

DREISSENA TRANSPORT FROM ST LOUIS RIVER TO APOSTLE ISLANDS DETECTED IN EDNA AND ZOOPLANKTON SURVEYS

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Lake Superior inhospitable to *Dreissena*



Two colonies: Saint Louis River Estuary and Apostle Islands National Lakeshore

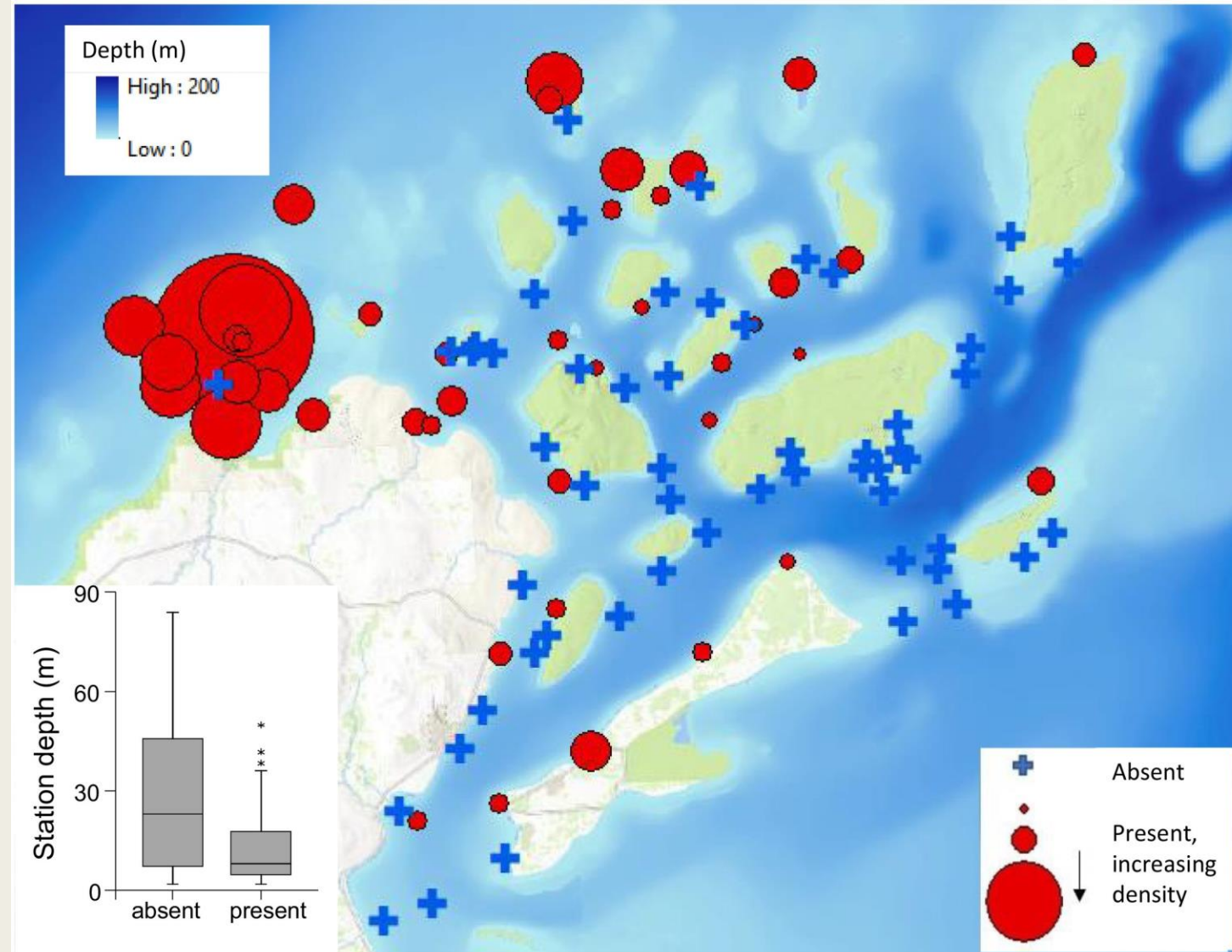


Are *Dreissena veligers* transported from the SLRE to APIS via currents?



