THE PEW CHARITABLE TRUSTS

2005 Market Street, Suite 2800 215.575.9050 Phone
Philadelphia, PA 19103-7077

901 E Street NW 202.552.2000 Phone
Washington, DC 20004
www.pewtrusts.org

April 24, 2020

Mr. Tancred Miller
Program Manager, Division of Coastal Management
North Carolina Department of Environmental Quality
400 Commerce Ave
Morehead City, North Carolina 28557
Submitted via email

Dear Mr. Miller:

RE: The Pew Charitable Trusts' Comments on the draft Assessment and Strategy of the North Carolina Coastal Management Program (2021-2025)

Thank you for the opportunity to provide comments on the Division of Coastal Management's draft Assessment and Strategy of the North Carolina Coastal Management Program for fiscal years 2021 through 2025 (henceforth referred to as the 309 Strategy), conducted as part of the Coastal Zone Enhancement Program under section 309 of the Coastal Zone Management Act. Every five years, this program allows states and territories to assess their coastal zone management programs across nine enhancement areas (wetlands, coastal hazards, public access, marine debris, cumulative and secondary impacts, special area management plans, ocean and Great Lakes resources, energy and government facility siting, and aquaculture), rank specific areas in order of priority, and develop new five-year strategies in these areas to improve protection and management of coastal resources through the development of enforceable policies. The Coastal Zone Enhancement Program helps states develop forward-looking plans for the coast that address current and emerging issues. Comprehensive planning efforts like the 309 process that guide strategic use of limited funding and result in improved coastal policy outcomes are of critical importance now, given the challenges facing our state's coastal resources and communities, including storms, sea level rise, and habitat loss and degradation.

The Pew Charitable Trusts' (Pew's) main interests relative to the Coastal Zone Management Act and the 309 Strategy are to promote and maintain healthy coastal ecosystems and to reduce the impacts of floods and hurricanes on communities. Healthy coastal and marine ecosystems provide many benefits and services that support strong coastal communities and help mitigate climate-related impacts such as sea level rise and intensifying coastal storms. With the 309 Strategy update occurring at the same time as other important policy developments in North Carolina, including Governor Cooper's Executive Order 80 (EO 80) and the Coastal Habitat Protection Plan (CHPP) update, we believe the Division of Coastal Management has an opportunity to coordinate and leverage the Coastal Management Program's 309 Strategy with these related efforts for effective management of North Carolina's coastal zone.

North Carolina's draft 309 Strategy for the period 2021 through 2025 identified **coastal hazards** and **aquaculture** as high priority enhancement areas that could result in new enforceable policies for North Carolina's Coastal Management Program (CMP). Pew agrees that these are important enhancement areas for the CMP to focus on in the context of the 309 Strategy. In addition, we would like to underscore the importance of the **wetlands** and **ocean resources** enhancement areas within the CMP given the growing threats (e.g., development, sea level rise, warming temperatures) facing these resources that provide a suite of ecosystem services, many of which serve to increase the resiliency of coastal communities.

Wetlands

We recognize the need to strategically prioritize limited 309 funding among the nine enhancement areas of the Coastal Zone Enhancement Program and recommend elevating Wetlands as either its own enhancement area or as a key "natural defenses" strategy under Coastal Hazards. Wetlands are an irreplaceable component of North Carolina's coastal zone. They provide valuable ecosystem services, such as supporting local businesses (e.g. fisheries[1]) and recreational activities, protecting coastlines, reducing nutrient loading into coastal waters (critical for wild fisheries and shellfish farming),[2] [3] and sequestering carbon. With particular respect to EO 80, wetlands can dramatically reduce storm surge experienced by vulnerable coastal communities and shoreline erosion,[4] and are major carbon sinks, accounting for 98% of the total carbon pool in North America.[5] Wetlands are too valuable to lose; on a global scale, they provide tens to hundreds of thousands of dollars in ecosystem services per hectare annually.[6] A recent study estimated that wetland losses increased property damage from Hurricane Irma by $430 million.[7]

Among east coast states, North Carolina has some of the most extensive coastal wetlands, but these areas are at risk. The growth in coastal development in North Carolina over the last decade and increasingly frequent and intense storm events threaten the health and extent of estuarine wetlands. Our state's palustrine wetlands (e.g., forested wetlands, pocosins and fresh marshes), which are vital for protecting estuarine water quality and reducing flooding, also are in decline. Between 1996 and 2010, North Carolina was among the top five states in loss of palustrine

