

Response to New Zealand mudsnails in Wisconsin

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Aquatic Invasive Species Monitoring Lead

International Conference on Aquatic Invasive Species
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Collaborators

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Overview

- Discovery
- Background
- Response strategy
- Next steps

Discovery

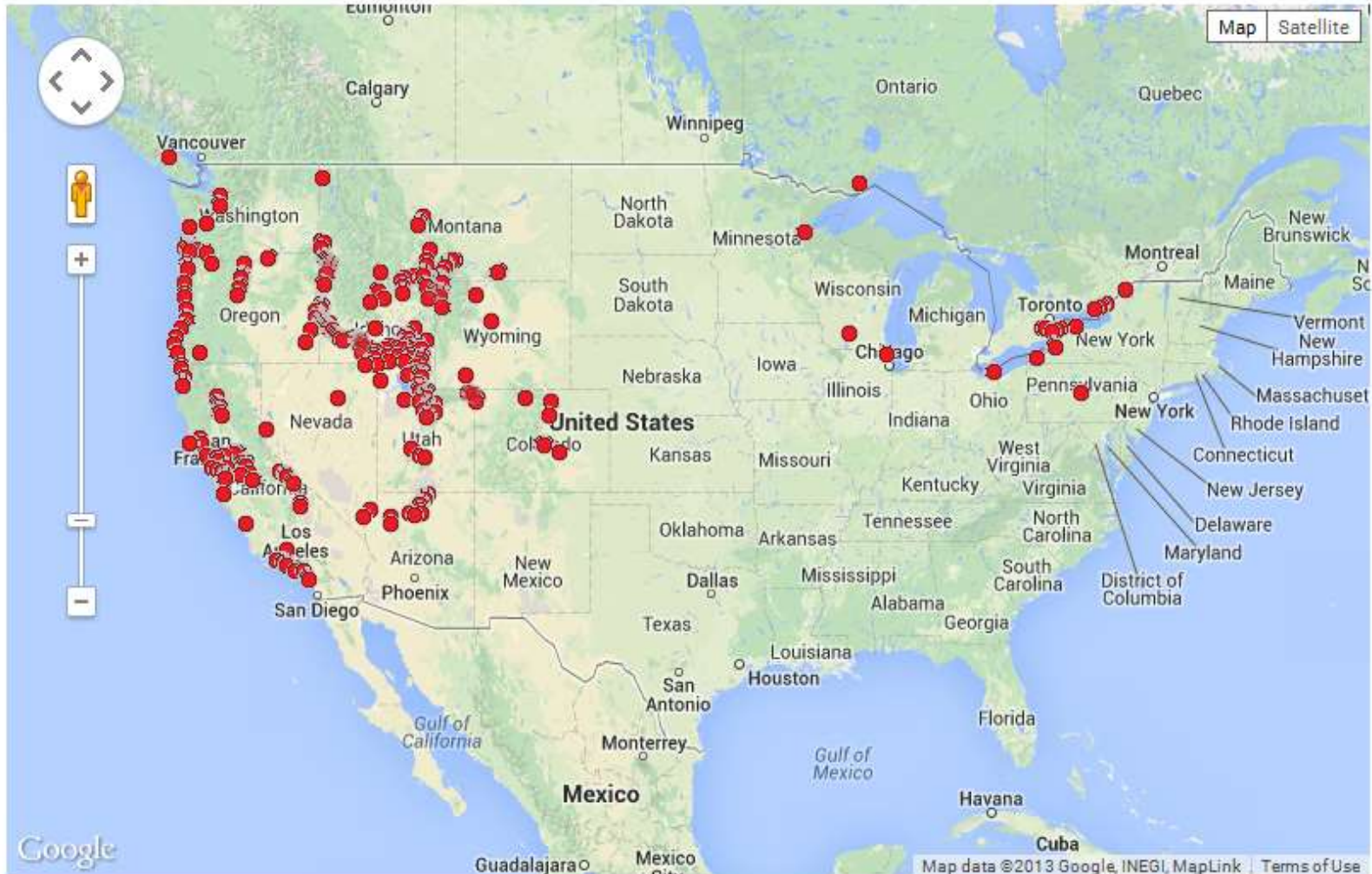


Discovery

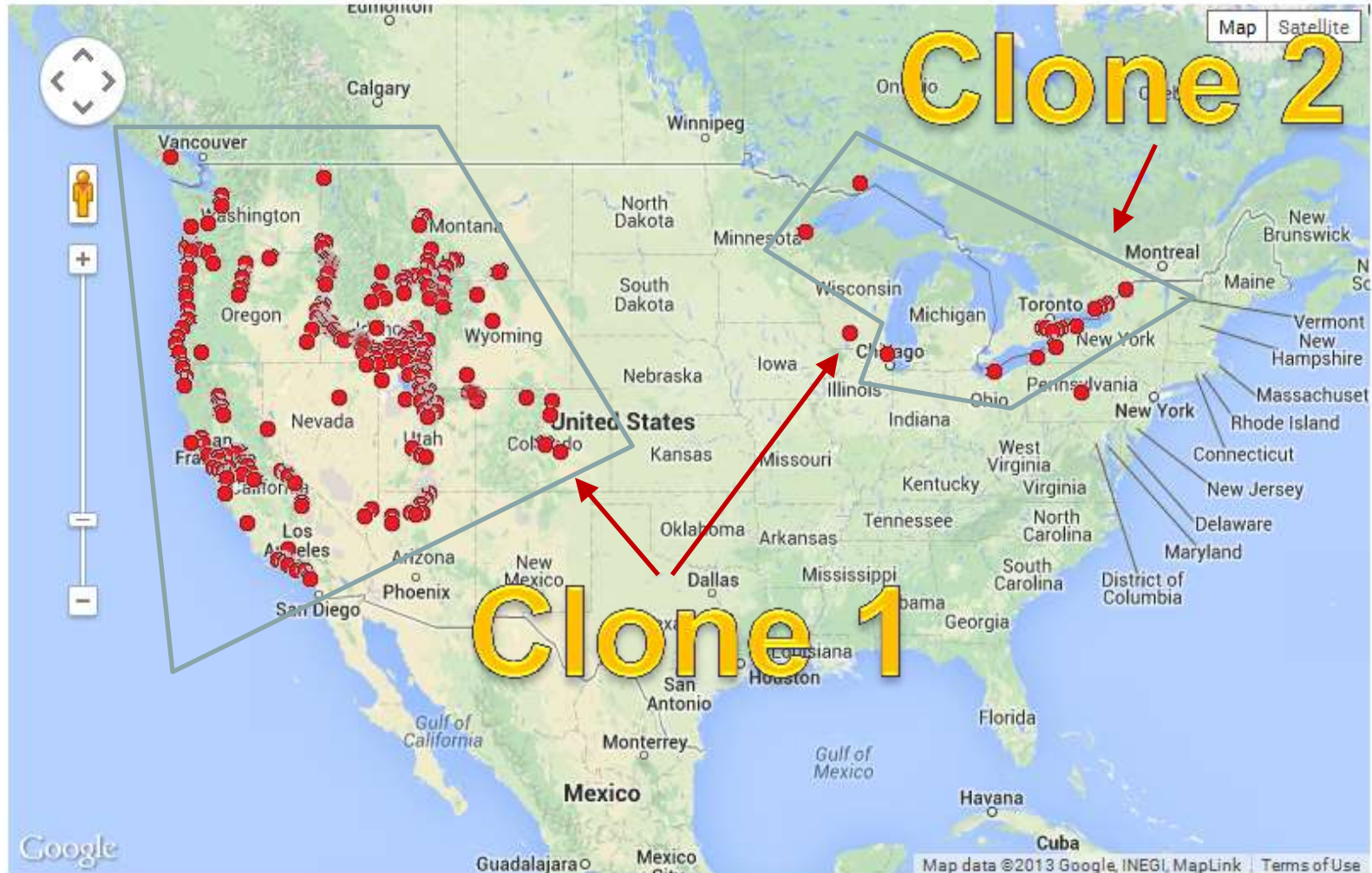


1: 3,089,554

U.S. Distribution



U.S. Distribution



Concern

- Transferable
- Operculum
- Clonal



Connie Isermann
UWSP Aquatic Biomonitoring Lab



United States Geological Survey

Concern

- Broad range
- Densities
- Grazers
- Ammonium
- Stream metabolism



Assess Resources



DANE COUNTY
LAND & WATER RESOURCES
DEPARTMENT

UNIVERSITY of WISCONSIN
LA CROSSE



RIVER ALLIANCE
of WISCONSIN



UNIVERSITY OF
WISCONSIN



BIOTECHNOLOGY
CENTER



Center for Limnology
University of Wisconsin



THE UNIVERSITY
of
WISCONSIN
MADISON



Golden Sands
Resource Conservation
& Development Council, Inc.

