Audubon | NORTH CAROLINA

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Via e-mail: federalconsistencycomments@deq.nc.gov
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Re: Federal Consistency: USACE Wilmington Harbor 403 Navigation Project

Dear Mr. Luck,

Thank you for the opportunity to provide the North Carolina Division of Coastal Management input on the federal consistency determination that was submitted by the U.S. Army Corps of Engineers for the proposed Wilmington Harbor 403 Navigation Project. Audubon North Carolina (Audubon) is the state office of the National Audubon Society, with 15 affiliated chapters and over 50,000 members statewide. Its coastal program manages and monitors nesting and non-breeding birds on the Lower Cape Fear River through a formal agreement with the North Carolina Wildlife Resources Commission and in cooperation with North Carolina State Parks. We submit these comments on behalf of our staff and our members who support our mission to protect birds and bird habitat.

As the State's CAMA Handbook for Coastal Development states, "The North Carolina coast may seem indestructible, but it's not. Left unmanaged, development around our state's sounds, rivers and beaches can destroy the very ecological, aesthetic and economic features that draw people to our shore." Because of this fact, North Carolina law declares that "among North Carolina's most valuable resources are its coastal lands and waters…which should be preserved and enhanced" (§ 113A-102). The State does this by ensuring that all projects taking place on the coast are consistent with its coastal management plan. This responsibility extends to coordinating with the federal government: "All State agencies shall keep informed of federal and interstate agency plans, activities, and procedures within their area of expertise that affect the coastal area. Where federal or interstate agency plans, activities, or procedures conflict with State policies, all reasonable steps shall be taken by the State to preserve the integrity of its policies (§ 113A-127)." Therefore, it is the Division of Coastal Management's duty to scrutinize the Corps' proposed consistency letter and the Draft Environmental Impact Statement (DEIS) on which the letter is based.

We have reviewed the DEIS extensively and commented on it during the Corps' recent public comment period and we have reviewed the consistency letter. In short, the two action alternatives promise unavoidable and irreparable harm to North Carolina's coastal ecosystems and human communities while offering inadequate mitigation, little real "beneficial use" of dredged sediment, and no monitoring to inform the public and relevant agencies of these impacts. Meanwhile, the DEIS—and therefore the Corps' consistency—fails to accurately describe those impacts and, in some cases, simply omits them altogether, even after years of stakeholder meetings and workshops during which impacts and data gaps were brought up over and over again. Therefore, the State cannot base its consistency determination on such a factually unsound document as the DEIS, and the Wilmington Harbor 403 Project cannot be consistent with North Carolina's obligation to adhere to its coastal management plan in order to ensure the "protection, preservation, orderly development, and management of the coastal area of North Carolina" (§ 113A-102).

We appreciate the public comment opportunity to explain in detail why we think this, and we note that while the DEIS and the Corps' consistency letter contain flaws in a variety of disciplines from fisheries to economics, due to our unique role managing and monitoring birds and their habitats south of Snow's Cut, Audubon is especially knowledgeable about impacts specific to birds, shorelines, and other resources on the Lower Cape Fear River.

1. An abundance of birds, including at least 24 species recognized by North Carolina as species of concern, occur on the Lower Cape Fear River within habitats classified as Areas of Environmental Concern.

The Audubon North Carolina coast program manages and monitors about 40% of North Carolina's nesting coastal waterbirds through direct ownership, leases, and collaborative agreements with public and private landowners. These sites range from Ocracoke Inlet south to Brunswick County and include the bird-nesting islands and marshes on the Lower Cape Fear River (Table 1). The birds nesting on the Cape Fear River—in 2023, over 16,000 breeding pairs and their chicks—represent about 30% of North Carolina's nesting coastal waterbirds, making it consistently the largest concentration of nesting waterbirds in the state.

The habitats that attract such numbers of birds are also habitats that North Carolina's coastal management plan has designated as Areas of Environmental Concern (AECs), habitats that the State must "conserve and manage […] so as to safeguard and perpetuate their biological, social, economic and aesthetic values" (15A NCAC 07H .0205). The AECs that birds depend on—and that the Corps' project would, or is likely to impact—are Coastal Wetlands, Estuarine Waters, Public Trust Areas, and Estuarine Shorelines.

Table 1. Waterbird nesting sites on the Lower Cape Fear River.

Island	Dredge Status	Material Last Received	Notes
Battery Island	Natural with placement	2000	
Striking Island	Never received material	--	
Smith Island Shoreline	Never received material	--	The eastern river shoreline between Fishing Creek and Still Creek
Shellbed Island	Never received material	--	Actually multiple marsh islands at the south end of The Fort Fisher Rocks
South Pelican Island *	Natural with placement	2004	It appears that a small marsh existed prior to sediment placement
Ferry Slip Island *	Manmade	2022	
No Name Island	Unknown	Unknown	Contains rubble probably placed by people
North Pelican Island	Natural with placement	1950s	
North North Pelican Island	Natural with placement	1950s	
Tricolor Island	Unknown	Unknown	Unnaturally round, mostly organic substrate but there is a small sand patch
Misc. other Shorelines	Never received material	--	Zeke's Island west shore, shell rakes near Southport and Snow's Marsh

* = site with current dredge material placement permit

Audubon North Carolina's coast program dates back to 1982, and our present coastal staff has about 15 years of experience working directly on the Cape Fear River, including multiple site visits per week during the March to August nesting season and at least monthly visits during the September to February non-breeding season. Audubon's work on the river includes monitoring breeding and non-breeding birds (productivity tracking to follow nests and chicks to success or failure, nest counts to census breeding populations, and counts of migrating and wintering shorebirds); habitat management and enhancement, often in partnership with the North Carolina Wildlife Resources Commission; and a variety of research projects in cooperation with various agencies and academic partners. This work encompasses over 20 species of migratory waterbirds, most with some conservation status, as well as additional species that, for various reasons, Audubon does not monitor on the Lower Cape Fear River (Table 2). All told, at least 24 avian species are classified as of concern (having some state or federal status) by North Carolina.

The non-breeding bird species of the greatest conservation concern are migratory shorebirds that either make stops to rest and regain body weight before continuing their journeys or stay and overwinter in the estuary. These birds are dependent on sand and mudflats with abundant benthic invertebrates and high-tide roosting sites. Most species are long-distance migrants that nest in the Arctic, but some are mid-distance flyers such as American Oystercatchers that breed in the continental U.S. and Canadian Maritimes. These non-breeding species are found primarily at or below Military Ocean Terminal Sunny Point south to the mouth of the river. An exception is Eagles Island, where the impoundments provide foraging and roosting habitat for shorebirds.

Table 2. Focal species monitored on the Cape Fear River by seasonal presence and conservation status.

	Seasonal Presence		
Species	**Breeding**	**Non-breeding**	**Conservation Status**
American Oystercatcher	x	x	SCGN, SC, SAR
Black Skimmer	x		SCGN, ST
Black-bellied Plover		x	SCGN
Black-crowned Night-Heron	x		SCGN
Brown Pelican	x	x	
Dunlin		x	NT
Glossy Ibis	x		SCGN, SC
Great Egret	x		
Gull-billed Tern	x	x	SCGN, ST
Laughing Gull	x	x	
Least Sandpiper		x	NT
Little Blue Heron	x		SCGN, SC, S-M
Marbled Godwit		x	SCGN, VU
Red Knot		x	SCGN, FT, ST
Royal Tern	x		SCGN, S-M
Ruddy Turnstone		x	NT
Sanderling		x	SCGN
Sandwich Tern	x		SCGN, S-H
Semipalmated Plover		x	LC
Semipalmated Sandpiper		x	NT
Short-billed Dowitcher		x	VU
Snowy Egret	x		SCGN, SC, S-M
Tricolored Heron	x		SCGN, SC
Western Sandpiper		x	LC
Whimbrel		x	SCGN, S-H
White Ibis	x		SCGN
Willet	x	x	SCGN, S-H
Wilson's Plover	x		SCGN, SC, S-H

SCGN = NC Wildlife Action Plan Species of Greatest Conservation Need, SC = state species of concern, ST = state threatened, FT = federal threatened (ESA), S-VH = SEAFWA Regional SGCN very high, S-H = SEAFWA Regional SGCN high, S-M = SEAFWA Regional SGCN moderate, NT = ICUN near threatened, VU = ICUN vulnerable, LC = ICUN least concern, SAR = USFWS species at-risk

Other species on the river that are of concern to the State that we do not monitor include the Eastern Black Rail (FT), Piping Plover (FT), Clapper Rail (SCGN and S-M), Nelson's Sparrow (SCGN and S-M), Saltmarsh Sparrow (SCGN, S-VH, and SAR), and Seaside Sparrow (SCGN and S-H).

The nesting season typically begins in March, though Brown Pelicans, Great Egrets, and American Oystercatchers can begin to occupy nesting territories in February. Though a variety of additional species breed throughout the project area, the nesting species that these comments focus on and that are of the greatest conservation concern all nest south of Snow's Cut (Figures 1 and 2). Most species complete nesting in August, but Brown Pelicans can have chicks as last as mid-October. Nesting occurs across all habitat types found on the Cape Fear River, in marshes, on shell rakes, along sandy shorelines, and on dredged-material islands. (Note we are not discussing nesting that takes place on nearby barrier island beaches.) Nest site selection is determined by suitable substrate—which can be sand, shell, or wrack on the ground or various shrub and tree species—elevation above the high tide line, predator presence, and social factors as some species prefer to nest with or far away from neighbors. Across all these habitats, many nests are very low and very close to the waterline (Figures 3 and 4).

Figure 1. 2025 locations of nesting American Oystercatcher pairs. (Colors represent different reproductive outcomes, but the purpose is to illustrate typical spatial distribution.)

Figure 2. Locations of colonial waterbird colonies on the Cape Fear River.

Figure 3. Birds nesting in marsh habitats on the Lower Cape Fear River. A) An American Oystercatcher nesting on a shell rake on Striking Island. The black arrow shows where the high water line is. B) Laughing Gulls nesting on wrack in Striking Island. Mean high water line not visible because the wrack is on top of it.

