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Title

Monitoring Invasion of the New Zealand Mudsail (Potamopyrgus antipodarum) in North Campus Open Space

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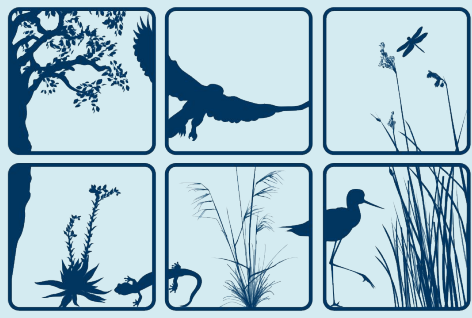
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Monitoring Invasion of New Zealand Mudsnail (*Potamopyrgus antipodarum*) in North Campus Open Space



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Introduction

Life History

- Small size and desiccation resistance facilitate transport
- Clonal populations with broad environmental tolerance
- Can reach extreme organism density (>500,000 m⁻²)

Invasion History

- Globally widespread aquatic invader (39+ countries)
- Spread across western U.S. since initial detection in Snake River, ID in the 1980s
- First detected in North Campus Open Space (NCOS) via eDNA sampling in Fall 2022

Research Aim

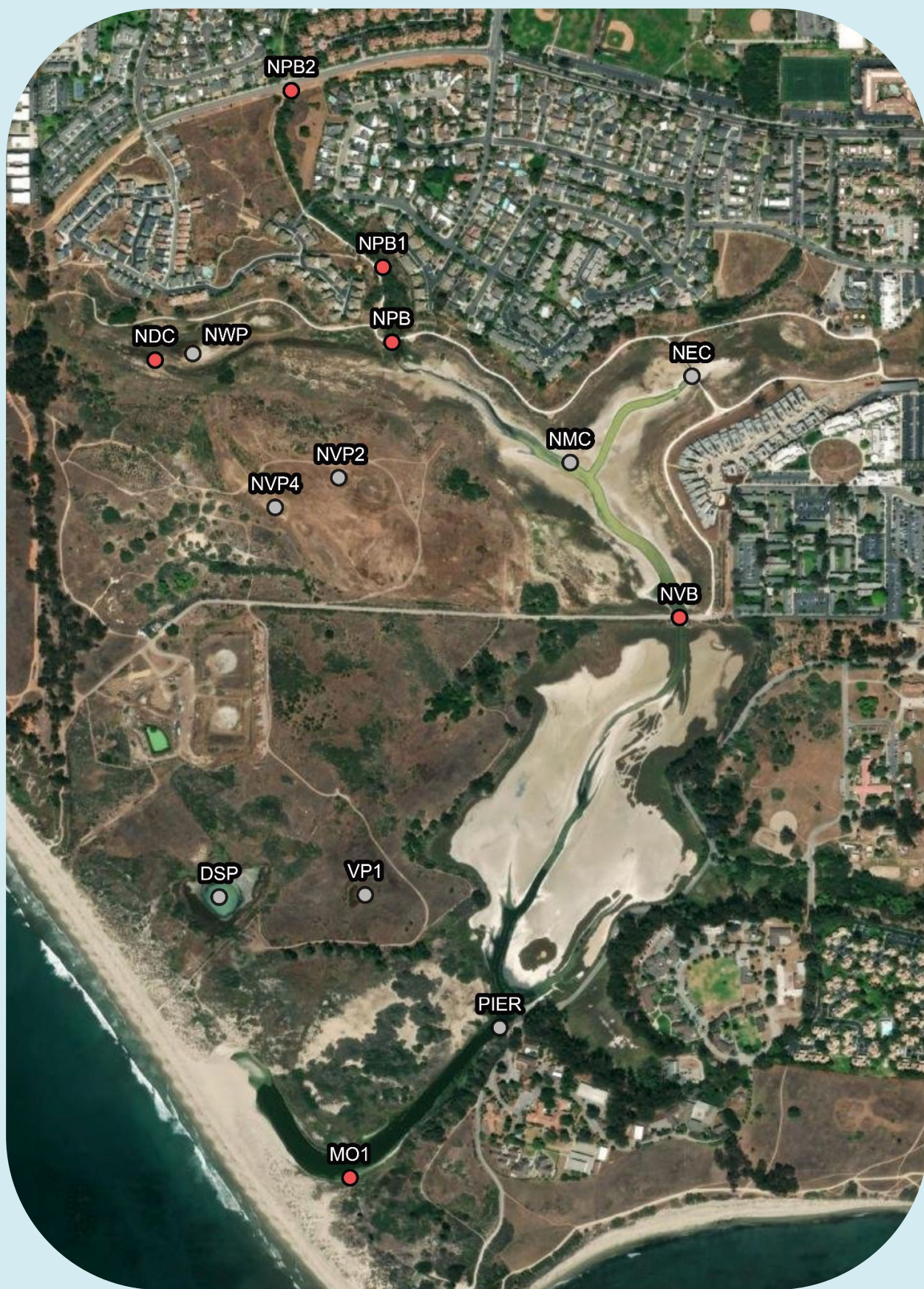
To assess where NZMS are found within NCOS, quantify their relative abundance across sites, and evaluate the ecological risk posed by their invasion, as well as explore factors influencing their distribution.

