

**Testimony of David Sutherland – Director of Government Relations  
Before the Environment Committee – March 8, 2013**

**In support of Raised Bill 1014 - AAC THE DEFINITION OF "RISE IN SEA LEVEL"  
If amended as suggested below**

On behalf of The Nature Conservancy, I would like to express our support for Bill 1014, with the changes recommended at the end of this testimony. The current language for this bill would have the revised definition of “rise in sea level” apply to municipal P&Z permitting, which does not reflect the following recommendation, approved unanimously in January by the legislature’s Shoreline Preservation Task Force, which was intended to apply for planning purposes only, not regulatory purposes:

“Members of the task force recommend: amending the statutory definition of “rise in sea level” for planning purposes, to enable planners to consider projected increases in the rate of sea level rise based on National Oceanic and Atmospheric Administration data.”

We believe the suggested JFS language in this testimony will most accurately and effectively reflect the task force’s recommendation.

**CURRENT STATUTORY DEFINITION OF SEA LEVEL RISE**

The current statutory definition of “rise in sea level” is based only on sea level rise (SLR) that has actually been observed in the past, averaged over several decades (*more info on last page*), which may be a practical definition for regulatory uses. Most scientists, however, maintain that the *rate* at which sea level is rising has increased significantly and that the rate will continue to accelerate. The JFS language we propose below is intended to authorize the use of projections of this increased rate of SLR **for planning purposes only**.

**RATE OF SEA LEVEL RISE ACCELERATING ALONG NORTHEAST U.S. COAST**

The rate at which sea level rises or falls varies significantly in different parts of the world and from year to year, affected by many factors, including ocean currents and temperatures, ocean oscillations (*i.e., El Nino, North Atlantic Oscillations*), land subsidence or rise, earthquakes, climate change, and glacial ice melt. Although there are global variations, change trends can be determined for different regions.

Unfortunately, research shows that Long Island Sound is within a region in which sea levels are rising and the rate of rise is accelerating faster than the global average. As noted by an October 2012 report<sup>1</sup> by the General Assembly’s Office of Legislative Research (OLR), a recent journal article<sup>2</sup> by US Geological Survey staff noted “*evidence of recently accelerated SLR in a unique 1,000-km-long hotspot on the highly populated North American Atlantic coast north of Cape Hatteras and show that it is consistent with a modelled fingerprint of dynamic SLR. Between 1950–1979 and 1980–2009, SLR rate increases in this northeast hotspot were 3–4 times higher than the global average.*”

A 2012 article<sup>3</sup> in the Journal of Coastal Research demonstrates that “*Evidence of statistically significant acceleration in sea level rise relative to land is found in a recent analysis of monthly mean sea level (mmsl) at tide stations on the Atlantic coast of North America.*” Unpublished calculations of a rolling 10-year average of mean SLR in New



London, as measured by the NOAA's tide gauge data, show a significant recent acceleration of the rate of rise. Compared to the average rate of rise from 1938 to 1988, the rate of rise has tripled since 1989.

## **PLANNERS NEED TO USE MORE REALISTIC SEA LEVEL RISE PROJECTIONS**

While various types of projections for future sea level rise might be more appropriate for other purposes, **the most useful projection for statutory and planning purposes will:**

- **be from a government source, preferably a federal agency in conjunction with other agencies, based on long-term consistently measured data;**

*It would be most prudent, for purposes of establishing in statute a projection for planning purposes, to use a federal government source, preferably involving multiple agencies. NOAA issued a report "Global Sea Level Rise Scenarios for the United States National Climate Assessment"<sup>4</sup> in 2102, which included a disclaimer noting that the conclusions in the paper do not necessarily reflect the agency's views, but it was published by NOAA, in conjunction with the Army Corps of Engineers and the U.S. Geological Survey.*

*The report projects four different scenarios for sea level rise over the next nine decades, ranging from a lowest projection based solely on historical observed rates, to intermediate projections based on continued warming of oceans, and recent observed ice sheet loss, to the highest projection which uses higher predictions of ice sheet and glacial melting.*

- **be based on a range of possible forecasts;**

*Many scientists project that the rate at which sea levels will rise globally is increasing and will continue to do so. It is impossible to be precise in predicting this increase for any specific area for any long-term time period. That is probably why states whose statutes account for increases in the rate of SLR usually use a wide range of potential rise over a longer time period.*

*For example, as noted by the OLR Report, it is the policy of Rhode Island's Coastal Management Program "to accommodate a base rate of a 3 to 5 foot rise in sea level by 2100 (equivalent of 4.1 – 6.8 inches per decade) in the siting, design, and implementation of public and private coastal activities...". Chapter 355 of Maine's Natural Resources Protection Act projects a two foot rise over the next 100 years.*

