

Corrections and Enhancements to the 2021 Tsunami Design Zone Map and Geodatabase

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WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES
WASHINGTON GEOLOGICAL SURVEY

History of the Tsunami Building Codes in WA

- In 2019 the WGS-DNR presented to the SBCC on issues with the ASCE tsunami loads and effects chapter (ASCE 7-16, Chapter 6).
 - Lower resolution modeling that was less conservative where model results are provided on land.
 - Sources developed were inconsistent with Cascadia earthquake science, not provided on request, and not peer reviewed by experts in the field.
- SBCC established a TAG to address the issue
 - New code amendments proposed and adopted
 - 2018 code amendments introduced the 2018 WA-TDZ with then published high resolution tsunami models for select areas of WA.
(<https://www.dnr.wa.gov/wa-tdz#2018-tsunami-design-zone>)

History of the Tsunami Building Codes in WA

- ASCE 7-22 was released in late 2021 providing updates to engineering and design calculations with no change to tsunami mapping.
- SBCC via a change proposal, adopted ASCE 7-22 with amendments to adopt additional high resolution tsunami publications and accompanying data.
- Released a new 2021 WA-TDZ geodatabase and map tool to display data from those publications in addition to the offshore amplitude points.
(<https://www.dnr.wa.gov/wa-tdz#2021-tsunami-design-zone>)

2021 WA-TDZ Map Tool Displaying Geodatabase Data

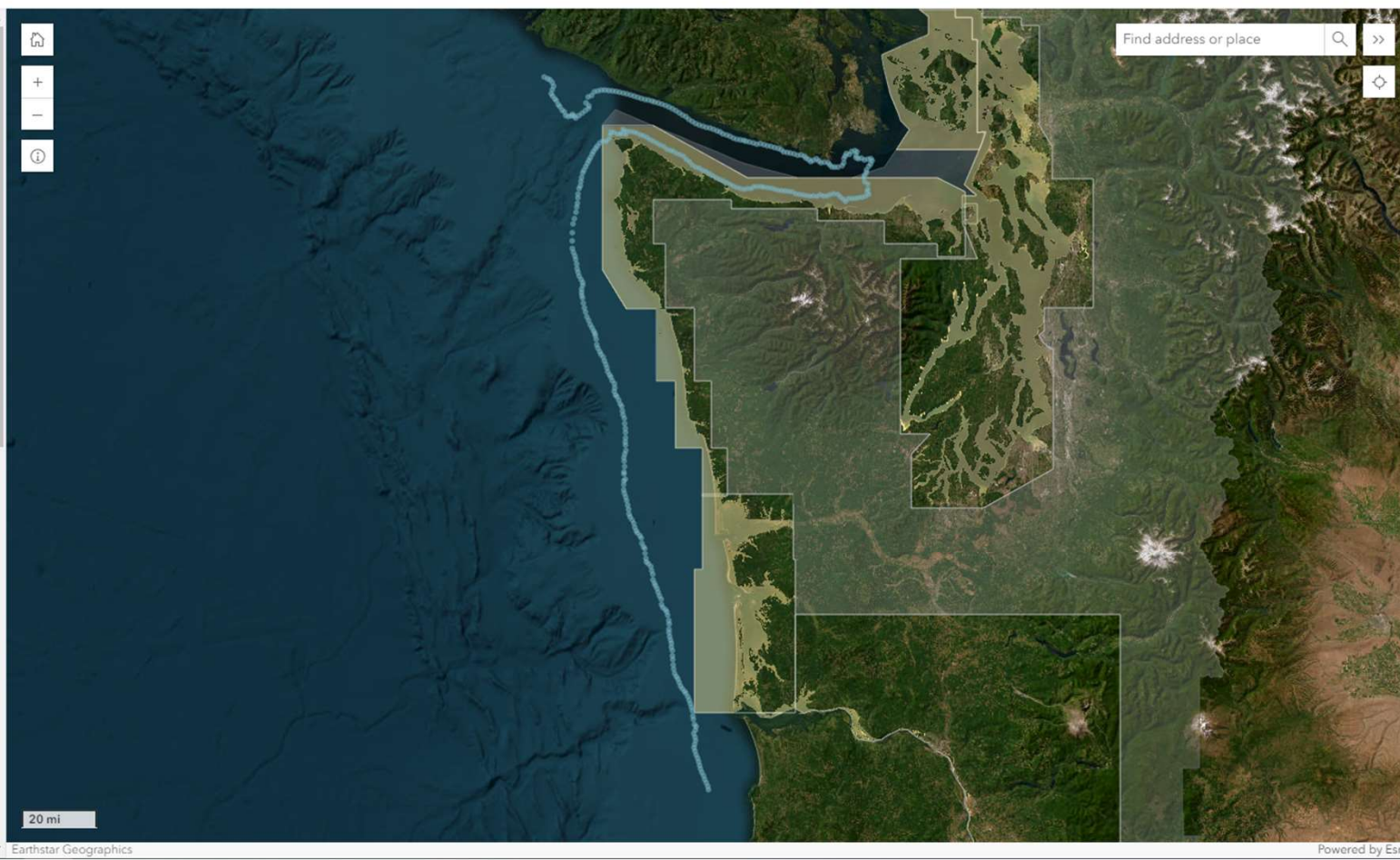
Washington Tsunami Design Zone (WA-TDZ): 2021 Building Code

