

# USGS NAS Database – Tracking AIS Movements

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# Nonindigenous Aquatic Species Database



<https://nas.er.usgs.gov>

- The program is the central repository for spatially referenced accounts of introduced aquatic species.
- The program provides scientific reports, online/real-time queries, spatial data sets, distribution maps, and general information.
- The data are made available for use by biologists, interagency groups, and the general public.
- Part of a national Early Detection Rapid Response (EDRR) system

# NAS Database

- Tracks >1,290 aquatic taxa
- Across conterminous US, Alaska, Hawaii, and US territories
- Observations ranging from 1790-2019
- Potential introduction pathways and population status



# Terminology

- **Vector** – method of introduction to a particular location
  - Single species can have multiple introduction vectors
  - = Pathway
- **Nonindigenous** – any species introduced outside of its native range
  - Includes “exotics” and “transplants”
  - Includes species considered “invasive”

# How do invasive aquatic species spread?

- Vectors can be intentional or accidental
  - Boats, boating and fishing equipment, trailers
  - Ballast water in wakeboards and livewell water
  - Fish stocking (sometimes includes “hitchhikers”)
  - Pet releases: unwanted pets released often at ponds and boat ramps
  - Bait and fishing releases
  - Escapes from aquaculture and other facilities

# How do invasive aquatic species spread?

- Over 50 aquatic species hitchhike on boats, vehicles, scuba gear, and other species!!



# Hitchhikers

All AIS vectored  
by hitchhiking

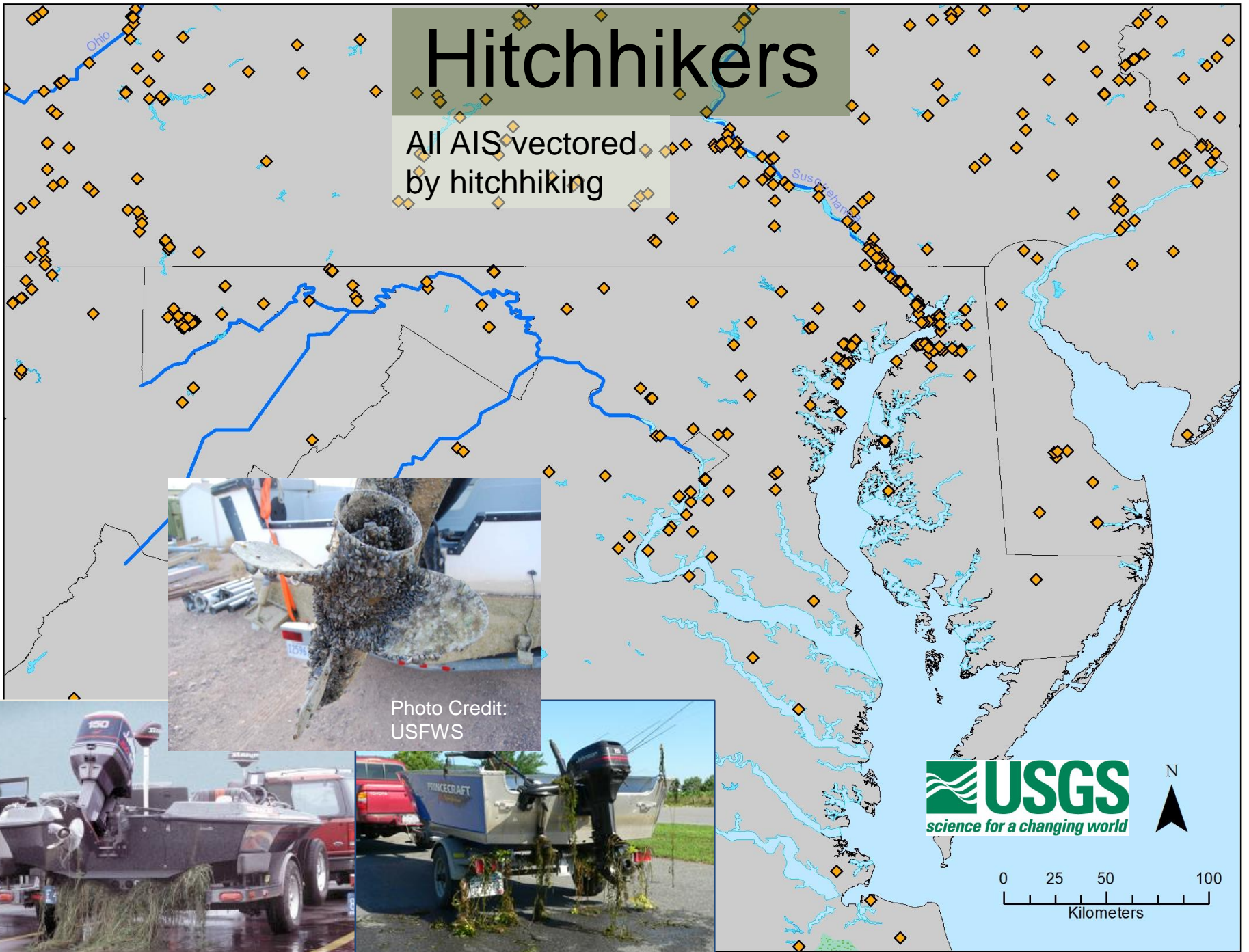
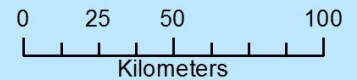


Photo Credit:  
USFWS



# How do invasive aquatic species spread?

- Over 120 aquatic species released as bait, pets, or in aquaria!!



