



# Trust, Values and Behavior in the Context AIS Among Boaters in Illinois

North Joffe-Nelson, Elizabeth Golebie,  
Cory Suski, Richard Stedman, Carena van Riper

Illinois Chapter of the American Fisheries Society  
Annual Meeting, March 2021



- Costs from aquatic invasive species (AIS) are high (Blackburn et al., 2011)
  - Economic impacts
  - Changes in biodiversity
  - Altered habitat
- Illinois waters are home to valuable waterways that are at risk of further AIS spread (Cole et al., 2016)
  - Lake Michigan
  - Major river systems
  - Inland lakes



Bighead carp  
Photo: David Riecks, UIUC



Zebra mussel  
Photo: INHS



- Boaters may spread AIS and experience their impacts
  - **Human dimensions research** provides important insights into boater behavior regarding AIS spread and mitigation
  - Popular support of AIS-related management decisions is vital for their success
  - Conservation boils down to human behavior (Shultz, 2011)



Biofouling on prop



Boat wash station

# Mitigative Behavior



- Managers count on water users to perform mitigative behavior
- Despite extensive outreach campaigns, **Illinois waters are still at risk** of further AIS spread (Cole et al., 2019)



**STOP AQUATIC HITCHHIKERS!**

Be A Good Steward.  
Clean. Drain. Dry.

[StopAquaticHitchhikers.org](http://StopAquaticHitchhikers.org)



# I Values Influence User Behavior

- **Personal values** have emerged as a helpful basis for understanding behavior (Nilsson et al. 2020; van Riper et al., 2019)
  - Trans-situational guiding principles in one's life (Schwartz, 1992)
    - **Biospheric** – *Appreciation for the environment*
    - **Altruistic** – *Concern for other people*
    - **Egoistic** – *Emphasis on self and personal influence*
- Offers a powerful tool in understanding water using constituents and how their worldviews may differ from managers/scientists (Acheson, 1975)

# I Trust Influences Behavior



- **Institutional Trust** has an Important role in influencing popular support for management decisions (Needham et al., 2004)
- Attitudes on **government** and **scientists** may affect intention to engage in recommended behaviors (Taniguchi & Marshall, 2018)



