

Dreissinid mussel monitoring by Portland State University in 2019

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Outline

- Waterbody selection by project
 - Calcium assessment
- Allocation of ZQM sampling effort by project and method including monitoring results
- What went well, what needs work
- Plans for 2020

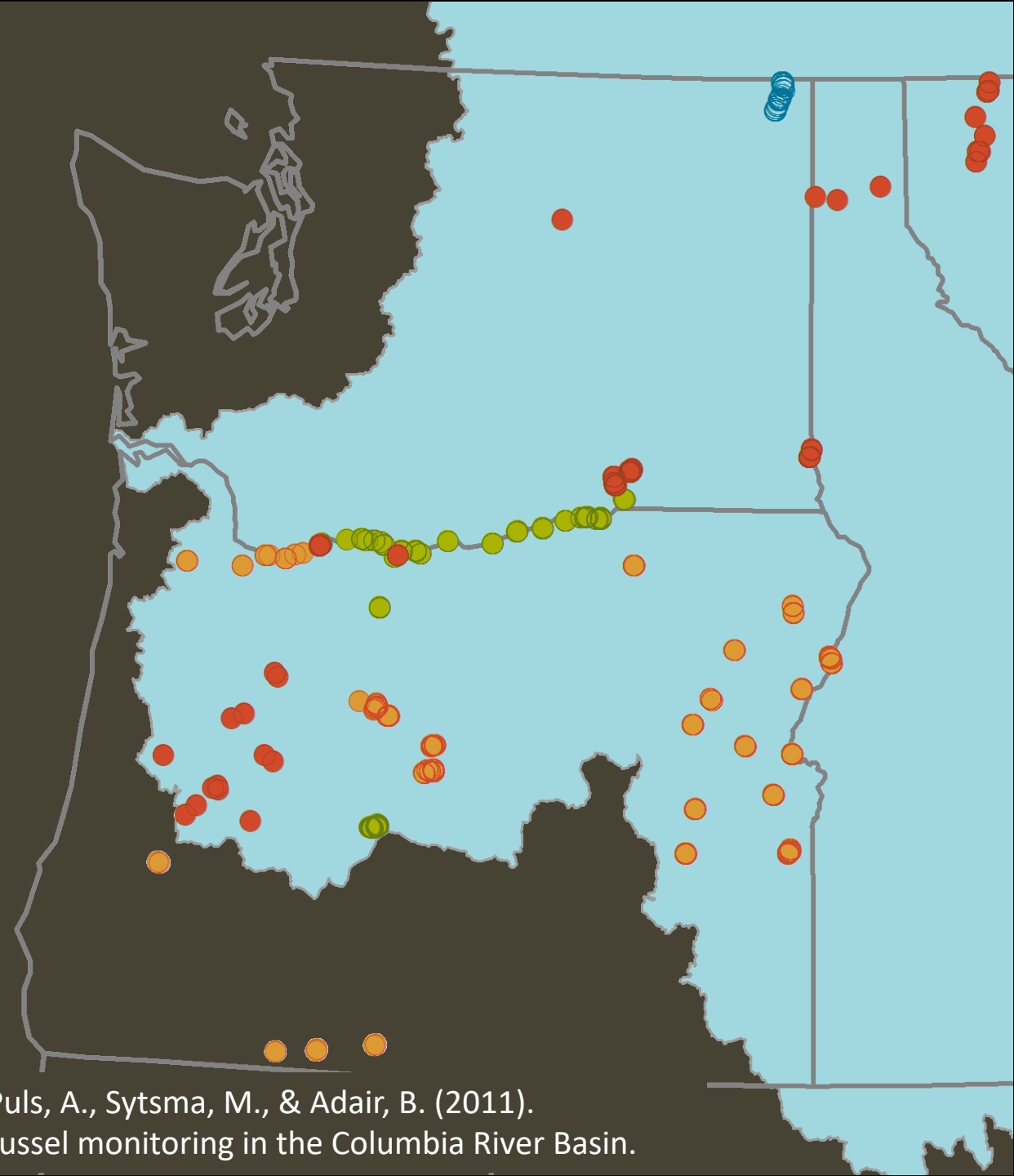
Waterbody selection

Project based:

- Seattle City Light
- BPA/USACE

Risk assessment* and opportunistic:

