

Board of Commissioners

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Clerk to the Board
Jeanette S. Deese, CMC, NCCCC

January-31, 2011

Steve Tyson, Chairman
Craven County Board of Commissioners
406 Craven Street
New Bern, NC 28560

Re: Proposed State Sea-Level Rise Policy

Dear Chairman Tyson:

As you may be aware, the N.C. Division of Coastal Management (NCDQM) has recently developed sea-level rise policy language, which if subsequently approved by the governor-appointed Coastal Resources Commission (CRC), would add a new section to the State's Administrative Code governing coastal management within our 20 CAMA (Coastal Area Management Act) counties, and furthermore would be used as a springboard for future regulations. The implications of this proposal in terms of its geographic scope and potentially detrimental economic impact are enormous. This is perhaps the most important and pervasive piece of policy the CRC has considered in a very long time, and I'm respectfully requesting your attention to this matter, and ultimately for your support in repudiating the proposal altogether.

The draft sea-level rise policy is attached for your review, and your comments can be submitted in written form and/or can be articulated directly to the CRC when they meet on February 23rd and 24th and again on May 4th and 5th, at the NOAA-NERR Auditorium located on Pivers Island, Beaufort, N.C. I'm also attaching a technical memo prepared by our Shore Protection Office that provides a succinct summary and historical perspective of the State's approach concerning sea level and the development of the policy.

Most importantly, the draft policy formally adopts the prediction of a **1 meter sea-level rise** (to 2100) for all the 20 CAMA Counties as the official state benchmark. As disclosed in our conversations with NCDQM, North Carolina is the first state along the East Coast to propose a future sea-level rise rate and would be the first to develop a policy based upon this future rate. Beyond this, there are three main items in the policy that you and your staff may wish to pay particularly close attention to (see Policy Statements 15A NCAC 07M .1303 (b), (g), and (h)).

- (1) The 1 meter rise benchmark is mandated to be used in **Land Use Plans**.
- (2) **Private development** will need to be designed and constructed to avoid sea-level rise impacts (1 meter) for the structure's design life.
- (3) **Public infrastructure** will need to be designed and constructed to avoid sea-level rise impacts (1 meter) for the structure's design life.

We have identified several flaws in the manner the data is presented and with overall policy that are listed below.

(a) Validity of 1 meter prediction – The justification for the 1 meter prediction is contained in a 2010 Science Panel report, which was first requested by the CRC and subsequently utilized exclusively for developing the sea-level rise policy. The Science Panel Report further states that various models and observations indicate accelerated rates of sea-level rise are “likely”, and subsequently cites one study that uses a proportional relationship between near-surface air temperature and mean sea level. That’s really the extent of the analyses. A 1 meter sea-level rise (3.28 ft. or 39 inches) is almost 3 times the existing rate and will cover square miles upon square miles of tax base, infrastructure, and natural resources in just about every CAMA County. Again, we believe codifying this prediction is cavalier with very little thought to how it will impact the livelihoods of citizens and the economic fortunes of the coast - development, tourism, taxbases, infrastructure, military operations, and more.

(b) No Maps – Similarly, it has been hard to quantify the impacts of a 1 meter rise in sea level because there have been no maps presented by NCDRC representing the square acres or miles of the lands that will be underwater. We have produced our own “bathtub line” analysis by shading all lands within Carteret County that are less than 1 meter in elevation. The results have been staggering and will likely be so as well in your County.

(c) Economic considerations/consequences – The rather speculative rationale that was used to generate the 1 meter solution also did not take into consideration the economic impacts of the policy in the least. There have been no discussions concerning the policy mandates to incorporate the 1 meter sea-level rise into Land Use Plans and private and public infrastructure. What will these costs be to provider and consumer? How do local governments account for the land drowned by a 1 meter sea-level rise? What impacts does a 1 meter sea-level rise have to our citizen’s ability to secure insurance? What impacts does a 1 meter sea-level rise have to one’s ability to secure financing? What will happen to our favorite tourism destinations (probably water dependent)? These are just a few examples of the economic impacts that need to be thoroughly vetted. Let alone are these discussions even prudent to have based on a “prediction” of 1 meter.

