Selection of In-bay Dredged Material Placement Sites for the Tillamook Bay Federal Navigation Project Oregon

James M. McMillan [1], Jason C. Seitz [2], Chanda Littles [1], Heidi Moritz [1], Hans Moritz [1], Jason Miller [1], and Gregory Speer [1]

[1] U.S. Army Corps of Engineers, Portland District, Portland, Oregon

[2] ANAMAR Environmental Consulting, Inc., Gainesville, Florida, and Hood River, Oregon

BENEFICIAL USE OF DREDGED MATERIAL (BUDM)

USACE-wide BUDM currently

30 to 40%

GOAL:

70%

by 2030

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
441 G STREET, NW
WASHINGTON, DC 20314-1000

CECW-CO 28-Aug-23

MEMORANDUM FOR COMMANDERS, MAJOR SUBORDINATE COMMANDS AND DISTRICT COMMANDS

SUBJECT: Expanding Beneficial Use of Dredged Material in the USACE

1. References:

a. EM 1110-2-5025, Dredging and Dredged Material Management, 31 July 2015.

b. CECG - Beneficial Use of Dredged Material Command Philosophy Notice, 25 January 2023.

2. Purpose: On 25 January 2023, LTG. Scott A. Spellmon issued a "Beneficial Use of Dredged Material Command Philosophy Notice" outlining the USACE's goal to beneficially use at least 70% of its dredged material by the year 2030. Achieving the beneficial use (BU) goal of 70% by 2030 will require innovation and commitment as we focus on dredged material as a resource with benefits to the ecosystem, economy, and project delivery. The intent of this memorandum is to encourage robust innovation, planning, and categorization of dredged material for beneficial use. Additionally, this policy memorandum clarifies which dredged material placement activities shall be classified as beneficial use and how to capture this information in the USACE data systems. Finally, this memorandum introduces transitional placement as a third description for dredged material.

ANAMAR

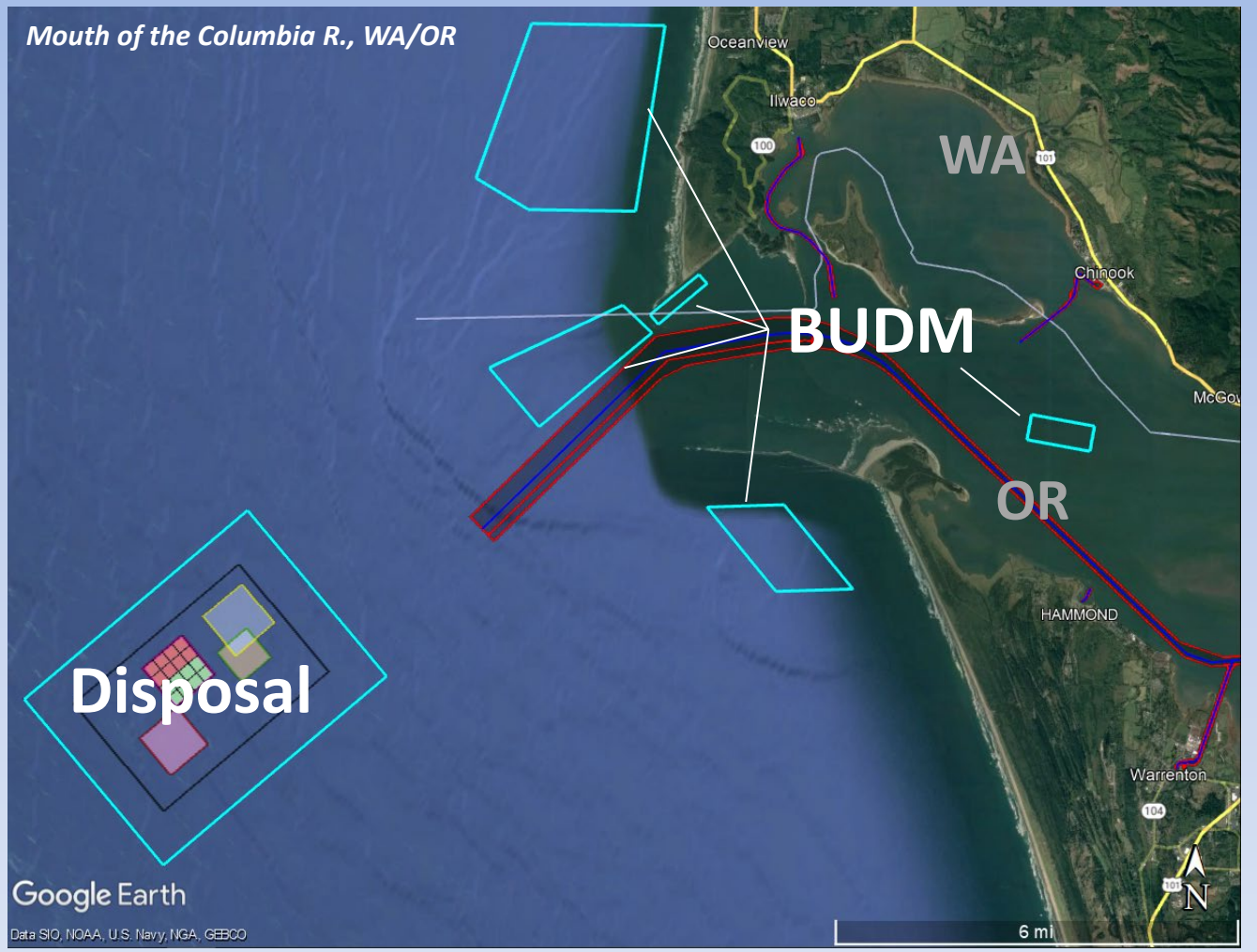
NEARSHORE / ESTUARINE VS. DEEPWATER PLACEMENT

