



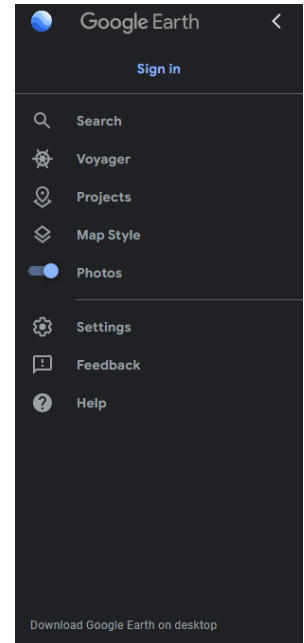
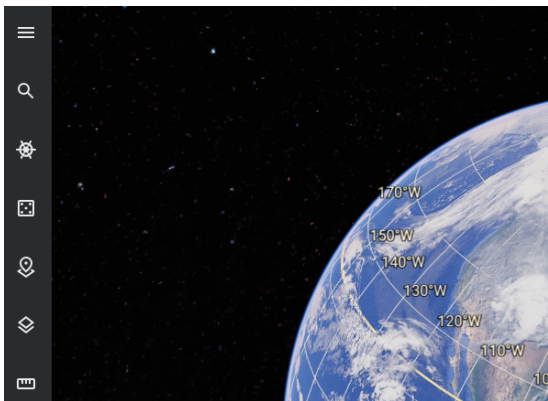
Desktop Analysis Guide

Day 1: Site Assessment

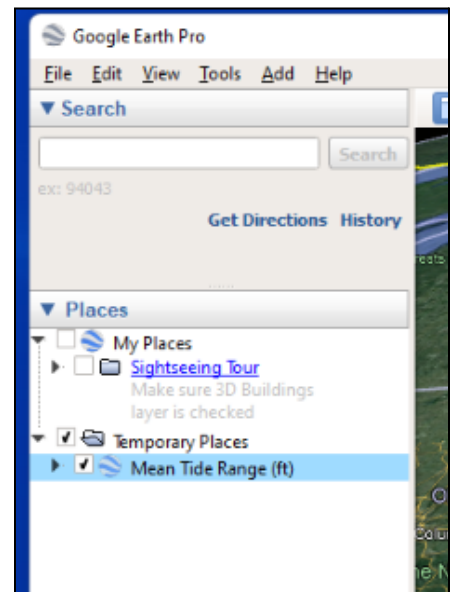
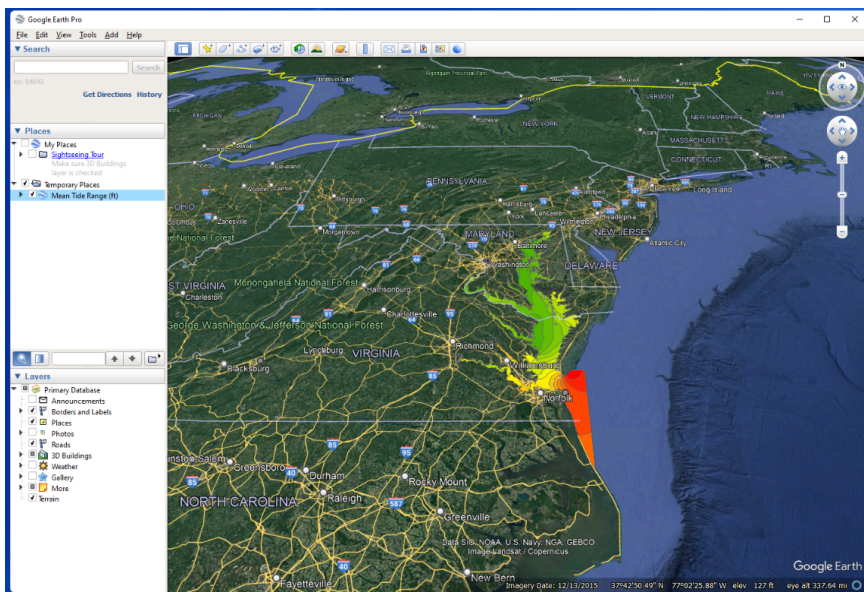
This instruction guide is intended to assist in conducting a desktop analysis for a potential living shoreline project. Use this guide to complete the Desktop Analysis portion of the Site Evaluation Form. Refer to the *VIMS Living Shoreline Design Guidelines* key reference for a more detailed discussion of terminology and the site assessment process. For convenience, the analysis criteria in this guide are organized according to the digital tool used and may not be in the exact order found on the evaluation form.