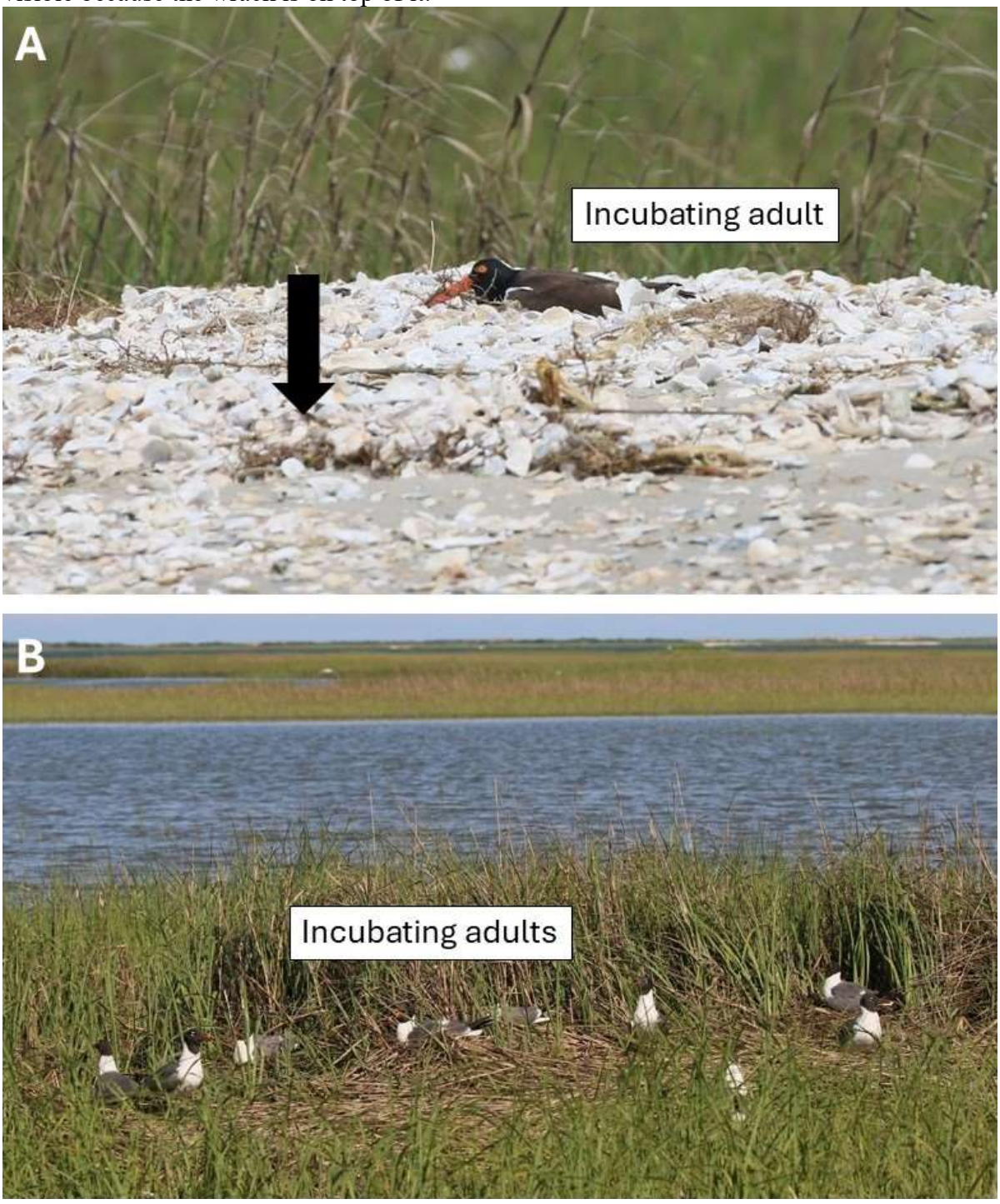

Figure 4. An American Oystercatcher nest laid in sandy habitat on Ferry Slip Island. The black arrow shows where the high water line is.

Foraging and roosting by a wide variety of species occurs year-round throughout the river channel, its islands, and shorelines, from above the Port to the Atlantic Ocean. Roosting—resting and preforming feather maintenance necessary for survival—can take place on nearly surface, from logs sticking out of the water to sandy shorelines, to docks. The site must be predator-free at the time and not contain disturbances such as dogs or children that are prone to chasing birds. Likewise, foraging may take place in many habitats, from piscivorous birds diving for fish in the river channel, to wading birds stalking small aquatic prey along a marsh edge, to sandpipers probing in sand or mud to extract benthic invertebrates. How valuable a foraging or roosting site is considered to be would depend on the specific species using it, the number of individuals using it, its proximity to other resources, how unique or limited that type of foraging or roosting habitat is, and other factors. The majority of species of conservation concern, by number of species and number of individuals, forage and roost at or below Military Ocean Terminal Sunny Point.

2. a. The DEIS does not accurately describe how nesting birds use the Lower Cape Fear River.

As the managing organization with the most direct knowledge of birds and bird habitat on the Lower Cape Fear River, Audubon staff have attended all available stakeholder meetings, workshops, planning meetings, and public sessions regarding this project since its inception in 2019 and provided input at each juncture. Bird data is also available through many sources, including databases, state and federal agencies, and NGOs. Although we have made every effort to provide relevant information through these various channels, the Corps continues to fail to grasp basic, foundational facts about birds on the Lower Cape Fear River, as is reflected in the DEIS. These deficiencies fundamentally undermine the Corps' ability to evaluate the impacts of the proposed project.

Most glaringly, in the DEIS the Corps does not even accurately state what species occur on the river, where on the river they exist, how many islands they use, or which ones are considered species of concern by the State (see Table 2 above). Instead, Section 3.15 of the DEIS describes birds that use the ocean beaches within the project area and lists some species that nest on two of the dredged material islands, Ferry Slip and South Pelican, as though these were the only places they occur on the river. However, as described above and illustrated in Figures 1 and 2, *birds nest throughout the Lower Cape Fear River in a variety of habitats*. This makes them more vulnerable to multiple impacts from the proposed project, including flooding from ship wakes and habitat degradation or loss from shoreline erosion. Correctly understanding where nesting occurs on the river and in what habitats is necessary to accurately describing impacts to them. The DEIS does not reflect this fundamentally necessary understanding and instead focuses on beach habitats almost exclusively. This error is carried through into the consistency and allows the Corps to state, incorrectly, that "The proposed action would not adversely affect any biota recognized by the State as species of concern."

This error also allows the Corps to disregard opportunities to protect coastal resources by restoring or enhancing a variety of habitats important to nesting birds. The exclusive focus on *two* of ten bird nesting sites on the Cape Fear River may stem from the Corps' primary experience with birds coming from its work on sandy dredged-material islands. And, Ferry Slip and South Pelican Islands are the only two islands with active dredge placement permits. These sandy islands do support large numbers of migratory waterbirds and are essential to maintaining healthy state and regional populations of many species. However, a "bird island" does not have to be a sandy island or beach, and while many species prefer sparsely vegetated sand for nesting, many other species actually require vegetative structure—and other sites are just as important.

2. b. The DEIS does not accurately assess project impacts to nesting migratory waterbirds relative to vessel wake changes and wake interactions with shorelines and birds.

As explained above, Audubon staff are on the river in small outboard motorboats year-round at bird-nesting sites south of Snow's Cut. The only hydrologic data collection at any of these sites in the past 15 years has been a UNC-Wilmington senior capstone class project and a UNC-Wilmington master's project, both under the direction of Dr. Ryan Mieras and in partnership with Audubon. Outside of that, the best information available about how ship wakes behave when they interact with the shorelines of these islands is observations made by the people who are there. No one from the Corps or consultants working for the Corps or the Port has visited the islands to observe these events.

The DEIS uses a model to predict how shorelines along the river channel will be impacted by ship wakes (Section 3.3.3.). The two parameters it says it generated are bed shear stress, which is reported, and water surface elevation, which is mentioned but not reported in the body of the DEIS. However, *these parameters do not describe how ship wakes behave as they approach islands or how they interact once they hit their shorelines*.

When a ship travels up or down the river, the water it displaces forms a tsunami-like wave that travels outward towards the two opposite shores. When the displacement wave encounters shallower water (probably about ≤2 m), it first forms a standing wave up to about a meter in height (Figure 5). On the shoreline, the waterline first recedes (as during a tsunami), exposing several meters of wet substrate in less than a minute. Then, within a few minutes, the water rushes back in, and the water level rises almost instantaneously, often above the high-high water mark. A series of waves then crash onto the shore, further pushing water up the shoreline into what had been dry ground. This run-up inundates dry sandy shores and floods high marsh (see Figure 9 for a visual example). The speed and velocity with which this process happens can tear anchors out of the substrate and ground boats above the high-water line, so it is not safe to be at anchor on the bird-nesting islands when a ship passes. These wake events vary in severity with many factors—tide height, direction of ship travel, direction of tide and current, etc.—which could and should be studied before determining consistency or approval of project like this in which wake effects should be considered crucial, not only to "birdy" shorelines but to all shorelines along the channel.

Despite the variation in individual ship wake events, based on 15 years of direct observation, wakes became visibly more extreme with each step-up in size of container ship, from the Yang-Ming Unity in 2016, to the HMM MV Hyundai Hope in 2020, to the ZIM Mount Rainer in 2025. It is also observable that ships that are riding visibly lower in the water (with the bulb on their prow mostly or entirely submerged) throw more severe wakes than ships with the bulb riding high; the larger ships throw more severe wakes than smaller tankers and MOTSU transports. The DEIS, and the Corps' consistency with it, forecasts more-heavily loaded ships will transit the river under the preferred alternative, which based on this pattern of observations will clearly result in more severe wake events, resulting in an increase in wake-induced nest and chick loss and habitat degradation.

These ship-driven wakes impact shorelines throughout the river, even those that seem distant and unlikely to be affected (Figure 6). Audubon staff have observed waves impacting the north-facing shore of Striking Island at heights great enough to overwash nests (and put boats at risk of being grounded above the high tide line). Impacts at the more distant sites tend to be more serious at high tide, when the wakes can cross areas that would be shallower when the tide is low. The most greatly impacted sites observationally appear to be North North Pelican Island, North Pelican Island, No Name Island, Ferry Slip Island, South Pelican Island, and Battery Island, but Shellbed and Striking Island also receive flooding events (Figure 7).

Figure 5. Ship-wake waves on or near bird-nesting islands. A) A wave crossing a shoal near Ferry Slip Island. B) A standing wave off of North Pelican Island. C) A wave beginning to strike North Pelican Island. D) A wave striking the north tip of North North Pelican Island with pelican heads just visible above the crest. E) A wave striking the northwest shore of Shellbed Island.

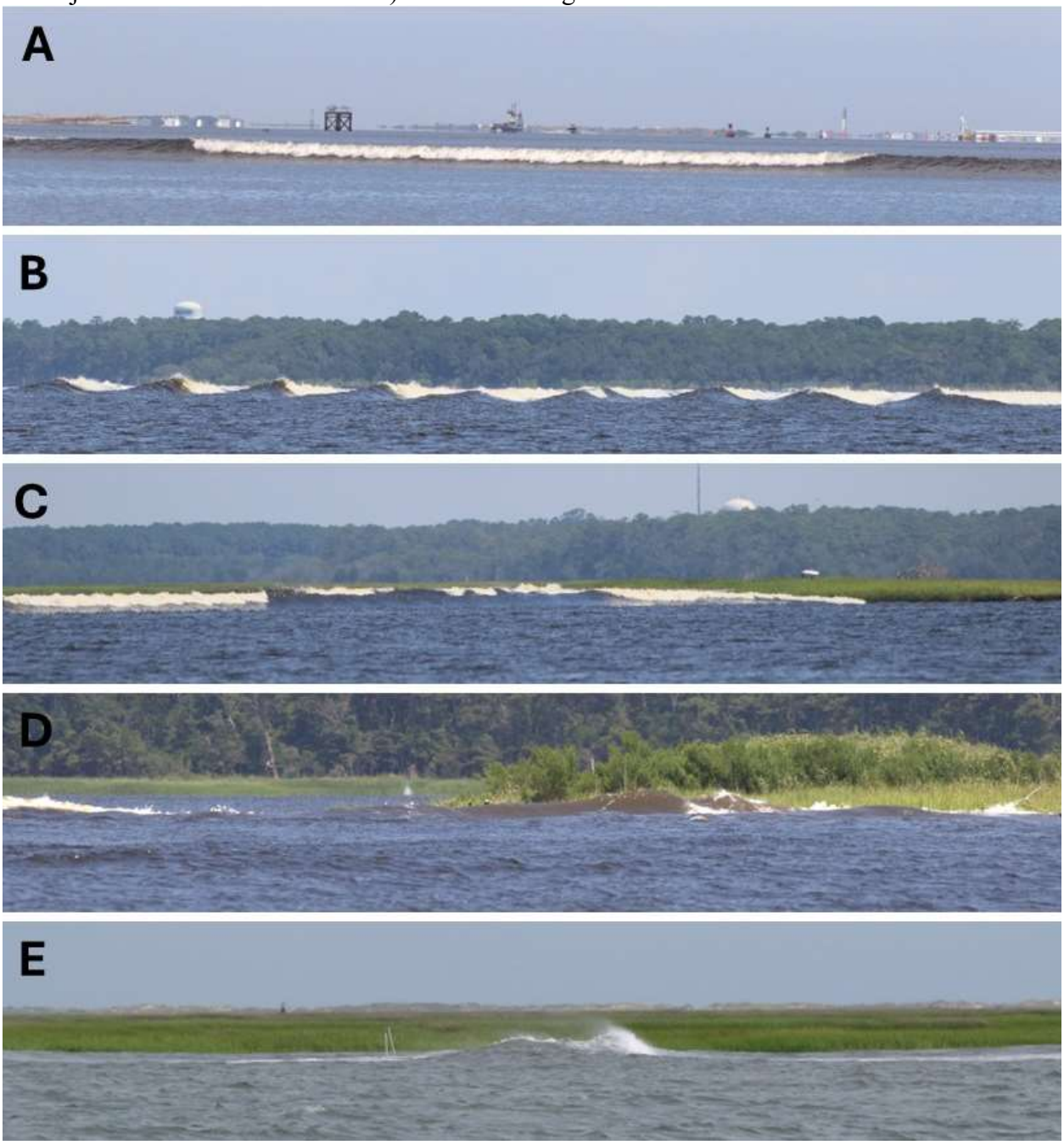

Figure 6. Shorelines on or near bird-nesting islands where Audubon North Carolina staff have observed breaking ship wakes. This is not a depiction of all shorelines that ship wakes impact, only ones at or near bird-nesting islands.

