



Image courtesy of Garitzko / Public domain



An AIS risk assessment for wakeboard boats: Potential for spread and possible solutions

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Aquatic Invasive Species

- Impacts to ecology and economy
- Good News
 - Boaters are aware of AIS issues
 - A large percentage of boaters take action
 - Fishing tournament project
- Not as good news
 - New activities, new pathways
 - Ones we may not be familiar with





What are wakeboard sports?



Fat Sacs & Ballast Bags



Eight.3 Plug 'N Play Ballast Bag
Black/Juice 400Lb

Size: 400lbs

Our Price:
\$159.99



Eight.3 Plug 'N Play Ballast Bag
Black/Juice 800Lb

Size: 800lbs

Our Price:
\$169.99



Eight.3 Plug 'N Play Ballast Bag
Silver/Scuderia 800Lb

Size: 800lbs

Our Price:
\$169.99



Eight.3 Plug 'N Play Ballast Bag
Silver/Scuderia 400Lb

Size: 400lbs

Our Price:
\$159.99



Fly High Mastercraft X-Star Bow
Walkthru Fat Sac Fit Not Incl 450
Lbs

Size: 450lbs

Our Price:
\$209.95



Fly High Pro X Series Side Sac Pair
48X12X12 260Lbs

Size: 48x12x12

Our Price:
\$189.99



Fly High Pro X Series Ultimate
Wake Surf Sac 20x20x60 1150Lbs

Size: 24x16x60

Our Price:
\$369.99



Freemotion Single Ballast Bag
540lbs

Size: 540lbs

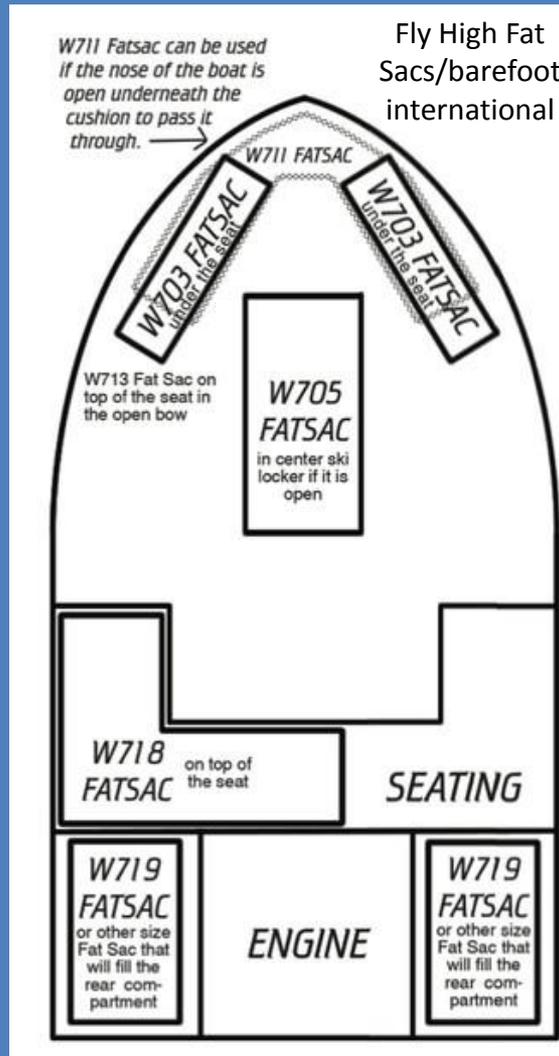
Reg. \$99.95

15% Off

On Sale:
\$84.95



- Bags & hard tanks
- Volume
 - 80 L to 600 L
- Possibility to transport large volumes of water
 - It is in the boater's interest to drain this water



Research Questions

- How much residual ballast is being transported by wake boats with ballast bags?
 - It is thought that hard tanks might drain better, but we were unable to sample these
- What organisms are being transported by the residual ballast?
- What can be done to reduce the amount of water transported?
- What can be done to treat any remaining ballast to eliminate AIS risk?

