Ballast Water, Aquatic Invasive Species, and the Great Lakes

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Aquatic Invasive Species and the Great Lakes

Aquatic Invasive Species are one of the biggest threats to the Great Lakes

- Focus on Prevention
- Environmental Impacts
- Economic Impacts
- Ballast Water Regulations = Critical protections

Photo: Great Lakes Fishery Commission

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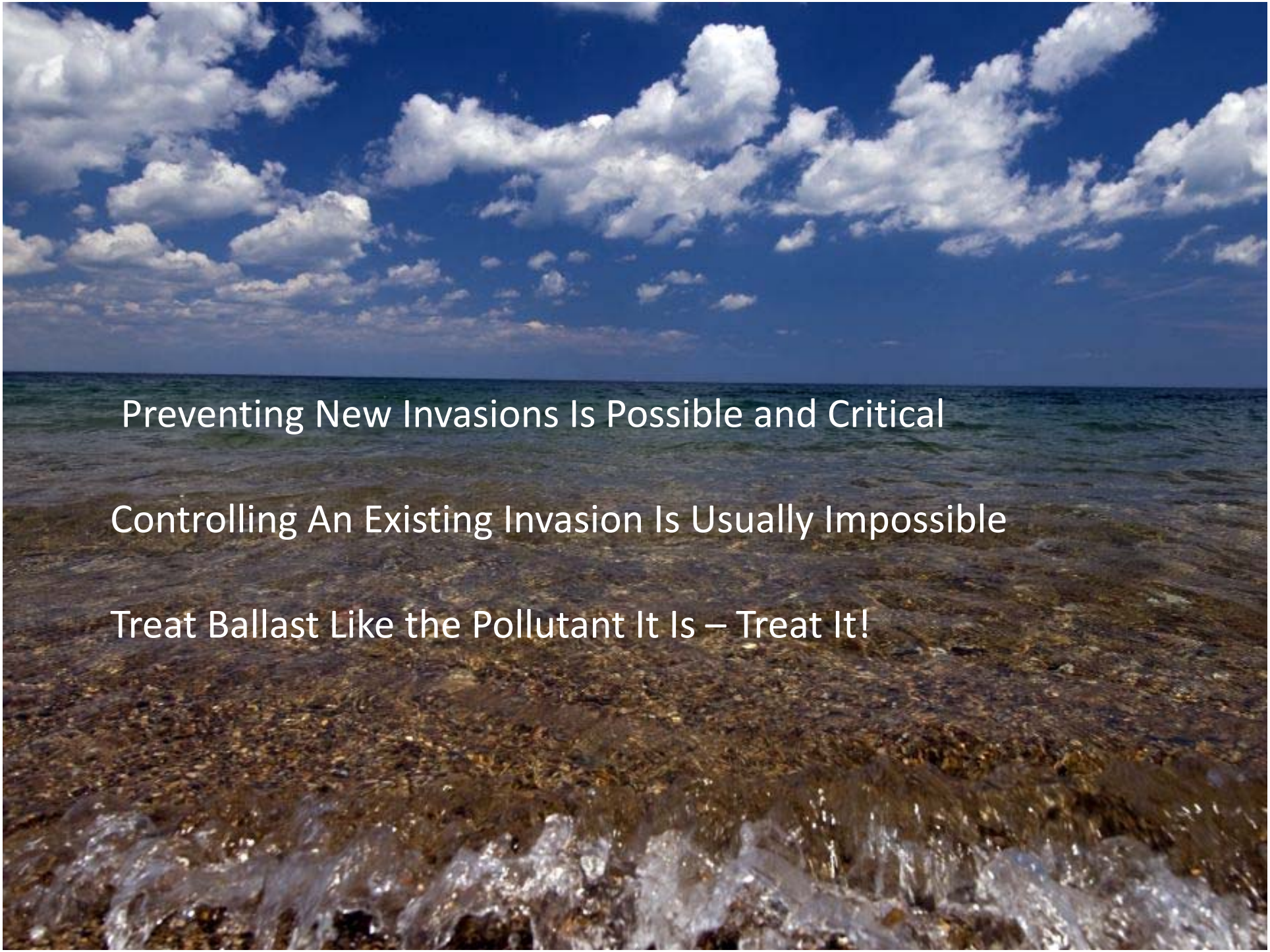
Preventing New Invasions Is Possible and Critical
Controlling An Existing Invasion Is Usually Impossible
Treat Ballast Like the Pollutant It Is – Treat It!

