



# Salish Sea Science Roundtable

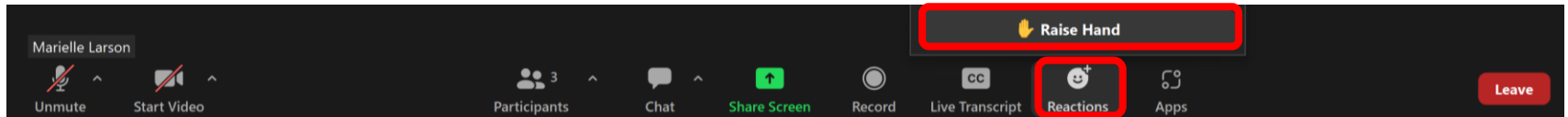
# Navigating the Roundtable

## Welcome! While we wait, please:

- Update your name to include your pronouns and organization
- Message Marielle with any access needs
- Introduce yourself in the chat. We've muted participants to minimize technical issues, so we encourage you to use the chat to say hello instead

## Questions or Comments?

- Add them to the chat
- Raise your hand and we'll unmute you



The slides and recording will be available on [Puget Sound Institute's website](#)



# Land Acknowledgement

The UW Tacoma community acknowledges that we learn, teach, work and live on the ancestral land of the Coast Salish people. In particular, our campus is situated on traditional lands of the Puyallup Tribe of Indians. We recognize that this is a difficult and painful history, and we understand we must play an active role in remembering, not just what happened to Indigenous communities; post settlement, but also the rich history that existed long before colonization. This land acknowledgement is one small act in an ongoing process of honoring the past while working together with local Tribes to build a more inclusive and thoughtful community.

# eDNA in the Salish Sea

Ryan Kelly  
University of Washington

Salish Sea Science Roundtable  
May 7, 2024



# eDNA Collaborative

BY THE NUMBERS



Visiting Scholars



150  
Microgrants from  
Awarded

40+  
Countries on

6  
Continents

# eDNA Collaborative

Ryan Kelly – Director

Eily Allan – Chief Scientist

Cara Sucher – Program Manager

Kate Bertko – Project Manager

Shana Hirsch – Staff Scientist

Aden Ip – Staff Scientist

**Funding:**

David & Lucile Packard Foundation  
Oceankind

# Goal

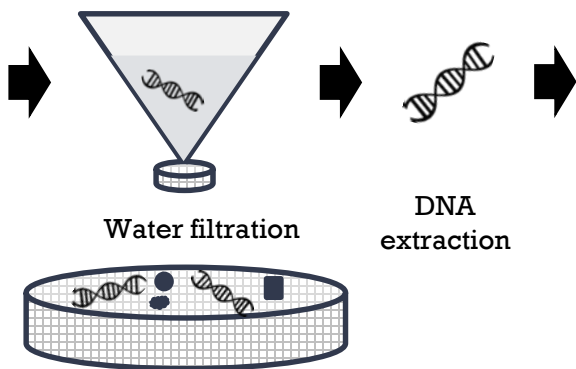
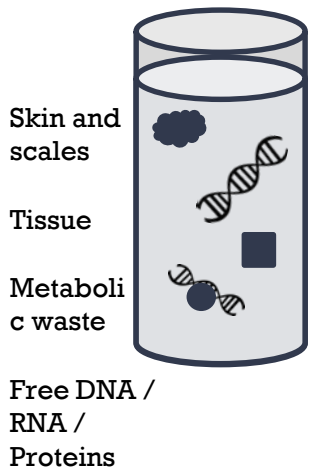
To move eDNA out of the lab and into practice for researchers around the world





# What is eDNA?

## A soup of information



PCR

Metabarcoding:  
Hundreds/thousands of species  
less quantitative



**Scalable**  
**Automatable**  
**Sensitive**  
**Non-invasive**

Quantitative PCR:  
single-target, quantitative





# eDNA in Practice

Invasive species detection

Fisheries management

Detecting secret dolphins

But is it legal?

