MEOPAR
MARINE ENVIRONMENTAL OBSERVATION PREDICTION & RESPONSE NETWORK

OCEAN NETWORKS CANADA

Influences of wind, sea state, and oil type on oil dispersion in the Salish Sea

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THE UNIVERSITY OF BRITISH COLUMBIA

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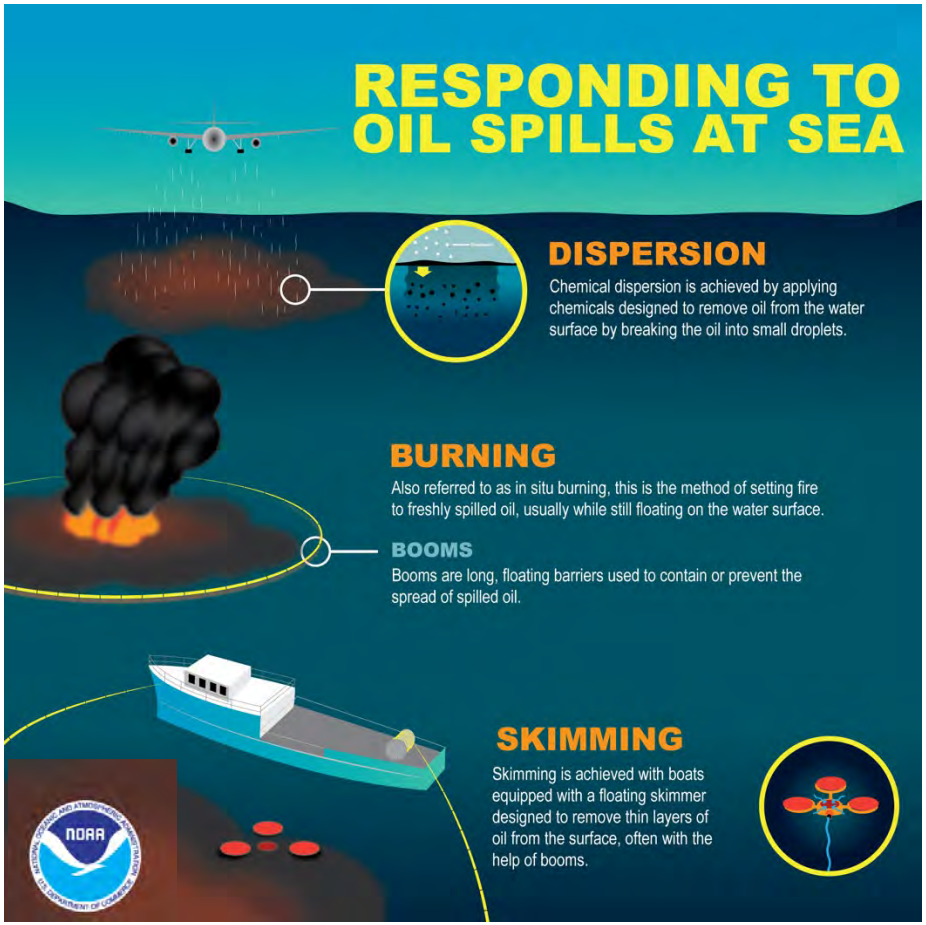
Queen Charlotte Sound (11/27/2017)
ATB de-coupling

Oil spill response strategies



f(sea state)

https://response.restoration.noaa.gov/about/media/how-do-oil-spills-out-sea-typically-get-cleaned.html

Spill response by wind speed

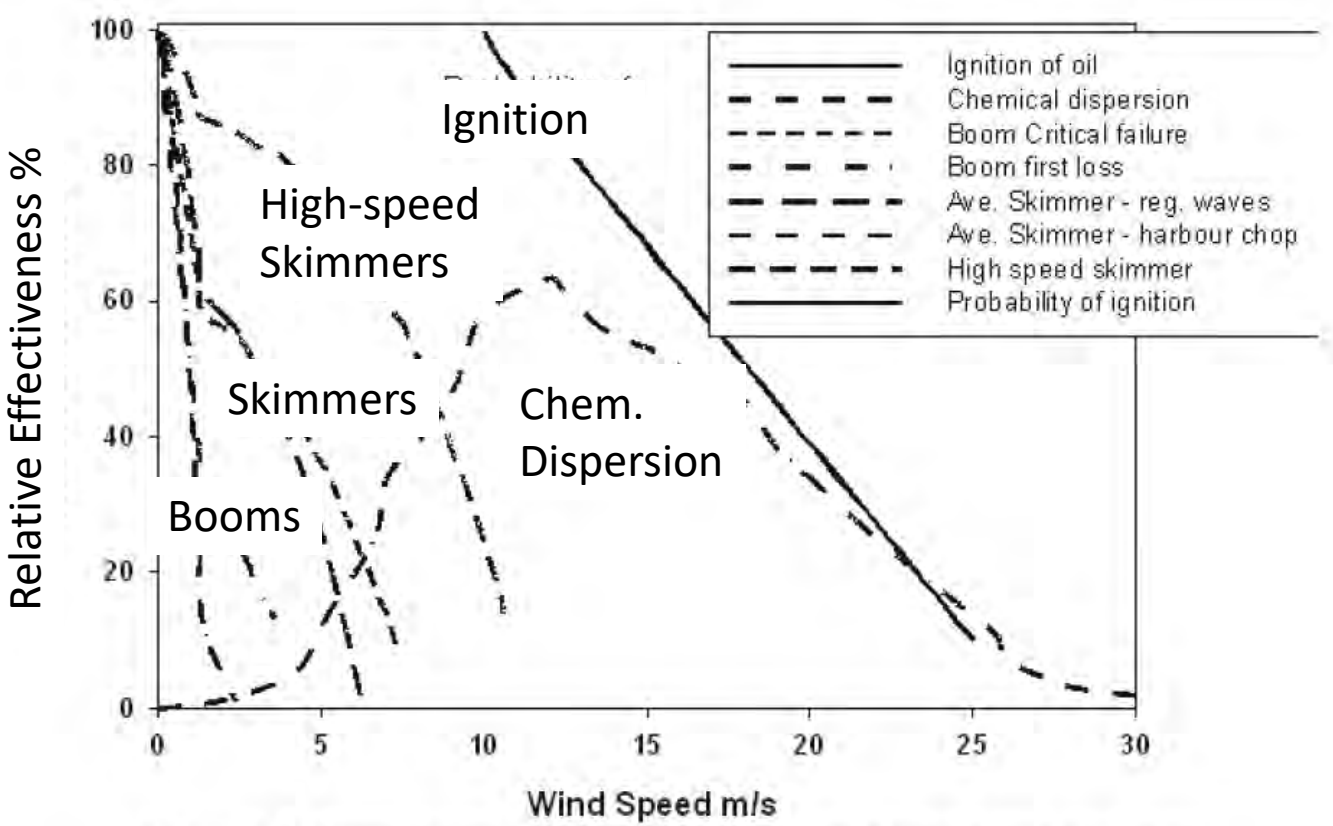
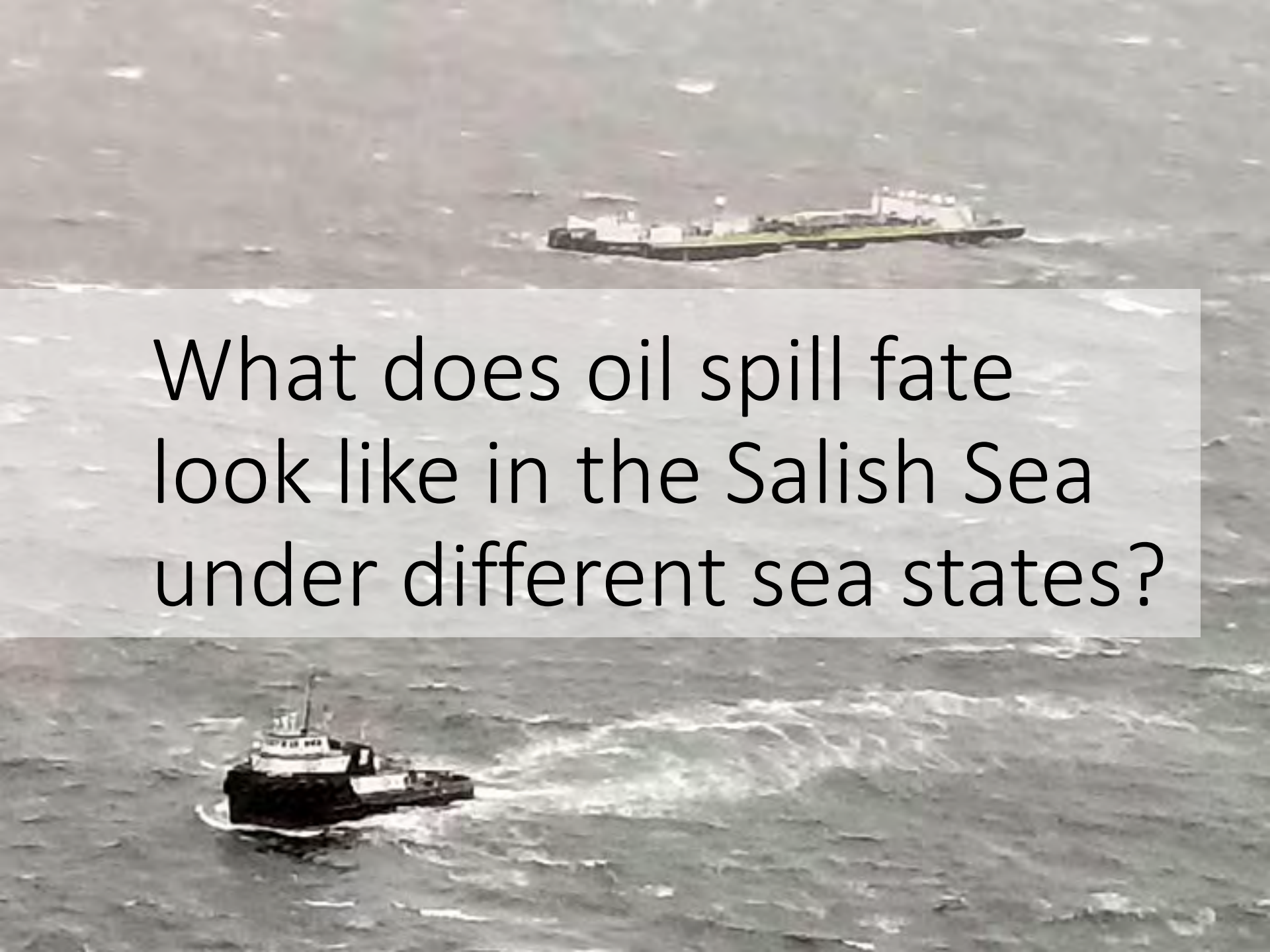


