

Dr. Scott Doney
Office of Science and Technology Policy
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November 18, 2022

Dear Dr. Doney,

We write in response to OSTP's request for information to inform the development of the agency's Ocean Climate Action Plan (87 FR 60228, October 4, 2022). The organizations and individuals submitting this letter are members of the U.S. commercial fishing industry: vessel owners, captains, crewmembers, port associations, and seafood businesses that participate in a regenerative harvesting system that provides healthy, low-carbon protein to our neighbors and the world while respecting the limits of ocean and coastal ecosystems. We do this in partnership with a federal and state fisheries science and management system that is constantly evolving to better align fishing activity with changing ecosystems and to ensure that the human and underwater elements of the coupled socio-ecological fisheries system act in harmony to sustainably co-produce the wild seafood that has been a staple of coastal economies, cultures, and food systems since time immemorial.

The signers of this letter came together under the auspices of the Fishery Friendly Climate Action campaign,¹ a grassroots initiative that empowers fishermen to advocate for robust climate solutions that work *for* U.S. fisheries and not at their expense. Since early 2022, the Fishery Friendly Climate Action campaign has facilitated the bottom-up creation of a series of public comment letters and statements through which 12 fishery associations and 40 fishermen and fishing businesses from coast to coast have collectively called on policy makers to preferentially support climate solutions that:

- Reduce, sequester, or avoid GHG emissions;
- Avoid collateral impacts on the physical, chemical, and ecological properties and processes of ocean, coastal, estuarine, and watershed environments;
- Avoid interference with the harvest and provision of wild seafood;
- Wherever possible, contribute conservation co-benefits that enhance the resilience of ocean, coastal, estuarine, and watershed ecosystems;
- Help the fishing industry address its own carbon footprint by supporting transition to low-carbon fishing vessels; and
- Contribute to putting the U.S. on track to reduce its share of GHG emissions to a level that will hold warming well below 2°C while pursuing efforts to limit warming to 1.5°C.

In this letter, signers reflect on ensuring equity and a just transition (Question 4), priorities related to seven areas of critical action (Question 2), suggestions for enhancing knowledge and science (Question 3), and our interest in continued partnership and collaboration with the Office regarding the development and ultimate implementation of this Plan (Question 5).

¹ More information can be found at www.fisheryfriendlyclimateaction.org

Equity and ensuring a just transition

A necessary part of a just transition is ensuring that the communities that are most affected by climate change are not also disproportionately impacted by the solutions pursued to combat it. Like many ecosystems and resource-dependent communities, fish and fishermen are significantly affected by the accelerating impacts of climate change. The recent high-profile closure of several Alaska crab fisheries is the latest in a growing list of climate-induced fisheries upheavals that also includes: the loss of commercial and subsistence salmon harvests in several northern California, Pacific Northwest, and Western Alaska rivers; the shrinking size of salmon throughout Alaska; the closure in 2020 of the Gulf of Alaska cod fishery; the continued failure of Atlantic cod stocks to rebuild despite minimal harvests; the closure since 2013 of the Gulf of Maine shrimp fishery; changes in whale migration patterns that lead to increased risk of entanglement in fishing gear; the spread of toxic domoic acid in phytoplankton and harvested resources on the West Coast; and population-wide poleward shifts of many marine species on both coasts.

Authors of an Ocean Climate Action Plan should ensure that ocean ecosystems and fishing communities do not also bear a disproportionate burden of the negative impacts resulting from climate solutions, particularly from the industrialization of nearshore waters, which would export the mostly terrestrial problem of establishing ‘sacred groves’ and ‘sacrifice zones’ to a massive and vulnerable new maritime domain. Increasingly, we hear statements from within the Biden Administration lauding the ocean as “part of the climate solution” and urging policy makers and investors to view the ocean as a climate “hero” instead of a “victim.” But this well-meaning rhetoric comes close to being a dangerous reformulation of what industrial economies have been doing for centuries: conscripting the ocean to clean up our messes. By absorbing 30% of anthropogenic greenhouse gas (GHG) emissions, the ocean is already doing more than its share to combat climate change, in the process straining many of its fragile ecosystems to the breaking point. It is vital to ensure that the work of addressing the climate crisis enhances, and does not further burden or jeopardize, the absorptive capacity and resilience of ocean ecosystems and those who depend on them.

