

Decadal Assessment of Non-indigenous Marine Species in Southcentral Alaska

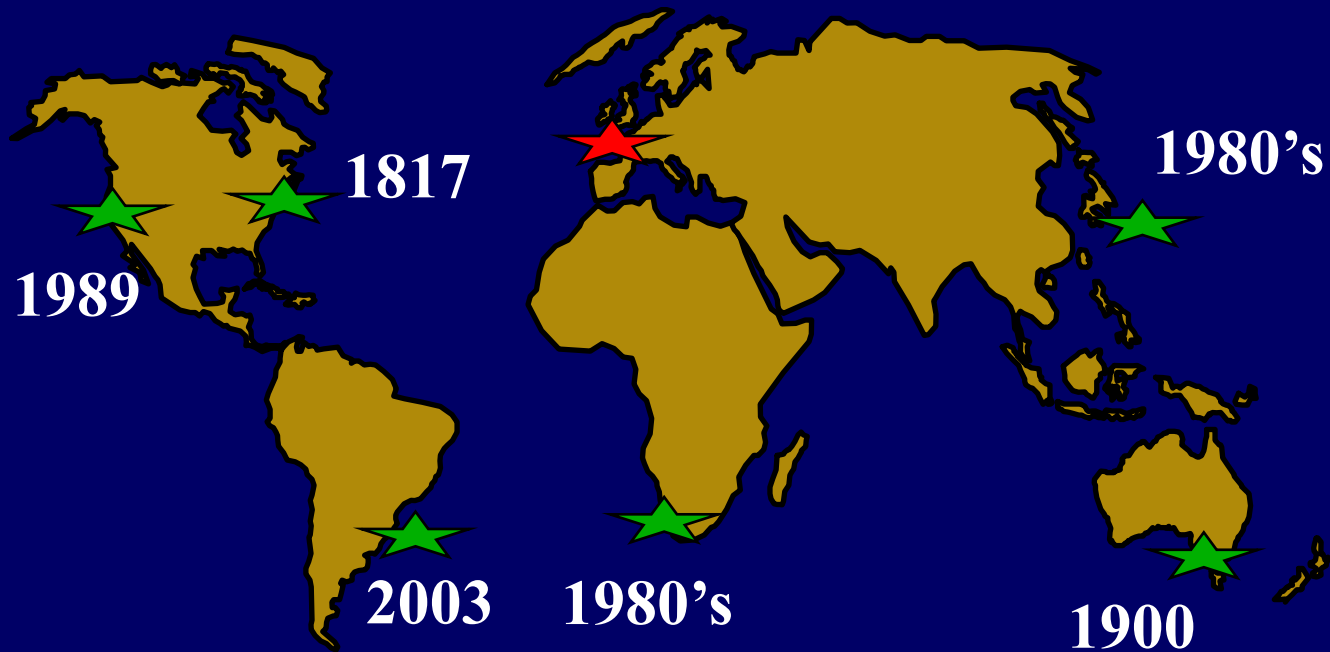
Kachemak Bay and Lower Cook Inlet (Part I)

Greg Ruiz

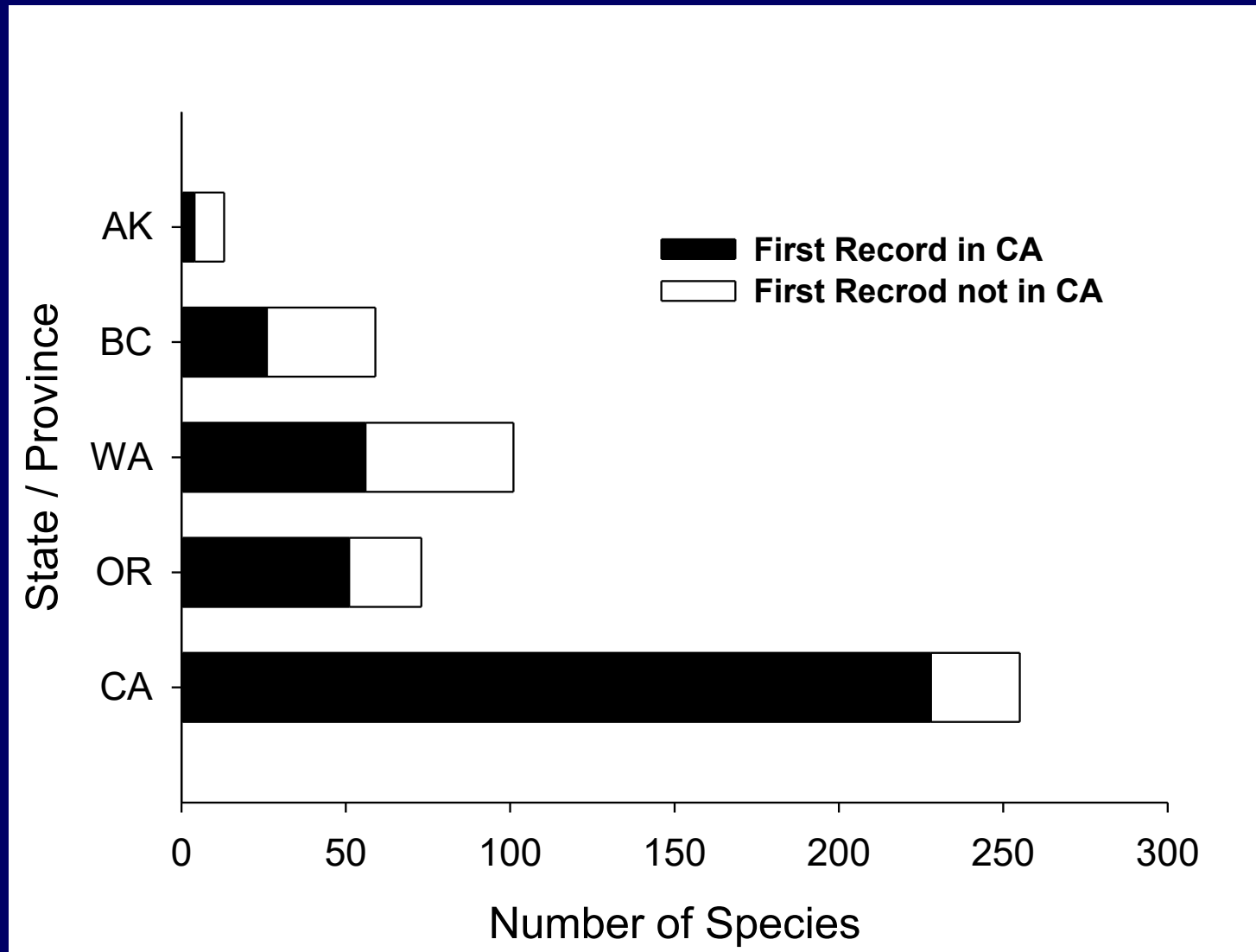
Smithsonian Environmental Research Center

Brief Presentation to
Prince William Sound Citizens' Advisory Council
September 18, 2026

