High Tide Line (HTL) Delineation

Methods and WDSOT recommendations

September 15, 2021

WSDOT | ENVIRONMENTAL SERVICES OFFICE | WETLAND PROGRAM

Presentation outline

*Note additional information provided in the presentation notes.

- Define HTL.
- Review 3 options for delineating HTL.
- Review 3 options and their outcomes in relation to 2 different example project sites.
- Look at resources & tools to help you make HTL recommendations.

Use high tide line (HTL) to document tidally influenced waters for USACE jurisdiction and 404 permitting

HTL replaces MHHW as the jurisdictional boundary for Section 404

February 21, 2020 USACE Special Public Notice
Establishes Section 404 jurisdiction of tidal waters extends to the HTL.

This replaces what the Seattle District of the Corps was using,
which was Mean Higher High Water

HTL definition

33 Code of Federal Regulations (CFR) § 328.3
https://ecfr.federalregister.gov/current/title-33/chapter-II/part-328/section-328.3

The line of intersection of the land with the water's surface at the ***maximum height reached by a rising tide***.

The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide.

The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds, such as those accompanying a hurricane or other intense storm.

Spring tides don't refer to the season spring, instead a **spring tide** (known as a "King Tide") refers to the **'springing forth' of the tide** during new and full moon.
In comparison, a **neap tide**—seven days after a spring tide—refers to a **period of moderate tides** when the sun and moon are at right angles to each other during the first and third quarter moon, when the moon appears "half full."
https://oceanservice.noaa.gov/facts/springtide.html

3 HTL delineation options with various outcomes

Option 1- use HAT tidal datum

Option 1: use tidal datum

Highest astronomical tide (HAT) is a datum that can be used to establish HTL.

Outcome:

- HAT is often higher (than HPT/Option2), in terms of topographic elevation, and therefore more inclusive of tidal water for 404 jurisdiction.
- Quick and easy to look up datum and have project engineer office (PEO) apply the elevation to plans.
- Quick and easy for WSDOT Corps liaisons to approve. They can concur without question – saves time.
- What NOAA uses for limit of designated critical habitat for marine species (NOAA uses HAT to establish "extreme high tide line").

HAT definition

NOAA HAT tidal datum
https://tidesandcurrents.noaa.gov/datum_options.html

HAT: The elevation of the highest predicted astronomical tide expected to occur at a specific tide station over the National Tidal Datum Epoch.

- Astronomical tide: rise and fall of water due solely to gravitational interactions between earth/moon/sun - very periodic and predictable.
- In comparison, meteorological tide: rise and fall of water due to wind/fluctuations in atmospheric pressure - only as predictable as the weather.
- National Tidal Datum Epoch: specific 19-year period of tide observations, comprising official time segment to report mean values (MLLW, MHHW) for tidal datums. The present NTDE is 1983 through 2001.

3 HTL delineation options with various outcomes

Option 2- use ten-year average of HPT

Option 2: use ten-year average of HPT

Highest predicted tide (HPT) uses data to establish HTL. Look at the HPT for each year with in a 10 year period, starting with the year of field work. Then average the 10 highest tides to determine HPT.

Outcome:

- HPT is often lower (than HAT/Option1), in terms of topographic elevation, and therefore less inclusive of tidal water for 404 jurisdiction.
- Takes a bit of time to perform the analysis (~<2 hours). Then quick and easy for PEO to apply the elevation to plans.
- Quick and easy for WSDOT Corps liaisons to approve. They can concur without question – saves time.

3 HTL delineation options with various outcomes

Option 3- use field indicators
https://apps.ecology.wa.gov/publications/documents/1606029.pdf

Option 3: use Ecology's field indicators of OHWM for tidal waters.

Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State, Chapter 4, P. 66-110

Outcome:

- Takes significantly more time for biologist (office & field tasks).
- Longer timeline for WSDOT Corps liaisons, expect delays - Corps liaisons send submittal for review by USACE Office of Council. Project gets in line with all other applicants to be reviewed – takes significant time.
- This option is not recommended due to longer processing times. Only use this option for project specific scenarios, such as the nearest tidal stations do not provide relevant tidal data for your project location and therefore Options 1 or 2 result in inaccurate estimate of HTL.

Note: WSDOT does not use Ecology OHWM methods for delineating OHWM for palustrine systems. We use Corps methods from RGL 05-05 for freshwater streams. So if you use the Ecology OHWM methods you'd need to review the SMA OHWM manual referenced on the slide.

Add Mean High Water (MHW) to Plan Sheets

WSDOT page on USACE jurisdiction
https://wsdot.wa.gov/environment/technical/disciplines/wetlands/jurisdiction/US-Army-Corps-Engineers

USACE website for Navigable Waters in WA
https://www.nws.usace.army.mil/Portals/27/docs/regulatory2/FormsEtc/NavigableSec10List-v20200212.pdf?ver=2020-02-12-191659-707

MHW is the USACE limit of jurisdiction for waters regulated under Section 10 of the Rivers and Harbors Act of 1899.

Section 10 waters are tidally influenced navigable waters – waters currently or historically used to transport commerce.