Photo credit: R. Sivertsen



Photo credit: F. Hrusa, CDFA





# Releases

All AIS vectored  
by releases



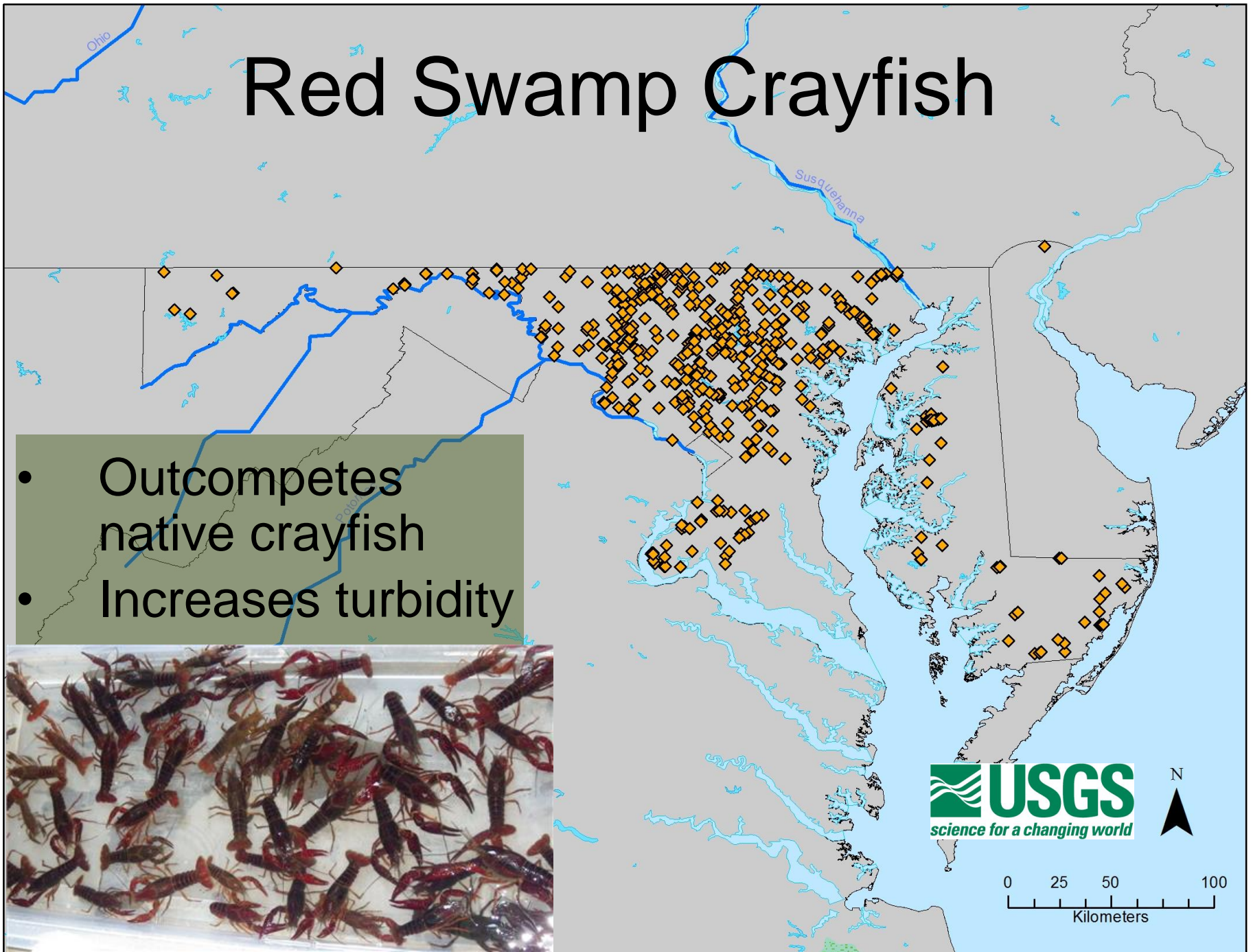
# Negative Impacts of AIS

- Predation and competition
- Alter habitats
- Increase or introduce disease/parasites
- Hybridization
- Recreation



