Carbon to Sea Initiative

February 5, 2025

Director Stacey Jensen
Office of Wetlands, Oceans and Watersheds
U.S. Environmental Protection Agency
1200 Pennsylvania Ave, N.W.
Washington, DC 20460

Via *regulations.gov*

RE: LOC-NESS Wilkinson Basin Study (Proposed Permit No. EPA-HQ-MPRSA-2024-002)

Dear Director Jensen:

The **Carbon to Sea Initiative** (CTS) is a nonprofit effort whose mission is to systematically assess whether and how ocean alkalinity enhancement (OAE) can deliver safe, cost-effective, and permanent CO_2 removal at scale. We are guided by a set of core principles that emphasize transparency, an outcome-agnostic approach, strong and clear governance standards, and meaningful stakeholder engagement. The project that is the subject of EPA Permit Number EPA-HQ-2024-02 was funded in part by a grant from CTS to the Woods Hole Oceanographic Institution (WHOI).

CTS is pleased that the Environmental Protection Agency (EPA) has evaluated WHOI's updated LOC-NESS Wilkinson Basin Study Application and again made the tentative determination to issue a research permit for the proposed Wilkinson Basin Study. **We urge the agency to expeditiously issue the final permit for this study so that in-water research can take place in 2025.** This step builds on years of research by leading scientists, including prior lab and mesocosm studies.

We think that the following information from the EPA Fact Sheet on the Wilkinson Basin Study is especially important to emphasize:

- "EPA re-affirms that the proposed activities for the LOC-NESS Wilkinson Basin Study are scientifically justified." (p. 26)
- "The EPA considered the new information provided by the applicant in the Application Update (January 2025) as well as peer-reviewed studies (cited herein) published after the publication of the previous EPA Fact Sheet for LOC-NESS Phase 1 and Phase 2 (May 2024) and re-affirmed its assessment that the proposed activities would not result in severe or long-lasting adverse effects to the marine environment." (pp. 26-27)
- "Overall, the changes to the proposed activities described in the Application Update (January 2025) would decrease the geographic scale and duration of the temporary impacts resulting from the research activities." (p. 27)
- "Several experiments have demonstrated that increasing ocean alkalinity, including by adding sodium hydroxide into seawater, could reduce the impact of ocean acidification on corals, seagrasses and many marine organisms." (p. 9)

- "The EPA re-affirms its overall assessment of low likelihood of adverse, if any, impacts to esthetic, recreational and economic values." (p. 37)
- "The proposed activities are not expected to significantly affect living marine resources of recreational or commercial value. The alkalinity patch is expected to remain in the surface layer and would likely not interact with fisheries in the water column or any major fishing activity below the mixed layer depth." (p.38)
- "The proposed activities are not expected to significantly impact fisheries or economically or recreationally important species—either through direct exposure to elevated pH and alkalinity or indirectly through changes in prey availability or habitat changes." (p. 38)
- "The EPA does not expect the proposed activities to cause long-range or long-term effects to commercial or recreational fishing, navigation, recreational use of shorelines or beaches, use of living or non-living marine resources (including offshore energy development or exploration), or scientific research and study." (p. 38)

The EPA's tentative determination shows that the existing process under the MPRSA is sufficient to accommodate much-needed research on ocean-based carbon dioxide removal (oCDR). Analysis by McKinsey and Company, and others, estimates that the global market for carbon removal may exceed $1 trillion by 2050. The United States has been a leader in developing carbon management technologies. If the United States is to maintain its leadership in this rapidly developing field, it is critical to conduct research now to assess the safety and efficacy of a broad portfolio of approaches. In its 2022 **Research Strategy for Ocean-based Carbon Dioxide Removal and Sequestration**, the National Academies of Sciences, Engineering and Medicine recommended demonstration-scale in situ experimentation as essential to assess the benefits, risks, and potential scalability of a broad spectrum of oCDR approaches.

Rigorous evaluation of the proposed field research benefits the emerging oCDR sector, the environment, and the public interest. The MPRSA "prohibits or restricts disposition in the ocean that would adversely affect human health, welfare, amenities, the marine environment, ecological systems or economic potentialities."[1] CTS agrees that oCDR should gain social license to operate at significant scale in ocean waters only if its methods are shown to be both safe and effective.

