DRAFT

NC Coastal Resources Commission Science Panel
September 24, 2014
Craven County Cooperative Extension
New Bern, NC
Meeting Summary

Follow-Up Action Items

Action	Responsible Party	Due Date
Update and distribute report outline & schedule	Bill Birkemeier	
Invite Larry Atkinson to speak with panel	Bill Birkemeier	
Invite Gary Thompson to speak with panel	Beth Sciaudone	
Update and distribute references list	Tancred Miller	
Research east coast states' SLR numbers/timeframes	Tancred Miller	

Attendance

Margery Overton (Chair)
Bill Birkemeier (Vice Chair)
Bill Cleary
Tom Jarrett
Stan Riggs
Spencer Rogers
Greg Rudolph
Beth Sciaudone

Absent: Steve Benton, Charles Peterson

8 of 10 duly appointed members present.

Other attendees: Mike Lopazanski (DCM); Tancred Miller (DCM); Ken Richardson (DCM); Dave Burton (NC-20); Dave DeWitt (WUNC Radio); John Murowski (Raleigh News & Observer); James Early; David Duane; Mike Shutak (Tideland News).

Call to order
Margery Overton called the meeting to order at 10:10 a.m. Overton announced that the meeting is being voice recorded by DCM staff and WUNC radio and reminded members and guests to sign in.

Sea-level data at various stations
Tom Jarrett presented his analysis of the data and trends from several tide gauges in SC, NC and VA. Jarrett said that his work was not a rigorous statistical analysis nor meant to be seen as representing the Science Panel, and was open for critique. Jarrett's first demonstration was a visual analysis of the monthly averages from multiple tide gauges with the long-term trends removed. The analysis showed that the comparative trends across gauges, made up of 10-point moving averages, were visually very similar over time.

Jarrett also presented an analysis of the sea level trends across several gauges with different lifespans. Jarrett calculated ratios between gauges with dissimilar lifespans and used the ratios to infer amount of rise in regions with shorter gauge histories. The method was intended to be a way of estimating how much relative sea-level rise might have occurred at locations without long tide gauge records. Some panel

members had questions about the 0.01 mm/yr rate that Jarrett presented for Springmaid Pier over the period 192-2014, and the 0.52 mm/yr rate reported for Wilmington over the same period. The long-term trend reported over the life of the Wilmington gauge is 2.02 mm/yr. The panel said that if they want to use Jarrett's methodology they should ask NOAA or possibly other colleagues comment on the validity of the approach, then to do more processing of the data (e.g. removing seasonal variability) and then re-run the analyses.

Future sea level scenarios

Greg Rudolph said that his goal with the following analysis was to figure out the potential global eustatic rate from 2015-2045 as the first component of estimating potential ranges for North Carolina. Rudolph used the IPCC (Church & White) number over the period 1971-2010, 2 mm/yr. In the new IPCC report the projected amount of rise by 2050 is between 2.6 inches (low emissions scenario) and 8.5 inches (high emissions scenario).

Rudolph estimated a range by 2045 by averaging the IPCC's projected ranges at 2040 and 2050. Rudolph used Table AII.7.7 from Section 13.5.1 of the IPCC report. Rudolph noted that the values shown are medians from the models, and that since the starting period for the models is 1986-2005, some of the projected rise has already occurred. Rudolph said that his eustatic curves are not fitted to points, and if the graphs are used in the report the points should be displayed.

Rudolph used a combination of vertical land movement (VLM) numbers from the published literature and VLM numbers from Stan Riggs to calculate relative sea-level change projections for the four regions of the coast. The panel agreed that the regions that Riggs had presented were more appropriate for the SLR report and would be used instead of the BIMP regions. All of the VLM rates used were based on marsh isotope data. The panel said that when combining eustatic and VLM numbers, it is better to show calculations as inches of rise; do not convert inches of rise to rates because rates are not always linear and may lead to misinterpretations.

Vertical land movement & USACE calculator

The panel noted that the Continuously Operating Reference Station (CORS) data is too recent to be reliable, but that they can include a discussion of CORS in the report, including what the limited data shows, and say that CORS will become increasingly relevant in the future as the dataset matures. The panel said that if there are no acceptable publications that deal directly with VLM and RSLR then there needs to be a clear explanation as to how they arrived at their numbers.

The panel also mentioned that the USACE uses VLM numbers from the NOAA Technical Report NOS CO-OPS 065 from May 2013. Beth Sciaudone went through a deconstruction of RSLR from the technical report, separating eustatic rise from VLM, and then compared the technical report VLM numbers to Riggs' numbers. The panel agreed not to rely totally on tide gauge data because there are many other data sources available; other sources should be used to reinforce the gauge data.

The panel looked at a bar graph comparing tide gauge data (low, mean, high) and the IPCC's full RCP range (lowest rise at lowest emissions to highest rise at highest emissions), as well as the USACE's highest projection (1.5 m by 2100) and NOAA's highest projection (2 m by 2100). For Sewells Point, Duck and Oregon Inlet, the gauges show more potential rise than the IPCC's low scenario (RCP2.6).

Sciaudone noted that when she looked at (1) combining eustatic and VLM, and (2) gauge data, the two approaches don't match up. What accounts for the difference? One possibility is oceanographic noise, so would eustatic plus VLM work on the estuarine side? The panel talked about river gauges, but noted that many of the USGS river gauges are not tied to a vertical datum. The panel also questioned to what extent they wanted to get into a discussion of what could happen after 2045.

Report outline

The panel went through the report outline again and made a few changes in the sections and organization, as well as authors for the various sections. The panel talked about the need to address models, risk, uncertainty, minority science, and how to report other regional states' projections. The panel said that SLR is not the biggest issue on the coast, flooding from storm surge is a bigger hazard. The panel does not expect their report to be used as a technical or engineering reference, but to be more informational.

Next steps

The panel discussed whether Sewells Point and Charleston might have similar dredging impacts as Wilmington, and that Rick Luettich found insignificant impacts at Morehead City but bigger impacts in Wilmington. The panel has asked NOAA to help determine whether the Wilmington dredging has had significant impacts that affect the SL trend. NOAA hopes to have a response within the next month.

The panel talked about a recent NOAA report about nuisance flooding, NOS CO-OPS-073, and discussed whether to include anything about nuisance flooding in the report.

The panel talked about reaching out again to Larry Atkinson and Gary Thompson in time for the October meeting. Atkinson has a peer-reviewed, published methodology for deconstructing gauge data into eustatic and VLM signals.

Public comments

Jim Early spoke about British gauge data. The Permanent Service for Mean Sea Level (PSMSL) has a worldwide network of over 1,000 gauges. The PSMSL reports a global average SLR of 1mm/yr with no sign of acceleration. Early referred the panel to a report published in the Journal of Environmental and Ecological Statistics. Early said that a Church and White (2013) paper concluded that a relationship between global climate change and SLR is weak or nonexistent.

Dave Burton commended Tom Jarrett and Spencer Rogers for their recent work, and encouraged the panel to use Jarrett's methodology to try to detect dredging signals in Wilmington. Burton said that it would be a mistake to rely on information from only one end of the political spectrum. There is no detectable acceleration in SLR after 70 years of increasing emissions, and no fundamental relationship in the data between anthropogenic global warming and SLR. The panel should ask the IPCC to show them their data. Storm surge matters more than SLR. Models should not be used to project forward. 1.7 mm/yr of eustatic SLR includes a 0.3 mm/yr adjustment for seafloor subsidence.

Adjourn

The panel adjourned at 3:00 pm.