Monitoring

- Evaluate risk
- Benthic
- eDNA



United States Geological Survey

Evaluate Risk

- Staff
- Increase disinfection
 - scrub
 - rinse
 - freeze
 - Virkon



Benthic



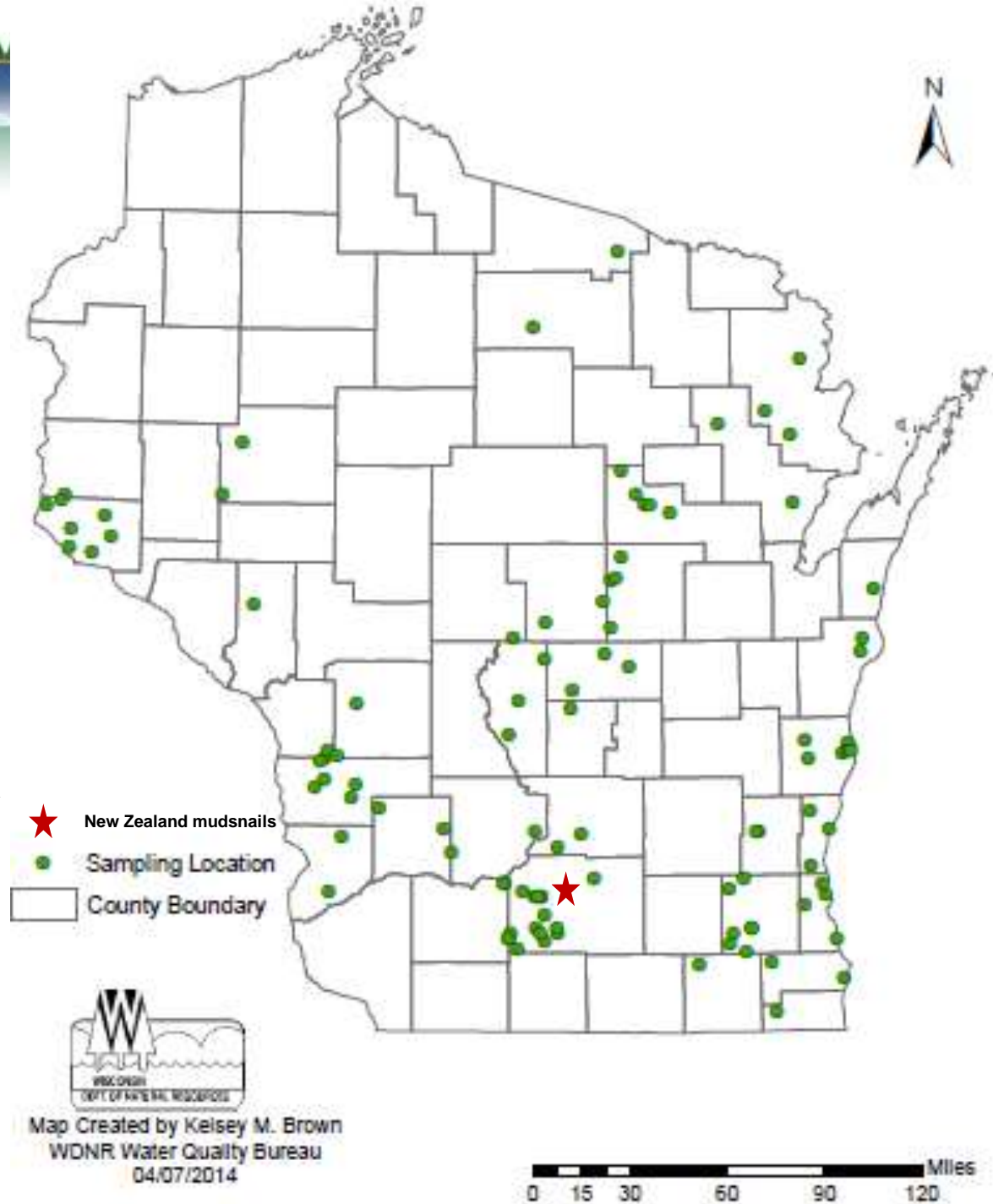
Benthic Screening





Benthic Results

- 75 samples
- None observed outside Black Earth Creek

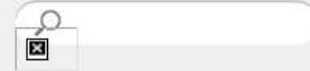


eDNA