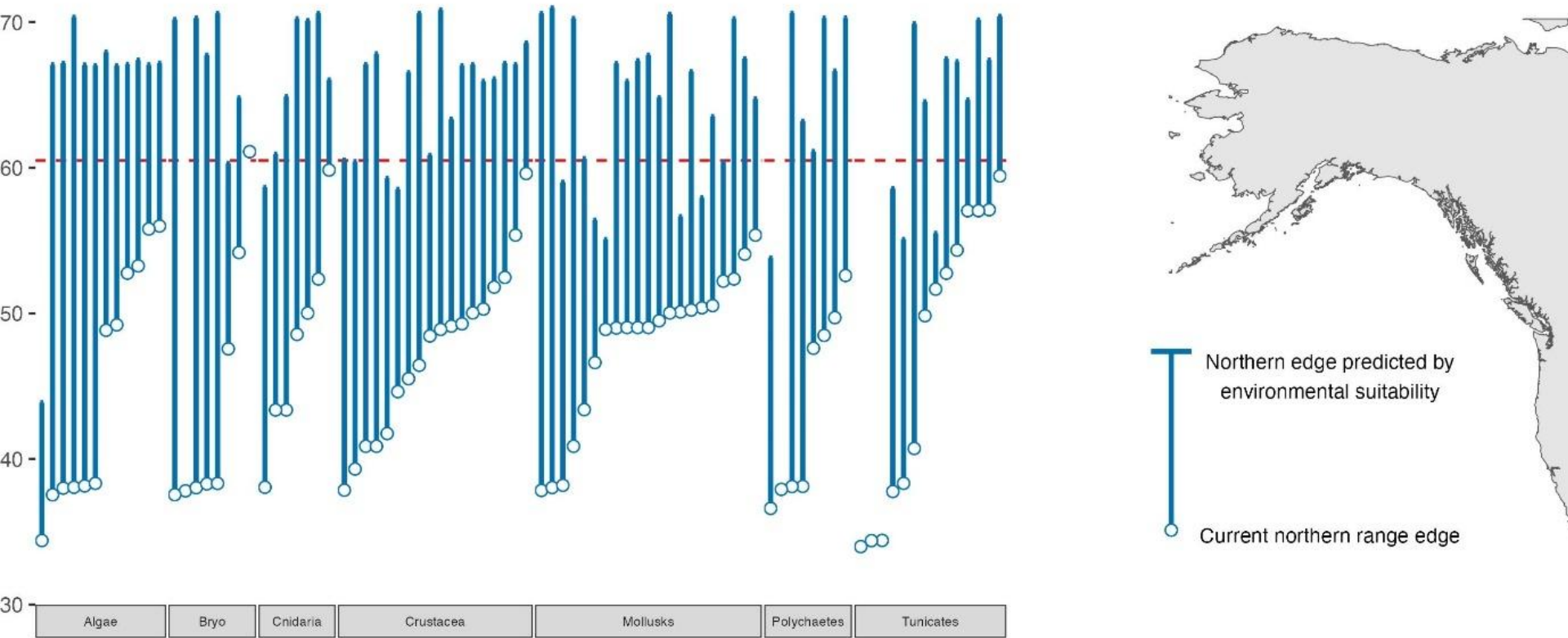
Invasions by European Crab (*Carcinus maenas*)



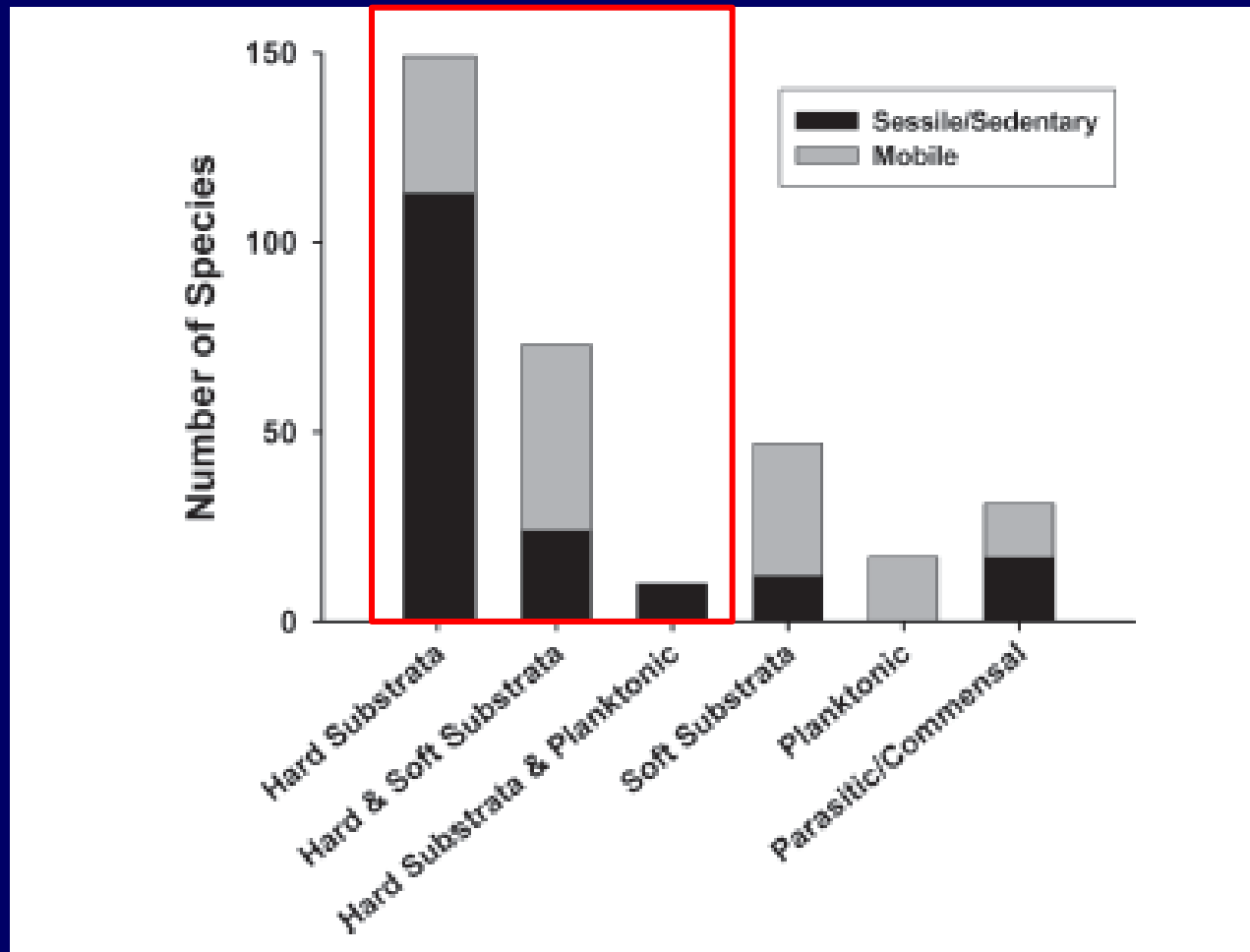
Northward Spread of California Invasions



Potential for continued Northward Spread ?



Most NIS utilize Hard Substrata



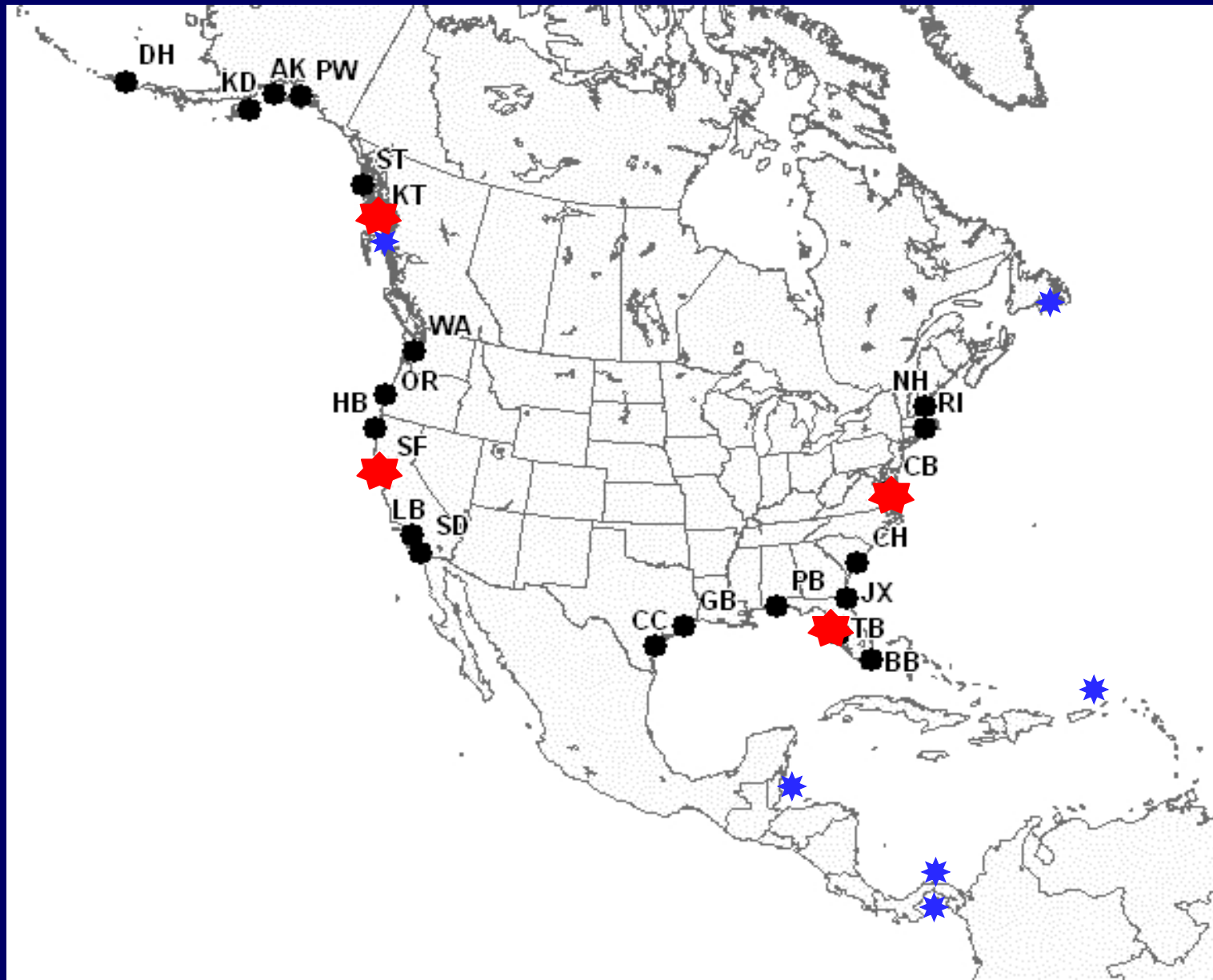
Standardized Surveys (Sessile Invertebrates)

