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Date: **February 10, 2019**

To: **John Grande, Town of Tisbury**

From: **John Ramsey**

Subject: Progress Update for Tisbury

Task	Scheduled	Completed
Task 1a. Kick-off Meeting	09/15/2019	100%
Task 1b. Site-specific Analysis of Coastal Flooding	09/01/2019 to 02/28/2020	80%
Task 2. Quantitative Analysis of Coastal Change and Sediment Transport Processes	10/01/2019 to 03/15/2020	60%
Task 3. Initial Engineering Analysis to Screen Alternatives	01/01/2020 to 04/30/2020	20%
Task 4a. Working Session #1	04/15/2020	0%
Task 4b. Prioritize Shore and Flood Protection Strategies	01/01/2020 to 04/30/2020	10%
Task 4. Working Session #2	05/31/2020	0%
Task 6: Draft Report	05/01/2020 to 06/01/2020	0%
Task 7: Final Report	06/15/2020 to 06/30/2020	0%

Following Applied Coastal's processing of LiDAR data to identify low regions of Tisbury prone to coastal flooding, storm tide pathways (low points in the topography that expose areas to flooding) were identified. These sections of Town were primarily along roads, in the downtown commercial area. Several flood mitigation measures are being considered to manage these storm tide pathways in downtown Vineyard Haven.

Shoreline change rates were also analyzed by Applied Coastal. Several high-water line shorelines were generated and compared to estimate erosion rates (Figure 1). Further analysis of shoreline change and erosion are being completed using a "one line" shoreline model (Exodus) and XBEACH to estimate long and short-term erosion respectively. A timeseries of wave data was required to prescribe as a boundary condition to operate the model. A year of above average wave energy (2018) was collected from NOAA's 44020 buoy in Nantucket sound to evaluate the chosen models under the most active wind and wave conditions for significant fetches that approach Vineyard Haven Harbor. In this case, 2018 was determined to be the most active year based on the measured wind speeds at the buoy for compass sectors with the longest fetches to the entrance to Vineyard Haven Harbor (from north to east). Conditions during 2018 had the greatest cumulative wind-wave generating capacity for the selected sectors, and thus would have the greatest potential for wave-driven sediment transport at the study site. A plot of total relative wind-wave energy plotted for each year and compass sectors is presented in (Figure 2). In this plot, the wind-wave energy for the year 2018 is plotted using the thick dot-dash line. Waves from this synthesized time series are being used alongside sediment transport models to estimate sediment transport patterns.

Figure 1 Shorelines used in shoreline analysis for Vineyard Haven Harbor.

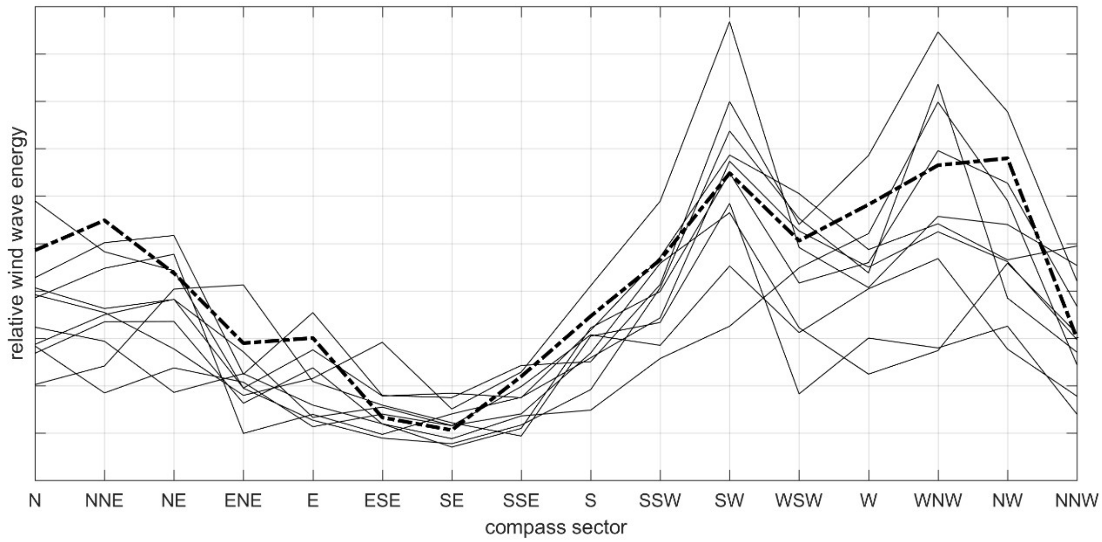

Figure 2 Plot of relative potential wind-wave energy (estimate as wind speed to the 1.5 power) by compass sector (x-axis) and year (plotted lines) from 2009 through 2019. The thick dot-dash line is the distribution for 2018, which is the most energetic for wave fetches from north to east, and has the greatest potential for sediment mobility at the Vineyard Haven study site.