By rigorously examining the materials, methods, and monitoring proposed by oCDR research projects, the EPA is assisting project proponents in ensuring that "the scientific merit...outweighs the potential environmental or other damage."[2] Research that proceeds under these conditions is likely to inform adjustments to materials, methods and monitoring to improve results, as well as provide insights necessary to plan for increasing the scale of subsequent efforts for any approaches that prove safe and effective at the research scale. It can also help identify methods that should either be abandoned or returned to the laboratory or mesocosm for further experimentation, as warranted.

The U.S. and the EPA are gaining valuable experience and insights into how the MPRSA permitting process can be fine-tuned to accommodate in-water research for oCDR technologies. A rigorous review of oCDR-related MPRSA permit applications is both expected and appreciated.

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[1] EPA, Fact Sheet On the Proposed LOC-NESS Wilkinson Basin Study, Updated January 2025, https://www.regulations.gov/document/EPA-HQ-OW-2024-0189-0047
[2] Ibid.

It is our understanding that Dr. Subhas and the WHOI have engaged with EPA regarding this permit for more than two years. With any permitting process, uncertainty and revision are to be expected. At the same time, it is important to ensure that permits are issued in a timely manner when activities are judged to meet the permitting criteria. This was previously tentatively determined and already subject to public comment. While a change in vessel availability and WHOI's analysis of its initial in-water research in 2023 resulted in updates to the proposed research permit application – those changes reduced scale and are less than previously proposed. Timely issuance of this permit is critical to provide researchers the certainty needed to conduct their field research as planned.

We strongly urge the EPA to ensure that the final permit is issued expeditiously so that this important research can proceed this summer. The proposed research and this permit represents an important step forward for the U.S. in developing an effective and timely regulatory process for oCDR research and can provide important insights into the potential of this OAE pathway.

Additional resources to supplement the record:

- Dupont, S. and Metian, M.: General considerations for experimental research on ocean alkalinity enhancement, in: Guide to Best Practices in Ocean Alkalinity Enhancement Research, edited by: Oschlies, A., Stevenson, A., Bach, L. T., Fennel, K., Rickaby, R. E. M., Satterfield, T., Webb, R., and Gattuso, J.-P., Copernicus Publications, State Planet, 2-oae2023, 4, https://doi.org/10.5194/sp-2-oae2023-4-2023, 2023.
- Cyronak, T., Albright, R., and Bach, L. T.: Field experiments in ocean alkalinity enhancement research, in: Guide to Best Practices in Ocean Alkalinity Enhancement Research, edited by: Oschlies, A., Stevenson, A., Bach, L. T., Fennel, K., Rickaby, R. E. M., Satterfield, T., Webb, R., and Gattuso, J.-P., Copernicus Publications, State Planet, 2-oae2023, 7, https://doi.org/10.5194/sp-2-oae2023-7-2023, 2023.
- Marín-Samper, L., Arístegui, J., Hernández-Hernández, N., Ortiz, J., Archer, S. D., Ludwig, A., and Riebesell, U.: Assessing the impact of CO2-equilibrated ocean alkalinity enhancement on microbial metabolic rates in an oligotrophic system, Biogeosciences, 21, 2859–2876, https://doi.org/10.5194/bg-21-2859-2024, 2024.
- Ferderer, A., Chase, Z., Kennedy, F., Schulz, K. G., and Bach, L. T.: Assessing the influence of ocean alkalinity enhancement on a coastal phytoplankton community, Biogeosciences, 19, 5375–5399, https://doi.org/10.5194/bg-19-5375-2022, 2022.
- Moras, C. A., Bach, L. T., Cyronak, T., Joannes-Boyau, R., and Schulz, K. G.: Ocean alkalinity enhancement – avoiding runaway CaCO3 precipitation during quick and hydrated lime dissolution, Biogeosciences, 19, 3537–3557, https://doi.org/10.5194/bg-19-3537-2022, 2022.

Sincerely,

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Carbon to Sea Initiative