Dreissena detection in Apostle Islands 2017 survey

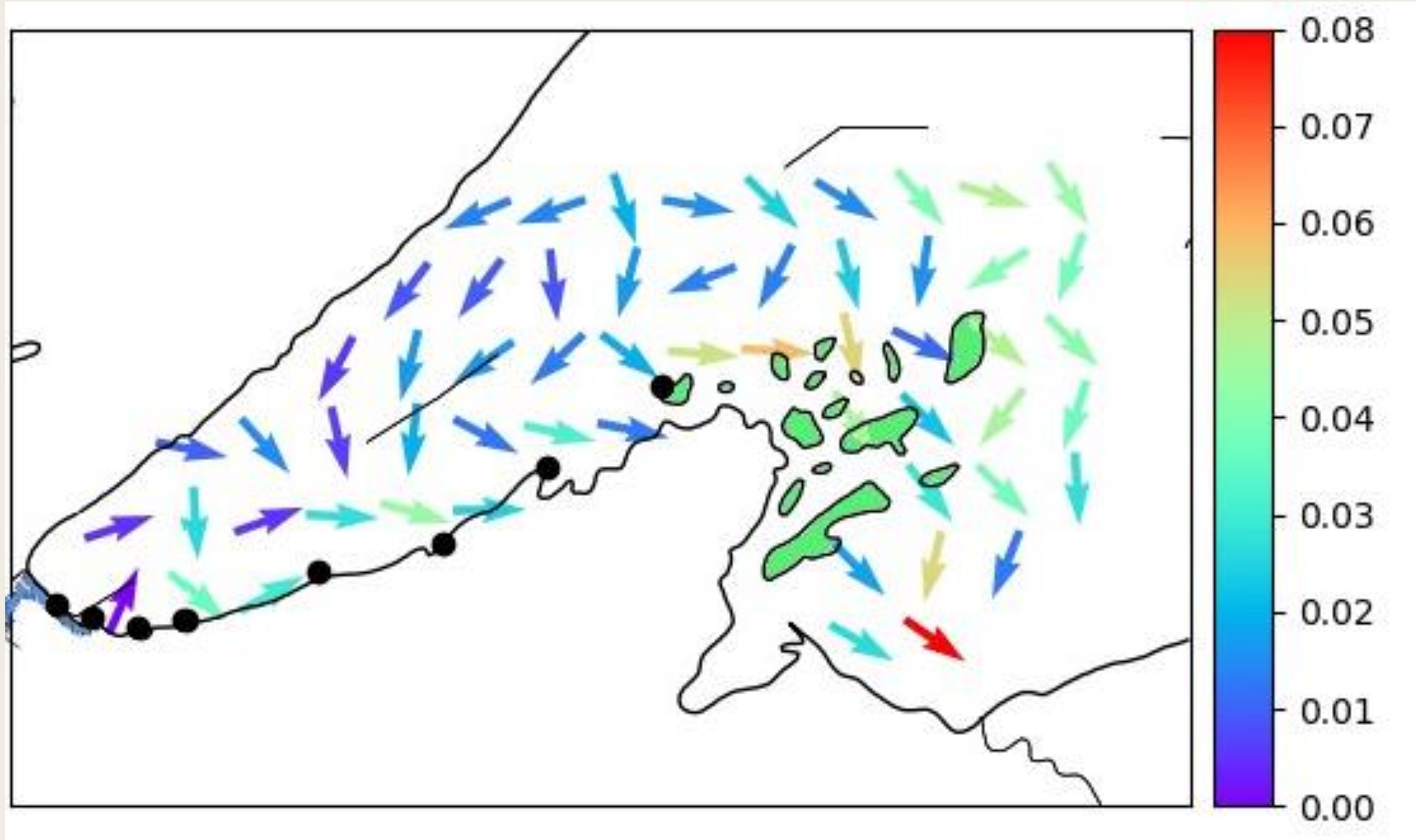
- Greater densities in the west and north side of the islands
- Primarily absent from south east islands
- Suggests veligers could be transported from SLRE to APIS (~100 km away) via summer currents