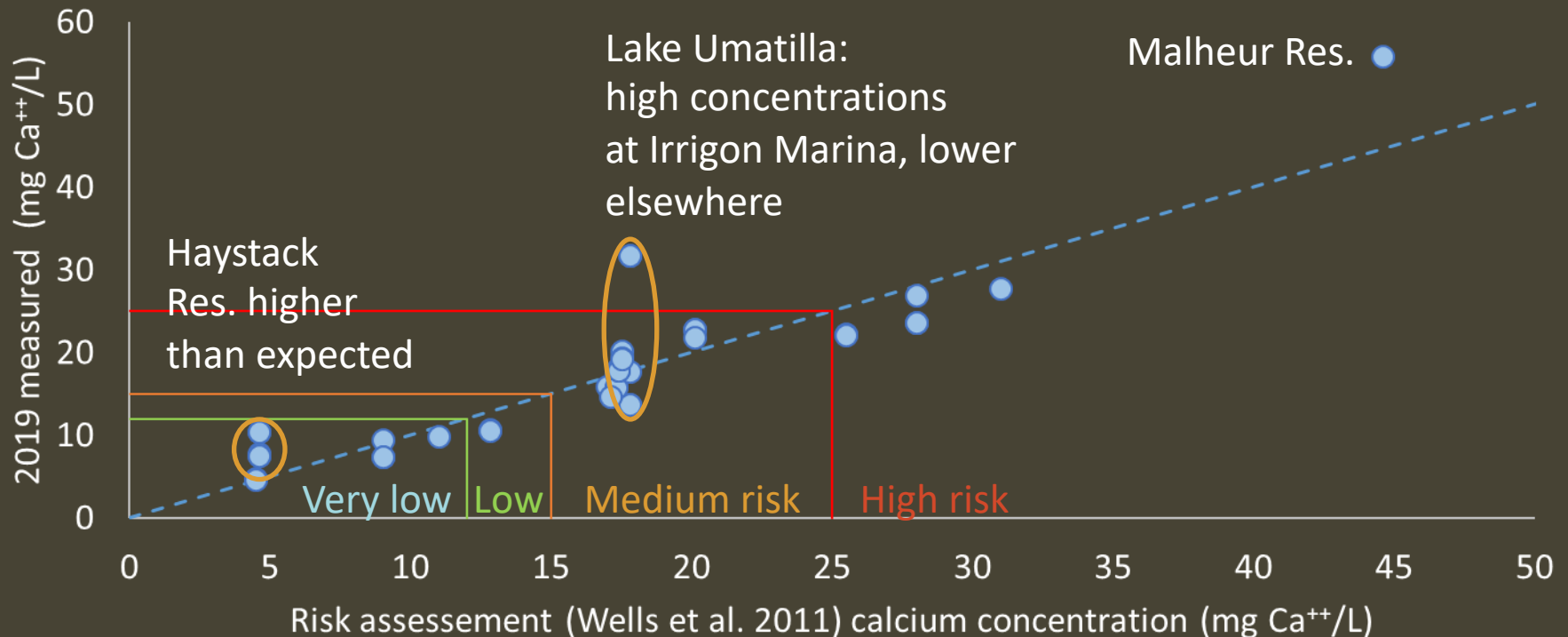
- WRRDA
- Bureau of Rec.



* Wells, S. W., Counihan, T. D., Puls, A., Sytsma, M., & Adair, B. (2011).
Prioritizing zebra and quagga mussel monitoring in the Columbia River Basin.

Calcium assessment

- Subset of WRRDA and BOR sites
- 2019 meas. vs. Wells et al. compilation (2011)