(d) Existing tide gauge data – The following table is from the Science Panel report, and as mentioned in the attached technical memo, the Science Panel developed three sea-level rise scenarios – (1) the “current rate” extrapolated to 2100, (2) the “1 meter solution” adopted by the CRC, and (3) the “worse case” (1.4 meters). As gleaned from the table below, the highest current relative sea-level rise rate reported is for Duck – however, that gauge has been out of service for almost a decade. Thus just for the “current rate” the CRC is using; (1) a gauge that doesn’t exist, (2) is located in the area of the coast that is sinking the most (see attached technical memo), and (3) is the worst case scenario for the State. An average or some other metric would have been much more appropriate. The Duck measurement is more than double some of the other rates in the State.

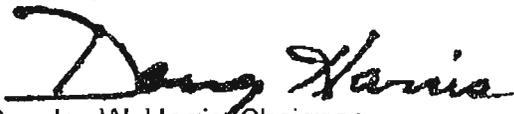
Station Number	Station Name	Rel. Sea-Level Trend (mm/yr)	Rel. Sea-Level Trend (inches/century)	Period of Data
8651370	Duck	4.27 +/- 0.74	16.8 +/- 2.9	1978-2002
8652587	Oregon Inlet Marina	2.55 +/- 1.21	10.1 +/- 4.8	1977-1980, 1994-2002
8654400	Cape Hatteras	3.46 +/- 0.75	13.6 +/- 3	1978-2002
8656483	Beaufort	3.20 +/- 0.54	12.6 +/- 2.2	1973-2002
8656590	Atlantic Beach	2.48 +/- 1.99	9.7 +/- 7.8	1977-1983, 1998-2000
8658120	Wilmington	2.12 +/- 0.23	8.4 +/- 0.8	1935-2002
8659084	Southport	2.04 +/- 0.25	8 +/- 1	1933-1954, 1976-1988
8659182	Yaupon Beach	2.92 +/- 0.77	11.5 +/- 3	1977-1978, 1996-1997

Moreover, the dataset utilized in the Science Panel Report is current through 2002. That's completely unacceptable – if sea level is rising at a purported increased rate, then we should be privy to the last decade's worth of data and that data should be incorporated into the report. NOAA's own website at http://tidesandcurrents.noaa.gov/sltrends/sltrends_states.shtml?region=nc has more recent data and in fact their rates of sea-level rise are different than those reported in the Science Panel Report. Southport = 2.08 +/-0.46 mm/yr, Wilmington = 2.07 +/-0.40 mm/yr, Beaufort = 2.57 +/- 0.44 mm/yr, and Oregon Inlet = 2.82 +/- 1.76 mm/yr.

(e) Tide gauge monitoring – By no means are we denying sea level is rising as this fact is nicely evidenced in the tide gauge data. It's the leap of faith of going from a near foot rise in sea level to 2100 (approximately the current rate) to over three feet (1 meter) that is problematic. The draft sea-level rise policy dictates that the planning benchmark of 1 meter should be re-visited every 5 years using the best available data. We support a 5-year review, but not the 1 meter or any other planning benchmark. As the years pass, and only if the data indicates a significant spike in sea-level rise is taking shape, then a new rate of sea-level rise can be considered. Until that time, establishing a 1 meter planning benchmark is entirely premature.

In closing, I very much appreciate your time and consideration of this correspondence. The more our Board and staff began to examine the policy, the more concerned we became about its real-world impacts to local governments. As mentioned in this correspondence, North Carolina would be the first State to adopt a sea-level rise policy – there is no reason for the 20 CAMA counties to be the guinea pigs for this policy experiment. It sends the wrong type of message and would surely stymie the economic recovery and growth our region needs and strives for. Please don't hesitate to contact me or our County Manager, Duncan Ballantyne if you have any questions, comments, or require additional information.

Sincerely,



Douglas W. Harris, Chairman
Carteret County Board of Commissioners

cc: Governor Beverly Perdue
Senator Jean Preston
Representative Pat McElraft
All Carteret County Municipalities
Myles Stempin, Director, Carteret County EDC
Mike Wagoner, President, Carteret County Chamber of Commerce
Carol Lohr, Executive Director, Tourism Development Authority (TDA)
Harold Blizzard, Craven County Manager

15A NCAC 07M .1301 DECLARATION OF GENERAL POLICY

The Coastal Resources Commission (hereafter referred to as the "Commission") is charged under the Coastal Area Management Act (CAMA) with the protection, preservation, orderly development, and management of the coastal area of North Carolina. To that end, the Commission is specifically charged with the protection of certain rights and values, which include ensuring the protection of public trust resources and access to those resources, preserving the quality and optimum use of water resources, managing land use and development to minimize environmental damage, and preserving private property rights.