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University of Idaho



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Stemming the Stream of Snails

UI research scientist investigates use of DNA to identify New Zealand mudsnails before they take over streams

Pilot Project

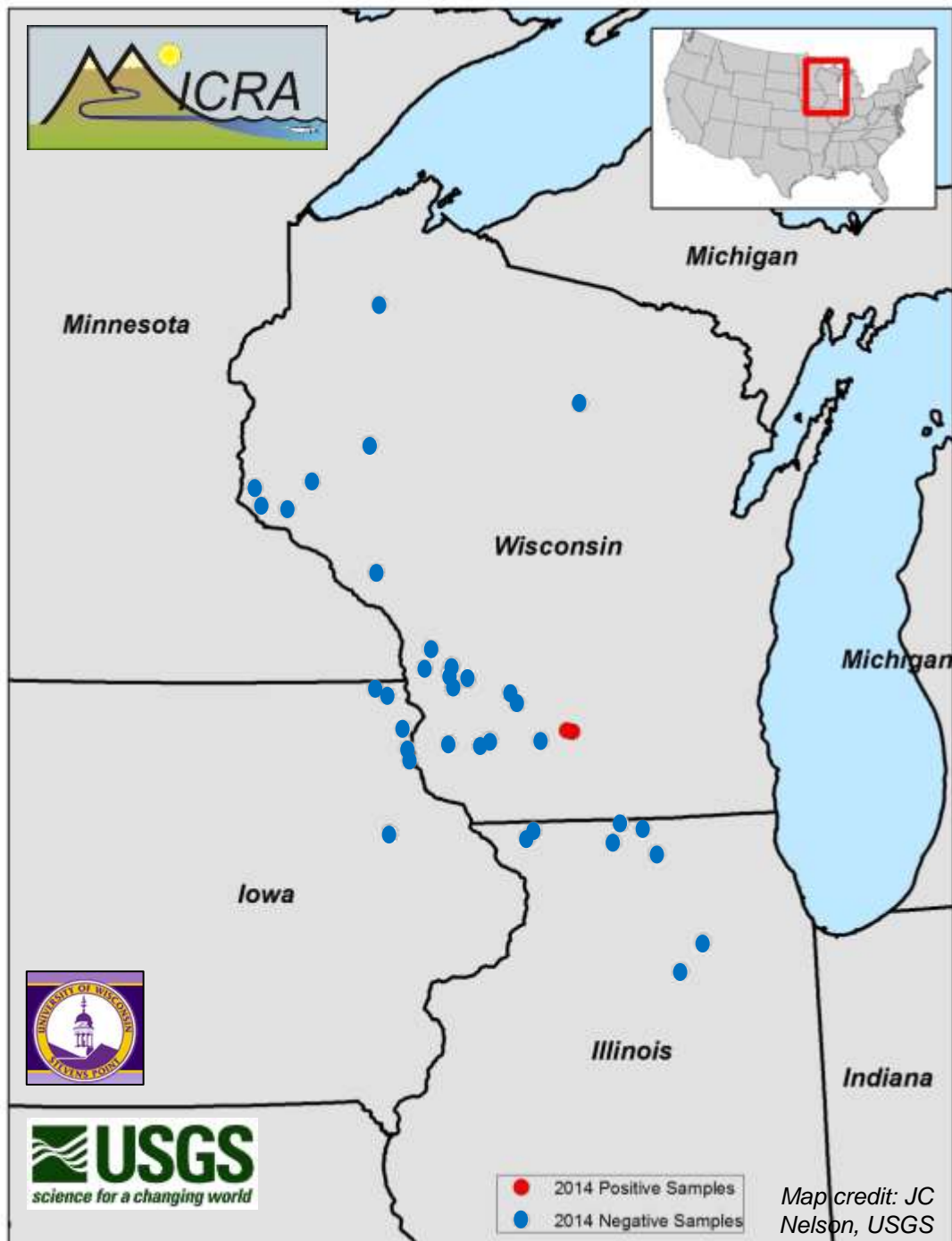
- 15 sites on Black Earth Creek
- eDNA more effective
- Validate method