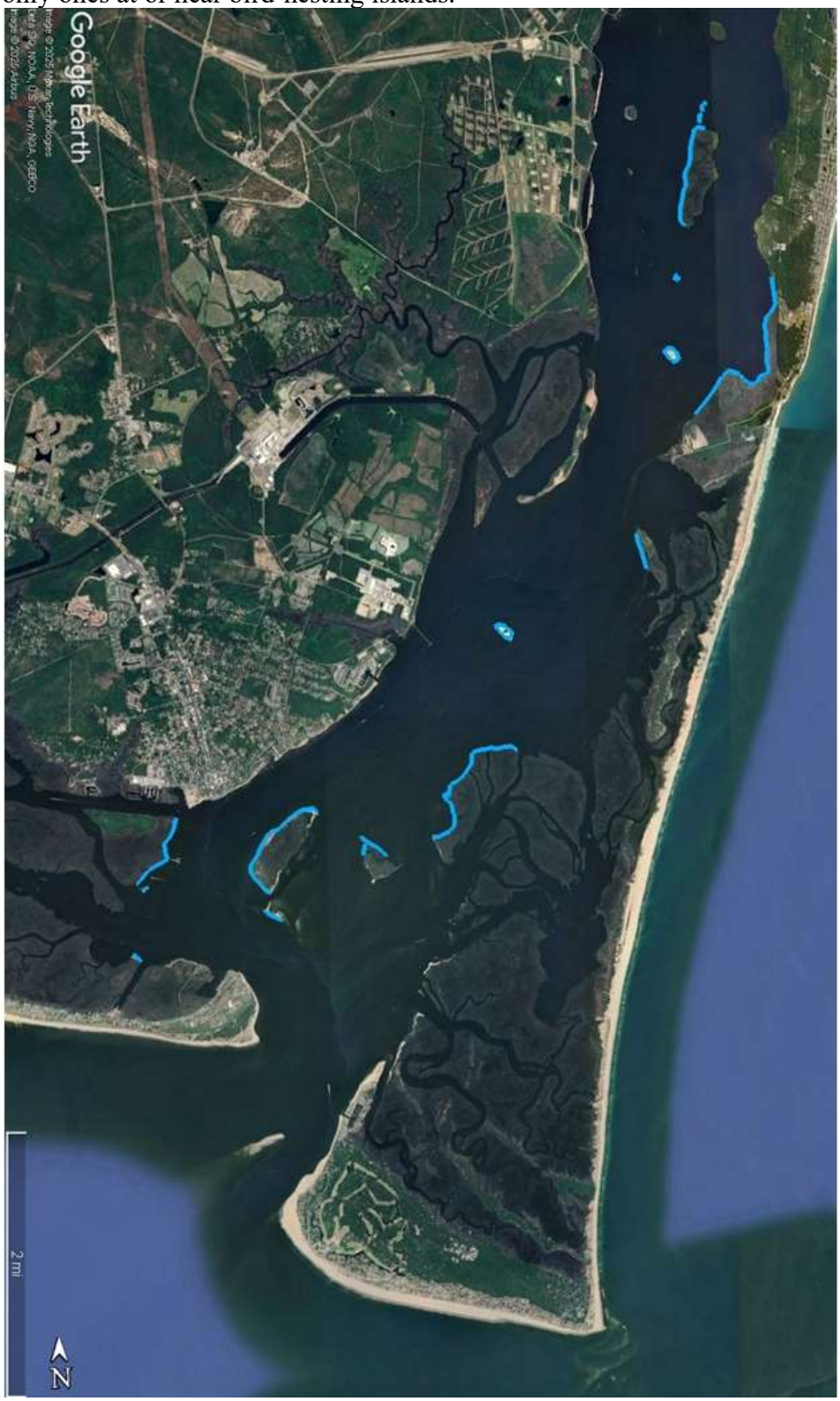

Figure 7. The wake from Figure 5E flooding a nesting shell rake on Shellbed Island. The light-colored substrate visible on the left-hand side of the photo and obscured by the wave on the right-hand side is the nesting area being affected.

During or following wake events, staff have seen nests swept away, colonies disappeared, nesting areas inundated, and chicks flooded (Figures 8-10). More typically, because 24/7 observation isn't possible and it's not safe to be anchored on an island during a wake event, a nest or colony simply disappears and all that is left is a new high-water mark that is above where a nest has been. Storms and king tides flood nests and chicks as well of course, but they also make more nests vulnerable to loss from wakes because the base water level is higher while they are occurring. So, the DEIS cannot dismiss all water-related nest and chick loss as a natural phenomenon.

It is unclear why these impacts are not included in the DEIS or considered by the consistency. The models in the DEIS do not contain parameters that measure run-up or the volume of water that enters nearshore shallow waters and floods the shoreline above the high tide line, or how hard waves strike vegetated shorelines. In other words, *they do not capture the parameters that matter when considering impacts to nesting birds and the shoreline habitats they nest on*, and the Corps has been informed of this. Ideally, there would have been quantitative data collection and study of how these wakes behave on the river's shorelines, but in the absence of *any* new data collection by the Corps for the DEIS—a decision made by the Corps that was communicated to stakeholders during a workshop at the beginning of the environmental review process—these observations are the best information available.

Figure 8. An American Oystercatcher nest on South Pelican Island being flooded by a ship wake. A) The adult incubating. B) The adult leaves the nest as it sees or hears the wave. C) The nest is destroyed. D) The nest is gone. The adults returned to look for the eggs repeatedly for over 24 hours.

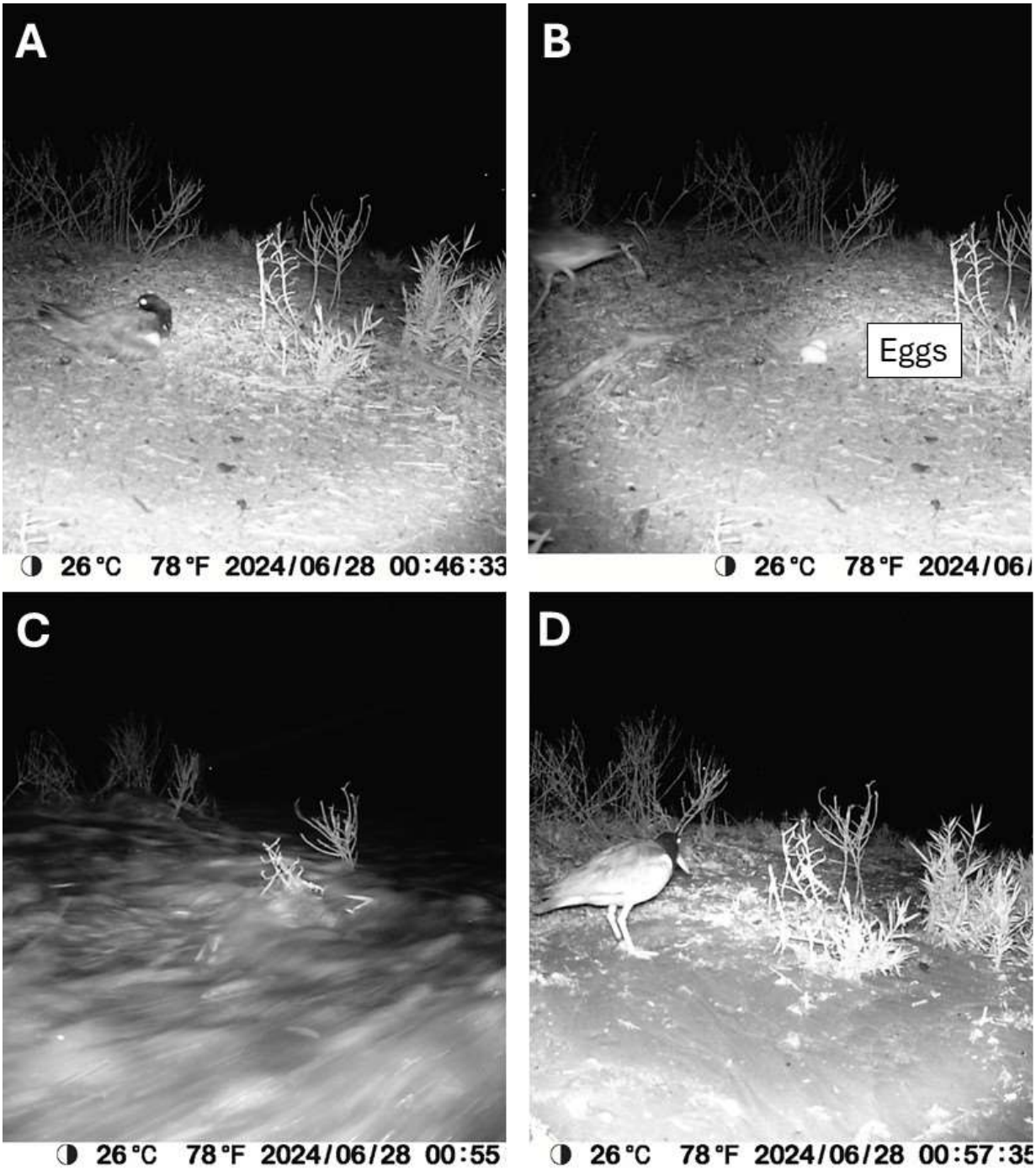

Figure 9. An American Oystercatcher nest on Ferry Slip Island being flooded by a ship wake. A) The adult incubating. B) The first wave strikes the shore. C) The second wave cresting. D) The second wave breaking on the shore. E) The run-up floods the nest. F) The run-up receding.