10 SITES/BAY X 5 PLATES = 50 PLATES/BAY

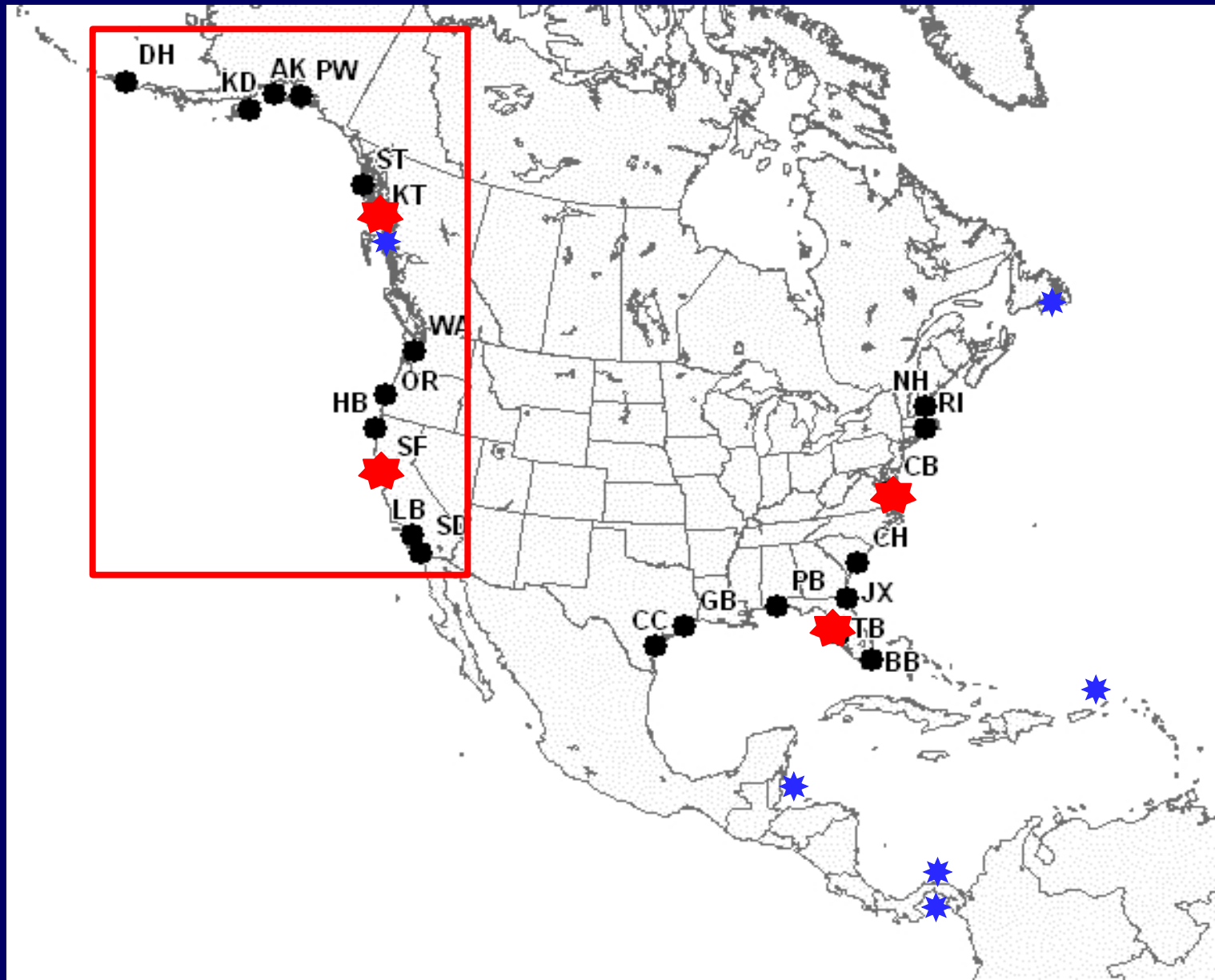
- **PVC Plate (14x14 cm)**
- **Suspended from dock / pier @ 1m depth**
- **High salinity (>25 ppt) sites**
- **3 months deployment (summer)**
- **Sessile species richness / plate**
- **Invasion status (NIS, Native, or Cryptogenic)**



SERC Marine Biofouling Community Surveys



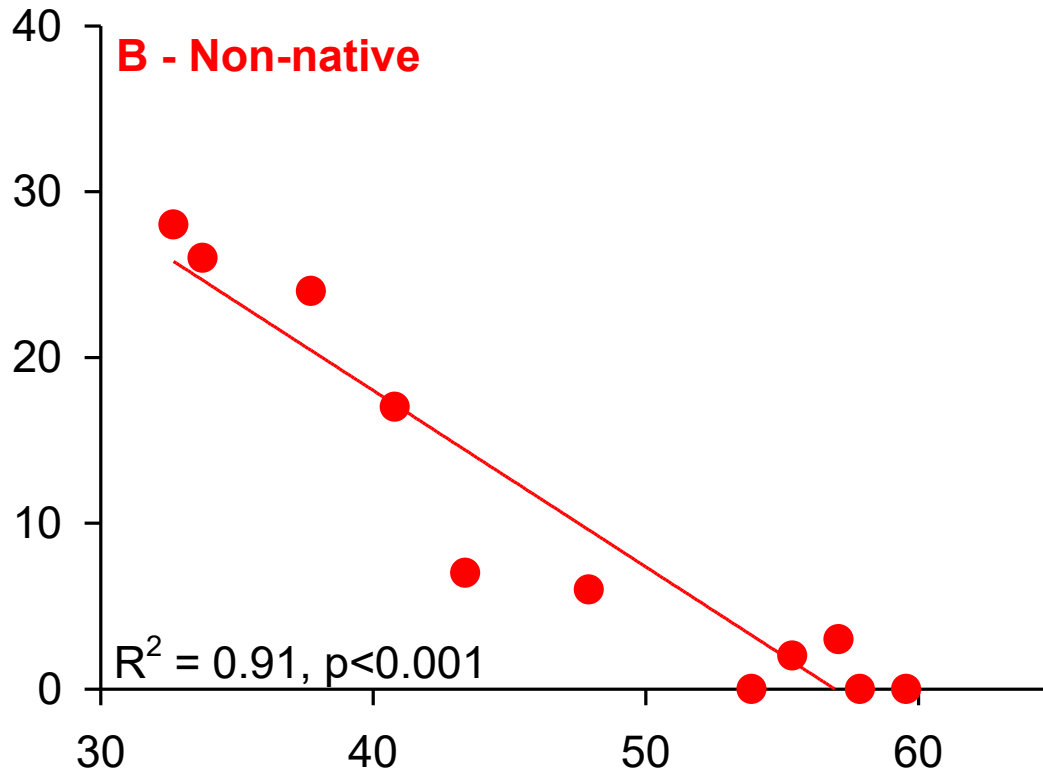
SERC Marine Biofouling Community Surveys