Figure 1 Summary of Wind Effects on Countermeasures

Environment Canada 2004 report by Merv Fingas



What does oil spill fate look like in the Salish Sea under different sea states?

Modeling Potential Oil Spills

(for preparedness)

SalishSeaCast

NEMO 3.6

- 500 m, structured grid
- 1 – 27 m depth levels

Open boundaries

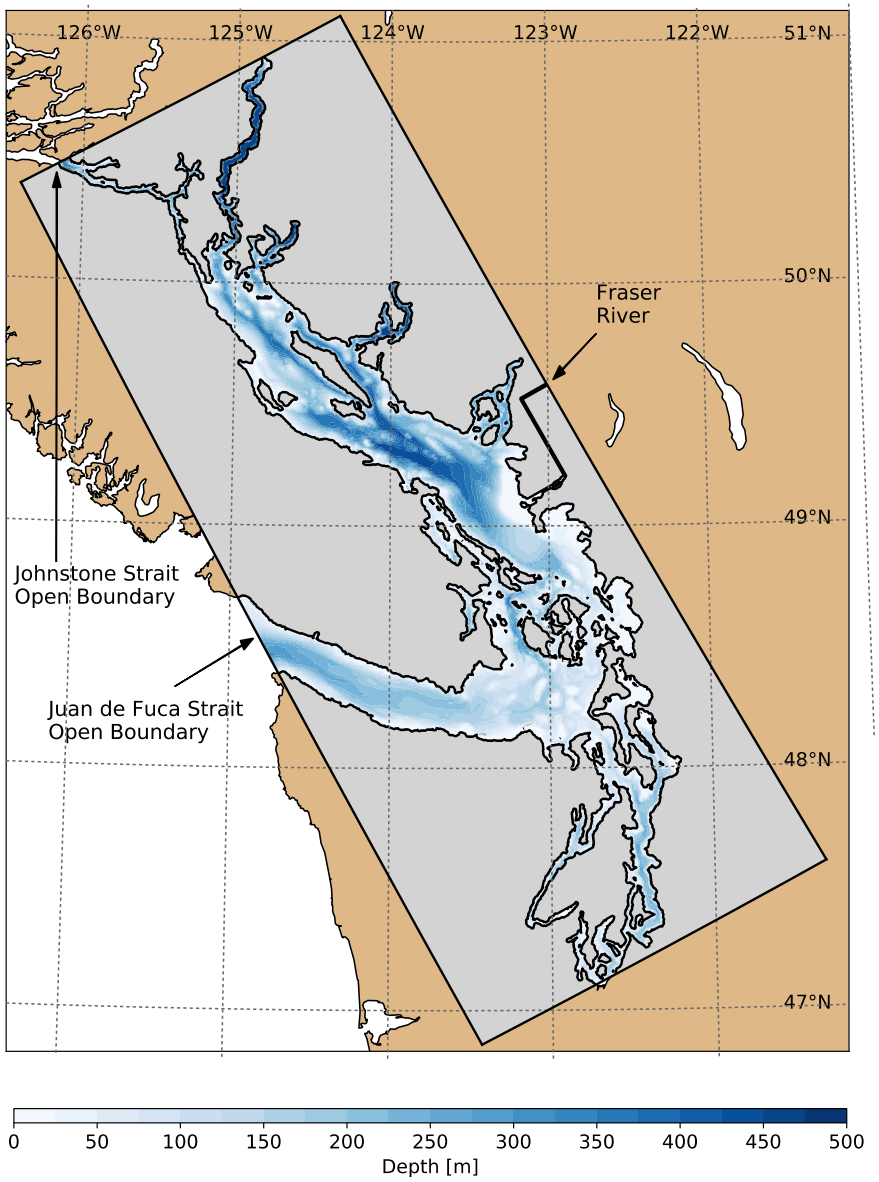
- Temperature and Salinity
- Tides
- Sea Surface Height