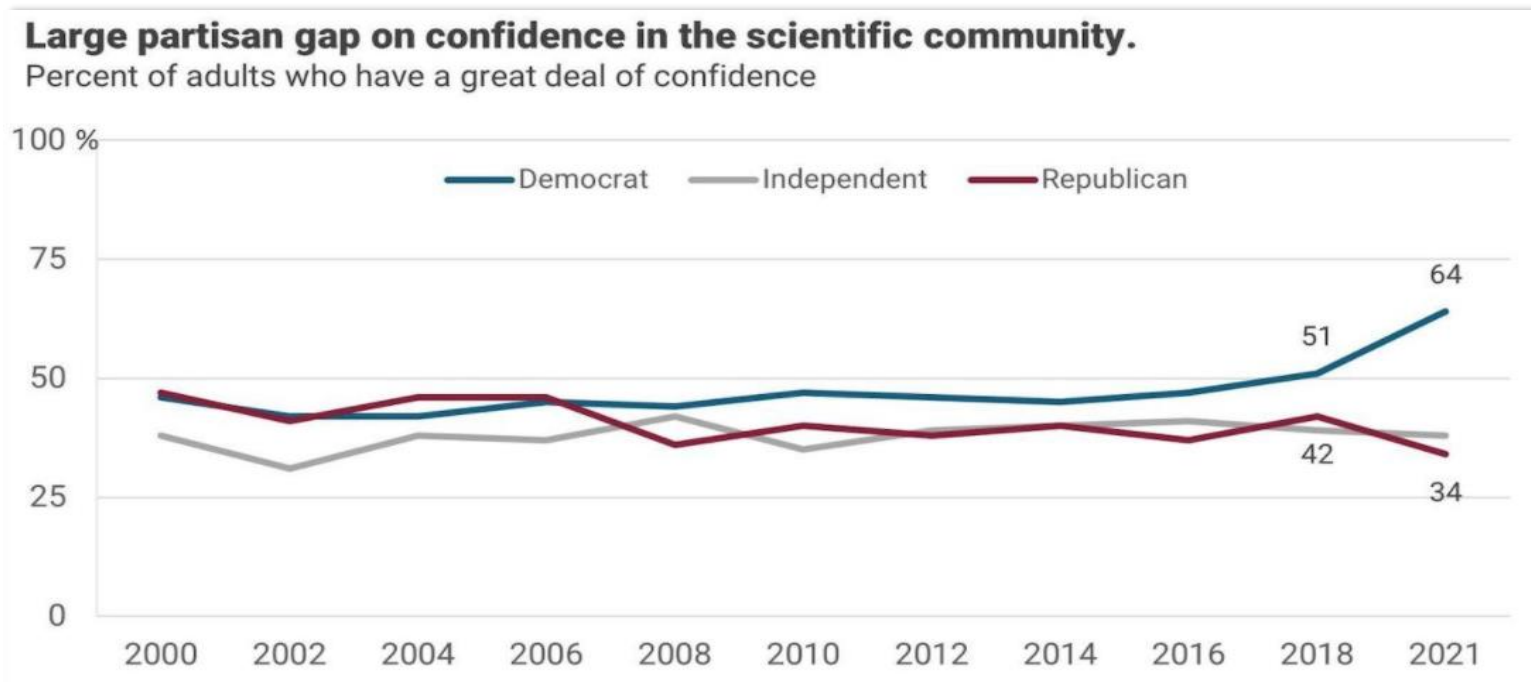
IL DNR project  
Photo: ILDNR



UIUC project  
Photo: IL-IN Sea Grant



- Especially relevant with **increasing polarization** and **declining trust in science and government** (Boxell et al., 2020; Pew Research Center, 2021)



AP-NORC Center for Public Affairs Research



## Understand how trust affects the relationship between values and pro-environmental behavior

1. Understand how personal values correlate with Remove, Drain, Dry behaviors
2. Test how levels of trust held in the regulatory community affects values-behavior relationships
3. Incorporate statistical controls (I.e., socio-demographics, boater type) to refine model



Zebra mussels

Photo: Michigan Sea Grant



Round goby

Photo: Michigan Sea Grant



Eurasian watermilfoil

Photo: Michigan Sea Grant





- Online Qualtrics survey of Illinois residents who rent or own a boat (N=389)
- Respondents were asked to report:
  - Level of trust in scientific community & IL DNR
  - Biospheric, altruistic, egoistic values
  - Intention to engage in Clean, Drain, Dry mitigative behaviors (PEB)
  - Demographic and other data



Intro and screening questions

## A survey about aquatic invasive species in Illinois

The University of Illinois at Urbana-Champaign and Illinois-Indiana Sea Grant are conducting research to learn more about the opinions of recreational water users in Illinois and the spread of aquatic invasive species, which are organisms that move into areas beyond their natural, historic range causing ecological and economic problems.

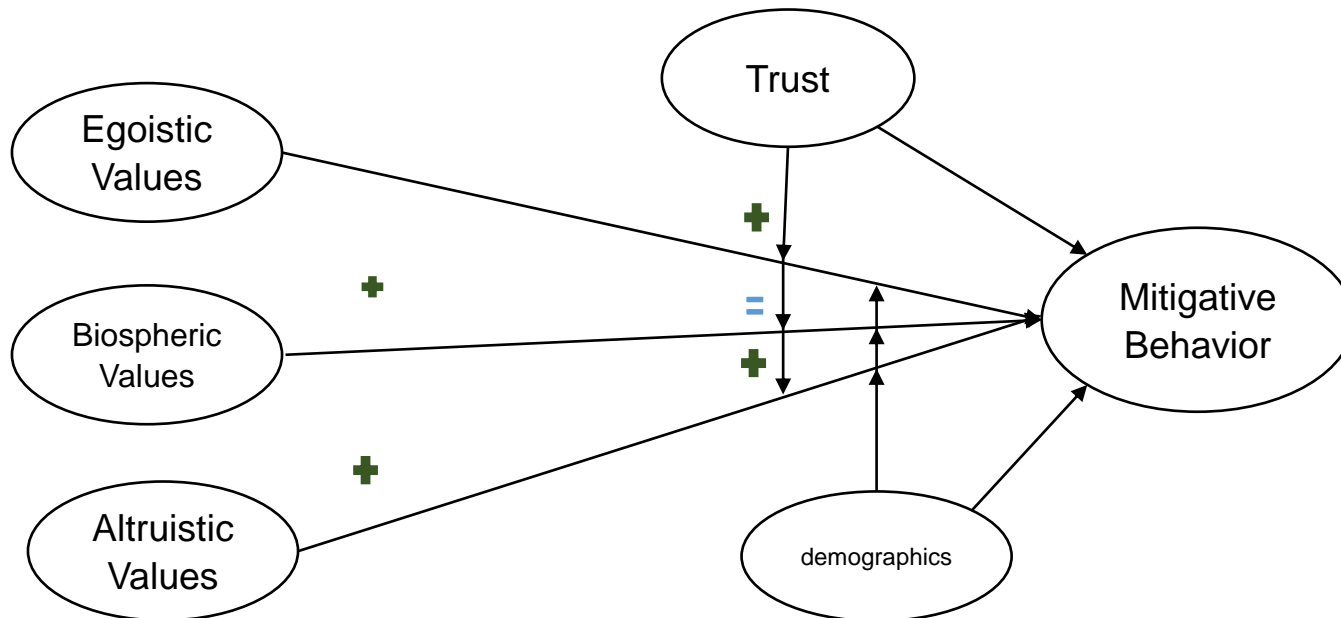
To help decision makers understand the opinions of recreational water users and develop helpful materials for sharing information about aquatic invasive species, we are asking you to participate in this survey. Responding to survey questions about your experiences and preferences as an angler or boater will take approximately 15 minutes.