- Legend
- Bookmarks
- Details
- Layers
- Info

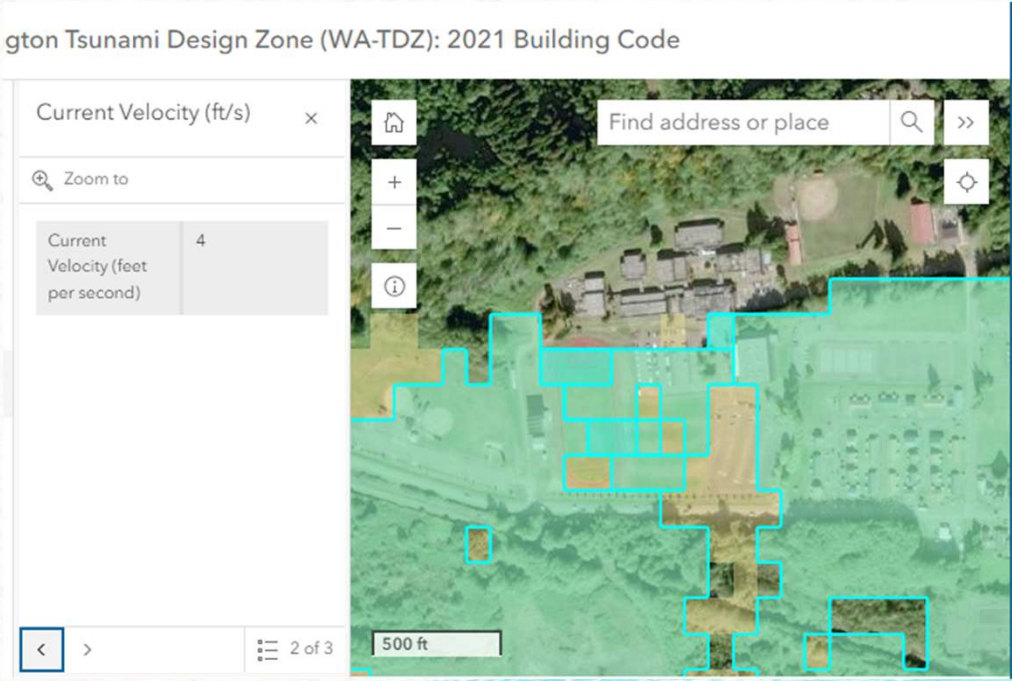
USER NOTE: This Washington Tsunami Design Zone (WA-TDZ) interactive map contains a lot of data and may take time to load. The intent is for this map to be used at the site-specific location you are interested in. Please zoom in to the specific site you are interested in before clicking, we recommend zooming in to the "100 ft" scale as shown in the bottom left-hand corner. If your site is located within a mapped tsunami inundation area (colored overlay on the base map) then it is located within the WA-TDZ. By clicking on your location of interest you can find values for maximum tsunami inundation elevation, maximum current velocity, the study area and download information, and offshore amplitude points.