# Red Swamp Crayfish

- Outcompetes native crayfish
- Increases turbidity



# Goldfish

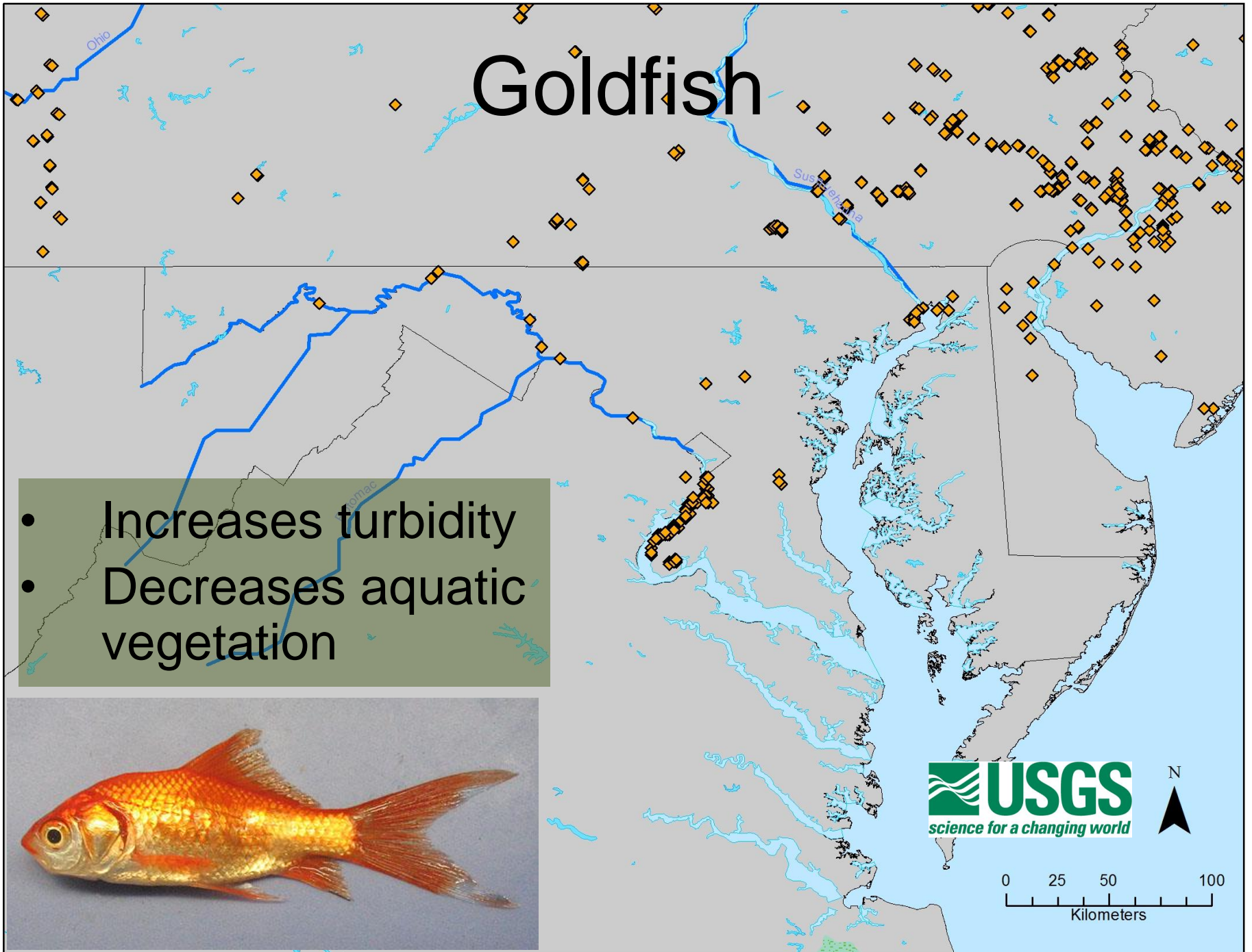
- Increases turbidity
- Decreases aquatic vegetation



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science for a changing world

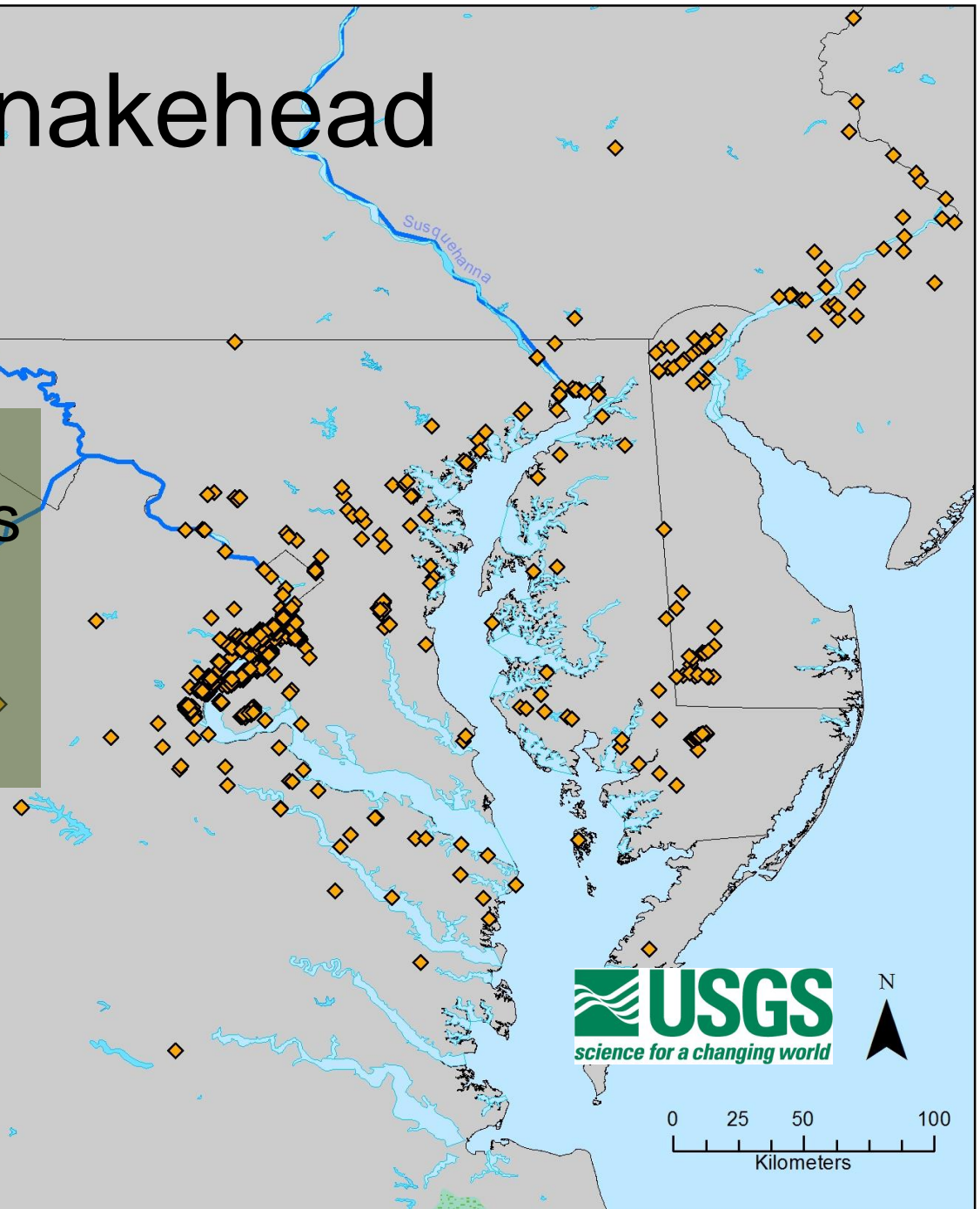


0 25 50 100  
Kilometers



# Snakehead

- Compete with Largemouth Bass
- Adults feed on other fishes (>97% diet)



