



111 SW Columbia Street, Suite 200
Portland, Oregon 97201
pewtrusts.org

January 25, 2021

Ms. Catherine Macdonald, Chair
Oregon Global Warming Commission
550 Capitol St. NE
Salem, OR 97301
Submitted via email: oregon.GWC@oregon.gov

Dear Ms. Macdonald and Global Warming Commission Members:

RE: The Pew Charitable Trusts' Comments on the Global Warming Commission's Natural and Working Lands Proposal

Thank you for the opportunity to comment on the Oregon Global Warming Commission's (Commission) work plan to fulfill Governor Brown's Executive Order 20-04, which (among other issues) tasks the Commission with submitting a proposal to the Governor for consideration of adoption of state goals for carbon sequestration and storage by Oregon's natural and working landscapes. This proposal, which will include development of Oregon's first natural and working lands (NWL) inventory, goals to increase sequestration in this sector, and associated policy options, will represent an important piece of the state's overall climate mitigation efforts while yielding significant adaptation and resilience co-benefits.

The Pew Charitable Trusts' (Pew's) main interest relative to the Commission's NWL proposal is to elevate the critical role healthy coastal and subtidal landscapes play in capturing and storing carbon, and advance science-based approaches for including these "blue carbon" habitats in the NWL proposal. On a per acre basis, blue carbon habitats can store up to 10 times more carbon¹ in the soil than forests, while also protecting frontline communities from sea level rise and flooding, filtering water, and providing vital habitat for salmon and other wildlife. By including and accounting for tidal wetlands (particularly tidal forested swamps) and seagrass habitats into the NWL proposal, the Commission will lay the foundation for Oregon to harness the greenhouse gas (GHG) mitigation potential of these resources.

Accordingly, we encourage the Commission to include blue carbon habitats in the baseline inventory and projections, as well as in the development of carbon storage and sequestration goals, in the NWL proposal that will be submitted to Governor Brown in June 2021. We specifically highlight the following for the Commission's consideration:

- The coastal and subtidal landscapes found in Oregon's estuaries – when intact and restored – represent important carbon sinks, but they also can become sources of emissions when degraded. As such, these ecosystems are important to consider in GHG accounting and reduction efforts.

¹ The National Oceanic and Atmospheric Administration (NOAA) Fisheries Service: Coastal Blue Carbon (<https://tinyurl.com/y6a2zkgs>)

- Mapping and tools exist to develop a baseline “blue carbon inventory” even in relatively data-poor situations.
- Incorporating blue carbon into state mitigation strategies will enable Oregon to leverage and advance other priorities, including the adaptation strategies described in the Draft Climate Change Adaptation Framework, modernizing the state’s estuary management plans, and enhancing coastal fisheries and increasing biodiversity.

Estuaries and Blue Carbon

Coastal ecosystems, including tidal salt marshes, seagrass meadows, mangroves, and brackish river outflow wetlands, have recently been recognized for their impressive ability to store carbon.² Unlike terrestrial forests, most of the carbon is stored in the soil; if left undisturbed, these blue carbon ecosystems can store carbon for hundreds of years, preventing that carbon from contributing to climate change.³ In its 2017 annual greenhouse gas inventory,⁴ the United States Environmental Protection Agency (EPA) estimated that for the period between 1990 and 2016, coastal wetlands in the United States provided a net sink of 8.5 million metric tons of carbon per year,⁵ the equivalent of approximately 1.8 million cars driven annually.

Although Oregon’s coastal habitats occupy a small footprint relative to other landscapes, they represent an important natural climate solution because of their ability to trap and store significant amounts of carbon for long periods of time. Oregon’s tidal forested wetlands, for example, have been identified as significant carbon sinks and are projected to be particularly resilient in the face of sea level rise. A recent study⁶ noted that the Pacific Northwest’s tidal forests are equivalent to mangrove forests in terms of carbon stocks. Given that Oregon has lost over 95% of its tidal forested wetlands due to extensive diking and vegetation conversion,⁷ restoration of these habitats could play an important role in increasing carbon sequestration while also providing habitat for juvenile salmonids and delivering other important ecosystem services.

In addition, Pew recommends the Commission consider the role of impounded coastal wetlands – i.e., wetlands that have been drained for farmland or blocked by roads, which is evident within most of Oregon’s 22 major estuaries – in releasing greenhouse gases, particularly methane. Recent studies indicate that reconnecting wetlands with ocean tides by removing anthropogenic barriers can avoid these emissions, while also helping to create future carbon storage opportunities through restoration.⁸ For example, a study from Massachusetts’s Waquoit Bay Research Reserve found that restoring tidal flow to 1,100 acres of degraded wetlands could, over four decades, prevent estimated carbon dioxide emissions of up to 300,000 tons from entering the atmosphere.⁹ Opportunities associated with these restoration efforts (e.g., climate funding) could also help coastal communities facing challenges related to the marginalization of agricultural lands from sea level rise, saltwater intrusion and subsidence. Pew is working with the Smithsonian Environmental Research

² Chastain, S.G., K. Kohfeld, and M.G. Pellatt, Carbon Stocks and Accumulation Rates in Salt Marshes of the Pacific Coast of Canada. *Biogeosciences Discuss.*, 2018. 2018: p. 1-45

