North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

MEMORANDUM

TO: GOVERNOR OF NORTH CAROLINA
The Honorable Pat McCrory

PRESIDENT PRO-TEMPORE OF THE SENATE
The Honorable Phil Berger

SPEAKER OF THE HOUSE OF REPRESENTATIVES
The Honorable Tim Moore

SECRETARY OF THE DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
The Honorable Donald R. van der Vaart

ENVIRONMENTAL REVIEW COMMISSION
The Honorable Mike Hager, Co-Chair
The Honorable Brent Jackson, Co-Chair

FROM: Neal Robbins
Director of Legislative Affairs

SUBJECT: Coastal Resources Commission Cape Fear River AEC Feasibility Study

DATE: January 30, 2015

Pursuant to Session Law 2012-202, Section 4, the Coastal Resources Commission shall study the feasibility of creating a new Area of Environmental Concern for the lands adjacent to the mouth of the Cape Fear River. The Commission concluded that other ocean inlets often must contend with similar issues and therefore undertook a comprehensive review of ocean inlet-related issues over the past year, as was described in the Commission's original report in December 2013. The attached report also addresses Session Law 2012-202, Section 5, which states:

> *"The Coastal Resources Commission shall study the feasibility of eliminating the Inlet Hazard Area of Environmental Concern and incorporating appropriate development standards adjacent to the State's developed inlets into the Ocean Erodible Area of Environmental Concern. If the Commission deems action is necessary to preserve, protect, and balance the economic and natural resources adjacent to inlets, the Commission shall consider the elimination of the inlet hazard boxes; the development of shoreline management strategies that take into account short- and long-term inlet shoreline oscillation and variation, including erosion rates and setback factors; the development of standards that account for the lateral*

movement of inlets and their impact on adjacent development and habitat; and consideration of how new and existing development standards, as well as existing and proposed development, are impacted by historical and ongoing beach and inlet management techniques, including dredging, beach fill, and engineered structures such as groins and jetties. As part of this study, the Commission shall collaborate with local governments and landowners affected by the Commission's Inlet Hazard Areas to identify regulatory concerns and develop strategies for creating a more efficient regulatory framework. The Commission shall report its findings, including any proposed actions the Commission deems appropriate, to the Secretary of Environment and Natural Resources, the Governor, the President Pro Tempore of the Senate, the Speaker of the House of Representatives, and the Environmental Review Commission on or before January 31, 2015."

Please consider the attached at the formal submission of this report.

If you have any questions or need additional information, please contact me by phone at 919-707-8618 or via email at Neal.Robbins@ncdenr.gov.

cc:
Tom Reeder, Assistant Secretary for Environment, NCDENR
Braxton Davis, Director, Division of Coastal Management, NCDENR
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N.C. COASTAL RESOURCES COMMISSION – INLET MANAGEMENT STUDY

In 2012, the N.C. General Assembly directed the N.C. Coastal Resources Commission (CRC) to study the feasibility of creating a new Area of Environmental Concern (AEC) for the lands adjacent to the mouth of the Cape Fear River (Session Law 2012-202). In its final report, the Commission recommended a comprehensive review of ocean inlet-related issues with the expectation of developing additional management tools that will allow the CRC to more proactively address the issues confronted by local governments in these dynamic areas. This comprehensive review included a second legislatively-mandated study of the feasibility of eliminating the CRC's Inlet Hazard Area rules, also as required by Session Law 2012-202. The Commission has identified the following short-term and long-term priorities with respect to coastal development, dredging activities, beach fill, beneficial use of dredged materials, and the use of engineered structures in association with the state's developed inlets:

Short-Term Priorities

- Address dredging depths and sediment criteria rules
- Improve erosion rate calculations for Inlet Hazard Areas
- Improve emergency permitting for beach bulldozing
- Revisit rules establishing "Static Vegetation Lines" for beach setbacks
- Explore options for the stockpiling of sand resources
- Extend the permit period for long-term beach and inlet projects

Long-Term Priorities

- Ensure the beneficial use of beach compatible dredged materials
- Explore Inlet Management Plans
- Identify potential funding sources and partnerships
- Expand dredging windows / moratoria related to endangered species
- Improve monitoring conditions placed on beach and inlet permits

The Commission has already begun to work on several issues, including the potential establishment of a State Ports Inlet Management Area of Environmental Concern and exploring policy alternatives to the existing static vegetation line and static line exception rules for beachfront development setbacks. Full details of the study are contained in the attached report.

With regard to the feasibility of eliminating the Inlet Hazard Areas of Environmental Concern, the CRC's Science Panel advised that the physical processes affecting inlet areas of barrier islands are significantly different from those affecting oceanfront and estuarine areas of barrier islands. Since management options in these areas should consider relative risks, the Commission recommends the establishment of an "area of inlet influence" for each developed ocean inlet. Full details of this recommendation are also contained in the attached report.

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N.C. COASTAL RESOURCES COMMISSION
INLET MANAGEMENT STUDY
PRIORITIES AND RECOMMENDATIONS
JANUARY 15, 2015

Introduction

The 2012 N.C. General Assembly directed the Coastal Resources Commission (CRC) to study the feasibility of creating a new Area of Environmental Concern (AEC) for the lands adjacent to the mouth of the Cape Fear River. Session Law 2012-202 required the CRC to consider the unique coastal morphologies and hydrographic conditions of the Cape Fear River region, and to determine if action is necessary to preserve, protect, and balance the economic and natural resources of this region through the elimination of current overlapping AECs by incorporating appropriate development standards into one single AEC unique to this location.

During the course of this study, the CRC found that while the Cape Fear River inlet did present a unique set of challenges, other inlets may have similar issues. The Commission therefore decided to undertake a comprehensive review of inlet-related issues and with the expectation of developing additional management tools that will allow the CRC to more proactively address the issues confronted by local governments in these dynamic areas.

This comprehensive review of inlet management related issues included a number of related initiatives and legislative mandates currently underway such as determining the feasibility of eliminating the Inlet Hazard AEC (Appendix C) and incorporating appropriate development standards adjacent to developed inlets (S.L.2012-202); an examination of permit mechanisms to streamline inlet dredging projects (S.L.2013-138); and efforts to promote regional sediment management through implementation of the Beach and Inlet Management Plan.

These efforts have been combined as part of a comprehensive inlet management study in an effort to develop a solutions-oriented approach that provides appropriate remedies with respect to proposed development, dredging activities, beach fill, beneficial use of dredged material, and the use of engineered structures through close collaboration with local governments.

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Over the course of the study, the Commission reviewed existing shoreline management strategies, inlet dynamics, erosion rates and setback factors as well as CRC development standards adjacent to inlets. The study also considered how historical and ongoing beach and inlet management techniques, including dredging, beach fill, beneficial use of dredged material, and engineered structures such as groins and jetties can be incorporated into a management strategy. Of particular focus was an examination of CAMA permit mechanisms to streamline routine inlet projects and collaboration with local governments and landowners in an effort to ensure a cost-effective and equitable approach to beach and inlet management and restoration.

Stakeholder Input

The Commission sought input on inlet management from a wide array of stakeholders that included sand managers, engineers, dredging industry representatives, the U.S. Army Corps of Engineers and those with an interest in environmental impacts associated with inlet management. Stakeholders provided the Commission with an overview of their concerns and ideas regarding inlet management, including in-water issues (dredging), erosion control alternatives, and development standards on adjacent lands.