Predictions

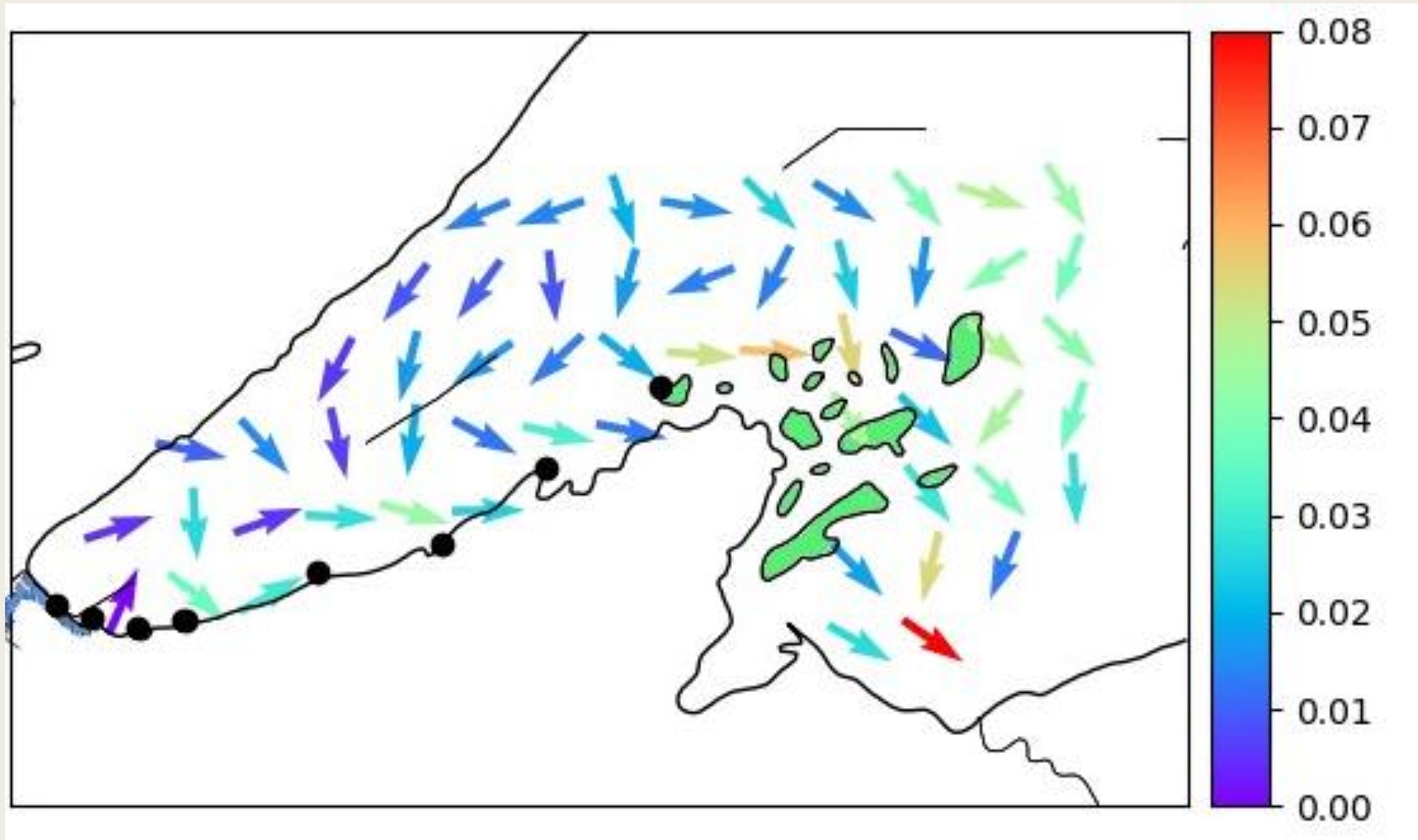
- With increased distance from the SLRE
 - *P1: Dreissena eDNA detection will decline, with D. polymorpha dominating Dreissena detections;*
 - *P2: Veliger density will decline, but size will increase;*
 - *P3: “SLRE”-type (littoral) zooplankton density will decline.;*
 - *P4: Water quality shifts from estuary to open lake consistent with mixing.*