Nearshore/Estuary Placement Enables BUDM

BUDM = productive use of dredged material for habitat restoration, sustaining sediment budget, beach building, and commercial purposes.

...Deepwater placement does NOT

The placement of material in an offshore area where the material is anticipated to remain in place and have no measurable benefit to nearshore.



ANAMAR

BUDM in Portland District

USACE-wide BUDM GOAL:

70%

by 2030

USACE-Portland BUDM now:

68 to 74%

(2018–2022)

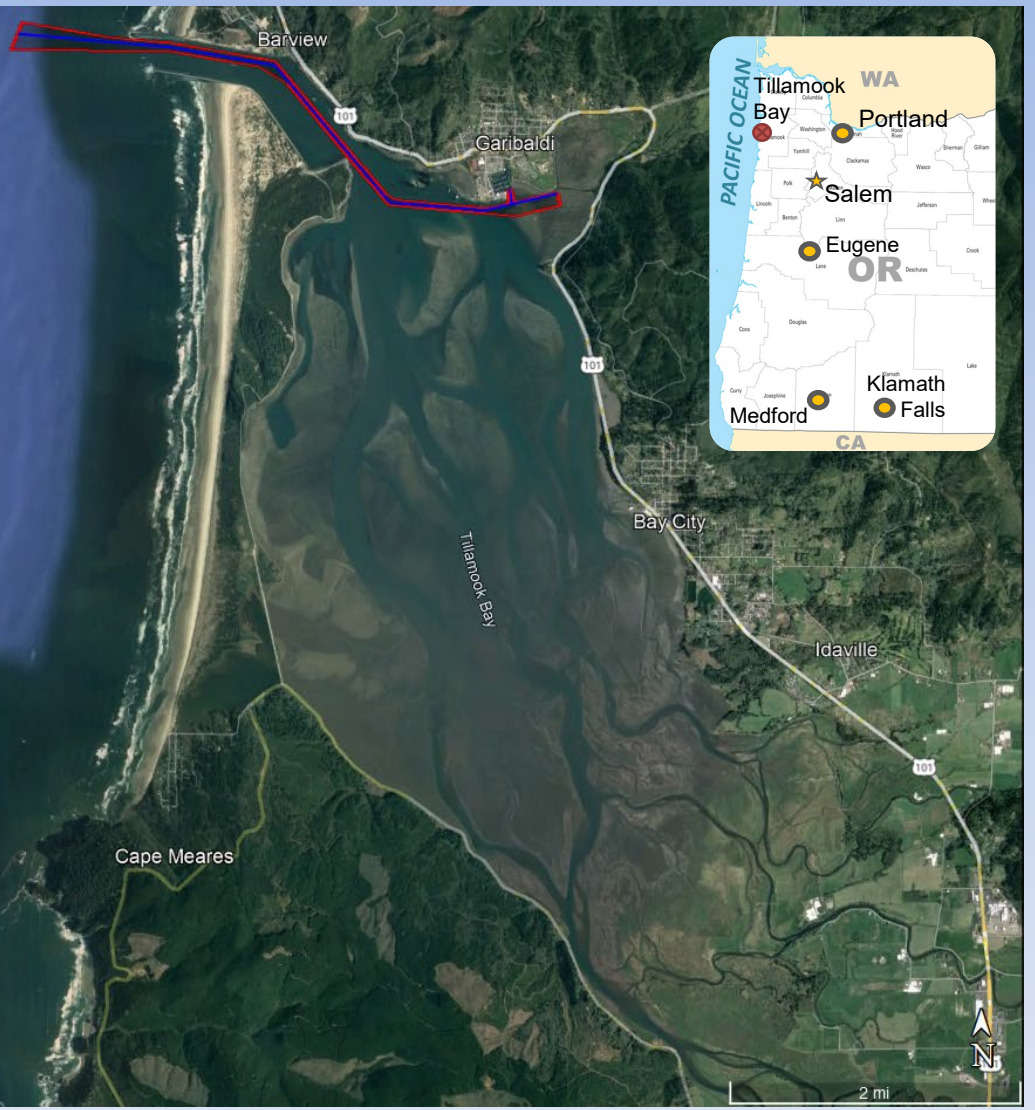
Rice Island beach nourishment by pipeline dredge (Dredge OREGON), lower Columbia R., WA/OR

