

# DISTRICT WQ PROGRAM UPDATES



US Army Corps  
of Engineers®

2026 NAB Dam Operators Training  
McHenry, Maryland  
16 April 2026

Presenter: Sarah Pedrick



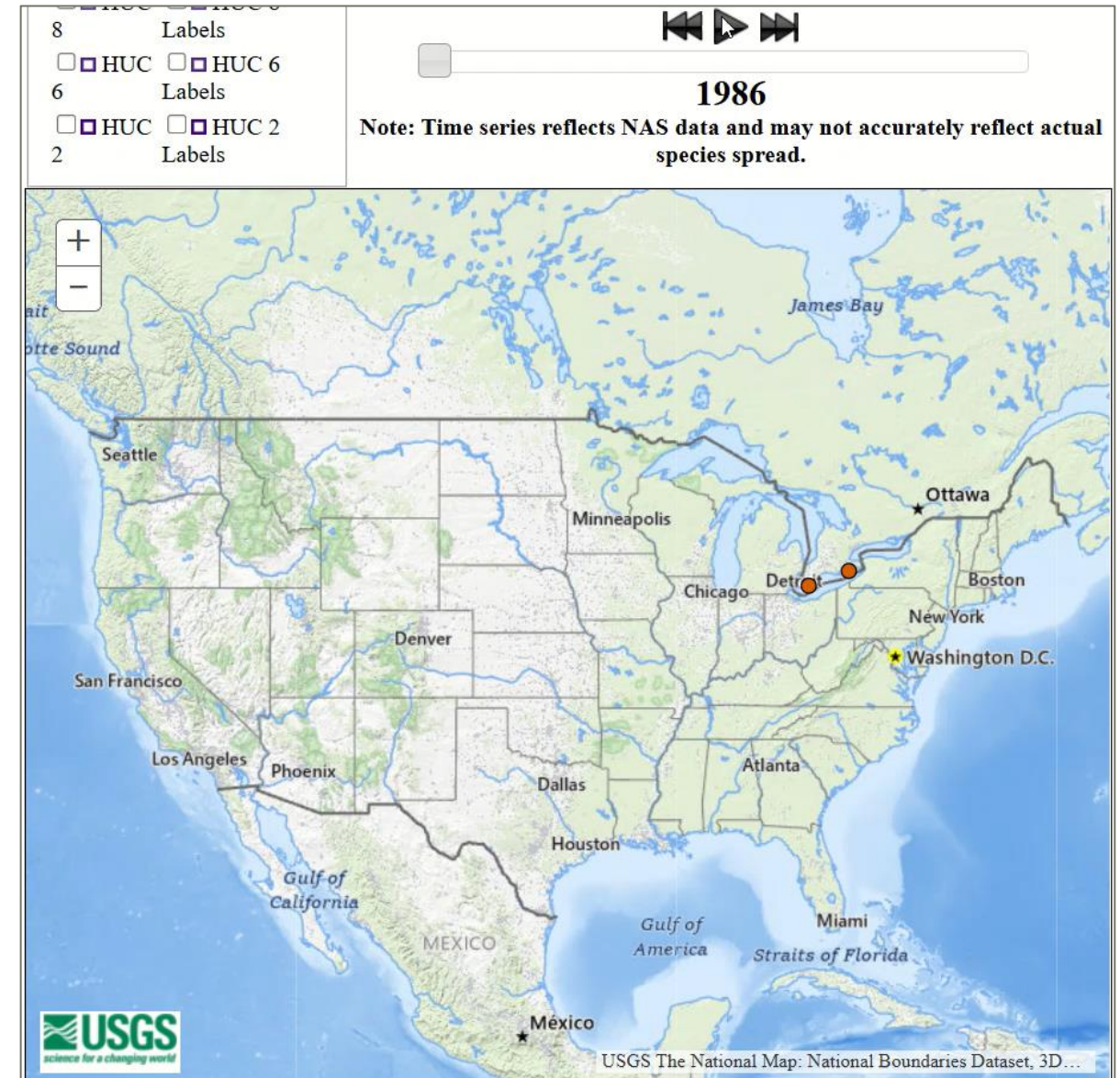
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# ZEBRA MUSSELS OVERVIEW

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- How It Started
  - 2024 Interagency Agreement with USGS initiated at Division
    - Focus: Keeping invasive mussels out of USACE lakes and expanding populations of native freshwater mussels.
    - Goal: Study why zebra mussels have not proliferated within Cowanesque and use the results of the findings to help inform management efforts and/or limiting factors that can be applied to other water bodies.
- Why It Matters
  - Infrastructure
  - Recreation
  - Water Quality