Rivers

- Gauged Fraser River
- Watershed climatology

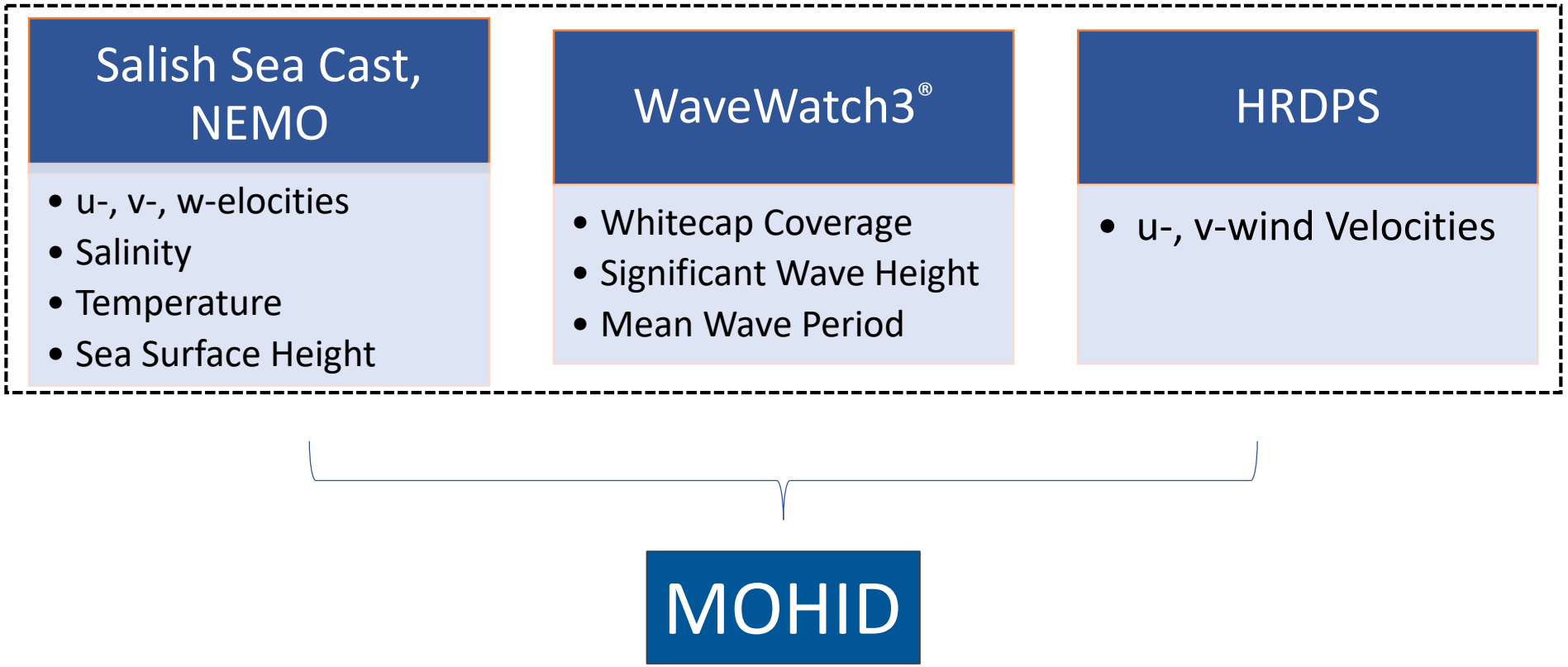
Atmospheric Forcing

- 2.5 km HRDPS winds

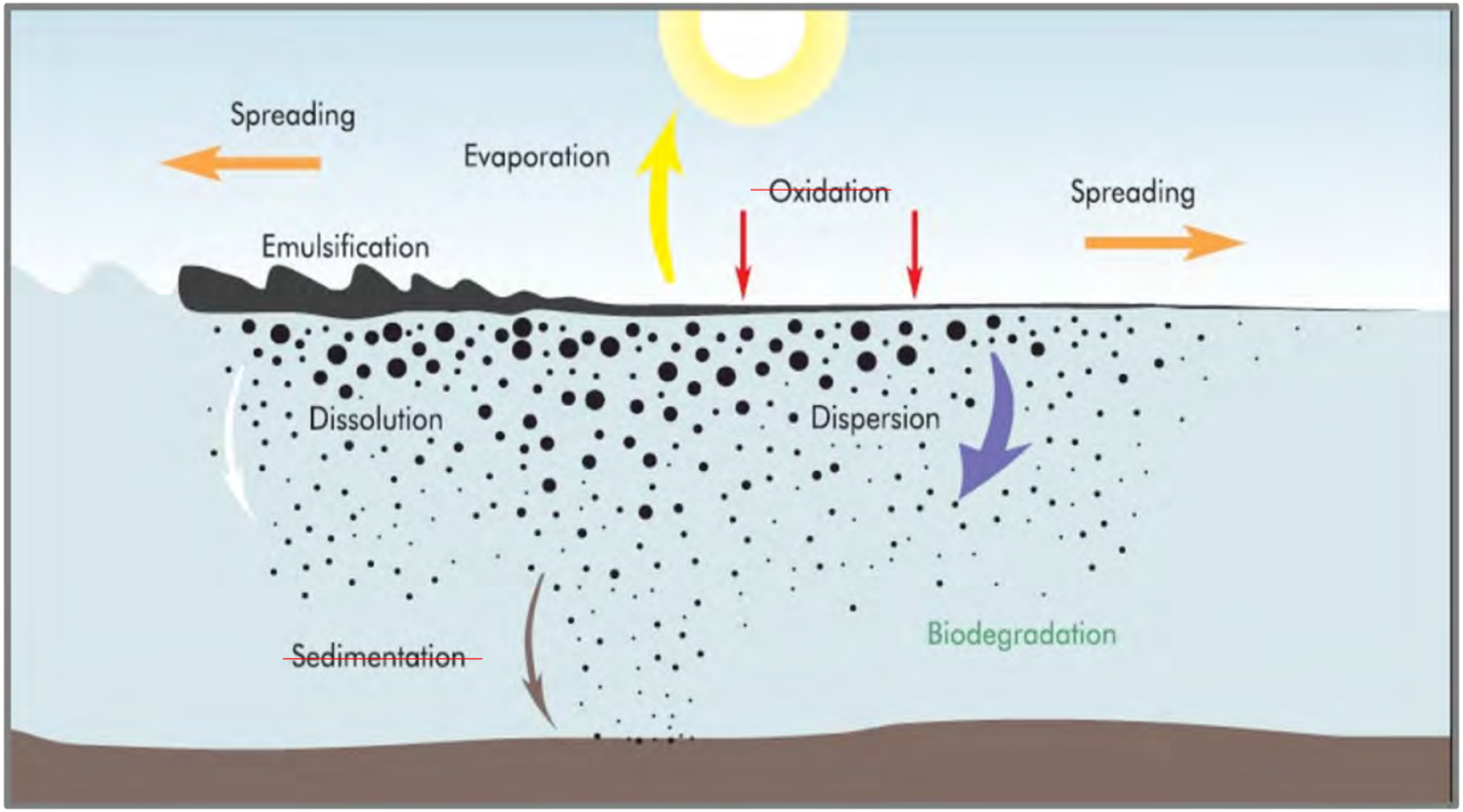


SOILED: Salish Sea Cast (Oiled)

(for preparedness)