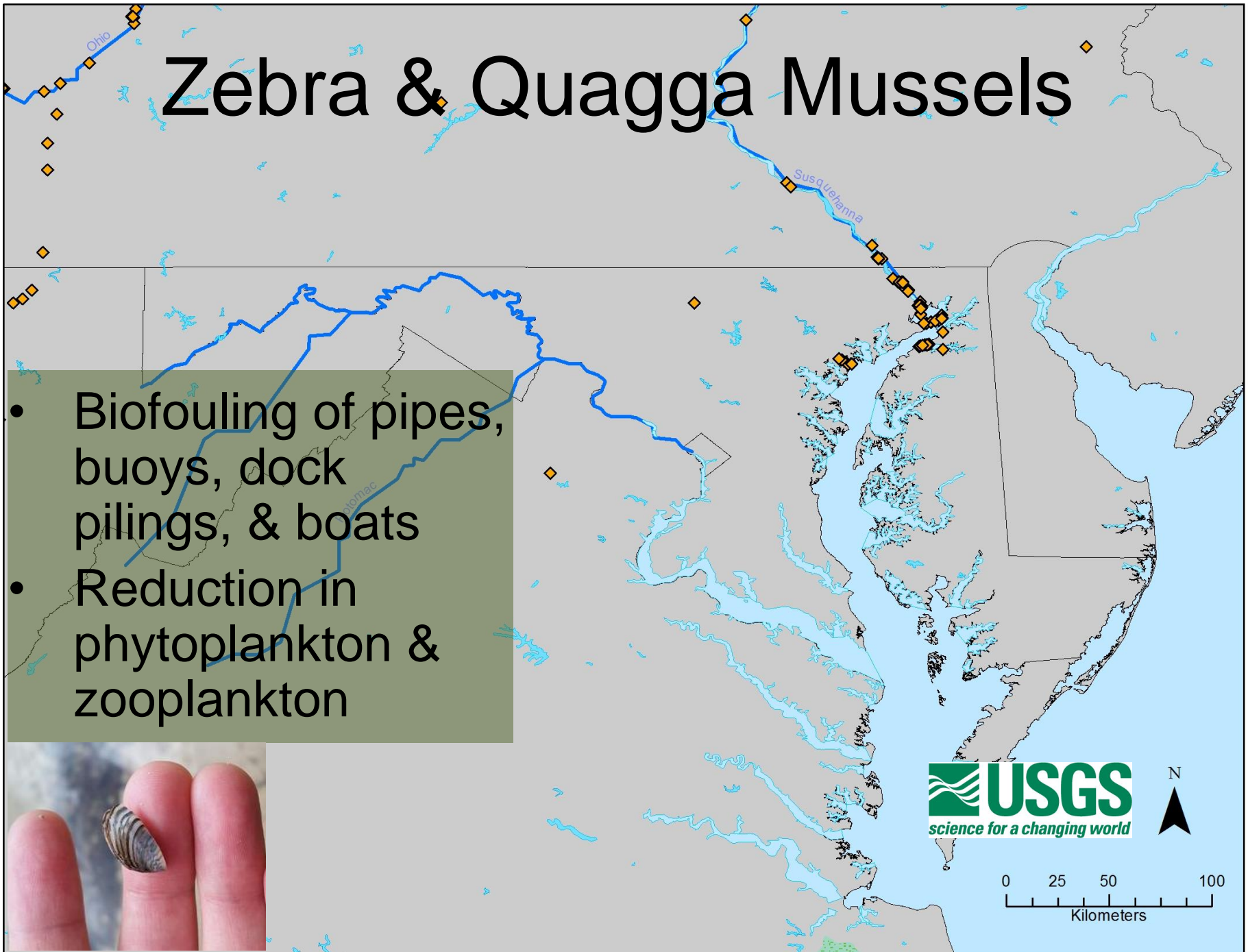
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0 25 50 100  
Kilometers