The Commission recognizes that global sea level rise is occurring as a natural hazard, and is predicted to continue and possibly accelerate during the next century. Sea level rise will intensify the challenges that the Commission faces in preserving and managing the natural ecological conditions of the estuarine system, barrier dune system and beaches, while perpetuating their natural productivity as well biological, economic and aesthetic values.

Sea level rise is a coastal threat that magnifies other coastal hazards such as flooding, storm surge, shoreline erosion, and shoreline recession. Sea level rise is also a threat to the use of and access to public trust resources, water resources and quality, private property and development, and public property and infrastructure.

The Commission recognizes that sea level rise is a pervasive and persistent hazard that must be incorporated into all aspects of the coastal program. Incorporation is necessary in order to address the implications of the expected continuing rise in water levels, along with the resulting magnification of hazards, disruption and losses that such increases will bring.

The goal of this policy is to establish a framework for planned adaptation to rising sea levels. Planned adaptation will help to minimize economic, property and natural resource losses, minimize social disruption and losses to public trust areas and access, and minimize disaster recovery spending.

15A NCAC 07M .1302 DEFINITIONS

As used in this Section:

1. "Accommodate" means designing development and property uses such that their function is not eliminated as sea level rises.
2. "Conservation measures" are non-regulatory tools that can include easements, land acquisition, low impact development, and similar measures.
2. "Planned adaptation" means taking a proactive and deliberate approach to designing and implementing measures to either live with, or retreat from, rising seas.
3. "Planning benchmark" means a scientifically-based amount of sea level rise that is expected to occur by a specified time.
4. "Relative sea level rise" means an increase in the average surface height of the oceans over a long period of time that may be caused by an absolute increase in the water level, by sinking of the land at the water's edge, or by a combination of the two.
5. "Sea level rise" means an increase in the average surface height of the oceans over a 19-year tidal epoch.
6. "Shoreline erosion" refers to the chronic or episodic landward migration of a shoreline caused by the loss or displacement of sediment.
7. "Shoreline recession" means the long-term landward migration of the average position of a shoreline.

15A NCAC 07M .1303 POLICY STATEMENTS

(a) The Commission will promote public education of the impacts associated with rising sea levels and measures to cope with changing shorelines.

(b) The Commission shall adopt planning benchmarks pursuant to the best available scientific information, recognizing that there is a measure of uncertainty involved in any projection of future conditions. The Commission's Science Panel on Coastal Hazards prepared a North Carolina Sea-Level Rise Assessment Report (March 2010) which projects a relative sea level rise range of 0.38 meters (15 inches) to 1.4 meters (55 inches) above present levels by the year 2100. This report, and any future updates, will be available from the Division of Coastal Management and posted on its website. Consistent with this report, the Commission adopts a planning benchmark of one meter (39 inches) of relative sea level rise above present by 2100, for the twenty coastal counties. The benchmark will be used for land use planning, and to assist in designing development and conservation projects. The planning benchmark shall be reviewed at least every five years, and adjusted if necessary.

(c) Relative sea level rise is not uniform across the State's coastal zone, and the differences are amplified by topographical variations. As a result, specific adaptation measures might not be appropriate for all communities in the coastal zone, or at the same time. Pursuant to available scientific data and justification, the Commission may apply regional benchmarks and adaptation measures as appropriate for different parts of the coast.

(d) CAMA directs the Coastal Resources Commission to protect coastal resources and their productivity. Sea level rise is altering the physical and chemical aspects of the coastal area, and increasing the susceptibility of upland areas to inundation, storm surge, and accelerated erosion. Intertidal areas are being flooded at greater frequency and to greater depths, spurring landward migration of coastal habitats. In order to maintain their ecological function, fisheries habitats such as nursery areas may need to migrate landward, keeping pace with rising waters. The Commission may consider appropriate conservation and regulatory measures that can enable resources and habitats to migrate and persevere.

(e) The Commission has the responsibility to assist local governments with land use planning guidance and support. Due to the technical nature of sea level rise science and the need for a coordinated adaptation strategy, the Commission shall, to the best of its

ability, provide local governments with scientific data and technical assistance with regard to adaptation planning and specific adaptation measures. Specific guidance and planning requirements will be incorporated into the Commission's Subchapter 7B Land Use Planning Guidelines. The Commission may provide financial assistance for local adaptation planning and implementation as available.