- At least 186 non-native organisms in the Great Lakes
- One third of AIS thought to come from ballast water

Image: The Nature Conservancy


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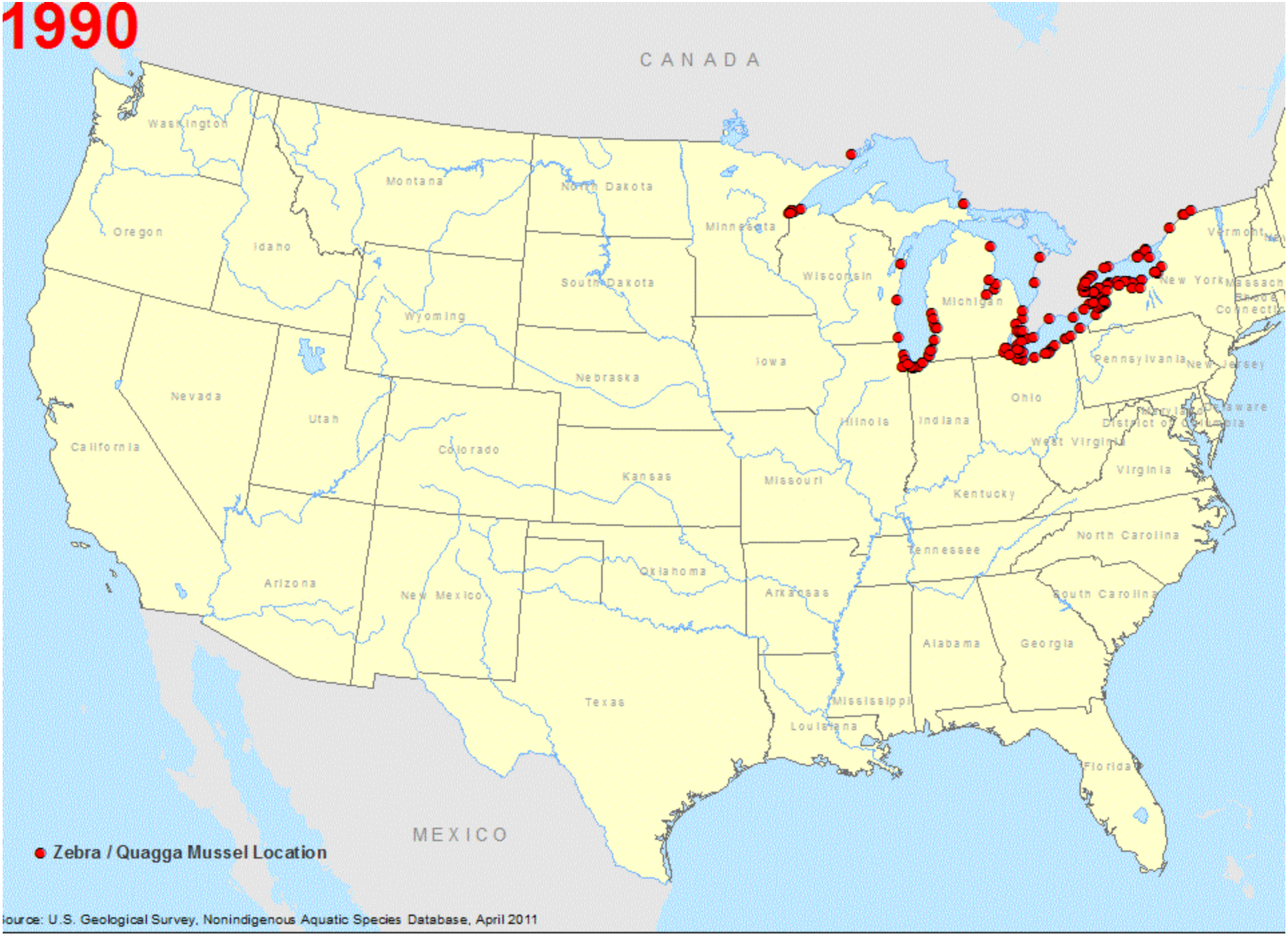
MEXICO
Zebra / Quagga Mussel Location