In order to build on the Cape Fear River AEC Study and elicit a range of management options and regulatory reforms related to inlet management, a series of community-based discussion forums were held along the coast. These regional meetings were held in Hatteras, Beaufort, Wilmington and Ocean Isle Beach and included discussion of the existing regulatory framework with regard to dredging and beach nourishment, as well as specific issues/actions related to the inlets encompassed by the region. Local governments and representatives of other organizations adjacent to inlets in the region were invited to present their specific concerns related to the inlet(s) within their jurisdiction (see Appendix B Summary of regional Inlet Management Meetings and Preliminary Findings). Written comments were also solicited on new tools and management options to address the following areas:

- Beneficial use of dredged materials
- Dredging depths and sediment criteria rules
- Channel realignment projects
- Development standards/erosion setback
- Volumetric triggers for “static lines”
- Emergency permitting: bulldozing and sandbags
- Dredging windows/moratoria
- Terminal groins and sand bypassing
- Erosion rate calculations for Inlet Hazard Areas
- Dune creation in the Inlet Hazard Area
- Monitoring conditions associated with beach and inlet projects

Priorities and Recommendations

The Commission utilized the information gathered from the regional meetings, stakeholders and public comments to develop a list of short-term and long-term priorities contained within the N.C. Coastal Resources Commission, Inlet Management Study, Findings and Policy Options document (Appendix A). The Findings document contains a full discussion of specific public comments, implementation actions and relevant laws or rules associated with each inlet management topic.

The commission recommends beginning implementation of the following priorities to address inlet manage related issues. These initial efforts will focus on areas that are within the existing authority of the CRC, build in current initiatives and include a mix of short and long-term actions:

Short-Term Priorities

- Address dredging depths and sediment criteria rules
- Improve erosion rate calculations for Inlet Hazard Areas
- Improve emergency permitting for beach bulldozing
- Revisit rules establishing "Static Vegetation Lines" for beach setbacks
- Explore options for the stockpiling of sand resources
- Extend the permit period for long-term beach and inlet projects

Long-Term Priorities

- Ensure the beneficial use of beach compatible dredged materials
- Explore Inlet Management Plans
- Identify potential funding sources and partnerships
- Expand dredging windows / moratoria related to endangered species
- Improve monitoring conditions placed on beach and inlet permits

Complete Science Panel technical study of Inlet Hazard Areas

The purpose of the Inlet Hazard Areas, or IHAs, is to define areas that are subject to coastal processes associated with inlet dynamics (tidal currents, influence of ebb shoals on erosion patterns, etc.). A 1978 report defined the original Inlet Hazard Area boundaries, and minor amendments were made in the early 1980s. Since the boundaries are outdated, there are many cases where the inlet has completely migrated out of the hazard area. Currently, the setbacks for the IHAs are based on the erosion rates calculated for the adjacent Ocean Erodible Areas (OEAs) and not for the actual inlet area itself.

The CRC has tasked its Science Panel with completing its Inlet Hazard Areas study focusing on developing a methodology for calculating erosion rates adjacent to inlets and responding to the requirements of House Bill 819 (S.L. 2012-202), to include a feasibility analysis of whether the

Inlet Hazard Area of Environmental Concern can be eliminated. The recommendations of the CRC Science Panel can be found in Appendix C.

Establish Deep Draft, Port or Navigation Inlet Management Areas

Since each inlet in the state has unique attributes, individual inlet management plans could be developed to guide future management actions at each inlet. Some aspects of inlet management plans already exist to a certain extent at a few of North Carolina's inlets. The two deep-draft inlets in the state, Beaufort Inlet and Cape Fear River Inlet, have 20-year Dredged Material Management Plans (DMMPs) which guide the frequency and distribution of dredged material disposal. Inlet management plans could also include sediment budgets, relevant research and studies, delineated areas of inlet influence, and appropriate development standards adjacent to inlets.

The Commission will begin development of separate, distinct deep-draft Inlet Management AECs that would result in Beaufort Inlet and Cape Fear River Inlet having specific management objectives and associated development standards. The management objects will recognize the priority placed on providing shipping access to the state ports through channels maintained by the United States Army Corps of Engineers. The use standards for development in these areas will recognize the influence of a federally mandated channel location on adjacent shorelines, additional considerations to address erosion control, beach management, the beneficial use of dredged material and the protection of coastal resources.

Expansion of dredging windows related to moratoria due to biological activity

Dredging projects require coordination with other state and federal agencies, including the U.S. Army Corps of Engineers (USACE), the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) to mitigate impacts to natural resources. The Division of Coastal Management relies on federal and state resource agencies during the Coastal Area Management Act (CAMA) Major Permit process to provide guidance on the timing of projects to minimize adverse effects on biological activity.

Representatives from Coastal Planning and Engineering, Moffatt and Nichol, Dial Cordy and Associates, and other consultants in North Carolina are currently undertaking a study to evaluate the feasibility of expanding the current dredging windows. The objective of the study is to develop summer dredging protocols to mitigate possible impacts to biological resources. The study will be circulated to the various resource agencies and the Commission will evaluate the extension of dredging windows.

Develop alternative approaches to static vegetation line and static line exception rules

In areas that have received a large-scale beach fill project (greater than 300,000 cubic yards of sediment or any storm protection project constructed by the USACE), the building setback is

measured from the Static Vegetation Line, which is the vegetation line in existence within one year prior to the onset of the project. In some communities with a long-term commitment to beach fill, proposed development on many lots could meet the required setback from the natural vegetation line, but could not be permitted since they could not meet the setback from the static vegetation line. The CRC created the static line exception [15A NCAC 07H.0306(a)(8)] as a mechanism to allow setbacks for small-scale development in areas with a long-term commitment to beach nourishment to be measured from either the natural vegetation line or the static line, making more lots developable in these areas.

The Commission will consider developing an alternative to the existing static vegetation provisions, replacing it with a "development line" established by local governments and approved by the CRC, seaward of which no new development will be allowed. New or replacement structures would be sited based on the graduated setback from the vegetation line, or the development line, whichever is further landward. The CRC will also consider amending the static line exception rules by eliminating the 2,500-square-foot maximum building size limit and determine structure setbacks based on the graduated setbacks from the first line of stable and natural vegetation where local governments have demonstrated a commitment to long-term beach nourishment.

Coordinate with U.S. Army Corps of Engineers on beach bulldozing practices

The CAMA General Permit for beach bulldozing (15A NCAC 07H.1800) allows bulldozing landward of the Mean High Water Line (MHWL) in the Ocean Erodible AEC (OEA), but it does not apply to Inlet Hazard AECs (IHA). Bulldozing of material from seaward of the MWHL is also allowed but requires a CAMA Major Permit and State Dredge and Fill Permit. Bulldozing and building of new dunes are both currently prohibited in IHAs, but the rebuilding of existing dunes is allowed. Bulldozing is allowed to protect vacant lots if the lots are not located in an IHA. The Commission and DCM will begin development of a more comprehensive General Permit for bulldozing below the MHWL in consultation with the U.S. Army Corps of Engineers, as well as address dune building and bulldozing practices in IHAs.

Amend the definition of "imminently threatened" and its application in CRC rules

Sandbags are allowed as temporary protection for threatened structures such as houses, septic systems, and roads. They currently cannot be used to protect swimming pools, decks, gazebos, vacant lots, or natural features such as dunes. A structure is considered imminently threatened if its foundation, septic system, or right-of-way in the case of roads, is less than 20 feet away from the erosion scarp. Buildings and roads located more than 20 feet from the erosion scarp or in areas where there is no obvious erosion scarp may also be found to be imminently threatened at the DCM director's discretion when site conditions, such as a flat beach profile or accelerated erosion, increase the risk of imminent damage to the structure.

The Commission will consider amending the definition of "imminently threatened" including the distance at which point sandbags would be allowed. Also to be considered will be natural features such as dunes in addition to structures.

Beneficial Use of Dredged Materials

The state currently has an enforceable beneficial use policy that has been approved by the National Oceanic and Atmospheric Administration (NOAA) for the purposes of federal consistency. Under this policy, clean, beach quality material dredged from navigation channels will be disposed of on the ocean beach or shallow active nearshore area where environmentally acceptable and compatible with other uses of the beach unless no practicable alternative exists. The state also adopted legislation [N.C. Dredge and Fill Act (NCGS §113-229)] that has not been approved by NOAA for purposes of federal consistency since it does not include a "maximum extent practicable" clause.

