Evaluating Water Quality

Tracy Burds

High School Science

•Biology

•Chemistry

•Earth & Space

•Environmental

•Forensics

2021 extern at Central Park, Jones County Conservation

Central Park Background

Central Park in Central Junction, Jones County was established around the 1950s.

Central Park has a man-made lake. In 2019, they did some major renovations on the lake in order to lessen the amount of sediment draining into it and add habitat for the fish in many areas. The beach was reconstructed as well.

There is now a sediment pond and two wetlands to help prevent pollution from reaching the main lake.

Central Park Opportunities

Conservation of the Environment
- Protecting habitats
- Monitoring water quality

Education
- Nature Center
- Seasonal events
- Traveling programs

Recreational opportunities for the public:
- Swimming at the beach
- Paddleboating
- Kayaking
- Boating (only electric motors)
- Fishing
- Hiking
- Camping
- Playgrounds

Workplace Focus

- Identifying and monitoring plants and animals in the park.

    - Monitoring the prairie by adding plants as needed and eliminating unwanted trees.

    - Collecting data on the Purple Martins in the provided housing units.

- Evaluating the health of the lake through water testing.

Workplace Focus--Youth Conservation Crew

Workplace Focus

. **Educating others on the habitats and species present.**

- **Providing professional development opportunities to educate participants on safe or edible plants vs. poisonous or dangerous plants.**

- **Created a Go Fish game with the species present in the Central Park Lake.**

- **Lots of programs!**

Workplace Focus—Externship Projects
Created Labels for the Informational Brochures

Workplace Focus—Externship Projects

Compass Courses

Pict-O-Cache
Covers the Entire Park

Tree-O-Cache
North Side of Park

Problem

- Central Park has completely restructured its lake due to runoff issues to improve its health.

- Facts:
    - Only 34 of Iowa's lakes are natural.
    - Sediment is the number one pollutant
    - Farm runoff is the main source of pollution (sediment and chemicals)
    - Iowa is primarily farm ground.
    - Lake Eerie and Toledo, Ohio had instances of bad drinking water and lake/river water due to algal blooms from chemical pollution

Problem

- Water drains within a watershed. Major rivers and lakes are polluted. How do we prevent water pollution?

  - Determine how to improve the water quality by investigating methods to prevent pollution of water sources.

    - Option 1: Reach out to any local farmers that have ponds. Test their water quality if able.

    - Option 2: Consider any public water bodies and test a water sample.

Final Product

- Consider what causes the quality of the water for the location tested. Develop a model lake or river that would promote quality water.

  - Preferred: Reach out to the farmers or DNR and discuss methods to improve the water quality.

  - Write an opinion piece to the newspaper related to findings.

  - Make a YouTube video or other informational resource to inform on water quality.

Standards

- HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

- HS-LS4-6 Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity

- HS-ESS2-1 Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and oceanic-floor features.

- HS-ESS2-5 Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.

- HS-ESS3-4 Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

- HS-ESS3-6 Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

Driving and Essential Questions

- What water sources can we test?

- What determines how healthy a water source is?

- Is the water source healthy?

- What's polluting (or could pollute) the water?

- How do we improve water quality?

- How do we prevent pollution?

- How can we make a difference with what we learn?
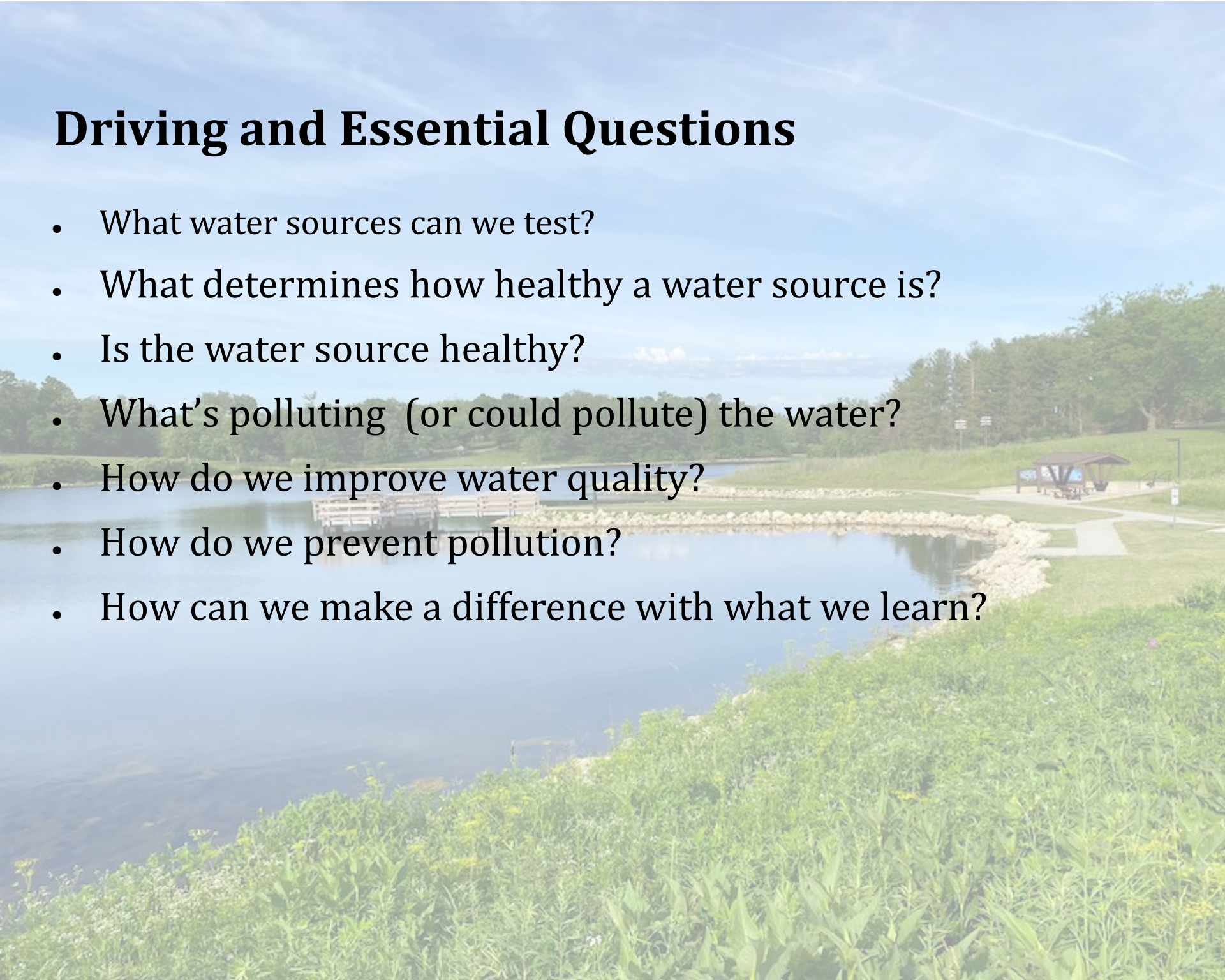
Extern Host Role