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# INFRASTRUCTURE IMPACTS

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- Intake Structures
  - Gate Failure
  - Trash Rack Clogging
  - Weight Stress
  - Sensor Interference
- Piping
  - Diameter Reduction
  - Shell Jamming
  - Corrosion
- Hydropower Generation
  - Overheating
  - Mechanical Failure
  - Fire Protection Failure

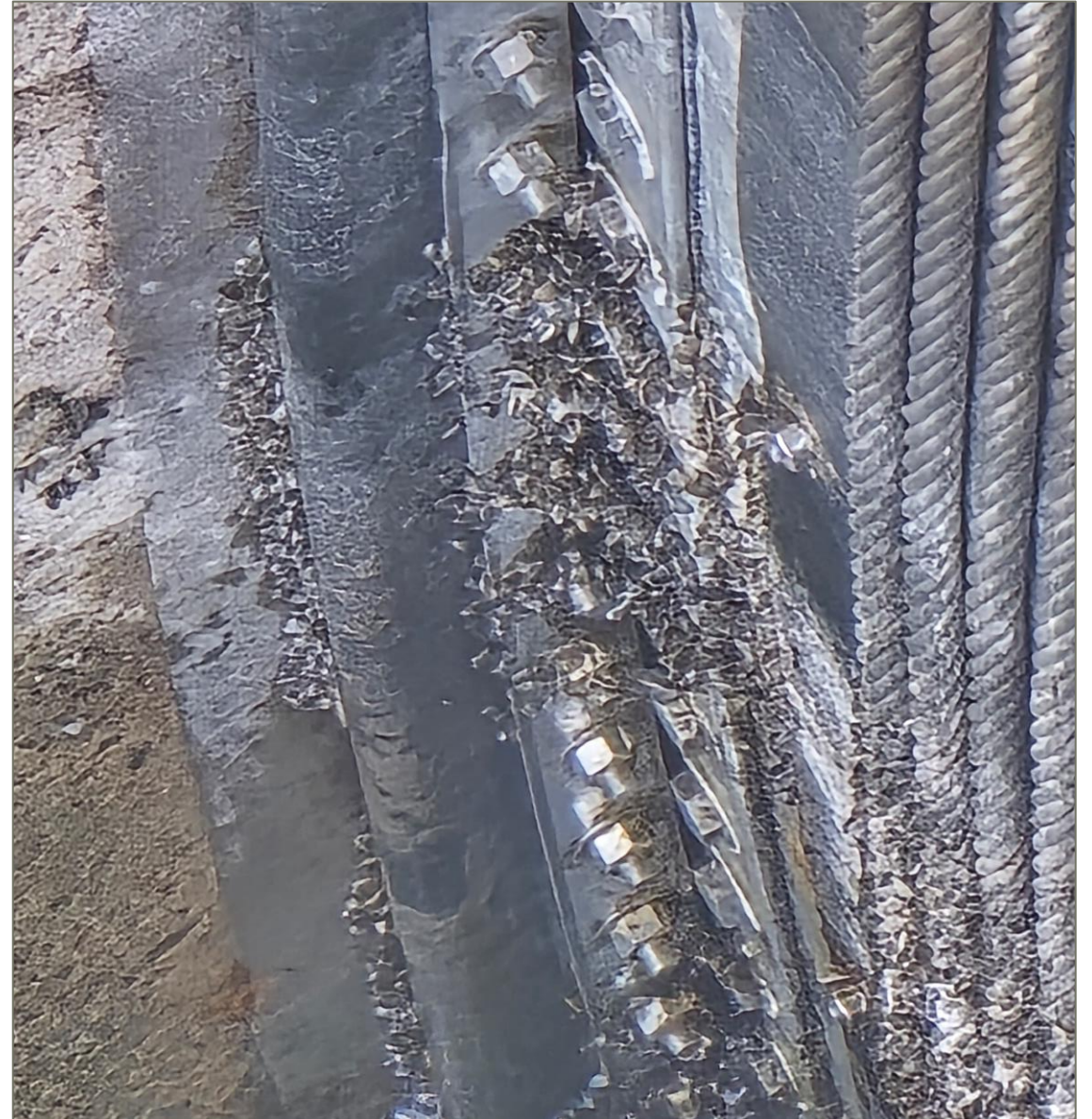




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# RAYSTOWN LAKE, PENNSYLVANIA

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# MONTGOMERY LOCKS AND DAM, PENNSYLVANIA





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# GAVINS POINT DAM, SOUTH DAKOTA