ource: U.S. Geological Survey, Nonindigenous Aquatic Species Database, April 2011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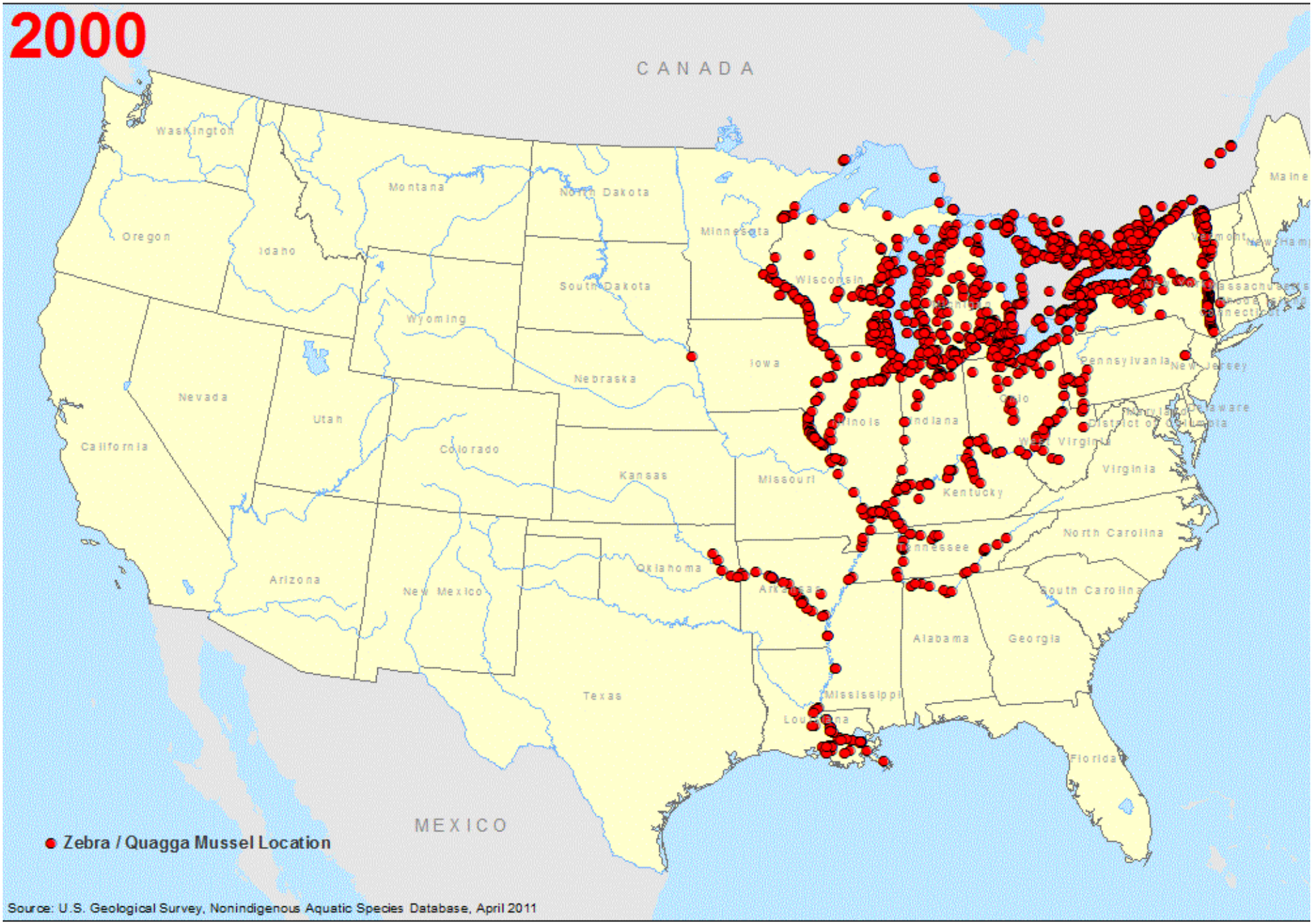