Therefore, in this letter, we reiterate the need to prioritize fishery friendly climate actions (as defined on page 1) and to replace zero-sum tradeoffs with win-win solutions that mitigate the root causes of climate change without further taxing the resilience of ocean ecosystems and their dependent human communities. The longer policy makers, individuals, and businesses delay action to reduce GHG emissions, the more we are faced with sharp tradeoffs, including decisions that pit rapid scale-up of renewable energy infrastructure and geo-engineering practices against the integrity of landscapes, seascapes, wildlife, and resource-dependent communities. Public discussion must immediately move beyond the misguided question of *whether* to address the root causes of climate change, and quickly shift to the question of *how* to best address root causes while *also* upholding the ecosystems and economies that are most affected by clean energy development and carbon removal practices – including, but not limited to, oceans and fisheries.

Critical Actions and Issues

In light of the above, we strongly advise the authors of an Ocean Climate Action Plan to focus not on *maximizing* the growth of ocean-based climate solutions *at any cost*, but rather on reaching necessary GHG mitigation goals with *minimal* negative impacts on the oceans. The Plan must identify challenges and opportunities at a fine scale and build upwards, rather than identify solutions and strategies that are broadcast across geographies and ecosystems; this is a recipe for failure, inefficiency, and inequity. In other words, the question planners should be asking themselves is not, “How can we maximize the clean energy and carbon sequestration potential that the ocean delivers?” but rather, “How can we work with communities to design an economy-wide energy transition and carbon sequestration platform that achieves net-zero goals by mid-century with as little negative impact to the ocean as possible?” Such a plan should not limit its focus to climate solutions that take place in the ocean, for it is just as important to evaluate and address potential impacts to ocean ecosystems from solutions that take place on land.

Below, we consider seven specific “critical action” areas that merit consideration in an Ocean Climate Action Plan. These topics are not exhaustive. Indeed, one area which we will not discuss in this letter – climate-ready fisheries – is also top of mind for many of the signers. However, submission length limits preclude us from a comprehensive treatment of all of the many climate-related issues affecting fisheries. Thus, we will limit our focus to actions with potential to address the root causes of climate change through reduction and removal of GHG emissions.

Throughout our reflection, we will consistently reiterate a key theme: deployment of GHG emissions reduction and removal processes, both in the ocean and on land, must be done in a way that *leads with* and *maximizes* use of technologies and practices that offer win-wins for, or are known to have no significant impact on, ocean ecosystems and fisheries. Immediate maximization of no-regrets strategies will buy time to fill existing knowledge gaps regarding the impacts of riskier, large-scale clean energy and carbon removal technologies, and to establish mitigation pathways through public processes and guardrails that minimize and mitigate these negative impacts.

Ocean-based renewable energy. Any large-scale energy production taking place in the ocean – whether renewable or fossil fuel-based -- is likely to have impacts on ocean ecosystems, and may negatively affect fishing through displacement of fishing activity, disruptions to scientific fish survey methodologies, and increases in safety risk, investment risk, and costs of doing business for fishing operations. In the case of offshore wind development, specific impacts of concern to fishery resources and ocean ecosystems include: noise, vibration, and turbidity during construction and cable laying; reduction in kinetic energy via wake effects of turbines (which can induce changes in stratification, temperature, cloudiness, and primary productivity); reductions in wind-driven coastal upwelling that may disrupt multiple fragile ocean ecosystems; impacts of electromagnetic fields on migratory behavior; etc. While the precise nature and magnitude of impacts resulting from offshore renewable energy development cannot be known in advance and will depend on the siting and density of development, it goes without saying that the greater the scale of development, the greater the magnitude of cumulative impacts will be.

Given the potential for significant ocean ecological impacts to occur, expanded efforts are needed to understand the impacts of offshore renewable energy development at a variety of scales and to develop holistic and adaptive governance schemes capable of balancing competing objectives, addressing cumulative impacts, and setting upper bounds for the level of impacts that will be considered tolerable. For more information on the elements that an appropriate governance scheme for offshore renewable energy development should include, we refer you to the Responsible Offshore Development Alliance’s “Goals for Collaboration.”² Although these goals were created with offshore wind in mind, they are equally applicable to any other kind of energy development and are very similar to recommendations that have been put forth by the scientific community around ocean-based carbon removal, as we will discuss below.

