

# Columbia River Basin Dreissenid Mussel Monitoring Forum

January 2020

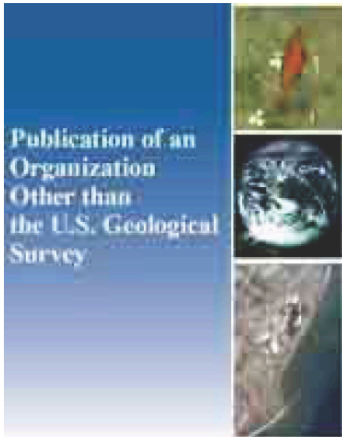
Tim Counihan, USGS, Western Fisheries Research Center



# Results from workshop are available online

<https://pubs.er.usgs.gov/publication/70199102>

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## Columbia River Basin dreissenid mussel monitoring forum workshop

By: Lisa DeBruyckere, Timothy Counihan , and Stephen Phillips



# Columbia River Basin Dreissenid Mussel Monitoring Forum

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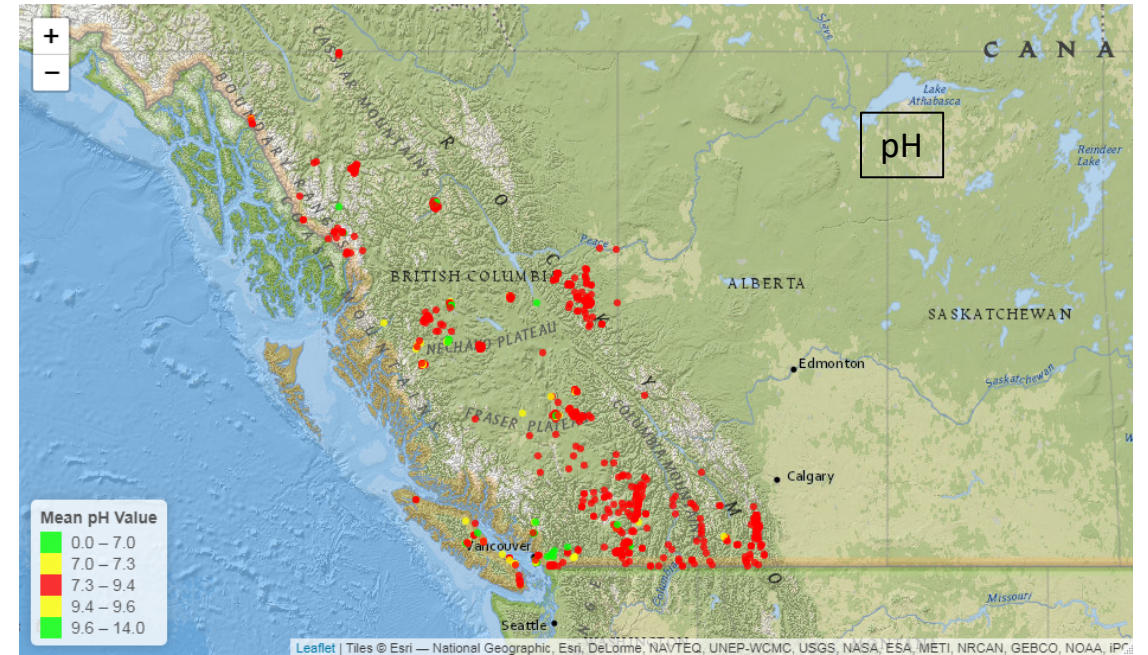
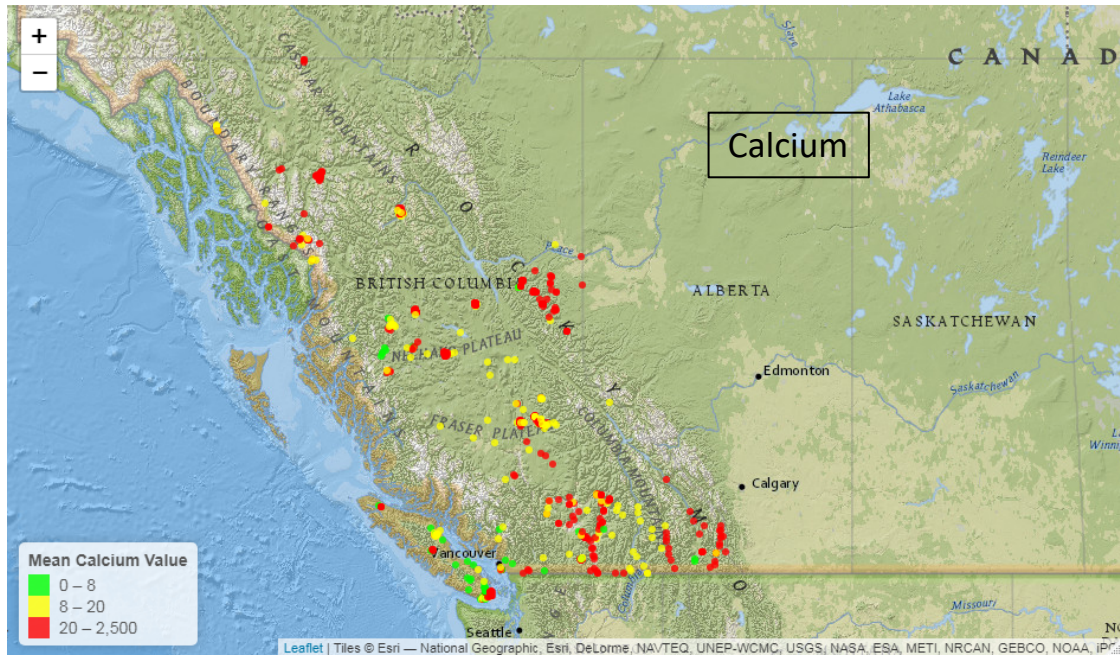
b. Develop a flexible regional model to facilitate optimal resource allocation that incorporates establishment, introduction risk, and monetary/non-monetary valuation of natural resources.