³ Hodgson, C. and A. Spooner, The K’ómoks and Squamish Estuaries: A Blue Carbon Pilot Project; Final Report to North American Partnership for Environmental Community Action (NAPECA). 2016, Comox Valley Project Watershed Society

⁴ See: <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks>

⁵ Crooks, Sutton-Grier, Troxler, Herold, Bernal, Schill-Beers, Wirth. Coastal wetland management as a contribution to the US National Greenhouse Gas Inventory. *Nature Climate Change*, vol 8, December 2018. <https://doi.org/10.1038/s41558-018-0345-0>

⁶ Kauffman JB, Giovanonni L, Kelly J, et al. Total ecosystem carbon stocks at the marine-terrestrial interface: Blue carbon of the Pacific Northwest Coast, United States. *Glob Change Biol.* 2020;00:1–14. <https://doi.org/10.1111/gcb.15248>

⁷ See: https://appliedeco.org/wp-content/uploads/Brophy_2019_Oregon_tidal_swamp_and_marsh_losses_FINAL_Dec2019.pdf

⁸ See <https://environment-review.yale.edu/tidal-marsh-restoration-could-be-powerful-tool-fight-global-warming>

⁹ See: http://nerssciencecollaborative.org/media/resources/TerraCarbon_HRR_Feasibility_v1.7_Clean.pdf

Center to summarize opportunities related to coastal wetland impoundments in Oregon and other states and would be happy to share this research with the Commission when completed (likely end of February).

Incorporating Blue Carbon in the NWL Inventory

The NWL baseline inventory is foundational to the overall NWL plan and provides an opportunity to include a first-generation accounting of the state's blue carbon to inform NWL goals and future plan updates. Oregon is fortunate to have access to mapping and research to facilitate the development of an initial baseline, and subsequent updates to the inventory can incorporate improvements in the data that will come about given the growing body of blue carbon research in the Pacific Northwest. Pew is equipped to help connect the state with new and ongoing research as appropriate, as well as provide expertise related to blue carbon accounting. In particular, we would like to highlight the following information sources that could facilitate the inclusion of blue carbon into the inventory:

- Research conducted by the Pacific Northwest Blue Carbon Working Group¹⁰
- Research on current and historic forest tidal wetland habitat conducted by Laura Brophy (Institute for Applied Ecology)¹¹
- Coastal habitat mapping conducted via the Pacific Marine and Estuarine Fish Habitat Partnership.
- Federal datasets, including NOAA's [Coastal Change Analysis Program \(C-CAP\)](#)
- Guidance for incorporation of wetlands into GHG inventories: [2013 Supplement to the 2006 Guidelines for National Greenhouse Gas Inventories: Wetlands](#)

Blue Carbon Leverage Opportunities

Climate mitigation goals, which focus on reducing greenhouse gases, and climate resilience goals, which help communities adapt to inevitable changes, are distinct but interconnected. Many NWL strategies developed for mitigation purposes can also contribute significantly to adaptation, creating synergies and economies of scale that would be invaluable given resource constraints. For example, new policies and funding associated with the state's NWL plan can be coordinated with those developed via the draft Climate Change Adaptation Framework.¹²

Pew would also like to highlight the opportunity to use existing land use frameworks for Oregon's estuaries to help advance GHG reduction goals. Statewide Planning Goal 16, via required 'management units' and associated estuary management plans, could be used to identify areas where restoration and improved conservation would increase Oregon's carbon sinks while also addressing key resilience and adaptation goals related to sea level rise and flooding. Estuary management plans provide a vehicle by which managers can incorporate carbon storage and sequestration information spatially to help prioritize areas of demonstrable carbon value and link this work with management efforts related to coastal resiliency, restoring salmon habitat, and other critical challenges facing Oregon's estuaries.

¹⁰ See: <https://www.pnwbluecarbon.org/> and Kauffman JB, Giovanonni L, Kelly J, et al. Total ecosystem carbon stocks at the marine-terrestrial interface: Blue carbon of the Pacific Northwest Coast, United States. *Glob Change Biol.* 2020;00:1–14. <https://doi.org/10.1111/gcb.15248>

¹¹ See <https://appliedeco.org/ecoregions/oregon-coast/>

¹² See <https://www.pewtrusts.org/en/research-and-analysis/speeches-and-testimony/2020/11/15/pew-recommends-oregon-adopt-nature-based-approach-to-coastal-resilience>

Conclusion

The inclusion of coastal blue carbon habitats into the NWL proposal is an opportunity to deliver a triple win for Oregon to address climate change through mitigation, adaptation and resilience. With national momentum¹³ building for the inclusion of coastal lands and waters as part of new climate mitigation efforts (including potential commitments made via the Paris Agreement), Oregon can lead the country in protecting and restoring blue carbon ecosystems. Pew welcomes the opportunity to help build knowledge and advance science-based policies in support of Oregon's blue carbon efforts.

We thank you for the opportunity to comment on the Commission's efforts relative to natural and working lands and look forward to engaging as the work progresses.

Sincerely,

Jos Hill
Project Director, Pacific
Conserving Marine Life in the United
States

Sylvia Troost
Senior Manager
Conserving Marine Life in the United
States

¹³ See: <https://bonamici.house.gov/media/press-releases/bonamici-announces-ocean-based-climate-solutions-act>