

M.L. 2021 Minnesota Aquatic Invasive Species Research Center Subproject Abstract

For the Period Ending December 31, 2024

SUBPROJECT TITLE: MAISRC Subproject 48: Beyond the sign – Influencing recreational boaters required behaviors

SUBPROJECT MANAGER: Dr. Ingrid E. Schneider

ORGANIZATION: University of Minnesota

COLLEGE/DEPARTMENT/DIVISION: Food, Agricultural, and Natural Resource Sciences, Department of Forest Resources

MAILING ADDRESS: 1530 Cleveland Ave North

CITY/STATE/ZIP: Saint Paul, Minnesota, 55108

PHONE: 612-414-1163

E-MAIL: ingridss@umn.edu

WEBSITE: <https://maisrc.umn.edu/research/48>

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SUBPROJECT BUDGET AMOUNT: \$253,291

AMOUNT SPENT: \$248,267

AMOUNT REMAINING: \$5,024

Sound bite of Project Outcomes and Results

Boating anglers have high intentions to perform actions to prevent the spread of AIS. However, many miss required prevention actions when leaving the launch. While augmented reality may not significantly increase already high intentions to take these prevention actions, it offers a unique way to engage with this audience.

Overall Subproject Outcome and Results

A prominent path for aquatic invasive species (AIS) are boating anglers. Existing communication efforts are inconsistently effective to influence AIS prevention behaviors among boating anglers. One known challenge is getting boating anglers to engage with messages. As ways to communicate advance and digitize, their application to boating anglers is of interest but underexplored. In this project we implemented an innovative experiment to test if and how increasingly engaging message presentation impacted boating anglers' behavioral intentions to prevent AIS spread. Specifically, we unobtrusively observed 193 fishing vessels to see what boating anglers were and were not doing at four similar boating landings. The majority completed at least one cleaning prevention behavior, however 21% of observed fishing vessels still left the public water access area with visible vegetation on the boat, trailer, and/or equipment and the majority left with visible vegetation in more than one location. The majority of anglers completed at least one draining prevention behavior. Second, we interviewed 18 boating anglers to understand their behaviors and barriers to prevention behaviors. Based on this information and best practices, we created and tested messaging in both sign and augmented reality (AR) formats among 303 boating anglers to see if and how they impacted intentions to perform prevention behaviors. Our survey respondents self-reported very high intentions to perform AIS prevention behaviors, regardless of messaging. Our comparisons among signs and AR yielded no significant differences. However, engagement with AR among parties seemed high and subsequently it remains appealing. A follow-up experiment tested the presence of new signs and various messages to increase the time boating anglers spent conducting prevention behaviors. Neither new signage nor the messages significantly impacted time spent at the landing. As educational campaigns continue, judicious evaluation and testing engagement choices seem prudent to effectively influence boating anglers.

Subproject Results Use and Dissemination

Our team shared results through a variety of ways: in-person at eight separate presentations, online through an AIS webinar and the MAISRC web page, as well as through the creation of a two-page fact sheet. Our multi-media resources are available through an online resource (<https://aisprevention.elevator.umn.edu/>) and we have created a “best practices in augmented reality” guide which will be shared through MAISRC and UMN Extension’s distribution channels, as well as in relevant newsletters (e.g. Association for Natural Resources Extension Educators). In addition, we have four publications in process for refereed journals.

Peer-Reviewed Publications

- Weber, M. et al. Risky Business: Identifying the most-missed AIS prevention actions among boating anglers. *In preparation.*
- Schneider I.E., et al. Are signs sufficient? Exploring augmented reality to influence boating angler behavior. *In preparation.*
- Schneider I.E., et al. Barriers-related. *In preparation.*
- Bahlman, B. et al. Time is of the essence: Testing the effect of various message frames on time spent performing AIS prevention behaviors by anglers. *In preparation.*

Presentations/Videos

- 2023 MAISRC Research & Management Showcase: Beyond the sign – observing angler behaviors to inform prevention message development. <https://z.umn.edu/2023ShowcaseBeyondTheSign>
- Weber, M.M., Schneider, I., Bahlmann, B. (2024, November). Risky Business: Identifying the most-missed AIS prevention actions among boating anglers. Upper Midwest Invasive Species Conference. Duluth, MN. *Oral presentation.*
- Schneider, I., Weber, M.M., Bahlmann, B. (2024, November). Beyond the sign: Assessing boating anglers intentions across message mediums. Upper Midwest Invasive Species Conference. Duluth, MN. *Oral presentation.*
- Schneider, I.E. & Weber, M.M. (2024, November). Impacting the above-average intentions of Minnesota anglers: Does message medium matter? In Aquatic Invasive Species Webinar Series. Larkin, D.J. (moderator). *Oral presentation.*
- Schneider, I.E., Weber, M., Khadka, A., & Bahlman, B. (2024, November). Assessing boating anglers intentions across message mediums. Upper Midwest Aquatic Invasive Species Research Conference. Duluth, MN. *Poster presentation.*
- Schneider, I.E. (2024, September). What works to influence recreational boater behaviors: signs or augmented reality? MAISRC AIS Research and Management Showcase. Saint Paul, MN. *Oral presentation.*
- Schneider, I.E. (2024, September). Developing, testing and implementing augmented and virtual realities: Applications for invasive species management. Minnesota Parks & Recreation Association Conference. Mankato, MN. *Oral presentation.*
- Weber, M., Schneider, I.E., & Bahlman, B. (2024). Beyond the sign: Augmented reality outreach for aquatic invasive species prevention. Association of Natural Resource Extension Professionals Conference, Hershey, PA. *Oral presentation.*

Factsheets/Informational Documents

- Guide: Best Practices in Augmented Reality. *In preparation.*

- Multimedia Library: [Aquatic Invasive Species Prevention Message Gallery](#)
- Factsheet: [Social Norms and AIS Prevention: What Works?](#)