- ■ Fill gaps in
  - i. water quality data - collection and discovery
  - ii. human behavior - boater trips
  - iii. data describing valuation of resources
  - iv. data exchange and collection standards
  - v. monitoring, WQ data
  - vi. protocols

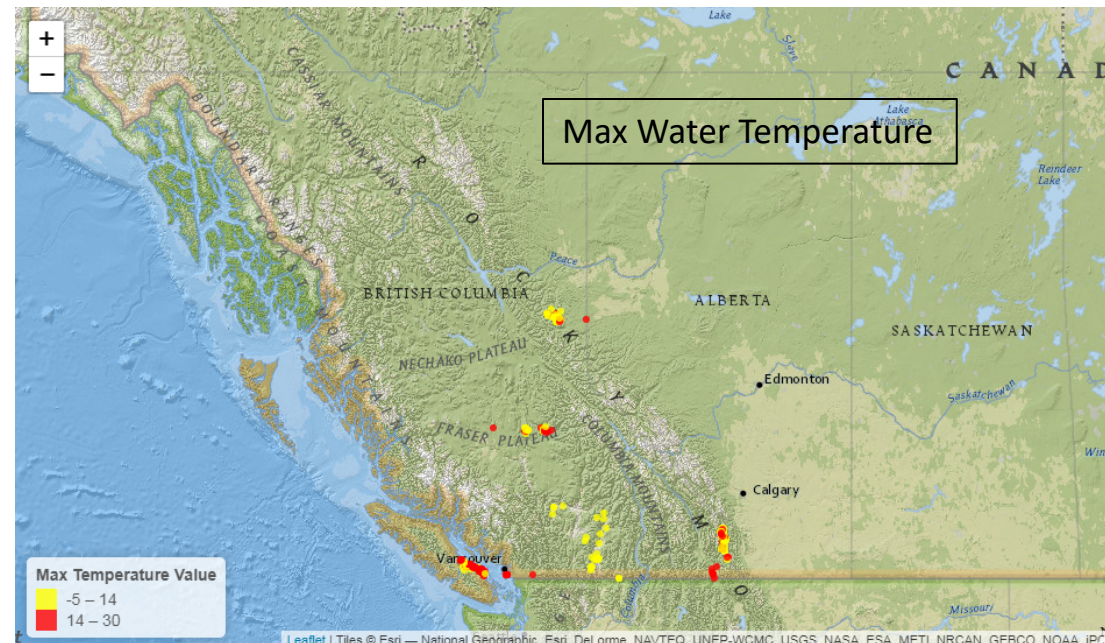
Table. Risk factors and proposed ranges in conditions that constitute Minimal, Moderate, and High Risk.