Weathering of spilled oil



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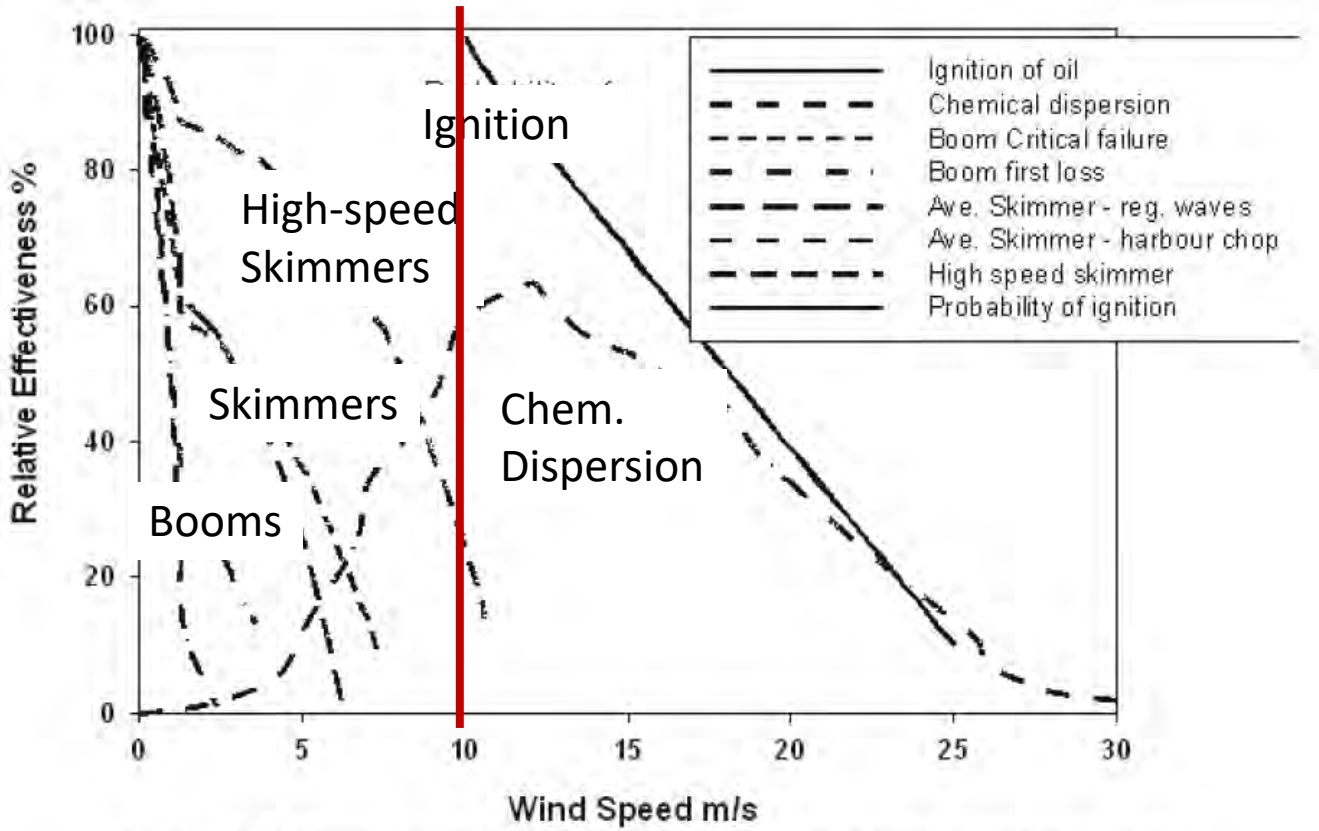
http://www.medess4ms.eu/marine-pollution.

Response efficacy by wind speed



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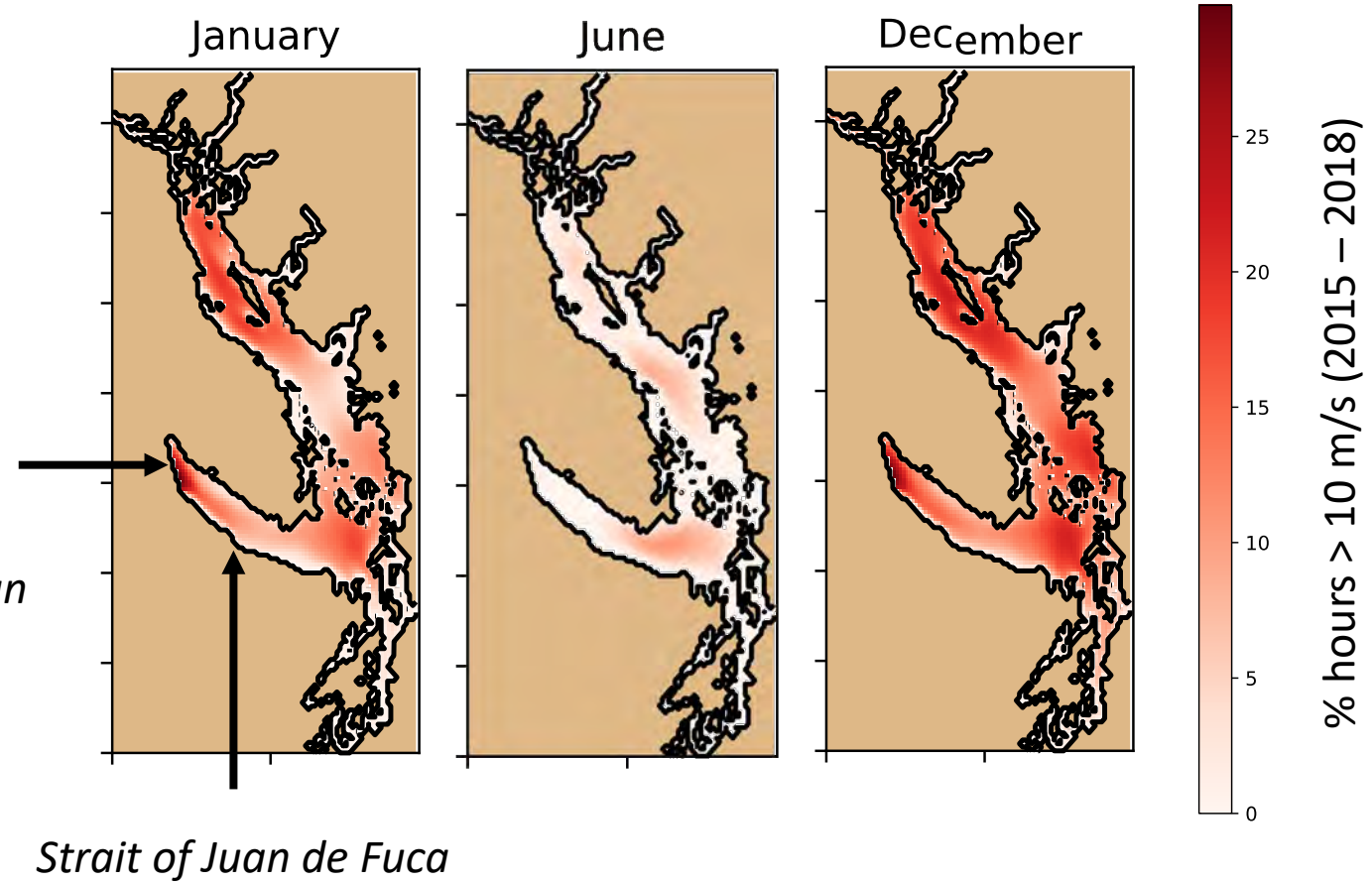
Wind-climatology of spill impacts