(f) It is in the State's interest to invest in long-term sea level rise research and monitoring, as such investments will contribute to lowered future economic losses and disruption. The Commission will actively support efforts by the State to fund data collection, research, and monitoring.

(g) In order to minimize the magnification of hazards, disruption and losses associated with water levels, private development should be designed and constructed to avoid sea level rise impacts within the structure's design life to the maximum extent practicable, except in instances where the structure is built to serve an adaptation purpose. Water dependent structures should be designed to accommodate projected sea level rise within their design life. The Commission may require additional development standards for new and replacement structures built within areas subject to sea level rise impacts.

(h) In order to minimize the magnification of hazards, disruption and losses associated with water levels, public infrastructure should be designed and constructed to avoid sea level rise impacts within the infrastructure's design life to the maximum extent practicable, except in instances where the infrastructure is built to serve an adaptation purpose. Water dependent structures should be designed to accommodate projected sea level rise within their design life. The Commission may require additional development standards for new and replacement structures built within areas subject to sea level rise impacts.

(i) The Commission shall, on an ongoing basis, review and revise its Subchapter 7H State Guidelines for Areas of Environmental Concern to ensure that these rules account for the additive effects of sea level rise. The Commission shall also ensure that Procedures for Handling Major Development Permits; Variance Requests; Appeals from Minor Development Permit Decisions; and Declaratory Rulings account for the exacerbating effects of sea level rise.

Shore Protection Manager

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Memorandum

To: Duncan Ballantyne, County Manager
From: Greg "rudi" Rudolph
Date: January 12, 2011
Re: **Proposed Sea-Level Rise State Policy - addition to the N.C. Administrative Code**

The N.C. Division of Coastal Management (NCDCM) has generated sea-level rise rule language, which if subsequently approved by the governor-appointed Coastal Resources Commission (CRC), would add a new section to the State's Administrative Code governing coastal management within the 20 CAMA (Coastal Area Management Act) counties. The purpose of this memorandum is to; **(I)** review the sea-level rise issue as a whole, **(II)** the State's approach concerning sea level in the 20 CAMA counties, and **(III)** summarize the key elements of the proposed rule language.

(I) Causes of Sea-Level Movement/Rise

The mechanisms governing "global warming" or "global cooling" are complex and multifaceted, however the root cause is often correlated to greenhouse gases that allow the sun's radiation to penetrate the Earth's atmosphere but trap this same radiation near the Earth's surface. The higher the concentrations of greenhouse gases in the atmosphere – the warmer the climate; and vice-versa (i.e.; less greenhouse gases – the cooler the climate). The extremes of cool and warm phases are signified by periods of glaciation and interglaciation, respectively with the last interglacial cresting at roughly 125,000 years ago and the last glacial episode climaxing at roughly 18,000 year ago. Thus the Earth has been warming since this 18,000 year ago glacial peak. Sea level has been rising as well since this time because of two main factors; **(1)** increasing atmospheric temperature causes the melting of continental ice packs (or glaciers) and thereby contribute "new" water to the world's oceans, and **(2)** the water itself expands (i.e., thermal expansion). Scientists estimate the average air temperature and sea level has increased by approximately 7° Celsius (13° Fahrenheit) and 400 feet, respectively in the past 18,000 years. There was rapid warming and sea-level rise that occurred at first, which stabilized (relatively speaking) at roughly 10,000 years ago, which marks the beginning of the Holocene Epoch – this is the time frame and interglacial we are currently living within.

Recent emissions of greenhouse gases such as carbon dioxide from industrial processes, fossil fuel combustion, and changes in land use have been cited as exacerbating the "greenhouse effect". However, although greenhouse gases are considered as the main vehicle behind warming climate and sea-level rise, the forces shaping climate and sea-level oscillations can be many and are complexly related. Factors such as dust from volcanic eruptions and air pollution, oceanic currents, solar activity, water evaporation from oceans, tectonic activity, land subsidence, isostatic rebound of land, and a host of other variables can impact climate and/or sea-level response.