Endangered species monitoring

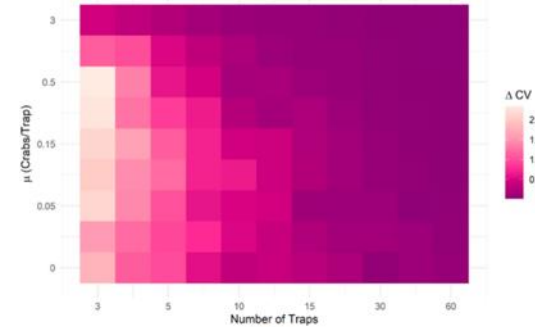
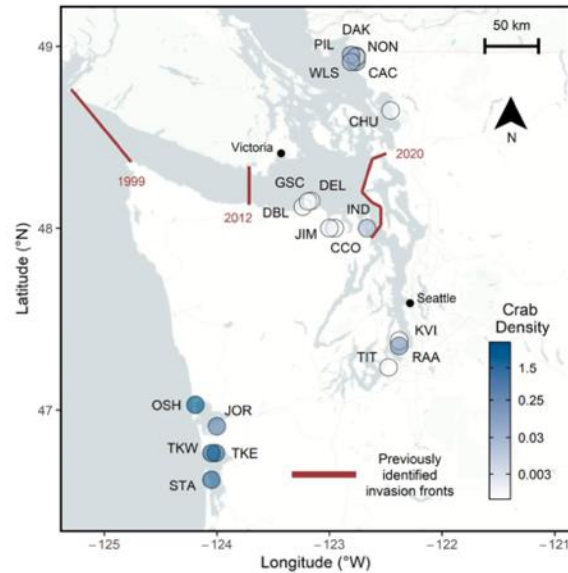
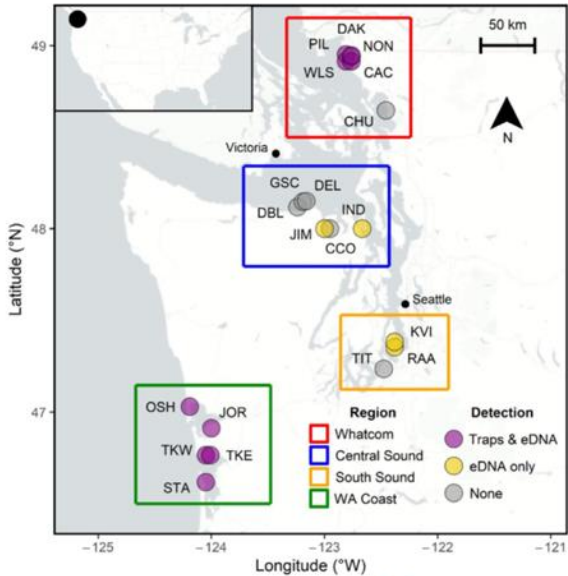
Salmon culverts

