



Tools and Technology

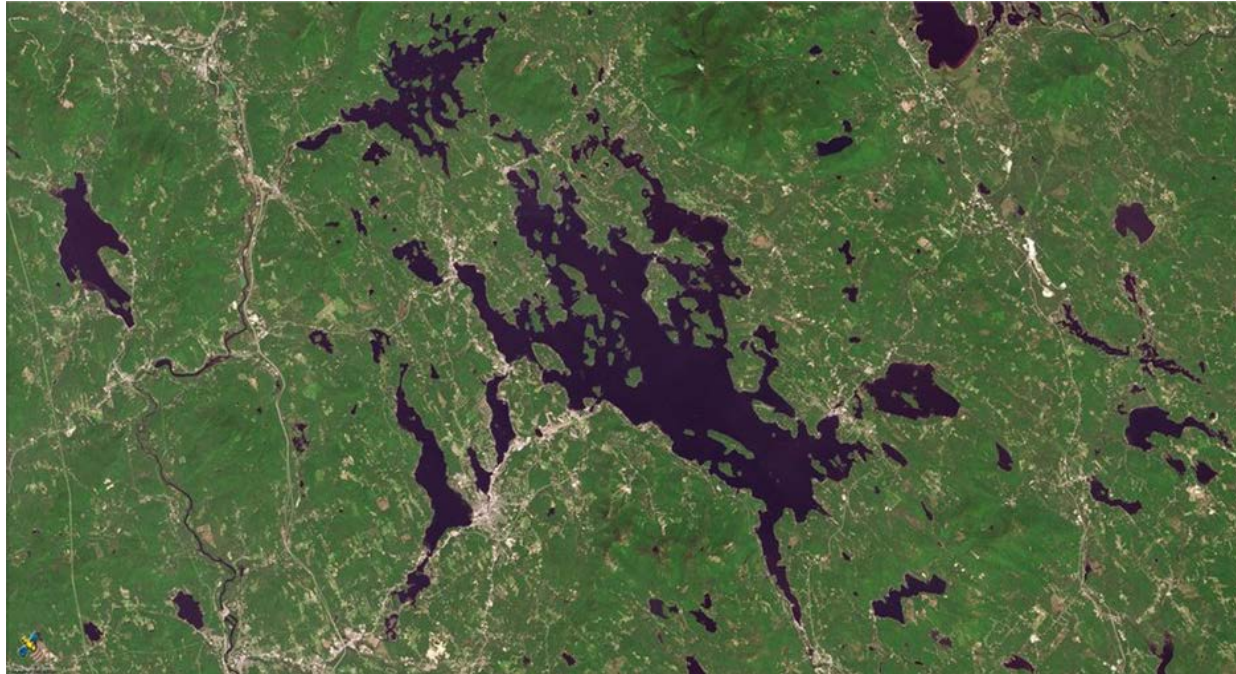
for Aquatic Invasive Species Spread Prevention

2019 Lakes Congress
May 31, 2019

Andrea LaMoreaux, Vice President, NH LAKES



How many lakes & ponds are there in NH?





How many miles of rivers & streams are there in NH?



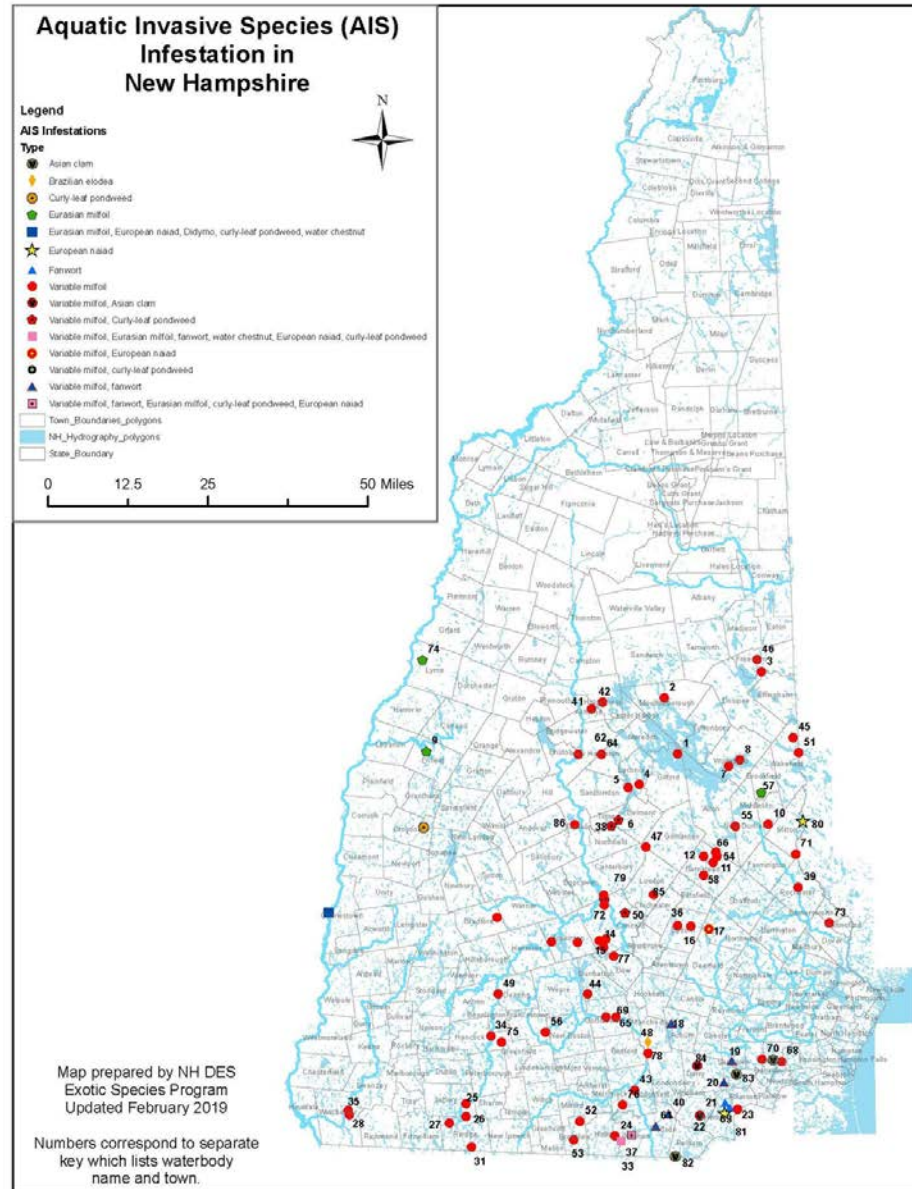


How many waterbodies are infested with aquatic invasive species?



