

Introductory Model Development Webinar: Grays Harbor Focus

June 17th, 2020

Ecology Staff

Brian Kirk, *Prevention Section Manager*

Jase Brooks, *Legislative Policy Analyst and Tribal Liaison*

Adam Byrd, *Research and Information Technology Unit Supervisor*

Alex Suchar, *Expert Model and Analysis Scientist*

Melba Salazar-Gutiérrez, *Model and Analysis Scientist*

JD Ross Leahy, *Maritime Risk Modeling Specialist*

Rachel Assink, *Washington Sea Grant Hershman Fellow*

Participants

David Berliner, *U.S. Coast Guard -
Waterways Management*

Kevin Campbell, *Brusco Tug and
Barge/Grays Harbor Safety Committee Chair*

Christine Cleland, *Citizen*

Darren DeLoe, *REG Grays Harbor*

John Doucette, *REG Grays Harbor*

Kayla Dunlap, *Port of Grays Harbor*

Tom Ehrlichman, *Swinomish Indian Tribal
Community*

Wes Geyer, *U.S. Coast Guard - Sector
Columbia River*

Dena Horton, *Pacific Northwest Waterways
Association*

Haley Kennard, *Makah Tribe*

Kristin Meira, *Pacific Northwest Waterways
Association*

Annie Merritt, *Washington Military
Department*

Linda Orgel, *Friends of Grays Harbor*

Lovel Pratt, *Friends of the San Juans*

Brian Shay, *City of Hoquiam*

The following summary notes are not intended to be a transcript but rather a review of the question and answer session that took place at the conclusion of the webinar. Attendee questions and comments are shown in bold text followed by Ecology responses.

I was disappointed to hear that the model won't include fate, transport, and effect of spilled oil. I am wondering if you can have this connected with NOAA's GNOME fate and modeling software and whether Ecology could do an analysis of this. My concern is that if you are just looking at the risk of spills, you might not be able to tell if a small spill could have a large impact based on location. I was involved in 2010 and 2012 VTRA analyses, and those looked just at the risk of allisions and groundings, and I'm interested at the risk of spills from transfer operations including bunkering and bunkering at anchorages. This relates to the issue of understanding the consequences of a small spill in terms of the location where it happens.

When people quote from VTRA, they tend to focus on the low probability of a large spill, but not on the probability of small spills. Even though a small spill likely wouldn't be as significant, it could still be significant in sensitive areas. And there are possibly areas where a large spill would be less significant than other areas. Including this information would be helpful to better quantify the impact of spills. (Lovel Pratt)

JD Leahy: Regarding transfer spills, so far we have been thinking a lot about how to model particularly challenging components like the dynamic movement of vessels, so we haven't done a lot of thinking how to represent transfer spills. However, we haven't made any decisions about excluding any type of spill, so we look forward to continuing that conversation. Regarding the GNOME model, accurately modeling fate and transport is a big lift, and this is an interesting suggestion of looking at ways we can utilize existing work.

I do want to clarify that we are primarily going to be looking at vessel movements and the risk from spills happening, but that doesn't mean we can't characterize spills that could be happening in areas of increased sensitivity.

In assessing spill risk, doesn't it make sense to identify smaller vessel traffic in addition to your stated large vessels (Cargo, fishing, passenger over 300 tons, tankers, oil barges regardless of size) because these larger vessels would have to maneuver to avoid these concentrations of those smaller vessels? (Tom Ehrlichman)

JD Leahy: The bill requires that we assess the risk of oil spills from covered vessels, so that means we need to characterize the risk of spills coming from those vessels, but that doesn't limit what we can model. We can model the rest of the factors within the waterway, like for instance, smaller vessels. They are certainly a factor in the complexity of the waterway, and we don't plan to limit the modeling just to covered vessels.

Will the probability analysis compare a baseline to expected increases? (Tom Ehrlichman)

Alex Suchar: The idea of an increase in traffic represents a type of scenario. The model will be capable of assessing the increases in traffic. How exactly we do that – like by comparing a baseline with scenarios, remains to be seen. This is definitely something that we are taking into consideration in the construction of the model.