HABs

Environmental impact reporting

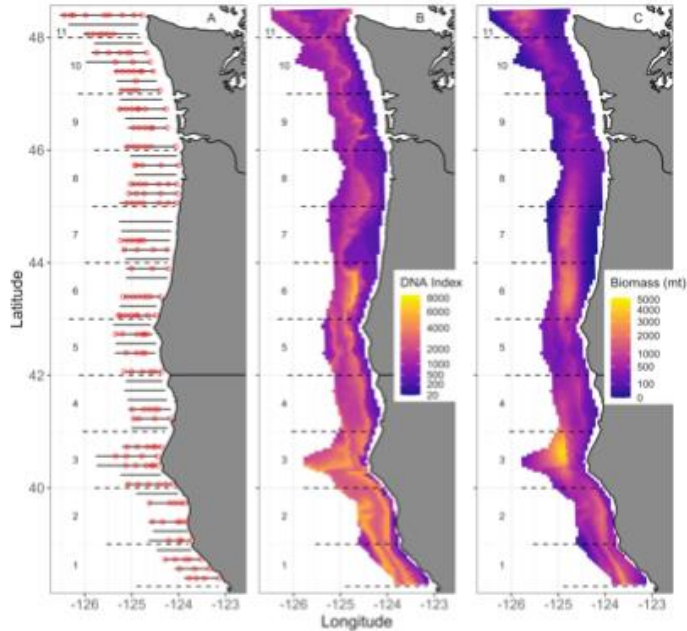


# Invasive species: European Green Crab

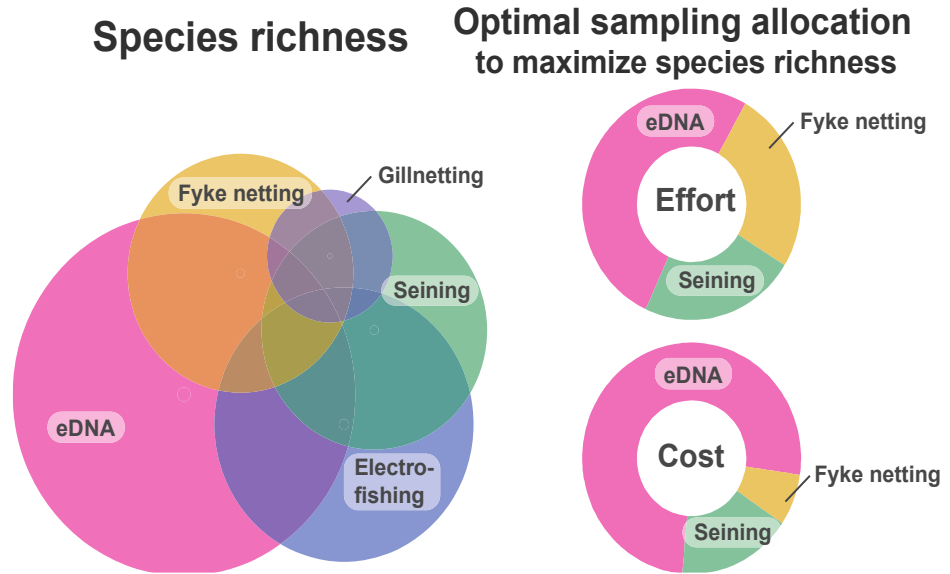


Formally equating eDNA detections and traditional trapping methods

# Fisheries Management



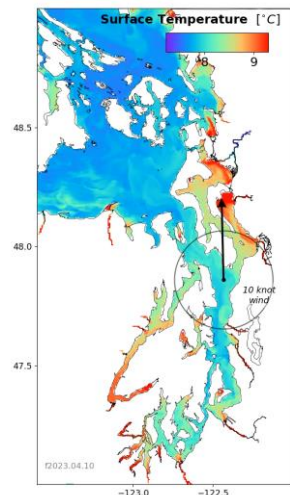
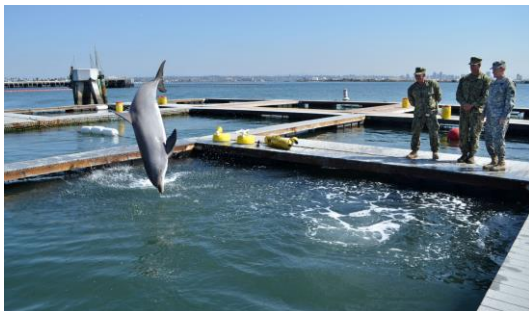
Shelton et al. 2022 *Proceedings B*



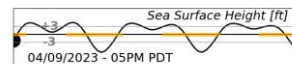
Andres et al. 2013

# eDNA Fate and Transport

When we detect mammal eDNA, what does that mean in terms of actual animals?



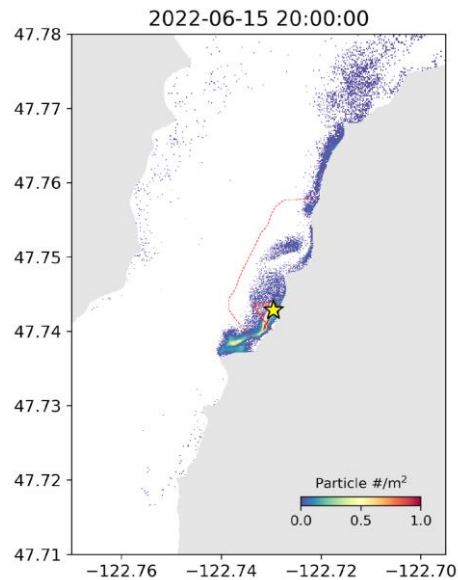
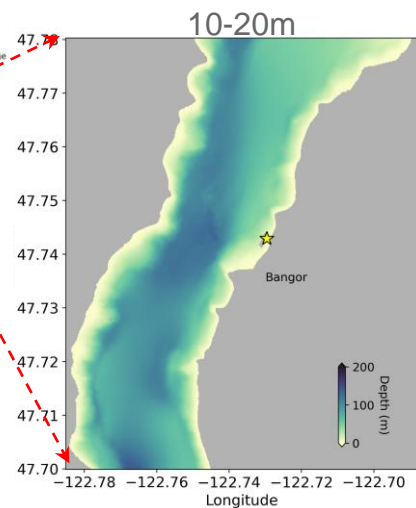
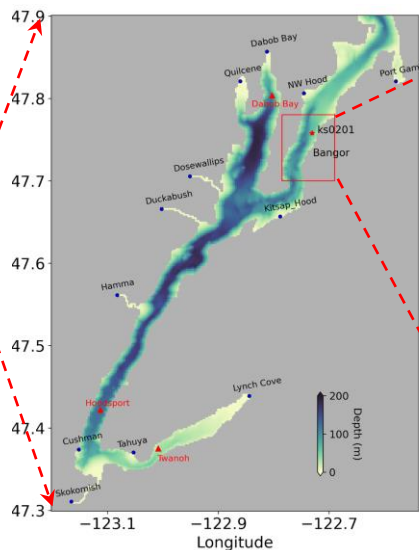
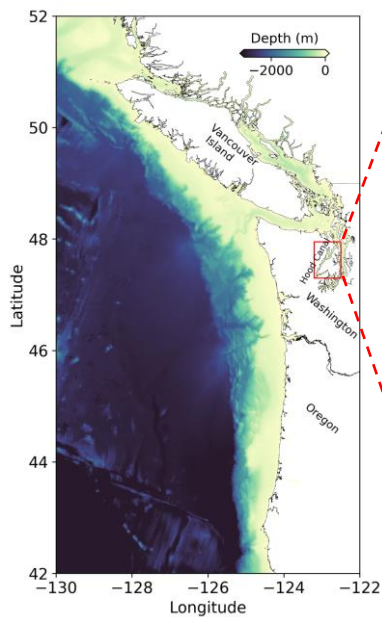
Live Ocean  
(MacCready)