Those of us at the University of Illinois who may see your information will maintain confidentiality to the extent of laws and university policies. Personal identifiers will not be published or presented. If you have questions or concerns about your rights as a participant please contact the University of Illinois at Urbana-Champaign Office for the Protection of Research Subjects at 217-333-2670 or via email at [irb@illinois.edu](mailto:irb@illinois.edu). If you have any questions about the study, please contact the project leader, Carena van Riper at [cvanripe@illinois.edu](mailto:cvanripe@illinois.edu).

Your participation in this research is voluntary. If you decide to participate, you are free to withdraw at any time. If for any reason you prefer not to participate in this study, you may exit now. If you would like to be removed from our email list, please let us know by responding to our email.

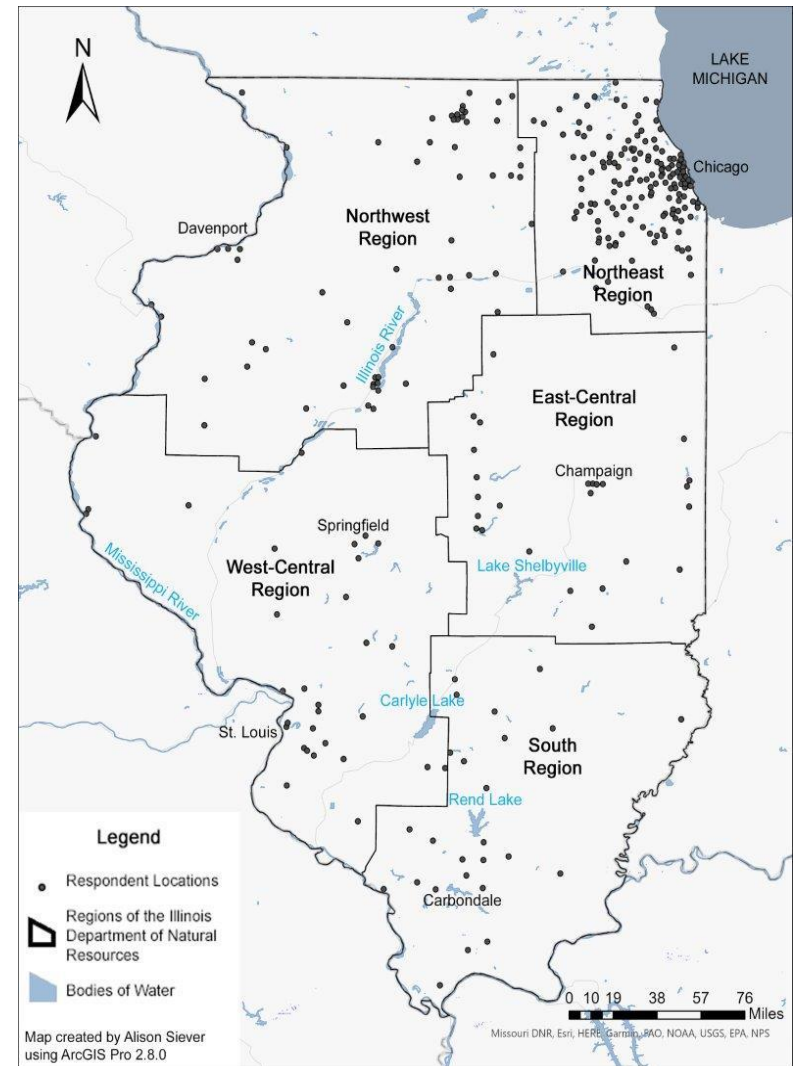
# Analysis

- Structural regression modeling to test relationships (Kline, 2016)
  - Multigroup analysis to test for differences among those reporting high/low levels of trust and demographic differences (Henseler, 2007)