Physical Risk Factor	Species	Minimal Risk	Moderate Risk	High Risk
Calcium Concentration	<i>Dreissena polymorpha</i>	<8 mg/l	8-20 mg/l	>20 mg/l
	<i>Dreissena rostriformis bugensis</i>	<12 mg/l	12-20 mg/l	>20 mg/l
pH	<i>Dreissena polymorpha</i>	<7.0 or >9.6	7.0-7.3 or 9.4-9.6	>7.3 - <9.4
	<i>Dreissena rostriformis bugensis</i>	<7.0 or >9.6	7.0-7.3 or 9.4-9.6	>7.3- <9.4
Mean Long-term (≥29 Days) Summer Water Temperature	<i>Dreissena polymorpha</i>	>32°C	31-32°C	<31°C
	<i>Dreissena rostriformis bugensis</i>	>30°C	29-30°C	<30°C
Minimum Temperature for Spawning	<i>Dreissena polymorpha</i>	<14°C	14-16°C	>16°C
	<i>Dreissena rostriformis bugensis</i>	<14°C	14-16°C	>16°C
Salinity	<i>Dreissena polymorpha</i>	>5‰	4-5‰	<4‰
	<i>Dreissena rostriformis bugensis</i>	>5‰	4-5‰	<4‰
Percent Full Air Oxygen Saturation at 25°C	<i>Dreissena polymorpha</i>	<20%	20-30%	>30%
	<i>Dreissena rostriformis bugensis</i>	<20%	20-30%	>30%
Annual Water Level Variation	<i>Dreissena polymorpha</i> <i>Dreissena rostriformis bugensis</i>	No Minimal Risk	Extensive Variation exposing Mussels to Air and/or Submergence in a Hypoxic Hypolimnion	Relatively Constant Water Levels
Water Flow Rates (Turbulence)	<i>Dreissena polymorpha</i>	Unknown	High-Flow Lotic Habitats	Low-Flow Lotic or Lentic Habitats
	<i>Dreissena rostriformis bugensis</i>	Unknown	High-Flow Lotic Habitats	Low-Flow Lotic or Lentic Habitats





Data from British Columbia  
analog of the Water Quality  
Portal





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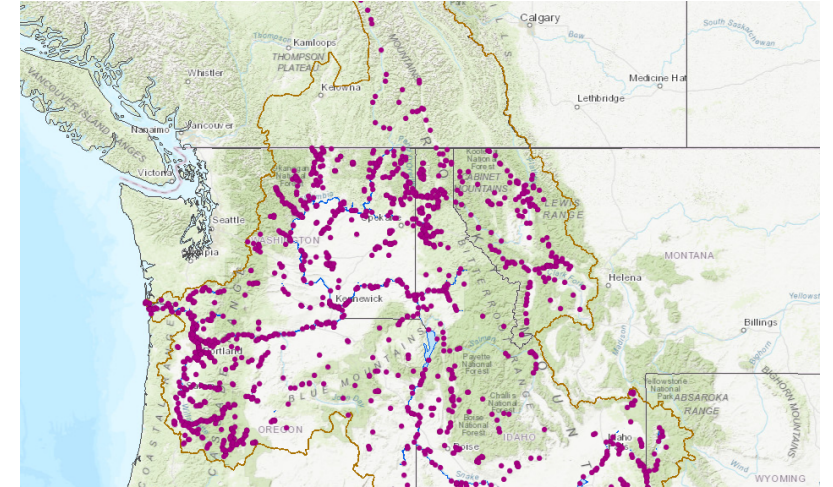
## Propagule Pressure