[1] Lellis-Dibble, K. A., McGlynn, K. E., & Bigford, T. E. (2008). *Estuarine fish and shellfish species in US commercial and recreational fisheries: economic value as an incentive to protect and restore estuarine habitat*.
[2] Mitsch, W. J.,and J. G. Gosselink (2008). *Wetlands*. Van Nostrand Reinhold, New York, New York, USA.
[3] Engle, V. D. (2011). *Estimating the provision of ecosystem services by Gulf of Mexico coastal wetlands. Wetlands*, 31(1), 179-193
[4] Barbier, E. B., Hacker, S. D., Kennedy, C., Koch, E. W., Stier, A. C., & Silliman, B. R. (2011). *The value of estuarine and coastal ecosystem services*. Ecological monographs, 81(2), 169-193.
[5] Bridgham, S. D., Megonigal, J. P., Keller, J. K., Bliss, N. B., & Trettin, C. (2006). *The carbon balance of North American wetlands. Wetlands*, 26(4), 889-916.
[6] Costanza, R., De Groot, R., Sutton, P., Van der Ploeg, S., Anderson, S. J., Kubiszewski, I., ... & Turner, R. K. (2014). *Changes in the global value of ecosystem services*. Global environmental change, 26, 152-158.
[7] Sun, F. and Carson, Richard (2020). *Coastal wetlands reduce property damage during tropical cyclones*.

wetland occurring in coastal counties,[8] due in part to conversion of this habitat to other land uses like agriculture and development. New federal rules related to Waters of the United States will likely reduce protections for palustrine wetlands that are not adjacent to navigable waters, which could further accelerate conversion of these habitats to other land uses.

In order to protect the state's existing coastal wetlands, we recommend that the CMP consider strategies that prioritize avoidance of impacts over mitigation, particularly since new wetlands created as offsets for mitigation purposes are rarely functionally equivalent to the established tidal wetlands that were lost in the first place.[9] In addition, since avoidance will not always be possible, we recommend embracing emerging technologies to help inventory the state's most valuable wetlands, and focusing limited resources on conserving these areas. This strategic approach could be the focus of a 309 Project of Special Merit (PSM).

We would also like to highlight the need to proactively conserve undeveloped space as future habitat for coastal wetlands (e.g. future wetland designation). Because of the vulnerability of the state's estuarine wetlands to inundation and drowning caused by sea level rise, we recommend the program – either as a specific wetlands strategy or through the coastal hazards strategy – advance efforts to identify and protect marsh migration corridors through special area management planning or similar state planning processes to enable salt marshes to persist in the future. Given the population growth occurring in North Carolina's coastal plain, the region harboring approximately 95% of the state's wetlands,[10] planning approaches aimed at avoiding development in areas vulnerable to "coastal squeeze" (i.e., areas where inland retreat is impossible due to hardened structures) are critical. This can be achieved through continuation and expansion of the CMP's Certified Land Use Plan program and leveraging relevant federal funding sources.

We note that the CMP is considering a PSM to explore opportunities to integrate marsh migration areas into the state's "Areas of Environmental Concern" system. We welcome the opportunity to assist in the development of a PSM and express our support to the National Oceanic and Atmospheric Administration (NOAA) for the project. We also recommend that the CMP consider on-going policy developments related to salt marsh conservation currently taking place via the CHPP update process. The Albemarle-Pamlico National Estuary Partnership (APNEP) is anticipated to update its Comprehensive Conservation and Management Plan soon, which also offers possible leverage opportunities.

Finally, we would like to commend the Division of Coastal Management's successful efforts described in the draft 309 Strategy to advance the use of living shorelines, including working with the Army Corps of Engineers to streamline permitting for living shorelines to protect

[8] Gittman, R. K., Baillie, C. J., Arkema, K. K., Bennett, R. O., Benoit, J., Blitch, S., ... & DeAngelis, B. (2019). *Voluntary restoration: mitigation's silent partner in the quest to reverse coastal wetland loss in the USA*. Frontiers in Marine Science, 6, 511.
[9] Moreno-Mateos, D., Power, M. E., Comín, F. A., & Yockteng, R. (2012). *Structural and functional loss in restored wetland ecosystems*. PLoS biology, 10(1).
[10] USGS Water Supply Paper 2425

coastal areas while improving wetland habitat and reducing erosion. We encourage the program to expand upon this work, including developing a formal state definition of living shorelines, considering policies to protect features that incorporate oysters from harvest, and building the foundation of knowledge necessary to identify sites where living shorelines would outperform hardened structures.

Coastal Hazards

We agree that the coastal hazards enhancement area is a high priority given the increase in the occurrence and severity of storms and flooding events, as well as the hazards posed by sea level rise to coastal communities and natural resources. We agree that the Division of Coastal Management is well-suited to partner with the Office of Recovery and Resiliency to design a program to help local governments plan for and integrate resilience measures into its existing plans, and we welcome the opportunity to partner to advance this strategy. We also support efforts at the local and state levels to restore and improve natural infrastructure defenses and habitat as a key component of resiliency. Improved mapping of shoreline change, along with appropriate setback requirements and construction limits, support for local resilience capacity-building, and enhanced use of natural infrastructure, will help communities and individuals make risk-informed decisions and prepare for sea level rise and changing flood risk.