A dolphin “megacosm” + A high-res oceanographic model + eDNA sampling

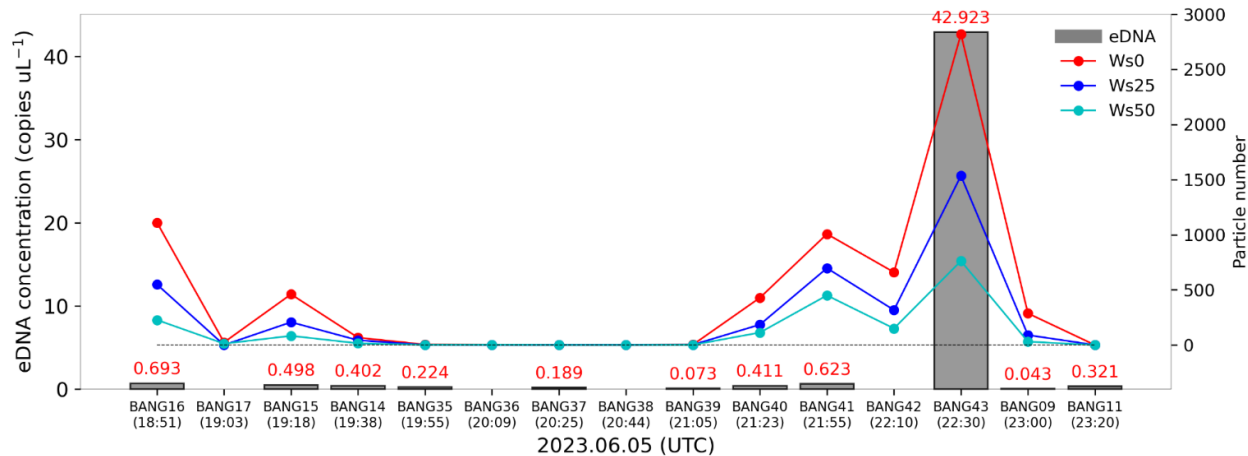
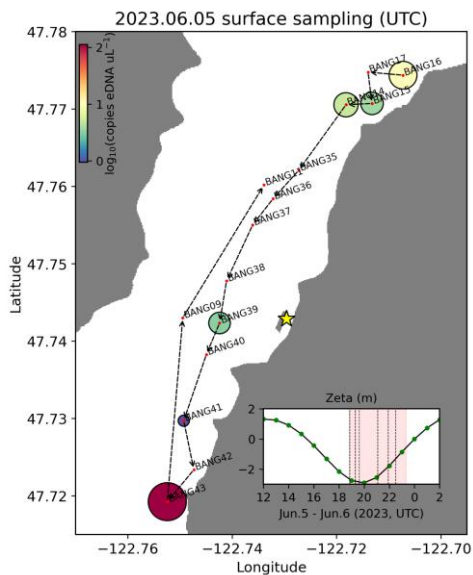
# eDNA Fate and Transport