- Boaters (n=389)
  - Majority female (59.6%)
  - Average age of 43.73
  - 71% had at least 2-yr degree
  - Income was evenly distributed, 30% of households earning over \$100k



From Golebie et al. 2021



- Boaters (n=389)
  - 9.73 average days spent boating in 2020
  - 14.99 average years of experience
  - 57.3% owned a boat
    - Fishing Boat – 27.8%
    - Pontoon – 7.3%
    - Kayak – 15.1%
    - Sailboat – 5.2%
    - Power boat – 10.8%
    - Canoe – 17.2%
    - PWC – 9.0%
  - 42.7% rented a boat

RESEARCH REPORT  
OCTOBER, 2021

*Addressing barriers to aquatic invasive species prevention behaviors among Illinois recreational water users*

**PREPARED BY:**

Elizabeth Golebie<sup>1</sup>, North Joffe-Nelson<sup>1</sup>, Alison Siever<sup>1</sup>, Greg Hitzroth<sup>2</sup>, Amanda Huegelmann<sup>2</sup>, & Carena J. van Riper<sup>1</sup>

<sup>1</sup>Department of Natural Resources and Environmental Sciences  
University of Illinois at Urbana-Champaign

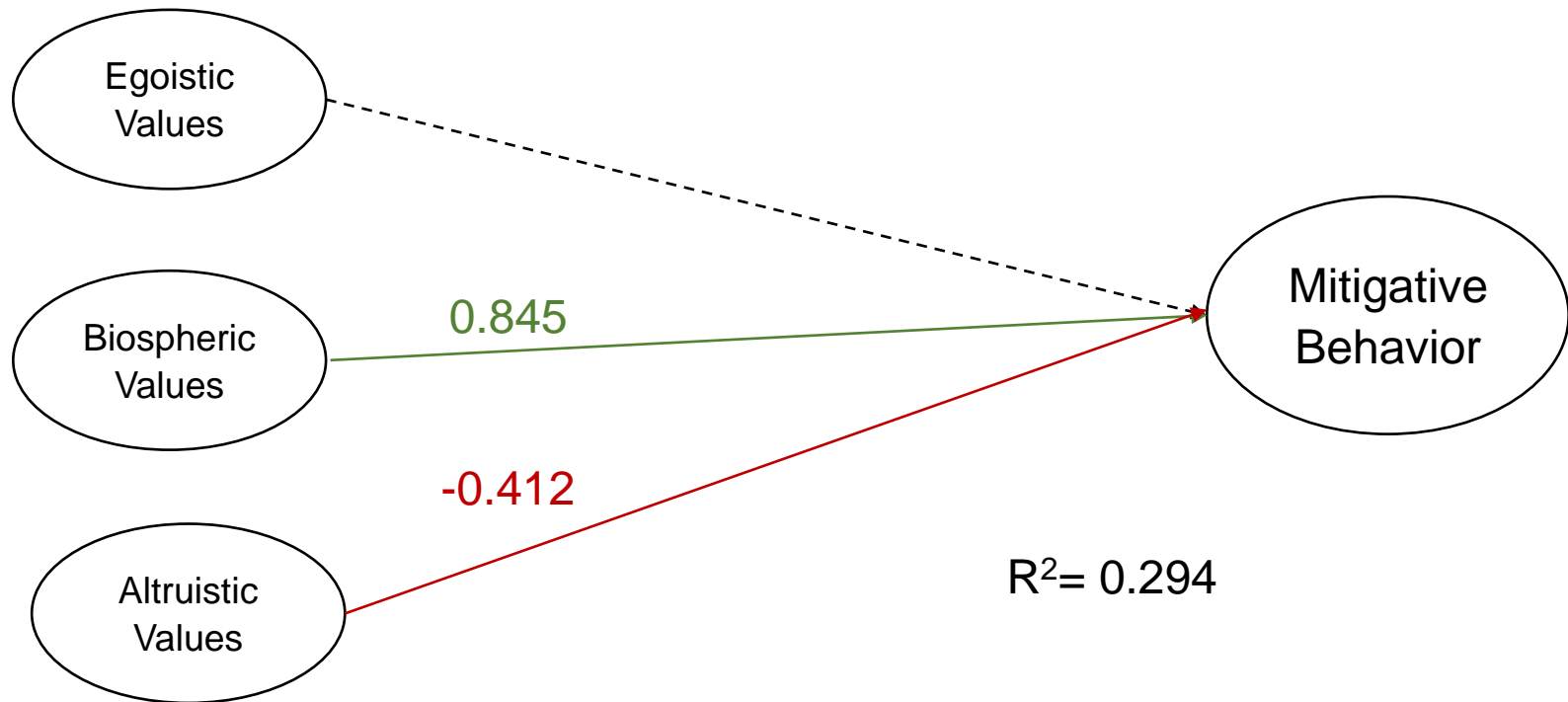
<sup>2</sup>Illinois-Indiana Sea Grant

[http://publish.illinois.edu/angler-behavior-and-aquatic-invasive-species/files/2021/10/DNR-report\\_Final.pdf](http://publish.illinois.edu/angler-behavior-and-aquatic-invasive-species/files/2021/10/DNR-report_Final.pdf)





- Pooled Sample



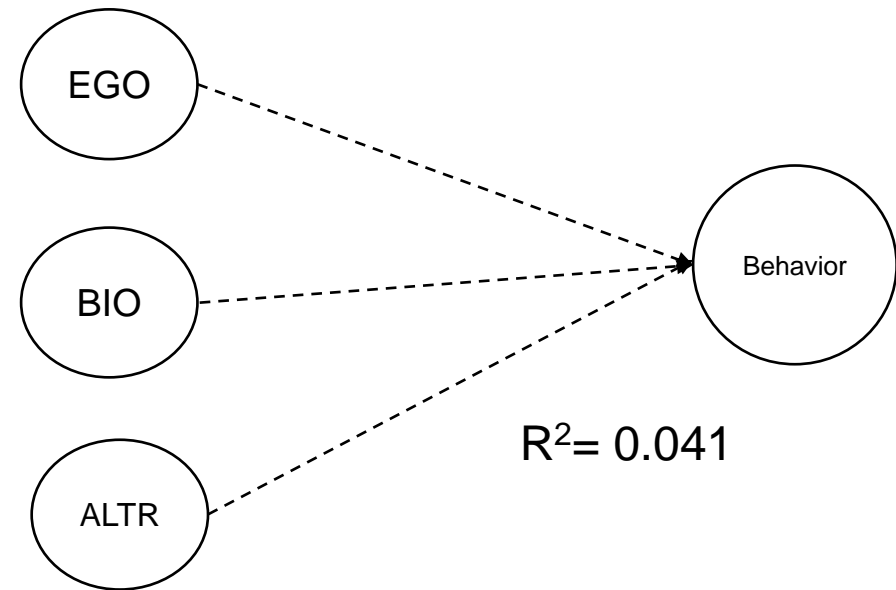
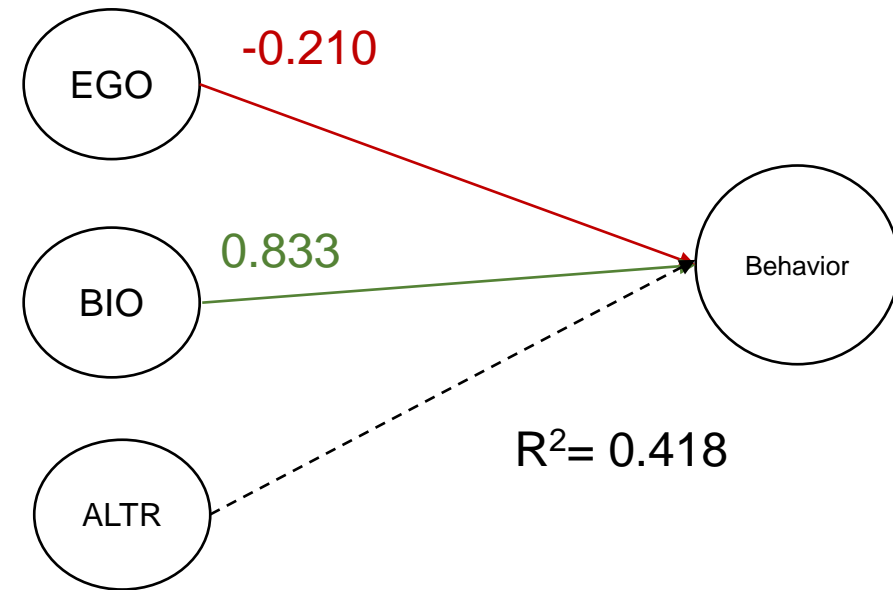
$\chi^2=243.224$ , Df = 85, CFI = 0.934, RMSEA = 0.076, SRMR = 0.066,  $R^2=0.294$