# Zebra & Quagga Mussels

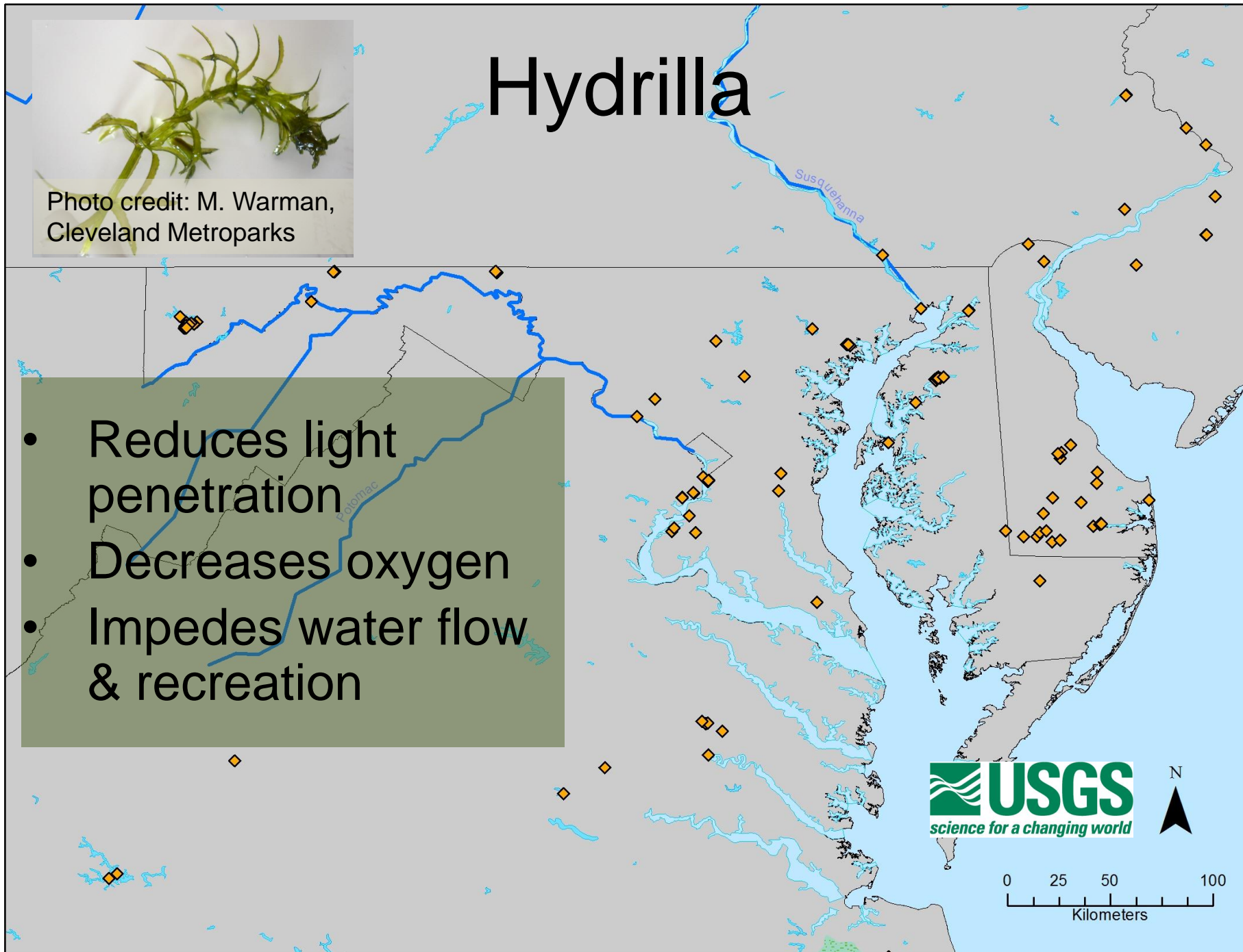
- Biofouling of pipes, buoys, dock pilings, & boats
- Reduction in phytoplankton & zooplankton



# Hydrilla

Photo credit: M. Warman,  
Cleveland Metroparks

- Reduces light penetration
- Decreases oxygen
- Impedes water flow & recreation



# Avian Vacuolar Myelinopathy (AVM)

- Cyanobacterium (*Aetokthonos hydrillicola*)
- “Eagle-killer living on hydrilla”
- Degenerative brain disease affects coots & eagles
- Increased predation, drowning, starvation, & injury
- Photos courtesy of Dr. Susan Wilde Lab, UGA