We need Section 10 permits for any work in or over Navigable Waters of the US.

The Corps provides a list of Navigable Waters in Washington State.

Discuss your HTL recommendation with the Corps prior to permit submittal

- WSDOT makes a recommendation of HTL placement to the Corps.
- WSDOT staff set a meeting with Corps liaisons to discuss project specific HTL jurisdiction limits prior to permitting.
- External partners coordinate with your project contact to coordinate your HTL recommendation with the Corps.
- Be prepared to show photos, diagrams, maps, data.

In addition to HTL (Section 404 CWA jurisdiction), show MHW (Section 10 RHA jurisdiction).

What to include in your report

Document HTL in the WSAR

Methods

- Include description of your HTL methods.

HTL description including (include info after Wetland and Stream sections of the report)**:**

- HAT or HPT (which ever one you chose)
- Date(s) of field work and high tide predictions immediately preceding your field visit.
- Field indicators observed including description of indicators above and below HTL.
- Labeled photos showing HTL and field indicators. The photo tells the story of how you placed HTL and if field indicators correlated with HAT or HPT.
- HTL summary table including buffer description.

Appendix with HPT data

- If you used HPT to determine HTL, include data in the report appendix.

WSAR template will be updated to add these sections.

Option 2 – HPT project example

Example of how to use HPT to establish HTL

Office tasks prior to field work:

- Select tide station to use from NOAA tides and currents.
- Then use the WSDOT HPT calculator to determine the 10-year average HPT.
- Schedule field work and review predicted high tide elevations for date of field work.

Field work:

- Note the last predicted high tide elevation prior to your field visit.
- Locate field indicators of the last high tide and assume the predicted elevation matches the field indicators.
- Then subtract that elevation from the HPT and estimate the difference in elevation on the ground.
- Navigate to that location and look for field indicators of HTL. Do the field indicators match the HPT elevation?

Mud Bay Bridges

Indicators above HTL:

- different soil (gravel/fill vs. fine textured silt)
- change to upland vegetation
- no scour, rack, deposition, or tidal water influence observed

HTL = - - - - -

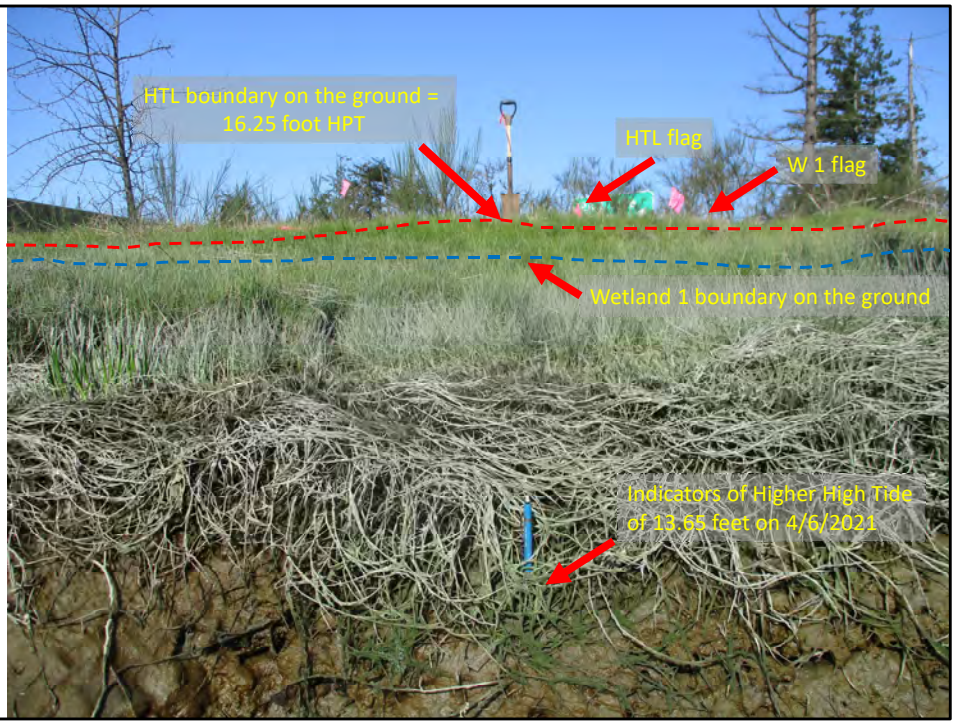
HTL shown by the red dashed line and at the base of the shovel. HTL indicators matched HPT of 16.25 feet

Wetland 1 boundary = - - - - -

Pencil indicates tidal elevation of higher high tide on date of field work, estimated at 13.36 feet

Indicators below HTL:

- different soil (fine textured silt vs. gravel/fill)
- change to salt tolerant and hydrophytic vegetation, and seaweed
- rack, deposition of fines, tidal water influence observed



Project example: report figure example explaining placement of HTL in relation to high tide preceding field work.