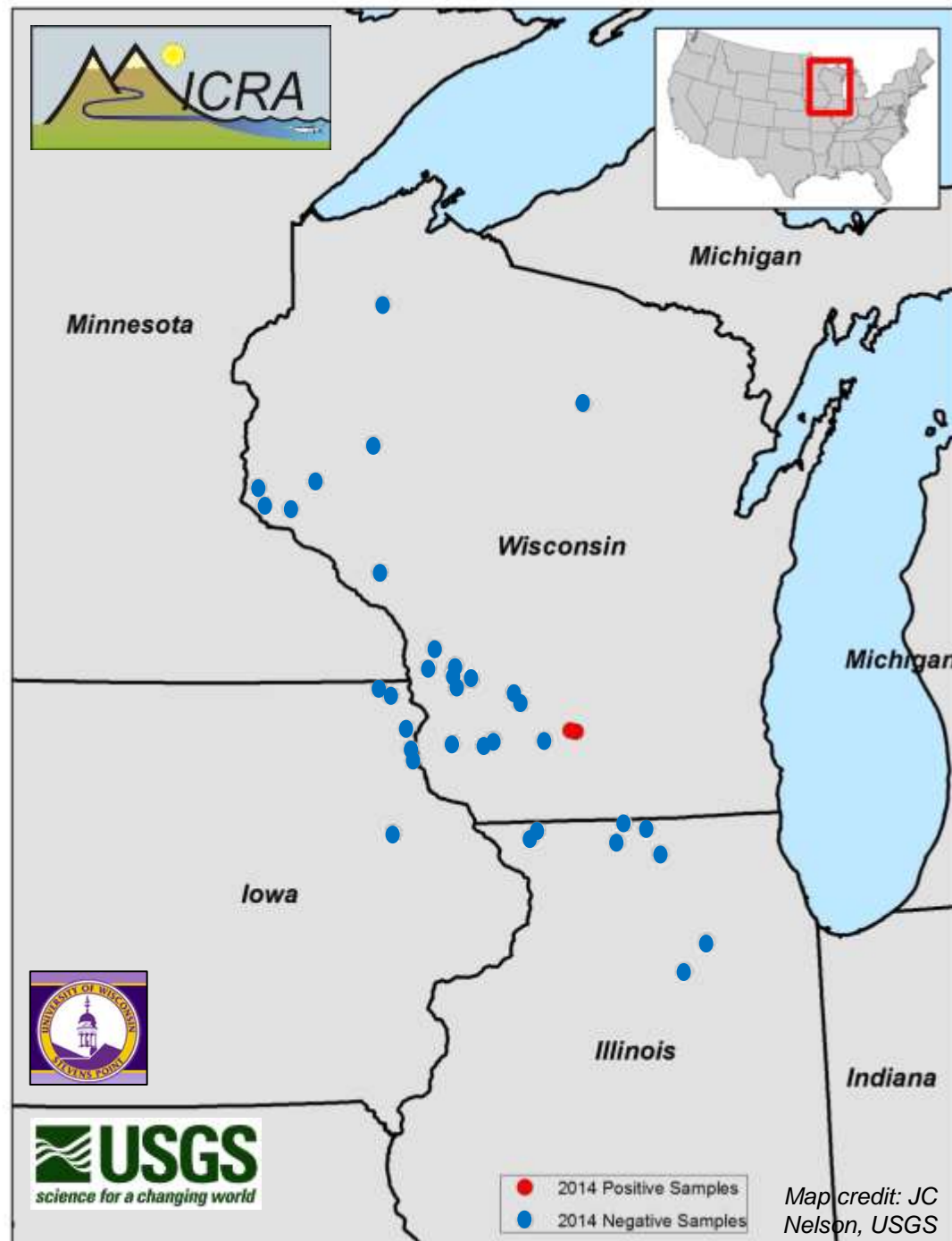
Tri-State Surveillance

- 45 sites
- triplicates
- 10% verification



Tri-State Surveillance

- None outside Black Earth
- Good evidence
- Be cautious



Prevention



“An ounce of prevention is worth a pound of cure.”