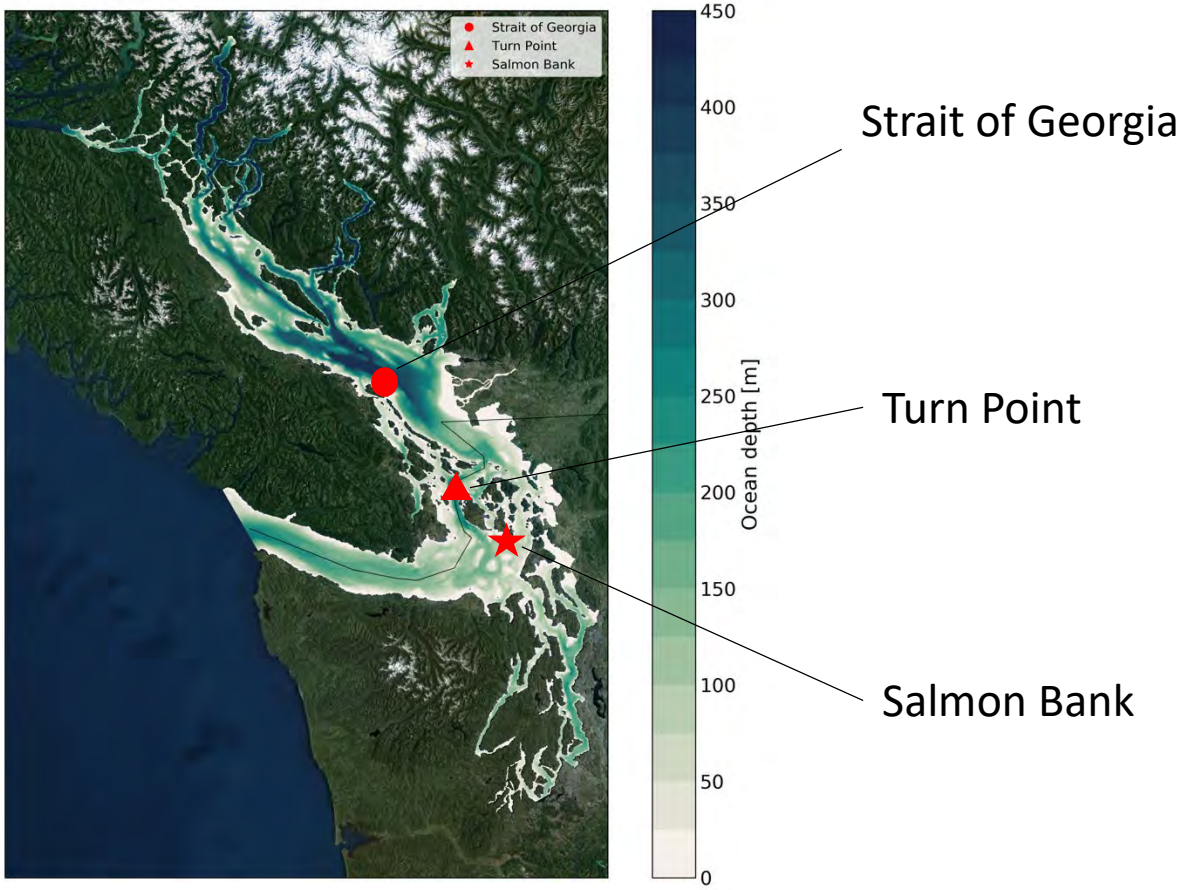


Western boundary of model domain and main source of open ocean exchange

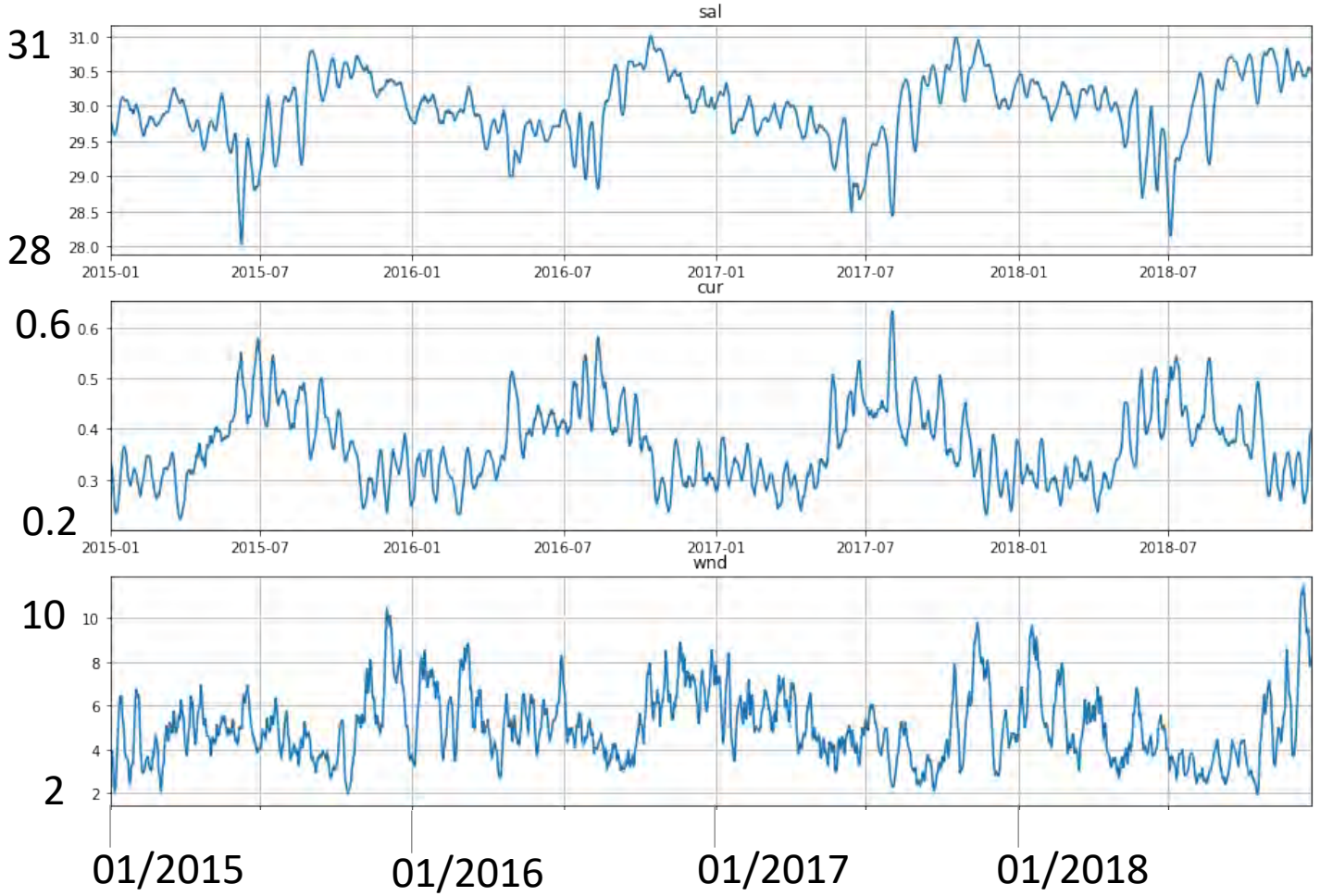
Strait of Juan de Fuca

HRDPS model climatology

Preliminary study sites



Variability: Salmon Bank (SB)