McAllister Creek Bridges

Indicators above HTL:

- change to upland vegetation, moss/lichen on boulders
- no scour, rack, deposition, or tidal water influence observed

HTL = - - - - -

HTL indicators matched HPT of 16.25 feet

Wetland 1 boundary = - - - -

Indicators below HTL:

- change to salt tolerant and hydrophytic vegetation
- rack and scum observed
- benches partially formed as a result of tidal flows

Project example: report figure example explaining placement of HTL in relation to high tide preceding field work.

Option 2 – HPT project example

Report Appendix showing 10-year average HTP

Appendix A. HPT Data

Appendix A provides the data showing mean elevation of HPT over a 10-year period.

I-5 McAllister Creek Bridges and US 101 Mud Bay Bridges

Mean elevation of HPT over a 10-year period from January 1, 2021 to December 31, 2030[a]

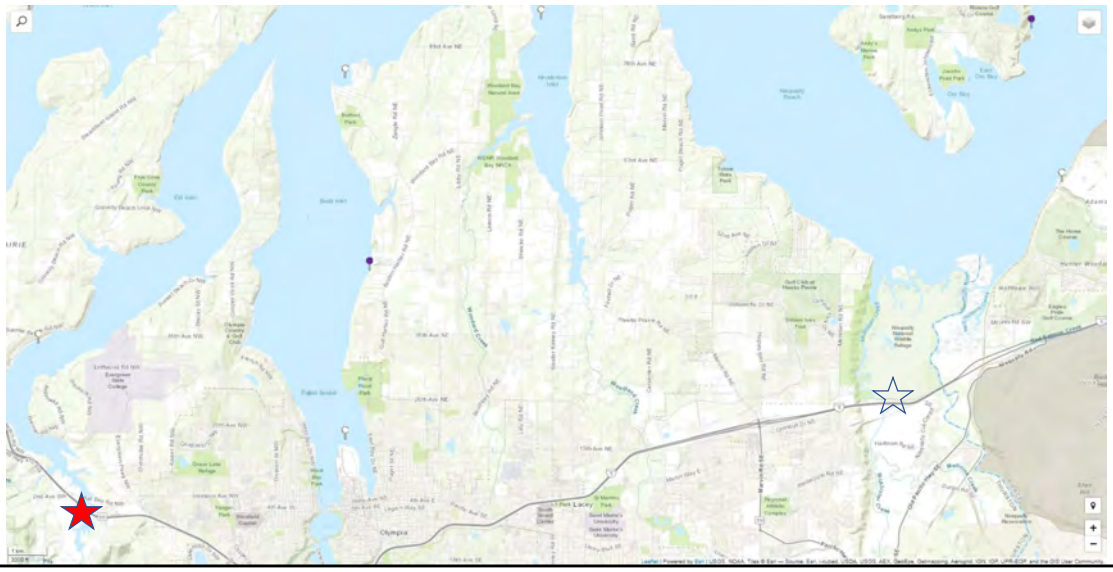
Date of HPT for 10 years (2021 to 2030)	HPT elevation (feet)[b]
6-Dec-21	16.088
4-Jan-22	16.254
24-Jan-23	16.267
15-Jan-24	16.195
7-Dec-25	16.058
5-Jan-26	16.151
25-Jan-27	16.339
16-Jan-28	16.49
3-Feb-29	16.322
27-Dec-30	16.332
mean elevation of HPT over a 10-year period from January 1, 2021 to December 31, 2030	**16.2496**

[a] NOAA 2021
[b] HTL elevation relative to MLLW of 0 at Budd Inlet, South of Gull Harbor, WA Station 9446807

Project example: report appendix showing HPT data.

Comparison of results of the 3 options.

Project location in relation to tide stations



Project locations shown by red stars. NOAA harmonic tidal data stations shown by purple pins. Review tidal data and field indicators to determine which station is most appropriate to use for your field location.

Comparison of the 3 methods & results

Looking at 3 different project locations

Comparison of HTL methods & results

Option 1 – HAT (feet)	Option 2 – HPT (feet)	Option 3 – Field Indicators (feet)	
I 5/US 101 McAllister Creek & Mud Bay Bridges Repair Bridge Piles			
Station used: BUDD INLET, SOUTH OF GULL HARBOR, WA [9446807]			
16.53	16.25	I-5 McAllister Creek	14.92
		US 101 Mud Bay - West Bank	15.64
		US 101 Mud Bay- East Bank	16.11
Difference between HAT & HPT: 0.28 Difference between HPT and field indicators 1.33 - 0.14			
Station considered: SANDY POINT ANDERSON ISLAND, PUGET SOUND [9446804]			
13.85	13.63	I-5 McAllister Creek	14.92
Difference between HAT & HPT: 0.22 feet			
SR 303 Victor Creek Remove Fish Barrier			
Station used: Wauna, WA [9446291]			
16.07	15.83	not available	
Difference between HAT & HPT: 0.24 feet			

Resources and tools

Available from the WSDOT webpage

- WSDOT HTL web guidance.
- WSDOT 10-year average HPT calculator & supporting instructions guide.
- WSAR template with optional HTL sections – delete sections if your project does not include tidal waters.
- WSDOT report example including HTL sections.

Demonstrate the HPT calculator.