Webinar on Revised Analysis Plan for Tug Escort and ERTV Analyses
July 13th, 2022

Ecology Staff:

Brian Kirk, *Prevention Section Manager*
Adam Byrd, *Research and Information Technology Unit Supervisor*
Alex Suchar, *Expert Model and Analysis Scientist*
James Murphy, *Model and Analysis Scientist*
Michael Koohafkan*, GIS Specialist*
Alex Hess*, Risk Lead*
JD Ross Leahy, *Maritime Risk Modeling Specialist*

Attendees:

Ahren Stroming, *Puget Sound Partnership*
Alan Sorum, *Prince William Sound Citizens Advisory Council*
Amber Carter, *Amber Carter Government Relations*
Bob Gowe, *Transport Canada Marine Safety Pacific Region*
Daniel Himebaugh, *WA State Senate*
Daniel Grabb, *Global Diving & Salvage*
Dustin Johnson, *Columbia River Pilots*
Eleanor Kirtley, *WA Board of Pilotage Commissioners*
G Chad Bowechop, *Makah Tribal Council*
George Clark, *DTOM Maritime, LLC*
Hannah Charrouf, *Pearson Consulting*
Jaimie Bever, *WA Board of Pilotage Commissioners*
Jamie Stephens, *San Juan County*
Jeff Pelton, *Transport Canada*
Jeff Dyer, *Marine Resources Committee SJC*
Jeffrey Slesinger, *Delphi Maritime, LLC*
Jerry White, *ConocoPhillips / Polar Tankers Inc.*
John Wright, *Polar Tankers*
John Veentjer, *Marine Exchange of Puget Sound*
Kelly Codlin, *Marathon Petroleum*
Kris Faucett, *Lund Faucett*
Laird Hail, *US Coast Guard*
Leah Harnish, *American Waterways Operators*
Lillith DeLoe, *REG Grays Harbor*
Liz Wainwright, *Maritime Fire and Safety Association*
Lovel Pratt, *Friends of the San Juans*
M. W. (Mac) McCarthy, *Mac McCarthy, Inc.*
Marla Powers, *Port Gamble S'Klallam Tribe*
Megan McPhaden, *WA State House of Representatives*
Michael Myers, *Centerline Logistics*
Michael Lowry, *Western Canada Marine Response Corp*
Mike Doherty, *retired*
Mike Moore, *Pacific Merchant Shipping Association*
Natalie Lowell, *Makah Tribe*
Patrick Gallagher, Marine Exchange of Puget Sound
Paul Devries,
Paul McCollum, *Port Gamble S'Klallam Tribe*
Rein Attemann, *Washington Environmental Council*
Reuben Greer, *Tidewater*
Ria Bordian, *BP Cherry Point Refinery*
Rick LaBlond, *HFSinclair*
Robert Poole, *Western States Petroleum Assoc.*
Ross McDonald, *Sause Bros.*
Shayne Cothern, *WA Dept of Natural Resources*
Sheri Tonn, *WA Board of Pilotage Commissioners*
Sol Kohlhaas, *Marathon Petroleum*
Susan Esler, *Gallagher Marine Systems, LLC*
Vinnie Catalano, *Cook Inlet Regional Citizens Advisory Council*

Is there a list of historical incidents used for data (for purposes of the model)? (Sol Kohlhaas)

JD Leahy: The hazard counts we use in the model are based on publically available incident data from the USCG MISLE and Canada's MARSIS databases.

Supplemental Answer: Sections 2.6.3, 2.6.4, and 2.6.5 of the model documentation describe our approach to counting hazards in the MISLE and MARSIS databases. We are considering how best to share files containing lists of the actual incidents that underpin the counts.

A tug does not need to be connected to be helpful to prevent grounding. The tug may be able to push a vessel away from a hazard without a line on. (Laird Hall)

JD Leahy: It's important to be clear that the model can't handle all real world complexity. A lot of details are simplified by necessity, and this is a good example of one of those details. However, we can look at shorter connection times as a way to examine the potential for tugs to respond without substantial delay related to putting up a line.