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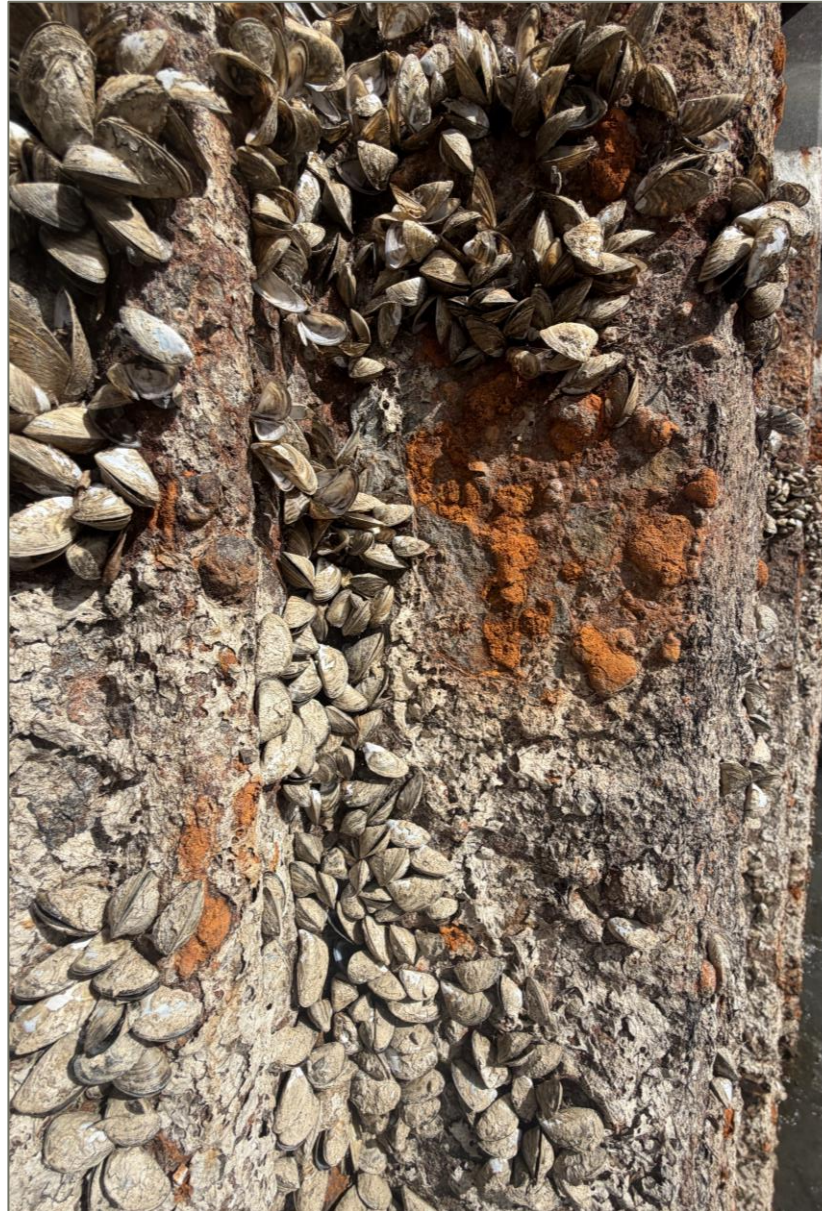
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# RECREATIONAL IMPACTS

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- Public Safety and Swimming
  - Razor-Sharp Shells
  - Harmful Algal Blooms (HABs)
  - Foul Odor
- Boating
  - Cross-contamination
  - Engine Damage
  - Hull and Prop Encrustation
  - Dock and Buoy Damage
- Fishing and Ecosystem Health
  - Cross-contamination
  - Starving Food Chain
  - Cut Lines and Litter
  - Damaged Gear





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# RAYSTOWN BOATS

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# RAYSTOWN, SEVEN POINTS BEACH

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# WATER QUALITY IMPACTS

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- Water Clarity
  - Increased Light Penetration
  - Explosive Plant Growth
- Selective Feeding
  - Picky Eaters
  - Harmful Algal Blooms
- Benthic Shunting
- Drinking Water and Chemical Impacts
  - Taste and Odor
- Dissolved Oxygen Depletion
  - Fish Kills





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# 2025 COWANESQUE PILOT STUDY

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- Focus: Keeping invasive mussels out of USACE lakes and expanding populations of native freshwater mussels.
- Goal: Study why zebra mussels have not proliferated within Cowanesque and use the results of the findings to help inform management efforts and/or limiting factors that can be applied to other water bodies.
- Shortcoming: insufficient data set
- Pivot: CY25 increased sampling effort
  - SRBC and Mansfield University
- Results: District path forward
  - Coauthored document with USGS
  - District SOP





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# SHORELINE SURVEYING

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# VELIGER SAMPLING

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# SETTLEMENT PLATE SAMPLING DEPLOYMENT

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# SETTLEMENT PLATE SAMPLING RETRIEVAL