Combined delineation of barrier island erosion hazards.

As described in the 309 Strategy, we support using the best available science to update the state's erosion rate methodology and applying the methodology into planning and permitting of uses in sensitive coastal areas. We urge the CMP to set and follow an ambitious schedule for completing the related work that has been ongoing for many years. As the draft assessment itself indicates, development of North Carolina's coastal areas is growing at a rapid pace. Thus, any delays in identifying hazard areas and instituting reasonable controls on new construction within those zones could complicate the task of protecting North Carolina's coastal communities from future storm and flood events.

Technical assistance program to support local resiliency efforts and plans.

We support the enhancement strategy that advances a comprehensive and community-based approach to addressing coastal hazards. Technical assistance to communities addresses critical gaps in local government expertise and capacity for resilience planning. We commend the Division of Coastal Management for providing climate data, planning tools, and case studies to local governments, and fully support the commitment to ensuring that communities incorporate resiliency planning into the traditional approaches that localities employ, including local comprehensive plans and capital improvement plans. This approach, along with a deliberate recognition of the role of nature and nature-based solutions to addressing flood risk can, as the assessment indicates, contribute to safer communities and yield important co-benefits. We encourage coordination of the 309-funded technical assistance program with development and implementation of the North Carolina Climate Risk Assessment and Resiliency Plan under

Section 9 of EO 80. The CMP's support for coastal communities' Climate Risk Assessments and Resilience Plans should also consider the potential for more extreme precipitation events and, in many communities, riverine flooding that can compound the threats posed by sea level rise and coastal erosion.

Protection and restoration of natural defenses

We support the identification of strategies and projects to enhance and restore natural infrastructure as a required element of local plans. In order to facilitate this work, we support leveraging the latest mapping and modeling efforts to prioritize areas for habitat enhancement and restoration; for example, incorporating research by Duke University to map specific areas where natural coastal habitats have the greatest potential to provide flood protection and where they require additional protections.

In addition to our comments on tidal marshes included under the Wetlands Enhancement Area, we would like to highlight the benefits of conserving and restoring oyster reefs and submerged aquatic vegetation as a part of resilience strategies. Among a suite of ecosystem services, these habitats provide important wave attenuation and shoreline protection services.[11,12] For example, the CHPP Source Document (2016)[13] notes that "By absorbing wave energy, aquatic grasses buffer turbulence, reduce erosion, improve clarity, and help stabilize marsh edge habitat."

It is important to note that, given general constraints on the availability of shell for use in living shorelines and other nature-based resilience projects as well as its shortcomings in terms of substrate stability and propensity to become a reservoir for boring sponge[14,15], the use of alternative, environmentally-responsible materials (e.g., granite, recycled fiber) merits continued consideration. As previously mentioned, there may also be opportunities for communities and managers to coordinate ongoing planning efforts such as the CHPP, the Oyster Blueprint, the APNEP Comprehensive Conservation and Management Plan, and the North Carolina Climate Risk and Resiliency Plan, to protect and restore the state's natural defenses. We welcome the opportunity to contribute to efforts to coordinate and leverage these on-going planning processes.

Additionally, the local resiliency program's emphasis on green infrastructure should extend beyond coastal features to support nature-based stormwater strategies that address flash flooding in rain events. To add value to expanding the application of green infrastructure, we recommend the CMP consider measuring and evaluating the performance of nature-based strategies in addressing risk and providing natural, economic and social benefits. Sharing this information

[11] La Peyre, M. K., Serra, K., Joyner, T. A., & Humphries, A. (2015). *Assessing shoreline exposure and oyster habitat suitability maximizes potential success for sustainable shoreline protection using restored oyster reefs.* PeerJ, 3, e1317.
[12] Christianen, M. J., van Belzen, J., Herman, P. M., van Katwijk, M. M., Lamers, L. P., van Leent, P. J., & Bouma, T. J. (2013). *Low-canopy seagrass beds still provide important coastal protection services*. PloS one, 8(5).
[13] NCDEQ (North Carolina Department of Environmental Quality) 2016. North Carolina Coastal Habitat Protection Plan Source Document. Morehead City, NC. Division of Marine Fisheries. 475 p.
[14] Theuerkauf, Seth J., et al. *Wave exposure structures oyster distribution on natural intertidal reefs, but not on hardened shorelines*. Estuaries and Coasts 40.2 (2017): 376-386.
[15] Dunn, Robert P. *Oyster Demographics and Cliona Boring Sponge on Potential Reef-building Substrates-Implications for Oyster Restoration*. (2013).

among communities in North Carolina can demonstrate the efficacy of those strategies and build the case for their broader use. This information can also make the case for investing in maintenance of green infrastructure features to enhance the benefits provided and length of project life. While it is useful to communities to identify shovel-ready projects, the technical assistance program should also consider options for funding, incentivizing, and improving local capacity to maintain green infrastructure.