BUILDING CODE: Washington State's adoption of the 2021 International Building Code (IBC) included an amendment to adopt the ASCE 22 7-22 tsunami loads chapter with amendments that direct designers, engineers, or architects to use the Washington Tsunami Design Zone Maps (WA-TDZ) to determine whether structures in Risk Category III or IV need to be designed for tsunamis. Special design parameters must be considered for these structures if they are located in the WA-TDZ. Further, the code requires the use of WA Department of Natural Resources (DNR) Tsunami Inundation Data for design purposes, or that such data be considered as a baseline for self-conducted studies. Please consult the 2021 Washington

← Collapse

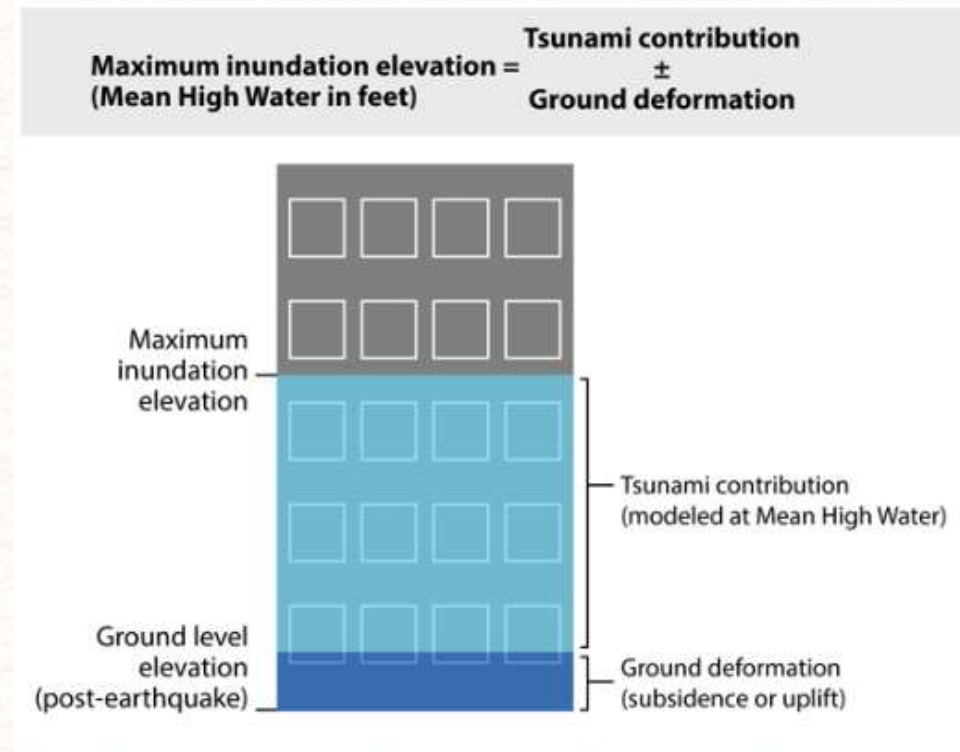


Site Specific View of the Inundation and Velocity Data



Inundation Elevation

- Inundation elevation (MHW datum) is the combined contribution of the tsunami and ground deformation (subsidence)
- Following consultation with practitioners it was identified that ground deformation (subsidence) is not presently included in the geodatabase or online tool.
 - This information is available in the published maps



The final inundation elevation is the combination of land level subsidence and inundation depth.

Actions Taken Considering the Issues

- The WA-TDZ online tool and geodatabase have been taken offline so as not to be misused
- The tsunami inundation publications are still available, and a data link added to provide a direct link to the data (already available elsewhere but added for convenience).