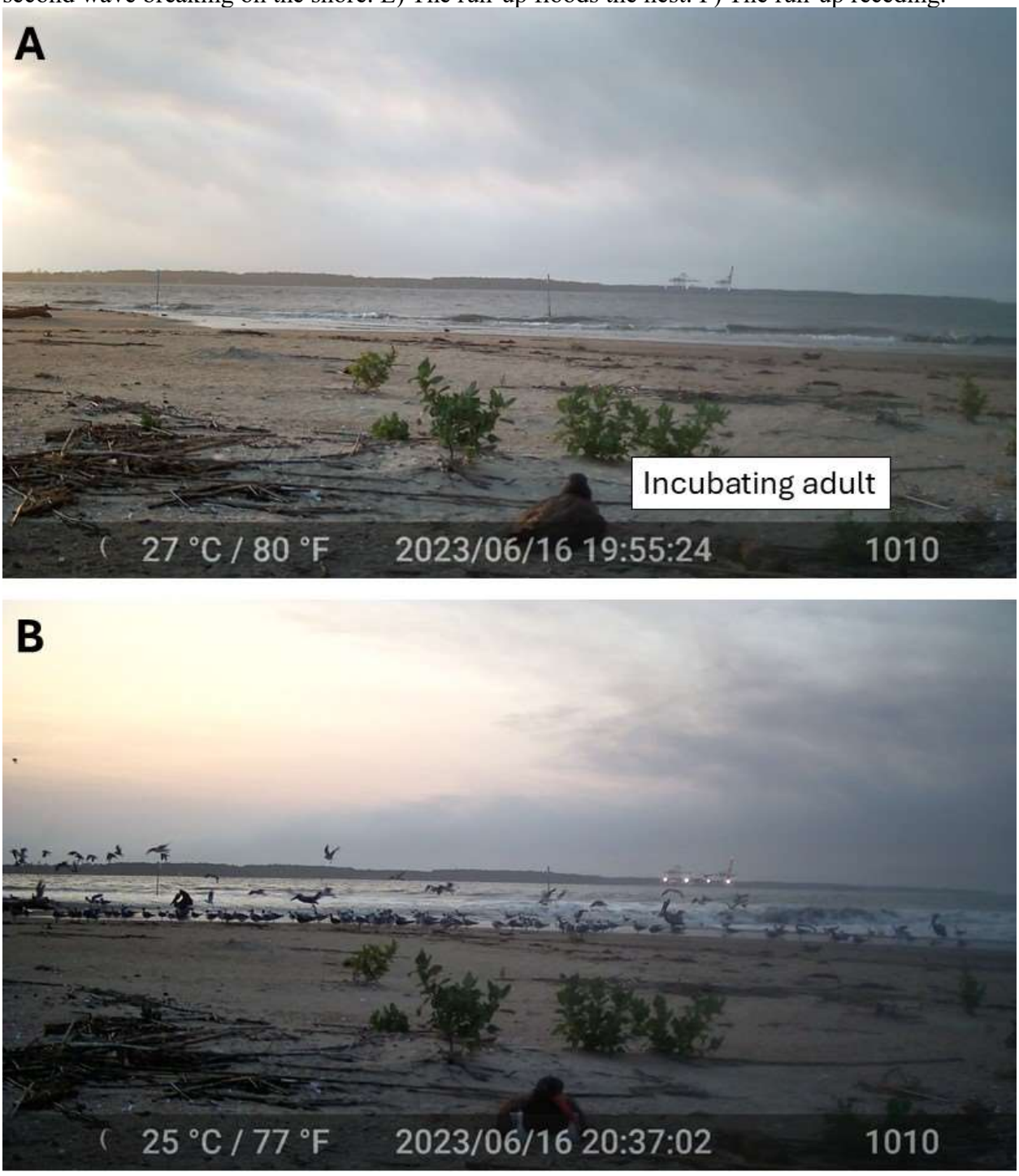


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Figure 10. The north end of North North Pelican Island awash after the passage of a ship. Note the sand is soaked from the wave. The sandy area in the foreground had previously been vegetated and supported nesting Great Egrets and Brown Pelicans.

One might think, perhaps the birds should take avoidance measures. When birds select a nest site, they can use their own observations of the high tide line to avoid predictable flooding, but ship wakes are unpredictable, stochastic events, so birds cannot take them into account. Even if they could, nesting habitat, especially on marsh islands, is not far above the high-water line (see Figures 3 and 4 above). This makes nesting habitat more susceptible to inundation even at the islands' high points. The DEIS must consider size scales relevant to affected resources. Changes in wave or water surface elevation, even on the scale of an inch or two, can determine if a nest or chick is swept away. The DEIS also must consider not just average characteristics but the most extreme cases, as it only takes one Post-Panamax III-caused wake to destroy nests along the affected shoreline. All of these failures in the DEIS propagate up to the consistency, rending its conclusions regarding birds invalid.

Finally, the wakes also affect shoreline vegetation and physical characteristics. Violent inundation from a series of wakes crashing onshore uproots shrubs and suspends shoreline sediment in the water column, increasing erosional forces acting on the islands' shorelines. These erosional effects are felt along the entirety of the river's shoreline, not only on bird-nesting islands and therefore affect coastal wetlands, developed shorelines such as the City of Southport, and natural and cultural resources on the river's western shoreline. (These interests have provided comment letters of their own that raise additional serious concerns about the project.)

By reporting only on modeled bed shear stress, the DEIS conveniently avoids describing any of these observable impacts that have been discussed at multiple stakeholder meetings. The impacts to coastal birds that the DEIS projects in Section 4, *which all relate only to beach placement*, are therefore incomplete and blatantly inaccurate:

> "Channel deepening would not be expected to result in impacts on intertidal or supratidal waterbird habitats under AA1. Beach placement for Oak Island, Caswell Beach, and Bald Head Island would be the same as the NAA. Carolina Beach and Masonboro Island placement would cause additional burial and temporary loss of intertidal benthic invertebrate infauna within the beach fill templates, thereby reducing the availability of benthic infaunal prey for shorebirds. The placement of material in and around important bird islands and Masonboro Island would have a short-term negative impact to feeding and roosting birds during construction but with a significant long-term improvement to overall bird habitat by providing resilience to ongoing shoreline erosion."

The same error replicates in the consistency and results in no avoidance measures being even suggested, even though the explicitly stated purpose of the project is to allow heavier ships to come up the river. Although direct mortality takes place now due to the 2000 deepening and widening project and the size and weight of present ships, additional direct mortality, along with additional habitat impacts, must be expected under both action alternatives and be taken into account when making a consistency determination—not only for birds but all affected shorelines and resources.

2. c. The assumptions in the model used by the DEIS are unlikely to hold and therefore cannot accurately reflect what will happen if the project takes place.

The DEIS uses modeling to predict how ship wakes will change if either of the action alternatives is implemented. Section 3.3.3. describes how the model was used to estimate changes in bed shear stress and states that water surface elevations were also calculated as a stand-in for wave height. In the body of the DEIS, there is no further mention of water surface levels, so it is unclear what the Corps projects those to be. It does, however project less total bed-shear stress based on 1) more distance between the hull of the ships and the channel bottom and 2) fewer ships transiting the river.

The model used in the DEIS projects greater under-keel clearance if an action alternative is implemented; however, the objective of the preferred action alternative is to allow the same amount of cargo to come up the river channel on more heavily loaded ships. When loaded more heavily, the ships would ride lower in the water than they do at present. Shippers, wanting to maximize their efficiency (as the DEIS explains is the reason for the project), would logically load the ships to the greatest extent possible, which, again logically would be to the under-keel clearances they tolerate today. Therefore, it is difficult to understand how the project will reduce bed shear stress unless the project includes a binding restriction on clearances that aligns with the model used in the DEIS. Similarly, the DEIS's, and consistency letter's, projection that there will be fewer ship passages up the river channel will not constrain what happens in reality. The economic analysis submitted by the Village of Bald Head Island in its comments on the Corps' economic analysis provides multiple reasons why this assumption is incorrect.

As with the failure to accurately describe the wakes, using these unsupportable assumptions undermines the Corps' assessment of impacts not only to birds and bird habitat, but to all river shorelines in the project area.

3. a. The Beneficial Use Plan is incomplete. Component parts of it are likely not feasible and possibly not consistent with the State's coastal management plan. The Beneficial Use Plan cannot be considered avoidance or mitigation, but it should be largely feasible and be designed with the needs of habitats within AECs in mind, not merely serve as a least-cost disposal option for millions of cubic yards of new dredge material.

The Corps defines beneficial use of dredged material as placement of sediment or other dredged materials "in a beneficial way with respect to the ecosystem and environment." It has established an agency-wide goal of 70% beneficial placement by 2030 and the Corps' consistency letter states that about half of the material dredged in the preferred alternative would be used beneficially. However, in order to determine how to place material beneficially, it is first necessary to assess existing conditions; identify at-risk habitats or ecosystems; describe threats and habitat enhancement, restoration, or creation needs; and determine if use of available material would address any identified threats and needs in a feasible way.

In the spring of 2024, a group of stakeholders was convened by the Corps to help with this process; however, there were just two short meetings totaling around two hours, with the promise of more. But additional meetings were never held. The general impression was that the project was left incomplete. The result of this truncated process is Appendix D of the DEIS, which is the full Beneficial Use Plan alluded to in the Corps' consistency. It provides a very cursory four-paragraph general overview of current site conditions, describes in more detail the types and quantities of material the Corps anticipates finding (though no new sediment sampling was done for the DEIS), and dives into a series of placement project descriptions. Most of these projects the group never suggested or asked for and others seem to have been lost in translation. Though it is a good idea, in concept, to use dredged material in an environmentally beneficial way, for the majority of non-sand dredged material, this Beneficial Use Plan is vague at best, not designed to benefit AECs in the Cape Fear River, and possibly not even feasible or consistent with the State's coastal management plan for reasons explained below.

The preferred alternative would produce about 35.2 million cubic (CY) yards of dredged material and in its letter the Corps proposes that half of it would be used beneficially rather than be barged offshore—we note that disposal near borrow sites is a cost-savings for the Corps, whether the ecosystem is benefitted or not, and inability to realize the beneficial use of a large proportion of the material would potentially drop the benefit-to-cost ratio to below 1.3. There are three main types of material: sand, fine sediment, and hard material. We will discuss each type in general and then provide commentary on the specific placement projects described in the Beneficial Use Plan.

3. b. Beach-quality sand placement focuses on barrier island beaches but misses an obvious opportunity to restore one of the most important bird-nesting islands in the state.

About 5.8 million cubic yards (CY) of the projected 35.2 million CY of dredged material that the preferred alternative would produce is projected to be beach-quality sand. According to the quantities described in Table 2-7 of the DEIS (the quantities in the narrative of the Beneficial Use Plan do not align), about 4.6 million CY would go on Brunswick County beaches and 300,000 would be placed on Masonboro Island's southern half. Another 563,000 CY would go to

two sandy dredged material islands that support nesting birds, Ferry Slip and South Pelican. This totals about 5.4 million CY, leaving about 400,000 CY left over.

The Corps' consistency letter touts "bird island placement" as one of the benefits of the material from the project. It proposes to place sandy material on Ferry Slip and South Pelican Islands, two of the ten identified bird-nesting islands in the river. However, this is an existing project, so *there is no new or improved benefit for bird nesting habitat on these islands accruing from the proposed deepening and widening*. Presently, when the Corps' maintenance dredging requires work in the reaches near to these islands, it uses a pipeline dredge to put sand on them up to the same historically permitted footprint (7 acres each) that the proposed project promises to recreate. (We will discuss these islands in more detail below.)

At the same time as it reaffirms its interest in placing sand on Ferry Slip and South Pelican Islands—welcome, but not a new benefit created by the proposed project—the Corps misses a chance to use the 400,000 CY that it does not account for to benefit another of the ten bird-nesting islands, one that is arguably the most impacted by the project.

Battery Island is an Important Bird Area (a scientifically validated designation by the National Audubon Society and BirdLife International) that is home to one of the largest wading bird colonies in North Carolina. It is globally significant for White Ibis, with as many as 14,000 nesting pairs, and eight other wading bird species along with American Oystercatchers, Wilson's Plovers, and Willets. It received dredged material island sometime prior to 1960, creating a 30-acre elevated sandy area on the southern portion of the island where eventually shrubs and trees formed a dense thicket that attracts the nesting wading birds today.