Diversity Gradient (31-61° N)

First Decadal Survey (2000-2010)

Number of Species

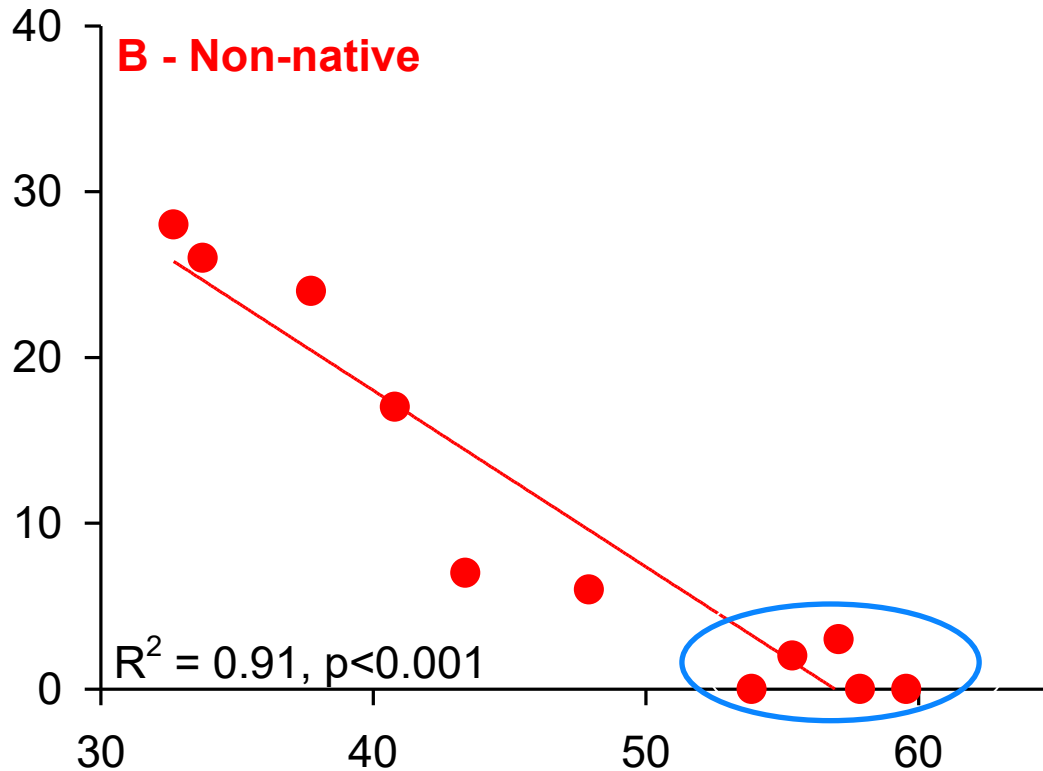


Latitude (Degrees N)

Diversity Gradient (31-61° N)

First Decadal Survey (2000-2010)

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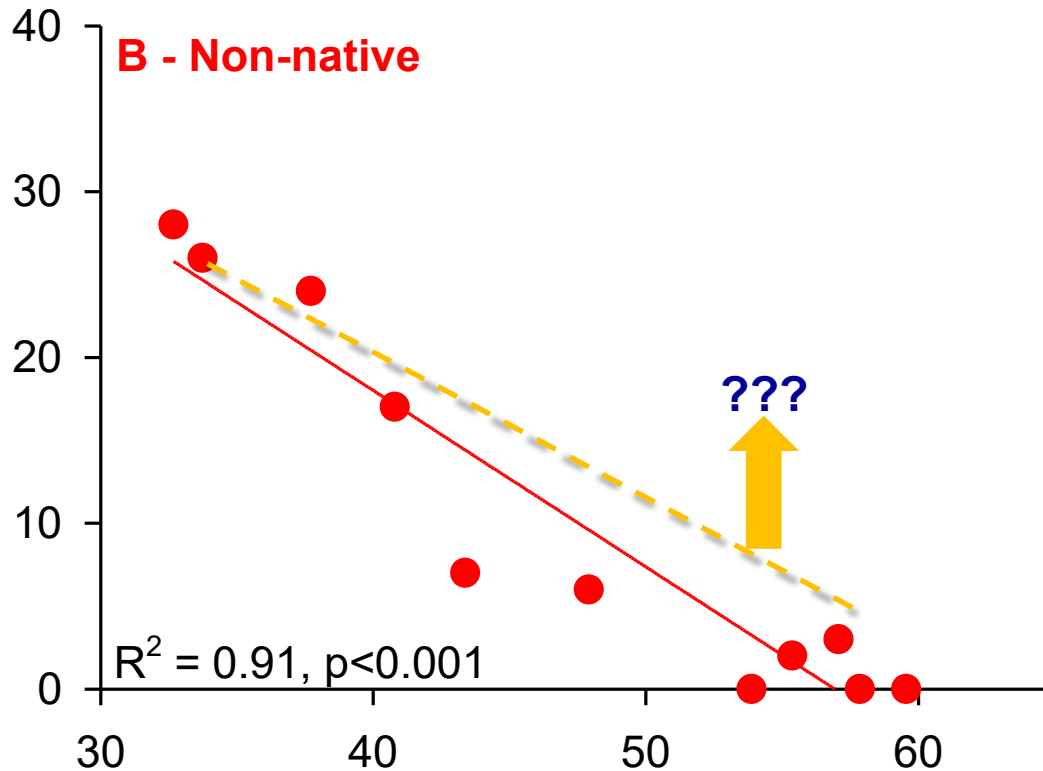


Latitude (Degrees N)

Diversity Gradient (31-61° N)

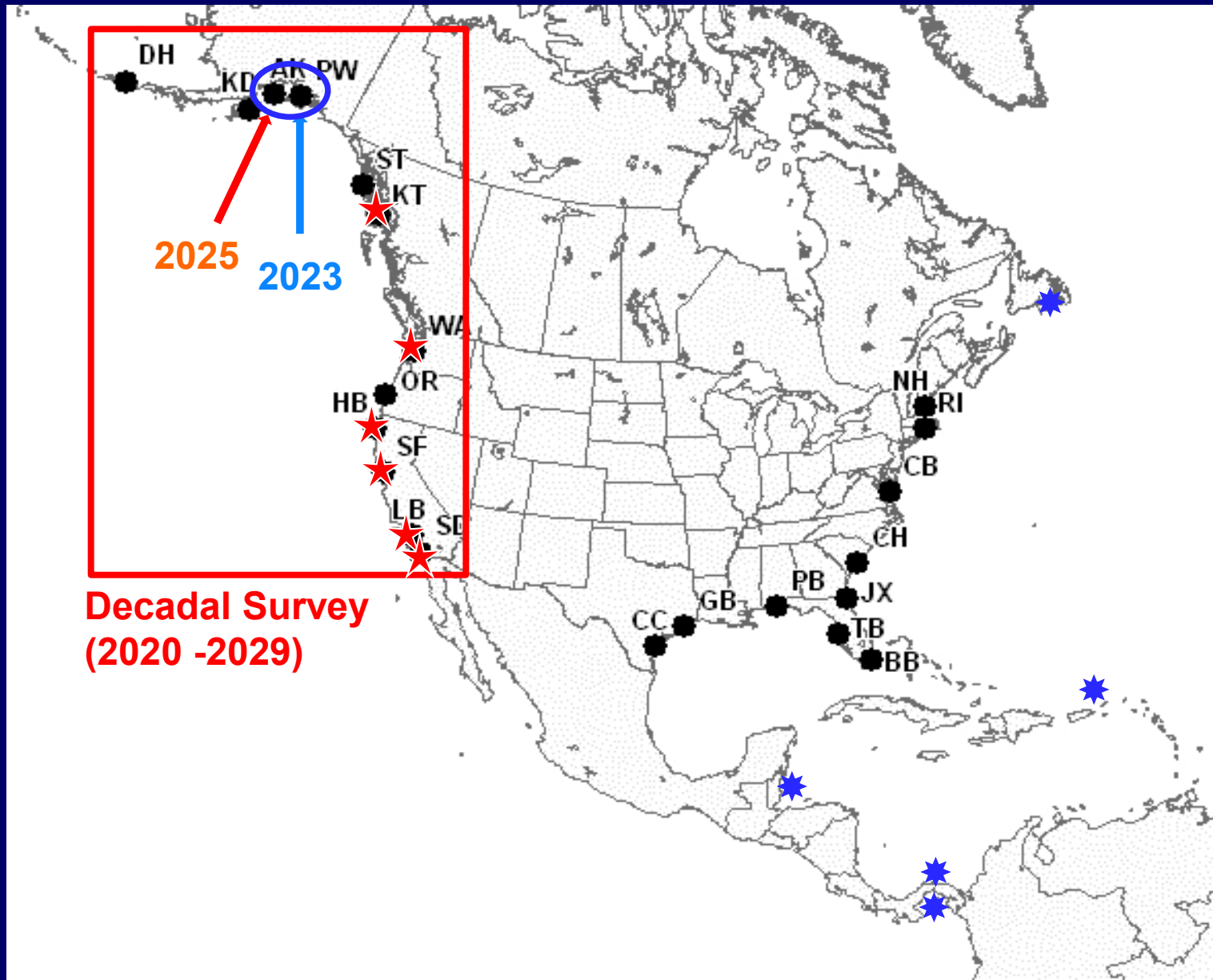
Second Decadal Survey (2020-2030)