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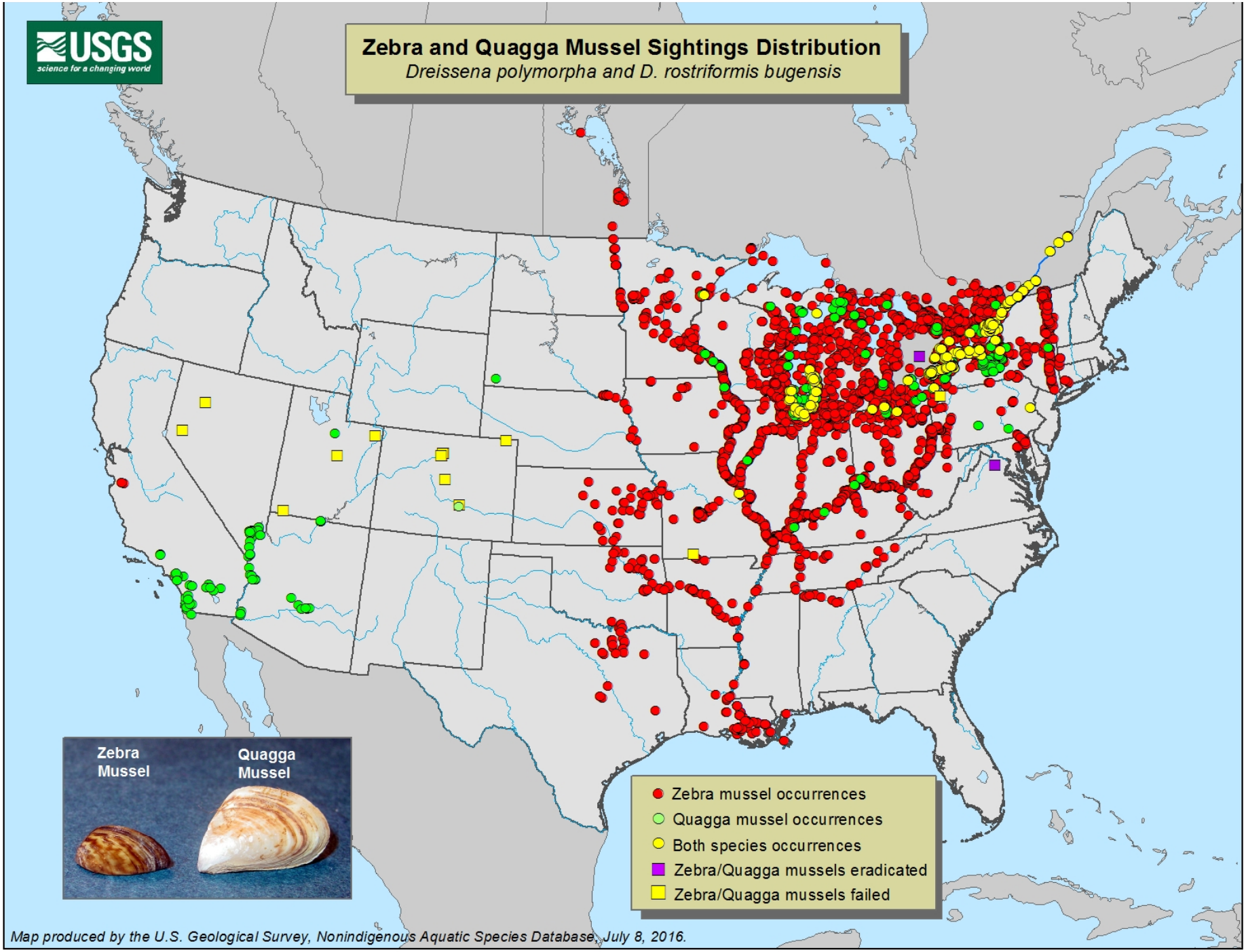
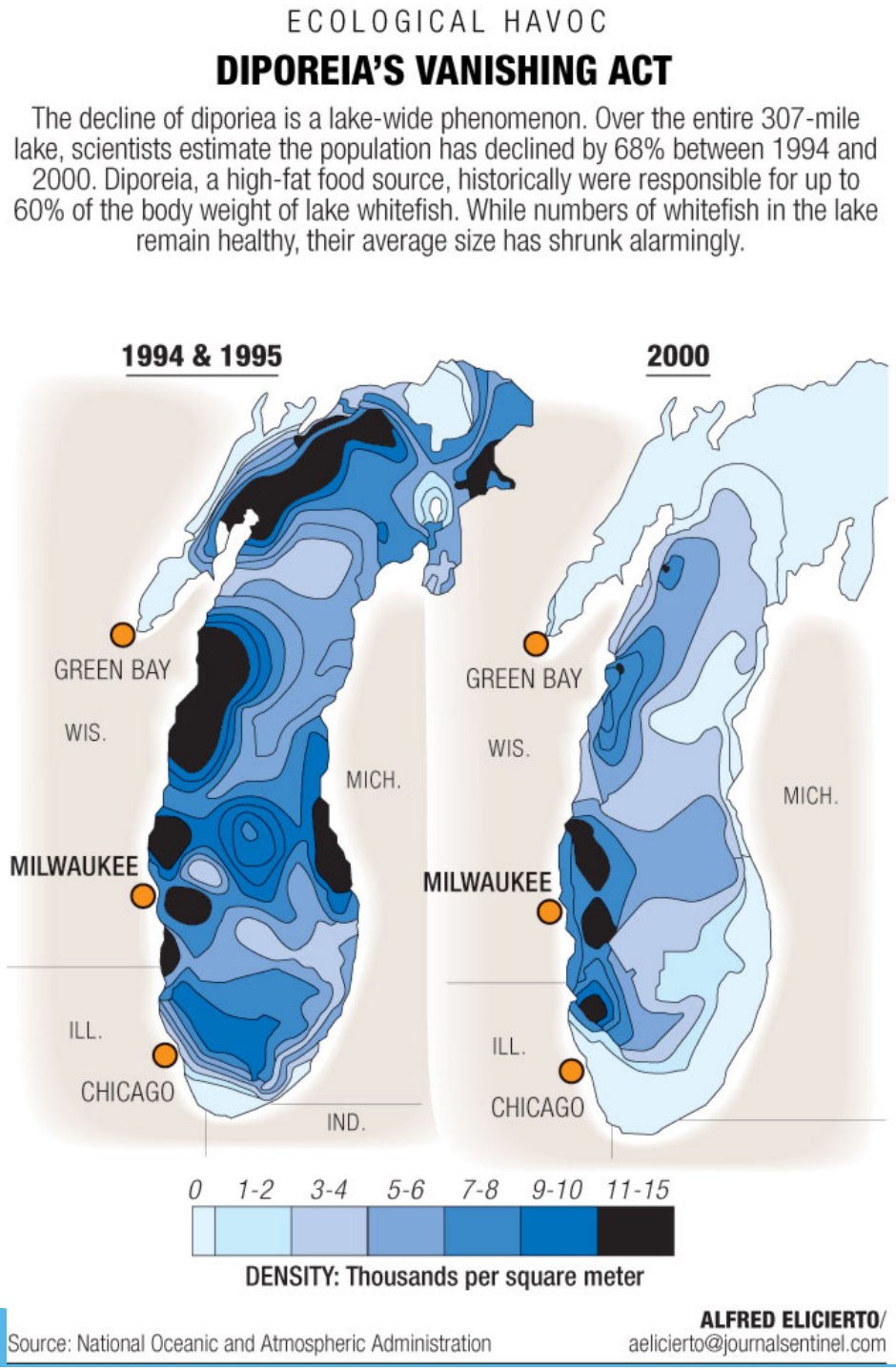

