

Focus on: Accident Probabilities



Figure 1. A ship at anchor in Elliot Bay

Introduction

We're seeking your input on our approach to estimating hazard probabilities in the development of an oil spill risk model.

You can provide feedback by email or at one of our virtual events. We are hosting a technical discussion on probabilities on July 28, 2021 ([register](#)).

For more information about our approach to modeling oil spill risk, you can review our Modeling Approach focus sheet ([link](#)), and our Model Development Project webpage ([link](#)).

Data Requirements

Our model structure requires use of hazard probabilities to answer questions about oil spill risk. We need at least one probability for each modeled hazard. Here is our list of hazards ([link](#)). To estimate a probability we need two counts:

1. The number of occurrences (i.e. number of incidents of a particular type)
2. A measurement of opportunities for the incident (e.g., ship-years, operation hours)

We plan to obtain these counts from historical incident records and AIS data. The larger the dataset we examine, the more occurrences we might find. The more occurrences we find, the better the model will be at providing insight into the risk of hazards, and the role of other factors like vessel type in accident probability.

How big a dataset we examine is determined by how large a geographic scope and how long a time frame we select for analysis.

A larger dataset may include incident trends that are not representative of the trends present in our study area, or at this moment in time. A smaller dataset could result in few or even no observed occurrences. Using few occurrences to calculate probability could result in biased estimates.

If our population of interest identifies no occurrences, the alternative is to use a zero failure approach – a way to estimate the likelihood of an event that is not observed in the dataset. See our previous presentations for more detail ([link](#)).

Our Ask

We are looking for your feedback on what factors to consider when determining the time period and geographic scope we'll examine for historical incidents.

Geographic Coverage

We are looking for factors that might help us identify areas that are functionally similar to the study area, in terms of hazard potential and vessel operation. Here are some factors that we are considering:

1. Similar waters: Exclude open ocean and restricted inland waters like rivers.
2. Similar traffic measures: Traffic Separation Schemes and/or Vessel Traffic Services.
3. Similar regulations: Comparable regulatory regimes and/or Port State Control standards.

Time Period

The time period that we look at should also reflect an era of operational similarity and similar hazard potential. Some factors we are considering to help determine an appropriate look back period include:

1. Regulatory changes that might affect incident rates, including:
 - a. Intl Safety Management Code (1998)
 - b. STCW 95 Convention (1997)
2. Changes in incident reporting standards or practices
3. Availability of AIS, for determining the exposure variables

How to Provide Feedback

We welcome feedback on these factors at our upcoming technical discussion session as well as in writing. All feedback is welcome, but you may find

the following questions helpful in guiding your comments:

- Are there any other factors to consider when selecting a geographic or temporal scope?
- Are any listed factors unsuitable for selecting a geographic or temporal scope?

Contact information

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ADA accessibility

To request an ADA accommodation, contact Ecology by phone at 360-407-6831 or email at ecyadacoordinator@ecy.wa.gov, or visit <https://ecology.wa.gov/accessibility>. For Relay Service or TTY call 711 or 877-833-6341.