The Commission will amend or replace the existing policy to ensure that all beach-compatible sand resulting from the dredging of navigation channels within tidal inlets, harbors, and rivers, shall be placed directly on adjacent beaches. To address possible federal objection, the CRC will consider clarifying what "no practicable alternative" or "maximum extent practicable" means through the specification or definition of financial and logistical constraints.

Monitoring Conditions

Monitoring conditions for CAMA Major Permits are coordinated with other state and federal agencies that are responsible for ensuring that impacts to natural resources are minimized. For some types of projects that have been performed frequently over the course of decades, such as inlet dredging with beach disposal of compatible sediment, comprehensive biological monitoring may not be necessary. Additionally, monitoring protocols do not often allow for cross-project comparisons, so the utility of the results are sometimes limited. The Division of Coastal Management will pursue additional resources for a study to review monitoring conditions placed on past permits and monitoring reports to look for ways to make the data received from monitoring more meaningful and applicable to other projects.

APPENDIX A

N.C. COASTAL RESOURCES COMMISSION

INLET MANAGEMENT STUDY

FINDINGS AND POLICY OPTIONS

Short-Term Priorities

*(F) indicates federal authority, (S) state authority

Topic: <u>Dredging Depths and Sediment Criteria Rules</u>

Summary of Public Comments:

- Dredging projects should evaluate the optimal depth of a channel, not just the "authorized depth." Authorized depths should be increased. **(F)**
- It's difficult for the federal agencies to alter authorized channel dimensions, but obtaining permits at the local level may allow for more flexibility. **(F/S)**
- Increasing the depth of shallow-draft inlets would increase the tidal prism, change the flood shoal and ebb shoal geometry and orientations, and likely result in increased erosion on adjacent shorelines. **(F/S)**
- The sediment criteria rules should be reevaluated. If the sand came from the beach, it should be allowed to be placed back on the beach. **(S)**

Discussion:

Congress authorizes federal navigation channels by specific depth and width, so any proposed changes in dimensions to a federal channel would require an act of Congress. For non-federal channels, if an applicant wanted to dredge to a depth deeper than the previously permitted depth, he could apply for permits from the N.C. Division of Coastal Management (DCM) and the U.S. Army Corps of Engineers (USACE) to do so. As noted above, obtaining permits at the local level may allow for more flexibility in dredging depths.

Characterization of the recipient beach is not required for the placement of sediment directly from and completely confined to a maintained navigation channel or associated sediment basins within the active nearshore, beach, or inlet shoal system. Sediment dredged from these areas is considered beach compatible if the average percentage by weight of fine-grained sediment is less than 10%. Revisions to the sediment criteria rules in 2013 and 2014 have further reduced the burden on project applicants for sampling and analysis. Costs for applicants have been reduced while maintaining adequate sampling to ensure that only beach-compatible sediment is placed on the beach. In 2013, a rule change was implemented to allow two sets of sampling data, with one dredging event in between, from maintained navigation channels, sediment deposition basins within the active nearshore, beach, or inlet shoal system, or Offshore Dredged Material Disposal Sites (ODMDS) to be used to characterize material for subsequent nourishment events from

those areas if the sampling results were found to be beach-compatible. Another rule change, which will become effective on August 1, 2014, will require fewer vibracores to be collected in small offshore borrow areas and allow for slightly more granular (coarse sand) sediment to be placed on the beach. The 2014 rule change will also remove 15A NCAC 07H.0312(4)(a), which states that the "sediment excavation depth from a maintained navigation channel shall not exceed the permitted dredge depth of the channel."

Dredging depths cannot exceed the maximum depth of recovered core samples if the dredged material is going to be placed on the beach (15A NCAC 07H.0312(4)(b)). For example, if sediment cores are recovered that reach 8 feet below the bottom of the inlet, the inlet cannot be dredged to 12 feet deep. The purpose of this rule is to ensure that non-beach-compatible sediment is not placed on the beach. If the core sample does not reach the proposed dredge depth, there is no assurance that the sediment will be beach-compatible. The sediment sample needs to be physically recovered to a depth meeting or exceeding the dredge depth so the sediment can be analyzed. Some have argued that it is not always easy to get deep enough cores in inlets due to tides, currents, waves, shoals, and well-sorted sands on the bottom. DCM maintains that without getting cores as deep as the proposed dredge depth, the dredged material below the cores cannot be placed on the beach because its characteristics are undefined.

CRC Policy Options

Proposed inlet dredging depths should continue to be evaluated and permitted on a project-by-project basis. For federal navigation channels, any changes in dimensions would require an act of Congress. For non-federal channels, applicants may dredge deeper than the previously permitted depth if they receive permits from DCM and USACE. Projects should consider how deeper dredging may affect erosion on adjacent shorelines.

There is inherent imprecision in dredging processes which vary with the physical conditions, the dredged material characteristics, the channel design, and the type of dredging equipment. Due to these variables, the USACE recognizes that dredging below the Congressionally-authorized project dimensions for federal navigation channels will occur and is necessary to assure the required depth and width and least cost. For federal projects, the USACE incorporates an allowable overdepth of the authorized channel depth +2 feet. For non-federal projects, DCM allows the dredging depth to reach only the depth that was permitted. The CRC could consider adding two feet of overdepth to CAMA permits for non-federal projects to be consistent with how the USACE implements federal projects. If an applicant wants to dredge deeper, or at least have the flexibility to do so, they should obtain sediment cores as deep as the proposed dredge depth to make sure the dredged material is beach-compatible.

Relevant Laws or Rules:

NCGS §113-229; 15A NCAC 07H.0312

Topic: Erosion Rate Calculations for Inlet Hazard Areas

Summary of Public Comments:

- The CRC should task the Science Panel to complete the development of methods to define revised Inlet Hazard Areas and potential inlet and near-inlet setback lines for CRC review. **(S)**
- The Inlet Hazard Areas should be eliminated and incorporated into the Ocean Erodible Area (OEA) while applying the same development standards currently utilized in the OEA. **(S)**
- The current "adjacent erosion rate" rule for IHAs doesn't make sense. Every inlet is different and erosion rates are dramatically different. Good erosion rate information is needed for setbacks to be valid. **(S)**
- The concept of a Deep-Draft IHA and Shallow-Water IHA should be explored, and the boundaries should extend in the water, where issues related to dredging can be codified and enforced in policy. **(S)**

Discussion:

The purpose of the Inlet Hazard Areas is to define areas that are subject to coastal processes associated with inlet dynamics (tidal currents, influence of ebb shoals on erosion patterns, etc.). A 1978 report defined the original Inlet Hazard Area boundaries, and minor amendments were made in the early 1980s. Since the boundaries are outdated, there are many cases where the inlet has completely migrated out of the hazard area. Currently, the setbacks for the IHAs are based on the erosion rates calculated for the adjacent Ocean Erodible Areas (OEAs). Erosion rates should be calculated for the inlet shorelines instead of extending the adjacent OEA erosion rates into the IHAs.

CRC Policy Options

At its meeting on May 14, 2014 in Atlantic Beach, the CRC tasked the Science Panel with completing its Inlet Hazard Areas study. The Science Panel will focus on developing a methodology for calculating erosion rates adjacent to inlets. To respond to the requirements of House Bill 819 (S.L. 2012-202), DCM staff will also include a feasibility analysis of whether the Inlet Hazard Area of Environmental Concern can be eliminated. HB 819 requires the CRC to report its findings and proposed actions to the Secretary of the Department of Environment and Natural Resources (DENR), the Governor, the President Pro Tempore of the Senate, the Speaker of the House of Representatives, and the Environmental Review Commission by January 31, 2015. Upon the completion of the Science Panel's study, DCM staff will present potential options to the CRC for consideration. As discussed later in this document, DCM staff will also explore the development of individual Inlet Management Plans for each inlet in the state.

