<div align="center">

Webinar on Vessel Accident Module
May 26th, 2021

</div>

Ecology Staff:

Brian Kirk, *Prevention Section Manager*
Sara Thompson, *Vessel and Oil Transfer Unit Supervisor*
Adam Byrd, *Research and Information Technology Unit Supervisor*
Alex Suchar, *Expert Model and Analysis Scientist*
JD Ross Leahy, *Maritime Risk Modeling Specialist*

Attendees:

Ahren Stroming, *Puget Sound Partnership*
Alex Hess
Bonnie Gee, *Chamber of Shipping*
Casey Dick-Wyatt, *Tsawout First Nation*
Charlene Nelson, *Shoalwater Bay Tribe*
Christopher Burns, *Jamestown S'Klallam Tribe*
Clare Fogelsong, *City of Bellingham*
Daniel Himebaugh, *Washington State Senate*
David Bain, *Orca Conservancy*
Dhaval Shah, *Seaspan ULC*
Don Noviello, *WA State Dept of Fish and Wildlife*
Fred Felleman, *WAVE Consulting*
Gary Nelson, *Port of Grays Harbor*
George Galasso, *NOAA OCNMS*
Haley Kennard, *Makah Tribe*
Hans Kahl, *Skagit Dept of Emergency Management*
Hedia Sammari, *Security Minister of Quebec*
Jaimie Bever, *WA Board of Pilotage Commissioners*
James Jannetta, *Swinomish Indian Tribal Community*
Jeff Pelton, *Transport Canada*
Jim Peschel, *Vane Brothers*
John Doucette, *Renewable Energy Group (REG)*
John Fu, *US Coast Guard*
John Veentjer, *Marine Exchange of Puget Sound*
John Wright, *Polar Tankers*

Katie Wrubel, *NOAA OCNMS*
Kevin Campbell, *Brusco Tug and Barge*
Kim Pearce, *Transport Canada*
Kris Faucett, *Lund Faucett*
Laird Hail, *US Coast Guard*
Lovel Pratt, *Friends of the San Juans*
Mark Toy, *Washington State Department of Health*
Marta Green, *San Juan County*
Melba Salazar-Gutierrez, *Auburn University*
Michael Carlson, *US Fish and Wildlife*
Mike Moore, *Pacific Merchant Shipping Association*
Paul McCollum, *Port Gamble S'Klallam Tribe*
Randy Lewis, *Port of Grays Harbor*
Rick LaBlond, *Shell Trading*
Ross McDonald, *Sause Bros*.
Salma Abdel-Raheem, *The Whale Museum*
Shayne Cothern, *WA Dept Natural Resources*
Sheri Tonn, *WA Board of Pilotage Commissioners*
Terry Garcia, *EPA*
Tessa Coulthard, *Clear Seas Centre for Responsible Marine Shipping*
TJ Moore, *CSS Inc./NOAA*
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 session. 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."

How does the model address the progression of calamities? How are damage stability calculations addressed? (Dhaval Shah)

JD Leahy: The model treats spill events as one-time events – it doesn't explore the complexity of how a spill may evolve over time. It does not include damage stability considerations, for instance. Instead, the model works to simplify and aggregate complex accident and spill event information.

You mentioned that the human factors can't be considered quantitatively; can rest hours, fatigue, drills, training be addressed qualitatively in this analysis? (Dhaval Shah)

JD Leahy: We'll talk more about human factors and probabilities later. The challenge we are facing in terms of representing these quantitatively comes down to available data. We may know that generally training is a good thing, but it is hard to quantify that system-wide.

I understand that you aren't using human or corporate factors (such as tanker ownership). Lloyds and Coast Guard has data on accidents -- will this information be used to inform the model? (Paul McCullen)

JD Leahy: We may be able to include some of the factors that you reference, but only if we are able to find enough data to support their inclusion. If there are enough occurrences, then we might be able to make estimates correlating some of these factors to hazard probability. We have access to Coast Guard, Lloyds and other datasets, and will be referencing them for this work.

Another item to consider is loss of barge or failure of a tow wire. Does the model factor in a tug going into irons and causing a roll over? (Rick LeBlond)

JD Leahy: In our current approach incidents precipitated by a tow wire failure are captured in the existing set of categories. If a parted wire results in a collision, the accident would be captured in the collision category. If a parted wire results in a grounding, the grounding category, etc.

Adam Byrd: We are hoping to capture all items in one of 3 ways: Implicit, explicit, or consolidated in another category. We will make sure that the data reflects hazard probability in one of those 3 ways.

Tow wire frequency of failure is close to zero. There are emergency tow wires that can be used and Vane also has manned barges. There are also now escorts in Rosario. Because of all of this, the probability of losing a tow is very low now.   Does the model take pre-booming of oil transfers into account to address the lower consequences of a spill due to pre-booming? (Jim Peschel)

JD Leahy: Interesting comment on pre-booming. We will consider that.

Seasonality is important to consider. I am interested in whether vessels call in clusters – are we seeing more traffic toward the weekend verse during the week? (Fred Felleman)

Alex Suchar: That question is on the list of things for us to investigate. We are focusing on the structure of the model at the moment. Trends should show up as we continue to populate the system with data and simulated vessels.

Are you working with AIS data from 2019? (Fred Felleman)

Alex Suchar: Our working dataset consists of AIS data from 2018.

Modeling is always limited by availability of data. It's always challenging to find the best data to draw from. (Fred Felleman)

San Juan county and Nuka just completed a tug response and vessel drift analysis. That work was limited to modeling the drift times for a mid-size containership. The Salish Sea modeling center ran 16 billion estimates of drift time and the hope is that those estimates are valuable and incorporated into Ecology modeling efforts. How will Ecology model expand the drift estimates for additional vessel types and sizes? (Marta Green)

Alex Suchar: We are working on drift modeling and working to design a way to include more types of vessels. More details in the next presentation. We can also talk about how we might integrate previous work or if we are not able to integrate previous work we will talk about why.

Risk communication is very challenging and these presentations are doing a great job on that. Interested in learning when participants will be able to see values, for example values for zero failure methodology and events. I want to make sure that methodology is useful and ground truthed to this geographic area. (John Fu)

JD Leahy: Our current focus is on the structure of the model and making sure it can do what we want it to do. In terms of calculating the numbers we need to get our population of interest first so we don't have an estimated date yet. With regard to ground truthing, we think our multiple probability approach will help bracket the high and low ends of the spectrum, and help with assessing the reasonableness of our methods.

Risk mitigation should be an aspect of the model. How will actions on the bridge to mitigate risk be incorporated? Pilots think about what to do with the vessel momentum after a loss of propulsion – if the model identifies good response actions they might be able to be inform pilot training process. (Mike Moore)

JD Leahy: The Momentum and Drift Model is necessarily going to be a simplification of what happens in the real world. We are looking at ways to include crew actions, and how crew might use vessel momentum after a loss of propulsion. However, the model will not be capable of coming up with ideal "crew response" actions, since the model will be based on aggregated probabilities and aggregated risk. The unique circumstances of a particular loss of propulsion event will not be known to the model in the same way that they would be known to the crew.

It seems like using the zero failure method may get tied to just having fewer ship calls. Hope that the zero failure approach will not result in just trying to shrink down ship calls. (Mike Moore)

Supplementary Answer: For whatever probability we are using, whether calculated from observed data or zero failure, the model will be able to test changes in vessel traffic (reductions or increases). There is not a link between the use of a zero failure methodology and which scenarios could be tested.