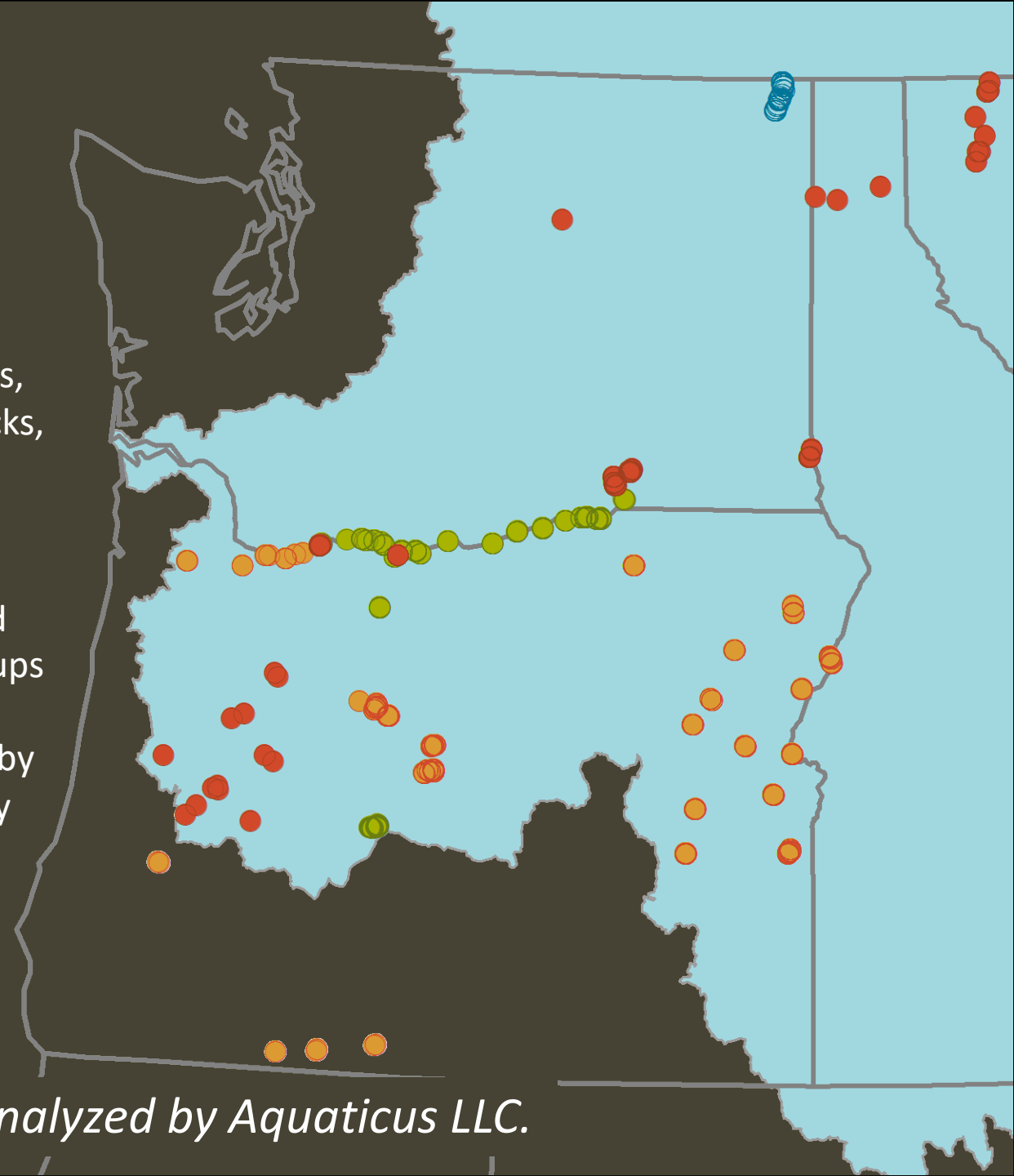


● Seattle City Light

- Boundary Reservoir
- July, August, September
- 54 veliger samples
- 317,000 L tow volume
- Adult surveys (substrates, shorelines, dredges, docks, abutments)

● BPA/USACE

- 21 waterbodies sampled by 8 USACE partner groups
- June-early October
- 5 waterbodies sampled by Portland State University
- 128 veliger samples
- 1,247,645 L tow volume
- Adult surveys at 7 waterbodies



All veliger samples analyzed by Aquaticus LLC.