Some believe that the term "Inlet Hazard Area" has a negative connotation, reduces property values within those areas, and discourages prospective buyers from purchasing real estate in those areas. An alternative term, such as "Inlet Management Area" could be codified in the rule language to indicate that inlet processes are influencing the shoreline and that additional management approaches may be necessary. However, by replacing the word "hazard" with "management," prospective buyers may be less aware of the additional risks of purchasing property near an inlet.

Relevant Laws or Rules:

15A NCAC 07H.0304(3); 15A NCAC 07H.0308(b)(5); 15A NCAC 07H.0310

Topic: <u>Emergency Permitting</u>

Summary of Public Comments:

- New dunes should be allowed to be created in Inlet Hazard Areas. **(S)**
- Sandbags in IHAs should have a different set of standards (permitted sooner and allowed to remain on beach longer). **(S)**
- More efficient and timely procedures for emergency permitting are needed. **(F/S)**

Discussion:

The CAMA General Permit for beach bulldozing (15A NCAC 07H.1800) allows bulldozing landward of the Mean High Water Line (MHWL) in the OEA, but it does not apply to Inlet Hazard Areas. Bulldozing of material from seaward of the Mean Low Water Line (MLWL) is also allowed but requires a CAMA Major Permit and State Dredge and Fill Permit, according to 15A NCAC 07H.0308(a)(4)(C). Bulldozing and construction of new dunes are both currently prohibited in IHAs, but the rebuilding of existing dunes is allowed. Bulldozing is allowed to protect vacant lots if the lots are not located in an IHA. DCM staff believe dune construction was originally prohibited in IHAs to prevent an artificial vegetation line from being established for setbacks. DCM agrees that new dune construction should be allowed in IHAs, but such created dunes should not be used as the reference point for measuring oceanfront setbacks.

Sandbags are intended to be used as temporary protection for threatened structures. They previously were allowed only once per structure, regardless of ownership, for a period of two to five years. In 2009, the CRC changed the rule to allow sandbags in the IHA to remain in place for up to eight years for properties within a community pursuing an inlet relocation project. That rule change also allows those sandbags to remain an additional eight years if the structure becomes threatened again and if the community is still seeking an inlet relocation project. The CRC then updated the rule again in 2013 to remove the one time per property limit for communities also seeking a beach renourishment or inlet stabilization project. Sandbags can only be used to protect houses, septic systems, and roads. They currently cannot be used to protect swimming pools, decks, gazebos, vacant lots, or natural features such as dunes.

At its meeting on May 14, 2014 in Atlantic Beach, the CRC expressed interest in allowing beach bulldozing seaward of the MLWL with a General Permit instead of a CAMA Major Permit and State Dredge and Fill Permit. The Commission is also interested in reviewing how "imminently threatened" is defined:

> "A structure is considered imminently threatened if its foundation, septic system, or right-of-way in the case of roads, is less than 20 feet away from the erosion scarp. Buildings and roads located more than 20 feet from the erosion scarp or in areas where there is no obvious erosion scarp may also be found to be imminently threatened when site conditions, such as a flat beach profile or accelerated erosion, increase the risk of imminent damage to the structure" (15A NCAC 07H.0308(a)(2)(B)).

CRC Policy Options

The Commission could consider developing draft rule language that would allow bulldozing and new dune construction in Inlet Hazard Areas without those dunes being used as the reference point for measuring oceanfront setbacks. Allowing bulldozing seaward of the MLWL would also require authorization by the USACE, triggering additional federal agency reviews. DCM could approach the USACE about developing a new Regional General Permit that could apply in emergencies and allow DCM to authorize beach bulldozing seaward of the MLWL under certain conditions. The USACE has regulatory jurisdiction seaward of the MLWL, and it is uncertain if they would grant DCM this authority.

The Commission could consider amending the definition of "imminently threatened," including an increase from 20 feet to a larger distance, at which point sandbags would be allowed. The definition of "imminently threatened" could also be expanded to apply to natural features such as dunes in addition to structures. Since sandbag time limits were recently extended, and the one time per property limit was recently removed, property owners have additional flexibility to keep sandbags protecting their property in emergency situations.

Relevant Laws or Rules:
NCGS §113-229; 15A NCAC 07H.0308(a)(2); 15A NCAC 07H.0308(a)(4); 15A NCAC 07H.0308(b); 15A NCAC 07H.1700; 15A NCAC 07H.1800

Topic: Static Vegetation Lines

Summary of Public Comments:

- The "300,000 cubic yard rule" for establishing a static vegetation line should be reevaluated. **(S)**
- Some communities have intentionally avoided having a static vegetation line established by keeping any nourishment projects under 300,000 cubic yards. In those cases, this results in more frequent dredging projects, which results in greater environmental impacts and greater costs.

Discussion:

A large-scale beach fill project is defined as any volume of sediment greater than 300,000 cubic yards or any storm protection project constructed by the USACE [15A NCAC 07H.0305(a)(7)]. In areas that have received a large-scale beach fill project, the building setback is measured from the vegetation line in existence within one year prior to the onset of the project. This is the "Static Vegetation Line," and once a static vegetation line is established, it is used as the reference point for measuring oceanfront setbacks in all locations where it is landward of the vegetation line. In some communities with a demonstrated, long-term commitment to beach fill, proposed development on many lots could meet the required setback from the natural vegetation line, but the development could not be permitted because it could not meet the setback from the static vegetation line. The CRC created the static line exception [15A NCAC 07H.0306(a)(8)] as a mechanism to allow setbacks for small-scale development to be measured from either the natural vegetation line or the static line, making more lots developable. Any local government or permit holder of a large-scale beach fill project that is subject to a static vegetation line may petition the CRC for an exception to the static line.

At its meeting on May 14, 2014 in Atlantic Beach, the CRC Chairman proposed the following changes to replace the existing static vegetation line rules:

- Eliminate static line and 300,000 cubic yard rule.
- No new development allowed seaward of existing development line.
- Local communities determine development line, DCM reviews.
- Use vegetation line for measurement of setbacks in the absence of a development line.
- Use graduated setbacks based on structure size and local erosion rate.
- New or replacement buildings sited based on the graduated setback from the vegetation line, or the development line, whichever is further landward.
- Apply this concept statewide, not just in IHAs

CRC Policy Options

The proposed changes above would eliminate the static vegetation line in areas where a static line has been established, and a static line exception would no longer be required to use the vegetation line for measuring setbacks. Setbacks based on square footage would be measured from the first line of stable and natural vegetation, and any new buildings could only be built as far seaward as the existing development line. The Commission could develop rule language to

replace 15A NCAC 07H.0305(a)(6) and the references to static lines and static line exceptions in 15A NCAC 07H.0306(a). Since static line exceptions would no longer be needed, the procedures for applying for and renewing the exception would be eliminated (15A NCAC 07J.1200).

Alternatively, the static vegetation line and static line exception rules could be retained, but the 2,500-square-foot maximum building size limit could be repealed [15A NCAC 07H .0306(a)(8)(B)]. Graduated setbacks would be measured from either the static line or first line of stable and natural vegetation (in areas with a static line exception). For beaches with a static line exception, structures that measure their setback from the first line of stable and natural vegetation are currently limited to a maximum size of 2,500 square feet. If this size restriction were removed, structures that measure their setback from the first line of stable and natural vegetation would need to meet the graduated setback based on structure size and be located no further oceanward than the landward-most adjacent structure, but they could be larger than 2,500 square feet.

The Commission could also amend the definition of "large-scale beach fill project," increasing it from 300,000 cubic yards to a larger number. If the volume trigger were increased, communities could continue to avoid having a static vegetation line established but build larger and potentially less-frequent beach nourishment projects.