## High Trust in IL DNR

(More likely to perform mitigative tasks;  
 $t(387) = 3.47, p = <.001$ )

## Low Trust in IL DNR

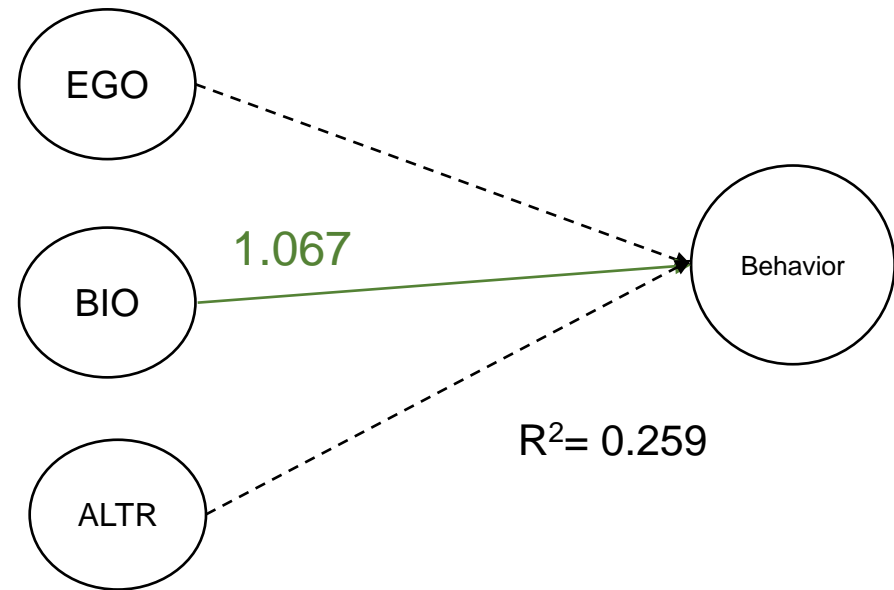
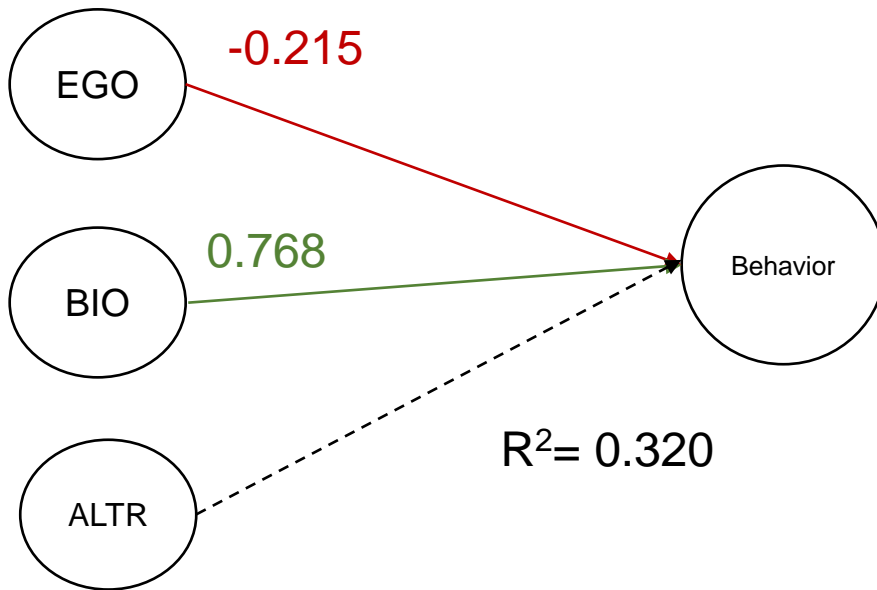


$\chi^2=357.089, Df = 191, CFI = 0.924, RMSEA = 0.072, SRMR = 0.067$



High Trust in sci. community  
(more likely to perform mitigative tasks;  
 $t(387) = 3.23, p = <.001$ )