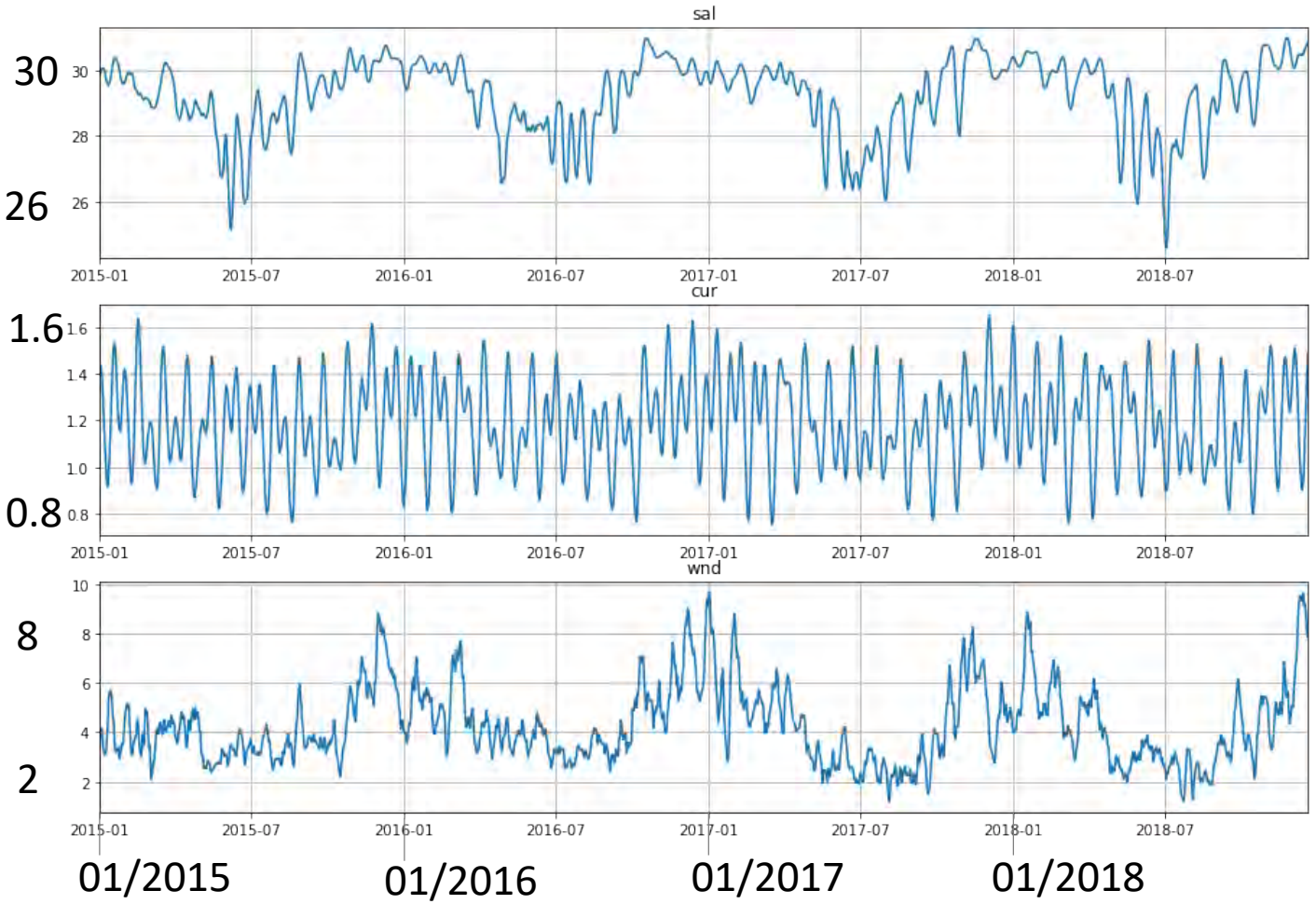


Salinity

Surface Current Speed

Wind Speed

Variability: Turn Point (TP)

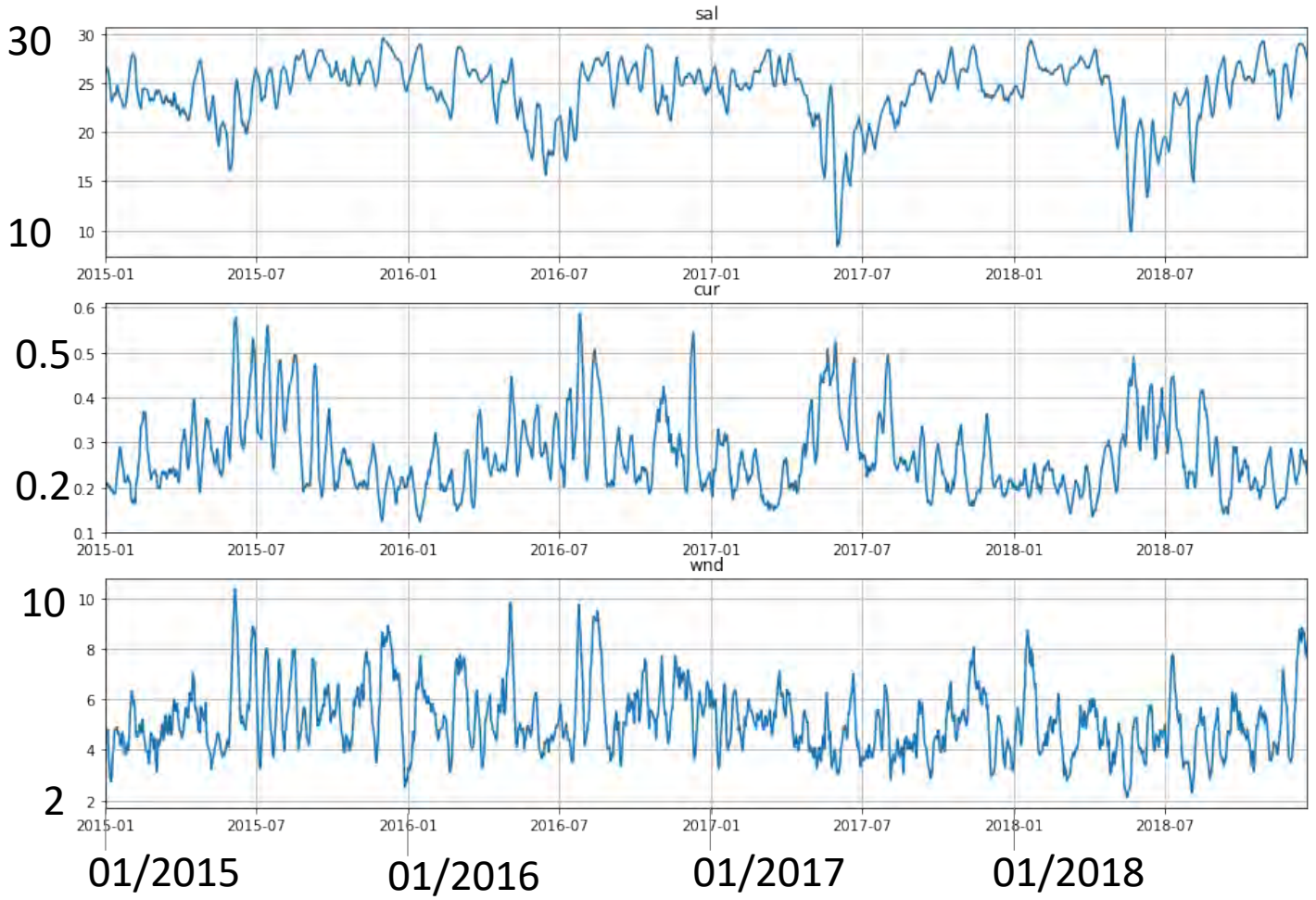


Salinity

Surface Current Speed

Wind Speed

Variability: Strait of Georgia (SOG)