Before you begin:

1. Download the free version of Google Earth, available [here](#). Click the hamburger icon (3 stacked lines) in the top left corner, then click “Download Google Earth on desktop” at the very bottom of the menu.



2. Download the VIMS Shoreline Studies Program’s Google Earth tools - Mean Tide Range & NAVD88 to MLW Conversion Factor [here](#). Click on the file names to automatically download the utility files.
3. Open the utility file (depending on your computer’s settings, look in the Downloads folder). This will open Google Earth with the utility active. Use the left menu to turn the utility on/off by clicking the box.



Complete the Desktop Analysis portion of the Site Evaluation Form using the following tools and methods.

Shoreline Orientation

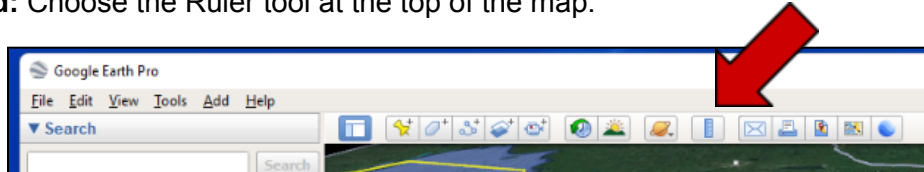
Tool: Google Earth

Method: In the Search field, enter the property address. For this exercise, use 9520 20th Bay St, Norfolk, VA, and click Search. (Refer to the site map provided with the Site Evaluation Form to determine the exact section of shoreline to analyze.) Find the North arrow in the top right corner, then determine the direction the shoreline is facing. Circle the corresponding direction(s) on the form.

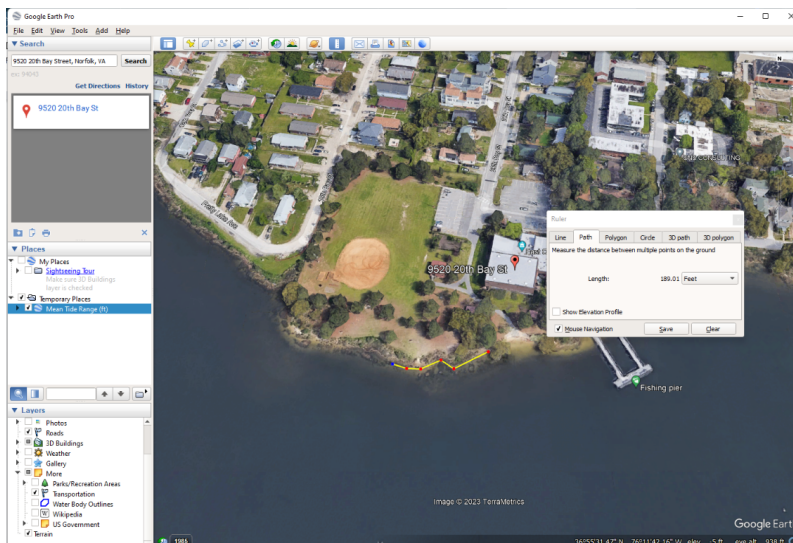
Shore Length and Width

Tool: Google Earth

Method: Choose the Ruler tool at the top of the map.



A small window will open. Choose the Path tab and change the measurement units to feet. Using the cursor, add points along the shoreline. The measurement will appear in the small window. Save this path as a starting point for determining fetch in the next step. Repeat this step to determine the width. You may need to zoom in for accurate point placement.