- **for planning purposes, be expressed in decade or multi-decade, rather than one-year or century-scale, timeframes;**

*The NOAA Report's two intermediate projections seem to be the most reasonable to use in statute for planning purposes, and are in line with projections by many other scientific sources. The two intermediate projections are Intermediate Low of 1.6 feet by 2100, and Intermediate High of 3.9 feet. An 87-year time horizon is not as useful for planning purposes as decadal averages. The Intermediate NOAA projections work out to an average decadal rise of between 2.2 inches to 5.3 inches, which would round off to 2 to 5 inches per decade.*

- **substantially conform to widely-accepted peer-reviewed scientific projections.**

*The projection of 2 to 5 inches per decade is within the equivalent range of many other widely-accepted and cited sources.*

The following proposed JFS language would make the existing part of the definition, passed last year, clearer. This more conservative part of the definition would apply to any regulatory purposes for which the General Assembly may subsequently decide to reference sea level rise. The second part of the definition, including projections of an increase in the rate of SLR, would include specification of the planning initiatives to which it would apply, and is based on the highly credible intermediate projections of the aforementioned NOAA Report.

#### **PROPOSED JFS LANGUAGE FOR BILL 1014:**

Subdivision (19) of section 22a-93 of the general statutes is repealed and the following is substituted in lieu thereof (*Effective from passage*):

(19) "Rise in sea level" means: [the] (1) The arithmetic mean of the most recent equivalent per decade rise in the surface level of the tidal and coastal waters of the state, as documented [for an annual, decadal or centenary period, at any sites specified in the state] in National Oceanic and Atmospheric ADMINISTRATION online or printed publications FOR THAT AGENCY'S BRIDGEPORT AND NEW LONDON TIDE GAUGES, or (2) for [the purposes of any municipal planning and zoning agency] PREPARATION OF THE STATE PLAN OF CONSERVATION AND DEVELOPMENT IN ACCORDANCE WITH SECTION, 16a-27, MUNICIPAL PLANS OF CONSERVATION AND DEVELOPMENT IN ACCORDANCE WITH SECTION 8-23, EMERGENCY EVACUATION PLANS, AND THE STATE'S NATURAL DISASTER PLAN AND THE STATE'S, REGIONAL, AND COASTAL MUNICIPALITIES' HAZARD MITIGATION PLANS, a projected rise of two to five inches per decade.

#### **If so amended, statute would read:**

(19) "Rise in sea level" means: (1) The arithmetic mean of the most recent equivalent per decade rise in the surface level of the tidal and coastal waters of the state, as documented in National Oceanic and Atmospheric Administration online or printed publications for that agency's Bridgeport and New London tide gauges, or (2) for preparation of the state plan of conservation and development in accordance with Section, 16a-27, municipal plans of conservation and development in accordance with Section 8-23, emergency evacuation plans, and the state's natural disaster plan and the state's, regional, and coastal municipalities' hazard mitigation plans, a projected rise of two to five inches per decade.

#### **Further Background on Current Statutory Definition**

The NOAA data to which the current definition in PA 12-101 refers is the agency's tide gauge data from Bridgeport and New London<sup>5</sup>. It is most meaningful for planning purposes to express sea level rise (SLR) in per-decade terms, so the definition calls for translating NOAA's annual and 100-year average figures into a recent per-decade number. Therefore, SLR is now effectively defined, according to our statute, as the mean of 2.56 mm (Bridgeport) and 2.25 mm (New London) per year, which equals 2.4 mm, which if then expressed in decadal terms, is 24.0 mm or .94 inches.

<sup>1</sup> <http://www.cga.ct.gov/2012/rpt/2012-R-0418.htm>

<sup>2</sup> <http://www.nature.com/nclimate/journal/v2/n12/full/nclimate1597.html>

<sup>3</sup> <http://www.jcronline.org/doi/abs/10.2112/JCOASTRES-D-12-00102.1>

<sup>4</sup> <http://www.cpo.noaa.gov/Home/Home/AllNews/TabId/315/ArtMID/668/ArticleID/80/Global-Sea-Level-Rise-Scenarios-for-the-United-States-National-Climate-Assessment.aspx>.

<sup>5</sup> NOAA Tide Gauge Data for Long Island Sound:

[http://tidesandcurrents.noaa.gov/sltrends/sltrends\\_station.shtml?stnid=8467150](http://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?stnid=8467150)