Watercraft Sampling

- All watercraft were sampled at Ft. Fremont Marine
 - Unique partnership that allowed us free access to watercraft after training
- 25 boats total
 - 13 with ballast bags sampled
 - 2 were already winterized
 - 5 were wake boats w/no tanks
 - 5 had hard tanks
- Residual ballast was filtered through a plankton net and preserved in 70% EtOH



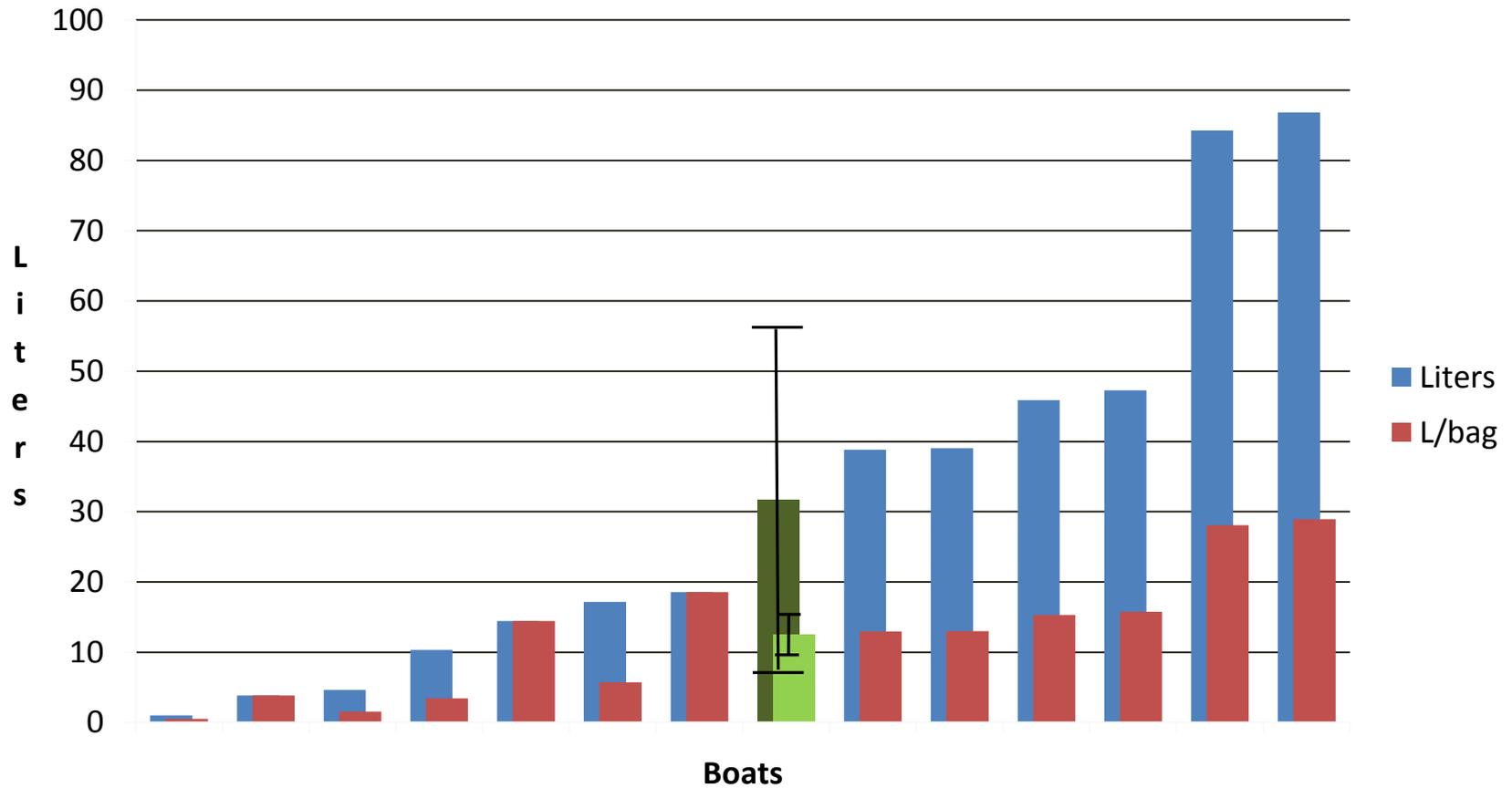


Ballast Volume

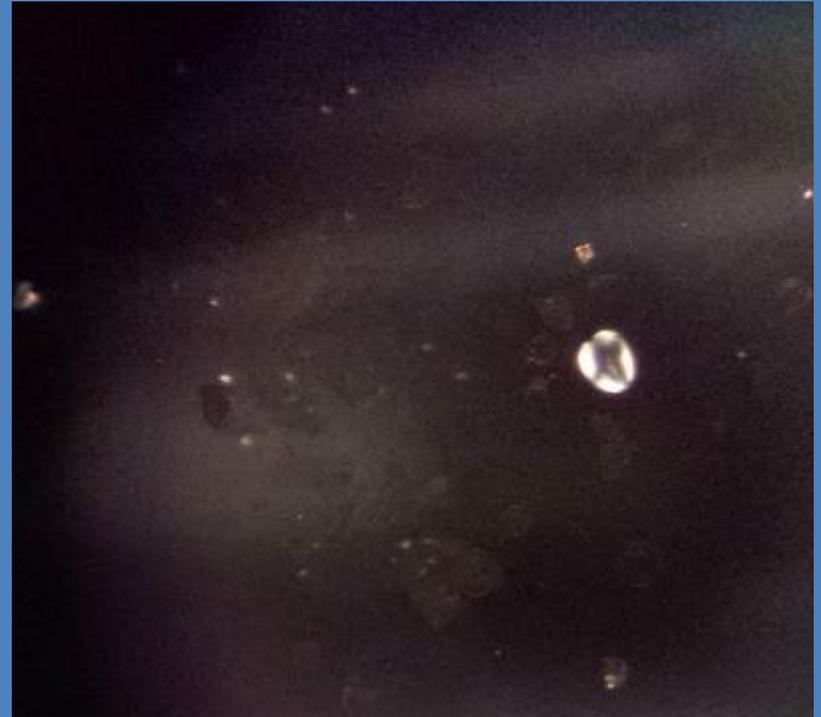
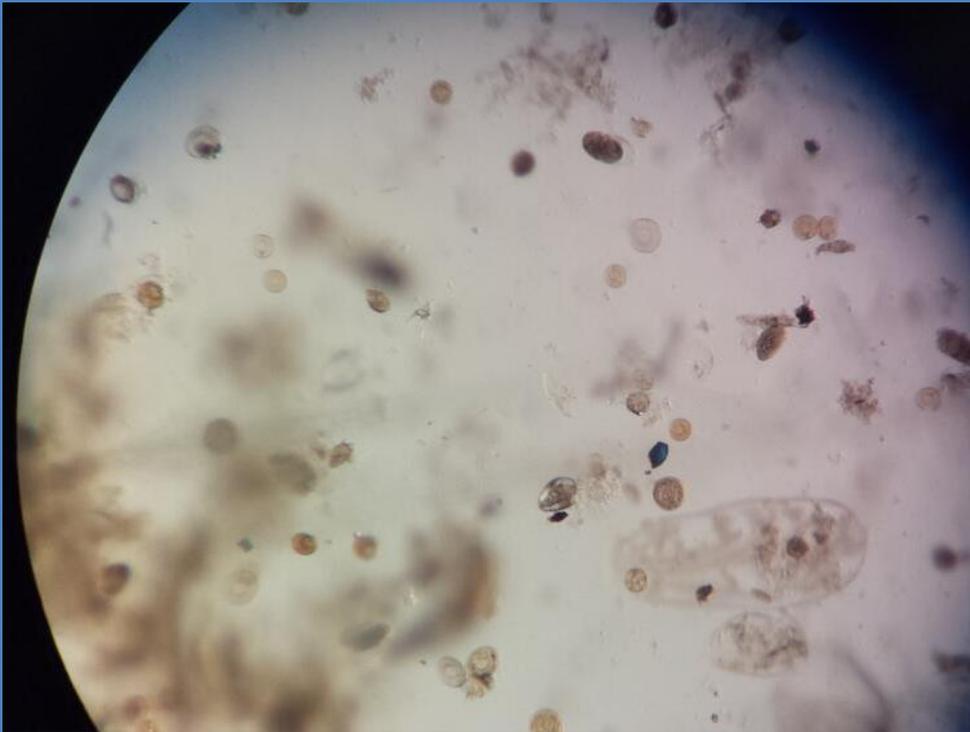
	Total Volume	Liters/Bag
Mean	31.69 L	12.47 L
Standard Deviation	28.79 L	9.31 L
Standard Error	7.98 L	2.58 L
Range	1.01-86.83L	0.50-28.94L

Ballast Volume

Residual Ballast in Wake Boat Ballast Bags



Ballast Contents



- Macroinverts can survive at least 7 days

Ballast Contents

- 2013 Rec Boat Study
 - 21 out of 63 watercraft had residual water
 - Mostly in live well and transom, some in “bilge”
 - Could that have included ballast systems?
 - 321 zoops in all sampled residual water
- Boat 1
 - 133 zoops over ten 1 ml subsamples
 - Mostly “small cladocerans”
 - Total sample size ~400ml
- Boat 5
 - 11 zoops over 15 ml of subsample
 - ~ 250 ml subsample