This leads us to two important terms regarding sea level – relative vs. glacio-eustatic. **Glacio-eustatic sea level** is the portion of sea level movement (rise or fall) only attributable to the melting or uptake of water in the world's glaciers. **Relative Sea Level**

on the other hand, is the measurement of the sea surface incorporating glacial melt/uptake and other dynamics such as land movements and sediment supply. So for instance, in an area where mountain building is occurring, the land may be rising at a rate close to that of glacio-eustatic sea level. Thus the relative sea-level surface is balanced and the rate of movement is close to zero. Conversely, in areas where land is subsiding (sinking), sea level may be considered "rising" at an enhanced rate because glacio-eustatic sea level is rising **and** the land is sinking – New Orleans is a good example.

The relative sea-level rise topic is nicely evidenced in the North Carolina tide gauge data presented below (Table 1). In general, the rate of relative sea-level rise increases north to south because the land is subsiding in the northern province of the State. The reason for this is two-fold and briefly; (1) There are more unconsolidated sediments underlying the barrier islands, estuaries, and mainland compartments north of Cape Lookout. Accordingly there is a greater tendency for these sediments to compact and subside/sink. And (2), there are land movements that continue to transpire related to the retreat of the glacier that once blanketed the northern U.S., which also has caused the land in northern North Carolina to sink (known as forebulge collapse).

Station Number	Station Name	Rel. Sea-Level Trend (mm/yr)	Rel. Sea-Level Trend (inches/century)	Period of Data
8651370	Duck	4.27 +/- 0.74	16.8 +/- 2.9	1978-2002
8652587	Oregon Inlet Marina	2.55 +/- 1.21	10.1 +/- 4.8	1977-1980, 1994-2002
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8659084	Southport	2.04 +/- 0.25	8 +/- 1	1933-1954, 1976-1988
8659182	Yaupon Beach	2.92 +/- 0.77	11.5 +/- 3	1977-1978, 1996-1997

Table 1 – Relative sea-level trends for N.C. water-level stations (adapted from Zervas, 2004).

We introduced these aforementioned technical terms and data for the main purpose;

- (1) To underscore the proposed rules being considered by the CRC **only** pertain to sea-level rise – they do not address climate change, carbon dioxide emissions, the causes of sea-level rise, etc. While indeed many of these climate factors are incorporated by *de facto* into the sea-level subject, the proposed rules truly constitute a sea-level rise policy. Controversial issues such as carbon credits, emission reductions, etc. are not directly part of the proposed rules.
- (2) To also highlight the CRC is operating under the premise that sea level is going to continue to rise throughout the remainder of this century. Moreover, because there are no expected reductions in greenhouse gases to occur, the rate of sea-level rise could increase as more and more glacial meltwater is donated to the ocean.
- (3) To de-mystify the issues associated with relative sea-level rise. Questions to the effect of "Why are there different sea-level rise numbers?" are often the first to surface when discussing sea level, and a fundamental understanding of this subject provides a basis to understand and comment coherently on the proposed rules.

(II) The CRC Approach to Sea-Level Rise (The Science Panel Report)

The CRC and the entire N.C. Department of Environment & Natural Resources (NCDENR) for that matter has been under pressure to do "something" about sea level. For

the CRC, this has been predicated by two factors in my opinion; (1) Inherently, sea-level rise is an important phenomenon impacting the gentle-sloping southeast coastal plains of the U.S., such as those that exist in North Carolina. A "small" rise in sea level can cover potentially huge areas (square miles) of land bordering estuaries and barrier islands. As the rule-making organization charged with protection, preservation, development, and management within the 20 CAMA Counties, the CRC feels obligated and believes it's primary function is to address coastal hazards such as sea-level rise – again operating under the premise that sea-level will continue to rise. (2) Reports from International and National Organizations including the U.N.'s Intergovernmental Panel on Climate Change (IPCC) and the U.S. Global Change Research Program have developed a host of climate models and sea-level rise scenarios, and furthermore have suggested and discussed the impacts of sea-level rise at rates greater than those we have experienced the past several decades/century. With most of the scientific community in consensus agreement, the CRC again has felt obligated to do "something".

In the mid 1990s the CRC developed the Science Panel on Coastal Hazards, a group populated by geology, engineering, and biology researchers and practitioners that has provided guidance and recommendations when tasked. Issues pertaining to beach nourishment sediment criteria, scientific analysis of inlet hazard zones boundaries, and other more science-intense topics have been under the purview of the Science Panel in the past. Usually the CRC will take the Science Panel's information to help create policy via their administrative wing, NCDCM. In January of 2010, NCDENR hosted a Science Forum on Sea-Level Rise in North Carolina showcasing a series of expert climate and sea-level scientists, and more importantly for this discussion, the forum was used as a platform to release a report prepared by the Science Panel concerning current and projected rates of sea-level rise in North Carolina. Most notably, the report projected sea-level rise ranges in 25-year intervals through 2100 that were envisioned to provide a foundation for future policy development and adaptation planning.

