

Using eDNA to Detect Invasive Carp

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1) UW Extension 2) UW Biotechnology Center 3) US Geological Survey 4) Wisconsin Sea Grant



What is eDNA?

Environmental DNA, or eDNA, is DNA left in an environment by organisms that live there.

Invasive Carp

Carp are a family of fish native to Europe and Asia. They escaped into natural waters after being intentionally introduced to aquaculture ponds. Carp are voracious feeders that may outcompete native species for food. Invasive carp have been found in the lower Wisconsin River and are known to cause damage to aquatic ecosystems and negatively impact recreational use.

Project Goals

- Engage youth in hands-on, community-based eDNA monitoring.
- Develop youth critical thinking and science inquiry skills
- Increase youth awareness about the impact of invasive species



Students field-filter a river water sample at Upham Woods



Student pipettes experimental sample into a gel at Upham Woods

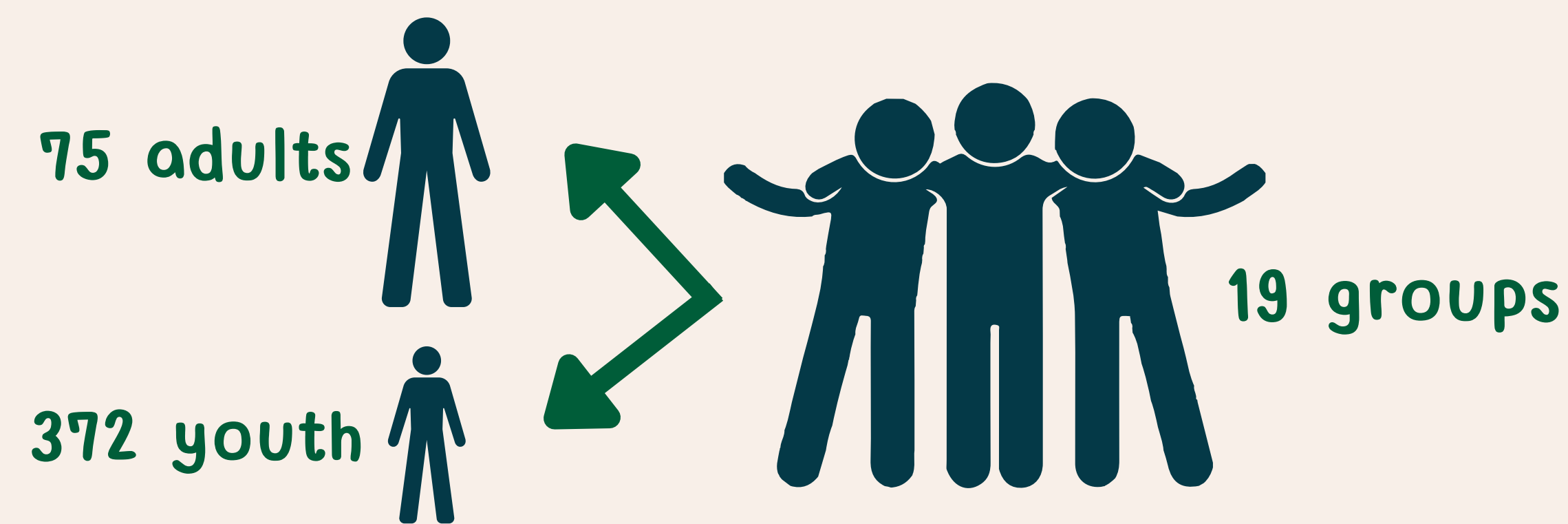
Methods

- Developed, piloted, refined, and evaluated field and laboratory methods in collaboration with UW Extension (Upham Woods Outdoor Learning Center, Wisconsin 4-H, Water Action Volunteers), UW Madison Biotechnology Center, US Geological Survey, Freshwater@UW program, and Wisconsin Sea Grant.
- Adapted field and laboratory methods for high school and middle school students to detect the presence/absence of two species of invasive carp, Bighead Carp (*Hypophthalmichthys nobilis*) and Silver Carp (*H. molitrix*), in the Wisconsin River, and a positive control species, Bluegill (*Lepomis macrochirus*).