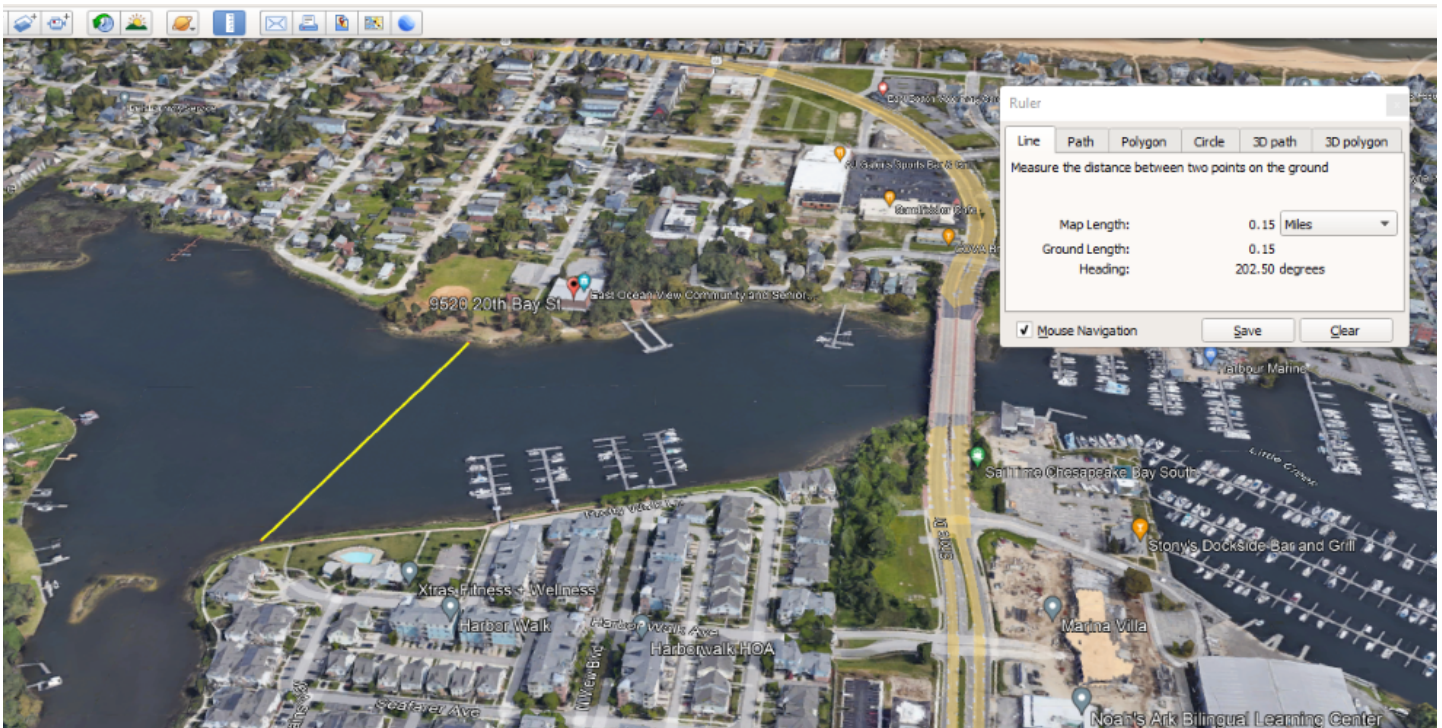
Fetch

Tool: Google Earth

Method: Zoom out sufficiently to see the opposite shoreline. Using the Ruler tool, choose the Line tab in the popup window and change the measurement unit to miles. In the popup window, you will see Map Length, Ground Length, and Heading. Map Length is the measurement you will use. Heading indicates the angle. To determine the average fetch, take 5 measurements (using your saved path as a reference for placing your points) and write them down: from the shoreline to the opposite shore at headings of 180°, 157.5°, 135°, 202.5°, and 225°. [These headings will change depending on the orientation of the shoreline, but correspond to 90° (perpendicular), and 22.5° and 45° angles on either side.]

