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February 1, 2018

**MEMORANDUM**

**CRC-18-08**

**TO:** Coastal Resources Commission  
**FROM:** Ken Richardson, *Shoreline Management Specialist*  
**SUBJECT:** Science Panel Update

**Background:**

Beginning with Hurricane Opal in October 1995 and ending with Hurricane Fran in September 1996, North Carolina experienced five presidentially-declared disasters within a twelve-month period. As a result, Governor Hunt formed a Disaster Recovery Task Force in October 1996 to develop a comprehensive set of recommendations to facilitate the state's recovery. One of the issues addressed was the review of the CRC's hazard mitigation rules and Ocean Hazard Areas. Specifically, the Commission was requested to evaluate the methodologies used to delineate hazard areas including an assessment of erosion rate calculations, setback requirements and accuracy of ocean, flood and inlet hazard area delineations.

To begin this assessment, the Division arranged for a panel discussion at the January 1997 CRC meeting to discuss the Ocean Hazard AEC. The panel was comprised of Dr. Bill Cleary (UNCW, geologist), David Owens (UNCCH Institute of Government, lawyer), Dr. Stan Riggs (ECU, geologist), and Dr. John Wells (UNC-CH Institute of Marine Sciences, geologist). During the presentations and discussion, Dr. Cleary recommended the creation of a barrier island erosion task force to re-examine erosion rates, setbacks and associated methodologies used in their determinations. Cleary suggested that formalizing the task force would allow scientists actively involved in such research to interact more regularly and effectively with the Commission.

The Commission discussed the need to get scientific knowledge to bear on the problems the CRC faced as regulators. Chairman Hackney added that the Commission needed the participation of scientists who understood the coastal management program and the CRC's rules. The intent of such a task force would be to determine how the current state of knowledge could assist the Commission in the development of regulations - bridging the gap between science and policy. The Commission also discussed the need for a long-term, on-going task and that there would need to be a clear charge from the Commission to ensure their direction.

The initial science advisory task force was assembled by DCM staff and included Dr. Bill Cleary (Geologist – UNC-W), Dr. John Fisher (NCSU - engineer), Mr. Tom Jarrett (US Army Corps of Engineers, engineer), Dr. Stan Riggs (ECU – Geologist), Mr. Spencer Rogers (NC Sea Grant - coastal engineering specialist), Dr. Margery Overton (NCSU - engineer), and Dr. John Wells

(UNC- Geologist), and Craig Webb (Duke Earth Sciences). Dr. Fisher volunteered to chair the panel and DCM provided staff support.

Officially named the CRC's Science Panel on Coastal Hazards, the original charge was developed by the Panel and the Commission focusing on:

1. Update and report on current state of knowledge of coastal processes in NC.
2. Review current methodologies being used by NC and others to define and identify coastal hazard areas.
3. Review current rules applied by DCM to development in coastal hazard areas.
4. Considering immediate (next 1-3 years) and long-term (3 or more years away) actions, develop recommendations for the CRC in the following areas:
  - Studies that are needed to better describe NC coastal processes for management purposes.
  - Specific changes to the methodology utilized by DCM to determine coastal hazards.
  - New hazard identification methodologies that should be considered.
  - Opportunities to incorporate current information on NC coastal processes.

Over the course of the next year, a set of short- and long-term recommendations were developed by the Science Panel and presented to the CRC in May 1999 and February 2000, respectively. The short-term recommendations included suggestions for digital mapping, erosion rate computation, storm surge modeling to define OEA width, development of a structures database (e.g., piers and bulkheads along estuarine shoreline), outreach and public education, creation of a coastal coordination committee (federal and state agencies with coastal responsibilities), inlet hazard area re-delineation, building code issues, sandbags, and oceanfront setbacks. The long-term recommendations included the development of an integrated hazard classification of the NC ocean shoreline—including physical dynamics, geologic framework, subaerial characteristics, modern inlets, sediment budget, and erosion/accretion rates. In the development of the recommendations, the Panel discussed that it would keep to the science and not make recommendations that were broader than the science and technical issues they were charged with examining.