Results

Youth showed measurable gains after participating

2025 participation

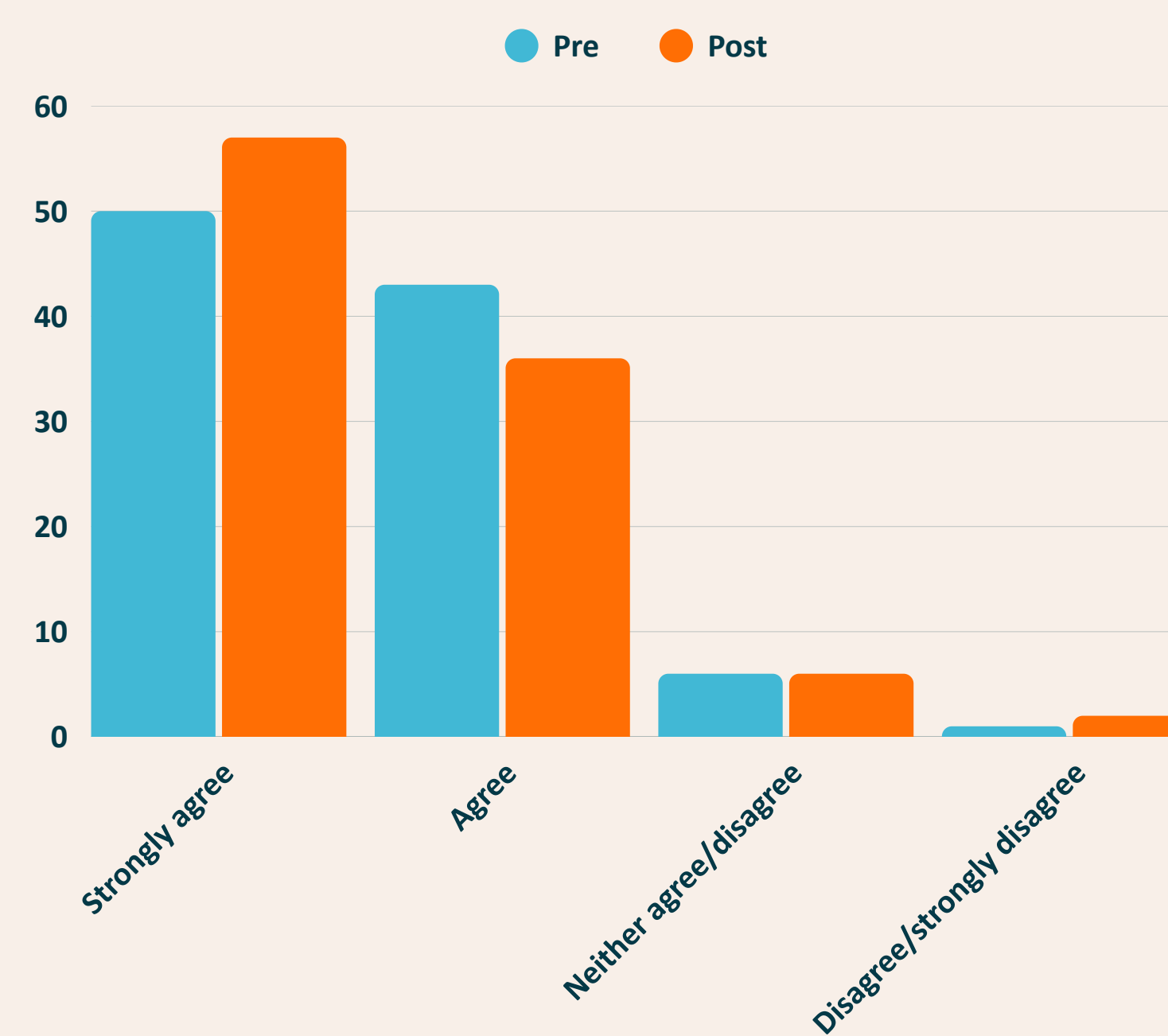


- Middle school students
- High school students
- 4-H clubs
- Girl Scouts
- Science and outdoor clubs