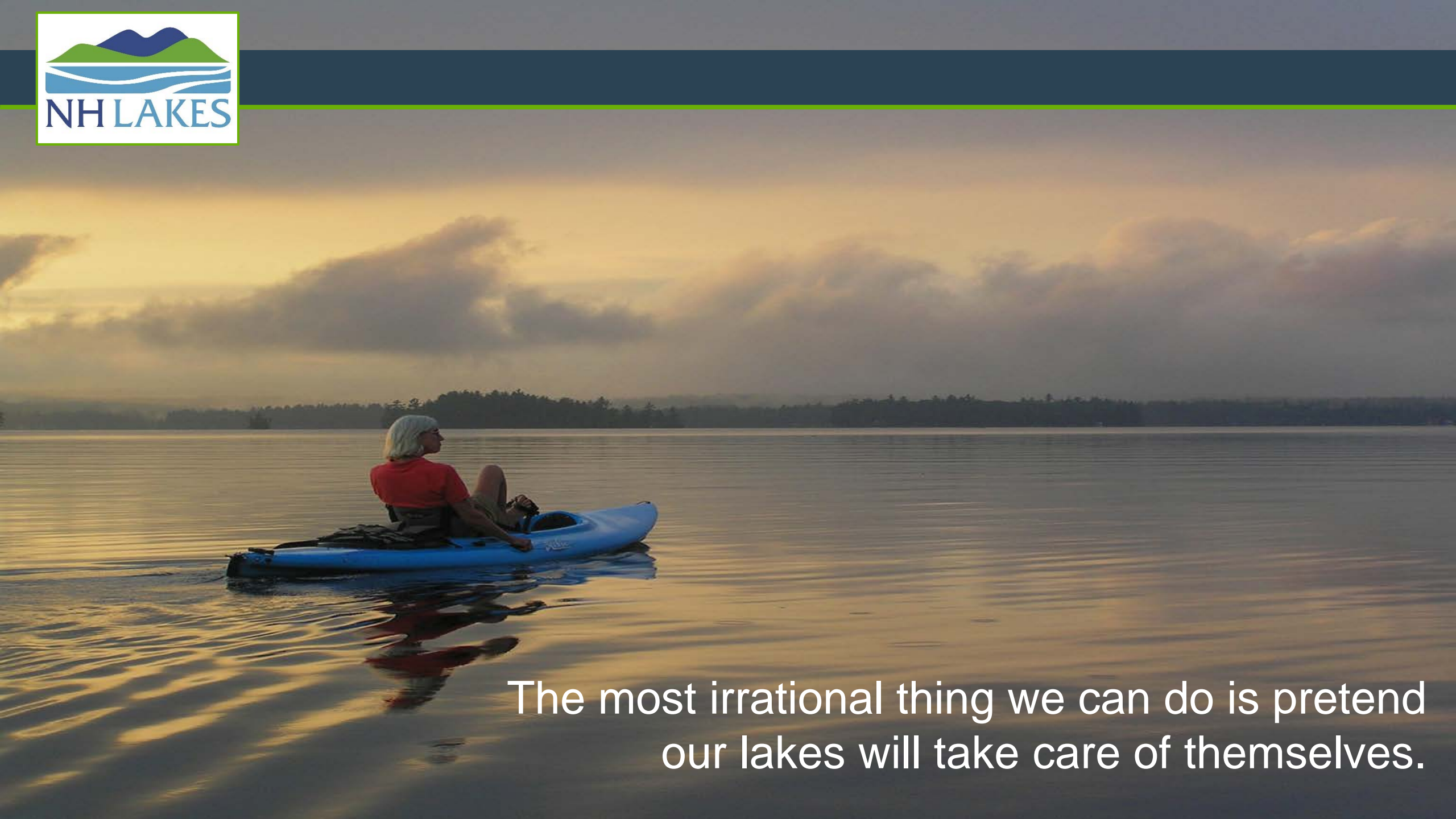


87 waterbodies in NH have an aquatic invasive species infestation.





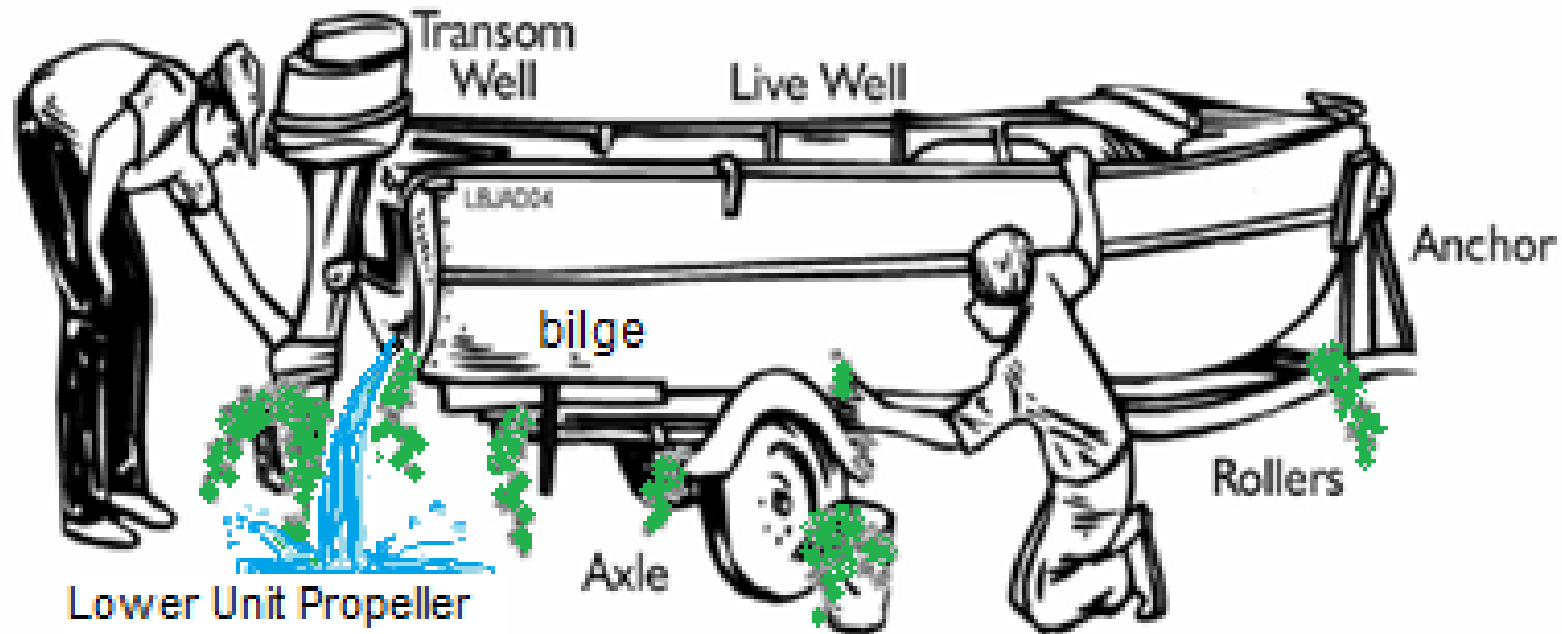
Aquatic invasive species make recreation dangerous and unpleasant, disrupt the ecological balance of waterbodies, reduce shoreline property values, and are difficult and expensive to control.



The most irrational thing we can do is pretend
our lakes will take care of themselves.



The NH LAKES Lake Host Program is the first line of defense in keeping our lakes free of invasive plants and animals.

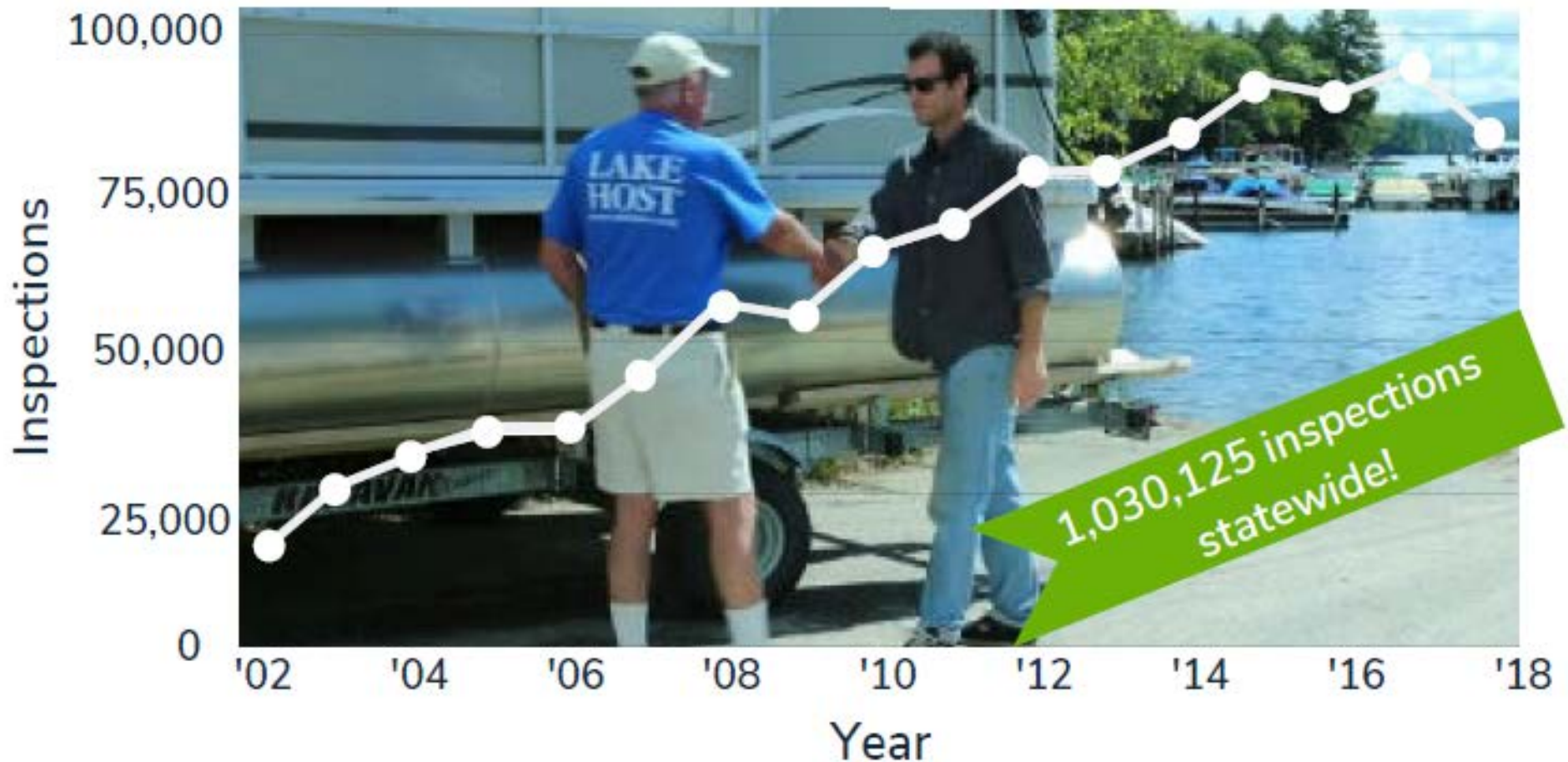


Lake Hosts teach boaters to clean, drain, and dry.