Ocean Resources

Though rated in the draft 309 Strategy as a lower priority relative to other enhancement areas, we would like to highlight emerging issues and challenges to North Carolina's ocean resources that the CMP could be well positioned to address in partnership with other state agencies, scientific institutions, communities and NGOs:

Increasing demands and uses of estuarine and ocean environments:

Coastal programs in states like Washington, Rhode Island and Virginia have (or are developing) strategies that take a comprehensive approach to managing these ecosystems, such as assessing and limiting impacts to sensitive habitats like submerged aquatic vegetation in nearshore waters and offshore habitats that are important for coastal fisheries. The CMP could consider a PSM to bring academics, NGOs and stakeholder groups together to assess expanding uses and trade-offs of the state's critical estuaries and ocean environments. We would welcome the opportunity to identify partners and technical resources for such an effort.

Shifting fish populations and improved understanding of "nursery areas":

Fish populations are moving northwards and into deeper waters in response to warming waters (see a recent study authored by Malin Pinsky of Rutgers University and Jim Morley of North Carolina State University, funded in part by Pew, on shifting marine species habitat[16]). At the state level and as part of multi-state/federal governing bodies, North Carolina's fishery managers will need to make pivotal decisions about how to respond and advance conservation for those shifting fisheries in the coming years. We encourage the CMP to engage in efforts related to the Mid-Atlantic Fishery Management Council's Northeast Regional Marine Fish Habitat Assessment, "a collaborative effort to describe and characterize estuarine, coastal, and offshore fish habitat distribution, abundance, and quality in the Northeast."[17] When complete, this process will provide an opportunity for the coastal program to work with partner agencies and councils to adopt new enforceable policies for essential fish habitat (e.g., submerged aquatic vegetation) in state coastal waters including North Carolina.

[16] Palardy, Jim. Warming Waters to Force Dramatic Shifts in Marine Species' Habitats. The Pew Charitable Trusts, May 16, 2018: https://pew.org/2k1kt87.

[17] Mid-Atlantic Fishery Management Council. Northeast Regional Marine Fish Habitat Assessment. Accessed March 10, 2020: http://www.mafmc.org/nrha.

Aquaculture

With growing interest in shellfish farming in North Carolina's coastal waters and its importance to coastal businesses (particularly in light of COVID19 impacts to local economies), we endorse strategies to foster the mariculture industry in a sustainable fashion. Continuing CMP's active involvement with mariculture working groups and advisory committees can ensure that decision makers are kept abreast of emerging research on ecosystem service provisioning by productive farms that embrace best management practices, as well as any unanticipated negative impacts on the ecosystem. We also note opportunities for coordination and leverage with the North Carolina Oyster Blueprint, the shellfish mariculture plan, the CHPP update process, and the APNEP Comprehensive Conservation and Management Plan, in developing new policies.

In addition, we suggest exploring the use of those guiding documents, particularly the North Carolina Oyster Blueprint, and tools like Special Area Management Plans to help manage the increasingly crowded estuarine environment and to increase the protection of priority shellfish growing waters in the state. Important shellfish growing areas are experiencing declining water quality, resulting in more frequent closures of these waters to harvest. The cause is typically hydrologic modification in adjacent watersheds that results in higher volumes and rates of runoff carrying bacteria, nutrients and sediment. The oyster steering committee has identified Stump Sound and Newport River as the two most endangered shellfish growing waters along the coast and is seeking the development of watershed management and restoration strategies for both areas, a process that could benefit from special area management planning. In addition, the steering committee is prioritizing other growing areas that are also becoming endangered. The CMP should place a high priority on working with the steering committee to protect these waters to safeguard not only the shellfish mariculture industry, but water quality and productivity of these estuaries for fisheries and recreation.

Pew is committed to supporting the important work of the North Carolina's Division of Coastal Management and the Coastal Management Program to improve protection and management of the state's coastal resources. We thank you for the opportunity to comment on the draft 309 Strategy and look forward to the development and implementation of new program enhancement strategies that will continue this vital work.

Sincerely,

Leda A. Cunningham
Officer, Conserving Marine Life in the U.S.
Morehead City, NC