but there's always room for improvement…

ANAMAR

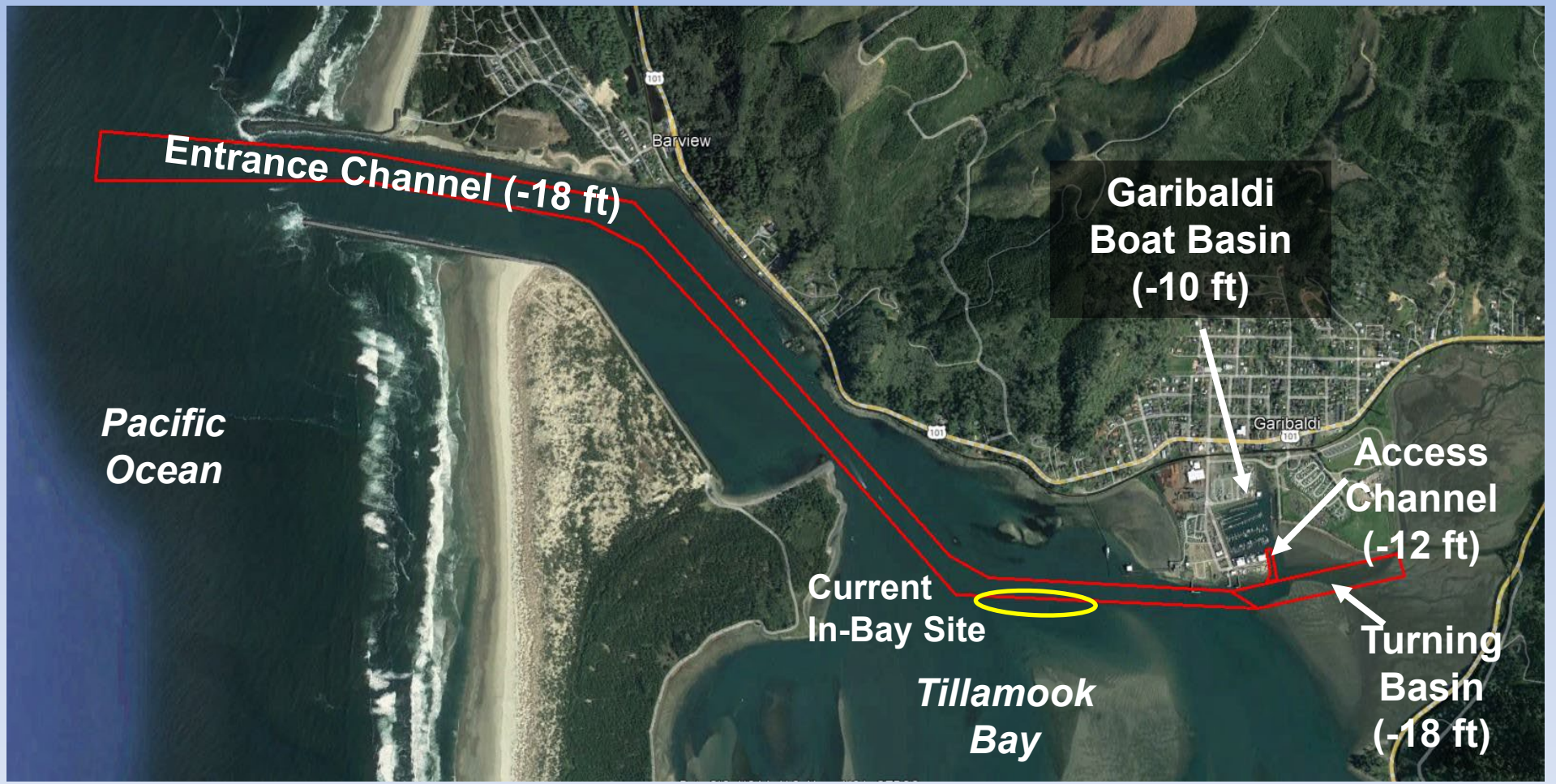
TILLAMOOK BAY

- 75 mi west of Portland
- Watershed area ~500 mi^2
- **FIVE** rivers flow into the bay (Wilson, Trask, Tillamook, Kilchis, Miami)
- 6 mi long, up to 2.5 mi wide, avg depth = 6.6 ft
- 3 mi nav channel provides Garibaldi Boat Basin & US Coast Guard access
- Local Industries: dairy/livestock, timber, tourism, commercial & rec fish/shellfish



ANAMAR

TILLAMOOK FED CHANNEL AND PORT OF GARIBALDI



ANAMAR

TILLAMOOK FED CHANNEL AND PORT OF GARIBALDI DREDGING

Need:

Port of Garibaldi
Boat Basin
18Kcy to 50Kcy
every 5 to 8 years

USACE dredging
23Kcy to 51Kcy
every 5 to 9 years

Present site too
small for both
projects

ANAMAR

Investigating Potential In-bay Dispersive Site

In-bay BUDM:

- Maintains sediment supply to the littoral zone, feeding beaches adjacent to the Tillamook Bay entrance
- Sustains intertidal flats and subtidal channels, which provide fish and shellfish habitat and support eelgrass beds

Objectives and constraints for in-bay sites:

- Located within 10,000 feet of navigation channel (distance limited by pipeline)
- Dispersive, in-bay
- Potentially non-dispersive if used to expand or enhance eelgrass beds

ANAMAR

Data Collection Methods

Current velocity and direction modeling

- ADCIRC (Advanced Circulation) 2-D hydrodynamic model (Moritz et al., 2003*)

Sediment grain size distribution survey

- Grain size analyzed from 83 stations from northern Tillamook Bay in December 2022

Submerged aquatic vegetation (SAV) survey

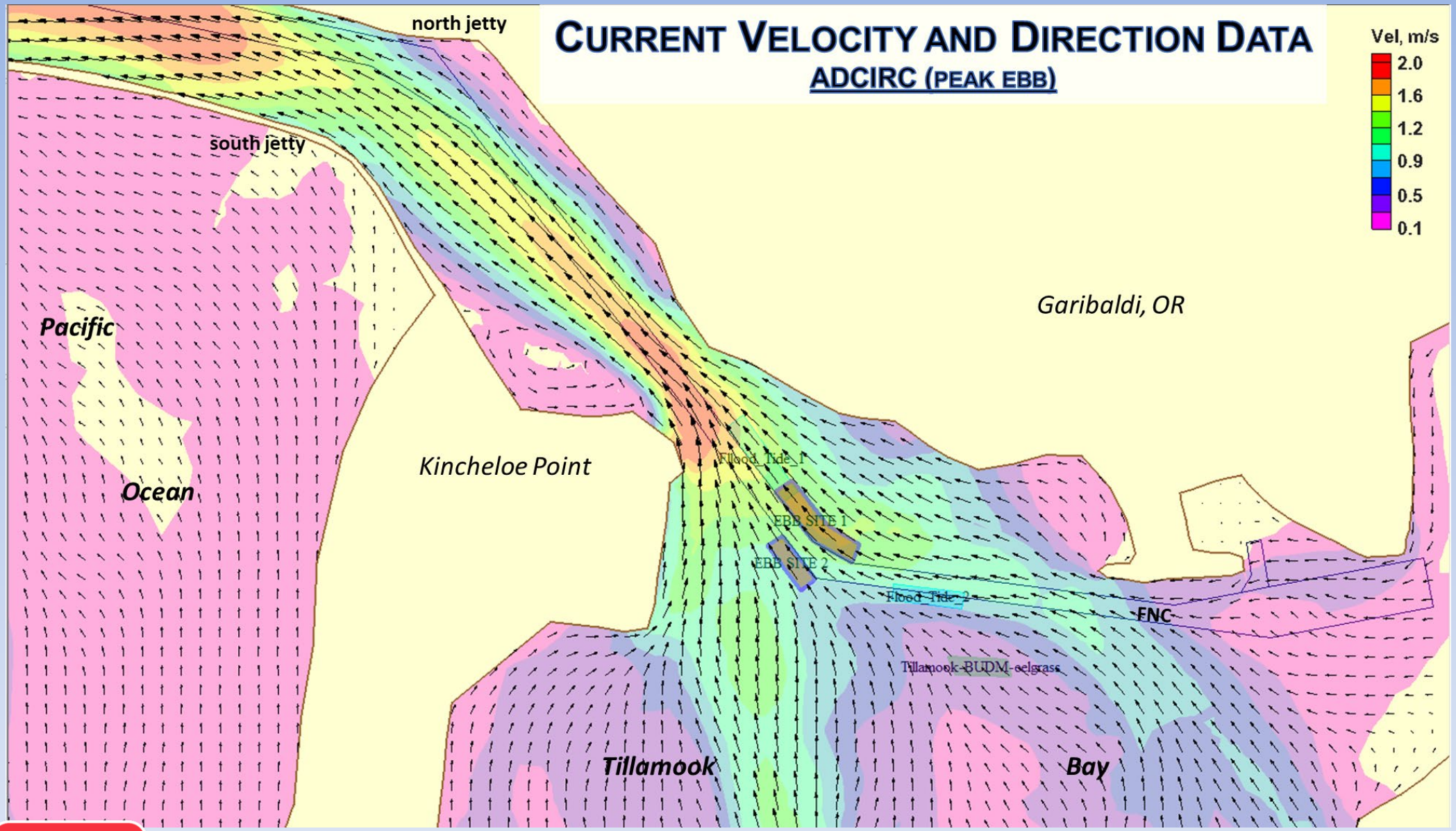
- Side-scan sonar survey conducted June 2023

* - Moritz, HR, A Chawla, MT Knuston, JR Hays. 2003. Modeling 2-Dimensional Unsteady Flow at the Confluence of Riverine and Estuarine Regimes. *Presented at* USACE Hydraulics and Hydrology Conference, Portland, OR. May 2003.