In determining the probability that a vessel will collide with another vessel, or leak or sink, will you also be weighing geographic areas where those collisions or incidents would be more likely to result in leaks or spills, or result in spills of greater magnitude? This seems important for the current rulemaking effort, as well as your hope to use this model as a template for future work. (Tom Ehrlichman)

JD Leahy: We are keeping an open mind to the factors that we might consider. Both those that could affect the probability of an incident occurring, and then similarly, the factors that might affect the size of a spill. If there are geographic factors that might result in a larger spill, then we would want to look at incorporating those.

The Swinomish and other Coast Salish Tribes have been actively engaged in spill risk analysis ever since VTRA. We participated in the October forums, and we greatly appreciate the opportunity to participate today. From our perspective, there is a structural problem inherent in vessel risk assessments that's never been addressed head on. You and others call this type of analysis a risk analysis, but I don't think any of us disagree that a risk analysis includes two key components, probability and consequence. You see this in SEPA, NEPA, and all over. You have to look at both the likelihood of it happening and the severity. An oil spill on the water represents something that has a terrible consequence. What I want to see is that we stop calling this a risk analysis. This is a probability analysis from what you have described. Lovel's comments hit on that directly. I know that consequence analysis is a huge lift, but it is the crux of risk analysis. If we are not looking at consequence, then we aren't providing an analysis of the effect on natural resources. This is particularly important from our perspective, as these are the natural resources the tribes have depended on for thousands of years. If you could acknowledge this, and frame this in that light, that would help us be freer in getting involved in the nuts and bolts of the model. (Tom Ehrlichman)

JD Leahy: This is a great time to point out these types of concerns, as we are still early in the process and while we still haven't baked in to many things to the model structure. I don't think that it's right to characterize the model as just a probability model, because when you look at different sizes of spills that's a way of looking at consequence. Within risk modeling, there are a number of different ways to look at consequence. What I hear you getting at is a broader definition of consequence that includes not only economic, but also cultural or ecological consequences. The question of how we establish a risk factor that is some combination of probability and consequence, and how we frame consequences as part of that, is deeply important. Right now we are looking framing severity in terms of just spill size, but we have heard several comments about this and will continue to look at this.

Brian Kirk: We knew as we started this work that how we handle consequences and outcomes would be of high interest. There is still room to continue this conversation as we develop the model. Just want to note for today as we think beyond model development, and the two analyses that we have to conduct first, those will come down to policy discussions once the analysis is done. The role of this team is to build the best model they can and perform analysis and explain results of analysis. The analysis will then inform policy discussions and rule making, which will have to consider things like consequence and costs as well as benefits.

Additionally, when thinking about consequence, if we end up feeding the output of the model into a tool like GNOME, the results will accumulate uncertainty. Our model will have a range of uncertainty, and if that information is fed through GNOME that will introduce additional uncertainty. Something to think about as we get to that point in the process is where you want to draw the line to really focus on the important factors to consider. This is a conversation that we intend to continue throughout the model development process.

Will the model include the time vessels spend over sandy vs. rocky bottoms? I.e. where an incident happens? (Wes Geyer)

JD Leahy: We envision a component of the model that allows us to estimate oil outflow. If we are looking at an incident like a grounding, we would include the factors that are relevant to that, which include what you describe – the bottom characteristics and other factors like the location of the fuel tanks.

Will the model look at the keel laid date for vessels? Will it look at a complete constructive loss of all fuel and cargo, or just probability of what may be released in an average spill? (Wes Geyer)

JD Leahy: I don't think we'll be looking at the probability of an average spill. We will be running a large number of simulations to look at the distribution of different sizes of spills based on different possible accidents.

Alex Suchar: The model will show if a vessel is involved in an accident, will it actually spill any oil and how much oil will it spill. We won't look at constructive loss of vessel or cargo, at this point we are only interested in the amount of oil spilled to water, and the location of the spill. There are a lot of different ways that would could do this. We could have a mechanistic model where we actually look at what might happen when to ships hit each other – and look at factors like the velocity of vessels, angle of collision, type of hull, etc. Or we could take a simpler approach and look at this from a probabilistic point of view. In a few months, we'll have a few outreach meetings that will look at this component in more detail and possible approaches.

