2015 SLR Report Draft #2: Initial Comments

Page i: "Inclusion of scenario based global SLR predictions from the most recent IPCC Report (AR5)."

> Insert the word "hypothetical". The linear fits in Figure 7 show no evidence of curvature/acceleration.

Page i: Recommend adding a bullet item to the report, material on Charleston (SC) and Sewells Point (VA) to provide context for the NC SLR locations.

Page i: "(2) effects of water movement in the oceans (including the shifting position and changing speed of the Gulf Stream)"

> Suggest adding: "neither of which humans have any control over."

Page ii: Our view is that the 1.7 global number should be 1.4 (per prior comments submitted by D. Burton).

Page ii: Table ES1 is in a different format than the following two tables. To be consistent, the third column of ES1 should be the **total**. [Page 18: Table 6 — make the same change as this.]

Page ii: "the projections of the IPCC scenarios is"

> As Figure 7 does not show curvature/acceleration, recommend omitting the IPCC scenarios. IPCC thinking is largely driven by models of temperature and those models have failed to predict 18 years of no temperature rise, while CO2 has increased by 10%. As this question will be revisited periodically, scenarios based on IPCC can wait for more data. If IPCC scenarios, they should be labeled "hypothetical" where ever mentioned. Any estimates of acceleration should be based on quadratic terms of fits to NC data.

Page iii: "sustainability" We are not aware of any fixed state of nature. Clearly on a geologic time scale, Figures 1 and 2, the earth is a very dynamic place. We would replace "sustainability" with something like "human well-being".

Page iii: "Agency groups involved in planning along the NC coast must determine acceptable levels of risk and from that determination, select appropriate planning numbers. Planning objectives spanning longer time frames (greater than 30 years) will require a re-assessment of the numbers provided in Tables ES1 through ES3."

> We would omit these sentences. They come across as "preachy". Presumably, government agencies know their duties.

Page iii: Suggest replacing “rapidly changing” with "current"

Page 1: “Since our original report … after fielding 50,000 comments.”

Recommend omitting this paragraph. Science is not a vote, and appeal to authority is not a method of argument that should be used.

Appeal to "peer reviewed" papers is also not a good argument. In the first place, IPCC often cites non-peer reviewed literature. More importantly, peer review is no guarantee of validity. Peer review merely means that the paper has been read and generally follows the standards of the field. Note:

> “The peer review process, however, provides assurance only that an act of research complies with accepted methods in a field of investigation. The process provides no assurance about the methods themselves, particularly if the reviewing experts also establish and maintain the very methods that they are asked to approve.” Feinstein, AR. (1988) Scientific standards in epidemiologic studies of the menace of daily life. Science 242, 1257-1263.

Page 2: It’s unclear what the “CO2 concentration in ice cores” readings have to do with past SLR data. Please explain the connection in the Report.

Page 2: “3)” Again, IPCC predictions have failed on temperature, so an appeal to IPCC does not improve the credibility of this report. Three projections make sense to us:

1. Linear projection for each gauge.
2. Quadratic projections for each gauge, IF the quadratic regression coefficient is statistically justified.
3. If a projection is based on a IPCC scenario then it should be labeled "hypothetical" in that it is model-based, not empirical data based.

Page 2: “4)” Provide guidance as to how to interpret and make use of these values” and “make use of” comes across as policy, so suggest omitting these.

Page 3: A reference to Kemp is in the Figure 3 description. The text statement “Figures 2 and 3; Kemp…” is confusing as Kemp only applies to Figure 3.

Page 3: “RSL = GSL + VLM + OE” Add words to the effect that Oceanographic Effects (OE) are generally transitory.

Page 3: Figure 2. The slope here is declared steeper, but does not look as steep as previous time period. 45 vs 40??

> Figure 2 might give the impression of "always upward," whereas Figure 1 shows some very dramatic decreases in sea level.

Page 4: Per prior comment, suggest adding Charleston (SC) and Sewells Point (VA) to tables and figures as reference points for the reader.

Page 4: Table 1: This table is suspect. IF there are problems in NC it is

1. combination of factors, hurricane, storm surge, rain to produce a big effect
2. Northeast NC, land subsistence.

#1 is more or less an act of God, and #2 is so gradual, that people are expected to adjust. The factors in this table are basically very slow processes and largely not of immediate concern.

Page 11: It's not clear how the information in Figure 5 relates to the rest of the report — especially the NC conclusions. Please explain in the Report.

Page 11: Figure 5(b) SLR acceleration is small for locations south of Hatteras.

Page 12: "The 2010 SLR Assessment Report based its projections on the Duck gauge, the only ocean gauge with a long term record." This sentence appears to be a walk back, without adequate explanation.

Page 13: Table 3, etc: Per prior comment, suggest adding Charleston (SC) and Sewells Point (VA) to tables and figures as reference points for the reader.