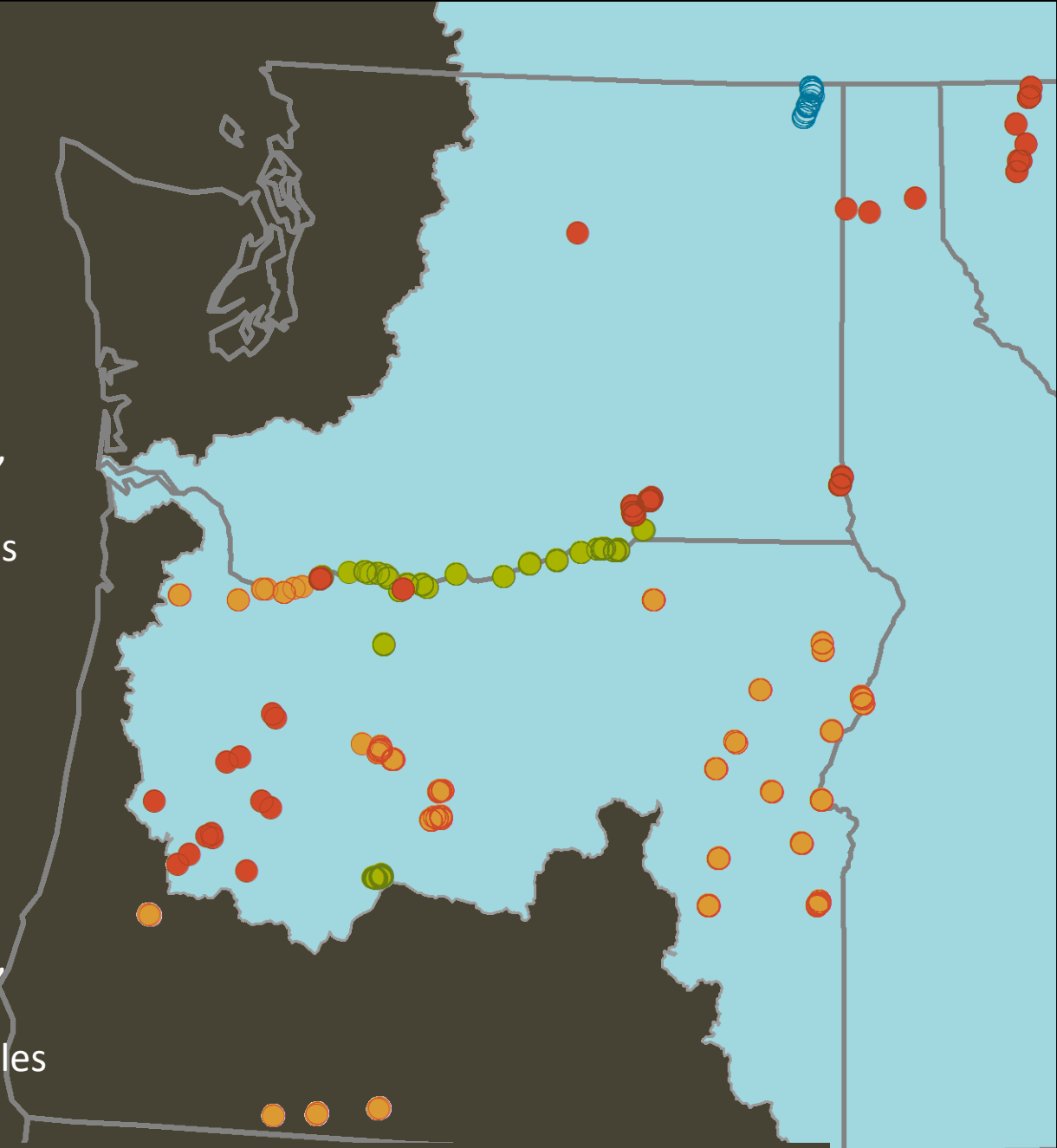
WRRDA

- 9 waterbodies sampled, most multiple times
- July - September
- 73 veliger samples
- 249,000 L tow volume
- Adult surveys (shorelines, dredges, docks)
- 93 - 250 ml eDNA samples



Bureau of Rec.

- 23 waterbodies sampled, some multiple times
- July - early October
- 95 veliger samples
- 414,000 L tow volume
- Adult surveys (shorelines, dredges, docks)
- 120 - 250 ml eDNA samples



eDNA analysis using PCR conducted by PSU (Crysta Gantz)

What went well, what needs work

- Timing of funding and reservoir drawdown
- Data management
 - Move towards Survey 123 form for all PSU crew data collection (currently used for all SCL sampling and some WRRDA/BPA sampling)
 - Provide form and training for USACE partners

ZQM monitoring plans for 2020

- Seattle City Light - Continue veliger and adult sampling, explore possibilities for eDNA sampling with analysis by outside lab
- BPA/USACE - Continue coordinating veliger and adult sampling with USACE partners
- WRRDA - Continue veliger and adult sampling, likely no eDNA monitoring (Dr. Cat DeRivera will be submitting proposal)

Reports

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Seattle City Light: Wells, S., R. Miller, T. Pennington, A. Strecker, and M. Sytsma. 2019 Report, Early Detection Monitoring Program for Zebra/ Quagga Mussels and New Zealand Mudsnails & Macrophyte Suppression Program for Boundary Hydroelectric Project (FERC No. 2144)

WRRDA: Gantz, C., R. Miller, C. De Rivera, M. Sytsma, and A. Strecker. 2019. Zebra and Quagga Mussel Monitoring in the Columbia River Basin. Report prepared for the Pacific States Marine Fisheries Commission

BPA/USACE: Wells, S., M. Sytsma, and R. Miller. Zebra and Quagga Mussel Monitoring in the Columbia River Basin by the U.S. Army Corps of Engineers and Portland State University in 2019. Report prepared for Pacific States Marine Fisheries Commission, Bonneville Power Administration and U.S. Army Corps of Engineers.

Bureau of Reclamation: Reporting before March 2020. Gantz, C., R. Miller, C. De Rivera, M. Sytsma, and A. Strecker.