– Coordinating with University of Alberta and USGS Nonindigenous Aquatic Species Program

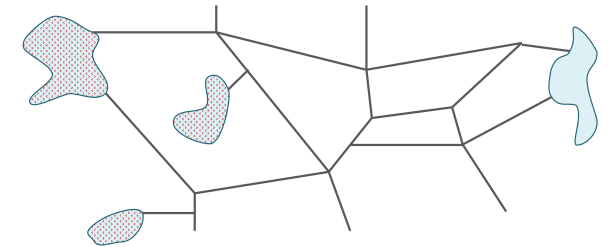
- Road network characterization
- Boat ramp database

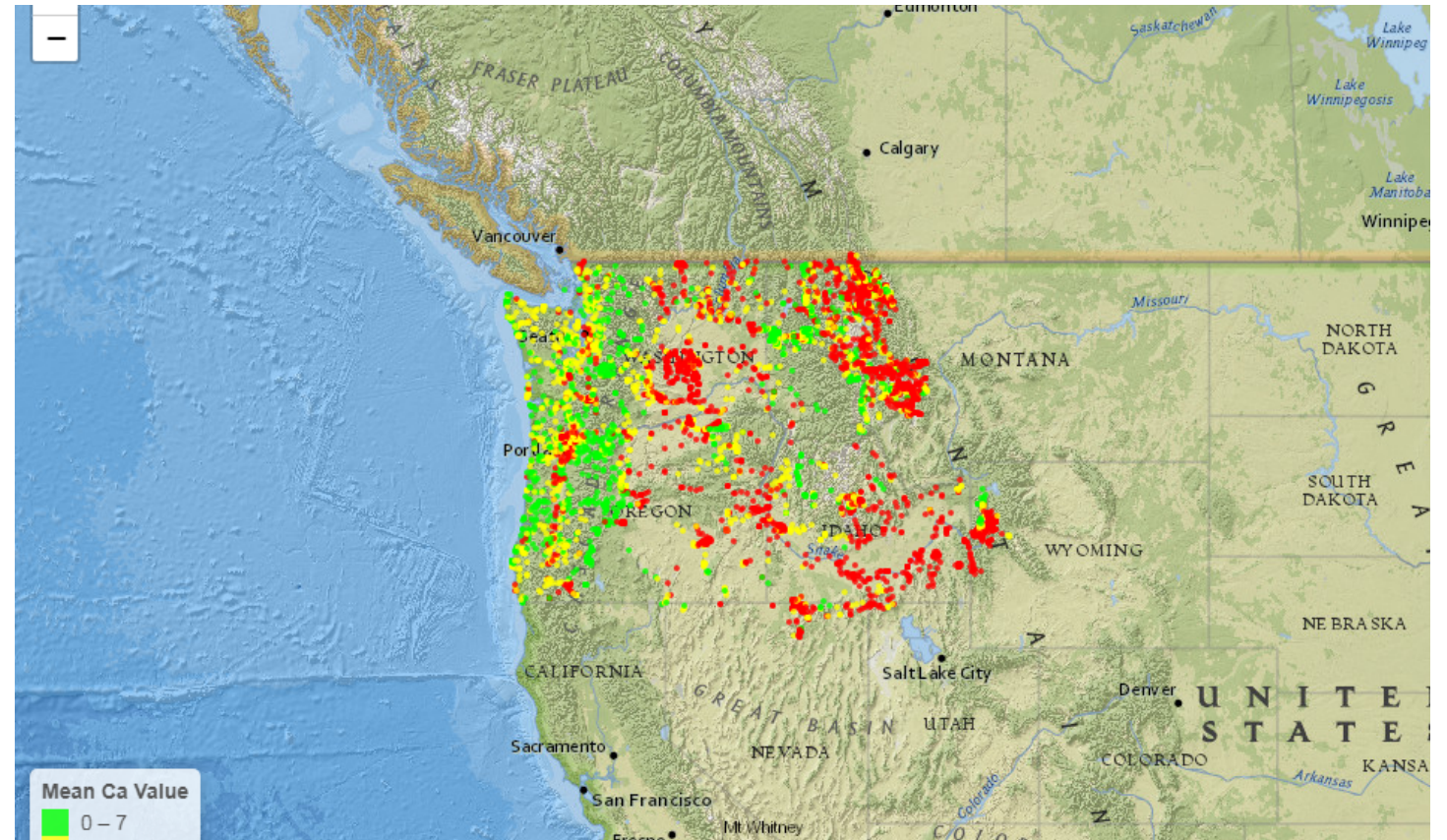
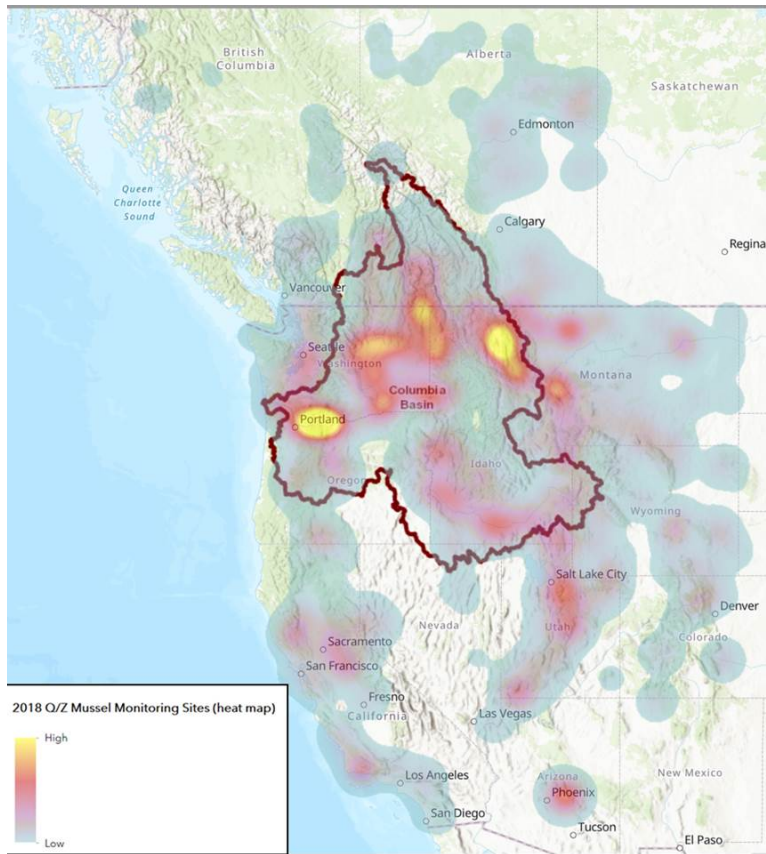
## *Watercraft Inspection Database*