Number of Species



Latitude (Degrees N)

SERC Marine Biofouling Community Surveys



Morpho vs. Genetic Detection: Taxonomic Overlap

98% identity - with binomial names



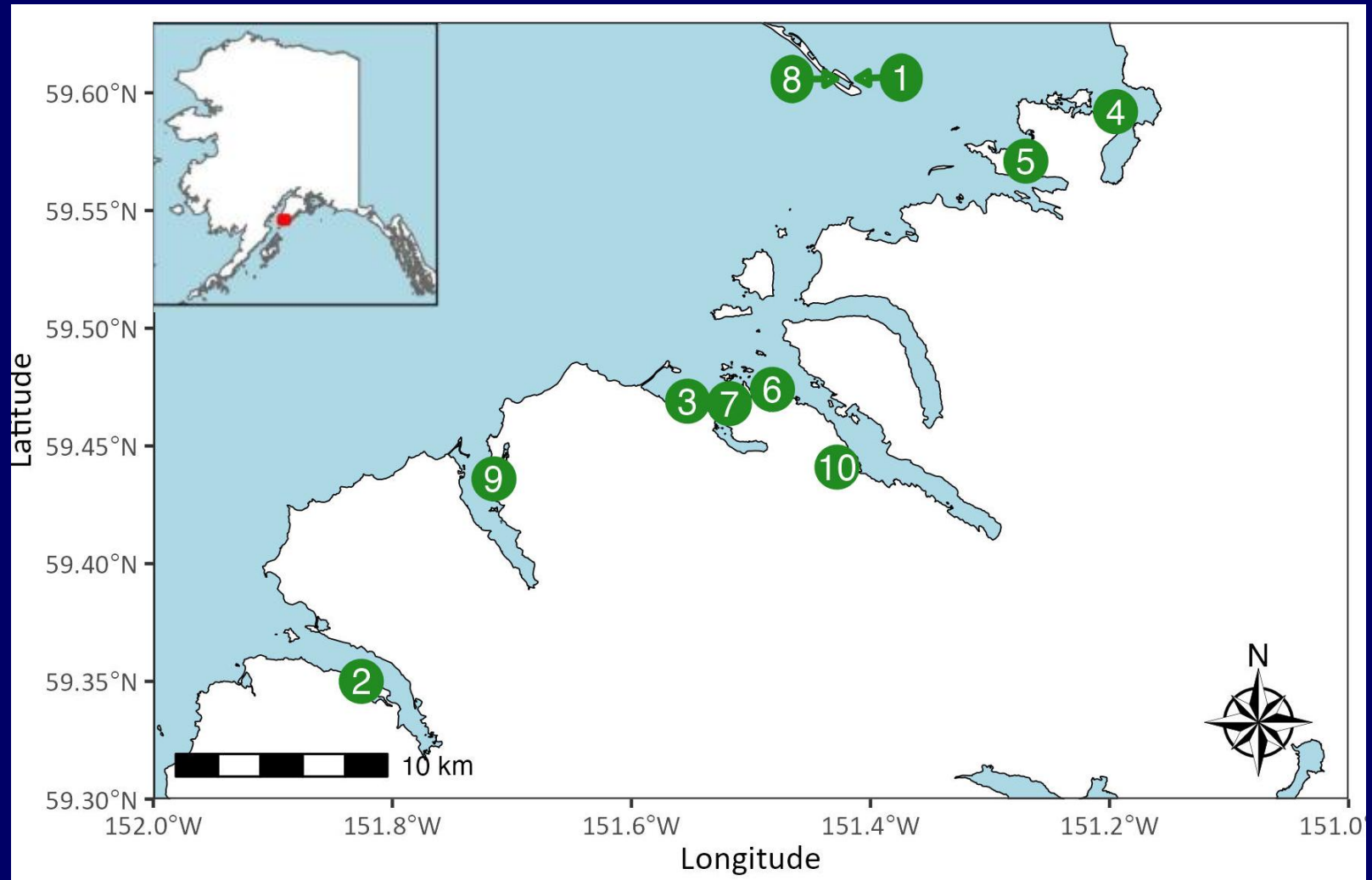
NIS Detections in Alaska by Region (21 Invertebrates)

Taxa Group	Taxon	Aleutians	Kodiak	Central Alaska (Cook Inlet)	Prince William Sound	Southeast Alaska
Brozoan	<i>Bugula neritina</i>					Unk
Bryozoans	<i>Cryptosula pallasiana</i>					Unk
Bryozoans	<i>Schizoporella japonica</i>				Estab	Estab
Bryozoans	<i>Watersipora subatra</i>					Unk
Cnidarians-Anthozoans	<i>Diadumene lineata</i>					Unk
Cnidarians-Hydrozoans	<i>Ectopleura crocea</i>					Estab
Crustaceans-Amphipods	<i>Ampithoe valida</i>					Estab
Crustaceans-Amphipods	<i>Caprella mutica</i>	Estab		Estab	Unk	Estab
Crustaceans-Amphipods	<i>Monocorophium acherusicum</i>				Unk	
Crustaceans-Amphipods	<i>Monocorophium insidiosum</i>					Unk
Crustaceans-Barnacles	<i>Amphibalanus improvisus</i>				Unk	
Crustaceans-Crabs	<i>Cardinus maenas</i>					Estab
Crustaceans-Isopods	<i>Orthonia griffenis</i>					Estab
Mollusks-Bivalves	<i>Magallana gigas</i>					Stock
Mollusks-Bivalves	<i>Mya arenaria</i>				Estab	
Tunicates	<i>Botrylloides violaceus</i>				Unk	Estab
Tunicates	<i>Botryllus schlosseri</i>					Estab
Tunicates	<i>Ciona savignyi</i>				Unk	Unk
Tunicates	<i>Didemnum vexillum</i>					Estab
Tunicates	<i>Molgula citrina</i>			Estab		