Not everything ends up discharged

100 L

Drain

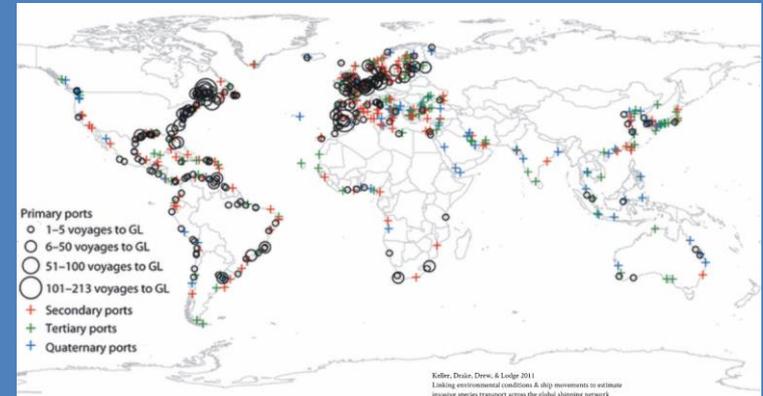
10 L

Transport

90 L new
10 transported

Drain

9 L new
1 L transported



- Original residual ballast diluted before discharge into new habitat
- Possibility of introduction of lake 1 organism in lake 3

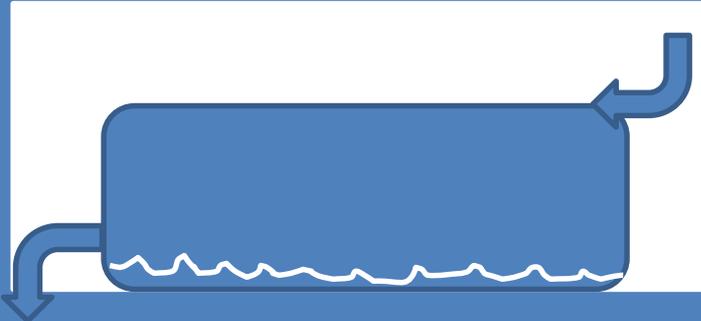
Research Questions

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 - It is thought that hard tanks might drain better, but we were unable to sample these
- What organisms are being transported by the residual ballast?
- What can be done to reduce the amount of water transported?
- What are the boating behaviors of wakeboarders?

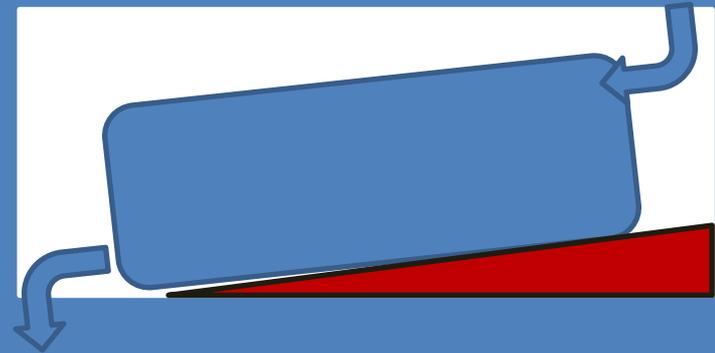
Draining BMP Goals

- Reduce the average amount of water these boats transport in order to reduce the risk of invasive species introduction
- Ideally we would have no water transported, but consistently small amounts of water are an improvement
 - Easier to remove and drain
 - Future treatment options?

