Updates and Follow Up on Vessel Encounter Module
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Attendees:

Alex Hess, *Global Diving & Salvage, Inc.*
Alex Pittman, *Snohomish County*
Brianna Snider, *Canadian Coast Guard*
Carol Reamer, *Makah Tribe - Port of Neah Bay*
Chris Wills, *Port of Longview*
David Bain, *Snohomish County Marine Resources Committee*
Eleanor Kirtley, *Green Marine*
Fred Felleman, *WAVE Consulting*
Hans Kahl, *Skagit Department of Emergency Management*
Jaimie Bever, *WA Board of Pilotage Commissioners*
James Jannetta, *Swinomish Indian Tribal Community*
Jeff Pelton, *Transport Canada*
John Fu, *US Coast Guard*
John Veentjer, *Marine Exchange of Puget Sound*
Kip Killebrew, *Stillaguamish Tribe Natural Resources*

Kris Faucett, *Lund Faucett*
Laird Hail, *US Coast Guard - VTS*
Lorraine Churchill, *Ammonia Safety and Training Institute*
Lovel Pratt, *Friends of the San Juans*
Marta Green, *San Juan County*
Martin Teachout, *Trident Seafoods*
Mike Doherty, *local gov't. retired.*
Mike Moore, *Pacific Merchant Shipping Association*
Paul McCollum, *Port Gamble S'Klallam Tribe*
Rein Attemann, *Washington Environmental Council*
Rick LaBlond, *Shell Trading NA*
Ross McDonald, *Sause Bros.*
Shayne Cothern, *WA Dept of Natural Resources*
Todd Hass, *Puget Sound Partnership*
Tom Ehrlichman, *Swinomish Indian Tribal Community*

The following summary notes are not intended to be a transcript but rather a review of the discussion. Participant questions and comments are shown in bold text followed by Ecology responses. Ecology responses that have been added after the conclusion of the event are preceded by the text "Supplementary answer."

Are you going to take into account ferry policies with regards to vessel crossings? If ferries can't pass a vessel with at least a mile distance they will go astern and yield the right of way. Will the model include this practice? (Laird Hail)

JD Leahy: We want to learn about standard practices that organizations have in place. We need to talk as a team about how we might be able to incorporate these practices.

Supplementary answer: Simulated vessels within the model will not be making navigational decisions based on the presence or absence of other simulated vessels. As a result, we will not initially be modeling practices like

one vessel changing course to pass astern of another in a crossing situation. Instead, our model will capture the event as an encounter – a situation where two vessels were close enough together to represent the minimum requirements for a collision.

I noticed you mentioned the upcoming addition of Washington State Ferries. Can you please consider adding fast/passenger ferries to the model, if they are not already included? They are among the top four in terms of time on the water in Puget Sound (estimated at >10,000 hours annually). Like WSF, they have published schedules, and improving mitigation of threats from this vessel category was identified in recommendation 49 of the Orca Task Force. This would help round out our comprehensive understanding of the potential inter-related environmental effects of this vessel category. Previous vessel traffic risk assessments took place before this vessel type came to prominence between Kingston, Seattle and Bremerton, etc., so the inclusion in this effort should be informative and timely. (Todd Hass)

JD Leahy: We will be adding the fast and independent private ferries to this work using their published schedules and AIS tracks; we just happened to start with the Washington State Ferries.

How is vector cone length determined? (Rein Attemann)

JD Leahy: The cone length is the result of a speed, time, distance calculation. For example, a 20-minute cone for a vessel operating at a speed of 12 knots would be 4 nautical miles in length. The length of the cone is dependent on the speed of the vessel.

Does the encounter (risk) module add weight or factor in both the redundant system tanker definition per 33CFR 157.03 or the critical system checks required of vessels 12 nm offshore 33CFR 164.25? (Rick LaBlond)

JD Leahy: The encounter discussion right now is more about trying to figure out how to distribute the potential encounters geographically throughout the system. For example for a grounding you need to have ground nearby and for a collision you need to have two vessels. In the accident module we will start talking about how likely it is that a bad thing will happen, and that is where we will start to talk about probabilities. The issue of how to account for the existing safety regime will be a discussion in the accident module.

When you look at modeling you need to look at likelihood and severity and consider controls and recovery barriers. It sounds like this kind of thing will be factored in during the accident phase of the model? (Rick LaBlond)

JD Leahy: Yes, but the level of detail that we are able to achieve for these aspects will depend on the availability of data. It would be great if we had statistics about how things like equipment checks impact accident rates, but many of these controls are hard to quantify and there is limited statistical data, if any. We may instead use historical accident data and assume the use of standard safety practices is included in that historical data. With regard to redundant propulsion and steering systems, when we have that information will include it.