Low trust in sci. community



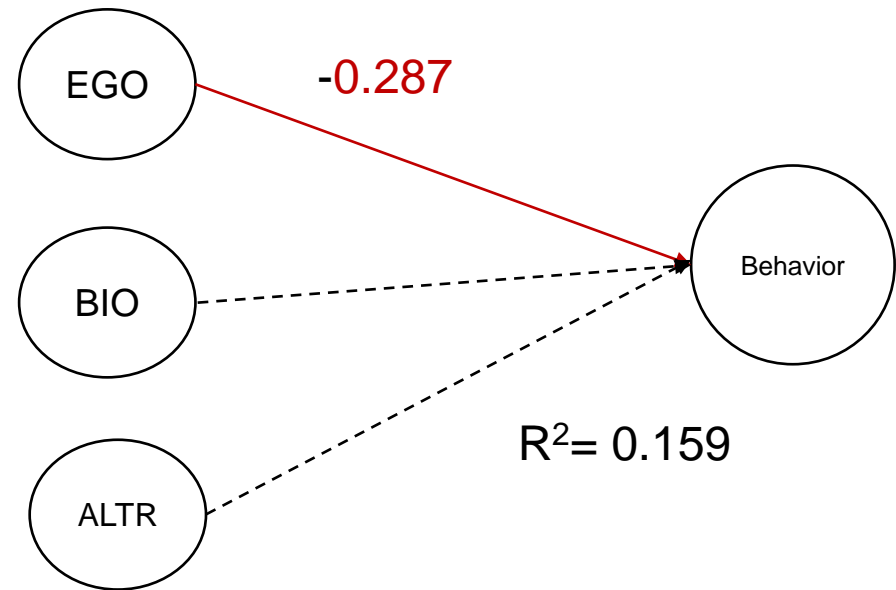
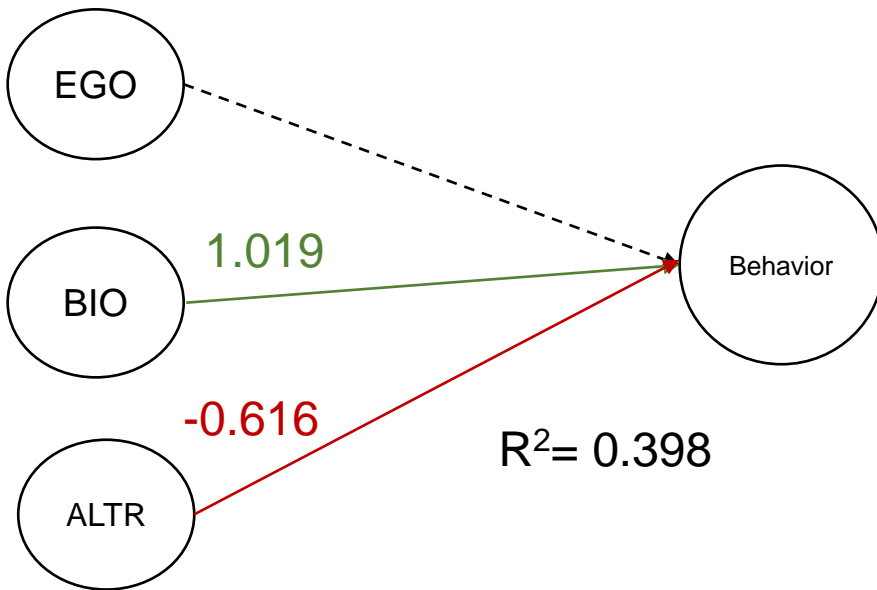
$X^2=350.574, Df = 181, CFI = 0.925, RMSEA = 0.074, SRMR = 0.067$   
(Only metric invariance established)