ANAMAR

CURRENT VELOCITY AND DIRECTION DATA

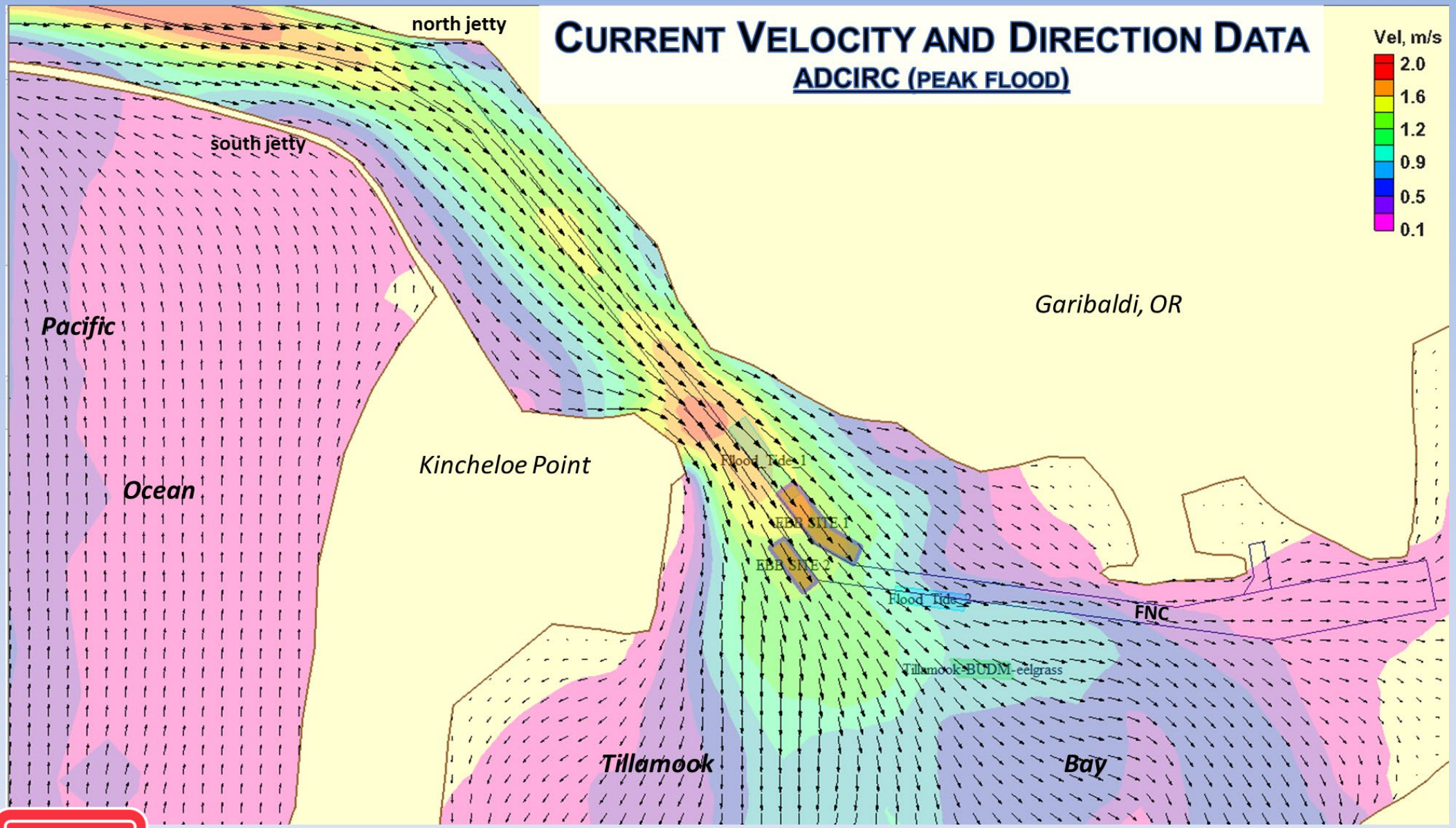
ADCIRC (PEAK EBB)