This definitely plays a big difference. You could have a vessels can run aground with 2,000,000 barrels of product and not a single drop will make it into the water if it's sandy bottom. However, if a vessel is t-boned by another vessel you could have multiple tank ruptures, and you could have the entire cargo be lost, or only one or two tanks be ruptured. Are you going to quantify or model what amount of product might be making it to the water? (Wes Geyer)

JD Leahy: Short answer is yes, all incidents are different and some may result in an oil spill and some may not. We will want to look at the characteristics of the accident, and characteristics of

the vessel, including vessel specifics like double hulls and protected fuel tanks. These are all things we want to consider to model as accurately as we can.

If it appears that analysis outside of the Salish Sea is needed to ensure the model is valid to waters outside of the Salish Sea, how will that additional analysis be done? If it seems like what you are analyzing in Salish Sea might not align with the geographical differences that you might find on the Columbia River or in Grays Harbor, how would you go about getting additional data for outside the Salish Sea to make sure it's valid for those areas? (Dena Horton)

JD Leahy: Our goal is to make sure that the model is generally applicable, while also making sure it can be used to answer these first two analysis questions. The Columbia and Snake Rivers are very different operating environments compared to the Salish Sea. If we need to do analysis on the rivers, then we will need to be working together and having conversations about how to do that accurately. We aren't expecting the model to immediately fit into all areas, we'll have to adjust and improve it over time.

Gnome is a modeling program that was very helpful in demonstrating the seriousness of an oil spill in Grays Harbor. Will the new data collection be compatible with the modeling of Gnome or similar projects? (Linda Orgel)

JD Leahy: We haven't selected a specific output strategy for our model. This is still open to discussion.

Adam Byrd: I want to unambiguously acknowledge that consequence is part of risk. We are definitely aware of that, and have been since the beginning. Early on we realized fate modeling is a separate endeavor all on its own, and we can't do a good faith effort on that. Lots of great work on fate modeling is being done, including at the University of Washington, University of British Columbia, and Pacific Northwest National Laboratories. Our general idea is that we are trying to create a tool that will be used for a variety of applications later. Certainly one of those is fate modeling and building a tool that's compatible with fate modeling applications is part of the goal.

The facility on your map in Grays Harbor produces biodiesel. Ecology treats that just the same as Crude oil. Is there a way that Ecology can show that facility differently so individuals don't get confused that there is crude oil going in and out of Grays Harbor? (Brian Shay)

Brian Kirk: I'll bring up your concerns with Ty Keltner, our communications manager. For those that have seen Ecology products in the past, we do like to have a standard way to show oil movement. I will pass these comments along, so we can figure out if there is a better way to show that facility.

When doing VTRA there wasn't the naval architectural data that was required to evaluate what would happen with LPG and LNG carriers. I would be interested in seeing what would happen in an accident with these ships. I hope this model will look at the consequences of the risk of fire and explosions, as well as an oil spill.

Other vessels were substituted for the LNG vessels because they didn't have data for LNG carriers. At least they could model something. Even if LNG carrier isn't carrying fuel, they can still hit a ship and then what happens to that ship? I hope you at least have a placeholder if you can't accurately model those ships at this time, that you would use some kind of substitute to model them. (Lovel Pratt)

JD Leahy: From my perspective as a mariner, those types of consequences are all very important to me. In my history of looking at maritime safety and risk analysis, those were always part of the puzzle. However, we are guided by legislative direction which is to look at oil spill risk. With that in mind, I don't think we will be specifically be modeling fire and explosions.

Brian Kirk: The legislative direction of the Ecology Spills Program is to focus on oil spill risk. If LNG/LPG ships are being fueled by oil then that certainly includes them as potential sources of oil spill risk. One of our guiding principles in model development is try to not preclude future work. We want the model to be flexible enough to incorporate different vessel designs, and if there is some future need for the State of Washington to do some more in depth modeling around LPG/LNG, then this model might be able to be part of that analysis.

This highlights two of the benefits of starting this new process and having a risk model that is a public model. The first benefit is that it allows an open discussion like the one we are having today and we will continue to have. The second is that we are building a new model from the ground up, and we don't have to come up with patch solutions for issues that we know are out there. We don't have to substitute one kind of vessel for another because we are dealing with the legacy of the model and data.