In the meantime, we encourage policy makers to dramatically accelerate the deployment of no-regrets emissions reductions strategies, such as:

- a) Maximizing deployment of energy efficiency technologies and energy conservation practices;
- b) Preferentially encouraging energy development in the built environment (e.g., rooftops, buildings, industrial and commercial lands, parking lots, and highways), brownfields, landfills, and working lands; and
- c) Encouraging deployment of energy storage and time-variant pricing in order to smooth the electricity demand curve to coincide with times of peak land-based production.

Together, these actions can help alleviate pressure on ocean environments by reducing both the speed and scale of offshore energy development to levels that are more appropriate given current knowledge and governance gaps, and more in keeping with the precautionary principle of environmental governance. An Ocean Climate Action Plan should embody these principles.

Coastal and ocean CDR. Carbon dioxide removal (CDR) in the coastal and ocean environment is a relatively novel set of tools in the climate solutions toolbox, and one that contains a variety of different approaches with potential both for valuable win-wins and for severe unintended consequences. Ramping up carbon removal is vital, given that it will no longer be possible to achieve international climate goals through emissions reductions alone. However, as with the energy transition, it is imperative to pursue a two-track approach that maximizes and front-loads strategies that pose little risk to ocean and other ecosystems (especially those that offer environmental and social co-benefits), while holding back riskier strategies for deployment at a more gradual pace that allows for thorough study and development of precautionary governance approaches.

Coastal and underwater vascular vegetation, such as salt marshes, sea grasses, and mangroves, is known to sequester a large amount of carbon. The habitats created by these plants also provide valuable ecosystem services to humans and fishery ecosystems, including water filtration, shoreline stabilization, storm protection, and refuge habitat for fish and invertebrates. Yet these vegetated coastal ecosystems have been lost at alarming rates due to residential and commercial development, energy development, aquaculture, and other stressors. This loss has had profound impacts on fishery ecosystems and seafood yields. Protection and natural restoration of coastal blue carbon is a win-win for fisheries and the climate, and should be at the top of the list of

² More information can be found at <https://rodafisheries.org/offshore-wind/>

carbon removal strategies. Commercial fishermen and small-scale mariculture growers represent ideal partners in this work.

Other potential ocean-based carbon removal methods are more novel and less understood. The National Academy of Sciences' 2022 publication *A Research Strategy for Ocean-Based Carbon Dioxide Removal and Sequestration* assesses six carbon removal practices: nutrient fertilization (i.e., addition of iron, phosphorous, or nitrogen to nutrient-limited areas of the ocean to stimulate photosynthetic activity by phytoplankton); artificial upwelling (i.e., mechanized transfer of nutrient-rich waters from depth to the surface to stimulate photosynthesis by phytoplankton) and downwelling (i.e., mechanized transfer CO₂-rich surface waters to depth for long-term storage); seaweed cultivation and transport to a carbon reservoir (e.g., in deep waters); recovery of ocean and coastal ecosystems (e.g., protection of kelp forests and *Sargassum* seaweed, long-lived marine mammals, and other animals); ocean alkalinity enhancement (i.e., addition of alkaline minerals and/or use of electrochemical or thermal reactions to increase the alkalinity of ocean water); and electrochemical approaches (i.e., approaches that pass electric currents through seawater in order to induce electrolysis and alter pH).

The NAS report finds that all ocean-based CDR approaches will modify the marine environment in some way, with both intended and unintended impacts on ecosystems and human communities. Potential impacts vary by approach, but could include alterations in marine chemistry and food web structure, and in some cases, displacement of fishing activities. In theory, some ocean-based CDR could also have co-benefits for fisheries: for instance, ocean fertilization could lead to enhanced fishery productivity, and alkalinity enhancement could counteract the effects of ocean acidification induced by the ocean's absorption of atmospheric CO₂. However, the current state of knowledge regarding both the efficacy of these approaches and their impacts is currently inadequate for making informed decisions, and governance systems do not yet exist to minimize or mitigate any negative impacts that may result from these approaches.

For these reasons, we concur with the NAS report that extensive pilot testing must be done before any of these approaches can be deployed at scale. We also concur with the Aspen Institute Energy & Environment Program's 2021 publication *Guidance for Ocean-Based Carbon Dioxide Removal Projects: A Pathway to Developing a Code of Conduct*, in its call for a Code of Conduct for ocean-based CDR rooted in "precaution, care, and thorough oversight to ensure protection of marine ecosystems and biodiversity, allow for consideration of impacts on coastal economies and cultural values and priorities, minimize harm, and avoid or at least allow early detection of and adaptation to other unintended negative consequences."