Battery Island is well known by the community of Southport, which overlooks it on the opposite bank of the river. It is also well known for its eroding shoreline. Due to concerns about increased erosion following the previous deepening and widening project, the USFWS funded the placement of 5,400' of geo-textile tubes along its entire western and southern shoreline in conjunction with the placement of about 22 acres of beach-quality sand along the same area. A shoreline change rate analysis in 2017 found that nearly all of the island's shoreline had experienced overall erosion. In the most recent era analyzed, 2008-2017, the shoreline transects in front of the nesting colony eroded an average of 1.79 m, with a mean shoreline change rate of -0.2 m/year ± 0.16 m (York *et al.* unpublished data). The presence of geo-textile tubes did not prevent erosion, even in the time step when they were new. Visible erosion has continued along the island's shoreline from a variety of causes, including storms, ship wakes, and other boat traffic.

Not only will the channel be deeper, with heavier ships passing Battery Island, the Corps proposes to widen the channel in this area by 550'. Despite the obvious need for measures to protect the shoreline and the mature trees that the wading birds require to nest in, the Corps surprisingly does not include any placement for Battery Island. Though a one-time placement would not be a permanent solution to the problem, it would be a stopgap and could be repeated, as this part of the river is dredged frequently. Battery Island and its shoreline have been discussed at meetings with no explanation regarding its omission.

3. c. Fine sediments (mud/clay/silt) are used overwhelmingly for intertidal mudflat creation on the scale of hundreds of acres and tens of thousands of cubic yards of material. These placements are unproven, unvalidated, and quite likely unhelpful to protecting, restoring, or enhancing AECs in the Lower Cape Fear River. New and creative options for such material should be developed and tested—thin and thick layer placements in other state's coastal zones provide examples—but the scale at which it is proposed here, combined with the vague and undefined methods and habitat goals, are inadequate to accompany a project of this scale and impact.

By far the largest amount of material by type is fine sediments: small-grain muds, clays, and silts that cannot be placed on beaches. This is clearly the sediment type that the Corps found most challenging to dispose of, as there is so much of it and because unlike sand, it does not have a long history of being used in large quantities as beach fill. The result is a series of proposed sub-tidal (in-water) placements. Because these were not placement concepts that the stakeholder group championed, it appears that they represent the easiest, least-cost disposal alternative rather than real environmentally beneficial use. Further, if anything (such as PFAS contamination or permitting barriers) prevents the use of the disposal areas at the scale proposed, the cost of the project would increase significantly. As the Beneficial Use Plan explains: "with the ODMDS approximately seven miles offshore, the cost to place material in beneficial use areas along the river, beaches, and other banks of waterways like the AIWW is generally less costly."

First, it is not technically clear that this placement method would work, as there are no descriptions of the equipment or configuration the Corps would use to do the work, there is no containment proposed for the fine sediment during or after pumping, and there are no references to other similar projects that have been successfully completed. The Wilmington District has a great deal of experience working with sandy material in North Carolina and is familiar with how it stacks, de-waters, and settles during and after construction, but this material may not behave in the same way; for example, it is quite possible that the sediment would erode and wash away quickly rather than cohere into a sub- or intertidal mudflat. This has been seen even on small, low dredge islands created in high energy settings similar to the Cape Fear River, such as at Wainwright Slough, NC in 2017 and in the Altamaha River, GA in 2022. Observationally, based on our staff's years on the river, the overall behavior of sediment in the river is not to accrete into marsh. In short, because beneficial use is linked directly both to the economic analysis and the environmental impact of the project, these placements should be well-planned and realistically feasible, but these do not appear to be.

Second, the range of grain size, organic components, and other properties are not well known, as the Beneficial Use Plan says: "The amount of sediment being placed is estimated based on past geotechnical studies and geomorphology of the river" (Beneficial Use Plan, Section D.6). As mentioned before, new data should have been collected to develop a plan with enough detail to assess whether or not it is technically feasible. Further, the Beneficial Use Plan states that in-water fill is the most flexible beneficial use because any type of material can be used. However, the properties of the fill would affect a wide range of outcomes, such as how it might respond to placement and what types of plants and invertebrates could be expected to recruit into it in the short- and longer term. All fine-grained material is not the same from an ecological perspective

so the amount of information the Corps is presenting is inadequate to assess the possible outcomes and whether the proposed work is consistent with the coastal management plan.

Third, the mudflat placement sites come with only very basic dimensional information: approximate footprint (area) and approximate quantity placed in the that footprint, with no evidence that bathymetry or any other siting considerations were made. There are also no stated goals, either in terms of finished dimensions, including water depth or land elevation, or ecological outcome (e.g., placement location A is intended to become a marsh, and placement location B is designed to be a sub-tidal shoal that is between 0 and -1' at mlw, etc.) Instead, the Plan offers some vague forecasts that are not grounded in what is presently known about the sites or an assessment of the area's ecological needs. As this is apparently a one-time placement, there is no mechanism, other than the hoped-for natural accretion, for any created marsh to persist in the face of erosional forces or sea level rise, bringing into question the duration of any benefit.

Fourth, the Corps does not present accurate information about how the proposed in-water placements would affect coastal resources. First the Corps' consistency letter states that "[t]here are no shellfish beds in the project areas." *This is wrong.* There is a manmade oyster reef located within or adjacent to the footprint of the Lower Swash Island in-water fill area. This is visible in aerial imagery and would have been identified if the Corps had coordinated with partners when developing this project or looked carefully at the project sites. Oyster beds are present near to the following proposed placement areas: Owens Island, Southport Island, Fort Caswell Back Barrier, including on the eastern shoreline of Battery Island, the western shoreline of Striking Island, in the embayment between the mainland and Ferry Slip Island, and within and along the shoreline of the Elizabeth River. It's likely that such large-scale placement in the water column would result in the silting in and destruction of significant oyster resources, a resource that has been historically depleted and which various management plans call for replenishing. Similarly, several of the proposed placement areas are adjacent to navigation channels such as the approach to National Gypsum's quay (Snow's Marsh Island placement area) and the AIWW (WH-DA 07 and WH-DA 08 placement areas). Due to this proximity, it's possible the in-water disposal could result in the filling in of navigation channels. And, in areas without established navigational channels, such large newly created shallow areas would create a hazard to boaters who use the State's public trust waters for commercial and recreational fishing.

The Corps also assumes that any mudflat created would be beneficial to birds. Many species of shorebirds do forage on intertidal mudflats, and additional properly sited flats might provide new foraging habitat to birds on the Cape Fear River. However, for the reasons stated above, it's not clear any such habitat would be created or persist, and these features would only be beneficial to birds if they successfully recruited benthic invertebrates, which is dependent on knowing more about various physical parameters including sediment type, grain size, and wave energy. Further, some "beneficial" mudflats are proposed in areas where existing mudflats already do not recruit birds—possibly due to lack of abundant invertebrate prey and lack of suitable nearby high-tide roost sites.

It's logical to be concerned about the future of coastal marshes on the Cape Fear River, given the long-term effects of sea level change and near-term effects of the deepening and widening of the navigational channel. However, what would make more sense is to propose beneficial use that

will directly accomplish those things rather than wish-casting that the fine material will accumulate into new marsh rather than simply dispersing following in-water placement. This could involve experimenting with thin- and thick-layer placement on carefully selected marsh sites, making the placement areas smaller so that they would be both easier to manage and emergent above the high tide from the beginning, or adding features such as living shoreline or plantings that would help to retain and recruit sediment. As with coastal marshes in general, bird-nesting islands face an uncertain long-term future, and the creation of one or more new islands would localize impacts to a smaller area and would not necessarily preclude the use of finer material, because not all islands used by nesting birds must be sandy. Indeed, eight of the ten islands are densely vegetated with a mix of marsh and low upland areas.

3. d. The Corps may be missing opportunities to use rock to create structure that could provide habitat for marine life and buffers or wave breaks for shorelines, if plans are developed to avoid armoring shorelines or creating navigational hazards.

The project would also yield a large quantity of rock—3.5 million CY of soft rock that is not proposed for offshore fish habitat creation. In the fairly distant past, some of this soft rock, which presents as various sportsball-sized chunks, has ended up on marsh islands, including No Name Island and the north end of North Pelican Island. In larger quantities and with study and coordination with resource agencies, it could provide structure for small invertebrates and fish and some naturalistic shoreline protection.

In summary, the Beneficial Use Plan is at best incomplete. It does not appear to have received thorough consideration which implies that the Corps is not sincerely determined to ensure material is used in a way that really would benefit local ecosystems. The DEIS touts beneficial use as an offset to impacts on shorelines by stating that, "For beneficial use, AA1 [the preferred action alternative] includes placement of new work and O&M material along the riverbanks, offering significant benefits for shoreline stabilization and habitat enhancement." In fact, it actually proposes scant shoreline protection or enhancement. Ironically, the vast majority of the intertidal placement in the river proper is on either the sides of islands facing *away* from the navigation channel or in open-water areas. Based on the Corps' maps and descriptions, it appears that less than 2 miles of approximately *50 miles* of shoreline would receive any attention from the Beneficial Use Plan. If it really were true, as the Corps incorrectly states in its consistency letter, that the deepening and widening would not have any erosive impacts on the river's shorelines, there would have been no harmful impacts from the previous deepening and widening project and no need for the DEIS to claim that the preferred action alternative would generate aid for the river's already challenged coastal marshes.

3. e. The following proposed Beneficial Use Sites were of particular interest to Audubon, and because of the scope and scale of the project we believed it was important to share detailed commentary on them with the broadest possible range of agency partners throughout the review process, including through the consistency's public comment period.

<u>Masonboro Island: Sandy Sediment Placement</u>

Audubon North Carolina has a permanent seat on the Masonboro Island Reserve Local Advisory

Committee and works closely with Reserve staff to monitor birds on the site. The barrier island supports state-significant numbers of nesting American Oystercatchers and Wilson's Plovers, in addition to large assemblages of Arctic-breeding shorebirds during spring and fall migration. The Corps constructed two jetties at Masonboro Inlet, on the island's north end. The north jetty, which is on Wrightsville Beach, was built in 1966, and the south jetty, which is on the north end of Masonboro Island was built in 1980. In 2000, the Corps released a special report (Special Report: Impact of Navigation and Storm Damage Reduction Projects on Masonboro Island, North Carolina) that found that both the jetties and dredging at Carolina Beach Inlet at the south end of the island were contributing significantly to a sediment budget on Masonboro Island. Longshore currents were not able to transport sand naturally down the coast, resulting in island narrowing that the Corps details in its report. Despite the average deficit of 206,000 CY/year, the Corps has not placed material on the north half of the island since 2009. Though Corps staff have expressed a desire to do additional placements to make up for the artificial sand deficit, and a history of placements in 1986, 1994, 2002, 2006, and 2009, none have been made. Therefore, the primary impact of Corps projects on Masonboro Island have been negative, without adequate actions being made to remedy them. This now presents an opportunity for a beneficial use project.

In 2019 and 2021, the Corps has placed sand on stretches of beach on the southern half of Masonboro Island. These placements, though well intentioned and helpful to the Corps in disposal of excess material, did not have a beneficial impact because the sand did not remain on the island for a meaningful length of time. The proposed placement box is to the north of these previous placements, which may help with sediment retention, but additional study would help the Corps to determine the best location and method (beach placement or nearshore) for a beneficial use project. Ideally, the location of the box would be farther north, to allow for the existing longshore current to move sand more naturally down the island. Because the site is a conservation property with specific enabling laws, the State should ensure the Corps coordinates closely with Reserve staff to develop any beach or nearshore placement project; ensure that best practices are followed to minimize impacts to birds, sea turtles, and benthic infauna; and develop and implement a robust pre- and post-project monitoring plan.