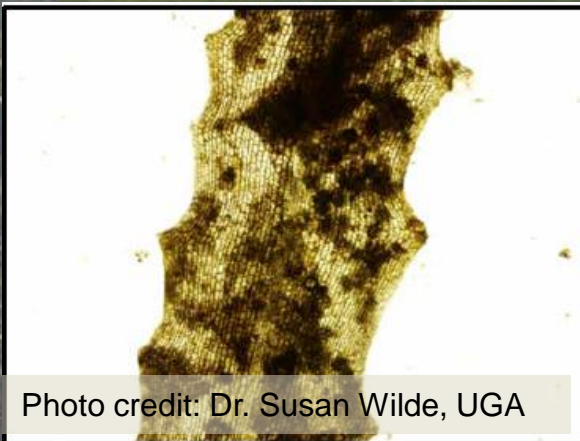


Photo credit: Dr. Susan Wilde, UGA



Photo credit: Dr. Susan Wilde, UGA



Photo credit: Dr. Susan Wilde, UGA



# Water Chestnut

- Decreases light penetration
- Impedes recreation
- Risk of injury

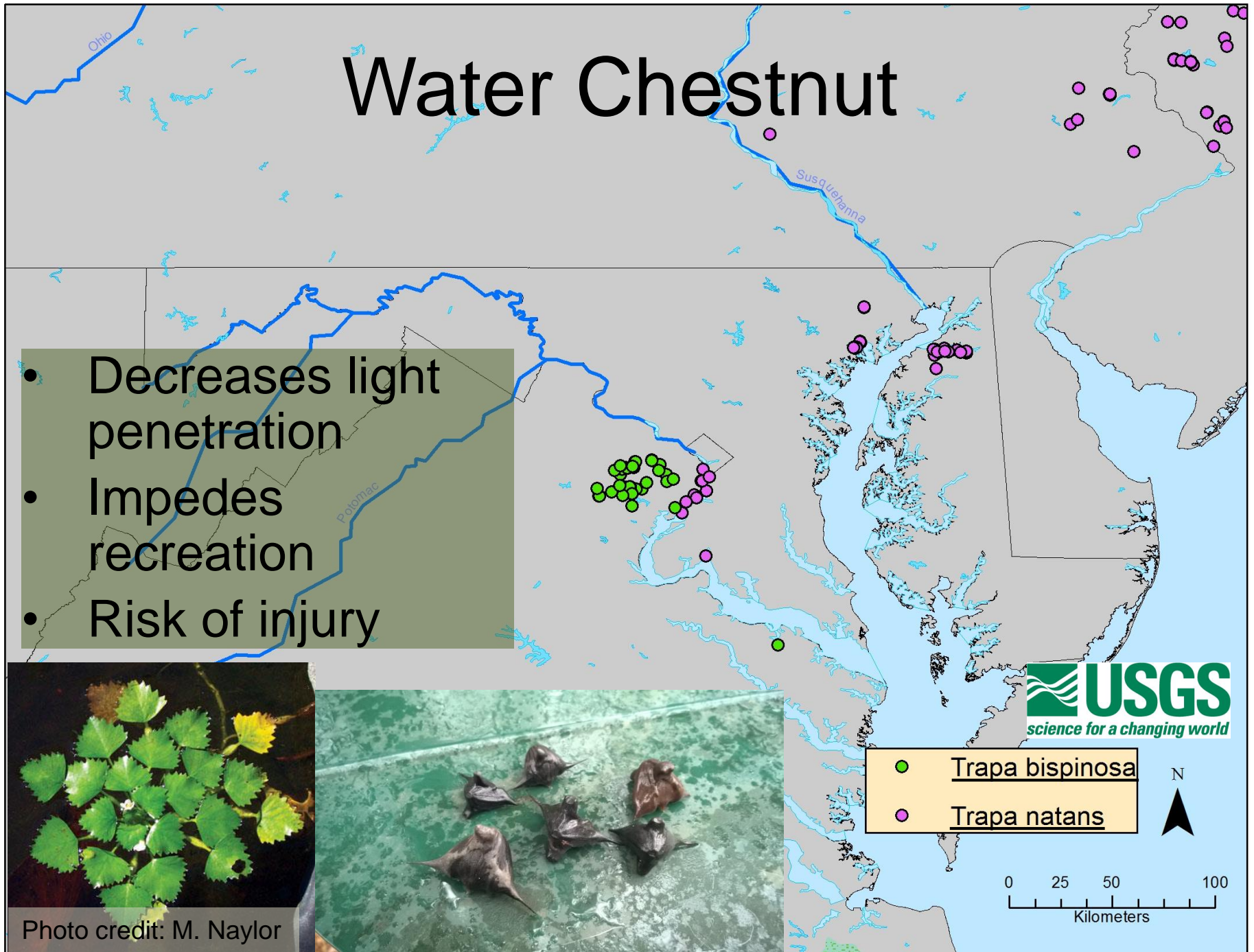
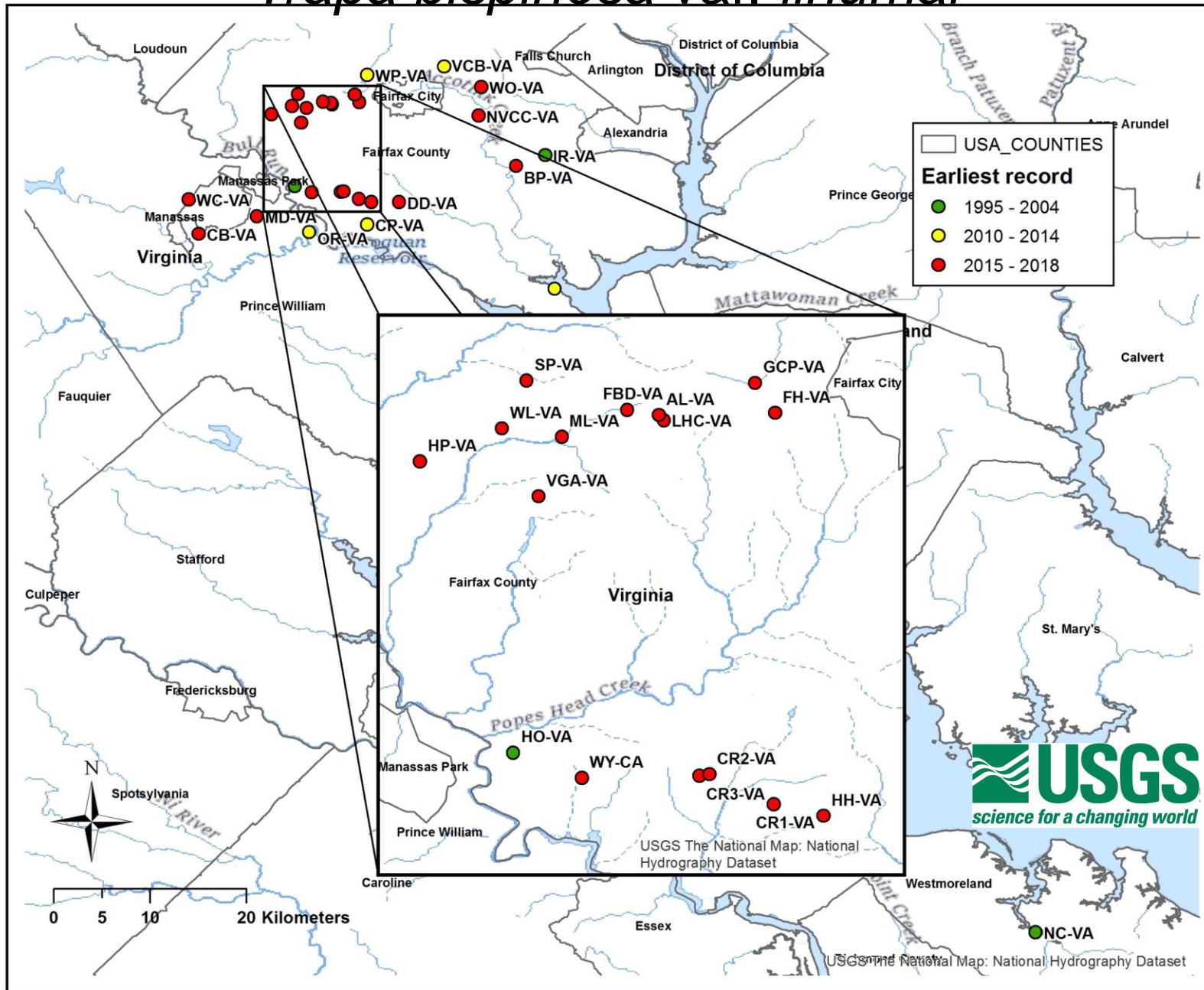