Land-based CDR. Many land-based carbon sequestration solutions have valuable co-benefits for oceans and fisheries, and these co-benefits merit inclusion in an Ocean Climate Action Plan. Land-based carbon removal approaches that are ready for large-scale deployment include afforestation/reforestation and agriculture-based soil carbon conservation. Both approaches not only have potential to remove and store carbon at low cost, but to do so in a way that provides co-benefits to landscapes, waterways, and ecological and human communities. For example, protecting and enhancing forested cover around watersheds can improve water quality, enhance water storage, reduce runoff, and provide a myriad of other benefits of value to anadromous and

downstream fisheries. Similarly, soil carbon conservation practices, such as no-till agriculture and cover cropping, can reduce runoff of chemicals and sediments into watersheds while retaining nutrients on farmland, in turn reducing the need for fossil fuel-based fertilizers and alleviating eutrophication in waterways and coastal areas. When pursuing policies and investments designed to maintain/expand forested acreage and invest in soil conservation techniques, elevated priority should be accorded to locations where co-benefits to fisheries can be achieved. An Ocean Climate Action Plan can highlight these connections.

Area-based marine conservation. President Biden’s Executive Order 14008 on Tackling the Climate Crisis at Home and Abroad directs the Department of Interior, Department of Agriculture, Council on Environmental Quality, and National Oceanic and Atmospheric Administration to conserve 30% of U.S. lands and waters by 2030 while “working with State, local, Tribal, and territorial governments, agricultural and forest landowners, fishermen, and other key stakeholders”. In the “Conserving and Restoring America the Beautiful” report, these agencies declare that:

Decades of land and water stewardship by ranchers, farmers, fishers, hunters, private property owners, conservation organizations, Tribal Nations, territories, State and local governments, and others have demonstrated that the most effective and enduring conservation strategies are those that reflect the priorities, needs, and perspectives of the families and communities that know, live, work, and care for the lands and waters.

We couldn’t agree more with these words, but if they are to be more than just words, OSTP and other federal agencies must pursue genuine engagement of fishing communities as allies, rather than perceived adversaries, of the marine environment. All too often in the past, this has not been the case, and we fear that implementation of the Ocean Climate Action Plan will be no exception. Any new area-based management implemented as a result of this initiative must be achieved in partnership with coastal communities through bottom-up planning that is designed with specific ecological goals or challenges in mind (such as community resilience or enhanced seafood production), rather than simply pursuing arbitrary quantitative objectives for protected areas or pursuing a top-down strategy that assumes *a priori* that area-based management or the exclusion of ocean users is the optimal solution for a given challenge. Therefore, the Ocean Climate Action Plan must develop a plan for engagement with fishing community members such as the undersigned using a bottom-up approach that identifies issues, challenges, and opportunities first, and develops tailored solutions second.

Sourcing of critical minerals. Many of the technologies in line for mass deployment as part of the shift from fossil to renewable energy and the electrification of previously fossil-fuel powered functions like transportation and heating will require the sourcing of large quantities of copper, lithium, nickel, cobalt, and other minerals. In fact, companies and investors are already lining up to pursue new mining ventures both on land and in the deep sea, and we are seriously concerned about the potential for new mining activity to exert deleterious impacts on oceans, watersheds, fisheries, and the people who depend on these fisheries for income and food.

An Ocean Climate Action Plan should include guidance for ensuring that mining activity associated with provisioning the green economy does not jeopardize critical fishery habitat. The

plan should identify geographic areas of concern where overlap exists between valuable mineral deposits and valuable fish habitat, and point to federal authorities available to minimize and mitigate impacts in these places through environmentally sensitive siting and other protections. In addition, we strongly recommend federal leadership in spurring research, investments, and innovations to support efficiency in materials usage and recycling of spent materials so as to reduce the amount of mining needed to supply the green economy.

Low-carbon fishing vessels. To support practical, cost-effective, and voluntary emissions reductions within the fishing industry itself, we recommend the streamlining of existing federal programs (e.g., Diesel Emissions Reduction Act) as well as the establishment of new and diverse dedicated funding streams to support bottom-up planning and innovation. At present, availability of financing for capital upgrades in fisheries tends to be scarce. Funding streams for energy efficiency and alternative fuels can fill a niche gap and increase industry resilience through upgrades that not only reduce vessel emissions but also achieve cost savings, safety improvements, and fleet modernization.