Masonboro Island: Fine Sediment Placement

In addition to sand placement on Masonboro Island, the Beneficial Use Plan proposes fine sediment placement on the west side of the island in the vicinity of Johns Creek. This area is characterized by shallow, non-maintained creek systems that are navigable at high tide, mud flats, marsh, and shellfish beds. Placement of material in this area has the potential to negatively impact shellfish and impede public access to the area. The Johns Creek area has seen significant narrowing, but this would not address the problem that has been created by the manmade sandy sediment deficit discussed above. Further, there is healthy marsh, shellfish, and mudflat in the area already, so there is no need to place more material there. It is not desirable from a bird habitat perspective either, as birds can currently forage in the existing habitat.

Finally, intertidal placement at this location is not currently allowed per the terms and conditions of the Masonboro Island Reserve State Nature Preserve dedication letter. An amendment to the dedication letter would be needed to allow such an activity via the process defined in 07 NCAC

13H .0300-.0306. Additionally, placement would require approval by the Reserve and compliance with all federal, state, and local rules and regulations to minimize impact to the environment. We encourage the Corps to coordinate closely with the Reserve's staff to find other opportunities to benefit Masonboro Island. If in the future the Reserve chooses to investigate fine sediment placement, more detail regarding material type, placement methods, and pre- and post-project monitoring would be needed.

Ferry Slip and South Pelican Islands: Sandy Sediment Placement

Ferry Slip and South Pelican Islands are owned by the State of North Carolina, allocated to the North Carolina Wildlife Resources Commission, and managed by Audubon North Carolina through a signed agreement. Both islands are considered Important Bird Areas due to the proportion of the state's nesting waterbirds that they support. In the spring and summer, they provide sparsely vegetated sandy habitat that some species, including the Royal Tern, Sandwich Tern, Gull-billed Tern, and Black Skimmer require and that other species, including the American Oystercatcher and Willet readily use. During the non-breeding season they, along with other emergent shoals and islands from Ferry Slip to the mouth of the river, are roost sites—high tide congregating locations where birds can maintain their feathers and rest safely—for regionally significant numbers of non-breeding shorebirds.

As discussed above, the islands are currently each permitted to be 7 acres above mean high water and receive sand when the Corps has a pipeline dredge project working in the adjacent reaches of the navigational channel. As much sand placement is appreciated when it happens, continuing an existing beneficial use practice at two sites as part of deepening and widening the entire 25-mile navigational channel does not offset the many other significant and irreversible harms to AECs along the Cape Fear River. Expanding their permitted footprints would be beneficial because it would ensure the islands would not miss opportunities to receive sand due to capacity constraints. As the Corps has informed Audubon, if the expected quantity of dredge material exceeds their combined capacity, it will all be barged offshore to the ODMDS.

Ferry Slip and South Pelican Islands: Fine Sediment Placement

The Beneficial Use Plan also proposes to place a huge amount of fine sediment in the intertidal and shallow water areas around both Ferry Slip and South Pelican Islands: 107 and 35 acres, respectively. For scale, the islands themselves are each currently about 3 acres above mean high water. If beach-quality material must be placed in the shallow water or intertidal zone in order for the islands to receive sand at all, we are willing to accept it, as a stopgap to prevent the islands from missing a placement entirely. However, Audubon does not seek to place large quantities of fine-grained material around these islands, as it is of marginal benefit to birds at these sites (high energy area such as these are not likely to recruit benthic prey items that would be valuable for birds), is not likely to stay in place (again, due to the high energy at the sites and because we do not currently observe the islands gaining area from sediment accretion), and at the scale the Corps proposes would actually impede access to the islands for necessary management, as there must be approaches available for shallow draft skiffs to pull up in order to perform vegetation management and monitoring activities.

Instead, we would suggest first looking at making No Name Island larger, as mentioned below, and if fine material must be placed on or adjacent to the existing sandy parts of Ferry Slip and South Pelican Island, we would suggest the Corps look at creating areas elevated above mean high water, and coordinate closely with Audubon and the North Carolina Wildlife Resources Commission. A major consideration is ensuring that beach-quality sand from operations and maintenance dredging can still be placed using the control of effluent method that the Corps employes for its usual "bird island" placement. Too much marsh, or other incompatible resources like shellfish, in the vicinity could prevent placement if turbidity or the outflow would destroy them.

Islands 13, WH-DA 09, WH-DA 08, and WH-DA 07: Fine Sediment Placement

No formal bird surveys are conducted on these sites, and they are not often visited by people using eBird, so data is limited, but generally the islands are used by non-breeding birds, such as Brown Pelicans, Double-crested Cormorants, and gulls for roosting and by wading birds for foraging where there is marsh edge. It is likely that songbirds, including Painted Buntings, nest on them during the spring and summer months, but no data exist. Audubon staff regularly observe intertidal flats in the vicinity of Snow's Cut, including on the north end of WH-DA08, and these do not attract the Arctic-nesting shorebird species that are of conservation concern. None of these islands are considered to be of especially high value for birds in general, as can be seen by the fact that none of them are classified as Important Bird Areas, whereas nearly the entire Lower Cape Fear River falls into one of eight Important Bird Areas.

The Beneficial Use Plan proposes in-water placement of fine to coarse-grained sediment on the sides of Islands 13, WH-DA09, and WH-DA08 that face *away* from the river channel. Based on Google Earth imagery, it does not appear that these islands have experienced much erosion on the shorelines that do not face the river channel. They do provide a buffer between the developed shoreline on the east bank of the river and the navigation channel but wakes cross to the mainland shore in the gaps between. Audubon staff have been contacted by homeowners who are concerned about shoreline erosion just north of Snow's Cut and believe it has gotten worse in the recent past.

The islands north of Snow's Cut have received dredged material from other projects in the 1960s and/or 1970s, according to various Colonial Waterbird Atlases and reports compiled by Dr. James Parnell and his students. At some islands, these depositions led to a small amount (not generally ecologically significant) of bird nesting that did not persist over time, as vegetative succession made them unsuitable for the terns that colonized them. Their relatively large size—which favors colonization by mammalian predators—and established vegetation, as well as perhaps their location farther up the river channel makes them unlike to host nesting coastal waterbirds without heroic measures, and we do not suggest an attempt should be made to turn them into nesting islands.

The addition of material in front of the marshes on the eastern shorelines of the three northern sites (13, 09, 08) might create an intertidal flat, but whether it would attract foraging shorebirds is doubtful, as we do not presently see these species using the existing intertidal habitat around WH-DA08. This may be because those flats do not support populations of benthic invertebrates,

or because there are no high-tide roost sites nearby. Consultation with invertebrate scientists and additional information and study would be needed to make more accurate predictions and to understand what type of benthic communities might recruit into them. Again, since the Corps has confirmed no additional data will be collected, we are left with inadequate information to determine feasibility, cost, benefit, or consistency.

At WH-DA07, the Corps proposes an extensive mudflat, about a mile long stretching from just south of the southern end of WH-DA08 to the north side of Tricolor Island. This is problematic because the AIWW channel runs between WH-DA07 and WH-DA08 out to the Cape Fear River channel. If the material placed in this area does not stay within the boundaries drawn in the plan, it has the potential to fill in the AIWW channel, an area that Audubon staff have not seen dredged in 15 years. The potential to create problems for commercial and recreational traffic on the AIWW should be a red flag for the Corps. Meanwhile aerial imagery of WH-DA07 does not show much if any loss of shoreline from its eastern shoreline, and as with the other islands, WH-DA07's significance for birds is minimal at best. Instead of creating a large and possible unstable shallow area, this project would do better to concentrate on creating a larger, higher marsh system attached to the existing marsh island, Tricolor Island.

Tricolor Island is dominated by smooth cordgrass marsh but hosts a small number of nesting birds, including American Oystercatchers, Tricolored Herons, and very probably Seaside Sparrows (the latter are not surveyed for). A smaller disposal area, with a higher, super-tidal elevation to start and potentially some living shoreline components, would be more likely to remain in place and recruit marsh habitat. As is described below, previous Corps projects have created elevated areas within marshes on the Lower Cape Fear River that support nesting wading birds, and the same could be experimented with here in a more intentional way. A recent example of this "thick-layer" placement exists in New Jersey where the Seven Mile Island Innovation Lab—of which the Corps is a partner—where dredged material was used in unconventional ways to elevate existing marsh and create nesting habitat (https://amoywg.org/wp-content/uploads/2021/02/Collins-habitat-2020.pdf). This is an opportunity for the Corps to propose meaningful and creative placement strategies that would do more than furnish a least-cost disposal option.

North Pelican Island: Fine Sediment Placement

The proposed beneficial use at North Pelican Island misstates how the island has changed over the past 10-20 years and does not address the nesting bird habitat that would be directly, indirectly, and cumulatively impacted by the Corps' deepening and widening project.

North Pelican Island is the name given to the single, large (approx. 1.5 km long) island located just west of Peter's Point. To its north are two smaller marsh islands, collectively referred to as North North Pelican Island in the Colonial Waterbird Database. They are each about 0.2 km long and they may be lumped into the term "North Pelican" in the Plan. (We suggest referring to all of the islands in this area as the North Pelican Complex.) Another bird island called UNI, Cape Fear River 3 in the Colonial Waterbird Database and here called No Name Island is about 0.75 km south of North Pelican Island (Figure 11).

Figure 11. The locations of North North Pelican Island, North Pelican Island, and No Name Island (yellow) and the colony locations on North Pelican Island (blue).

All of the North Pelican Complex islands were likely originally a naturally occurring shallow area or marsh where over time dredged material was placed due to its proximity to the navigational channel. Based on undigitized aerial imagery housed in the Wilmington District offices, the latest placement was in the mid-1950s. Photos show sediment—possibly predominantly sand, based on its lighter coloration in black and white photos—being deposited onto marsh. This created an elevated berm along North Pelican Island's western shore and four or five elevated interior areas that were colonized by salt-tolerant trees, shrubs, and tall *Phragmities* (unknown species). The combination of elevation and vegetation attracted Brown Pelicans and long-legged wading birds, including White Ibis, Glossy Ibis, Great Egrets, and Tricolored Herons, Snowy Egrets, and Black-crowned Night-Herons to nest in the four elevated areas. (These colonies are numbered North Pelican #1-#4, south to north, in the Colonial Waterbird Database.) In addition, American Oystercatchers and Willets nest in solitary pairs along the berm along with colonies of Laughing Gulls. Seaside Sparrows aren't surveyed for but occur on the site and likely nest as well.

A similar dredge placement appears to have happened to the northernmost small island (North North Pelican) which is smooth cordgrass marsh with sand deposits on its northern and western sides. A similar group of waterbirds began to nest on it. The histories of these sites provide an excellent, though originally unintentional example of how dredged material can be well used to create, restore, and enhance bird nesting habitat. The Corps' perfunctory concept of placing some silt behind North Pelican Island is inadequate to address the existing impacts that will be exacerbated by the preferred alternative.

Contrary to what is stated in the Beneficial Use Plan, the eastern shoreline of North Pelican Island has *not* eroded significantly and is not an area of natural resource concern. It's concerning that Corps reports basic factual information incorrectly. The eastern shoreline is smooth cordgrass dominated marsh with minimal intertidal shoreline, as can be seen in online aerial imagery. The southwest corner has experienced the greatest loss of area, visibly fragmenting following Hurricane Florence and possibly due to other storms prior to that—while the entire west-facing shoreline is the area of greatest concern from the standpoint of nesting migratory birds as well as loss of area in general. This shoreline parallels the navigational channel and is subject to sudden, stochastic inundation from the displacement wakes of passing ships. As described above, these wakes swamp nests of migratory birds, including American Oystercatchers, Willets, Brown Pelicans, and Laughing Gulls and wash over unflighted chicks.