Sorry if I missed this but what are you using to calculate the likelihood of a human or mechanical error occurring. How do we figure out the probability of a mistake or an accident? (Fred Felleman)

JD Leahy: That is what we will talking about next in the accident module. We will present some options on how to address those challenges.

Many risk assessments are compromised by the lack of data on towing and laden status. With all the good intentions we are still lacking data on who is under tow and who is laden. It is important to elevate the importance of getting this data. Given this is yet another study that is limited by not knowing if a tug has a tow or if it is laden will you be elevating the need for these data to be collected and made public by the USCG? (Fred Felleman)

JD Leahy: We have many data challenges that we are trying to address.

Are Samish and Jack islands also considered when evaluating the geographic distribution of encounters? Will vector maps of key collision points include Samish and Jack islands? (Tom Ehrlichman)

JD Leahy: Yes, we will evaluate all land areas including these.

Will collision vectors account for variations from AIS data to account for the possibility that a ship may alter its course to avoid a non-AIS fishing vessel? Is the swing of the vector just based on AIS data or will it be flexible enough to address some of the other events that could occur. (Tom Ehrlichman)

JD Leahy: The vessels in the model will move around on historical tracks. There may be a historical track out there where a vessel maneuvered to avoid a non-AIS fishing vessel so in that sense it could be represented in the simulated movements. However, the modeled vessels will not identify novel circumstances and respond appropriately, that is not how the model will work.

Alex Suchar: Yes, the vessels will move along observed AIS tracks, we will never simulate a vessel in a location where it has never been before. The simulated vessel transits will still have unique speeds, arrival times, etc. Individual vessels will not react to challenges that they never saw before or that are not in historic AIS tracks.

I thought the earlier comment about the probability and severity of risk is important. I encourage you to look at scenarios that are lower probability but higher consequence as well. You may need to plot tracks for vessels in location where they have never been before. We are increasingly seeing regulations that require different vessel maneuvers in response to the presence of whales. (Tom Ehrlichman)

How was the 20-minute parameter for the cone chosen? It seems excessive particularly in a managed waterway. (Laird Hail)

JD Leahy: We looked in literature for examples, one example we found was a 20-minute vector so we adopted it with the intent to test it out and evaluate its appropriateness. I hear your point about VTS management, but what we are doing when counting grounding candidates is figuring about how to geographically distribute encounters throughout the system. The cones do not change the number of groundings, just the possible geographic distribution.

Alex Suchar: The 20-minute parameter came from literature. If desired we can review literature and share their process to develop the 20 minutes. We wanted to have a dynamically calculated cone, based on speed, rather than a fixed cone.

Was the literature from comparable managed waters? (Laird Hail)

Supplementary Answer: Fowler (2000) described the 20-minute vector in connection to risk assessment work performed in the North Sea. Portions of the North Sea are managed by VTS systems. Skinnemoen (2018) described the use of a similar 20-minute vector for Norwegian coastal waters, which are managed by Vardø VTS.

JD Leahy: We are not married to 20 minutes as a vector line and are open to suggestions. One challenge we will need to be aware of, is that if we step away from the guidance we have found in the literature, we would then need to justify the rationale for an alternative approach.

What if an unusual vessel track results in an instance or a few instances that causes a collision? Will there be a "sanity check" to ignore one instance in the modeling. (John Fu)

JD Leahy: The way we structure the model is that the vessels are not aware of the other vessels in the system. They are just moving along historical tracks. You point out one drawback to this approach, another example is overtaking scenarios. In real life there is VTS management and planned overtakings between vessels. In the model a vessel might overtake in a location where overtaking doesn't typically take place.

Supplementary Answer: We will likely review a sample of individual encounters during the validation process for the encounter module to ensure our methods are producing reasonable results, but we do not plan to review all encounters. Some simulated track combinations may produce encounters that would not take place in real life. The large number of simulations we run should effectively minimize the impact of these instances.

My understanding is that at this point in the model, the focus is to assure that possible events are captured, and that judgments or assumptions about likelihood would be evaluated in the subsequent module. If that is the case, then the 20-minute vector would be sufficient as is, not because you are making a judgement on likelihood of an accident, but because it is simply a tool for identifying geographic areas were a collision or grounding could occur. (Tom Ehrlichman)

Adam Byrd: You are correct, at this point we are not making any determination about likelihood of accidents. We are focused on excluding circumstances and locations where collisions and/or groundings could not occur.