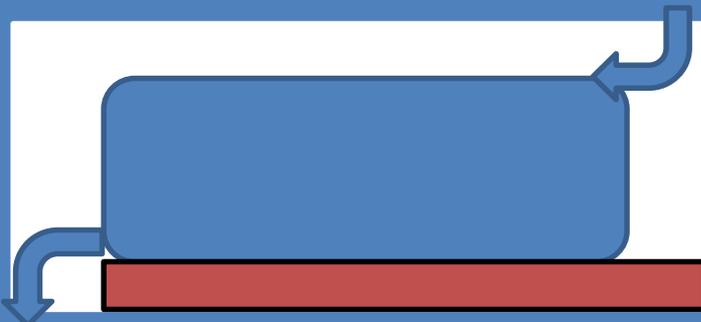
Changes to Ballast System



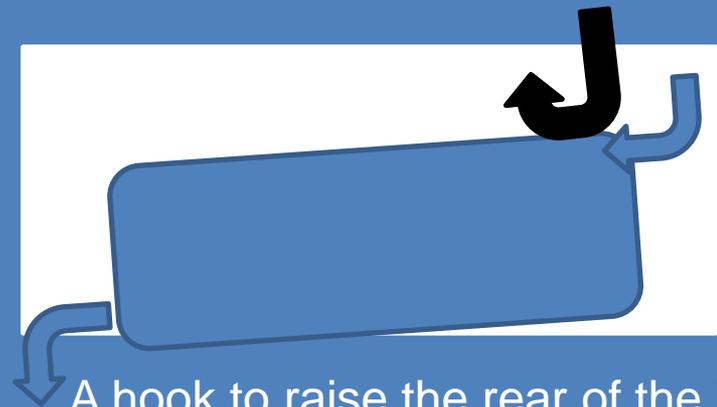
Current design does not promote complete drainage of the ballast



An incline may promote better drainage



Have drainage hose sit lower than rest of bag to promote drainage

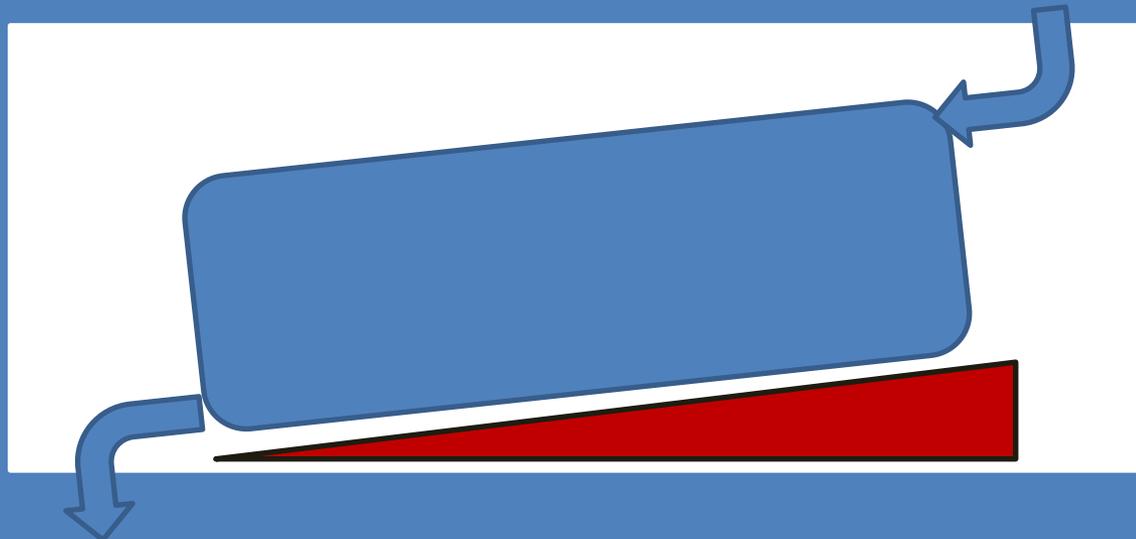


A hook to raise the rear of the bag may promote better drainage

Alternatively, hard tanks may drain more completely than bags

Changes to Draining Behavior

- Drain ballast system again on boat ramp to have more water get to the drainage hose
- Currently looking for new partners to help us evaluate these options



Boater Behavior

- Survey to determine how many different bodies of water these users visit
- Awareness of AIS issues
 - Including potential ballast risk
- What do I think?
 - High risk, low frequency event
 - Primary wakeboard friendly water bodies
 - Travel for vacation

Existing Solutions

- Wake Worx Mussel Mast'R
 - Filtration system that filters ZM/QM veligers



My Wisconsin Perspective

- Law requires water to be drained
- Filtration system may remove macroinvertebrates, but does not treat VHS or other pathogens
- Lag time in adopting a filtration system
- Little incentive for WI residents to adopt system
 - Decon not required, doesn't help them bypass decon
 - A change in law
 - There's always the "right thing to do", but...
 - Maybe there is another way?



Questions?

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Potential Solutions - BMPs

- Can different draining regimes reduce volume?
 - One bag at a time vs all at once
- Can draining on an angle increase efficiency?
 - Drain in water then again on ramp