In the past 10 or so years, the nesting areas on North Pelican and North North Pelican Islands have degraded in quality—both area and elevation—following the increase in container ship size and a spate of hurricanes. While the acute loss of peat-based marsh from the southwest corner of North Pelican Island was easily observable following Hurricane Florence, the rest of the islands have lost elevation and suitability for nesting birds more gradually. North North Pelican Island can no longer host nesting Brown Pelicans and Great Egrets, and the remaining Laughing Gulls, American Oystercatchers, and Willets as well as species like Seaside Sparrows that are not surveyed for but that are present in the spring and summer, see their nest sites swamped periodically with the passage of large container ships (refer to Figures 5 and 10). *In 2025, Brown Pelicans completely abandoned North Pelican Island*.

Due to these forces, which would worsen with the preferred alternative, beneficial use of dredged material would be logically placed on the western shoreline to restore the berm and on or near the existing elevated colony areas to restore them as well. While deposition would in the short-term cover marsh vegetation, it would help the island in the longer term by providing it with greater elevation to assist it in keeping pace with the exacerbated erosional forces as well as background sea level rise. Thin or thick-layer sediment placement is another option for areas of the island as well that are intended to remain smooth cordgrass-dominated. Examples of thin-layer placement exist around the U.S. and, as mentioned above, thick-layer placement has been used successfully in southern New Jersey by the Corps' Philadelphia District.

Considering the extreme wave energy the island experiences—essentially manmade tsunamis—more structural options may be warranted following study of the site. Wave attenuating structures, living shorelines, or a combination of some or all may be helpful in protecting both bird nesting habitat and the marsh in general, and some of the material needed for such structures could be available from a deepening and widening project. Design should be as naturalistic as possible and avoid the characteristics of seawalls. Placement of sediment near the eastern shoreline would not protect the island from the impacts of the preferred alternative and would not benefit nesting birds that have already been experiencing the inaccurately anticipated impacts of previous projects.

Owens Island: Fine Sediment Placement

This placement area lies in the middle distance behind Ferry Slip Island and No Name Island. It is projected to be a 180-acre shallow or intertidal flat. Its stated purpose is to "renourish the eroding salt marshes on the *western* side of New Hanover County and to protect parts of the cultural and historic resources of Fort Fisher," but it is placed offshore of the river's *eastern* shoreline, and there is probably not enough tidal or wind-driven energy to push that sediment on to the marsh shoreline. If the goal is to build the marsh shoreline that fronts Fort Fisher State Recreation Area and the cultural resources on the property, it would make more sense to place the material in closer proximity, directly on and adjacent to the existing marsh shoreline. Living shoreline and plantings could be added to help jumpstart marsh restoration and creation. Audubon North Carolina staff observe living oysters in that embayment, so at first glance recruitment to a living shoreline in the area seems likely, but the Corps must also demonstrate awareness of shellfish resources within the project area so it can take steps to avoid impacts to them.

Additionally, this intertidal placement area (and another large placement area at Ferry Slip Island) is very close to No Name Island, a small bird-nesting island. This island consists of a mix of coarser sediment, marsh peat, and soft rock rubble, and therefore we believe it was either created from dredged material or received dredged material. As with North Pelican Island, the birds nesting on this island (American Oystercatchers and Laughing Gulls) are subject to overwash from ship wakes, storms, and sea level rise. Presently, only a small number of pairs can nest there. Therefore, it would be beneficial to elevate it and expand it, to create additional nesting habitat and improve what is there. Material presently designated for Owens Island and Ferry Slip Island could be used to create a larger island that would extend eastward from the existing No Name Island footprint.

Snow's Marsh Island: Fine Sediment Placement

This 64-acre placement area is in a very high energy setting and is in close proximity to the National Gypsum Company's quay where large ships dock. The likelihood of it not staying put and the chance that it could interfere with the company's operations (an economic cost) are high. It should not be used.

We strongly encourage the Corps to study ambient wave energy in the river (not ship wakes). The stretch between Southport and the south end of MOTSU has some of the most intense currents and waves anywhere on the river.

Lower Swash Island: Fine Sediment Placement

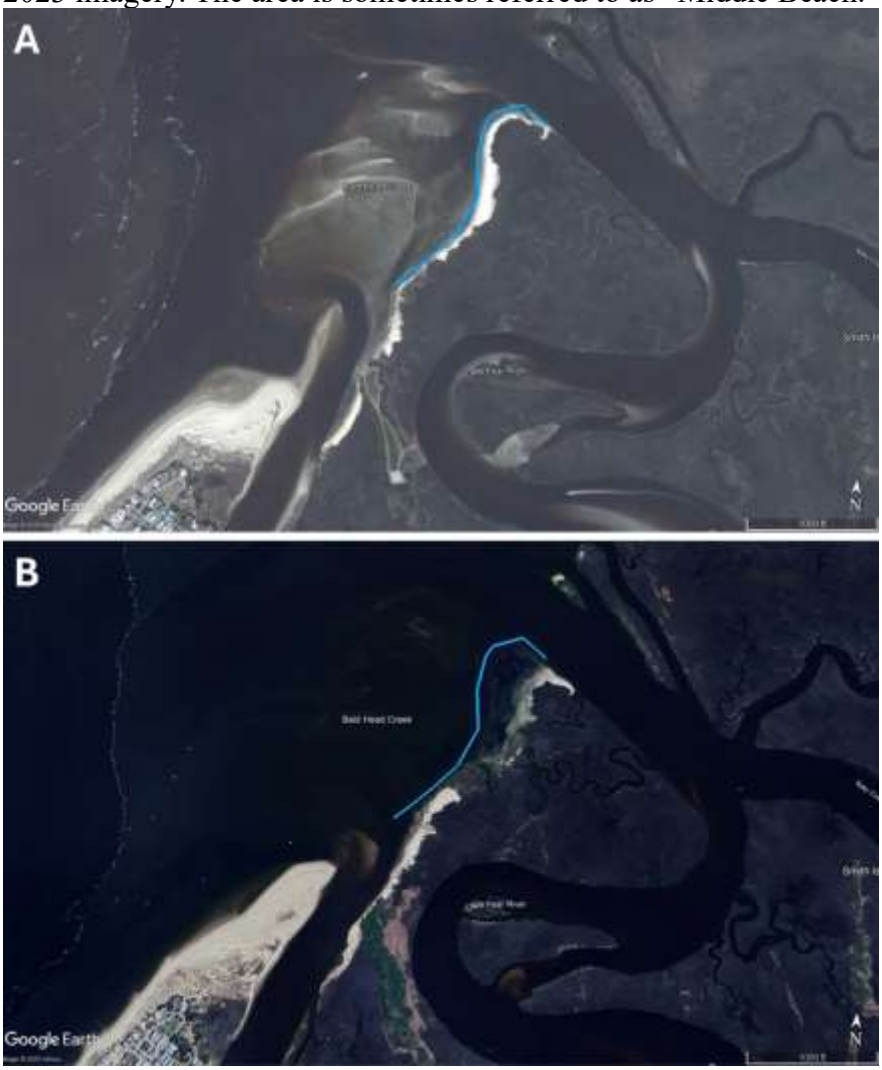
In its description of this placement area, the Beneficial Use Plan states that it would protect "the intricate tidal creek system of Bald Head Island" from erosional forces. However, the map shows the area is actually about 5 km from Bald Head Island, just off of the north end of Shellbed Island near where the southern terminus of the Fort Fisher Rocks. It's not actually clear, therefore, what the rationale for this site selection was.

The northern part of the Lower Swash Island placement area is in rather deep water—deep for an undredged part of the river—and the southern end is where a mudflat already exists. Further, there is oyster resource scattered all along the northern shoreline of Shellbed Island and a manmade oyster reef just behind the southern end of the Lower Swash polygon. Additionally, the area depicted on the map is rather deep, for the undredged part of the river, and the marsh edge in the area has a steeply scarped peat ledge, and it does not seem likely that it would replenish the marsh. This is also high-energy area, as northeast winds dominate in the winter and spring. If the sediment did not stay in place, it would have the potential effect of silting up the creeks that bisect Shellbed Island. Overall, this is not a location where we recommend sediment placement.

Instead, the Corps could consider experimental thin- or thick-layer placement in the Shellbed Island marsh, but only in close coordination with resource agencies and with a careful site selection process and monitoring program. Given that SLC projections show the near total loss of Shellbed and indeed the entire marsh system beyond it, work to investigate strategies that can help marsh that can't migrate stay in place longer is relevant and timely.

There is marsh shoreline that actually is in proximity to Bald Head Island, but it is farther south, and this area used to include a sandy beach which supported nesting American Oystercatchers and Willets, but has since disappeared allowing swell from the Atlantic Ocean to impact the marsh, which has since visibly retreated, especially following Hurricane Florence in 2018 (Figure 12). Placement, especially of sand, on the shoreline in this area would buffer the marsh and potentially restore lost bird nesting habitat as well as lost marsh. The open water in this area is shallow and the approach to the marsh edge is shallowly sloped, making it more likely that wave energy could attach it to the marsh than around the north edge of Shellbed Island, which is actually steep.

Figure 12. The shoreline just north of Bald Head Island's West Beach, showing A) 2015 and B) 2023 imagery. The area is sometimes referred to as "Middle Beach."



Southport Island: Fine Sediment Placement

Given the quantity of material apparently envisioned for this site as well as for Lower Swash Island, consideration should be given to the creation of a new bird island between Battery and Striking Islands. Bird islands are often made of sand, but as can be seen on the Cape Fear River, they are also marshy with fine material and wetland plants predominating. A smaller more defined area for disposal would also be less likely to impact the navigation of recreational watercraft in the area east of Battery Island, which is a popular fishing spot. At low tide, passage around Battery and Striking Islands already requires local knowledge and it is impossible to fully traverse at low tide. Finally, the parts of flats system that already exists there are used by foraging shorebirds, and a smaller placement footprint would be preferable.

Fort Caswell: Fine Sediment Placement

The intertidal placement areas in the Elizabeth River are in proximity to shellfish. Careful consideration should be given to placement location and methods to avoid impacting existing resources. Living shoreline would be likely to do well in the area, if installed as part of the project.

4. The Mitigation Plan (Appendix M) is inadequate.

The DEIS forecasts the loss of 1,071 acres of freshwater wetlands under the preferred alternative but does not commit to protecting the same number of acres through acquisition and protection. Instead, some 120 acres are gained through the proposed temporary removal of invasive *Phragmites*. *Phragmites* is widespread in the area and famously difficult to control. This would be especially true in the mitigation areas because nearby uncontrolled *Phragmites* would be available to recolonize, even if the plants within the target area were fully eradicated. Further, the *Phragmites* work is planned for only a few years, which means the DEIS is proposing a dubious temporary benefit to offset the permanent and unchangeable loss of wetlands. This cannot be consistent with the State's coastal management plan.

Interestingly, although *Phragmites* monoculture is less beneficial to wildlife, including in most cases birds, than a native plant community, in North Carolina it can stabilize marsh and store carbon efficiently in comparison with native marsh plants (https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0173007). Therefore, decisions to manage *Phragmites* or pursue other projects may require nuanced decision-making, including consideration of what species (like the Eastern Black Rail) may be supported if it were removed, or if the cost of removal would preclude the opportunity to do other more beneficial projects (https://www.wypr.org/wypr-news/2019-10-17/as-climate-changes-scientists-re-think-phragmites).

If the Corps deems that *Phragmites* removal does indeed compensate for lost acres, its management plan will need to be funded in perpetuity—and the costs factored into the economic analysis—as even a few years of treatments will not be sufficient to keep sites within the project area free from regrowth and recolonization. However, we propose that *Phragmites* work is not appropriate mitigation, and instead, in order to be consistent with the State's coastal management plan, the Corps must propose the acquisition—and funding must be guaranteed in advance—to purchase equivalent acres for mitigation.

5. The Corps does not adequately evaluate the increased sunny-day and storm-driven flooding that would be worsened by the proposed project.