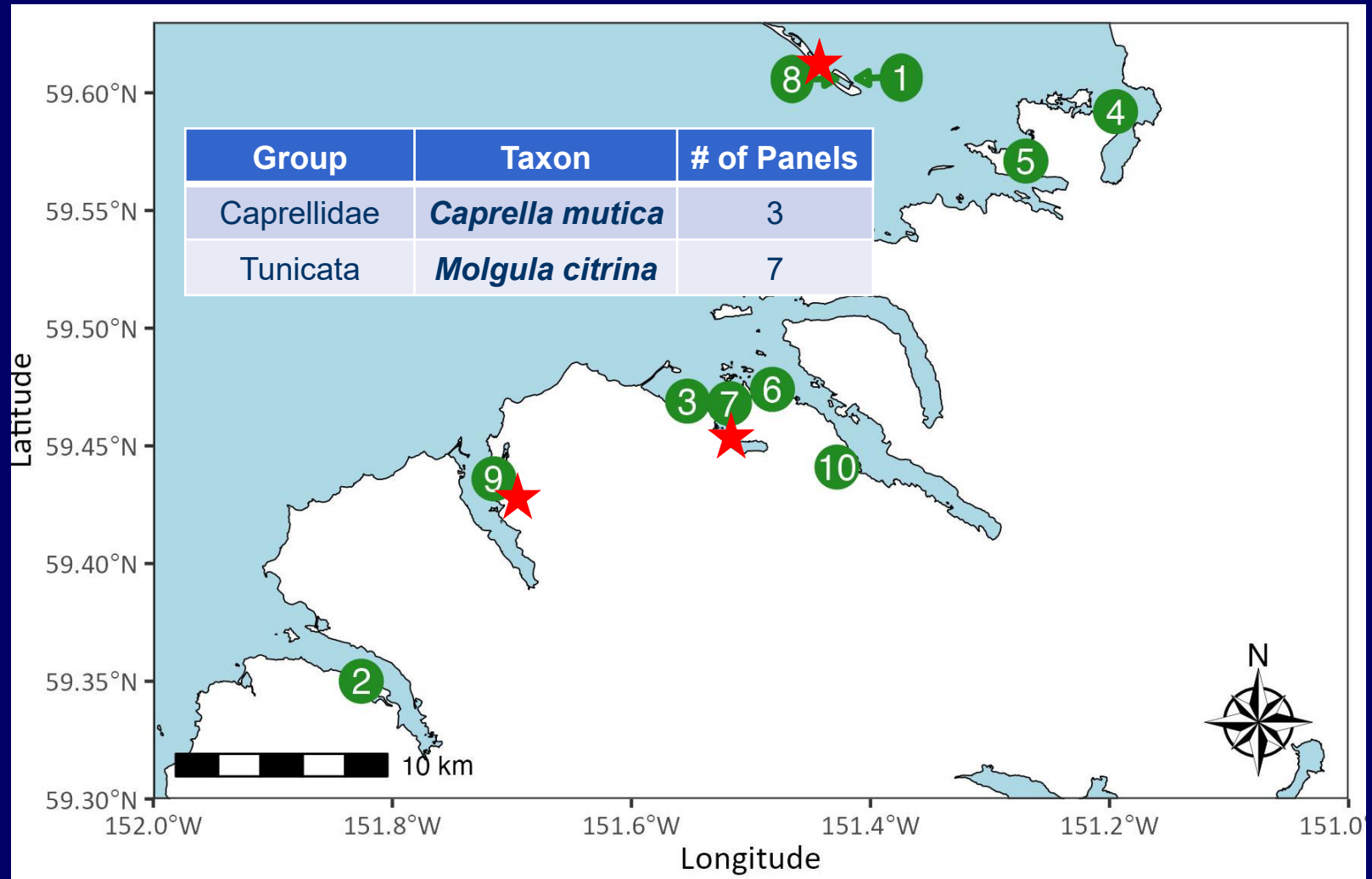
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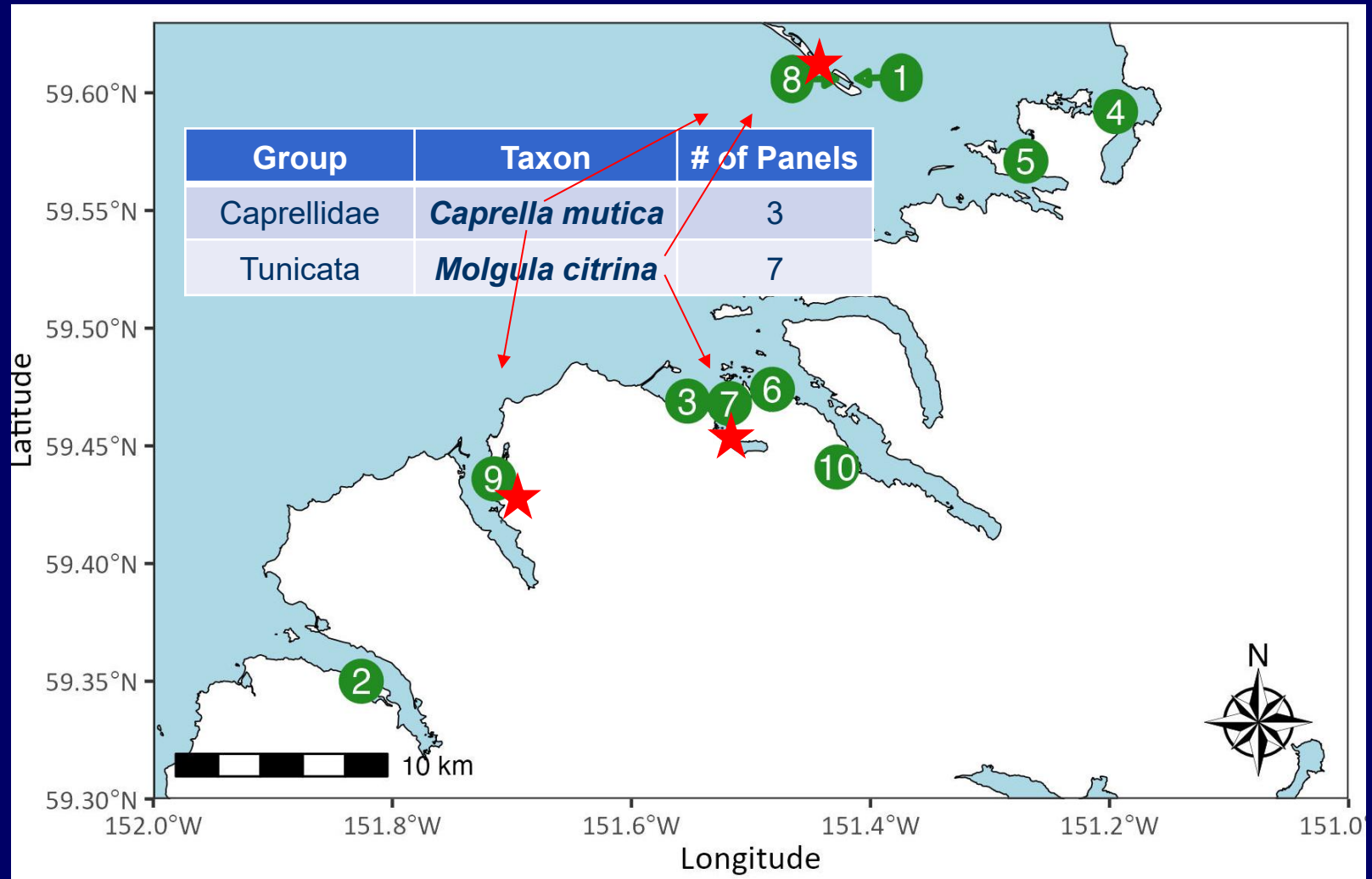
Survey Sites: Kachemak 2025