Downsampling oceanographic model + particle-tracking to predict eDNA dispersal



# eDNA Fate and Transport

Testing particle-tracking against surface eDNA samples – pilot phase



# Does eDNA meet legal requirements?

## In Court

Invasive species / Army Corps operations:

Carp assay admissible as evidence

Michigan v. US Army Corps (N.D. Illinois 2010)



Roanoke logperch (USGS)

FWS partial reliance on eDNA data upheld under Endangered Species Act  
(species not detected via qPCR or traditional sampling, treated as absent)  
Appalachian Voices v. US Dept of Interior (4th Cir 2022)



M. Bailey (blackwarriorriver.org)

## Rulemaking

FWS partial reliance on eDNA data for ESA Critical Habitat Designation  
(species not detected via qPCR or traditional sampling, treated as absent)  
Black Warrior Waterdog listing, 83 Fed. Reg. 257 (2018)



## Toward a national eDNA strategy for the United States

Ryan P. Kelly<sup>1</sup> | David M. Lodge<sup>2</sup> | Kai N. Lee<sup>3</sup> | Susanna Theroux<sup>4</sup> | Adam J. Sepulveda<sup>5</sup> | Christopher A. Scholin<sup>6</sup> | Joseph M. Craine<sup>7</sup> | Elizabeth Andruszkiewicz Allan<sup>1</sup> | Krista M. Nichols<sup>8</sup> | Kim M. Parsons<sup>8</sup> | Kelly D. Goodwin<sup>9</sup> | Zachary Gold<sup>10</sup> | Francisco P. Chavez<sup>5</sup> | Rachel T. Noble<sup>11</sup> | Cathryn L. Abbott<sup>12</sup> | Melinda R. Baerwald<sup>13</sup> | Amanda M. Naam<sup>14</sup> | Peter M. Thielen<sup>15</sup> | Ariel Levi Simons<sup>16</sup> | Christopher L. Jerde<sup>17</sup> | Jeffrey J. Duda<sup>18</sup> | Margaret E. Hunter<sup>19</sup> | John A. Hagan<sup>20</sup> | Rachel Sarah Meyer<sup>16</sup> | Joshua A. Steele<sup>4</sup> | Mark Y. Stoeckle<sup>21</sup> | Holly M. Bik<sup>22</sup> | Christopher P. Meyer<sup>23</sup> | Eric Stein<sup>4</sup> | Karen E. James<sup>24</sup> | Austen C. Thomas<sup>25</sup> | Elif Demir-Hilton<sup>26</sup> | Molly A. Timmers<sup>27</sup> | John F. Griffith<sup>4</sup> | Michael J. Weise<sup>28</sup> | Stephen B. Weisberg<sup>4</sup>

## Adoption of environmental DNA in public agency practice

Kai N. Lee<sup>1,2</sup> | Ryan P. Kelly<sup>3</sup> | Elif Demir-Hilton<sup>4</sup> | Eric Laschever<sup>3</sup> | Elizabeth Andruszkiewicz Allan<sup>3</sup>

REQUEST FOR INFORMATION (RFI)  
N00014-23-RFI-0014

National Marine and Great Lakes eDNA Strategy

This announcement constitutes a Request for Information (RFI) for the purpose of determining the capability of sources or obtaining information. It does not constitute a Request for Proposal (RFP), a Request for Quote (RFQ), or an indication that the Government will contract for any of the items and/or services discussed in this notice. In accordance with Federal Acquisition Regulation (FAR) 15.201, responses to this notice are not offers and cannot be accepted by the Government to form a binding contract. Contractors responding to this request are advised that participation does NOT ensure opportunities for future solicitations or contract awards. Any formal solicitation that may subsequently be issued will be announced separately through SAM.gov. It is the responsibility of any potential Contractor to monitor SAM.gov for additional information pertaining to this topic.

# Gracias

Eily Allan, Cara Sucher, Kate Bertko,  
Megan Shaffer, Ole Shelton, and many others

Contact information:

Ryan Kelly ([rpkelley@uw.edu](mailto:rpkelley@uw.edu))



Tuesday, June 4

**Enhancing climate change planning &  
adaptive management in marine protected  
areas**

Kaia Bryce and Karen Hunter  
12:30 – 1:30 pm on [Zoom](#)

**Happy Hour at 5 pm**  
7 Seas Brewery and Taproom in Tacoma

**Salish Sea  
Science Roundtable**

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updates on future Salish Sea Science Roundtables*