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Challenges with accurate tracking of oil spill trajectories within Puget Sound

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Tracking Oil Spill Trajectories with the Salish Sea Model

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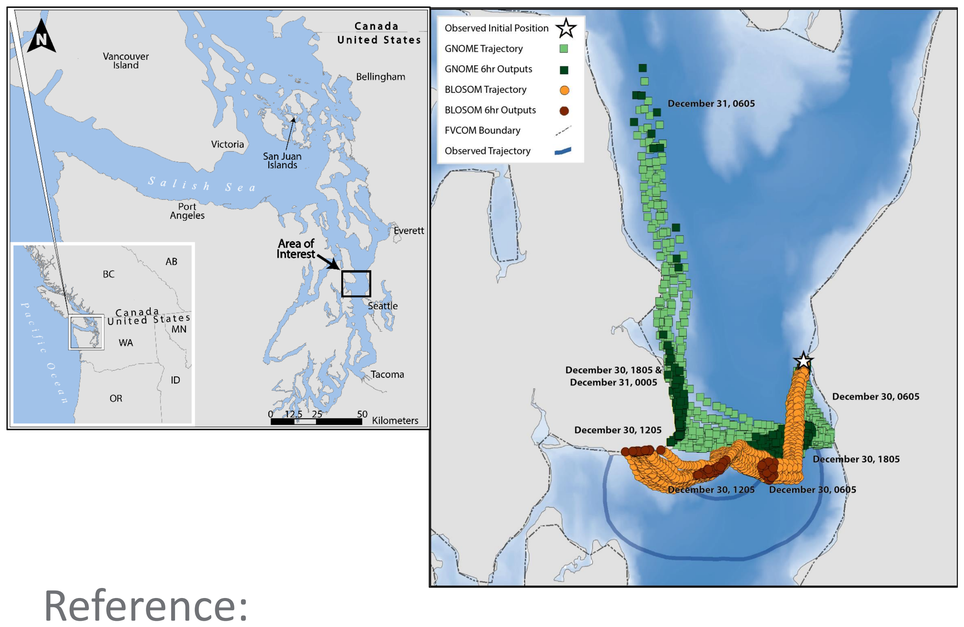
Oil Spills in Puget Sound

Future Spill Potential

Canada's Kinder Morgan Trans Mountain Expansion Project plans to expand capacity of an existing pipeline from 300,000 barrels to 890,000 barrels of oil per day. Pipeline construction is planned for December 2020, carrying heavy tar sands crude from Alberta to Vancouver, after which it is shipped through the Strait of Juan de Fuca.



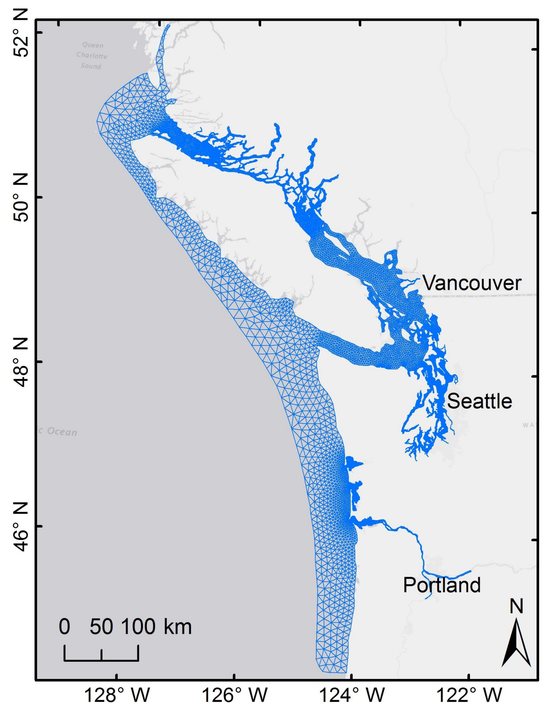
Reference:

Duran R, L Romeo, Whiting J, Vielma J, Rose K, Bunn A, Bauer J. **In Progress.** Simulation of the Foss Point Wells Oil Spill: A Comparison between BLOSOM and GNOME. Prepared for the Bureau of Safety and Environmental Enforcement (BSEE) by the National Energy Technology Laboratory (NETL) and Pacific Northwest National Laboratory (PNNL).

Salish Sea Model (SSM)

[salish-sea.pnnl.gov]

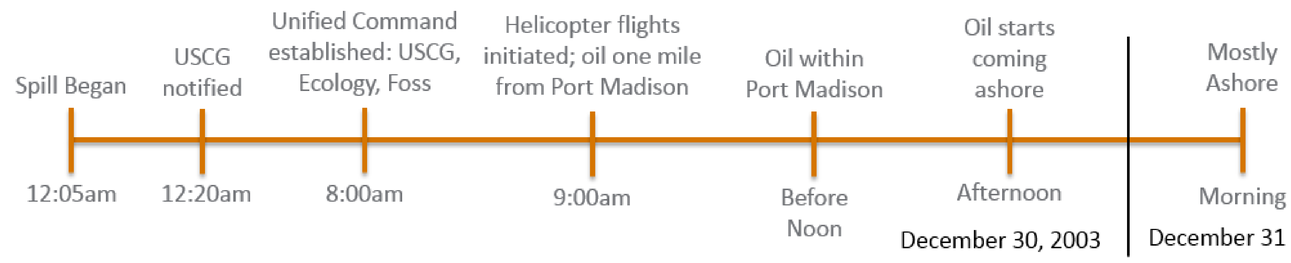
The SSM is a predictive ocean-modeling tool that encompasses the Puget Sound and Northwest Straits. Developed using the Finite Volume Community Ocean Model (FVCOM), carefully validated 3D hydrodynamics can be used to track particle movement, informing oil spill trajectories and contaminant circulation.



Pt. Wells Spill Model Comparison

As part of a larger project led by the National Energy Technology Laboratory (NETL), hydrodynamics generated by the Salish Sea Model were used to recreate the **2003 Pt. Wells Oil Spill** and compare two transport models:

- GNOME – General NOAA Operating Modeling Environment
- BLOSOM – NETL's Blowout and Spill Occurrence Model



Findings

- Salish Sea Model was able to successfully reproduce the trajectory of the Pt. Wells spill after improving the shoreline bathymetry and local wind forcing.
- Differences between GNOME and BLOSOM were identified, aiding model development and understanding capabilities.
- Methods were developed to optimize the hydrodynamic solution for surface transport, creating compatible NetCDF files.