

Mapping Sea Level Rise

1. Sea Level Rise Task Force (SLRTF) has recognized the importance of developing detailed SLR inundation maps that depict the impact of various SLR scenarios and potential increased storm surge inundation resulting from SLR, to enable our Infrastructure and Natural Resources work groups to fully identify and analyze impacts.
2. These inundation maps will also be valuable visual aids in the SLRTF report(s) to help us portray the potential magnitude of the problem to decision makers and the impacted public.
3. Ideally SLR inundation maps and storm surge inundation maps should be developed for the entire areas of concern (the “Study Area”):
 - **upper Hudson River estuary (up to the Troy Dam),**
 - **all of the NYC shoreline,**
 - **Nassau and Suffolk County north and south shore (including the Peconic Bay and barrier islands),**
 - **and the Westchester LI Sound shoreline**

4. Ideally these inundation maps should show the impact of SLR and associated storm surge at four different time periods:

- **Current time frame**
- **2020**
- **2050**
- **2080**

5. Ideally these inundation maps should show the impact of SLR and associated storm surge that would result from various sea level rise scenarios (consistent with the findings of the IPCC figures and validated for the northeast by the Columbia University Systems Research and adopted in the NYC Panel on Climate Change):

Projected SLR by	2020	2050	2080
● “conservative”	2-5 inches	7-12 inches	12-13 inches
● “rapid ice melt”	5-10 inches	19-29 inches	41-55 inches

Obstacles that the SLRTF faces in producing the ideal SLR inundation maps:

- **In the upper Hudson River estuary, the relationship between SLR inundation and hydraulics/hydrology is not clearly understood; i.e., we can't directly translate X feet of SLR at the Battery to Y feet of rise at a specific point along the estuary. [The SLRTF has determined that, at this time, it is not viable to produce meaningful inundation maps for the upper Hudson River Estuary.]**
- **The most widely accepted current mapping technology uses Light Ranging and Detection technology (LiDAR) to determine elevation data. LiDAR is not available throughout the entire "Study Area". For those counties that do have LiDAR, the accuracy varies from +/- 10 feet to +/- 2 feet (or better). [The SLRTF has determined that LiDAR accuracy of +/- 2 feet is the minimal acceptable resolution in order to make meaningful impact projections for SLR inundation. The only county in the "Study Area" that fully meets these criteria is Suffolk County.] ***
- **The SLRTF recognizes that it is important for mapping products coming out of the Task Force be coordinated and as consistent as possible with other Climate Change studies currently on-going in NYS.**

*NYS submitted an \$872,000 grant proposal to the USGS on March 27th to fund the collection of additional LiDAR data for the counties in the upper Hudson River estuary, Nassau County and NYC. NYS is still awaiting word from the USGS on the status of this proposal.

Obstacles that the SLRTF faces in producing the ideal SLR inundation maps: (continued)

- **The current level of accuracy with LiDAR based maps is limited, +/- 2 feet. The level of SLR in the near term will be measured in inches. Therefore, with regard to making infrastructure decisions, no GIS mapping product that comes out of the SLRTF efforts should be considered as the final decision tool as to whether to relocate, elevate or harden structures. Instead, the map products need to be viewed as identifying where there is greatest potential for risk. Further engineering studies will need to be used to confirm specific risk.**
- **There are several existing models that project storm surge impacts. The SLRTF is considering whether or not to use the Sea, Lake, and Overland Surges from Hurricane (SLOSH) Model to try predict and depict the potential increased extent of inundation from storms due to SLR. If we decide to use this model, at this time the Hurricane Forecast Center has agreed to run an updated model that changes the current elevation of sea level to account for future SLR and to do a limited number of hurricane track and intensity scenarios. However, they can not begin this update until after the close of the current hurricane season (November 2009).**
- **The steps for taking LiDAR data and creating a digital elevation model, then layering that product with roads, political boundaries, natural land features, etc. takes time and manpower. Currently the SLRTF has very limited staff time to dedicate to the GIS mapping efforts.**

STATUS:

- **GIS staff in the Hudson River Estuary Program have begun work to create “digitized” maps for Nassau County and Suffolk County.**
- **The SLRTF has determined that in order to be consistent and for the most efficient use of human and capital resources to use the mapping products that NYC has and will be producing as part of the ongoing work of the NYCDEP Climate Change Task Force.**
- **The initial mapping work on Nassau County is complete. We can produce SLR inundation maps that would depict the conservative and high ranges of inundation. However these maps would be highly suspect because the base LiDAR data is only accurate to +/- 5 feet. These maps may still be useful to focus where the most likely SLR inundation problems would be along the Nassau County coastlines and to establish priorities for future study/mapping efforts.**
- **Work on Suffolk County is still continuing and is expected to be completed by early August.**
- **On July 3rd, the SLRTF Steering Committee will have an opportunity to review the computer/web mapping tool that was recently developed and released by the Nature Conservancy to depict the impacts of various SLR scenarios and potential increased resultant storm surge. The tool can also help calculate the potential economic impact of future storms combined with SLR.**
- **The Steering Committee will be reviewing this tool to determine if it could serve as a “proto-type” for the way in which the SLRTF may want to communicate the issues and specifics of sea level rise and storm surge to the Legislature and to coastal community decision makers.**
- **The Steering Committee will determine if it can or can not recommend to the SLRTF that it adopt this tool for use in its reports.**