Salinity

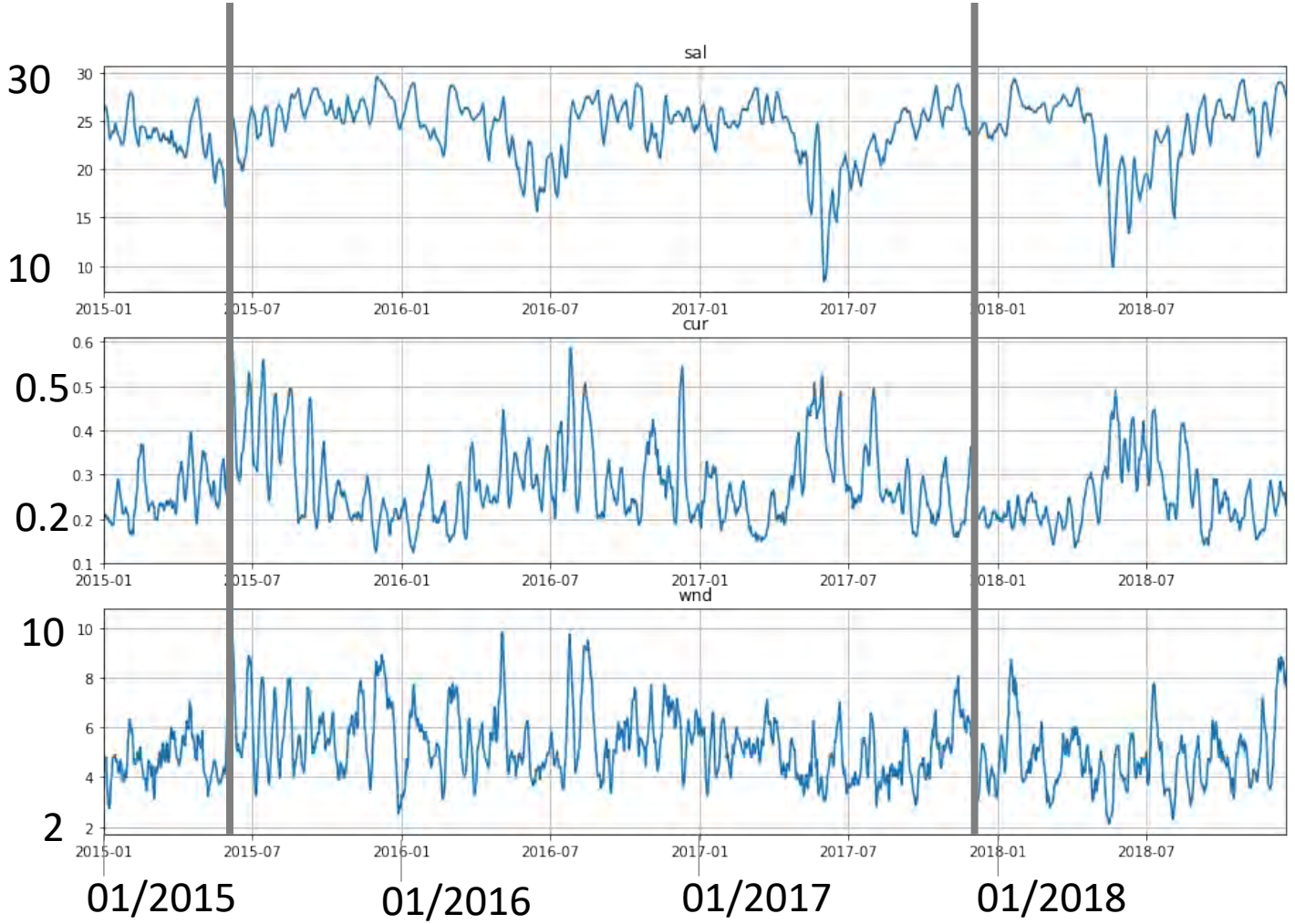
Surface Current Speed

Wind Speed

2 cases: Strait of Georgia (SOG)