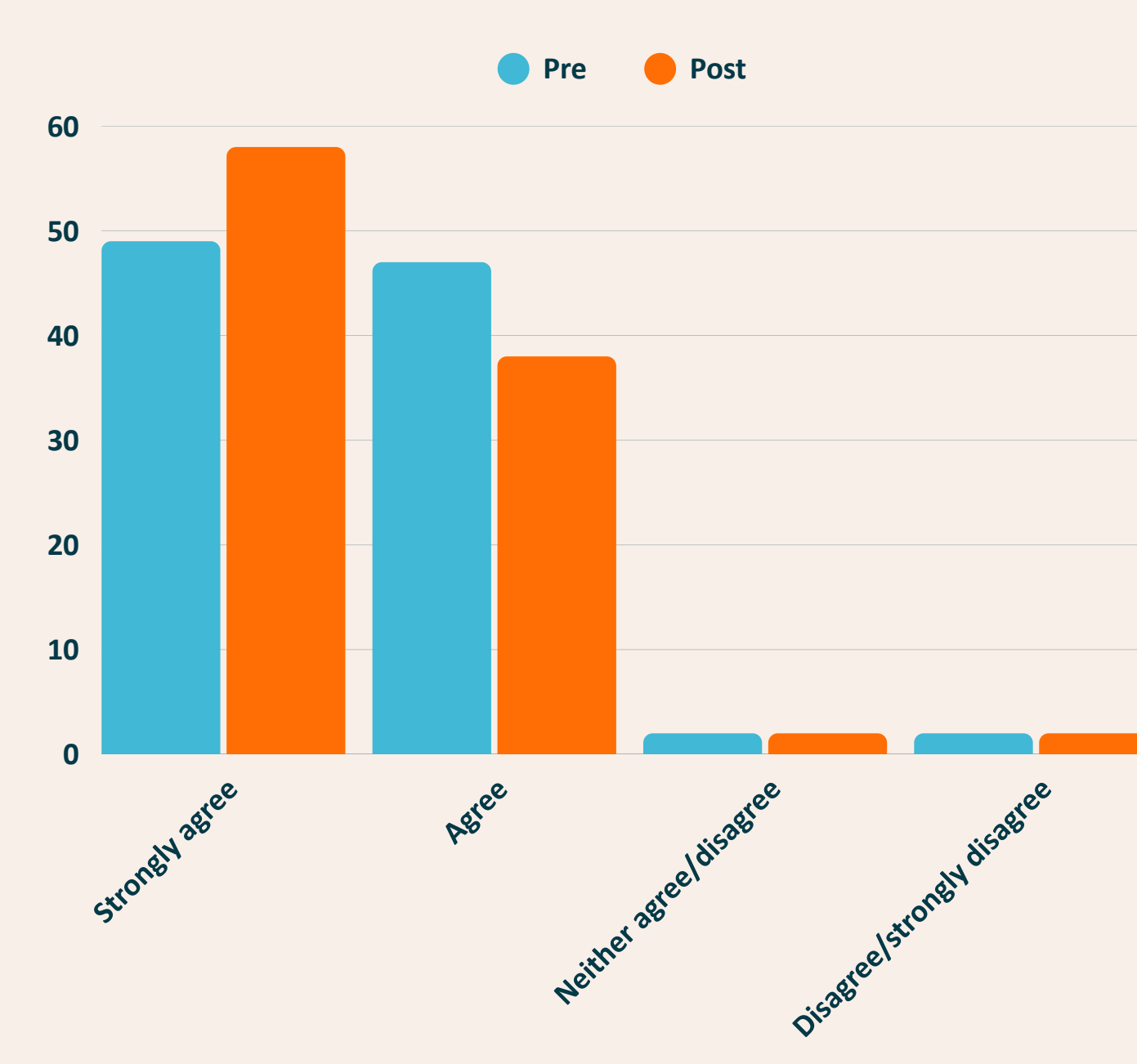
90% of youth were able to learn and apply new science skills

