NOAA Coastal High Tide Flooding - Mapping Methodology

The current mapping process for the High Tide Flooding layer uses NOAA COOPs derived thresholds from the report *NOAA Technical Report NOS CO-OPS 086 PATTERNS AND PROJECTIONS OF HIGH TIDE FLOODING ALONG THE U.S. COASTLINE USING A COMMON IMPACT THRESHOLD* (Sweet et al, 2018).

https://tidesandcurrents.noaa.gov/publications/techrpt86_PaP_of_HTFlooding.pdf

1. For each coastal area the most recent NOAA Digital Coast Digital Elevation Models (DEMs) are used with the following data sets.
2. Use the COOPs Derived Inundation Thresholds spreadsheet provided from COOPs report.
3. Create a MHHWinNAVD88 tidal water surface using VDatum for each coastal area
   a. This is an interpolation along the coastal regions based on gauge heights that accounts for the change in water levels due to tidal variability.
   b. Apply the derived threshold information from the COOPs report by adding it to the MHHWinNAVD88 tidal surface.
   c. This process is done for the minor, or lowest, coastal flood 'Threshold Surface' representing MHHW plus the threshold information.
   d. The two layers needed for mapping in ArcGIS include the DEM and the Threshold Surface.
4. For the 'Threshold Surface' the following steps are performed in ArcGIS using the Spatial Analyst toolset.
   a. In Raster Calculator create a conditional (CON) statement using the DEM and Threshold Surface layers:

   Con("DEM" <= "Threshold Surface", "DEM" > 0)

   **Set cell size to match DEM in Environments > Raster Analysis

   b. The map layer output will be a raster grid with two classes, 0 and 1. 0 represents areas that are dry and 1 represents inundated areas over land.
   c. The Reclassify tool is used to remove the areas that show water over water to better illustrate inundation over land. The final output for minor coastal flood thresholds layers will only show inundation over land, or above the 0 elevation mark.
   d. A cache dataset is then created to for the High Tide Flooding map service.

The layer is updated periodically as new elevation data is acquired. Please refer to the Updates section of the Sea Level Rise Viewer to see that latest geographic locations that have been recently updated.