Lake Host Program

COURTESY BOAT INSPECTIONS





Lake Host Program

Fanwort



Curly Leaf
Pondweed



Common Reed



Variable Milfoil



Water Chestnut



Eurasian Milfoil



Chinese Mystery
Snail



European Naiad



Zebra Mussel



**INVASIVE SPECIES
REMOVED**

**1,598 'saves' at 53
waterbodies over 17 years**



The rate of spread of invasive plants has slowed over the past 15 years.



But, the spread of invasive animals appears to be on the rise.



Despite spread prevention and outreach, and applicable state laws:

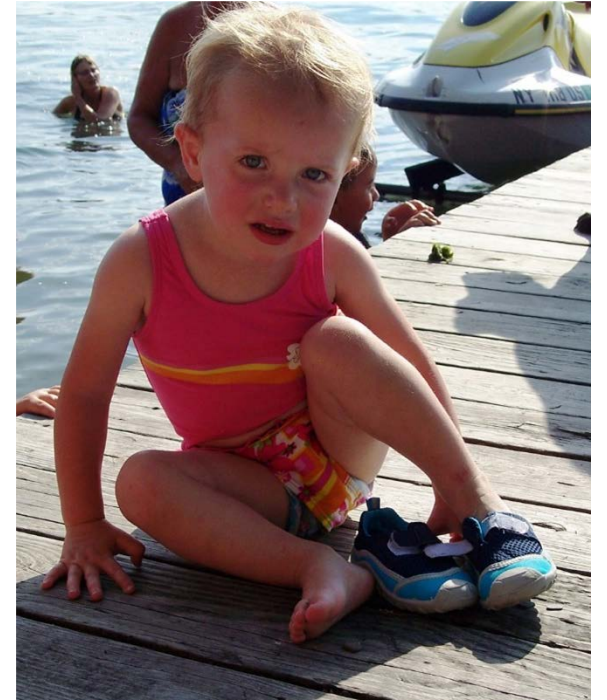


Boats that are not cleaned, drained, and dry continue to arrive.

Boaters with low awareness continue to arrive.



It can take just one infected boat to cause a widespread problem.



More must be done to prevent the spread.



Best Available Technologies for
Aquatic Invasive Species Spread Prevention:

A guidebook by NH LAKES for boat access site owners and partners



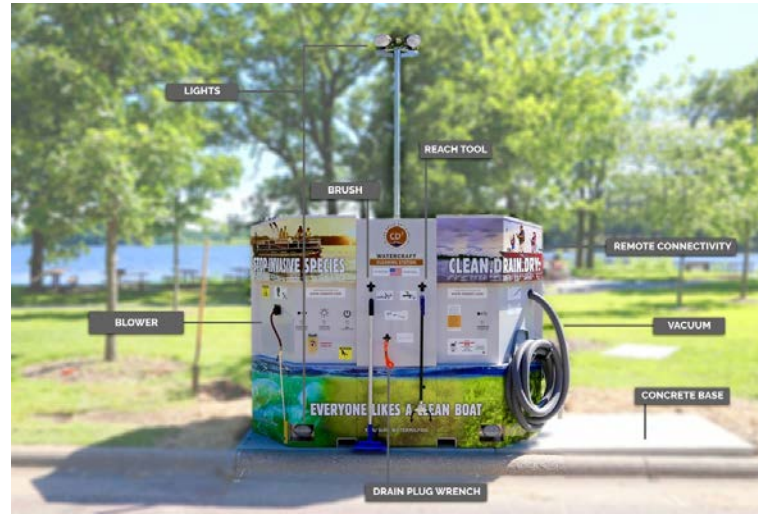
November 2018



Available for FREE download.
nhlakes.org/store/



Clean & Drain Areas



Waterless Cleaning Station



Decontamination Stations

Tools & technology can be provided by access site owners to empower boaters to take action to prevent the spread!



We work with local groups, state legislators, and individuals to develop programs and policies and to inspire action to keep our lakes clean and healthy.



January 2020: New AIS spread prevention law goes into effect!



Boaters must use AIS prevention technologies at public boat access facilities, if they are available to use.



Summer 2019: Take the next step in AIS prevention with NH LAKES!

Best Available Technologies for
Aquatic Invasive Species Spread Prevention:

A guidebook by NH LAKES for boat access site owners and partners



November 2018



Invite us to your local ramp to
identify opportunities!



Summer 2019: Take the next step in AIS prevention with NH LAKES!



Check out the NH LAKES mobile solar-powered
CD3 Waterless Cleaning Station in action!
Stay tuned for the touring schedule!



And, now let's hear from the CD3 Expert, Dr. Ed Rudberg!



The Science of Compliance

Empowering Boaters with “The Tools”



Edgar Rudberg, Ph.D.

NH LAKES Congress 2019



- The importance of compliance
- Boater behaviors
- Pilot sites and example locations
- 3rd party research
- Model options for AIS prevention
- Conclusions