Page 15: Figure 7. These graphs strongly imply that there is no acceleration and therefore the IPCC scenario does not seem reasonable — and certainly should not be highlighted. Church and White claim acceleration, but the degree of acceleration is very small.

Page 16: "Most important is the fact that both data sources indicate that subsidence has more influence on relative sea level rise in the northeastern portion of North Carolina than in the southeastern counties." This observation should be included in summary.

Page 16: Having "Pers Comm" in both the title and the table is a duplication.

Page 18: "The Science Panel researched the possibility" of SLR deceleration. Then states that they could find nothing. How hard did they look? A brief search came up with this study, and this, and this and this and this. If we spent more than ten minutes on this it's likely we could come up with more. The bottom line is that although we are not supporting a deceleration position, the topic deserves more than one dismissive paragraph in an objective scientific assessment Report.

Page 19: All this fawning over the IPCC is in stark contrast with the 2010 Report (*from the same authors*) which dismissed the IPCC's SLR findings as unsatisfactory… In our view this section is the most egregious of the entire report, so strong exception is taken to blind adherence of the IPCC's views.

There have been numerous critiques of the IPCC that have concluded that it is more of a political body, trying to deceive the public by representing itself as a scientific one. Regarding the SLR issue, this report (esp. Part 2) does a good job of addressing why reliance on the IPCC for SLR projections is unscientific at best. As a minimum, the Panel should reference dissenting sources, like the NIPCC (and their SLR documentation) — and acknowledge that there is significant scientific uncertainty in this field.

It would appear that a more Science-based 30 year projection would have a linear extrapolation as the low end expectation, with the IPCC 2.6 scenario as the high end. The 8.5 scenario is wildly speculative and unworthy of mention.

Page 23: "Making sense of the predictions" This section appears to go into policy. Is it necessary? If anything, the report should state something to the effect that "This report should not be the basis for coastal policies".

Page 23: The website ClimateCentral.org comes across as scare mongering. This report indicates that Wilmington will experience little or no sea level rise, yet a report on this site talks of floods of 4 to 7 feet over the next century. Maybe so, but they needlessly combine SLR with storms.

Page 23: The statement "…which more rapid climate change is expected" is a political and unscientific opinion that is being injected here. A substitution of "…which more rapid climate change is possible" would be acceptable.

Page 26: On Page 9 the report references a "Houston &Dean 2013 Report" — yet it is not listed in the references.

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12/15/14

Addendum: 12/18/14

Rudi:

The acronym "RSLR" is never officially defined in the current version of the SLR Report — so that needs to be fixed. (I believe that it means "Relative Sea Level Rise", but it should say so.)

"RSLR" first appears on **Page ii, Table #ES1**, so it needs to be defined before that.

In checking this out, I stumbled across a related problem:

a) the term **RSL** is not defined until "Page v" — *which is after it appears in the document (Page ii)*.
b) the term RSL is then defined in four places (see below) — *which is way too many*.
c) the term RSL is defined *somewhat differently* in these four places — which needs to be fixed.

Here they are, in sequence of appearance, where I've highlighted the RSL part in red:

Page #v —
Table 2. Major factors contributing to positive and negative changes to the surface of the Earth and Sea. These changes affect Relative Sea Level (RSL) defined as the measurement between the sea surface and a moving datum.

Page #2 —
2. Sea Level Change: What influences ocean water levels?
The sea level at any location and time is known at the Relative Sea Level or RSL, which is the combination of three main factors including the Global Sea Level(GSL), Vertical Land Movement (VLM) and Oceanographic Effects (OE), such that: RSL = GSL + VLM + OE

GSL and RSL are discussed in this section, VLM and OE are discussed in Section 3. These parameters are usually discussed in terms of their rate of change, commonly expressed in mm/year.

Page #5 —

2.3 Relative Sea Level (RSL)

Relative sea level is the measurement of the sea surface incorporating both the global rate of rise and other dynamics affecting land and/or sea movement such as tectonic uplift, land subsidence, glacial isostatic adjustment (GIA), El Ni–o Southern Oscillation (ENSO), and other non-climatic local effects. (Table 2, Church et al. 2013a). Importantly, relative sea level is what is recorded in measurements by tide gauges and satellites. For instance, in areas where mountain building is occurring, the land may be rising at a rate close to that of the global sea level. Therefore, the measured rate of sea level rise is close to zero. Conversely, in areas where land is subsiding (sinking), sea level measurements will record sea level rise at a higher rate because eustatic sea level/GSL is rising and the land is sinking, producing an additive effect.

Page #12 —

4. Tide Gauge Data in North Carolina

Relative sea level change refers to the change in mean water level at a specific location and is generally measured by tide gauges, and the measurements include the influence of GSL, VLM and OE. In North Carolina, rates of relative sea level change measured by tide gauges vary along the coastline, with the highest rates measured in Dare County in the northeast and lowest along New Hanover and Brunswick counties to the south.

Let me know any questions.

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