~ *Benjamin Franklin*

Boot/Wader Brush Stations



Signage & Scrub Brushes



WARNING

These waters contain New Zealand mudsnails.
Help protect trout streams by preventing their spread.



- 5mm or less
- 5-6 whorls
- Right-side opening



BEFORE YOU LEAVE THIS WATERWAY:

ALWAYS

- INSPECT** equipment and **REMOVE** attached plants and animals (required)
- DRAIN** all water from equipment (required)

BETTER

- SCRUB** equipment with a stiff brush, including crevices, and
- RINSE** equipment with tap water

BEST

- SOAK** in 2% Virkon Aquatic solution (2.7 ounces per gallon) for 20 minutes and
- RINSE** clean at least 100 feet away from surface waters.

Prevent the spread of invasive species, It's the Law!

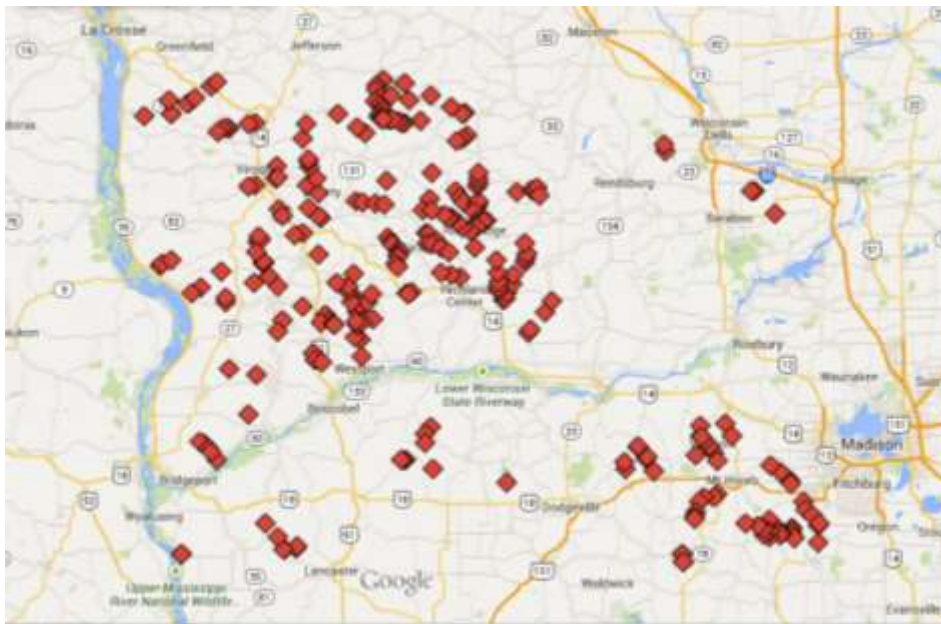
For more information scan this code using your mobile device

<http://dnr.wi.gov>



Signage & Scrub Brushes

- 277 AIS signs and brushes in Dane, Iowa, Grant, Crawford, Richland, Vernon and Sauk





Widespread Outreach

- **Presentations:**

- SWTU Icebreak
- Wisconsin TU Statewide meeting and banquet
- Badger Flyfishers Spring Opener
- Citizen Based Monitoring Conference
- Wisconsin Wetlands Association Conference
- Madison Fishing Expo
- Canoecopia
- Wisconsin Lakes Convention
- Project Red events
- Stream monitors (WAV) trainings
- Marine Officers Training- Janesville
- Wisconsin Conservation Congress Trout Committee
- Many smaller scale presentations

- **Articles:**

- Lake Tides
- WI Trout Magazine
- Rock River Coalition newsletter
- Natural Resources Magazine
- Articles in various newsletter and web postings
- Other Social Media Outlets