### **Projects:**

Over the subsequent years, the Panel has been asked by the Commission and Division to develop recommendations or provide technical advice on many issues, including:

1. Sediment Criteria Development (2002 - 2007)
2. Review Innovative Erosion Control Structures - Holmberg Stabilizer System (2002 - 2003)
3. Inlet Hazard Areas Analysis 7 Delineation (2007 – 2010; per HB-819 continue study in 2013)
4. Terminal Groins (Review Feasibility Study 2009)
5. Terminal Groins (Guidance on monitoring for adverse impacts 2011- 2012)
6. Sea Level Rise Assessment (2009 to Present)
7. Review results from updated Erosion Rate study (2011)

Currently, the Panel is working with staff to delineate updated Inlet Hazard Area boundaries using historical data, professional knowledge and updated mapping methodologies. In December 2017,

the Panel met in New Bern to review results from the most recent analysis. The Panel agreed that additional modifications to the methodology were needed before a proposal could be presented to the CRC. Staff has reanalyzed data based on the Panel's recommendations, and plans to submit results to the Panel for their review before March 2018.

In late spring/early summer 2018, staff will work with the Panel to compare end-point and linear regression shoreline change rate methodologies. The end-point methodology has been used since 1980 to calculate NC's oceanfront shoreline change rates using only two shorelines - an "early" and a "most recent." With the advancement of mapping technology and a greater inventory of shoreline data, a linear regression methodology would be used to incorporate multiple (more than two) shorelines.

### **Membership & New Member Nominations:**

Traditionally, the Science Panel membership has been balanced with coastal engineers and coastal geologists. A marine biologist was added to assist with the sediment criteria rule development, and vacancies were filled by the CRC with recommendations from the Division and Panel members. The Panel has also asked others to provide information when particular expertise was required.

There are currently nine active members of the Science Panel:

1. Dr. Margery Overton (Dept. of Civil, Construction & Environmental Engineering, NCSU, and current Chair)
2. Mr. William Birkemeier (Field Research Facility, ERDC/CHL, Retired USACE)
3. Mr. Steve Benton (coastal geologist, retired DCM)
4. Dr. William Cleary (Retired, Center for Marine Science, UNC-W)
5. Mr. Tom Jarrett P.E. (US Army Corps of Engineers, retired)
6. Dr. Charles "Pete" Peterson (Institute of Marine Sciences, UNC-CH)
7. Mr. Spencer Rogers (NC Sea Grant)
8. Dr. Elizabeth Sciaudone, P.E. (Dept. of Civil, Construction & Environmental Engineering, NCSU)
9. Mr. Greg "Rudi" Rudolph (Carteret County Shore Protection Office)

At the May 2013 CRC meeting in Beaufort, the Commission unanimously approved the following Science Panel nomination process:

- For vacant Science Panel slots, the Division will send a call for nominations letter to CRC, CRAC and Science Panel members seeking nominations for engineers and geologists.
- The charge to the Science Panel will be used as guidance for qualifications.
- Nominees will need to provide the CRC, CRAC or Science Panel member with a resume, CV and any other qualifying information that will be forwarded to the DCM Director
- The call for nominations will also request that the potential nominee be contacted prior to submission to ensure their interest in serving.
- The nominations period will be open for 30 days.

- Nominations would then be reviewed by the Science Panel and recommendations made to the Science Panel Chair.
- A subcommittee of the CRC, including the CRC Executive Committee (CRC committee chairs, CRAC Chair and Executive Secretary) and Science Panel Chair, would then review the nominees and make a recommendation to the CRC Chair. Having the Executive Committee and Science Panel Chair make recommendations incorporates all the Commission leadership into the process.
- The Chair would then make the appointments known at the next CRC meeting
- “Ad hoc” Science Panel Membership: The Science Panel could indicate that they need a certain number of members with specified expertise. The Commission or Advisory Council could also suggest a number of members with specific expertise. The call for nominations would be handled and reviewed in the same manner as above, with the specifics dictated by the needs.

At their December 2017 meeting, the Science Panel expressed their desire to add new members to the Panel in order to fill existing vacancies. Should the CRC desire to fill existing vacancies, the DCM is prepared to send a call for nominations.