ACCESS THE 2021 INTERACTIVE MAP

This application is temporarily unavailable. Note that the accompanying GIS data are also temporarily unavailable. You can still access the associated publications in the table below. Please contact Corina Allen (corina.allen@dnr.wa.gov) if you have questions or need assistance.

2021 WA-TDZ PUBLICATIONS

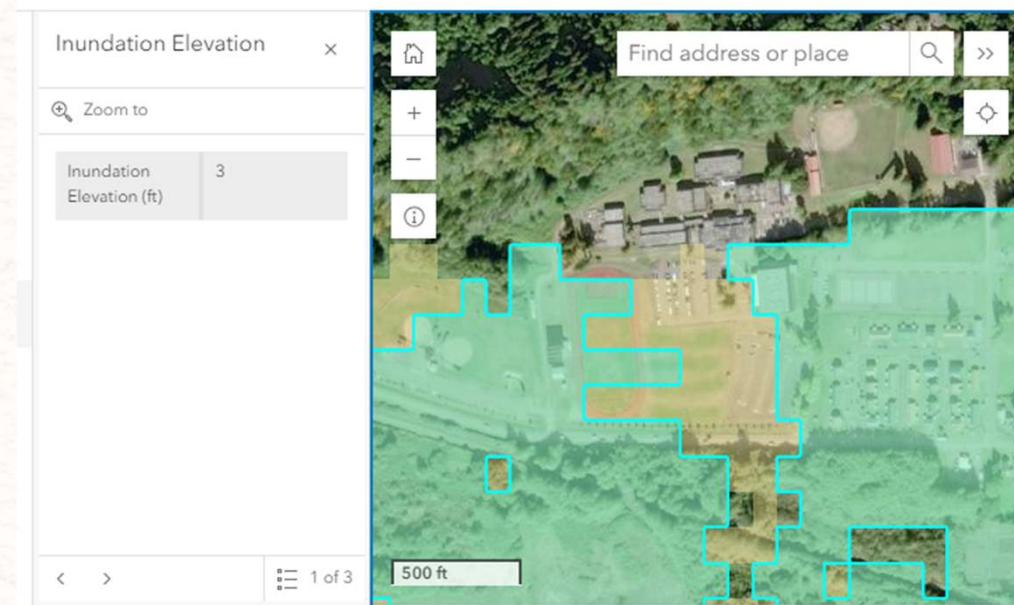
Maps adopted for the 2021 Tsunami Design Zone

Location	Publication	Publication Link	Data Link
Columbia River	DOGAMI SP-51	Download	Download
Outer Coast and Strait area	MS 2022-01	Download	Download
Port Angeles and Port Townsend area	MS 2018-03 (Partially superseded by MS 2022-01)	Download	Download
Puget Sound	MS 2021-01	Download	Download
San Juan Islands	MS 2016-01 (Partially superseded on its eastern edge by MS 2021-01)	Download	Download
Southern Washington coast	MS 2018-01	Download	Download

Proposed Enhancements to the WA-TDZ

- Additionally, it was identified that the practitioners would benefit from having Inundation Depth and Subsidence values reported in the WA-TDZ online tool as well.
- Both values are available or can be calculated between the publication data link and TDZ geodatabase, however directly providing these layers together would reduce confusion.