Past studies were never able to identify a propulsion loss in the study area that lead to a drift grounding and then oil outflow. Where you able to find one? (Mike Moore)

JD Leahy: A main assumption underpinning our work is that just because a drift grounding resulting in oil spill hasn't been observed in study area, that doesn't mean it is impossible. This is core assumption of the model – drift groundings resulting in oil spills are a potential risk. By simulating 1000s of loss of propulsion events, the model can help identify areas where grounding events may occur, even though we don't have examples of them in the historical dataset that we are looking at.

In addition, the report will include a discussion of the historical frequency of drift groundings in the study area, and how that source of spill risk relates to other sources of maritime spill risk.

Is there consideration of energy/force needed to result in oil spill or worst outcome from grounding? It's possible that oil spills that happened in the past, might not happen today due to differences in ship design, like for instance the inclusion of protected fuel tanks.

JD Leahy: No, the model does not explicitly model energy or force when estimating oil outflows. We did consider the use of a mechanistic models that considered force/energy but found the drawbacks for such an approach outweighed their positive features.

Instead, we are using a much simpler approach that relies on historical data. This approach does not include potentially meaningful parameters, like energy or force involved, bottom characteristics, presence or absence of protected fuel tanks, etc. However, it does mean that the oil outflow estimates are limited to what we have observed in real life.

Are there plans for professional peer review of model? (Lovel Pratt)

JD Leahy: Our focus is on producing our required deliverables for the legislature. As a result, we don't expect there to be enough time to have a peer review before submitting the reports. However we anticipate submitting articles on our modeling work to peer reviewed academic journals when time allows.

I am curious about model assumptions regarding to size of container ships. I am concerned about using averages of historical data because this doesn't take into account that different areas of Salish Sea have ongoing projects that will accommodate larger ships in the future. The size of ships in historical data may/will be smaller than ships in the future. An example is the container ship BENJAMIN FRANKLIN. (Lovel Pratt)

JD Leahy: The size of vessels included in the simulation is based on actual vessel sizes that have been observed in the study area. The simulated sizes are not based on averages. The Benjamin Franklin is in the vessel database that the model is using for vessel data, and container ships the size of the Benjamin Franklin will be included in the simulation.

One of the most important aspects of the 2015 VTRA modeling effort was that all the interested parties had a say in what data would be used in the modeling process. All parties collaborated on what data would be used. Some issues were very contentious while others weren't. One in particular was the question of how far back to look in the historical record. The Makah position was that although safety improvements may have taken place, they did not negate previous spills that severely damaged Makah treaty-protected resources even if those spills were 40-50 years old. I hope that risk assessment modeling accounts for Makah's sovereign interests. (Chad Bowechop)

JD Leahy: Our model uses historical incidents differently than how they were used in the 2015 VTRA. For our work, we are focused on probabilities of Loss of Propulsion (LOP) events, which are quite a bit more common than large scale oil spills. Because LOP events are relatively frequent, we felt comfortable using regional data for the only the last 20 years. Limiting our analysis to the last 20 years means we aren't including every historical LOP but it does a reasonable job of establishing the frequency that we see LOPs occur at.

Brian Kirk: Another difference between the 2015 VTRA and current modeling process is the compressed nature of the VTRA process. VTRA used a collaborative workgroup approach while also including diverse viewpoints. It was a valuable feature of the process. However, the process was constrained by time and funding, which resulted in various compromises. In contrast, the current modeling process has been developed over a longer period of time which has allowed for a greater number of participants and a greater opportunity for interaction and feedback over the 20 different outreach events. This transparency and greater participation is a strength of the current process.