Site/survey description

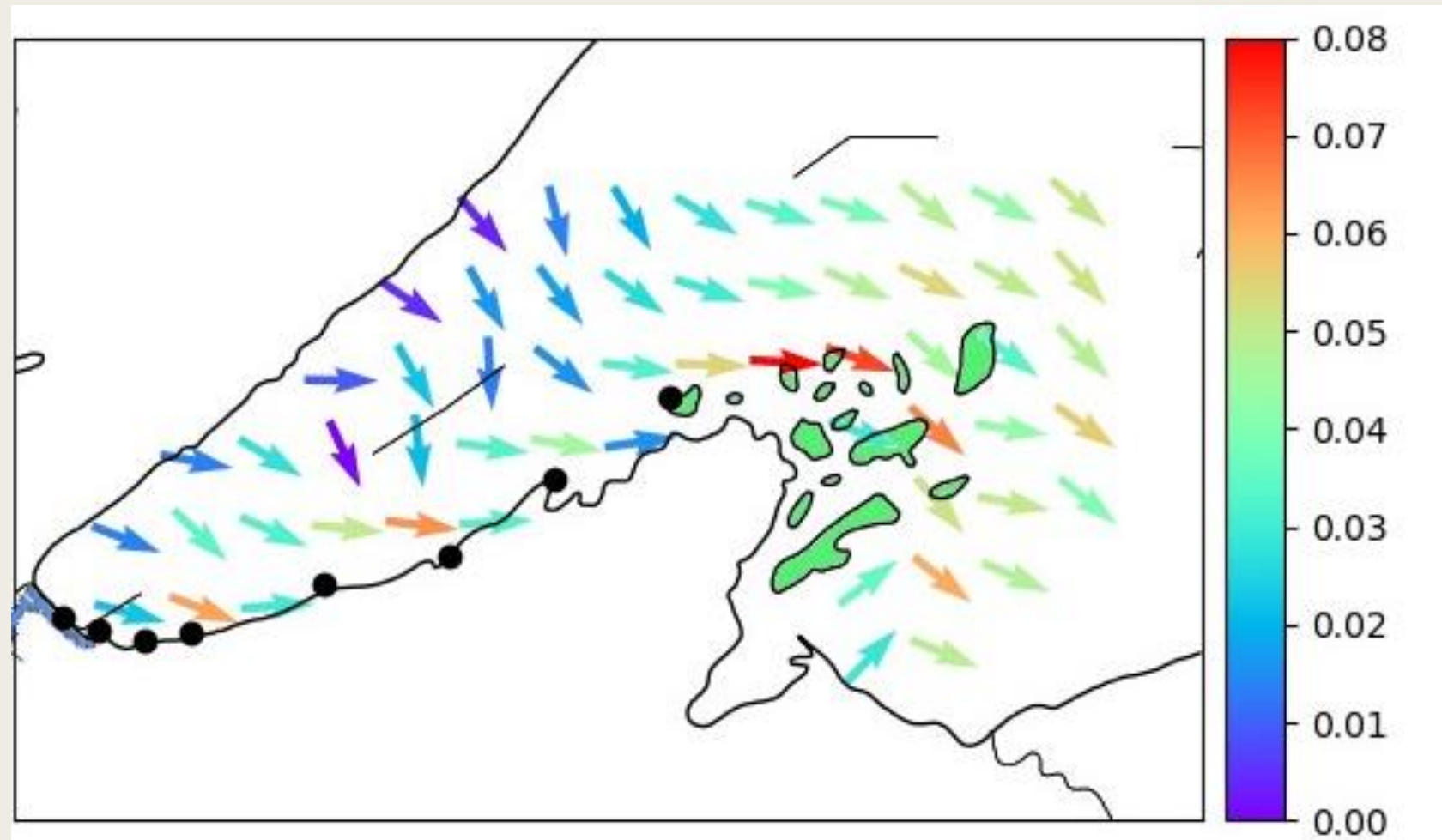


- 8 sites along south shore
- Sampled 3 times
 - *Dreissena* eDNA
 - Mesh banner
 - H₂O
 - Ethanol
 - Zooplankton
 - Community
 - *Dreissena* size
 - Water chemistry
 - Current patterns