*Colorado Parks and Wildlife*



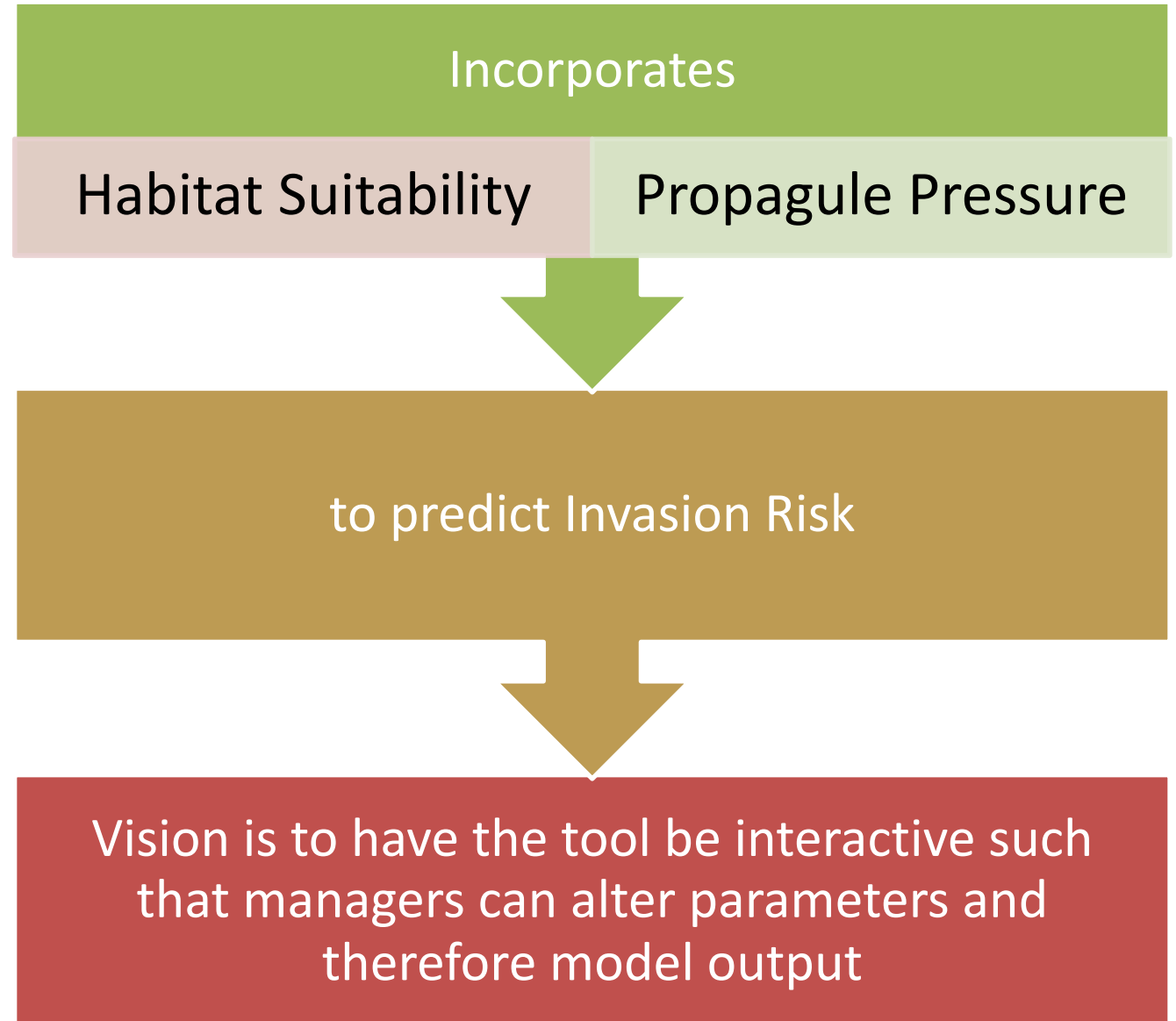
Route Model





Better understanding of  
how effort matches  
up with risk  
assessments?

# Risk Mapping Interactive Decision Support Tool





# Monetary/non-monetary valuation of natural resources

- Task: Develop a list of attributes that are of important to Forum members
  - Goal is to incorporate these into the Decision Support Tool such that they can be selected by users
  - Starting with non-monetary valuation is likely more achievable in the short-term
  - Webinar to discuss further – likely in the beginning of March



# Monetary/non-monetary valuation of natural resources

- Hydroelectric projects
- Irrigation delivery systems
- Municipal water systems
- Culturally significant fisheries
- Recreational use
- Endangered species
- Etc...