- Michele Olson—Naturalist with Jones County Conservation (or local DNR officer/naturalist)
  - consultant to evaluate student solutions
  - challenge students with problems that could arise with their solution
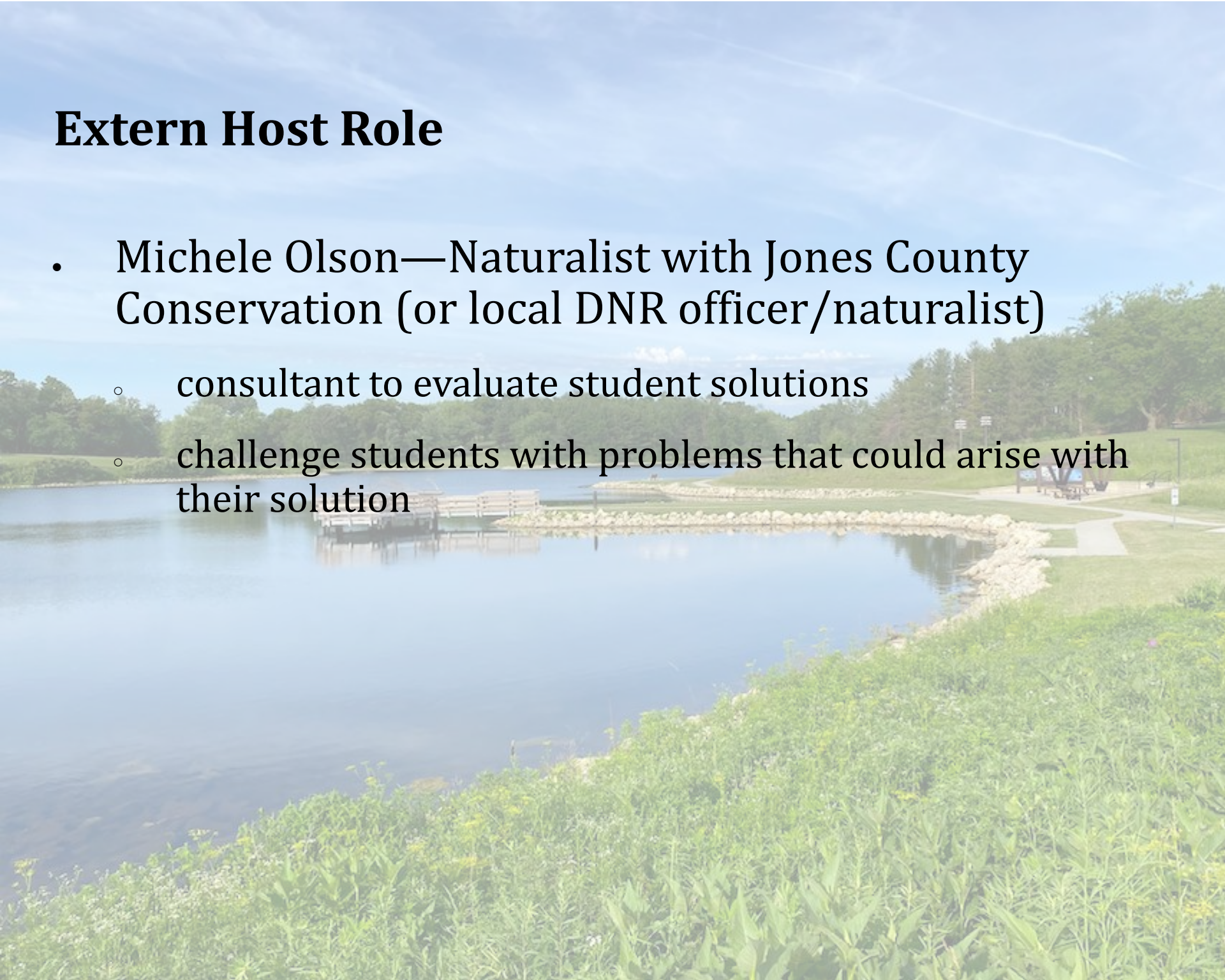
Student Learning

- Students can choose between a private pond or public water source for water testing.
- Students can choose what they do after developing their model.
- Students can revise after consulting with a naturalist/DNR officer.