1gton Tsunami Design Zone (WA-TDZ): 2021 Building Code

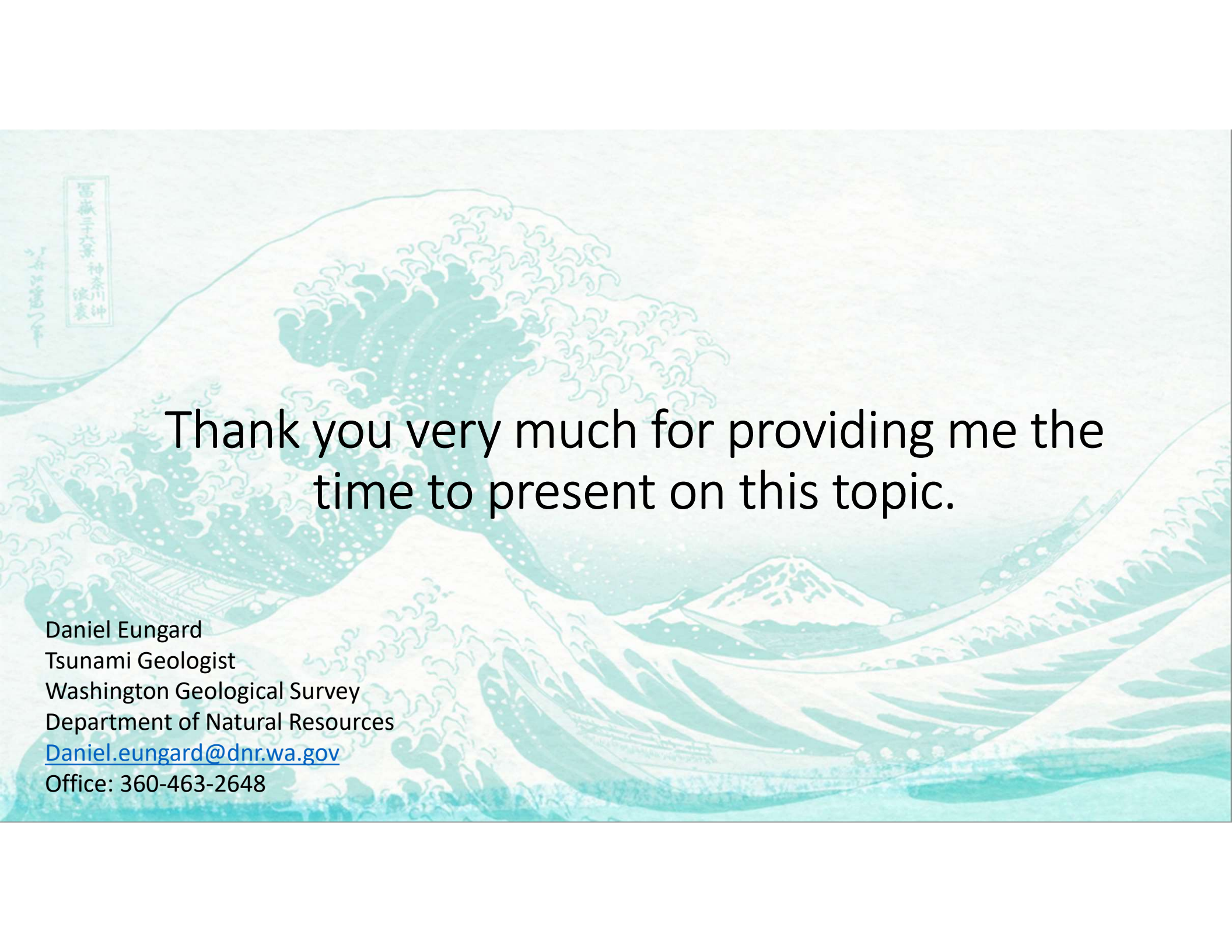


WA-TDZ Update Plan

- Correct reported Inundation Elevation values
- Add datasets for Inundation Depth and Land Level Change to both WA-TDZ online tool and geodatabase
 - Update metadata indicating the changes made and effective date of change
- Update the WA-TDZ online tool text and WA-TDZ webpage text indicating the changes made and effective date of change

Timeline for Changes and Relaunch of TDZ

- Updating geodatabase — 2-3 weeks
- Testing the enhancements to TDZ online tool — 2-3 weeks
- Review and testing of TDZ online tool from former TAG — 1 week
- Website updates and relaunch 1-2 days
- Proposed relaunch of TDZ in July

The background is a teal-toned illustration of a massive tsunami wave crashing over a landscape. In the distance, a mountain with a snow-capped peak is visible. Several boats are shown in the water, some appearing to be struggling against the waves. In the upper left corner, there is a vertical rectangular box containing Japanese text: 富嶽三十六景 神奈川沖 波裏 (Fujisan Sanjūrokkajō Kanagawa no Umi no Nami).

Thank you very much for providing me the
time to present on this topic.

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