\$146B

Invasive
species cost
to U.S./ year



Over 36,000
public boat
launches

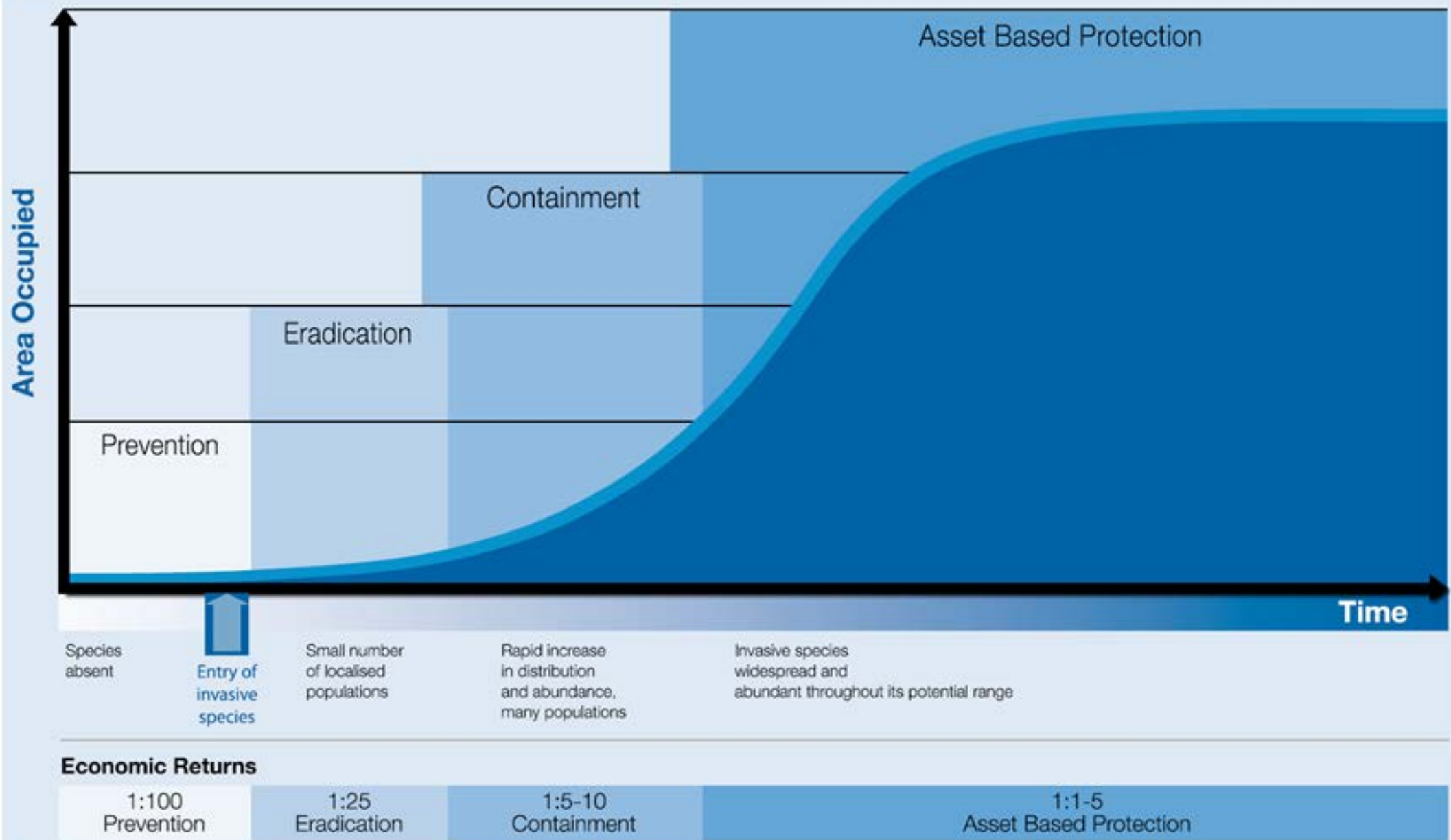


Existing
solutions are
costly &
cannot scale

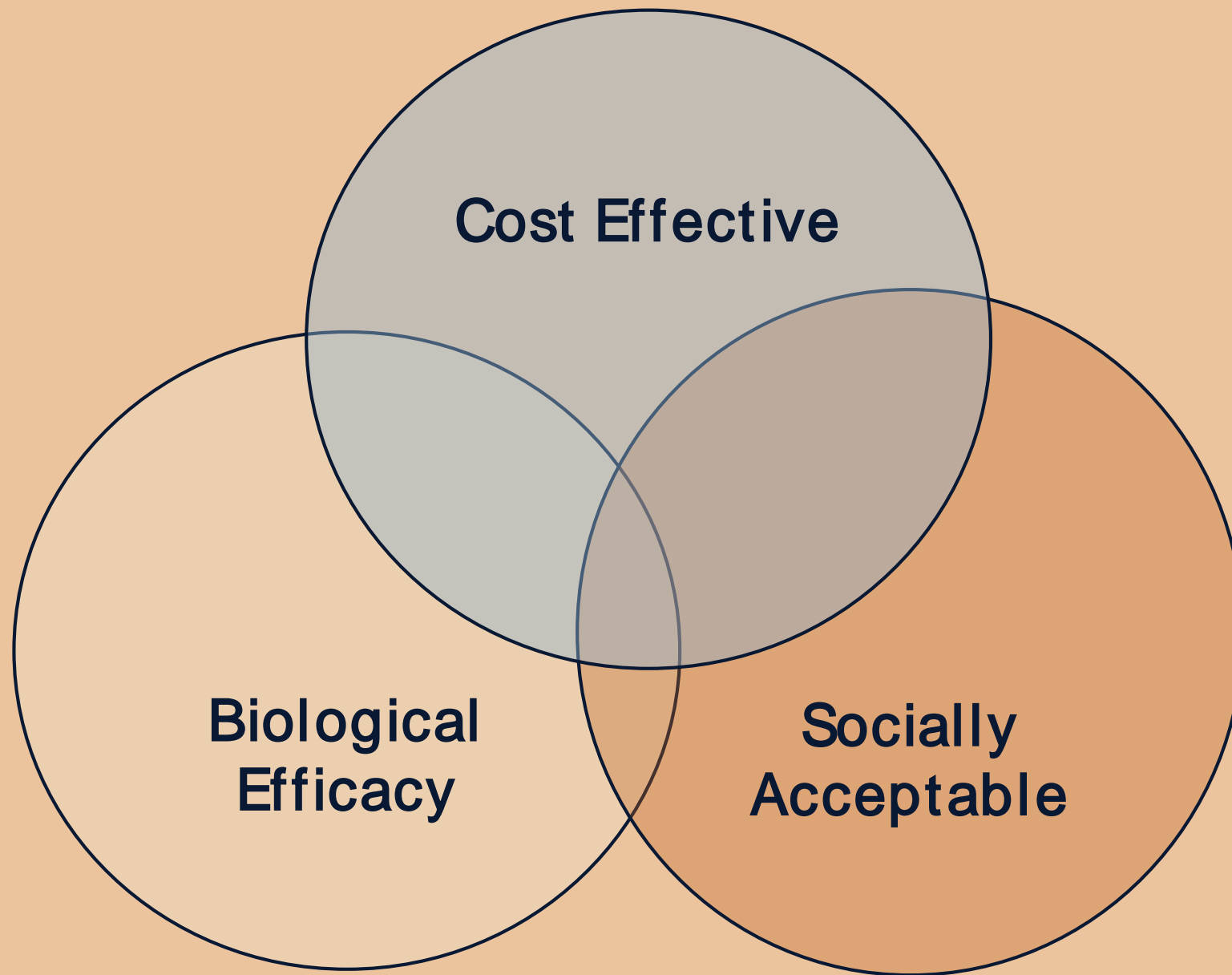


Problem

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Invasion Curve



Acceptance



- 2 Species in 2010
- 60% plankton Loss
- 2016 fishery closed

- 1 County
- 1 Fishing season lost
- 1 Lake



Failure : Mille Lacs



- Public violates biosecurity laws
- If we just educate the public...
- Numerous barriers to action



Myths of Outreach

Example: my first car... not a Ferrari

- Marketing
- High brand value
- All the cool kids are doing it
- Barriers



Marketing has Limits

- Rampant messaging
- Low recycle rates
- Centralized drop off
- All the cool kids are not doing it
- Barriers to action



Failure: Recycle CFL

Biosecurity works:

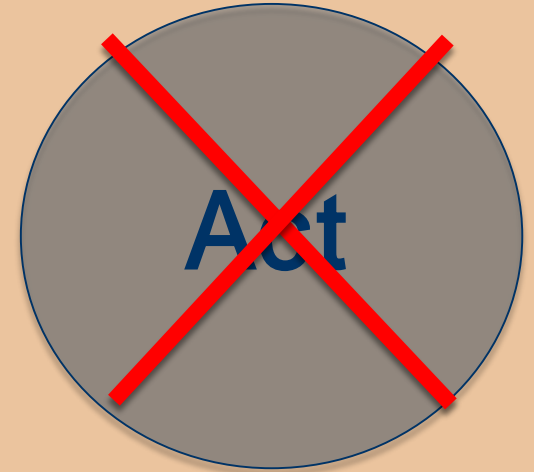
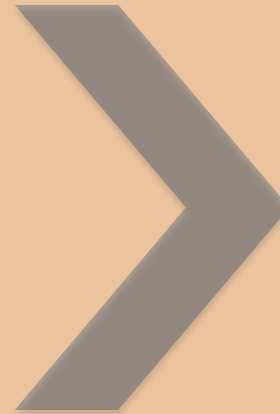
- Rampant messaging
- Hot water
- Soap
- Towels



Success: Hand Washing



Plan
to
Act



Example: Boaters

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ALS survey says...“Give ‘em the TOOLS”

