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NEW INLET DAM REMOVAL

The following facts or coastal engineering opinions relate to a recent N.C. Legislative proposal (SB160) to remove the historical New Inlet Dam so as to allow for or encourage the reopening of New Inlet which has been closed since 1879. A potential purpose of the reestablishment of New Inlet is to foster a new major navigational channel between the Ocean and various locations within the Cape Fear River.

BACKGROUND

- In 1857, federal nautical charts clearly indicate that New Inlet was a relatively robust tidal inlet having a major influence on the environs of the lower Cape Fear River (see **Figure 1**). At the time, sailing lines existed through *both* New Inlet and the natural primary entrance to the Cape Fear River which is located to the south between Oak Island and Smith Island (known today as Bald Head Island). As an unstabilized inlet, New Inlet's mapped location has varied significantly throughout the years.
- Anecdotally, New Inlet opened in about 1761 during a storm event at a "haulover" location across the barrier island that had been physically lowered by fishermen dragging their boats over the narrow beach which lay between the river and the ocean. It is reported that the haulover was utilized by small craft desiring to avoid transit around or across Frying Pan Shoals located seaward of Cape Fear.
- Various levels of attempted engineered improvements by State interests intended to foster a reliable navigation channel between New Inlet and the City of Wilmington met with little success. Accordingly, portions of the Cape Fear River in the vicinity of the inlet suffered extensive problematic shoaling throughout the 19th Century. In the 1820's, the

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State of N.C. formally requested the assistance of the U.S. Army Corps of Engineers via the newly established Rivers and Harbors Act.

- Before 1853, no work had been performed with the goal of improving navigation at the southerly natural entrance to the Cape Fear River. At or about that time however, the historical premise of needing to improve navigation between New Inlet and Wilmington was eventually abandoned. For example, a Commission appointed by the then Secretary of War, Jefferson Davis concluded that prior engineering improvements “attempted” at New Inlet had *not* been sound and had actually impacted or reduced navigability to the City of Wilmington. Not unexpectedly, the Commission similarly deduced that as depths throughout New Inlet increased over time, corresponding depths at the Cape Fear River mouth had decreased. As a result, the Commission subsequently recommended that New Inlet be *closed* in order to attempt to restore naturally occurring navigable depths over the ocean bar at the River entrance back to their pre-1761 conditions. No major navigation works on the Cape Fear were accomplished however until after the Civil War.
- Records show that the Corps of Engineers resumed work on the lower Cape Fear River in 1870. Although New Inlet had been invaluable to the City of Wilmington during the Civil War, it was recognized to be a “liability” after the war due to its propensity for shoaling and lack of reliable depth over its ocean bar. Accordingly, in 1869, Congress authorized a reexamination of the river’s navigation system. In 1870, work on the Cape Fear River proceeded in three phases with the first point of order being the *closure of New Inlet and nearby swashes to the south*. On 14 June 1879, after several years of implementation of various levels of engineered works, New Inlet was physically closed – via the “New Inlet Dam”. However, the initial closure of the inlet increased tidal flows through various swashes through the island requiring an extensive second structure extending to the south entitled the “Swash Defense Dam”. With the entire tidal prism of the Cape Fear River finally confined to the River mouth, the Wilmington District, USACOE was ultimately able to successfully dredge, expand and maintain a federally

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authorized navigation project channel from the Atlantic Ocean to the Port of Wilmington over the subsequent decades.

- In 1913, the Ocean Entrance Channel was dredged to a depth of -26 feet. Since 2000, it has been authorized at a depth of -44 ft. (MLW). As a direct result of channel improvements to the Cape Fear River's hydraulic efficiency, the tidal range at the Port of Wilmington has increased from 2.7 ft. in 1911 to over 4.15 ft. today – due to continuing deepening and widening of the federally authorized navigation channel. Corresponding increases in tidal flow, as well as riverine salinity have likewise occurred.

PREDICTIONS

Based upon historical data, recent numerical DELFT3D modeling (using software licensed from Delft University of Technology in the Netherlands) of the Cape Fear River Entrance by the Village of Bald Head Island and fundamental coastal engineering principles associated with tidal inlet hydromechanics, the following opinions or predictions are rendered for consideration regarding any proposal intended to reopen New Inlet:

- The New Inlet and Swash Dam structures were both authorized by Congress and constructed by the U.S. Army Corps of Engineers. Their removal would therefore necessitate deauthorization by Congress. Such actions would be subject to NEPA and would necessitate appropriate physical and fiscal justification, an Environmental Impact Study and significant federal, state and public coordination. The physical and environmental consequences of reintroducing a second tidal inlet to the Cape Fear River would be significant.
- Similarly, both the nature and the age of the subject dam structures constitute “engineered features” that would qualify for their inclusion in the National Register of Historic Places. Hence, considerations regarding cultural resource impact because of structure removal or modification would be significant. Any associated change in channel alignment could likewise impact the documented site of the CSS Raleigh sunk immediately west of the