70% of youth would participate in a similar project again

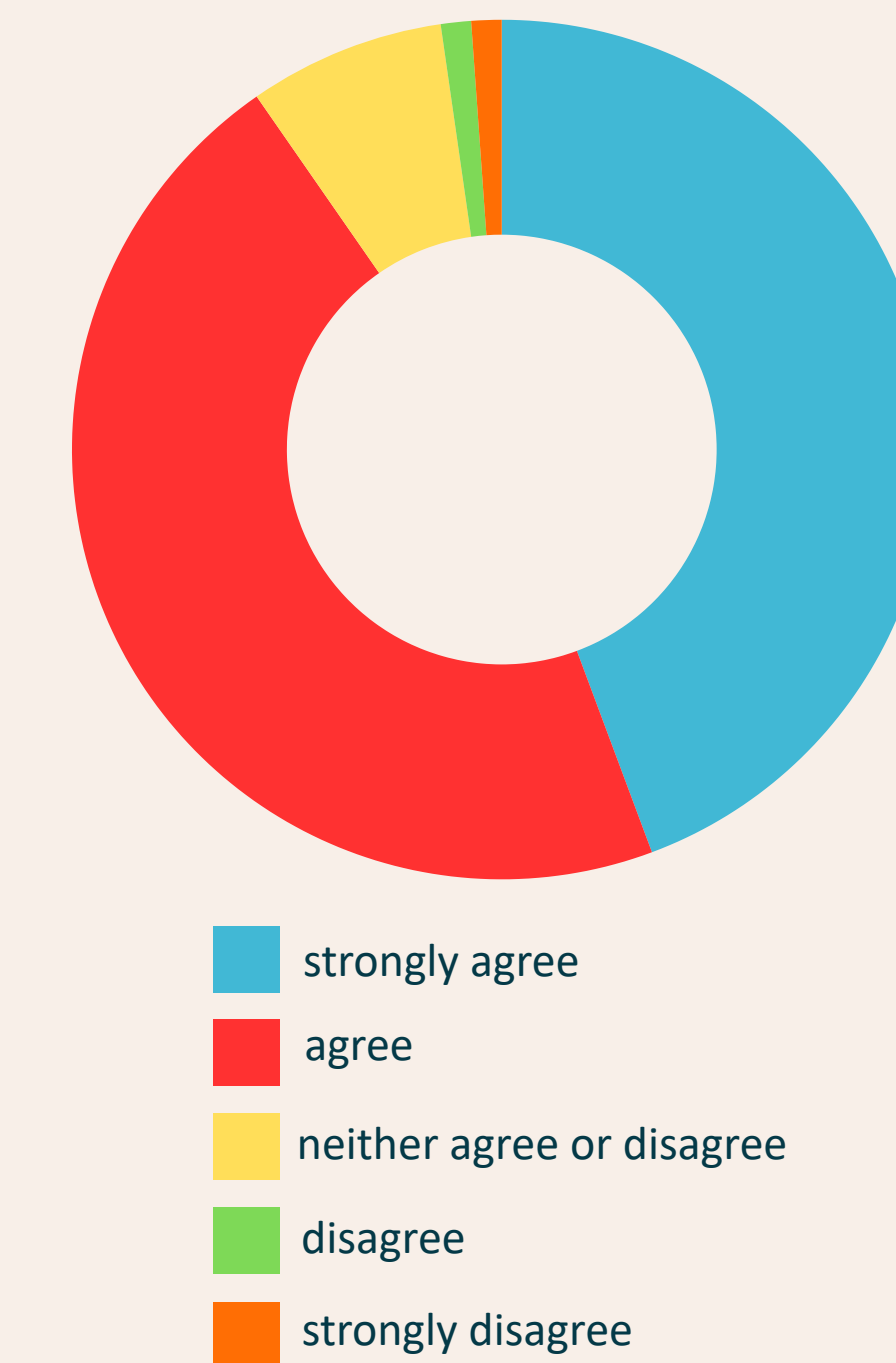
I understand the importance of following a protocol to collect good data in science.
% response on youth pre/post survey



I understand the impact of invasive species on the environment
% response on youth pre/post survey



I was able to learn and practice new science skills through this project.



Student Testimonials

What did you like most about this project?

"I loved that we got to connect with science and outdoors and to see the process of science,"
Logan Middle School student

"I liked using devices I haven't used before to collect data,"
Prairie School student

"I liked the cool machines and fishing,"
Sauk county 4-H & Friends youth participant

This project would be better if...

"it didn't rain" (x3)

"we found carp :(hehehe"

"it was somehow faster"

"I had a different lab group"

Educator Perspective

"This involved advanced science concepts and equipment but was applied to real life situations that students can relate to and can perform themselves with guidance. This is a naturally engaging activity about a real life concern."

Logan Middle School STEAM teacher

"Thank you for a wonderful afternoon of hands-on learning and enjoying nature"

Portage High School teacher



Students examine eDNA results visualized using gel electrophoresis at Upham Woods



eDNA Lesson Plan for Educators >>>