Add the five measurements together and divide by 5 to calculate the average fetch.

In addition to average fetch, measure the longest distance from one shore to the other and note the direction.



Shore Morphology

Tool: Google Earth

Method: Observe the location and outline of the shoreline. Determine if it is best classified as: pocket beach, headland, straight, or irregular. Refer to the VIMS [Living Shoreline Design Guidelines](#) key reference page 19, for photos illustrating each type of morphology.

Nearshore Morphology

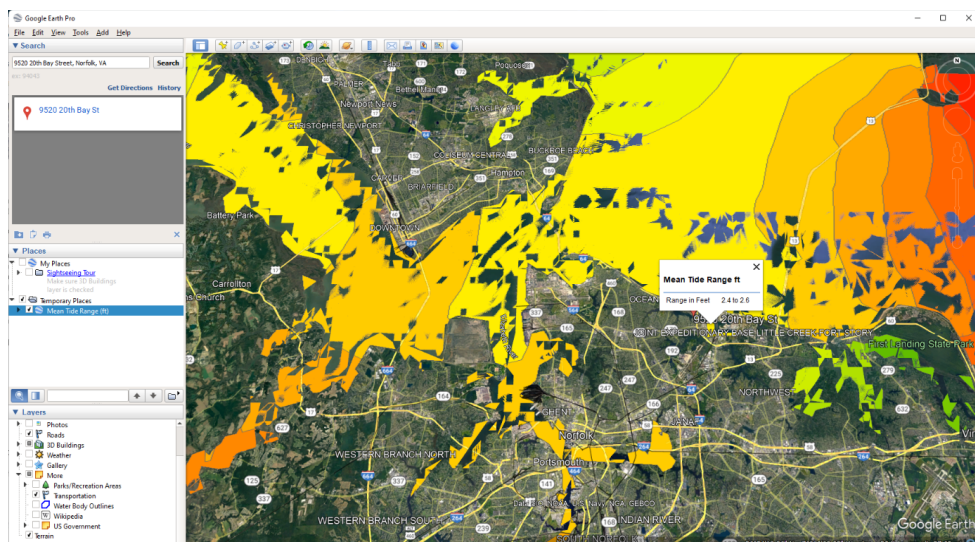
Tool: Google Earth

Method: Zoom in on the site and look at the areas just off shore to determine if tidal flats or sandbars are present. This should be verified during the site visit.

Tide Range

Tool: Google Earth w/ Mean Tide Range utility turned on

Method: Zoom out of the site area until you see the color-coded tide ranges appear. Click inside a color zone as close as possible to the site to find the mean tide range.



Storm Surge

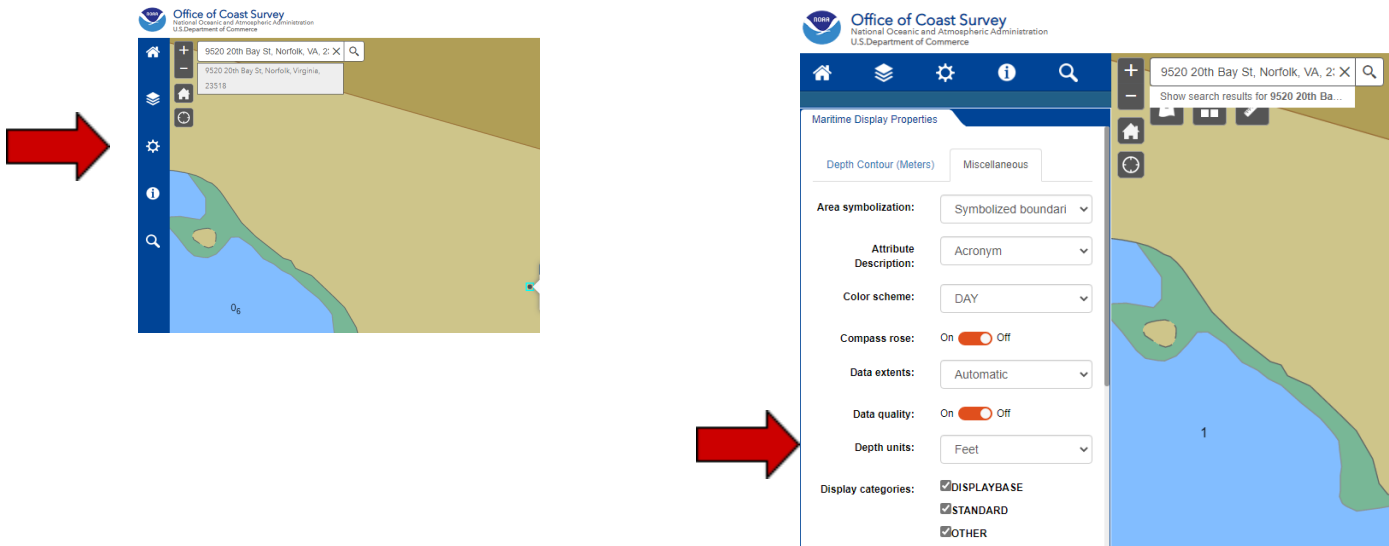
Tool: [Google Earth with NAVD88 to MLW Conversion Factor turned on](#) + [FEMA Flood Insurance Studies](#)