ANAMAR

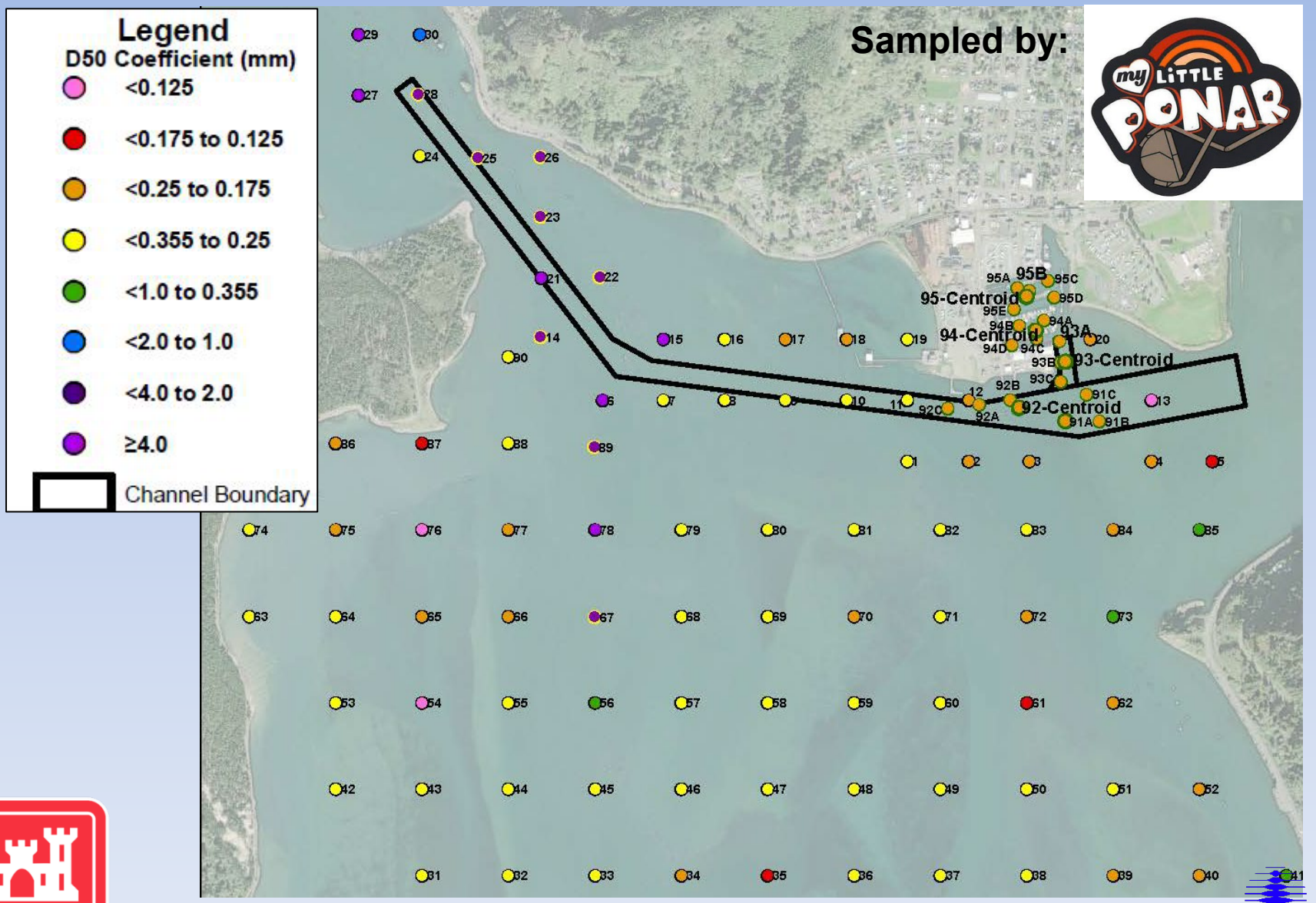
CURRENT VELOCITY AND DIRECTION DATA

ADCIRC (PEAK FLOOD)