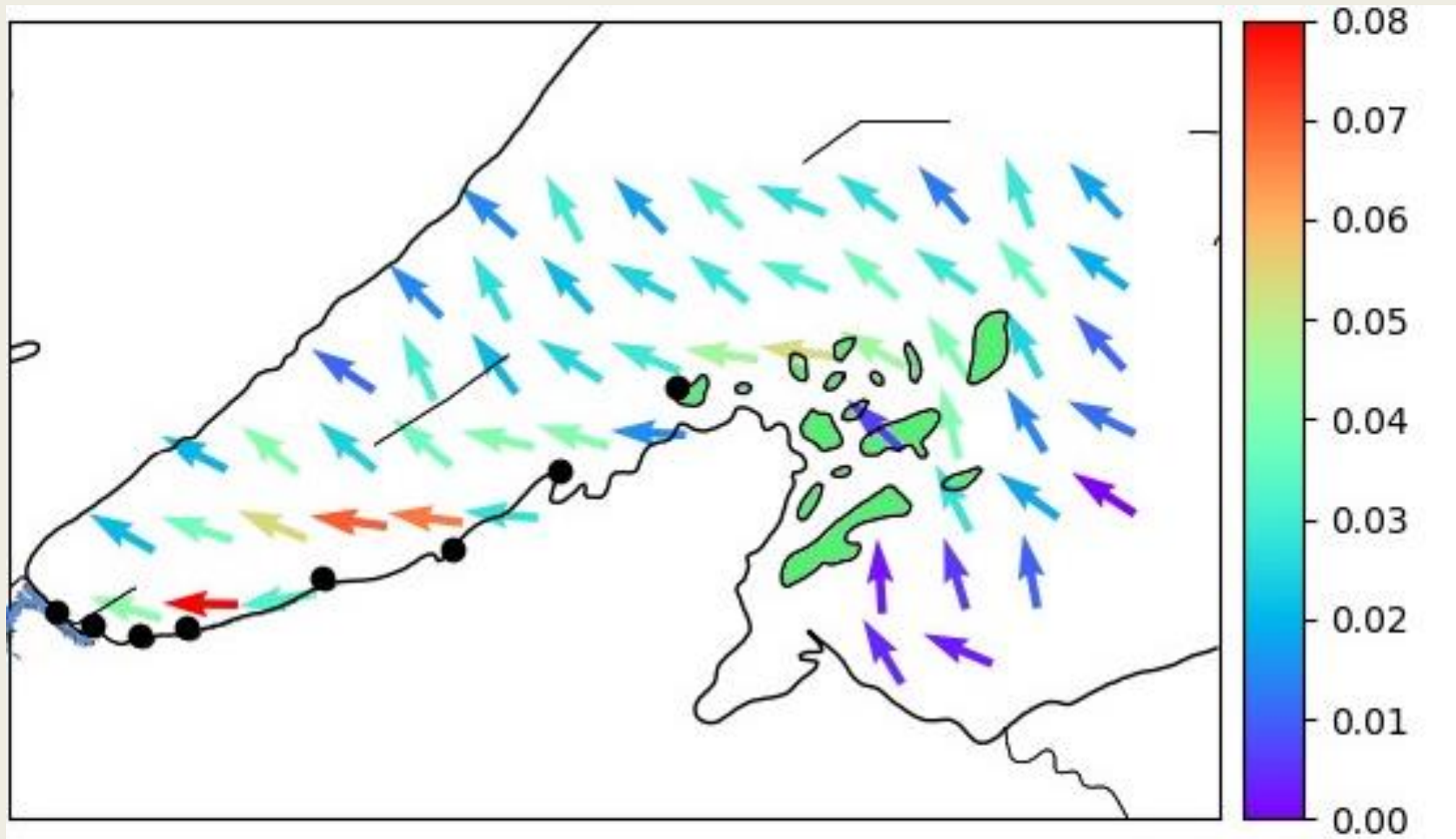
Current results Week 1



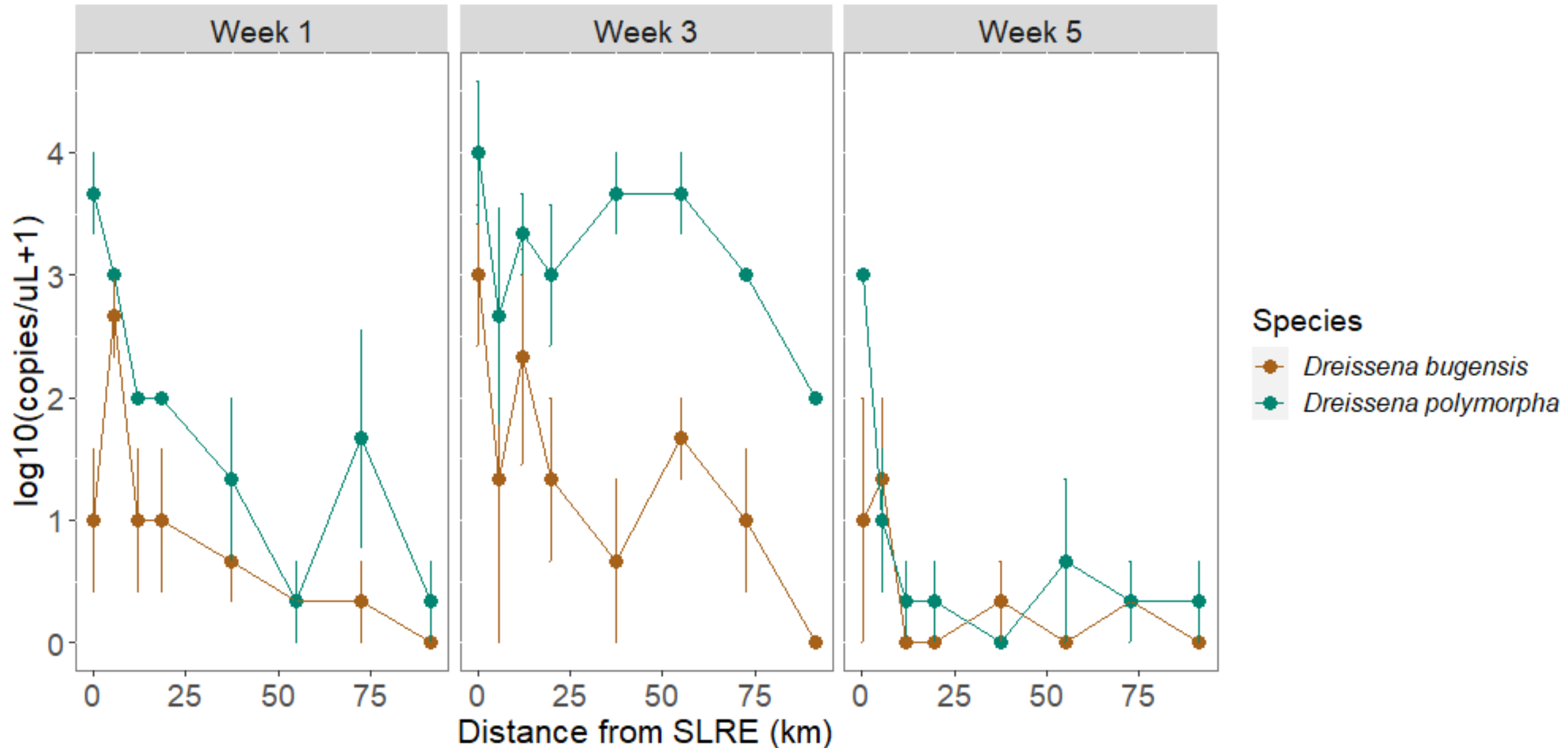
Current results week 3



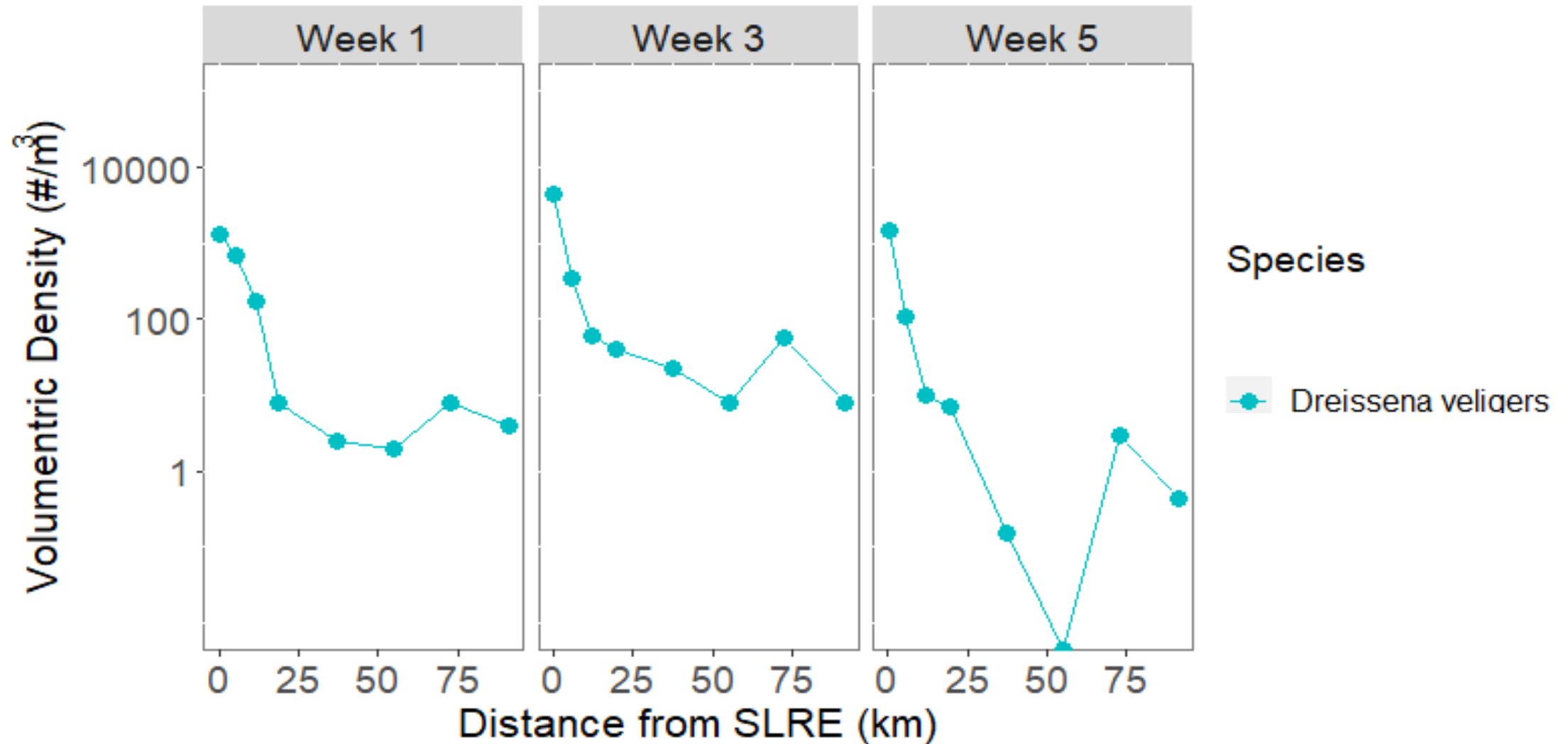