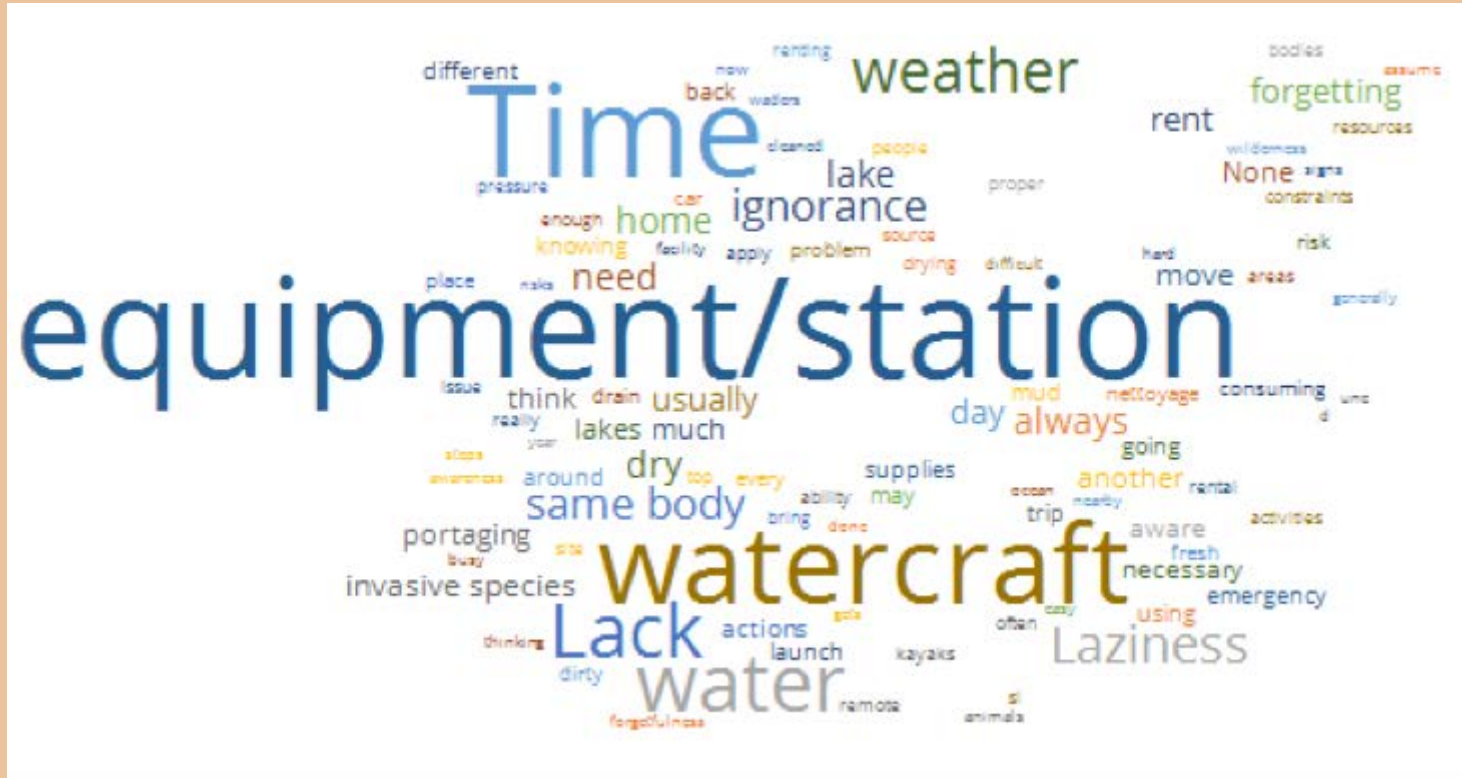


Image Courtesy of Canadian Council on Invasive Species



Empowering Action

Goals of 2017 Pilot

- Empower “day boaters”
- 5 locations
- Diversity of boater types
- Small - large launches
- Clean-in vs. clean out
- Urban - rural landscape
- Oligotrophic - eutrophic



Pilot Sites

Non-Profit Partners



Pilot Sponsors



Public Support



Minnesota Pollution Control Agency

Minnesota DNR

Texas Park & Wildlife



Pilot Partnerships



Design 1.0

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IoT connected

Tethered tools

Compressed
air



Marine LED lights

Solar Powered

Wet/ dry vac



Pilot Design

Copyright 2019

CD³ STATION REMOTE PORTAL

Views ▾ Grids ▾ Actions ▾

Stations

	Status ▾	Name ▾	Location ▾	Air Button ▾	Last Repo ▾	Vacuum B ▾	Light Buttc ▾	Off Button ▾	Tool 1 Use ▾	Tool 2 Use ▾	Tool 3 Use ▾	Compress ▾	Tank Leve ▾	AC Voltage ▾
➤	● Normal	Station #1	Bryant Lake	74 times	7/17/2017 2:49 PM	62 times	20 times	65 times	208 times	150 times	436 times	47 times	11%	3 volts

Map Navigate Details Provision View All



	Reading	Value	Date	History
●	Tank Level	11%	7/17/2017 2:49 PM	
●	AC Voltage	3 volts	7/17/2017 2:49 PM	
●	Air Button Uses	74 times	7/17/2017 2:49 PM	
●	Vacuum Button Uses	62 times	7/17/2017 2:49 PM	
●	Light Button Uses	20 times	7/17/2017 2:49 PM	
●	Off Button Uses	65 times	7/17/2017 2:49 PM	
●	Tool 1 Use Count	208 times	7/17/2017 2:49 PM	
●	Tool 2 Use Count	150 times	7/17/2017 2:49 PM	
●	Tool 3 Use Count	436 times	7/17/2017 2:49 PM	
●	Compressor Uses	47 times	7/17/2017 2:49 PM	



MyCD3Station.com

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CLEAN-DRAIN-DRY-DISEASE

CD³

WATERCRAFT

CLEANING INSTRUCTIONS

BY BOATERS



FOR BOATERS™

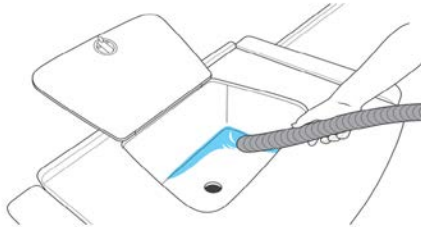
Please select your boat type:



Clean off trailer



Suck out all water in boat



Check for zebra mussels





Education



Bryant Lake

C 2019



Pike Lake

C 2019



Minnetonka - 1

C 2019



Lake Riley

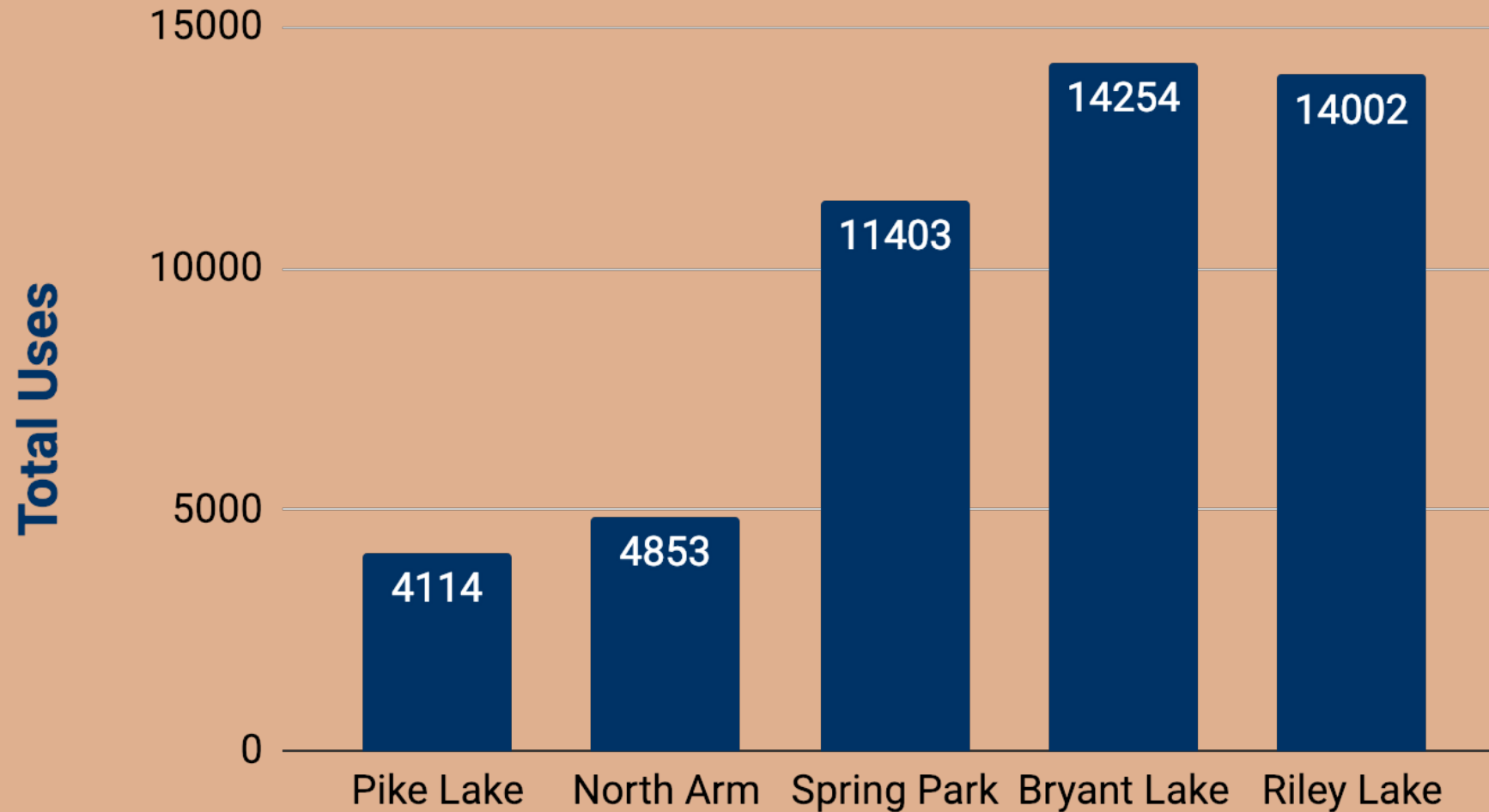
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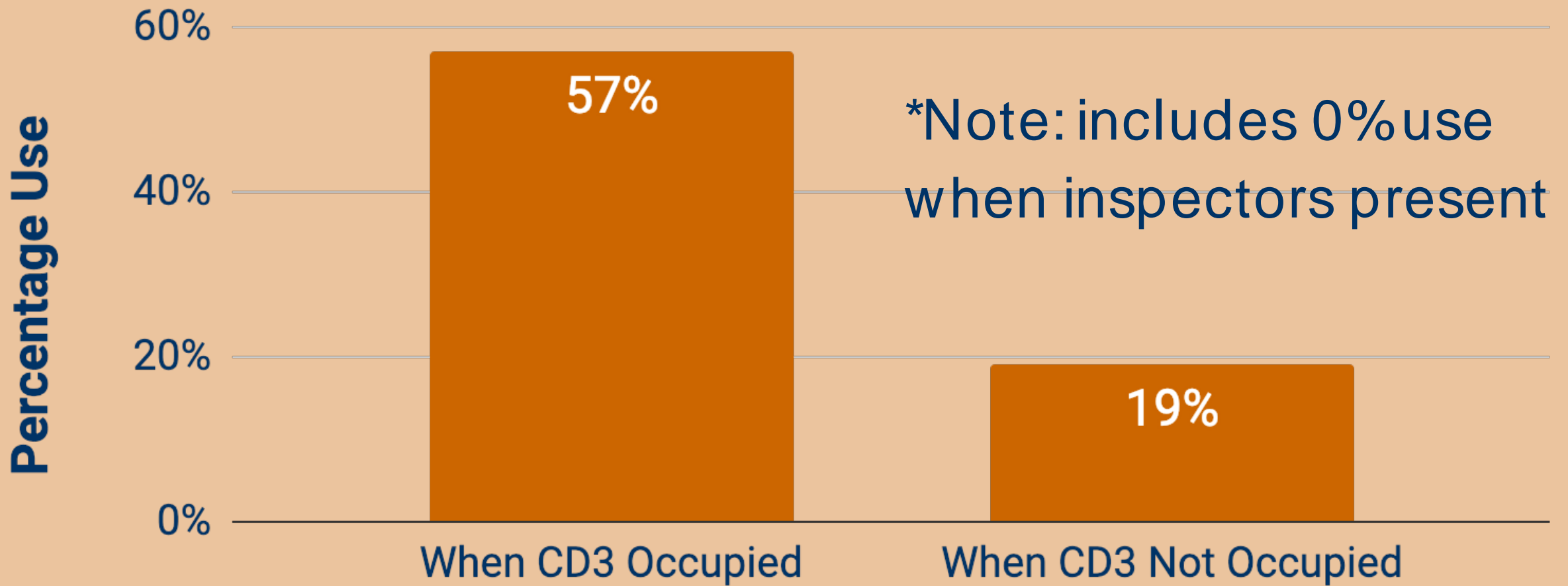
Minnetonka - 2