Relevant Laws or Rules:
15A NCAC 07H.0305(a)(6-7); 15A NCAC 07H.0306(a); 15A NCAC 07J.1200

Topic: <u>Stockpiling of Sand</u>

Summary of Public Comments:

- Stockpiling of sand dredged from inlets and stored for future placement on beaches should be allowed. Stockpiled dredged sand should not be required to be sampled a second time if it was already found to be beach-compatible. **(F/S)**

Discussion:

The Coastal Area Management Act, State Dredge and Fill Law, and administrative rules do not prohibit the stockpiling of dredged sand for future placement on beaches, but all dredged material must be confined landward of regularly and irregularly flooded coastal wetlands and stabilized to prevent entry of sediments into the adjacent water bodies or coastal wetlands [15A NCAC 07H.0208(b)(1)(B)].

For ongoing projects that have been reviewed and permitted under the National Environmental Policy Act (NEPA), stockpiling may not have been considered under the original NEPA review. In these cases, disposal of the dredged materials via stockpiling would likely require additional review as a new alternative disposal option. Adding another disposal alternative could also alter existing USACE dredging contracts.

CRC Policy Options

If dredged material is sampled and determined to meet the state sediment criteria rules for beach compatibility before it is stockpiled on high ground, then the stockpiled sediment should not need to be sampled a second time before it is placed on the beach. If the dredged material is stockpiled in the water for future placement on the beach, it may be necessary to sample a second time to ensure that the material has not been covered by finer, non-beach-compatible material.

Relevant Laws or Rules:

15A NCAC 07H.0208(b); 15A NCAC 07H.0312

Long-Term Priorities

Topic: <u>Beneficial Use of Dredged Materials</u>

Summary of Public Comments:

- Beach-compatible sand dredged from inlets should be placed back on adjacent beaches; it should never be disposed offshore. **(F/S)**
- The distribution of dredged sand that is pumped onto adjacent beaches should be guided by analytically derived sediment budgets. **(F/S)**

Discussion:

The state has an enforceable beneficial use policy that has been approved by the National Oceanic and Atmospheric Administration (NOAA) for the purposes of federal consistency. Under the Federal Coastal Zone Management Act of 1972 (CZMA), federal consistency means that federal projects are reviewed by Coastal Program staff (like DCM) to ensure that they are consistent with the state's approved enforceable policies. NOAA reviews any enforceable policy language that a state proposes to be used for the purposes of federal consistency. The enforceable beneficial use policy language in North Carolina is as follows:

> "Clean, beach quality material dredged from navigation channels within the active nearshore, beach, or inlet shoal systems must not be removed permanently from the active nearshore, beach, or inlet shoal system unless no practicable alternative exists. Preferably, this dredged material will be disposed of on the ocean beach or shallow active nearshore area where environmentally acceptable and compatible with other uses of the beach" [15A NCAC 07M.1102(a)].

The state also adopted legislation [N.C. Dredge and Fill Act (NCGS §113-229)] that was not accepted by NOAA for purposes of federal consistency but that does apply to state, local, and private sector projects:

> "Except as provided in subsection (h2) of this section, all construction and maintenance dredgings of beach-quality sand may be placed on the affected downdrift ocean beaches or, if placed elsewhere, an equivalent quality and quantity of sand from another location shall be placed on the downdrift ocean beaches. Clean, beach quality material dredged from navigational channels within the active nearshore, beach, or inlet shoal systems shall not be removed permanently from the active nearshore, beach, or inlet shoal system. This dredged material shall be disposed of on the ocean beach or shallow active nearshore area where it is environmentally acceptable and compatible with other uses of the beach" (NCGS §113-229(h1-h2).

CRC Policy Options

At the CRC meeting on May 14, 2014 in Atlantic Beach, the CRC Chairman proposed replacing the existing beneficial use policies in the administrative rules (15A NCAC 07M.1100) and the State Dredge and Fill Act (NCGS §113-229(h1-h2)) with the following language:

> "With respect to all beach-compatible sand, as defined by the Coastal Resources Commission through its rules and policies as set forth in 15A NCAC 07H.0312, resulting from the dredging of navigation channels within tidal inlets, harbors, and

> rivers, such sand shall be placed directly on adjacent beaches in a manner that minimizes shoaling and replicates the natural littoral system to the maximum extent practicable."

Instead of replacing the existing language in its entirety, the CRC could clarify what "no practicable alternative" means in 15A NCAC 07M.1102(a). Specific financial and logistical constraints could be defined, which would dictate whether beach-compatible dredged material could be disposed of anywhere besides the adjacent beaches.

Any proposed changes to the current enforceable policy would require review and approval from NOAA through the CZMA Program Change process. If changes in the policy are not approved by NOAA, they would only apply to local (not federal) projects. In this case, the burden of placing all beach-compatible dredged material onto adjacent beaches would fall solely on local governments.

Relevant Laws or Rules:
U.S. Coastal Zone Management Act of 1972; NCGS §113-229(h1-h2); 15A NCAC 07H.0312; 15A NCAC 07M.1100

Topic: Inlet Management Plans

Summary of Public Comments:

- Inlets should be managed proactively instead of reactively. **(F/S)**
- Beach and inlet management is related- what happens to one impacts the other. The goal of inlet management should be to reconnect sediment pathways to minimize dredging impacts. **(F/S)**
- Each inlet is diverse and unique, so one management scheme cannot be applied to all inlets. **(F/S)**

Discussion:

This topic was recognized by the CRC as a general inlet management philosophy. Since each inlet in the state is unique, individual inlet management plans could be developed to guide future management actions at each inlet. Some aspects of inlet management plans already exist to a certain extent at a few of North Carolina's inlets. For example, as part of federal 50-year Coastal Storm Damage Reduction Projects, Masonboro Inlet is dredged every four years, and Carolina Beach Inlet is dredged every three years, with the dredged material placed on Wrightsville Beach and/or Masonboro Island and Carolina Beach and/or Kure Beach, respectively. Similarly, the two deep-draft inlets in the state, Beaufort Inlet and Cape Fear River Inlet, have 20-year Dredged Material Management Plans (DMMPs) which guide the frequency and distribution of dredged material disposal. Inlet management plans could also include sediment budgets, relevant research and studies, delineated areas of inlet influence, and appropriate development standards adjacent to inlets. This type of effort would require separate plans than the dredging plans that currently exist.

CRC Policy Options

The N.C. Beach and Inlet Management Plan (BIMP) divides the state into regions and sub-regions and provides historical geomorphology information, dredging volumes, and economic valuation for each inlet: http://portal.ncdenr.org/web/cm/bimp-final-report1. The BIMP is the first statewide compilation of data and issues related to beach and inlet management, and it was developed in response to House Bill 1840 (Session Law 2000-67), which passed in 2000. The legislation required the N.C. Department of Environment and Natural Resources (DENR) to develop a state beach management and restoration strategy that could also be used for local government planning purposes. The information in the BIMP (2011) could serve as a starting point for developing inlet management plans for each inlet.

The idea of separate deep-draft Inlet Hazard Areas and shallow-draft Inlet Hazard areas has also been mentioned by some stakeholders. This concept would result in Beaufort Inlet and Cape Fear River Inlet having different development standards than the other inlets in the state.

The Florida Department of Environmental Protection has developed inlet-specific management plans for 17 of the 56 inlets in the state: http://www.dep.state.fl.us/beaches/publications/. The Florida plans are focused on sediment management and bypassing, but they do not include development standards adjacent to the inlets. DCM staff will review the Florida examples and determine if a similar approach could be applicable in North Carolina. If the CRC wants to

pursue the development of inlet management plans and related studies (to determine sediment budgets, for instance), it may be possible to use funds from the Shallow Draft Navigation Channel and Lake Dredging Fund (NCGS §143-215.73F).