Current results Week 5



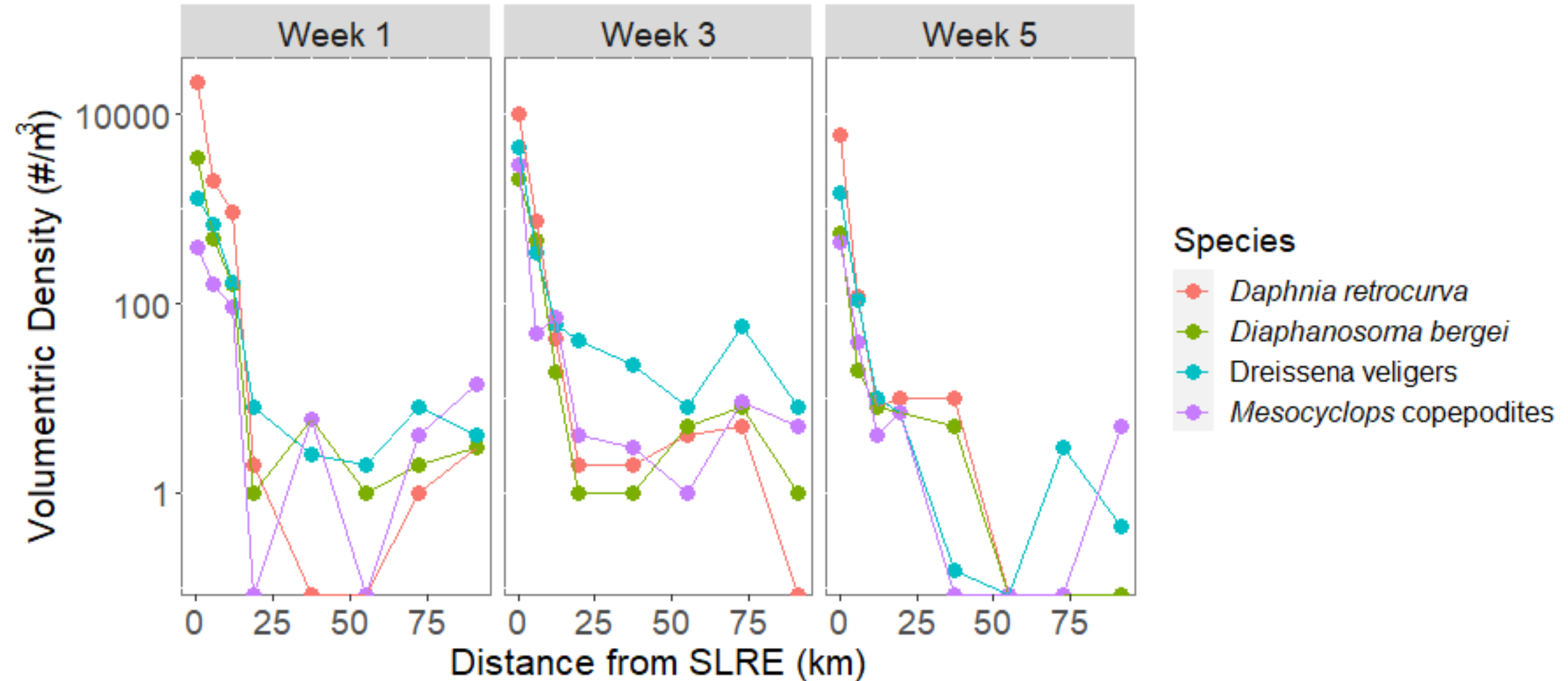
Dreissena eDNA decreases along south shore and *Dreissena polymorpha* dominates detections