Photo credit: M. Naylor



# *Trapa bispinosa* var. *iinumai*



# New water chestnut species

- *Trapa bispinosa* var. *iinumari*
- Small, pinkish flowers with four petals
- Fruit has two horns (with two pseudo-horns)



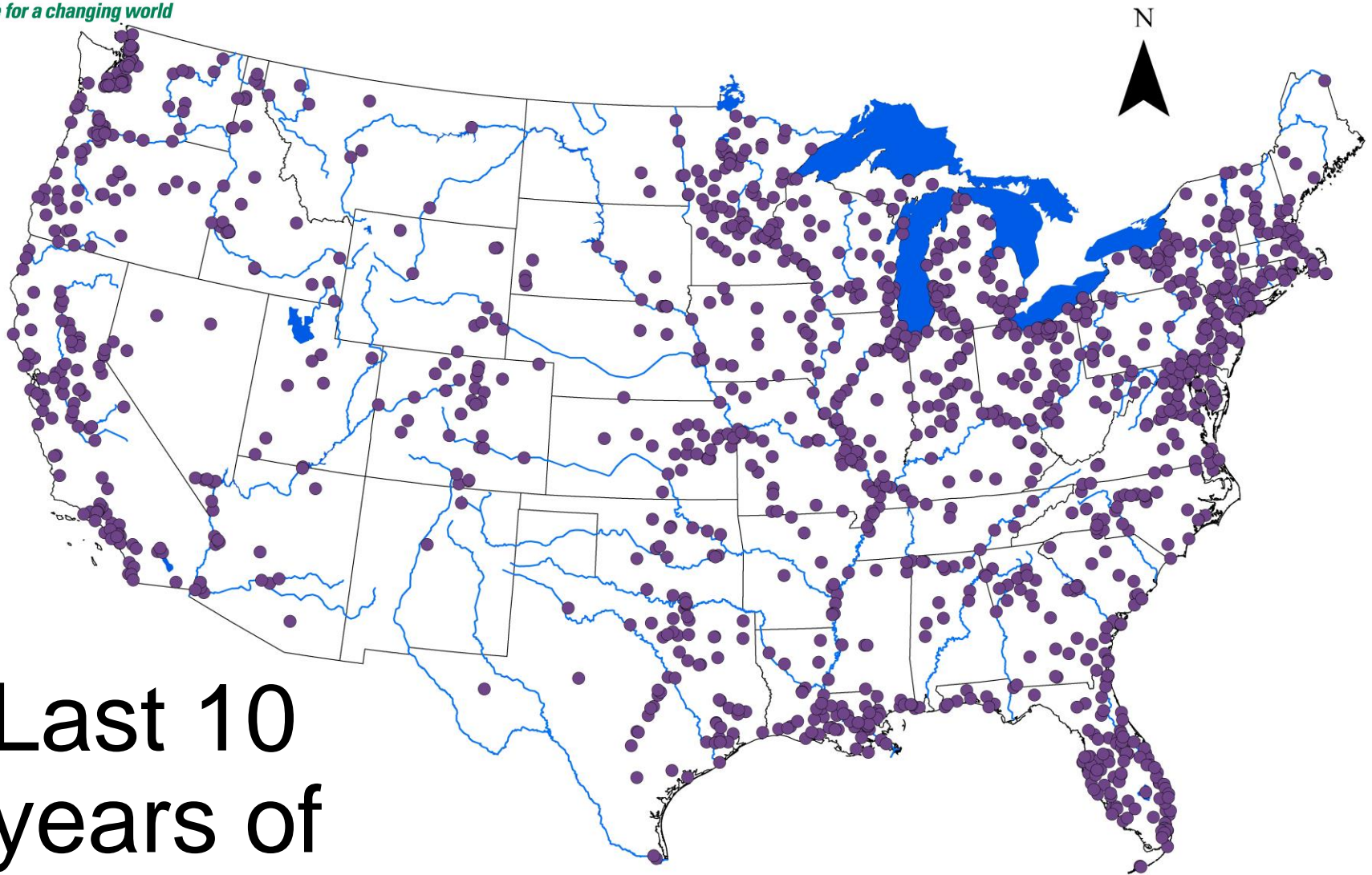
The banner features a map of the United States in the background. On the left, a person is shown holding a net over a body of water. On the right, a person is shown working at a computer. The text 'NAS Alert System' is prominently displayed in a large, red, serif font across the center of the map.