Relevant Laws or Rules:
NCGS §143-215.73F

Topic: Funding Sources and Partnerships

Summary of Public Comments:

- With decreasing federal funds, inlet management is increasingly a shared partnership between local and state government. A stable source of funding for beach and inlet projects is needed at the state level. **(S)**
- The 50% state matching fund for inlet dredging is a good start, but if one locality wants to undertake a major project and applies for the state matching funds, it could wipe out the funds for the rest of the state. **(S)**
- Congressional funding is an issue for federal projects. A project may be authorized and permitted, but if it is never funded, it does no good. **(F)**

Discussion:

Due to reductions in federal funds during the last several years, the state's shallow-draft navigation channels have not been maintained to authorized depths and dimensions. The N.C. General Assembly created the Shallow Draft Navigation Channel and Lake Dredging Fund during the 2013 session (NCGS §143-215.73F). Money from this fund will be used to provide 50% of the cost for dredging projects, and local governments will be responsible for providing the remaining 50% of the cost for a project they wish to sponsor. It is expected that the fund will raise approximately $4 million each year in state funds, and after local match funds are added, the total amount available for dredging would be approximately $8 million per year. Funds appropriated by the state for dredging or contributed by the Shallow Draft Navigation Channel and Lake Dredging Fund are administered by the Division of Water Resources (DWR). In addition to the state fund, a memorandum of agreement between USACE and DENR was finalized in November 2013 and runs through September 2017. The agreement allows state and local funds to be used to maintain federally authorized shallow-draft inlets when federal funds are not available.

CRC Policy Options

Some stakeholders have expressed concern that even if state funds are available, many local communities are unable to contribute the required 50% match. Others are concerned that one or two larger dredging projects using the state fund can wipe out the fund for projects in the rest of the state. The CRC could ask the General Assembly to reduce the local match requirement or to increase the total fund. The CRC could also work with local governments to find ways to raise additional funds to be used as match for the state dredging funds. Since DWR administers the state funds, they would need to be involved in the process. DCM could also assist with generating consistent information and outreach materials to highlight the economic, natural resources, and recreational values of North Carolina's inlets.

Relevant Laws or Rules:

NCGS §143-215.73F

Topic: Dredging Windows / Moratoria

Summary of Public Comments:

- The dredging windows should be extended under stipulated conditions to increase competition, increase the number of bids on projects, reduce costs, and provide more flexibility for completing the work. **(F/S)**

Discussion:

Dredging projects are considered major development and require other state or federal agency permits, including from the USACE. When the USACE reviews project applications, it coordinates with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) to determine impacts to natural resources. DCM relies on federal and state resource agencies during the CAMA Major Permit process to advise on how to comply with 15A NCAC 07H.0308(a)(1)(F), which states that "project construction shall be timed to minimize adverse effects on biological activity."

CRC Policy Options

Representatives from Coastal Planning and Engineering, Moffatt and Nichol, Dial Cordy and Associates, and other consultants in North Carolina are working together on a study to evaluate the feasibility of expanding the dredging windows. They are taking a statewide approach on dredging and are evaluating the number of projects that will likely be done statewide now and in the future. They are creating a fact sheet on summer dredging, protocols to mitigate impacts, and an evaluation of the impacts. They intend to circulate the document to the resource agencies, with the goal of receiving approval to extend the dredging windows. Once the study is completed and released, the CRC could appoint an ad hoc technical committee to review it and provide comments or recommendations back to the CRC. In the meantime, the CRC will invite the consultants who are working on the study to give a presentation at the July 2015 Commission meeting.

At the CRC meeting on May 14, 2014 in Atlantic Beach, one Commissioner noted that many communities would likely willingly accept additional monitoring requirements in exchange for expanded dredging windows. Similarly, another Commissioner questioned if it could be reasonable to extend the dredging windows in areas with approved sea turtle monitoring programs.

Relevant Laws or Rules:

U.S. Endangered Species Act of 1973; U.S. Migratory Bird Treaty Act of 1918; U.S. Magnuson-Stevens Fishery Conservation and Management Act of 1976; 15A NCAC 07H.0308(a)(1)(F)

Topic: <u>Monitoring Conditions</u>

Summary of Public Comments:

- Monitoring requirements should not be so onerous as to prohibit what has otherwise been authorized. The amount of monitoring on projects should be reasonable and consistent with CAMA objectives. **(F/S)**
- Monitoring conditions should focus more on physical monitoring and less on biological monitoring. **(F/S)**

Discussion:

Similar to the dredging windows and moratoria topic, monitoring conditions for CAMA Major Permits are coordinated with other state and federal agencies that are responsible for ensuring that impacts to natural resources are minimized. For larger inlet management projects such as channel realignment projects or terminal groins, some level of monitoring is justified. In the case of terminal groins, the N.C. Coastal Area Management Act (CAMA) specifies what is required to monitor the impacts of the structure (NCGS §113A-115.1).

Some local communities voluntarily monitor the physical aspects of their beaches (beach profiles, volumes, slopes, widths, etc.) because they want to stay informed about how beach nourishment projects are holding up and when another project may be necessary. However, many local communities view biological monitoring of invertebrates, shorebirds, and nearshore fish as less relevant and would prefer to not be required to monitor the impacts to these species. Local volunteer groups throughout the state monitor for nesting and hatching sea turtles.

CRC Policy Options

For some types of projects that have been performed frequently over the course of decades, such as inlet dredging with beach disposal of compatible sediment, comprehensive biological monitoring may not be necessary. Studies have shown that the impacts to invertebrates, shorebirds, and nearshore fish are temporary, and these species tend to recover within 2 or 3 years after the project. Additionally, monitoring protocols do not often allow for cross-project comparisons, so the utility of the results are sometimes limited. However, impacts to offshore borrow sites are still not well understood. More information on the long-term impacts to fisheries and the sedimentation rate and quality of sediment that fills in offshore borrow sites would be useful.

For inlet channel realignment projects or terminal groins, DCM Staff believe that additional monitoring is warranted, and they should continue to consult with other state and federal agencies in developing monitoring conditions.

With additional resources, DCM could lead a study to review monitoring conditions placed on past permits and monitoring reports to look for ways to make results more meaningful and applicable to other projects.

Relevant Laws or Rules:

NCGS §113A-115.1

APPENDIX B

N.C. COASTAL RESOURCES COMMISSION

INLET MANAGEMENT STUDY

SUMMARY OF REGIONAL INLET MANAGEMENT MEETINGS

AND PRELIMINARY FINDINGS

The N.C. Coastal Resources Commission (CRC) held a series of public meetings in March and April 2014 to hear from local government officials, citizens, and stakeholders about specific concerns related to the management of ocean inlets in North Carolina. The regional meetings are part of the CRC's comprehensive review of inlet management in the state. In addition to the four public meetings and the dredging expert panel at the February 2014 CRC meeting, written comments were accepted through April 15, 2014. The public comments received can be broken up into 20 categories as follows. (F) indicates federal authority and (S) indicates state authority.

1) **Beneficial Use of Dredged Materials: 15 comments**
   Common Themes:
   - Beach-compatible sand dredged from inlets should be placed back on adjacent beaches; it should never be disposed offshore. **(F/S)**
   - The distribution of dredged sand that is pumped onto adjacent beaches should be guided by analytically derived sediment budgets. **(F/S)**

2) **Dredging Depths and Sediment Criteria Rules: 15 comments**
   Common Themes:
   - Dredging projects should evaluate the optimal depth of a channel, not just the "authorized depth." Authorized depths should be increased. **(F)**
   - It's difficult for the federal agencies to alter authorized channel dimensions, but obtaining permits at the local level may allow for more flexibility. **(F/S)**
   - Increasing the depth of shallow-draft inlets would increase the tidal prism, change the flood shoal and ebb shoal geometry and orientations, and likely result in increased erosion on adjacent shorelines. **(F/S)**
   - The sediment criteria rules should be reevaluated. If the sand came from the beach, it should be allowed to be placed back on the beach. **(S)**

3) **Erosion Rate Calculations for Inlet Hazard Areas: 15 comments**
   Common Themes:
   - The CRC should task the Science Panel to complete the development of methods to define revised Inlet Hazard Areas and potential inlet and near-inlet setback lines for CRC review. **(S)**