(2) Freshet, stronger winds

(1) Non-freshet, weaker winds



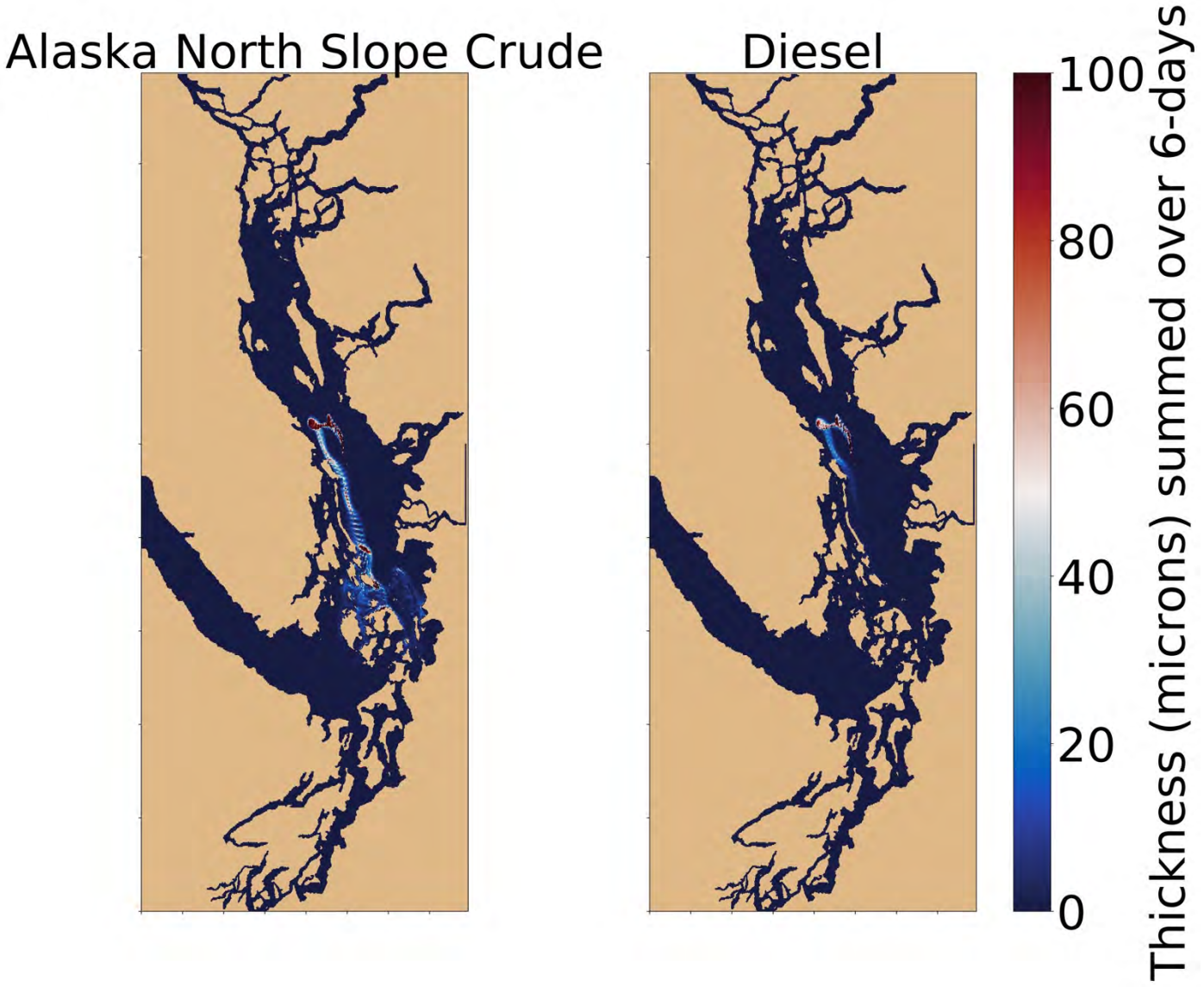
Salinity

Surface Current Speed

Wind Speed

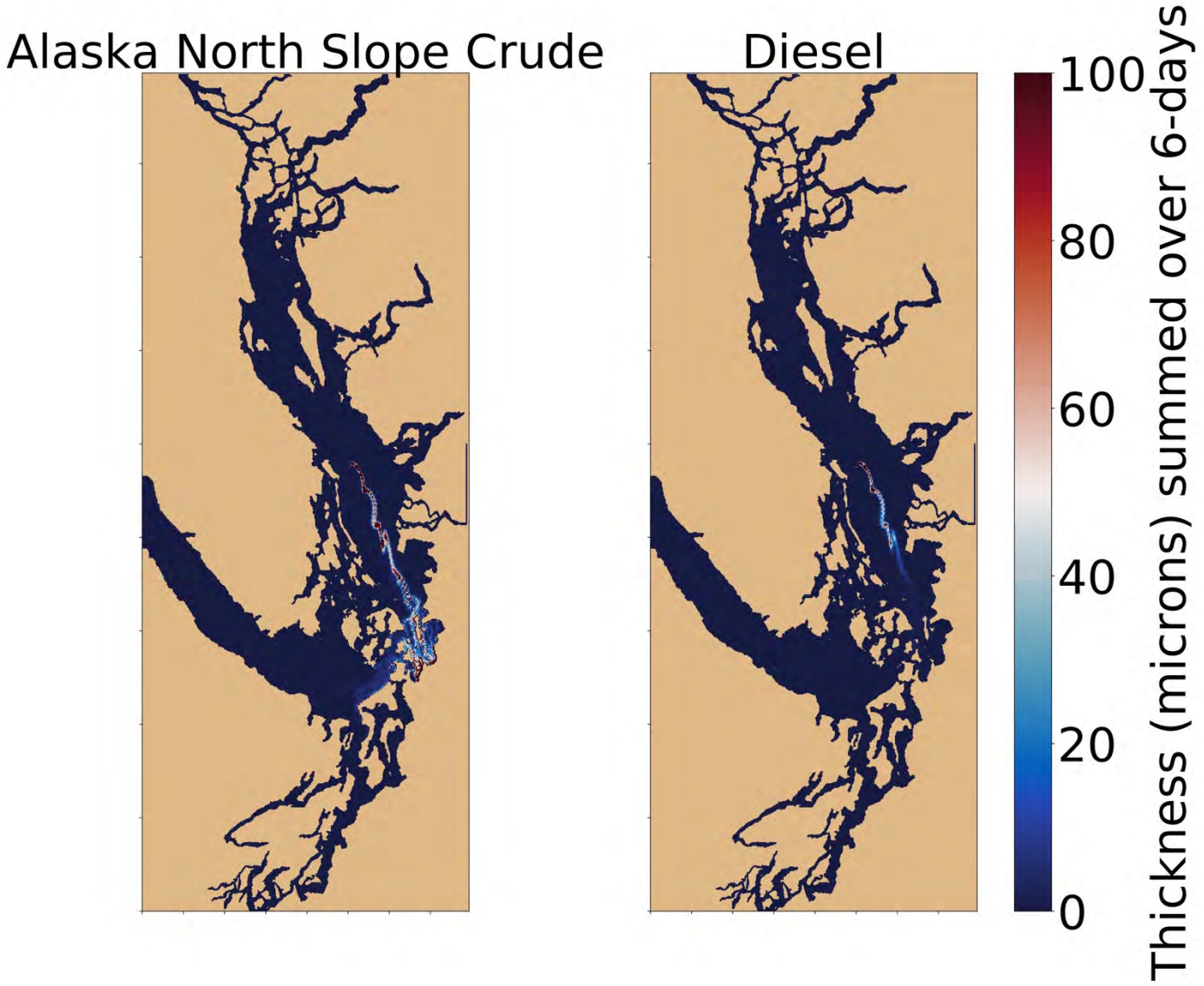
Non-freshet, weaker winds

PRELIMINARY RESULTS

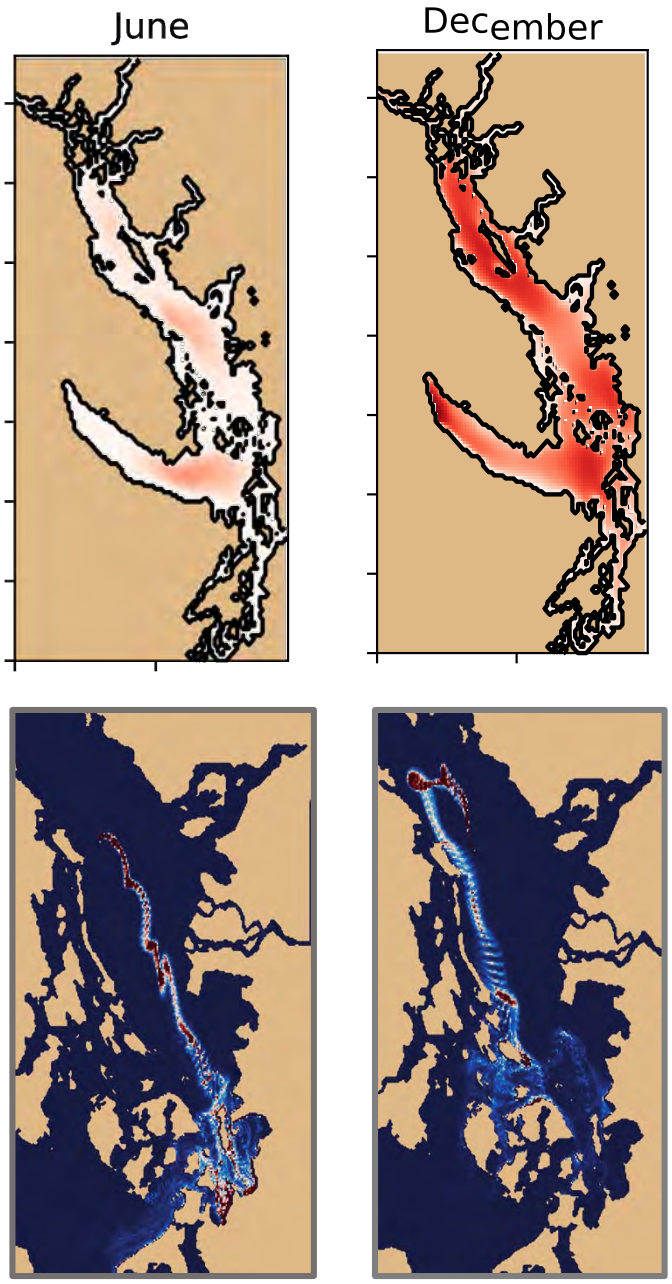


Fraser River freshet, stronger winds

PRELIMINARY RESULTS

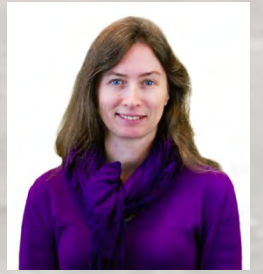


Consider: Oil Spill Impacts are likely to vary in space and time, based on ocean conditions and sea state



PRELIMINARY RESULTS

Model of Impacts of Dilbit and Oil Spills in the Salish Sea



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