# NAS Alert System

Nonindigenous Aquatic Species Program



- Provides a framework for the rapid dissemination of new invasions
- Notifies registered users of new sightings
- Part of a national EDRR system



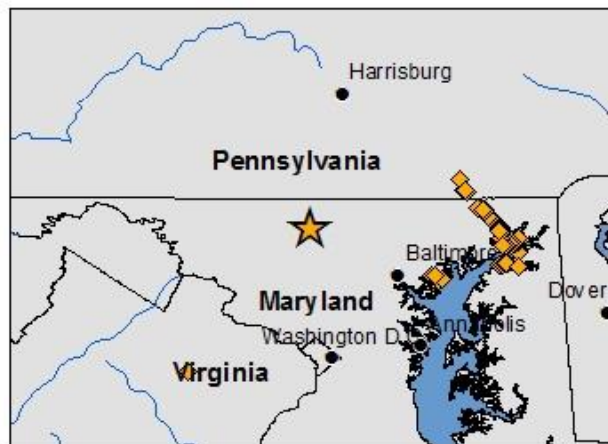
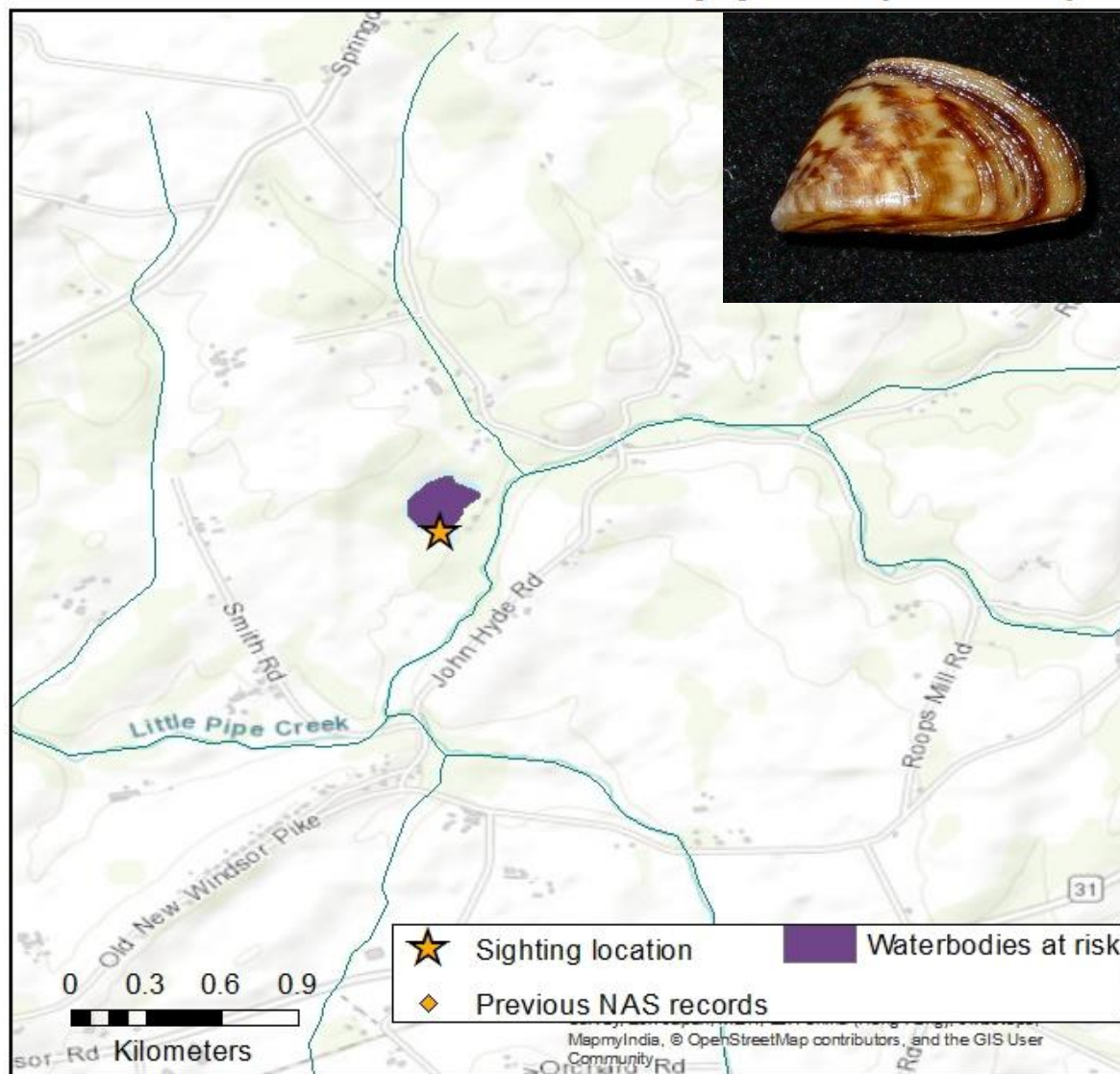
Last 10  
years of  
NAS alerts

0 160 320 640 960 1,280  
Kilometers



# NAS Alert Risk Mapper (ARM)

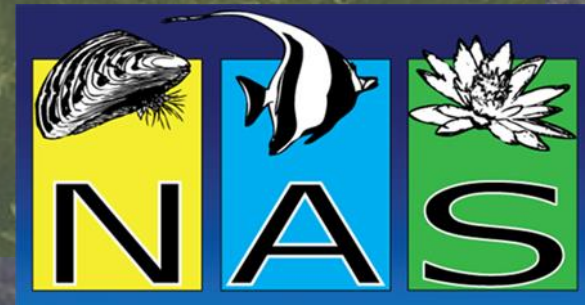
Specimen ID	1463812
Species	<i>Dreissena polymorpha</i> (zebra mussel)
Alert level	County: Carroll (MD) Drainage: Monocacy (2070009)
Alert Date	6/20/2018
State	Maryland
Locality	Hydes Quarry near the southern end and on the dive platform
Latitude (N)	39.56441
Longitude (W)	-77.0727
Collection Date	4/26/2018



The map shows waterbodies at short-term risk of invasion from the species sighting. The at-risk areas are determined by species mobility and drainage barriers (dams).

# Questions?

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- **Matthew Neilson** - Fishes & Technical Details  
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