- The Inlet Hazard Areas should be eliminated and incorporated into the Ocean Erodible Area (OEA) while applying the same development standards currently utilized in the OEA. **(S)**
- The current "adjacent erosion rate" rule for IHAs doesn't make sense. Every inlet is different and erosion rates are dramatically different. Good erosion rate information is needed for setbacks to be valid. **(S)**
- The concept of a Deep-Draft IHA and Shallow-Water IHA should be explored, and the boundaries should extend in the water, where issues related to dredging can be codified and enforced in policy. **(S)**

4) **Dredge Plants and Scheduling of Dredging Projects: 14 comments**

Common Themes:

- Shallow-draft hopper dredges can place material closer to the shore and should be used more frequently as a first option instead of sidecast dredges. Sidecast dredges are only good for clearing a channel enough for a hopper dredge to follow behind it. One benefit of sidecast dredges is that they keep the sediment in the sytem. **(F)**
- The U.S. Army Corps of Engineers (USACE) dredge plants are stretched thin and scheduled well into the future, so immediate responses aren't always possible. **(F)**
- Consistency is needed for dredging for ferries in Dare and Hyde counties. Dredging is needed not just for getting in and out of inlets, but also traveling between islands through the sounds. **(F/S)**

5) Terminal Groins and Sand Bypassing: 14 comments

Common Themes:

- The legislative cap of four terminal groins should be removed. **(S)**
- Monitoring of downdrift impacts and financial aspects of mitigation need to be sufficient to safeguard adjacent properties and communities that could be negatively impacted by terminal groins. **(S)**
- Migrating inlets are not good candidates for terminal groins. **(S)**

6) Approach to Inlet Management, In General: 13 comments

Common Themes:

- Inlets should be managed proactively instead of reactively. **(F/S)**
- Beach and inlet management is related- what happens to one impacts the other. The goal of inlet management should be to reconnect sediment pathways to minimize dredging impacts. **(F/S)**
- Each inlet is diverse and unique, so one management scheme cannot be applied to all inlets. **(F/S)**

7) Funding Sources and Partnerships: 13 comments

Common Themes:

- With decreasing federal funds, inlet management is increasingly a shared partnership between local and state government. A stable source of funding for beach and inlet projects is needed at the state level. **(S)**

- The 50% state matching fund for inlet dredging is a good start, but if one locality wants to undertake a major project and applies for the state matching funds, it could wipe out the funds for the rest of the state. **(S)**
- Congressional funding is an issue for federal projects. A project may be authorized and permitted, but if it is never funded, it does no good. **(F)**

8) Emergency Permitting: Bulldozing and Sandbags: 11 comments

Common Themes:

- New dunes should be allowed to be created in Inlet Hazard Areas. **(S)**
- Sandbags in IHAs should have a different set of standards (permitted sooner and allowed to remain on beach longer). **(S)**
- More efficient and timely procedures for emergency permitting are needed. **(F/S)**

9) Dredging Windows / Moratoria: 10 comments

Common Themes:

- The dredge windows should be extended under stipulated conditions to increase competition, increase the number of bids on projects, reduce costs, and provide more flexibility for completing the work. **(F/S)**

10) Economic Value of Inlets and Beaches: 10 comments

Common Themes:

- The economic value of inlets should consider tourism, culture, recreation, jobs, and storm damage reduction; not just commercial tonnage. **(F/S)**
- Safe and navigable inlets are vitally important to the local and state economy. **(S)**

11) Channel Realignment Projects: 9 comments

Common Themes:

- The Bogue Inlet and Mason Inlet channel realignment projects were successful, so the CRC should make sure that the permitting process is quicker and easier and that monitoring requirements are reduced for future similar projects. **(F/S)**
- These types of projects should be designed to accommodate the same volume of water (tidal prism) that the pre-existing ebb channel possessed. **(F/S)**

12) Permitting Process, In General: 8 comments

Common Themes:

- Permitting needs to be proactive. There is a need to be able to react quickly, be adaptive, and look longer term versus authorizing single events. **(F/S)**
- DCM Major Permit lifecycles should be increased for inlet management or Coastal Storm Damage Reduction projects. **(S)**

13) Development Standards / Erosion Setbacks: 8 comments

Common Themes:

- Inlets are a primary ocean hazard in North Carolina. Development standards adjacent to inlets should be different from development standards along the oceanfront. **(S)**
- Existing rules for new development adjacent to inlets should not be relaxed. **(S)**
- There is no need for IHA specific development standards. **(S)**

14) Monitoring Conditions Associated with Projects: 8 comments

Common Themes:

- Monitoring requirements should not be so onerous as to prohibit what has otherwise been authorized. The amount of monitoring on projects should be reasonable and consistent with CAMA objectives. **(S)**
- Monitoring conditions should focus more on physical monitoring and less on biological monitoring. **(S)**

15) Other Erosion Control Structures: 7 comments

Common Themes:

- Rock groins, breakwaters, jetties, sandbags, beach bulldozing, and beach nourishment should all be allowed to mitigate channel-induced erosion. **(S)**

16) Volumetric Triggers for Beachfront "Static Lines": 6 comments

Common Themes:

- The "300,000 cubic yard rule" for establishing a static vegetation line should be reevaluated. **(S)**
- The Ocean Reef Condominiums in Emerald Isle cannot meet the setback from the static vegetation line, and they are over 2,500 sq. ft. so they would not be able to rebuild from the first line of stable and natural vegetation (under the static line exception rule). Property owners request the CRC to consider allowing an exception for building back on the original footprint, even though the buildings are more than 2,500 sq. ft. **(S)**

17) Stockpiling of Sand: 6 comments

Common Themes:

- Stockpiling of sand dredged from inlets and stored for future placement on beaches should be allowed. **(F/S)**

18) Negative Impacts of Dredging: 5 comments

Common Themes:

- The federal engineered channel locations at Beaufort Inlet and Cape Fear River Inlet result in episodic maintenance dredging, high erosion rates, and shifting shorelines adjacent to these inlets. **(F)**
- Dredging of Oregon Inlet has exacerbated erosion of Hatteras Island. **(F)**

19) New Inlet Breaches: 5 comments

Common Themes:

- A new type of Area of Environmental Concern is needed for areas where an inlet used to exist, has closed, but could re-open again in the future. **(S)**
- If a new inlet is breached, it should be filled in instead of bridged. **(F/S)**

20) Dredging of Inlet Shoals: 3 comments

Common Themes:

- Since the orientation of ebb shoals is a primary driver of erosion on adjacent shorelines, any dredging of shoals should only proceed after modeling and studies indicate no adverse impacts will occur to the adjacent shorelines. **(F/S)**

APPENDIX C

S.L. 2012-202 STUDY REPORT: FEASIBILITY OF ELIMINATING THE INLET HAZARD AREA OF ENVIRONMENTAL CONCERN

COASTAL RESOURCES COMMISSION SCIENCE PANEL RECOMMENDATIONS

In 2012, Session Law 2012-202 (HB819) was passed which included a provision requiring the Coastal Resources Commission (CRC) to study the feasibility of eliminating the state's Inlet Hazard Area of Environmental Concern. Section 5 of the Act specifically states:

"The Coastal Resources Commission shall study the feasibility of eliminating the Inlet Hazard Area of Environmental Concern and incorporating appropriate development standards adjacent to the State's developed inlets into the Ocean Erodible Area of Environmental Concern. If the Commission deems action is necessary to preserve, protect, and balance the economic and natural resources adjacent to inlets, the Commission shall consider the elimination of the inlet hazard boxes; the development of shoreline management strategies that take into account short- and long-term inlet shoreline oscillation and variation, including erosion rates and setback factors; the development of standards that account for the lateral movement of inlets and their impact on adjacent development and habitat; and consideration of how new and existing development standards, as well as existing and proposed development, are impacted by historical and ongoing beach and inlet management techniques, including dredging, beach fill, and engineered structures such as groins and jetties. As part of this study, the Commission shall collaborate with local governments and landowners affected by the Commission's Inlet Hazard Areas to identify regulatory concerns and develop strategies for creating a more efficient regulatory framework. The Commission shall report its findings, including any proposed actions the Commission deems appropriate, to the Secretary of Environment and Natural Resources, the Governor, the President Pro Tempore of the Senate, the Speaker of the House of Representatives, and the Environmental Review Commission on or before January 31, 2015."