C 2019

Total Uses for 2017-2018 Pilot



28,487+Uses

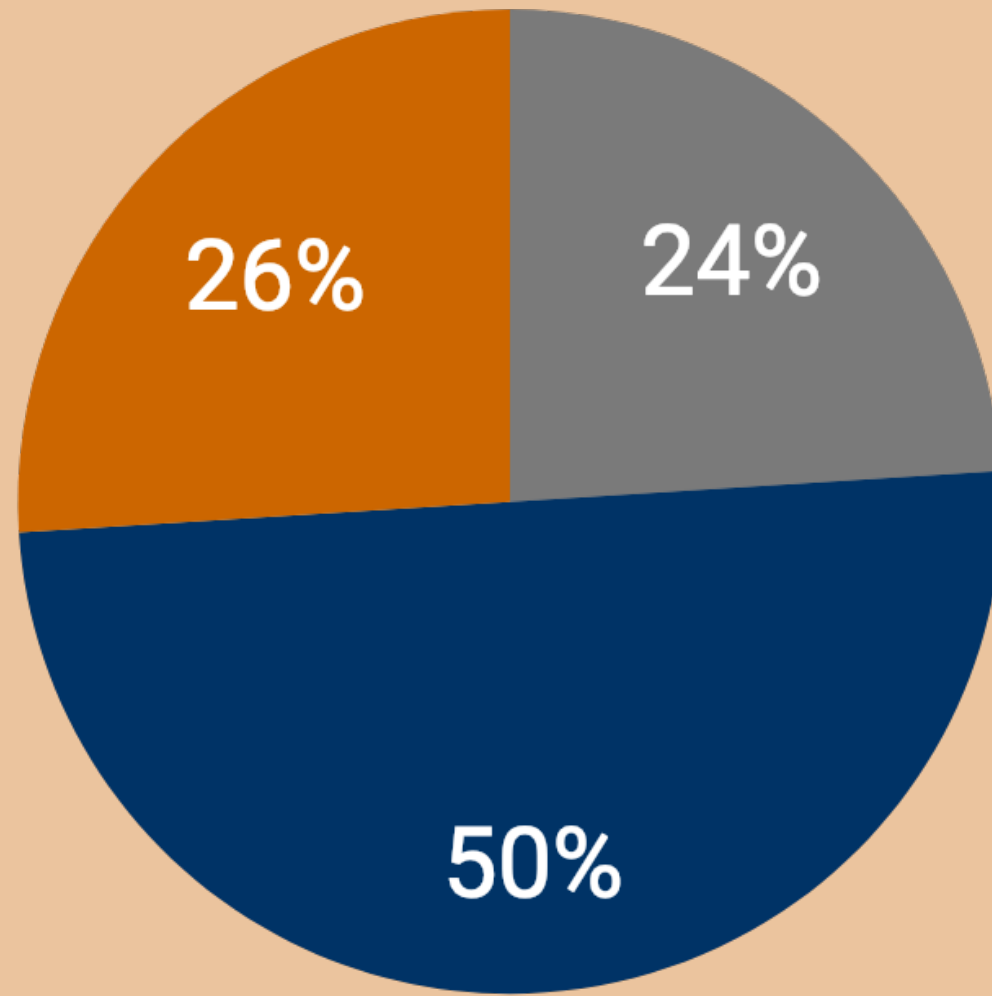


Percentage Using CD3 Station

*Source: Three Rivers Park District 2019 Survey



Percentage Use



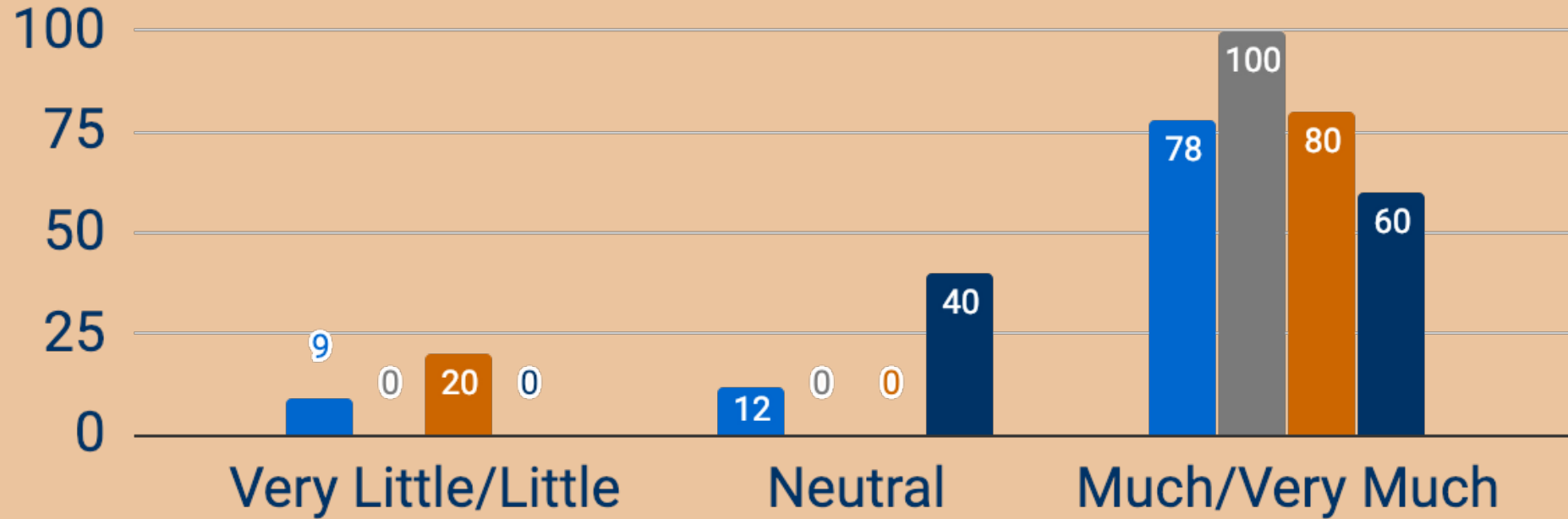
● < 3 Minutes ● 3-5 Minutes ● 5-10 Minutes