Method: Click on the tool link above to go to the FEMA Flood Map Service Center. In the Jurisdiction search column, choose state, county/city, and community where the project is located and click search. Under Search Results, click on Effective Products, then FIS Reports. Download the report. If it does not automatically open, find it in the Downloads folder. Within the report, locate the Transect Location Map (page 15) and find the transect line/number closest to the project site. Locate the Transect Data Table (begins page 19) and scroll to find the transect number you identified. The table lists stillwater elevations for the 10-year (10%), 50-year (2%), and 100-year (1%) storms. Write these down. Note: The listed elevations are relative to the North American Vertical Datum (NAVD88), which in Virginia is generally around mid-tide level (MTL). In order to convert to MLW, open the utility file you downloaded at the beginning of this worksheet. Find the color coded area closest to the project site and note the difference between NAVD88 and MLW. Add this number to the stillwater elevations found in the Transect Data Table.

Depth Offshore & Proximity to Navigation Channel

Tool: [NOAA Nautical Chart Viewer](#)

Method: Click on the tool link above to go to the viewer. Enter 9520 20th Bay St, Norfolk, VA 23518 in the Search field. Select the Settings tool from the left side menu. Change the depth units to feet. Record the number closest to the site shoreline. Identify how close the project site is to a navigation channel. For help with chart symbols, see [US Charts No. 1](#).



Tide Data

Tool: [NOAA Tides & Currents](#)

Method: Click on the tool link above to go to the Tides & Currents map. Zoom in to the site area or enter the address in the Search box. Click on the closest nearshore Station Marker (Sewells Point). In the popup window, click the More Data down arrow, then select Datums to view MHW, MLW, and MTL.

Storm Surge

Tool: [FEMA Flood Insurance Studies](#)

Method: Click on the tool link above to go to the FEMA Flood Map Service Center. In the Jurisdiction search column, choose state, county/city, and community where the project is located and click search. Under Search Results, click on Effective Products, then FIS Reports. Download the report. If it does not automatically open,

find it in the Downloads folder. Within the report, locate the Transect Location Map (page 15) and find the transect line/number closest to the project site. Locate the Transect Data Table (begins page 19) and scroll to find the transect number you identified. The table lists stillwater elevations for the 10-year (10%), 50-year (2%), and 100-year (1%) storms. Note: The listed elevations are relative to the North American Vertical Datum (NAVD88), which in Virginia is generally around mid-tide level (MTL).