Specifically, the 16-page report includes three sea-level rise scenarios based on the best available science;

- (1) 0.38 m (1.26 ft. or 15 inches) by 2100, or a rate of 4.27 mm/year ("low")
- (2) 1.00 m (3.28 ft. or 39 inches) by 2100, or a rate of 11 mm/year ("middle")
- (3) 1.4 m (4.59 ft. or 55 inches) by 2100, or a rate of 15 mm/year ("high")

However, the blanket rate is 4.27 mm/year (the "low" range) until the year 2030 when the scenarios begin to diverge – i.e., the rate of sea-level rise in each scenario is the same until 2030. This concept is neatly presented in the accompanying graphic (Figure 1). Note the "low" range scenario simply takes the highest historical rate in North Carolina (Duck) and extrapolates the line to 2100. The "low", "middle", and "high" range scenarios were presented because as mentioned above, key indicators such as the volume of greenhouse gases in the atmosphere and physical evidence such as increases in the acidification of sea water, increasing rates of glacial melt, etc. Indicate the rate of sea-level rise we can expect to see for the remainder of this century should increase from its present universal rate of roughly 3 mm/year. How much more of an increase is the big question, hence why there are three scenarios.

The Science Panel recommended that a rise of 1 meter (39 inches/3.28 ft.) be adopted as the amount of anticipated rise by 2100 for policy development and planning purposes. This constitutes the "middle" range scenario. The Science Panel also recommended a more robust tidal gauge network and a reassessment of sea-level rise predictions on a five-year basis. All of these recommendations were incorporated into the proposed rule language.

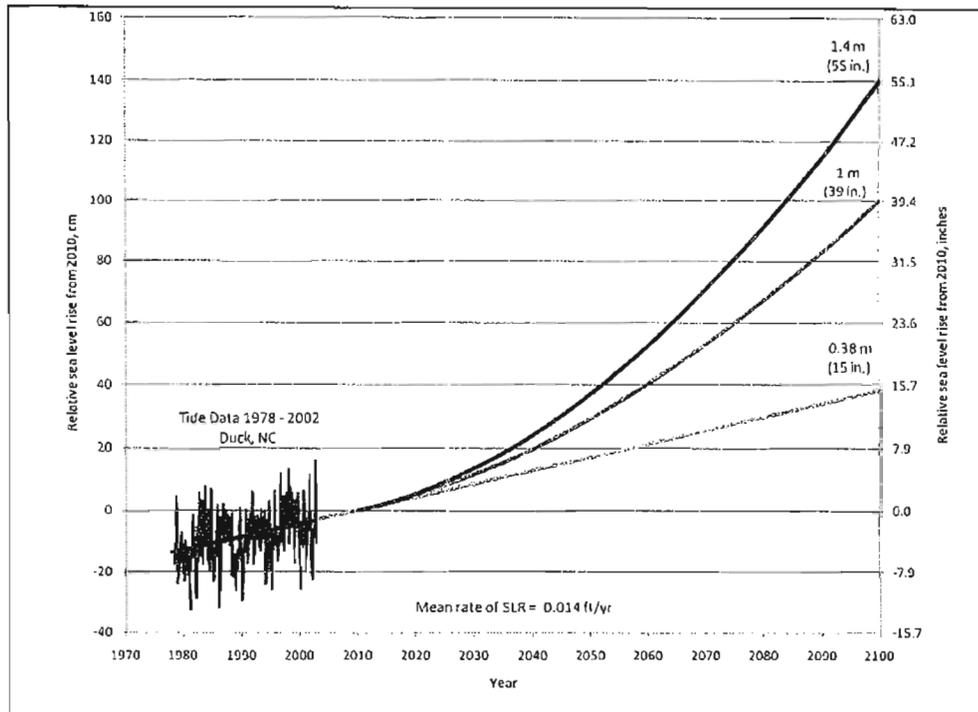


Fig.1 – Graphic depiction of the Science Panel’s three sea-level rise scenarios presented in their 2010 report. The CRC adopted the “1 meter solution” as their planning benchmark (blue line).