*Source: Three Rivers Park District 2019 Survey

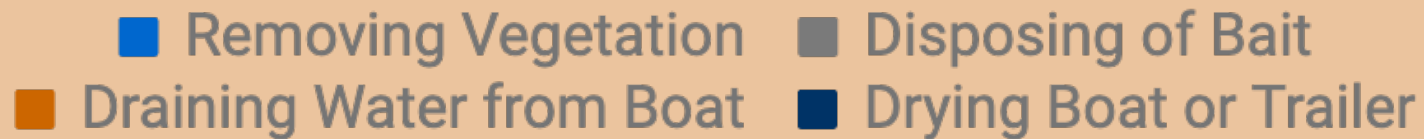


Length of Time Used

Percentage of Respondents



Tasks



*Source: Three Rivers Park District 2019 Survey



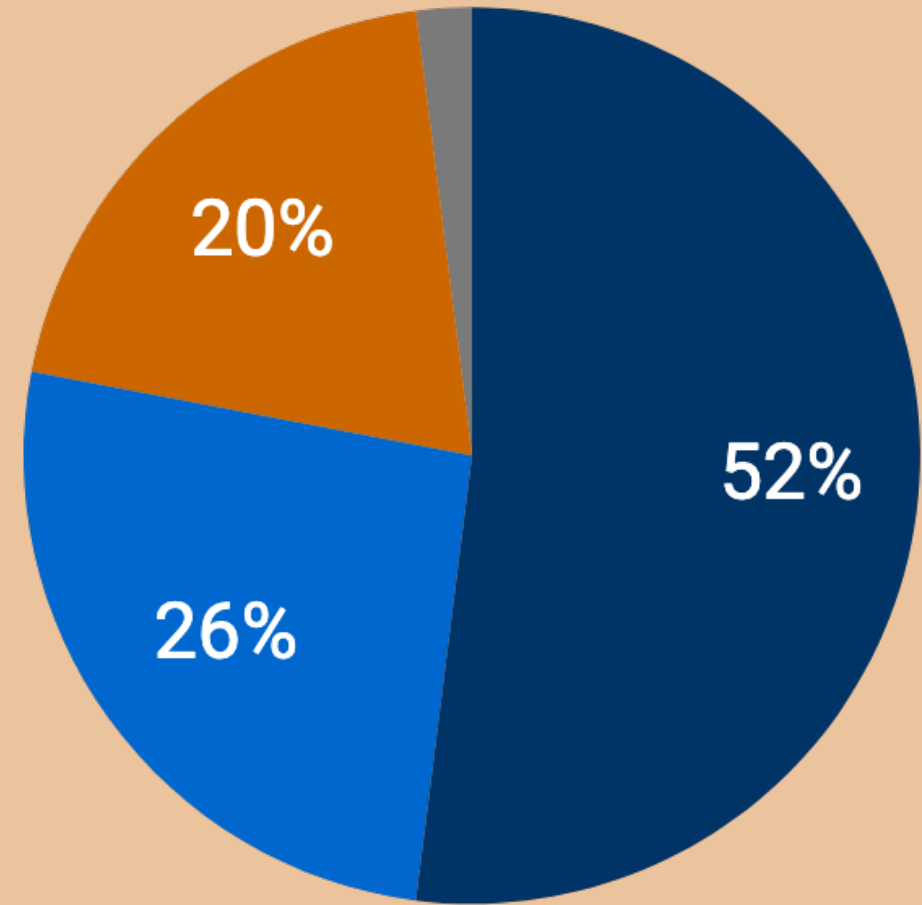
Helpfulness of CD3 in

What if anything was difficult?

- “Nothing” (plurality)
- “The vacuum sucked up my plug.”

What if anything was easy?

- “I find the entire station easy to use”
- “Everything”



● Very Easy ● Easy
● Neutral ● Difficult

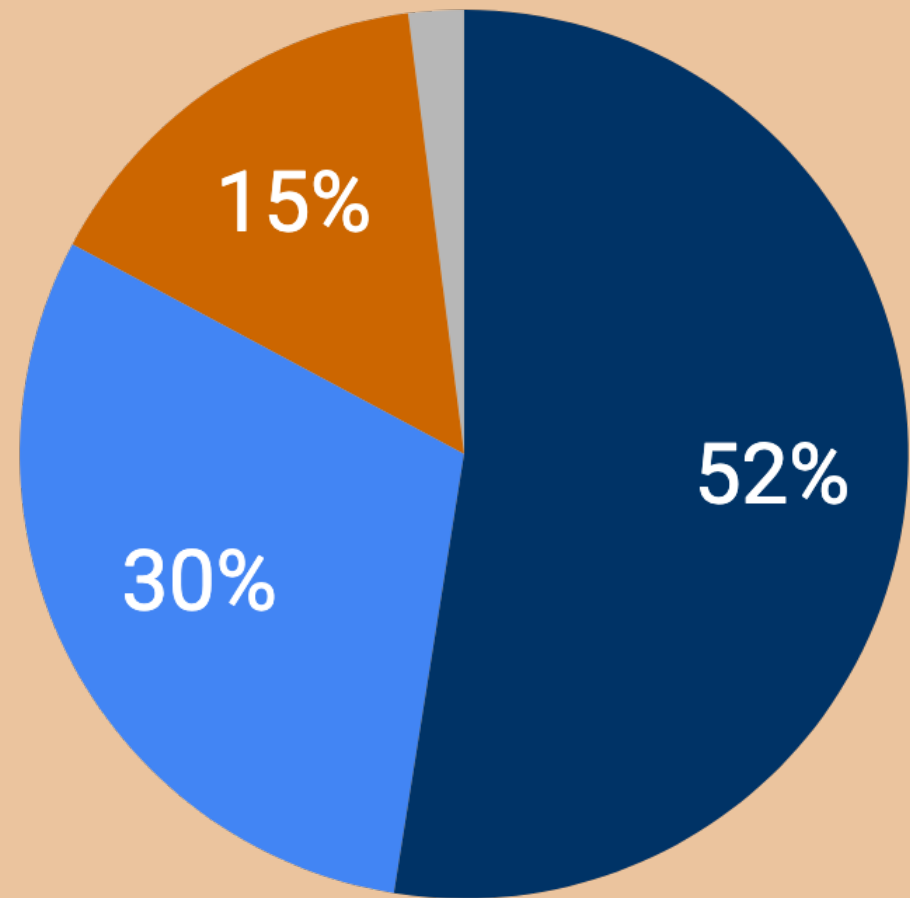
*Source: Three Rivers Park District 2019 Survey



Ease of Use of CD3

Likely to use:

- “Like to keep boat clean”
- “Easier than using your hands”
- “No reason not to”
- “Don’t want to spread AIS”