The CRC tasked the Science Panel to address specific questions related to the study:

1. How are hazards different in inlet areas compared to other beach areas?
2. What is the best method to delineate the areas at greatest risk in inlet areas?
3. How should dredging, beach fill projects, and groins or jetties be accounted for in the delineation of risk areas near inlets?

In addition, the Science Panel was asked to focus discussions on the delineation of risk areas adjacent to developed inlets and whether there is a viable alternative to the inlet hazard "boxes."

How are hazards different in inlet areas compared to other beach areas?

Inlets, including the adjacent oceanfront areas influenced by them are the most dynamic and rapidly changing portions of a barrier island system. They are affected not only by erosion,

accretion, overwash and on-shore/off-shore processes affecting the ocean shorelines, but also by tidal flows and channel migration (back and forth, or unidirectional, or both), which can be dramatic even during normal conditions, but potentially catastrophic during large storms.

A large storm surge – from the ocean side or estuarine side of the barrier island – can displace considerable volumes of sediment from dry land areas adjacent to inlets into the offshore ebb tidal system and beyond; or inland to the flood tidal delta and beyond. During large storms, the inlet channel location, orientation, and movement, can be dramatically altered, initiating an immediate change in inlet channel behavior and its role in influencing adjacent near-inlet, oceanfront shorelines.

Because inlet shorelines are highly dynamic they differ from more distant oceanfront shorelines that are not affected by inlet processes. Most oceanfront shorelines tend to have some degree of long-term erosion. However, inlet shorelines can migrate, eroding one island as the other island accretes, at rates of 10 to 100 times faster than non- inlet influenced shorelines. Near inlets these high erosion? rates may oscillate over years to decades. In some cases an inlet may persistently migrate in the same direction at high rates indefinitely.

These changes are sometimes cyclical in nature during non-storm periods or can occur rapidly during a single storm. Inlets can also be influenced by human alterations of the inlet system (channel dredging and engineered structures). Beach nourishment is seldom a viable erosion management option due to the high rates of sand transport losses. Shoreline erosion issues are far more often a concern in inlet areas than along the oceanfront shorelines.

What is the best method to delineate the areas at greatest risk in inlet areas?

The Panel generally agrees that this question was addressed as part of their study to update the original Inlet Hazard Area boundaries, which was completed and presented to the CRC in 2010. The focus of that study defined areas where historic inlet-related processes dominated geomorphic changes to areas of barrier islands adjacent to inlets. Oceanfront and landward boundaries of the 2010 Proposed Inlet Hazard Areas (IHA) were delineated for each side of each developed inlet, and were heavily based on statistical shoreline changes (spatial and temporal variability), topography, underlying geology, and the historical knowledge and expertise of the Science Panel members. The Division of Coastal Management also provided input on modifying the landward boundaries to follow infrastructure (roads) and lot lines to aid implementation of management objectives and development standards. Statistical methods were used to define the point along the oceanfront shoreline where inlet processes no longer dominated over oceanfront processes. Additional methods, including the consideration of the hybrid shoreline (compilation of landward-most shorelines), and the average and maximum beach widths at each transect (as measured in a landward direction from the hybrid shoreline), were cumulatively utilized to delineate landward boundaries. The 2010 proposed IHA boundaries reflect areas that have been, or could be, influenced by inlet-related processes as determined through analysis of historic data. However, the Panel acknowledges that “risk” is not spatially equal throughout the 2010 proposed areas, and recommends additional methods be considered in order to better define those areas, or “zones,” that are subject to a higher degree of risk.

To establish high risk, the Panel proposes their "30-Year Risk Line" concept as a working-methodology that can be used to define landward limits of high risks. The 30-Year Risk Line was developed as an alternative method for delineating the landward extent of areas vulnerable to shoreline changes due to inlet processes over a period of 30 years. It is intended to be similar to the 30-year minimum oceanfront setbacks with the addition of the higher variability and migration factors that are common to inlet and near-inlet shorelines.

While the 30-Year Risk Line or a similar concept could readily be applied at most inlets, there remain unresolved problems, with erosional "hot spots" (*e.g.,* Bald Head Island's south beach). Therefore, the Science Panel recommends that the CRC consider an inlet-by-inlet approach utilizing the methodology that works best in each situation. The Commission should also be cognizant of the fact that the issue is more related to differences between migratory and oscillating inlets, rather than deep versus shallow inlets or dredged versus non-dredged.

How should dredging, beach fill projects, and groins or jetties be accounted for in the delineation of risk areas near inlets?

The methodologies used in delineating the areas of inlet influence take into account the effects of past dredging and beach fill projects, as well as the influence of existing structures along the shoreline. The Science Panel recommends that since it has been 35 years since the original Inlet Hazard Areas were first delineated, the Commission should conduct a comprehensive update of Inlet Hazard Areas on a periodic (five-year) basis. Such updates would allow for the consideration of new dredging and beach fill projects as well as existing and future erosion control structures.

Inlet Erosion Rate Methodology

Under the present methodology for calculating oceanfront setback factors, erosion rates are not calculated within Inlet Hazard Areas. Instead, the oceanfront erosion rate directly adjacent to the boundary of an Inlet Hazard Area is applied throughout the entire IHA. On the oceanfront, North Carolina has used the endpoint method (two shorelines – early and most recent) to calculate long-term average annual shoreline change rates since its first study in 1979. Historically, this is due to lack of available shoreline data. In addition, techniques to accurately calculate erosion rates along highly curved shorelines have problematic. Both the number of shorelines available for analysis and the techniques used to map shorelines and calculate change rates are improved since the implementation of this methodology.

The Panel recommends that the Commission consider using best available methods and data to calculate inlet shoreline change rates on a periodic (every five years) basis. The Panel also recommends that these methods and future available data be re-evaluated and re-analyzed as needed.

Feasibility of Eliminating Inlet Hazard Areas

The Ocean Hazard Area of Environmental Concern (AEC) is comprised of oceanfront lands and the inlets that connect the ocean to the sounds. There are three subcategories within the ocean hazard AEC: the Ocean Erodible AEC, the Inlet Hazard AEC and the High Hazard Flood AEC. The nature of the hazard in different portions of the Ocean Hazard AEC are managed using varying siting and development standards designed to address a reasonable degree of hazard protection for oceanfront development based on the actual nature of the hazard.

The same strategy is needed for the IHA Areas of Environmental Concern, or "*Areas of Inlet Influence*." The physical processes affecting inlet areas of barrier islands are not the same as the physical processes affecting the oceanfront areas or the estuarine side of the islands, and the management of development in these areas should reflect the relative degree of risk. Since it would be difficult for the Commission to discuss and develop management plans for a unique geographic area without first delineating that area, the Science Panel recommends that the Commission update and adopt an "area of inlet influence" for each developed ocean inlet utilizing the 2010 Inlet Hazard Area Update report, and develop management strategies that account for the interactions between coastal processes and human activities.

With current data and analytical techniques, detailed maps of specific hazards associated with specific portions of the inlet boxes for each inlet along the North Carolina shoreline are achievable. A zoning approach could serve as a basis for developing a management strategy for each inlet. Zones could be defined by the nature of the hazard, or inlet geomorphology, and may involve development standards currently found in the existing Inlet Hazard AECs. The 30-Year Risk Line that is based on inlet erosion rates could be used to define areas at higher risk (area seaward of the 30-Year Risk Line. The Science Panel recommends that the CRC consider "zones" of specific hazards based on inlet history, morphology, and hazard nature be mapped and presented for their consideration in developing appropriate, responsible, management strategies.