Methods

- Student interns collected aquatic invertebrate samples and measured water quality at sites across NCOS
- Organisms were counted and identified by morphology under a microscope.
- I restricted data analysis to sampled collected post initial NZMS detection

North Campus Open Space in Goleta, CA
Coastal estuary currently undergoing restoration

New Zealand Mud Snail
(*Potamopyrgus antipodarum*)



● Species Presence ● Species Absence



Photo Credit: Jeremiah Bender ©

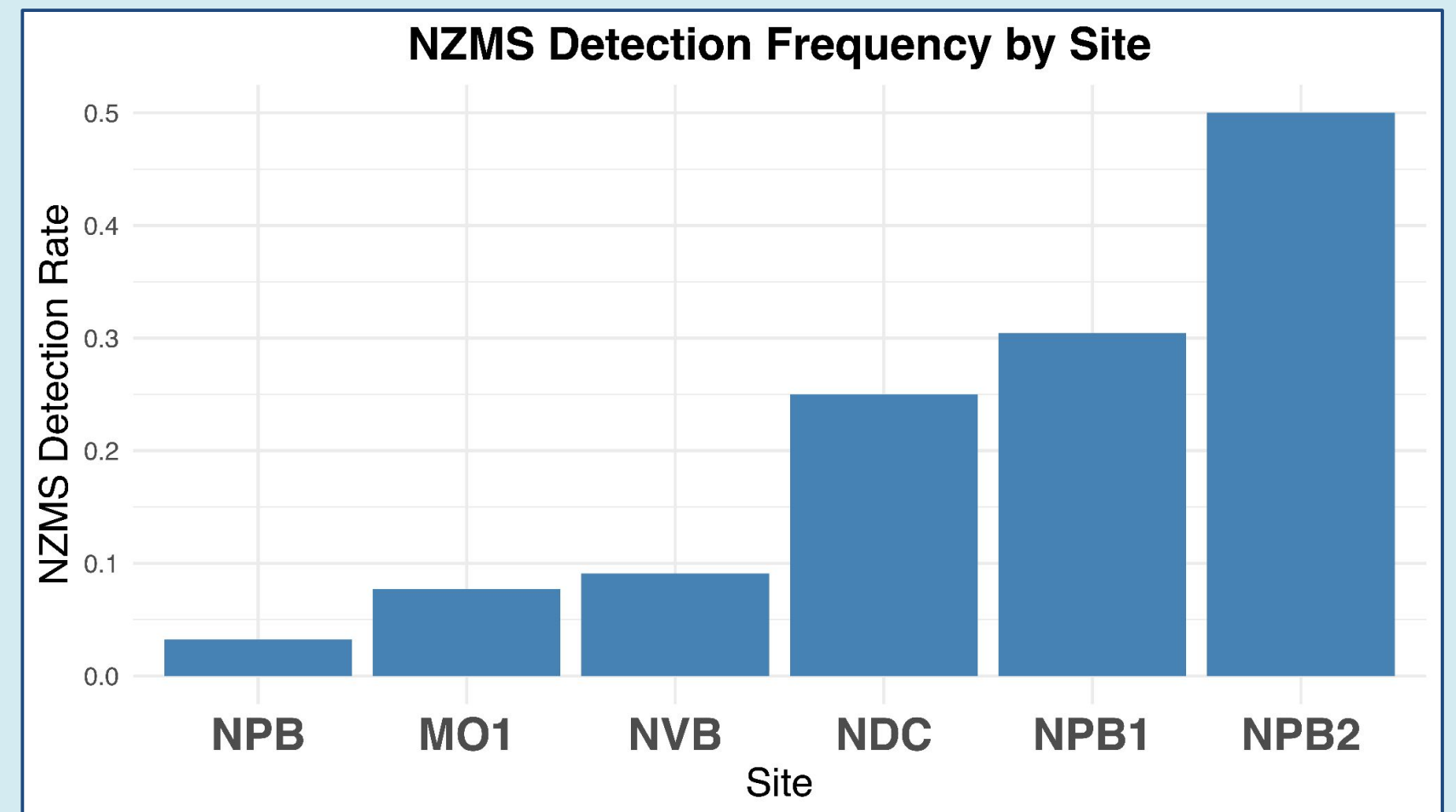
Acknowledgements

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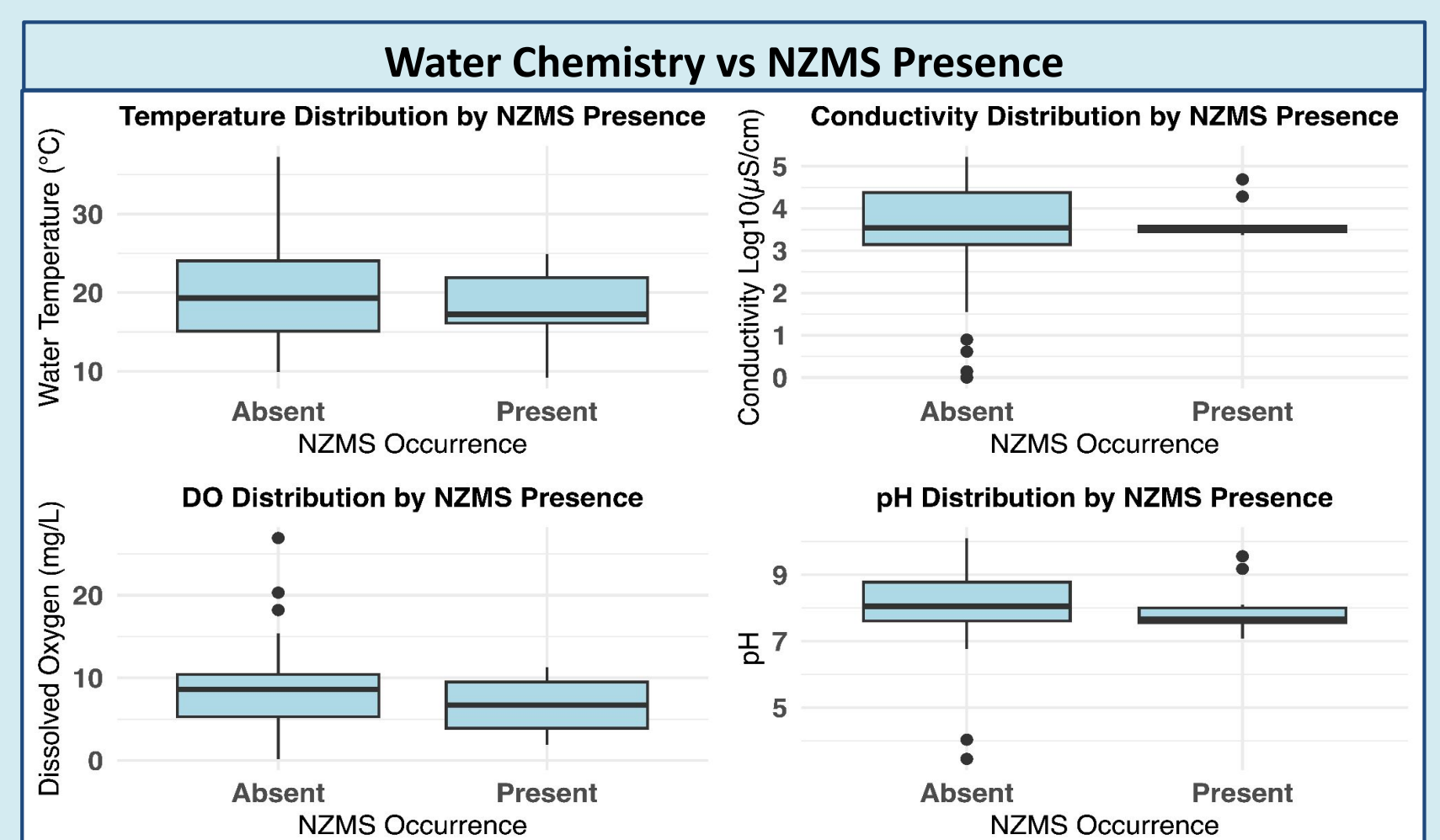
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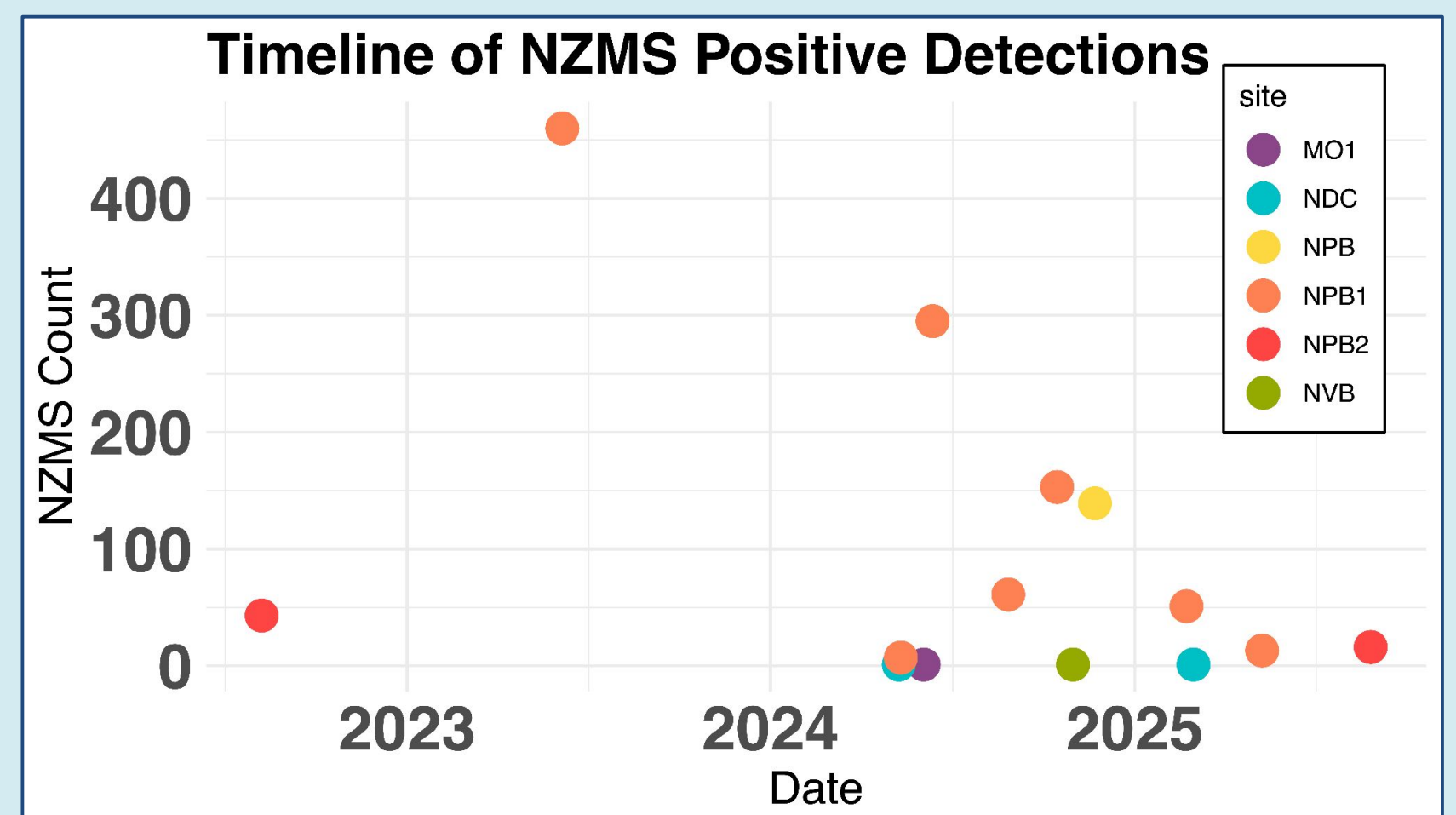
Results