(III) Proposed Rule

Attached is a draft of the proposed rule that would be added to the State’s Administrative Code governing Coastal Management. It has been marked up by the Shore Protection Office. The CRC has reviewed the language twice in September and November 2010, and NCDCM has held two small stakeholder meetings as well. The CRC recently directed NCDCM to solicit more local government input and it wouldn’t be surprising to see a new version of the rules submitted to the CRC in April 2011 in an effort to gain approval to officially initiate the rule-making process. Thus the County is recommended to submit formal written comments as soon as possible. The rules have three sections summarized with commentary below.

Declaration of General Policy (15A NCAC 07M .1301) – this section articulates the role of the CRC, recognizes sea-level rise is occurring and will likely accelerate, identifies the coastal resources at risk, and the threats to those resources. The section concludes by summarizing the need for the policy (establish a need for planned adaptation to sea level).

Commentary – If the Planning Commission and/or County Board of Commissioners (CBOC) have any misgivings concerning the general premise that sea level is rising and will continue to rise at possibly an increased rate, then this section would be the proper place to levy these types of arguments. The Shore Protection Office does not recommend this however – NCDENR is very entrenched with this thinking and there are other elements of the rules that bear attention and have a higher likelihood of being modified.

Definitions (15A NCAC 07M .1302) – This section is self explanatory as it defines terms such as “planning benchmark”, “relative sea-level rise”, and other vocabulary that are used in the following section.

Commentary – None, except a small technical suggestion that is highlighted in the attached. Otherwise a hyphen is used throughout this memorandum when referring to “sea-level rise” and should be used in the proposed rules because sea level is describing something as a compound adjective (in this case “rise”). If we say sea level is rising, then the hyphen should not be used.

Policy Statements (15A NCAC 07M .1303) – This is the most important section of the proposed rules as it articulates what is expected of local governments. There are nine components (a – i). Component **(b)** formally adopts the Science Panel recommendation for a planning benchmark of a 1 meter (39 inches) by 2100, and states this benchmark will be used in land use planning. Many of the other components essentially reserve the right of the CRC to develop future rules that pertain to possibly implementing regional benchmarks, allow habitats to migrate, and incorporate specific guidance and planning requirements into Land Use Plans. However components **(g)** and **(h)** mandate that private development and public infrastructure should be designed and constructed to avoid sea-level rise impacts for the structure’s design life.

Commentary – The impacts of a 39 inch sea-level rise to Carteret County (component **(b)** in the rules) could be very dramatic for health and human safety concerns, let alone for building requirements and possibly even flood insurance participation, especially “Down East”. Moreover, there is no certainty pertaining to the benchmark - the rate of rise in the three Science Panel scenarios don’t diverge until 2030 (i.e., they are the same until 2030), so it would be prudent to not pick any single rate until the data indicates one scenario is indeed coming to fruition. The current rate (the “low” scenario) can be used until 2030 for planning purposes and this benchmark can be changed to 1 meter once the data start reflecting this (either before or after 2030). As mentioned previously, the “low” scenario is actually the highest current rate of sea-level rise in the State (Duck). Sea-level rise rates are lower *per se* here in Carteret County, so an argument can be made that even the “low” rate of 4.27 mm/yr is conservative compared to the Carteret County rates (see Table 1 – Beaufort and Atlantic Beach).

Components **(g)** and **(h)** of the proposed rules are also problematic, perhaps because they lack specificity. If private property and public infrastructure need to be designed to avoid sea-level rise impacts and the planning benchmark is 1 meter, then the impacts could be far reaching. If this needs to be codified in the County’s next Land Use Plan (LUP), then as mentioned above, there will be huge impacts. Moreover, will there be someone in State government who will determine whether or not LUPs specifically or the County in general are adequately addressing sea-level rise in terms of private development and public infrastructure? If this is the case, then the level of subjectivity that can be utilized for these decisions is probably unacceptable.

In closing and to reiterate, it is recommended the County submit formal written comments subsequent to gaining input from the Planning Commission and CBOC. It would be advantageous to address some of the items highlighted above in the “Policy Statement” section of the rule only. Possible alternative language could include a LUP provision for local governments to identify the most vulnerable areas within their jurisdiction. Obviously this is just a suggestion and it would be advantageous for the Planning Commission and the CBOC to take a close look at the other components of the Policy Statement that were not highlighted above.

Cc: Jim Jennings, Director, County Planning and Development