- **Other:**

- Flyers
- Fact sheets
- Streamside Signage



Disinfection Manual Code

- Literature review
- Revisions
- Training
- Applies to agents, contractors, and permittees

Invertebrates

Treatment Method

AIS	Steam Cleaning (212°F)	Hot Water (140°F)	Drying (≤5 days)	Chlorine (400 ppm)	Virkon (2:100 solution)	Freezing (-3F, <24hrs)
Faucet Snail	✓	✓ ^{18*}	⊗ ^{18,35}	⊗ ¹⁸	⊗ ¹⁸	✓
New Zealand mud snail	✓	✓ ^{4,65*}	✓ ^{6*,66*}	⊗ ²¹	✓ ^{10*}	✓ ^{4,6*}
Quagga Mussel (Adults)	✓†	✓ ^{7*,16*}	✓ ^{14*,67}	✓	✓ ⁹	✓
Quagga Mussel (Veligers)	✓†	✓ ^{4*,17}	✓ ^{69*}	✓	✓ ⁹	✓
Zebra Mussel (Adult)	✓†	✓ ^{7*,8*,54,67}	✓ ^{14*,25*,67}	✓ ^{11,19,22}	⊗	✓ ^{25,27,67,68}
Zebra Mussel (Veligers)	✓†	✓ ^{4*}	Ⓡ	✓	⊗	✓
Asian Clam	✓	✓ ^{4,37,41,42,43}	⊗ ^{4,44*,45}	⊗ ^{36*,37*,38*,39*,40}	✓ ²³	✓ ^{46*}
Spiny Water Flea (Adult)	✓	✓ ^{7*,47*}	✓ ⁴	Ⓡ	Ⓡ	Ⓡ
Spiny Water Flea (Resting Eggs)	✓	✓ ^{2*}	✓ ^{2*}	⊗ ²	Ⓡ	✓ ^{2*}
Bloody Red Shrimp	Ⓡ	Ⓡ	Ⓡ	Ⓡ	Ⓡ	Ⓡ

***Additional details:**

² Frozen in water, not just in air; Hot water: 50°C (122°F) for >5 min (or 1 min at >50°C); Drying: ≥ 6 hr @ 17°C (63°F)

⁴ ≥ 140°F (60°C) likely to be 'instantly lethal'

⁶ Drying: Must ensure hot and dry environment (>84°F for 24hrs; ≥ 104°F (40°C) for >2 hours); Freezing: ≤ 27°F (-3°C) for 1 to 2 hours

⁷ >43°C (110°F) for 5-10 min

⁸ ≥ 140°F (60°C) for 13 to 10 seconds

¹⁰ 2% solution (77 grams/1 gal water) for 15-20 min

¹⁴ Adult *Dreissena* may survive overland transport for 3-5 days

¹⁶ ≥ 140°F (60°C) for 5 to 10 seconds

¹⁸ 50°C (122°F) for ≥ 1 min

²⁵ Must ensure hot and dry environment (>25 C for at least 2 days, or 5 days when humidity is high)

Disinfection Manual Code

- Inspect
- Drain
- Dispose
- Disinfect:
 - Dry 5 days
 - 140°F water/212°F steam
 - Chlorine solution
 - Virkon Aquatic solution



**PREVENT THE SPREAD OF
INVASIVE SPECIES
IT'S THE LAW**

PENALTIES MAY EXCEED \$2000

Before *launching* and before *leaving* **YOU MUST:**

- ✓ **INSPECT** boats, trailers, and equipment.
- ✓ **REMOVE** all attached aquatic plants and animals.
- ✓ **DRAIN** all water from boats, vehicles, and equipment.
- ✓ **NEVER MOVE** plants or live fish away from a waterbody.*

STOP AQUATIC HITCHHIKERS!
Prevent the spread of invasive species, it's the law

*Limited exceptions apply. Visit WWW.DNR.WI.GOV and search for "BAIT LAWS."



Next steps

- Monitoring
 - Benthic
 - eDNA
 - Citizen scientists
- Outreach
 - Disinfection manual code
 - Assess effectiveness of cleaning tools
 - Improve outreach products



Lessons Learned

- Strong early response
- eDNA promising
- Prevention challenging, but key
- Understand impacts

Questions?

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