NZMS were detected in ≥25% of samples at sites in Phelps Creek (NPB2, 0.50; NPB1, 0.30) and Devereux Creek (NDC, 0.25), and in <10% of samples at sites in Devereux Slough (NVB, 0.09; MO1, 0.07; NPB, 0.03).



NZMS occupancy occurred across broad ranges of temperature (9.2–24.9 °C), conductivity (2.3–48.7 mS/cm), DO (1.91–11.30 mg/L), and pH (7.08–9.56), with no significant relationships observed between water chemistry variables and NZMS presence ($p > 0.05$).



Since first detection in 2022, NZMS were detected at 6 NCOS sites and in 14 of 200 samples. Maximum observed count was 460 individuals, with a median positive sample count of 29.5.

Discussion

Species Presence in North Campus Open Space (NCOS)

- NZMS occur at relatively low abundances compared to densities associated with ecological impact
- Highest detection frequencies occurred in tributaries namely Phelps and Devereux Creeks
- Distribution was not significantly associated with measured water chemistry variables

Environmental Impact & Continued Monitoring

- NZMS can reduce native invertebrate populations, alter ecosystem function, and provide low nutritional value for predators
- Targeted sampling protocols may improve density estimates and long-term monitoring
- Further study of dispersal mechanisms and factors limiting spatial distribution may help assess risk of spread