Average Salinity

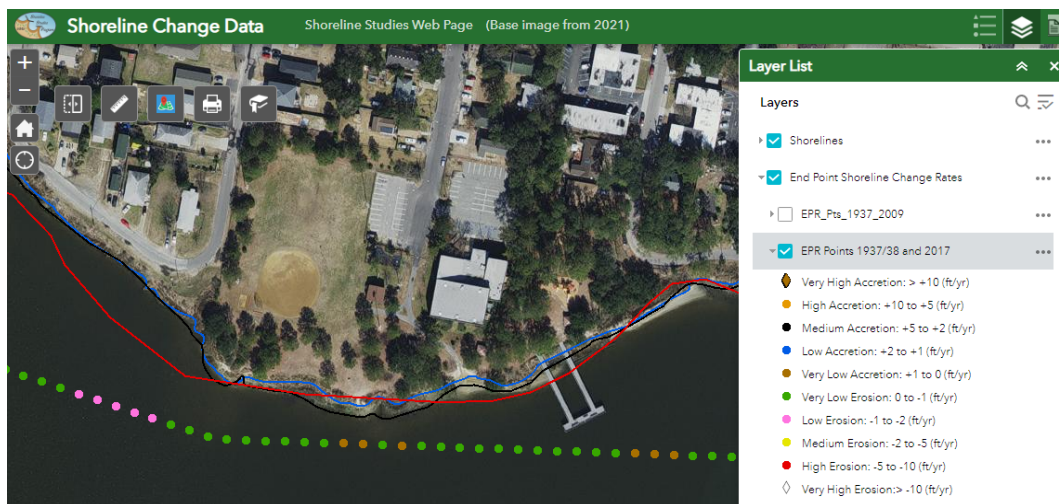
Tool: [VIMS Focused Salinity & Temperature Forecasts](#)

Method: Click on the tool link above to go to the Chesapeake Bay Environmental Forecast System's Focused Salinity and Temperature Forecasts page. Click the arrow next to Salinity - Lower Chesapeake Bay and look at the maps to determine salinity. Note: these maps are static and small water bodies are not color coded, including Little Creek where our site is located. Choose the salinity level closest to where Little Creek meets the Chesapeake Bay. Salinity is a factor in choosing appropriate marsh plants and determining the suitability of oyster structures for a living shoreline. During the site visit, field verify if oysters are present.

Erosion Rate

Tool: [VIMS Shoreline Change Viewer](#)

Method: Click on the tool link above to access the Shoreline Change Viewer. (Be patient - the map may load slowly) In the Layer List menu - make sure that there are checkmarks next to Shorelines and End Point Shoreline Change Rates. Click the arrow next to End Point, then select EPR Points 1937/38 and 2017. Now click the arrow next to that box to expand the color-coding key. Click on an individual point to view details. An alternative way to measure the erosion rate using historic imagery in Google Earth is described on page 24 in the *VIMS Living Shoreline Design Guidelines* key reference



Submerged Aquatic Vegetation (SAV)

Tool: [VIMS SAV Viewer](#)

Method: Click on the tool link above to access the SAV Viewer. Zoom into the project site or enter the address in the search box. Areas where SAV is present are highlighted green on the map.

Design Wave

Tool: [VDOT Significant Wave Height Prediction Curves](#) (not applicable to our project site*)

Method: Click on the tool link above to access the VDOT Drainage Manual; prediction curves can be found in Chapter 13: Appendix 13B-1. You will need to know the average fetch (calculated earlier in this exercise) and an estimated wind speed to determine the height and period of a design wave. Wind speed estimates come

from looking at the actual wind records from the site and general wind statistics. **Design wave is used when dealing with a site with an average fetch of 1 mile or greater. Leave this section blank on the Desktop Analysis form.*

Sea Level Rise (SLR)

Tool: [AdaptVA Sea Level Curves](#)

Method: Click on the tool link above to access AdaptVA's Sea Level Curves. To the right of the curve, click on the legend to turn each set of projections on/off. Use the NOAA 2017 Intermediate High Curve projections to complete the form.

Other places to find property information:

Other information (Chesapeake Bay Preservation Areas, utilities, etc.) may be desired. The following sources should be consulted.

[AdaptVA](#)

Municipal open GIS

Property plats & surveys from property owner

[VA811](#)