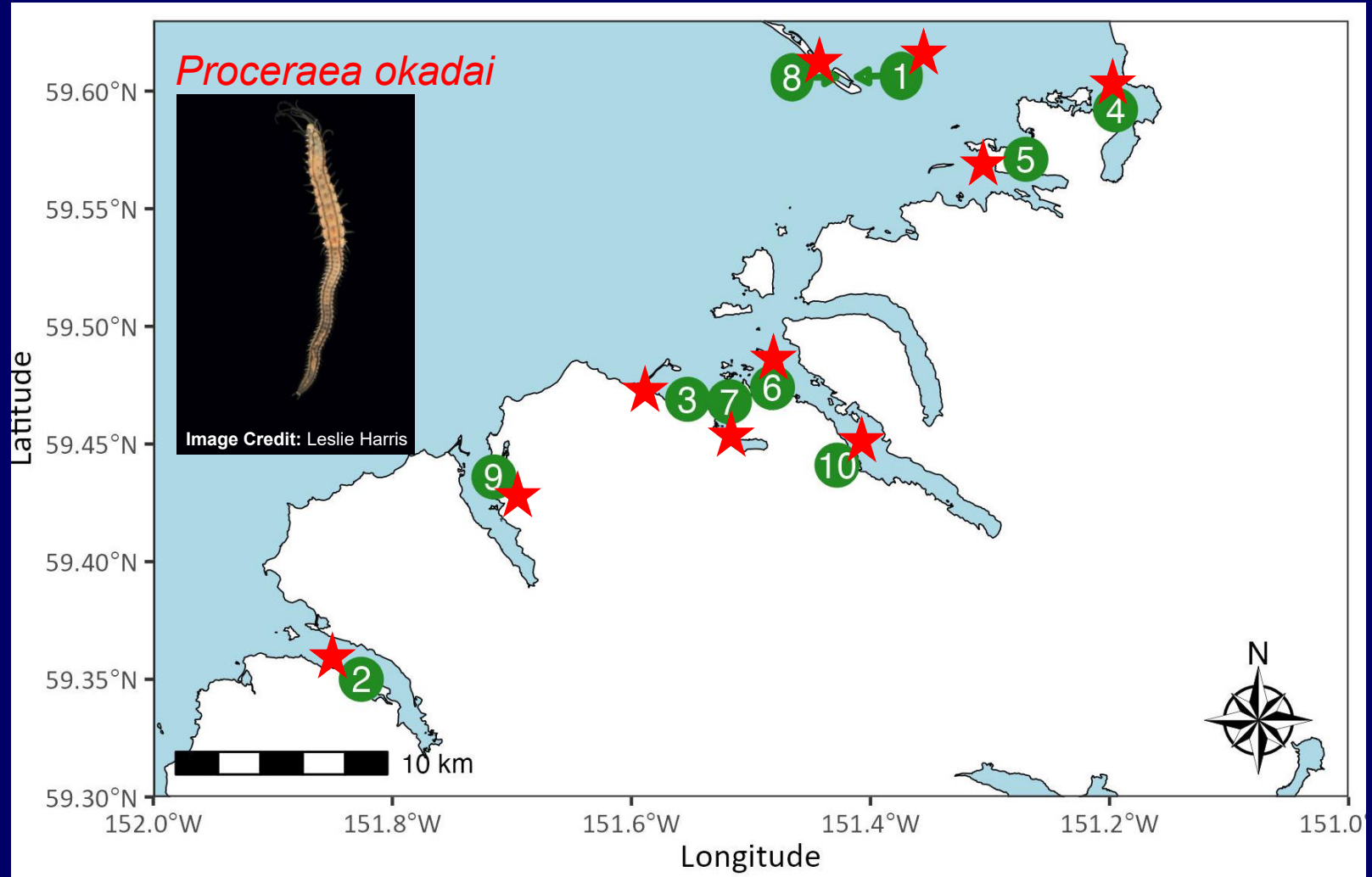
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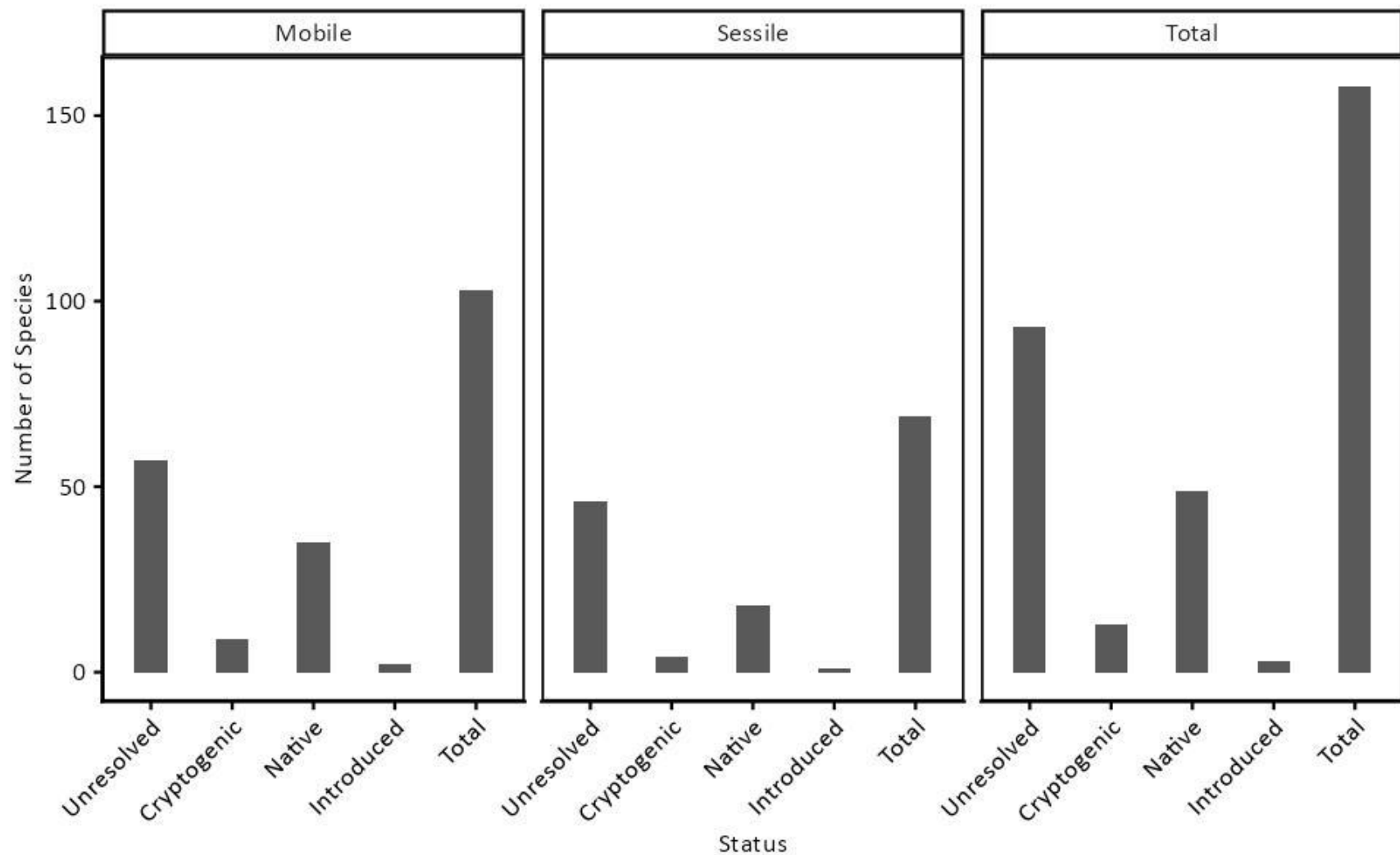