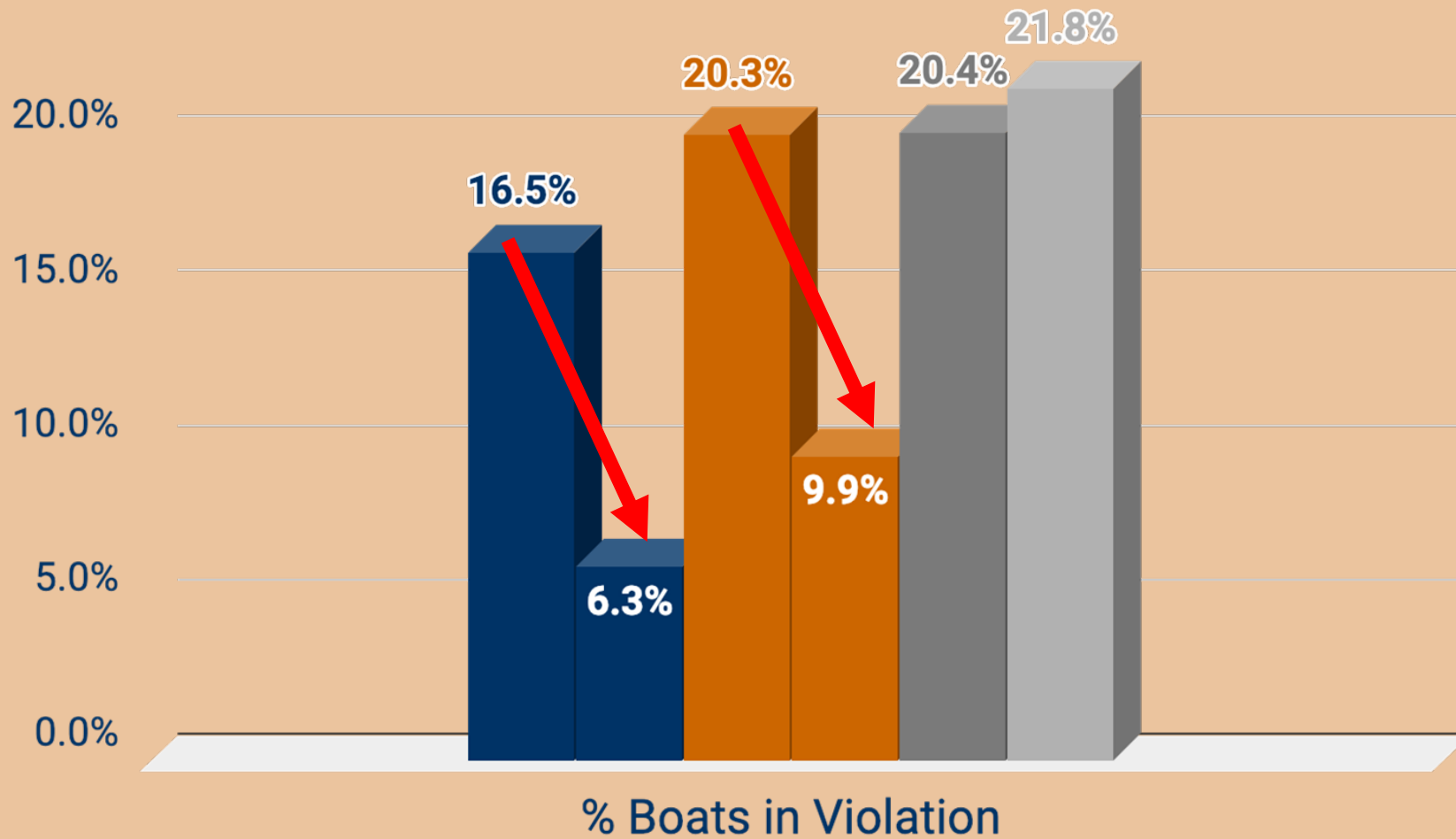


- Very Likely
- Likely
- Unsure
- Very Unlikely

*Source: Three Rivers Park District 2019 Survey



Future Use?



■ Spring Park (2017) ■ Spring Park (2018) ■ Long Lake (Traditional)
■ Long Lake (CD3 Station) ■ Weaver Lake (Traditional) ■ Surfside (Traditional)

*Source: Hennepin County Survey



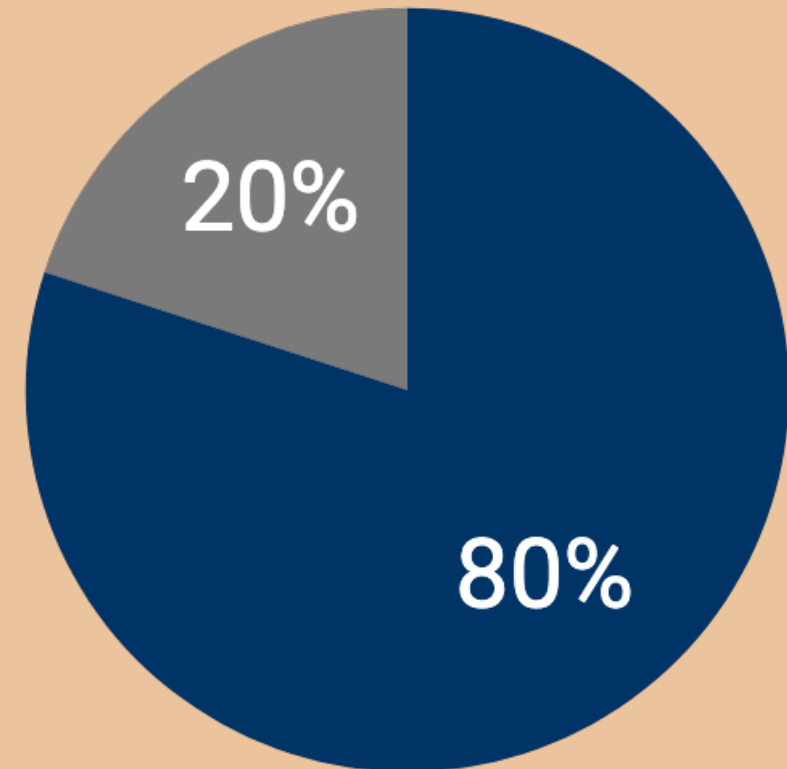
Violation Rates

Average Percent Residual H2O Removed from Livewell



● Removed

Average Percent Residual H2O Removed from Bilge



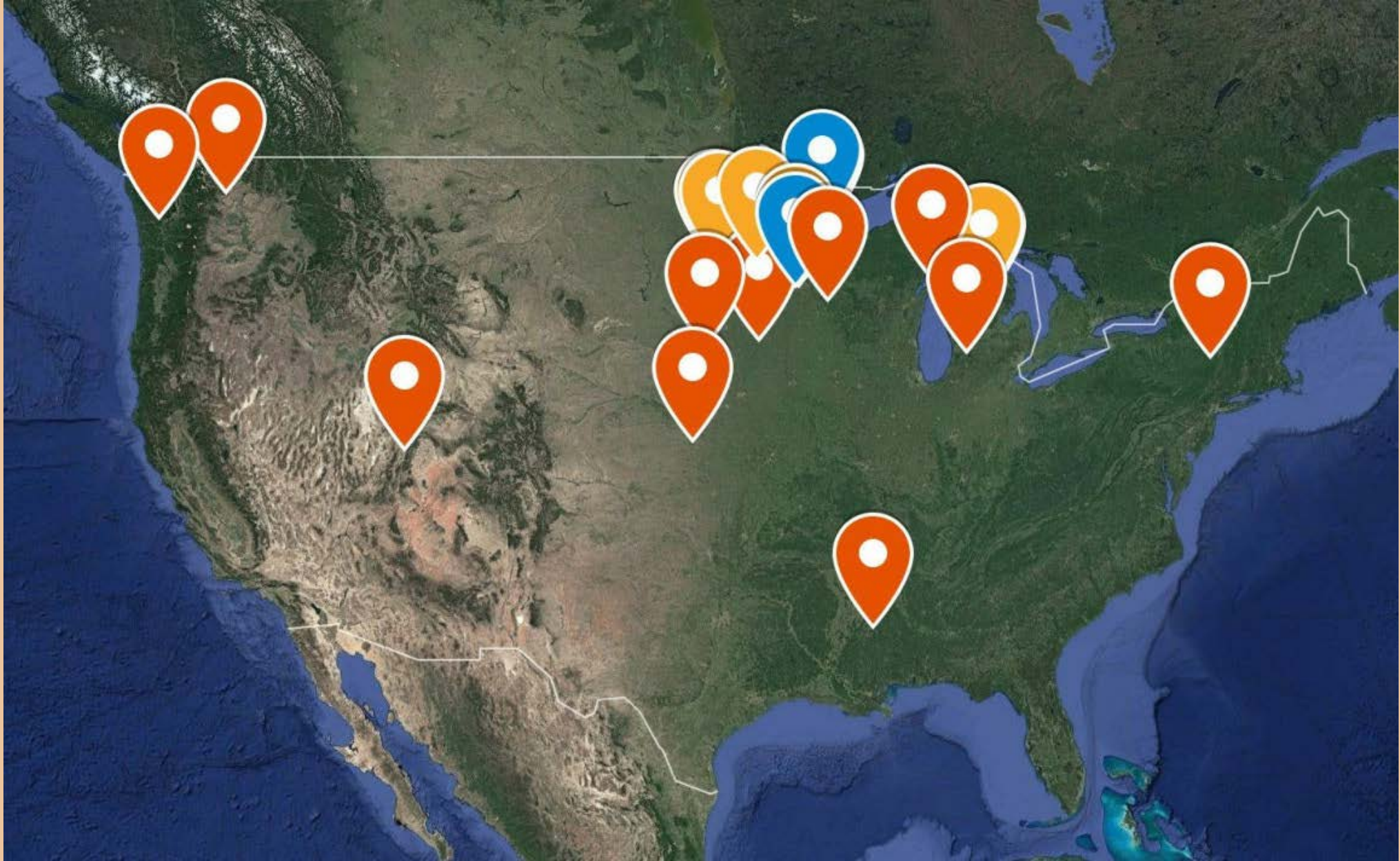
● Removed ● Remaining



Residual H2O Study

- 3rd party efficacy research
- Custom programs
 - Digital kiosk, geofencing, check-in
- Installations Across North America





2019 Locations

© 2019



Station



Trailer



Model Options



Outpost



Wayside



Model Options

- Decrease in violation rates by 70+%
- Automatic metrics and maintenance alerts
- High tool use
- Low O&M
- No vandalism
- High public approval



2018 Key Points

Empowering the public to take ACTION



Summary



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Questions?

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