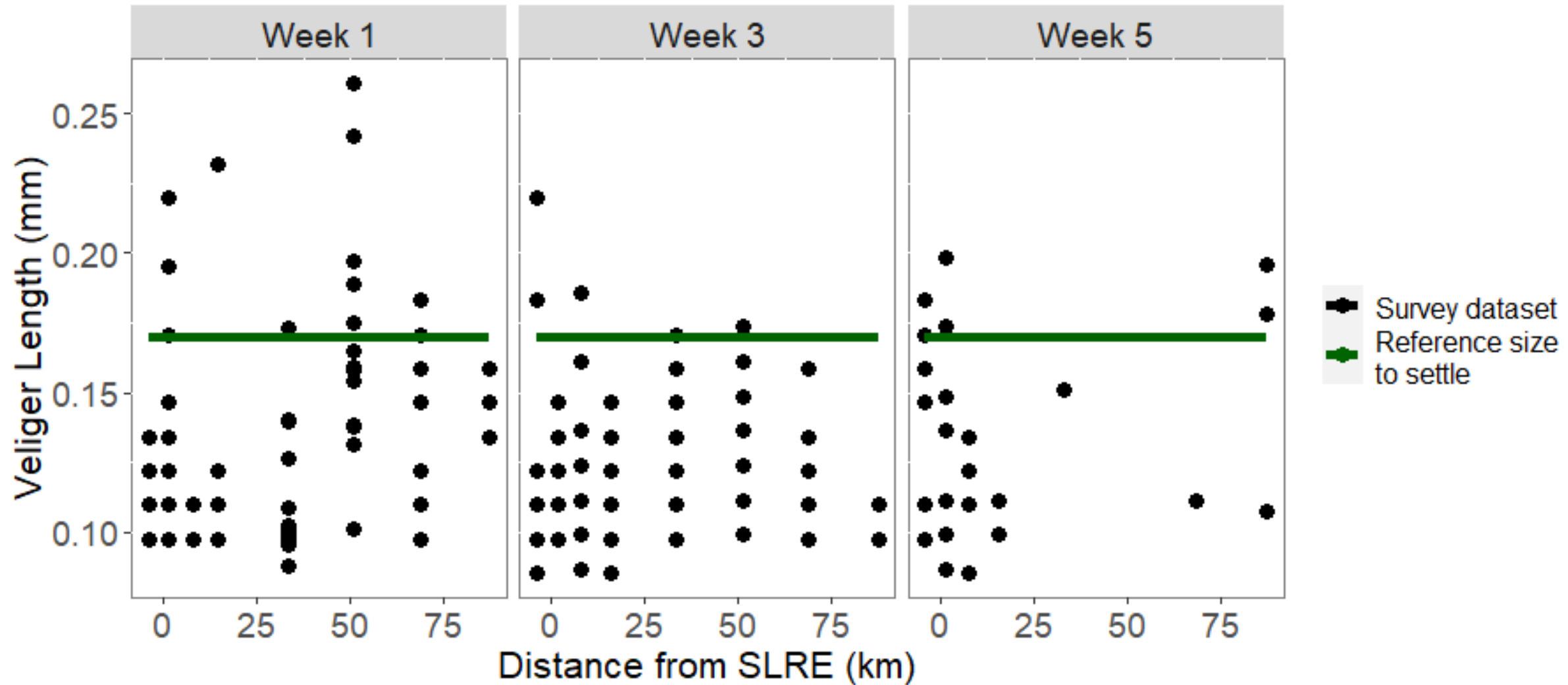
Dreissena veliger density decreases along south shore