I may have missed it in the presentation and material, but I presume multiple scenarios were conducted with the vessel breaking down in various locations? (Paul Devries)

Supplemental answer: The function of the simulation is to produce many scenarios where vessels break down (experience a loss of propulsion event) in various locations.

Could you go into more detail about how the momentum and drift modeling has been validated---i.e. simulator trials or Naval Engineering firm etc.? (Jeffrey Slesinger)

JD Leahy: We have done some comparisons between real life drift trajectories and simulated drift trajectories. We have not brought in any third party consultants for validation.

Does the momentum and drift analysis include weather factors of wind and current, visibility, sea conditions? (Jeff Dyer)

JD Leahy: The drift model includes as inputs current and wind velocities but not visibility or sea conditions like wave height.

Is the tug response speed of 10 knots that you are using a best case scenario? Would it be good to also include a worst case scenario or a minimum tug response speed? (Jeff Dyer)

JD Leahy: The numbers like the tug response speed that are used in the model do not cover all possible real-life situations/complexities. We selected 10 knots in this instance as an average speed that we think represents the middle of the expected range. The Analysis Plan does include planned investigation of the potential effect of tug response speed on drift outcomes.

Please define initial turn because under most scenarios LOP means a LOS due to a loss of propeller thrust on rudder that determines turning radius. (Jeff Dyer)

JD Leahy: As part of our work to establish a self-repair distribution we read a lot of incident reports for LOP events. We found that pilots regularly used their momentum to implement directional adjustments. When faced with a loss of propulsion, pilots were using residual momentum to try to change the ship's heading. We implemented a proxy in the model for this observed practice by allowing one initial course correction. The model will also include drifts without an initial turn for comparison.

With respect to the ERTV and escort modeling analyses, what steps or mitigations have addressed air emission standards, carbon footprints and underwater noise (ORCA impact)? (Rick LaBlond)

Supplemental Answer: The model structure is narrowly limited to examine oil spill risk. Air emissions, carbon footprint, and underwater noise are out of scope for these analyses. However, the rulemaking process associated with the tug escort analysis is much broader in scope and will include examination of additional topics, including for example underwater noise.

Could the modeling of required escorts throughout the study area inform understanding of underwater acoustic impacts? (Ahren Stroming)

JD Leahy: While analysis of air emissions, carbon footprint, and underwater noise are out of scope for these analyses, some parts of model output could potentially be used to address other questions/issues beyond oil spill risk. For example, operational time of escort tugs under various escort scenarios may be relevant to underwater noise considerations.

Does this modeling include all vessel traffic? (Jamie Stephens)

JD Leahy: The model includes all covered vessels, car ferries, bunkering tugs, and escort/assist tugs. The model vessel types are described in Section 2.3.1 of the Model Description.

Is it possible to model one way transits with tug escorts as part of the analysis for risk analysis for collision, allision, or grounding? E.g., ships only going one way in Boundary Pass or Haro Straits. Has that been considered at all? (Jeff Dyer)

JD Leahy: This current application of the model framework is focused on a single hazard: loss of propulsion and potential drift groundings. This focus represents a simplification of the potential value of tug escorts, which could theoretically also help prevent collisions and powered groundings in some limited circumstances. We did not consider revisions to current traffic schemes or current restrictions on vessel movement because those are not core aspects of the two analyses assigned as part of this work.

However, the creation of the model builds capacity at Ecology for analyzing oil spill risk. While we don't have anything on the docket beyond the two core analyses discussed today, future work could consider different questions or scenarios like the one you mention.

I am concerned about not looking back into historical spill data. For example in late 1980s there were three large oil spills and 1 million gallons were spilled into Washington waters. One incident was in protected harbor with spill response equipment nearby but there were still all sort of problems. Can't ignore these historical spills because people will remember them (citizens and politicians). (Mike Dougherty)

Keep in mind about transitions to different shipping fuels (decarbonization of shipping) and alternative fuel availabilities. Not enough data now to use in model but something to keep in mind. (Mike Moore)