CHALLENGE: AQUATIC INVASIVE SPECIES

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Great Lakes Orientation
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www.glfc.org
<table>
<thead>
<tr>
<th>NATIVE</th>
<th>NATURALIZED</th>
<th>NON-NATIVE</th>
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</thead>
<tbody>
<tr>
<td>Lake trout</td>
<td>Chinook salmon</td>
<td>Sea lamprey</td>
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<tr>
<td>Lake whitefish</td>
<td>Coho salmon</td>
<td>Zebra/quagga mussels</td>
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<tr>
<td>Lake Sturgeon</td>
<td>Steelhead (rainbow trout)</td>
<td>Alewife</td>
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<td>Brook trout</td>
<td>Brown trout</td>
<td>Round goby</td>
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<tr>
<td>Burbot</td>
<td>Common carp</td>
<td>Eurasian ruffe</td>
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<tr>
<td>Yellow perch</td>
<td>Atlantic salmon</td>
<td>Grass carp*</td>
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<tr>
<td>Walleye</td>
<td>Atlantic salmon</td>
<td>Spiny water flea</td>
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<tr>
<td>Atlantic salmon</td>
<td>Rainbow smelt</td>
<td>Fish hook flea</td>
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<tr>
<td>Sculpins</td>
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<td>Bloody red shrimp</td>
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<td>Cicsoes</td>
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<td>Mysis</td>
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<td>Diporeia</td>
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</table>
INVASIVE PLANTS

Phragmites
Reed canary grass
Purple loosestrife
Curly pondweed
Eurasian water milfoil
Eurasian frogbit
Narrow leaf cattail
Marsh thistle

Photos: Great Lakes Commission; Dave Brenner, Michigan Sea Grant; J. Vander Zanden
INVASIVE SPECIES VECTORS

- Ballast water
- Canals and waterways
- Trade of live organisms
- Recreational activities

Photos: NOAA-GLERL
INVASIVE SPECIES VECTORS

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Photos: T. Lawrence; M. Gaden; J. Nevin
INVASIVE SPECIES VECTORS

- Ballast water
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LIONFISH

BURMESE PYTHON

SNAKEHEAD

ASIAN CARP

Photos: Defenders of Wildlife; sportdiver.com; M. Gaden
INVASIVE SPECIES VECTORS

- Ballast water
- Canals and waterways
- Trade of live organisms
- Recreational activities

Photos: USGS; Texas State; townepost Network; National Park Service; deutz fishing; IL/IN Sea Grant
INVASIVE SPECIES IMPACT

ECONOMIC LOSS

- 50,000 foreign species in the US
- $120 Billion in losses annually
  - $5.4 billion from exotic fish
  - $1 billion from exotic mollusks
- 42% of Threatened and Endangered Species at Risk

Source: Pimental, Zuniga, and Morrison (2005)

Photos: D. Arcuri; T. Lawrence
WHY SHOULD WE CARE ABOUT AIS?

BECAUSE WE’LL BE STUCK WITH THE PROBLEM IF WE DON’T!

- 180+ non-native species in Great Lakes (not all invasive)
- Only 2 can be controlled (!)

Photos: GLFC; NYSDEC
THE FUTURE

- **PREVENT**
- Control
- Innovate
- Establish new laws & regs
- Monitor
- Conduct rapid response

Physically Separate Watersheds

Manage Ballast Water
RESOURCES

- Great Lakes Fishery Commission: Sea lamprey control
  www.sealampreycontrol.org

- NOAA: GLANSIS (GLERL)
  www.glerl.noaa.gov/glansis/

- USGS: Invasive species program
  www.usgs.gov/ecosystems/invasive-species-program

- Great Lakes Commission: Aquatic invasive species
  www.glc.org/work/invasive-species/

- National Invasive Species Council
  https://www.doi.gov/invasivespecies

- Reduce Risk From Invasive Species Coalition
  www.rrisc.org

Photos: GLFC; Lake George Association; University of Minnesota