USGS
science for a changing world
Zebra and Quagga Mussel Sightings Distribution
Dreissena polymorpha and D. rostriformis bugensis
Zebra Mussel
Quagga Mussel
Zebra mussel occurrences
Quagga mussel occurrences
Both species occurrences
Zebra/Quagga mussels eradicated
Zebra/Quagga mussels failed
Map produced by the U.S. Geological Survey, Nonindigenous Aquatic Species Database, July 8, 2016.

Environmental Impacts

- Alter food webs
  - Example: Lake Michigan
- Change the way energy flows through the lakes, with devastating consequences for some of the lakes' most popular fish species



Environmental Impacts

- Avian Botulism

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Lake Erie - Altered nutrient cycling = worse toxic algal blooms, higher microcystin concentrations
Photo: Tom Archer,
University of Michigan

Environmental Impacts

Direct threats of aquatic invasive species:

- Preying on native species
- Out-competing native species for food or other resources
- Causing or carrying disease
- Preventing native species from reproducing or killing their young

Indirect threats of invasive species:

- Changing food webs – bioaccumulation of toxins
- Decreasing Biodiversity
- Altering ecosystem conditions

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Economic Impact – AIS costs region

- ~$200 million in losses annually due to invasions caused by shipping – University of Notre Dame
- In 2009 and 2010, the eight states in the Great Lakes basin spent nearly $31 million on aquatic invasive species, with Wisconsin, Minnesota, Michigan and Illinois ranking among the top spenders
- Annual impact from invasions include costs to water treatment facilities, tourism industries, and energy production

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Economic Impacts - Tourism

- 2014 study from Michigan State University that targeted tourism industry professionals to help inform the development of the 2012-2017 Michigan Tourism Strategic Plan revealed that **the greatest threat to Michigan's tourism industry was the spread of aquatic and terrestrial invasive species**

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New Species Discovered in Great Lakes

- November 1, 2016 - U.S. Environmental Protection Agency announced discovery of new species in the Great Lakes — *Thermocyclops crassus*

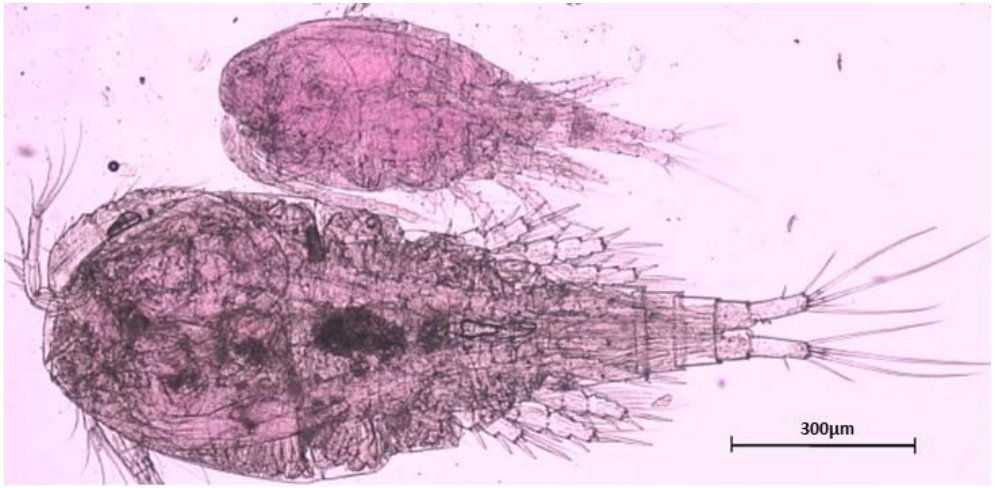

Image: Joe Connolly, Cornell University

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The Clean Water Act and Ballast Water

- EPA has expertise in setting performance based water quality standards for pollutants
- Allows states to go further if they believe that additional protections are necessary to protect their waters
- Enforcement provisions for failure to comply with the law

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Problems With Vessel Incidental Discharge Act

- Transfers regulatory authority from the EPA —the agency with water pollution expertise—to the Coast Guard, which lacks such knowledge
- Exempts ballast water discharges from Clean Water Act permits that must be renewed every five years to give states, EPA, and the public an opportunity to re-evaluate treatment levels, monitoring results, and compliance
- Eliminates the Clean Water Act's focus on ensuring water quality sufficient to protect public health, native species, and the use of waters for municipal and industrial purposes
- Creates path to exempt lakers from standards

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Great Lakes = Precious Resource

- 40 million people depend on the Great Lake for drinking water
- $7 billion sport fishing industry
- Jobs that depend on a healthy Great Lakes system

- Challenge: Today's standard can't remain the standard forever and adequately protect the Great Lakes. But we have to move forward with the standard that exists today and get technology on ships ASAP. How can we make that happen faster?

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