Because of variations in fishing activity patterns, vessel size and configuration, and local cultural, economic and regulatory conditions, there is no “one size fits all” emissions reduction solution that will work for the entire U.S. fishing fleet. Some technologies may require infrastructure investments on the waterfront (e.g., electric charging stations) or development of new supply chains and distribution networks (e.g., inventory and delivery of biofuels, ammonia, or hydrogen) in order to be feasible. In some cases, energy efficiency may be more effective and affordable than upgrading engines or switching to alternative fuels. Harbor design and electrification challenges in remote communities may enable or constrain certain approaches. Solutions must be designed and led by those who best understand the unique needs of this sector: fishing vessel owners and operators themselves.

Sustaining fisheries as a low-carbon food source. Food systems are responsible for about a third of global greenhouse gas emissions.³ Wild seafood and farmed shellfish generally have a low carbon footprint relative to land-based protein and farmed finfish.⁴ Consequently, sustaining the harvest of wild seafood represents an important societal objective, not only from the vantage point of coastal communities who depend on fishing and seafood for income and cultural continuity, but for the sake of the food and climate systems more generally. However, as outlined in several instances above, sustainable yields of low-carbon seafood may be threatened not only by climate change but by some of the solutions proposed to combat it. Authors of the Ocean Climate Action Plan should acknowledge these tradeoffs and consider how to boost the resilience of the fisheries system as it contends with both the impacts of climate change and ocean-based climate solutions. For example, just as the Inflation Reduction Act, Bipartisan Infrastructure Act, and Farm Bill make climate-smart investments in energy, transportation, and agriculture, the Ocean Climate Action Plan can signal the need to invest in fisheries as a core component of a low-carbon food system.

³ Crippa, M., et al. 2021. Food systems are responsible for a third of global anthropogenic GHG emissions. *Nat Food* 2: 198–209. doi.org/10.1038/s43016-021-00225-9

⁴ Hilborn, R. et al. 2018. The environmental cost of animal source foods. *Front Ecol Environ* 16(6): 329–335. doi:[10.1002/fee.1822](https://doi.org/10.1002/fee.1822)

Knowledge, Science, and Technology

The introduction of major new uses like offshore renewable energy and carbon removal technologies, at a time when the ocean is already changing in unprecedented ways as a result of climate change, necessitates the compilation and integration of as much information as possible on a very short timeline. You have asked respondents to share input regarding the way that Indigenous knowledge can be highlighted to inform solutions. We advocate for the additional incorporation of fishermen’s ecological knowledge (FEK) as vital to this effort.

FEK is the information fishermen accumulate over time through daily interaction with the ecosystem, supplemented by knowledge passed on by previous generations and fellow fishermen. FEK can fill gaps in scientific knowledge by providing rich historical and real-time information about ecological and socioeconomic dynamics, while also ensuring that planning efforts promote greater equity for ocean users. FEK can be a source of many different kinds of information ocean-based climate planning, including but not limited to characteristics and changes in fisheries usage, habitat, population dynamics, and ecosystem structure and function. FEK can provide detailed ecological information that may be especially useful at small spatial scales and in instances where environmental change has altered historical ecological patterns with a potential for future reemergence.

The White House’s 2020 “Memorandum on Indigenous Traditional Ecological Knowledge and Federal Decision Making” and NOAA’s 2019 memo “Guidance and Best Practices for Engaging and Incorporating Traditional Ecological Knowledge in Decision-Making” offer helpful roadmaps for integration of Indigenous knowledge into federal decision making. However, no official guidance has been promulgated to guide the collection and application of FEK in agency processes. This is a conspicuous gap, and one that we recommend addressing, beginning with the Ocean Climate Action Plan.

Partnership and collaboration

U.S. fishing communities and seafood businesses stand ready to collaborate with the Office of Science and Technology and the Ocean Policy Committee to ensure that the Ocean Climate Action Plan contributes to reaching GHG emissions reduction goals while sustaining the vital role that our nation’s fisheries play in supporting jobs, coastal communities, national food security, and low-carbon protein. We encourage the Office and Committee to communicate and coordinate with our industry through the Fishery Friendly Climate Action campaign.⁵ Additionally, a growing number of state and regional working groups around the U.S. are working to empower commercial fishing and seafood businesses to advance climate-related priorities of their members. These include the Seattle-based Working Group on Seafood and Energy and the Alaska Fishing Communities Climate Change Work Group. As groups like these expand and multiply, they too can be a resource to federal leadership with regard to fishery friendly climate action.

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Sincerely,

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