Question relating to the effectiveness analysis of an ERTV in San Juan Island. I am curious if San Juan County proceeds with securing funding for that work sooner than Ecology is required to provide that analysis, would you still conduct that analysis or would you be able to utilize resources spent on that to provide a more robust model or redirect those resources elsewhere? (Lovel Pratt)

Brian Kirk: For the tug analysis, we would have to look at what the plans might be and see what the analysis was going to be. That work could certainly inform the work that Ecology does. As a practical matter, even if San Juan County delivered the perfect analysis, we have still been assigned a task by the legislature and we'd still be obligated to continue working on it unless we got new direction from the legislature.

Is this project at risk of being cut due to the budget crisis the state is facing? Do you have any indication from the governor's office on this? (Lovel Pratt)

Brian Kirk: We are sure there are going to be impacts to the Spills Program, but we don't necessarily know how it will impact specific projects. New state revenue projections are due to come out today. It will take time for the agency to assess the impacts. Just like everyone is having to re-look at their financial situation, the State of Washington and Ecology will be doing the same. The State legislature has a history of being very interested in spill prevention and understanding risk of oil spills to State waters, and we certainly expect that interest to continue.

Will the Grays Harbor modeling tie into the Salish Sea model, showing trips into and out of the Salish Sea? (Tom Ehrlichman)

JD Leahy: At this point we're focused on developing a framework for the modeling. We can use different data or different geographic areas or different waterway specific adjustments as needed in different areas. We want to build the underlying structure, that we can use to look at different areas.

I'm assuming that the bunkering vessel traffic between Grays Harbor and the Salish Sea will be included in the Salish Sea analyses. Please confirm. (Lovel Pratt)

JD Leahy: Vessel traffic within Salish Sea will be part of the Salish Sea analysis. Don't know how far offshore we will go out, but once a vessel is in the Salish Sea it's included in the model

Brian Kirk: There are some vessels that call on Grays Harbor but come up to Port Angeles just to bunker. Vessel movements that are evident in the historical AIS data will be included in the model. We are aware of this behavior and will include this pattern in the modeling.

What is the time range for the AIS data you will use? (Tom Ehrlichman)

JD Leahy: Not necessarily decided yet, still needs to be discussed. Right now looking at range of last 5 years or so, but want to have a strong rationale for what we decide.

Will you include 2019 AIS data? (Lovel Pratt)

Adam Byrd: We don't have 2019 data yet, but we'll be talking about this later. We probably will, but haven't made any decisions yet.

Additional Comments

Create an accurate baseline that includes large vessels and regular fishing concentrations of small ships, tribal, commercial and recreational. Those concentrations should be used as “hazards” or “fixed obstacles” for purposes of collision analysis. These smaller vessel patterns and hazards should not be treated as “ancillary.” Note language in ESHB 1576. (Tom Ehrlichman)

The baseline should include not only transits but also differentiate between transits that are laden and those that are unladen. (Tom Ehrlichman)

Identification of laden vessels can be derived by cross-referencing AIS data with ANT data. While this would not be a complete picture, the data is there and should be used to make assumptions, rather than rely solely on the guestimates of the industry. As noted yesterday at the Board of Pilotage Commissioner’s Oil Transportation Safety Committee, the industry is reluctant to share that information and thus, there is the danger of underreporting of laden vessels. The estimates of laden bunker vessels in the VTRA was unrealistically low. (Tom Ehrlichman)

The model should treat anchorages that are used regularly (Port Angeles, Vendovi, Samish Island, Anacortes) as fixed hazard points, as though there is a rock or sand bar to be avoided by through transits. (Tom Ehrlichman)

Baseline should not include increases anticipated from Trans Mountain Pipeline, which is in litigation and unlikely to generate vessel trips for years. The probability analysis should assess those vessels in terms of increased risk. (Tom Ehrlichman)

The baseline should create separate AIS transit lines and frequency for tugs (both underway for barges and escorts and those traveling to meet up for those purposes). This data is critical to assessing the risk of small spills of fuel due to collisions with fishing vessels. (Tom Ehrlichman)

It would be great to hear answers to all the questions that Tom E. submitted. Please schedule more time for the Q&A at future webinars. I have more questions but want to give others a turn. Thanks. (Lovel Pratt)