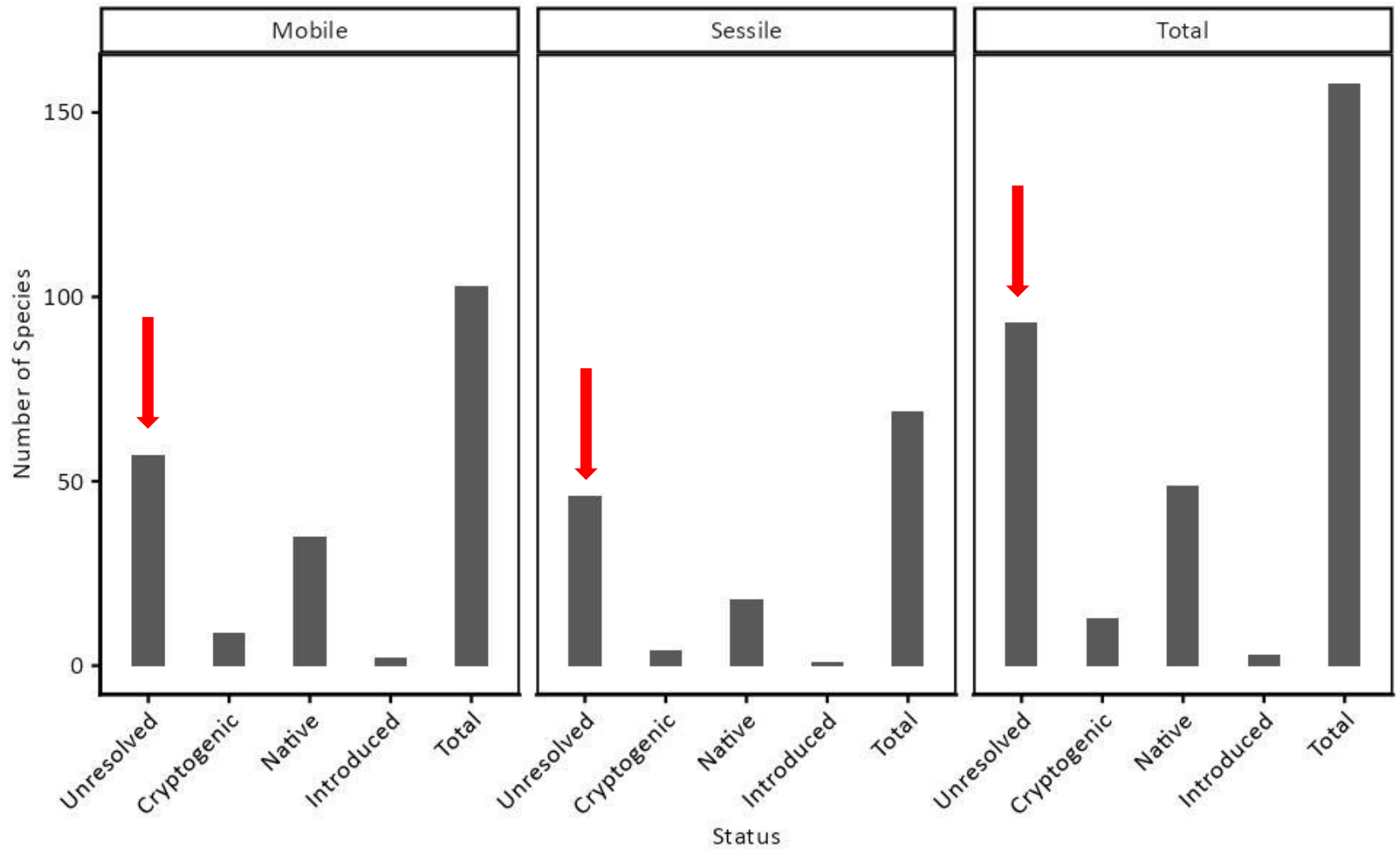
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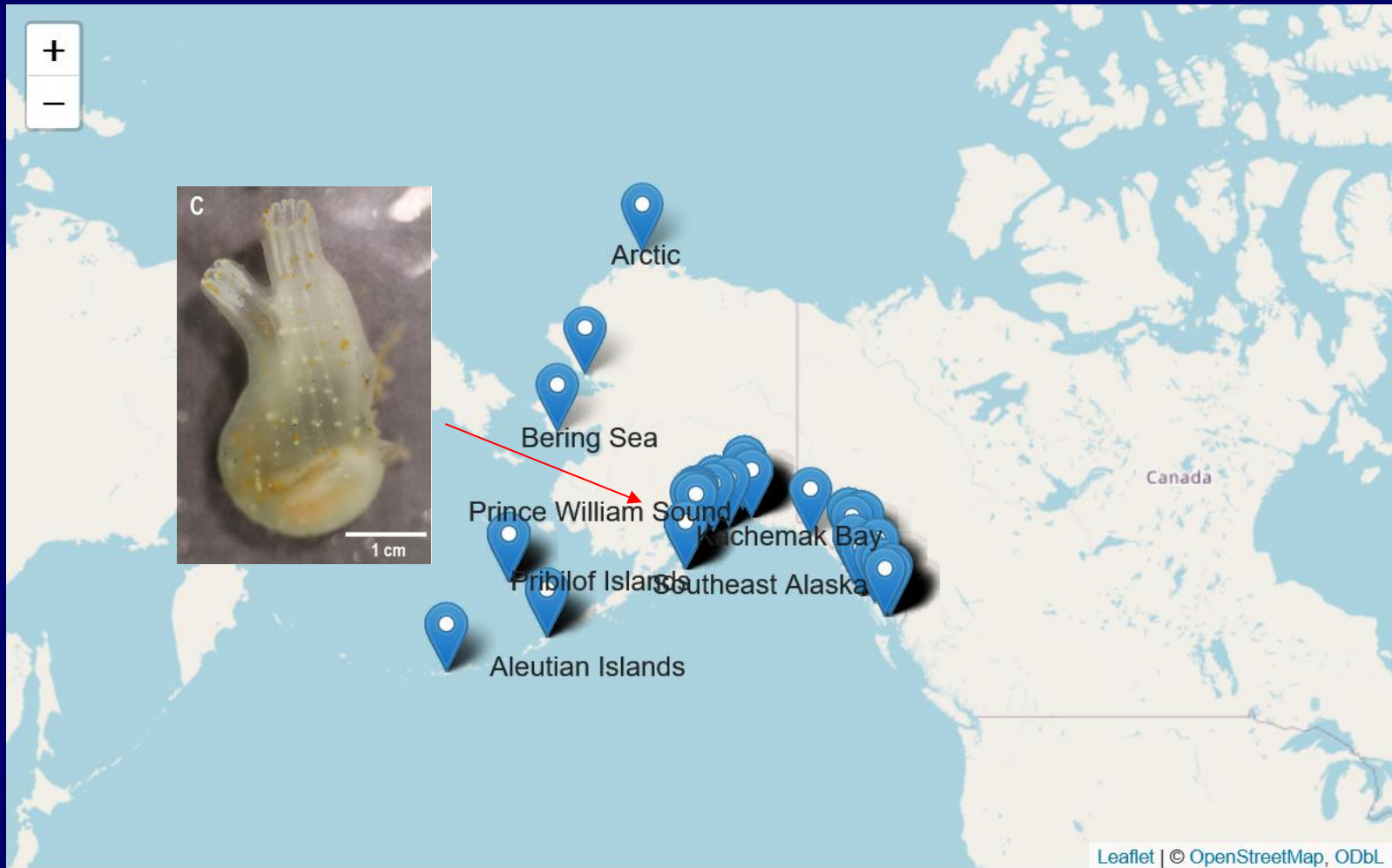
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Annelid	<i>Proceratea okadai</i>			★ Estab		

Decadal Assessment of Marine NIS in Kachemak Bay

- **Part I: Benthic Invertebrates (Morphological Analyses)**
- **Part II: Benthic Invertebrates (Genetic Analyses)**
- **Part III: Zooplankton (Genetic Analyses)**

PlateWatch: Non-Native Species Detection in AK



Recommendations

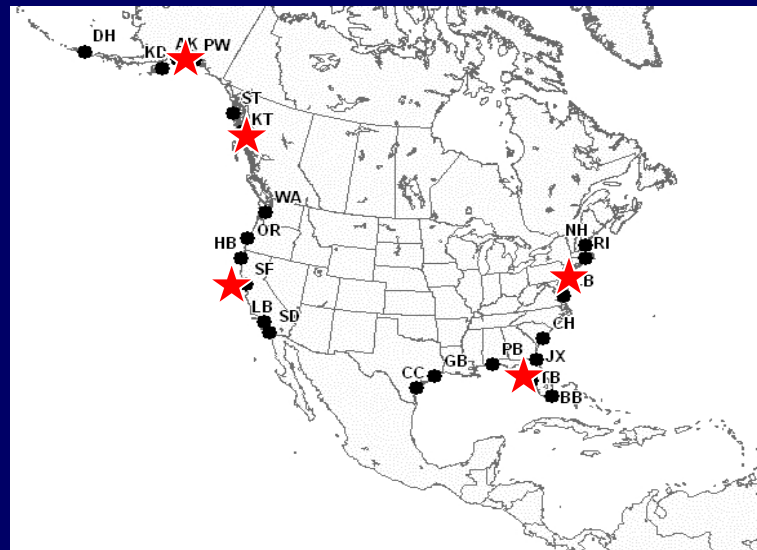
- Regular surveys of PWS & Kachemak Bay to evaluate:
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 - (b) long-term changes in marine community

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- * 3 Year Frequency in PWS or Kachemak Bay (Sentinel Site)



Recommendations

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 - (b) long-term changes in marine community
- Opportunities to Expand PlateWatch Program:
 - (a) standardized genetic detection
 - (b) training opportunities (workshops, online modules)

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- Prioritize frequent measures at transportation hubs:
 - (a) Valdez Marine Terminal, Tatilek Ferry Dock
 - (b) Homer Spit marina, Seldovia