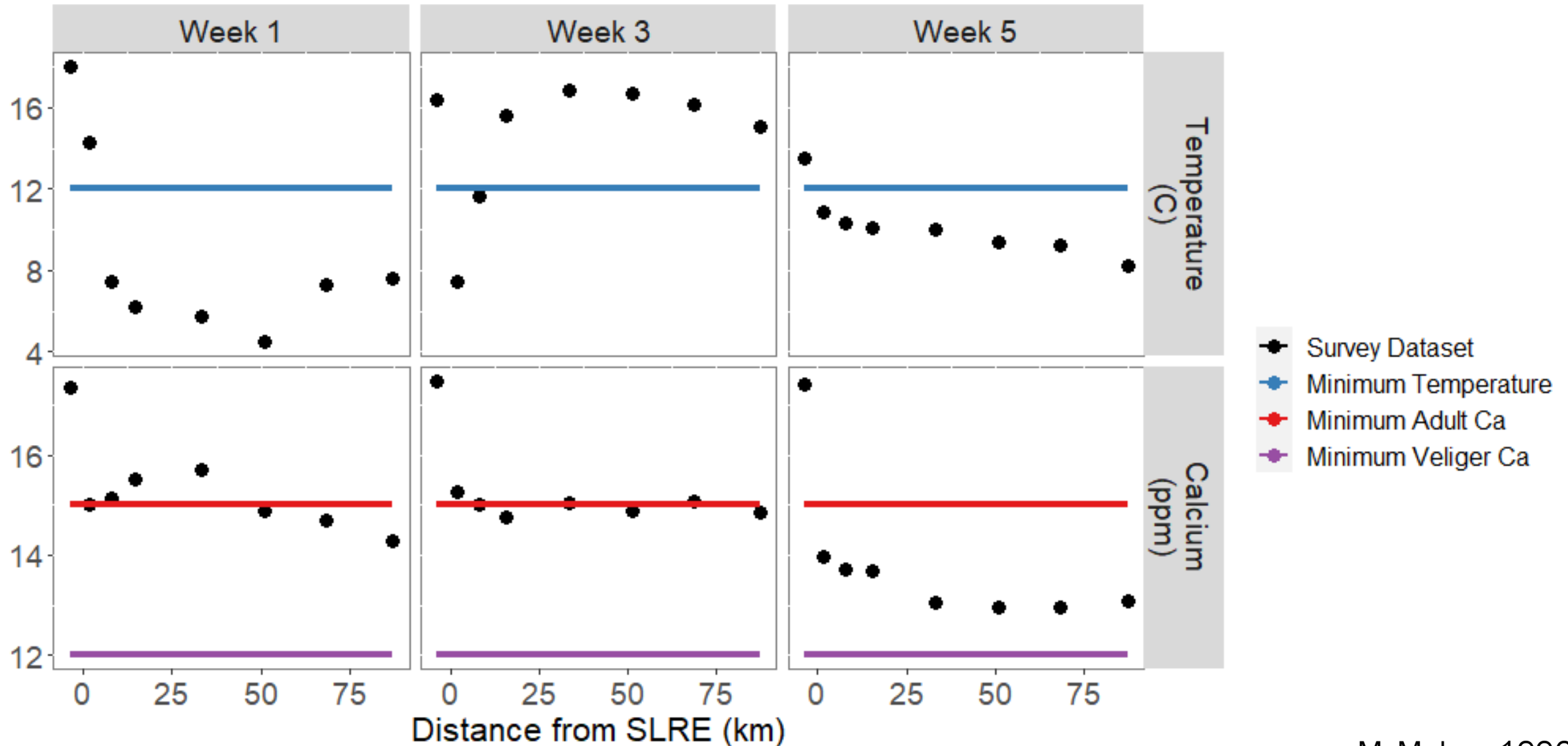
SLRE zooplankton correlate with *Dreissena veliger* densities



Dreissena veliger size does not change along south shore



Environmental threshold for *Dreissena* development



Revisit predictions

- With increased distance from the SLRE
 - *P1: Dreissena eDNA detection will decline, with D. polymorpha dominating Dreissena detections;* ✓
 - *P2: Veliger density will decline;* ✓
 - *P3: “SLRE”-type (littoral) zooplankton density will decline.;* ✓
 - *P4: Veliger size will increase; and* ✗
 - *P5: Water quality shifts from estuary to open lake consistent with mixing.* ✓

Conclusions

- Multiple lines of evidence of potential invasion front for *Dreissena* along the south shore of Lake Superior
- Physical conditions fluctuate along threshold for *Dreissena* survival, and environmental change (e.g. temperature and Calcium increase) may support *Dreissena* spread.
- Further *Dreissena* monitoring along the south shore and APIS

Acknowledgements

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