North Carolina's coastal management plan requires that the State take action to make coastal habitats and species more resilient to the impacts of climate change, but the Corps fails to adequately assess the flood risks associated with deepening and widening the navigational channel. Making the channel deeper and wider would allow a greater volume of water to come up the river with each tidal cycle, expanding the tidal prism. It will also allow a greater volume of water to come up the river during tropical storms and hurricanes. Thus *the project would make both tidal and storm-driven flooding worse, with or without sea level rise, because more water would be in the coastal system due to the deeper, wider channel.* The Corps dismisses this fact by

citing climate change, but the Corps should not be allowed to ignore the fact that the project will worsen flooding all by itself and bring that more extreme flooding to the river's shorelines as soon as each section of the channel is expanded. This not only worsens flooding but accelerates the timing of more extreme flooding.

Already, public roads in downtown Wilmington and neighboring communities flood during king tides. These events make roads impassable, damage property, and hamper local businesses. Causing these events to become more frequent is a significant burden the Corps proposes to place on communities with no effort at minimization or avoidance. More water making its way up the river during the normal tidal cycle and storms will increase erosional forces on coastal marshes, damaging AECs found along the river's shoreline, making the affected areas more vulnerable, not more resilient, to climate change. Damage to AECs will be by increased level and duration of inundation, habitat conversion and loss, and physical stress to the physical structure of the marsh due to greater energy in the system driven by the greater volume of water moving within it—even without increasingly large ship wakes.

An economic analysis would find that worsened flooding would impose significant economic costs on residents, businesses, and governments responsible for maintaining infrastructure and cleaning up water damage in homes and businesses. These costs should give the State pause, as it would impose an additional burden on communities along the Cape Fear River even while the meager projected benefits of the proposed project would accrue to international shippers. Meanwhile, the coastal marshes that provide buffers to human communities and that the coastal management plan directs the State to protect would be lost or degraded.

6. The Corps does not consider the known presence of PFAS in the Cape Fear River, or how dredging and re-suspension of legacy and newer PFAS compounds would affect North Carolina's estuarine waters, wildlife, and human health.

Stakeholders throughout the public comment process have brought to the Corps' attention that toxic PFAS have been dumped directly into the Cape Fear River since 1978 from a chemical manufacturing company upriver, and possibly earlier from global reach of the compounds from other sources. Data obtained from a 2019 Consent Order found that there are at least 350 unique types of PFAS coming from the facility alone; and the concentrations of 257 of them are yet unattainable due to lack of scientific standards.
Universities, the State, and other entities have already determined that PFAS is present in and affecting wildlife in the Cape Fear River, along with as the human residents of the Cape Fear Region. Notably, in 2023 the State issued the most restrictive fish-consumption advisory to date on fish caught in the Cape Fear River. This is alarming in and of itself, but more so when considering this advisory is based on analysis of uptake into the fish by just one type of PFAS, among the more than 350 in the river.

There is plenty of data showing that PFAS is absorbed by both plants and animals; however, there is no data on what impacts may arise from dredging layers of long-sequestered material and resuspending it in the water column, or how this disturbance may impact human health, ecosystems, wildlife, fisheries, tourism and recreational activities, or costs to local utilities and private individuals, should the disturbance increase concentrations in the river and drinking

water supply for half a million people. Despite this, the Corps chose not to include testing for PFAS in the DEIS.

The DEIS also fails to consider the legal or economic constraints that may arise in managing the contaminated dredge material. Two extremely persistent PFAS compounds in the river are already designated as Hazardous Substances under CERCLA and it is highly probable that other PFAS will be regulated at the federal or state level during the initial dredging or the ongoing maintenance dredging this project would require. Economic impacts would also affect surrounding local governments, utilities, healthcare providers, businesses, and others. For example, local utilities and ratepayers are already bearing the burden of filtering PFAS out of the drinking water supply, and this fall we learned that some PFAS compounds (ultra short-chain PFAS with low carbon counts) are breaking through the $43 million filtration system already in place in New Hanover County. This is one example of how dangerous and costly it is to manage PFAS due to the enormous knowledge gap we face. These potential impacts and costs should not be ignored by the State or the Corps.

7. Without a fully funded, independent monitoring and adaptive management plan, it is impossible for the State to know the impacts of the proposed project.

Following the previous deepening and widening project, there was a ten-year study to monitor the impacts of the project on the Cape Fear River and surrounding areas (https://people.uncw.edu/culbertsonj/). In conjunction with the recent expansion of the Port of Savannah, a monitoring and adaptive management plan was put in place—and funded—prior to the start of work. The Corps offers no such plan for this project. While collecting data alone cannot address damage caused by a project, it is necessary to understand the impacts of an action in order to attempt to offset or otherwise address adverse results. This is especially important since many of the predictable impacts involve increased flooding to human communities and infrastructure, including disadvantaged communities. In addition to developed areas, there are many public trust properties that are in some form of ownership meant to preserve natural and cultural resources which would also be negatively impacted by predictable outcomes of the proposed project.

Therefore, the Corps should clearly commit to a substantive, long-term monitoring plan, including pre-project monitoring, *and the cost of such work should be included in the economic analysis*. A reasonable first step would be to convene a working group of stakeholders and subject-matter experts to assist in the development of such a plan. Providing for monitoring is especially pertinent since the Corps informed stakeholders at the outset of the EIS drafting process that it would not collect any new data to inform the document. Not requiring a funded monitoring and adaptive management plan would prevent the State from being able to even know the proposed project's impacts, let alone take whatever corrective action may be possible.

8. The DEIS proposes significant, permanent, irreversible damage to coastal ecosystems with no identified economic benefit to the affected region or the State.

Given the foregoing significant impacts of the proposed project, it would be logical to expect that the project carries an impressive projected benefit-to-cost ratio. Instead, it offers a slim 1.3

benefit-to-cost ratio, in comparison with 7.3 for the 2020 Port of Savannah project and 5.8 for the 2018 Norfolk Harbor project. Given that Audubon is not an economic expert, we refer the State to the independent economic analysis in the November 17, 2025 letter submitted by the Village of Bald Head Island to the Corps. It describes how multiple unjustifiable assumptions are made to arrive at even the 1.3 ratio, and asks why the methods used for this project were not the same as those used for the Port of Savannah EIS. Meanwhile, the Corps forecasts *the same amount of cargo will pass through the Port of Wilmington with or without the project*. Therefore, the only benefits would be to international shipping companies, not the local communities or North Carolinians in general. In fact, the local community has recently acted to protect coastal wetlands with New Hanover County's purchase of 28 undeveloped acres across from downtown Wilmington. These are the types of investments that will benefit the community in the long run by limiting exposure to risk and protecting wetlands that help absorb the impacts of flooding. Based on the Corps' own analysis, there is no good reason to justify the many serious threats to North Carolina's coastal resources that this project proposes.

Despite all of these issues, the Corps' consistency letter makes multiple unsubstantiated claims in order to find that project is consistent with North Carolina's coastal management plan. These unsubstantiated claims include:

1. "Project modeling indicates that erosive forces to shorelines and riverbanks would be reduced under the action alternative as compared to the No Action Alternative" (Corps consistency letter, pg. 14).

As has been discussed, *the results of the Corps model do not conform to observed reality on the Cape Fear River and the model does not output parameters that are essential in assessing negative impacts on coastal habitats and wildlife*. They are further undermined by the failure of the Corps to collect new data to inform its model, including such parameters as nearshore bathymetry, intertidal and shoreline topography, sediment characteristics, wave characteristics, and more. This lack of data was identified all the way back in the 2019 stakeholder meetings and concerns were not addressed at that time, and they continue not to be. For the river channel, the only reported output of the model is bed shear stress, and bed shear stress is not the only force that affects the AECs found the Cape Fear River.

2. "Under the proposed action, the fleet analysis showed a decrease in yearly passages from 1,214 to 949, helping reduce bottom stress which in turn would reduce river shoreline erosion throughout the project area. The project also includes placement of new work and O&M dredged material along the riverbanks, offering significant benefits for shoreline stabilization and habitat enhancement. These efforts protect vegetation, spawning areas, and infrastructure, while increasing resilience to storm events and sea level change" (Corps consistency letter, pg.17).

Even if the model results were credible, the Corps imposes no limit on ship tonnage, under-keel clearance, or transits up and down the Cape Fear River. These are the parameters the Corps says make the project less harmful than no taking action. Therefore, there is no constraint on the

negative impacts that would result from the proposed project. Further, the Corps offers placement of dredged material along the river shoreline in such a way as to suggest that this placement is a reason for proceeding with the project. However, without the previous deepening and widening project, the harms that AECs, including coastal wetlands and estuarine shorelines, are experiencing now would be significantly less. It is illogical to pursue additional deepening and widening and expect any different result than what has already been observed over the past 25 years.

3. "There are no shellfish beds in the project area" (Corps consistency letter, pg. 14).

This is just not true. That the Corps is wrong on such basic facts raises concerns about the quality of much of the other information presented in the consistency letter and DEIS.

4. "The project is not expected to have any negative impacts to coastal wetlands […] estuarine waters […] public trust areas [… or] coastal shorelines" (Corps consistency letter, pg. 15-16).

These assertions are not aligned with information presented here and elsewhere by other affected stakeholders. Negative impacts include but are not limited to increased shoreline and marsh erosion, wetlands loss and conversion, likely exposure of estuarine waters to contaminants including PFAS, hazards to safe navigation, and the worsening of sunny day and storm-driven coastal flooding with predictable impacts to human communities and coastal AECs.

5. "The proposed action would not adversely affect any biota recognized by the State as species of concern, would not adversely impact water quality, and would result in minimal, temporary and short-lived impacts to fisheries and the aquatic habitat. Placement of dredged material would be conducted using previously employed and approved methodologies" (Corps consistency letter, pg. 18).

The Corps is unable to even completely list species the State recognizes as species of concern, and as we have extensively documented, it fails to accurately describe direct and indirect negative impacts to multiple bird species and their habitats. The Corps also fails to even test for PFAS in long-sequestered sediment proposed to be dredged or describe a framework by which it could be evaluated for various types of placement. Finally, the in-water placement of millions of cubic yards of fine material is not a previously employed or approved methodology and the scant detail provided in the Beneficial Use Plan is inadequate to such a massive undertaking. Smaller, carefully planned and monitored projects would be welcome and rational, but they would not serve what is probably the real purpose of the Beneficial Use Plan, which is to contain costs so as to avoid compromising the project's marginal 1.3 benefit to cost ratio.

Overall, the DEIS proposes a project that is enormous in both scale and impacts on human communities and natural ecosystems, thereby failing to "safeguard and perpetuate" "natural productivity" and "biological, economic, and esthetic values" of the area as described by the

goals of the North Carolina Coastal Management Act. For such a large and costly project, the economic benefit is slim, slim enough that any number of plausible factors could upend the benefit-to-cost ratio and render it unfeasible. Given the outsized environmental impacts, it would have been rational to expect a massive economic benefit to be realized by North Carolinians, but none is offered by the DEIS or the Corps' consistency letter, and even those meager benefits do not stand up to expert scrutiny. It would also be rational to expect a well thought out monitoring and adaptive mitigation plan, but none exists even though the Corps is capable of producing such plans as it did for the Savannah Harbor project. What little offsets the Corps does propose lack detail and clarity and may not even be feasible.

Given all this, we respectfully conclude that the proposed Wilmington Harbor 403 Navigation Project is inconsistent with the enforceable policies of North Carolina's Coastal Management Program. Instead of exposing coastal resources—from birds to coastal communities—to a host of negative outcomes from an unnecessary, costly, and destructive project, we urge the Division of Coastal Management to act to protect its irreplaceable coastal resources.

Sincerely,

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