## Boat Owners

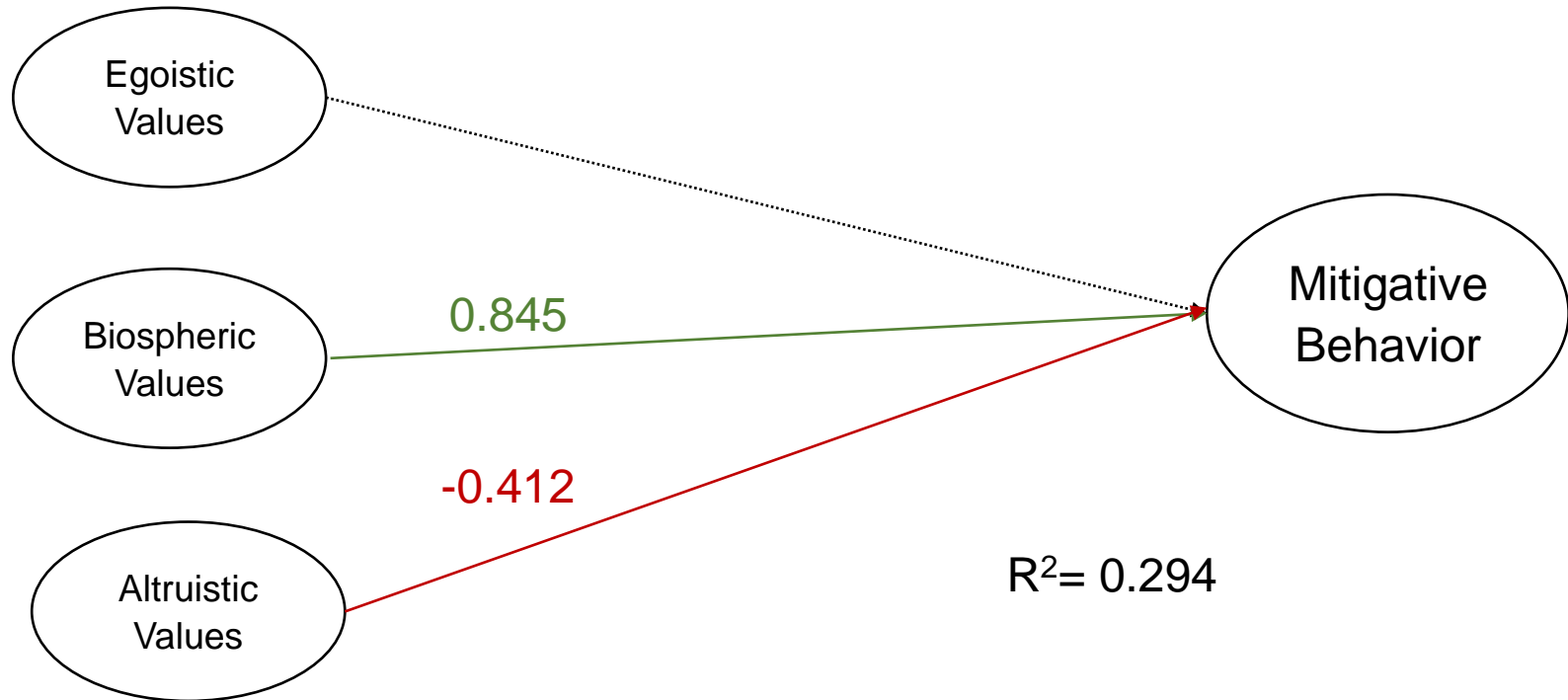
## Boat renters/borrowers



$X^2=386.003$ , Df = 191, CFI = 0.922, RMSEA = 0.078, SRMR = 0.072



- Gender: differences were not significant



$\chi^2=243.224$ , Df = 85, CFI = 0.934, RMSEA = 0.076, SRMR = 0.066, R<sup>2</sup>=0.294



- High trust groups are more likely to engage in mitigative behavior
- Results suggest that trust is important in *activating* paths from some values to behavior
- Boat owners behave differently than renter/borrowers
  - Non-owners likely have less interaction with management outreach and infrastructure, making PEB more dependent on context
- Studies and outreach may miss crucial segments of the water-using constituency (i.e. borrowers, those not registered)



Great Lakes Commission  
AIS outreach



Boat wash zone in Lake County  
Photo: IL-IN Sea Grant



- Education based outreach is likely important for boaters who do not own
  - Although behavioral intentions are similar based on gender and ownership
- Emphasizing trust in constituents makes behavior easier to predict and understand based on values



photo: Shawneeforest.com

- Invasive species are **impacting aquatic ecosystems** and are spread by recreationists (Heck et al., 2015)
- Personal values are a helpful basis for predicting conservation behavior
- Managers require insights into how resource users' level of institutional trust affects conservation behavior in a volatile political environment



Photo: Caleb Gllkerson



# Acknowledgements



## Project Team

Carena van Riper

Danika Ford

Elizabeth Golebie

Greg Hitzroth

Amanda Huegelmann

Alison Siever

North Joffe-Nelson



United States Department of Agriculture  
National Institute of Food and Agriculture



**Thank you!**

**North Joffe-Nelson  
Graduate Student  
Department of Natural Resources and  
Environmental Sciences  
University of Illinois at Urbana-Champaign  
northj2@illinois.edu**