C]Worthy (2989-1540)	Computational Systems for Tracking Ocean Carbon (C-Star)	A9
Pacific Northwest National Laboratory (2989-1501)	Integrated Experimental and Modeling Assessment of Ocean Alkalinity Enhancement for Scalable Marine Carbon Dioxide Removal	A9, B3.6
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University of Texas at Austin (2989-1514)	Acoustic Methods for mCDR based on Blue Carbon Burial in Seagrass Meadows	A9, B3.6, B3.16