METHOD DESCRIPTION

Coastal Flood Event Frequency and Duration Calculation

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The inundation analysis program was developed by the National Ocean Service's Coastal Oceanographic Applications and Services of Tides and Lakes (COASTAL) program. It uses the observed 6-minute water level time series and the observed times and heights of the observed high waters (tides) over a specified time period as data input. The data output of this program is an Excel spreadsheet that takes each of the tabulated high tides in a specified time period relative to the user-specified datum reference or threshold elevations, and calculates the elevations and durations of inundation of each of the high waters above the reference datum.

1. For each high tide, the analysis computes the elevation of the tide above a user-specified datum reference.
2. Then for each of the high tides, the duration of the time before and after the time of the high tide that the water level is above the user-specified reference datum is computed using the 6-minute observed time series.
3. This program also generates the output for the number of high tides analyzed and total number of hours inundated for the specified time series and reference datum.
4. The Excel program automatically generates graphical outputs on demand.
   a. Histograms of frequency of occurrences by elevation
   b. Histogram of frequency of occurrences by duration
   c. X-Y plot of elevation vs. duration
5. For each threshold elevation, statistical summaries of flooding frequencies are generated for number of tides inundated, total number of high tides, hours inundated and number of days inundated, and the percentage of time inundated.

For application of analyzing various sea-level rise scenarios, the reference datum is adjusted by the estimated amount of elevation change for a given sea-level rise scenario and the statistics above are regenerated.