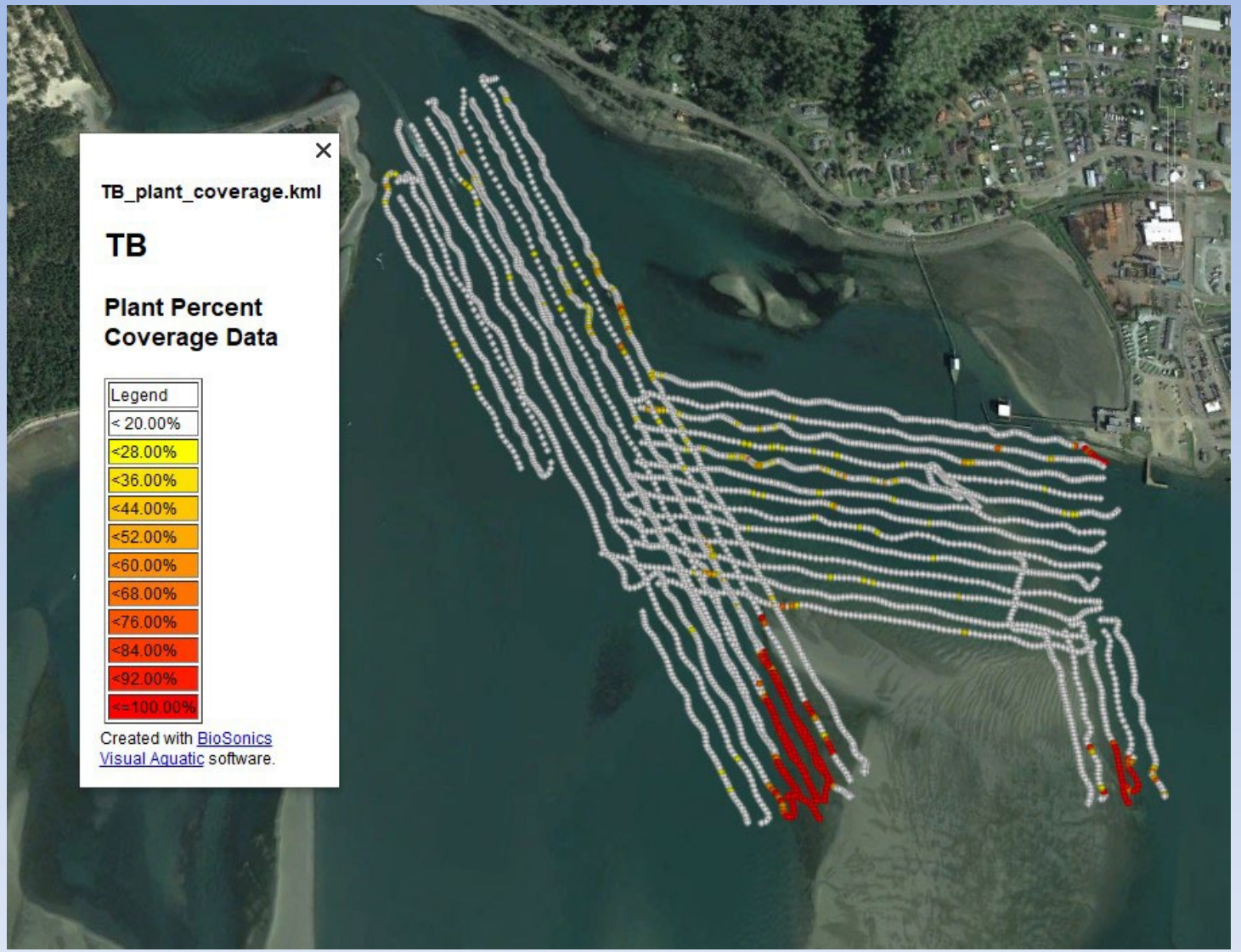
ANAMAR

SEDIMENT GRAIN SIZE DISTRIBUTION



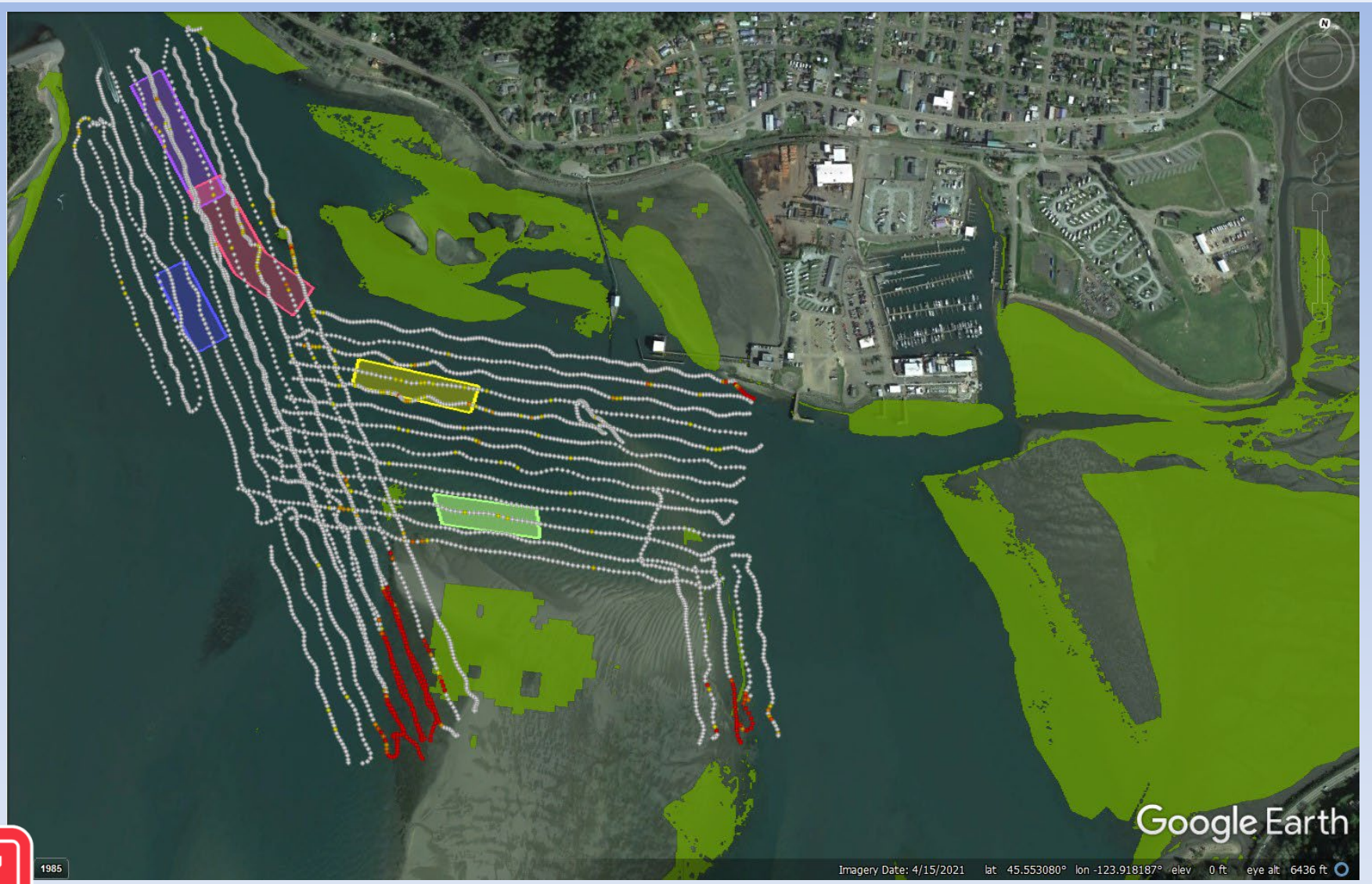
ANAMAR

SUBMERGED AQUATIC VEGETATION SURVEY



ANAMAR

SAV Surveys: Previous and Recent



ANAMAR

BUDM Potential Sites

ANAMAR

Additional Data Needs

BOTH DISPERSIVE & NON-DISPERSIVE

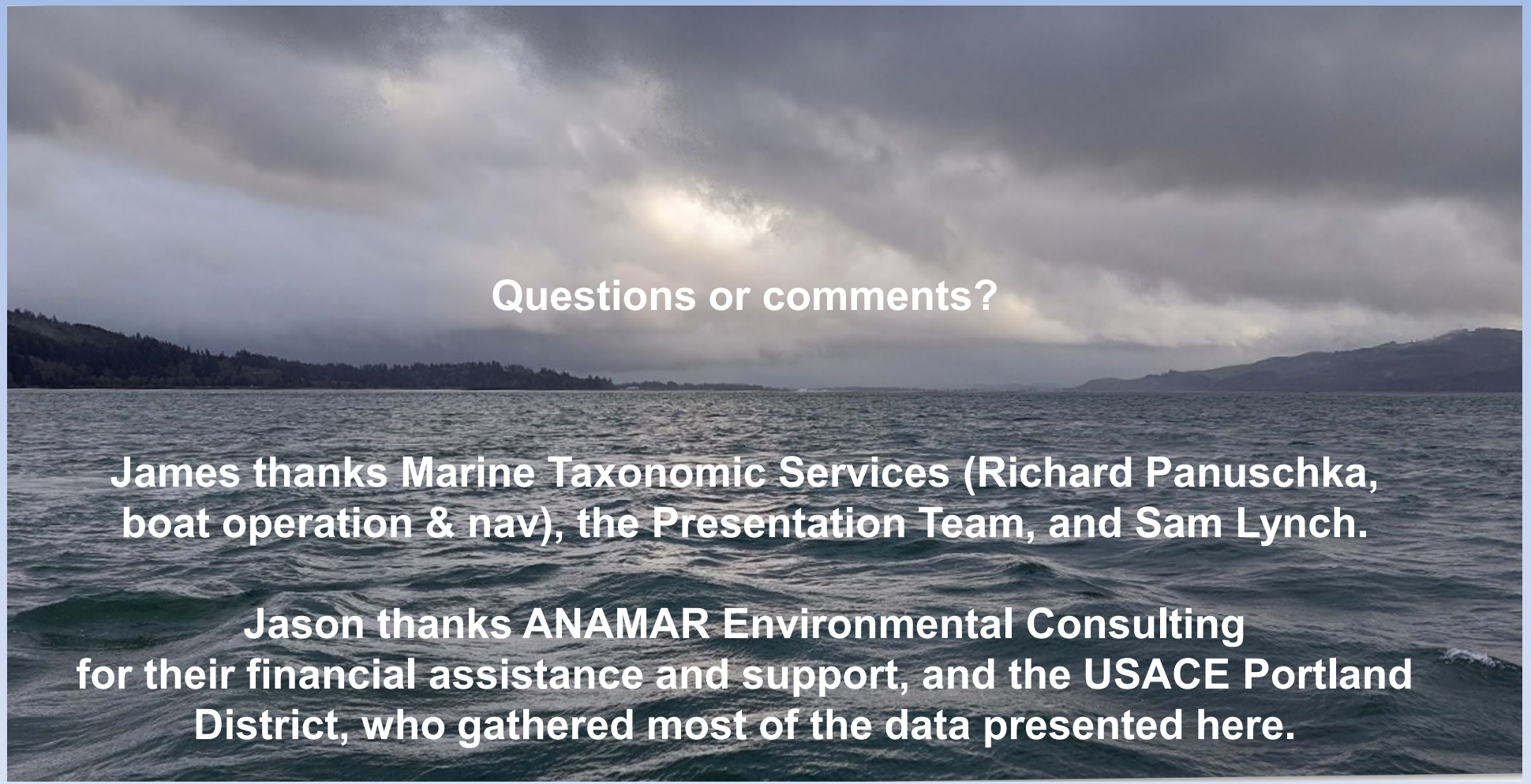
- Pre- and post-dredge bathy at placement site
- Tiered 1-, 2-, and 3-month post-dredge bathy (verify DM dispersal) at placement area AND downstream
- Pre- and post-dredged material placement survey of adjacent eelgrass beds (verify NO HARM)

NON-DISPERSIVE (Eelgrass Bed Enhancement/ Expansion)

- Annual post-planting survey (stem counts and cover)

ANAMAR

THANK YOU!



James thanks Marine Taxonomic Services (Richard Panuschka, boat operation & nav), the Presentation Team, and Sam Lynch.

Jason thanks ANAMAR Environmental Consulting for their financial assistance and support, and the USACE Portland District, who gathered most of the data presented here.

ANAMAR