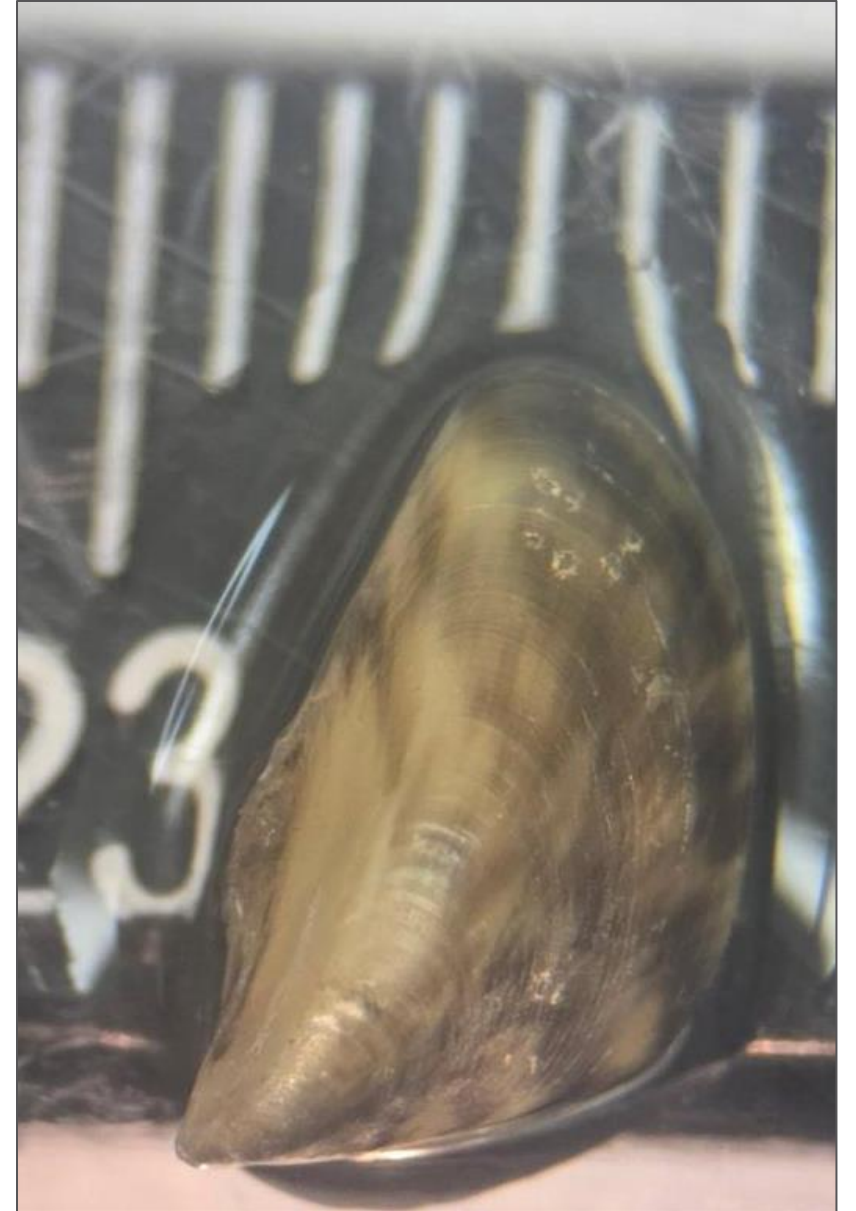
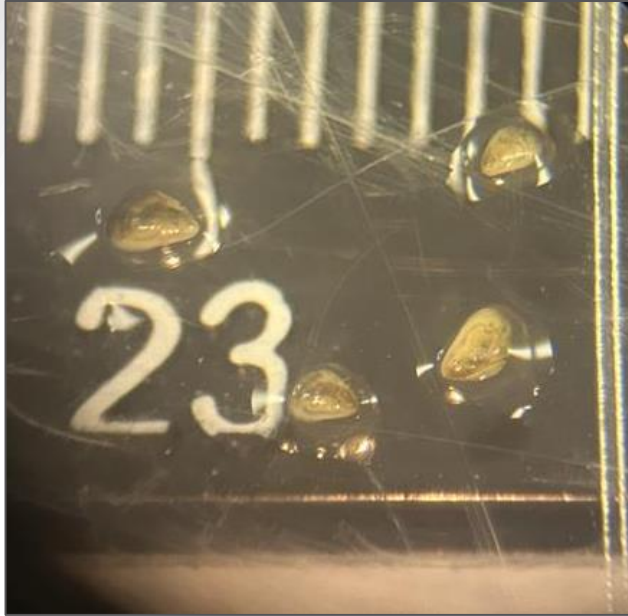




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# COWANESQUE DATA ANALYSIS

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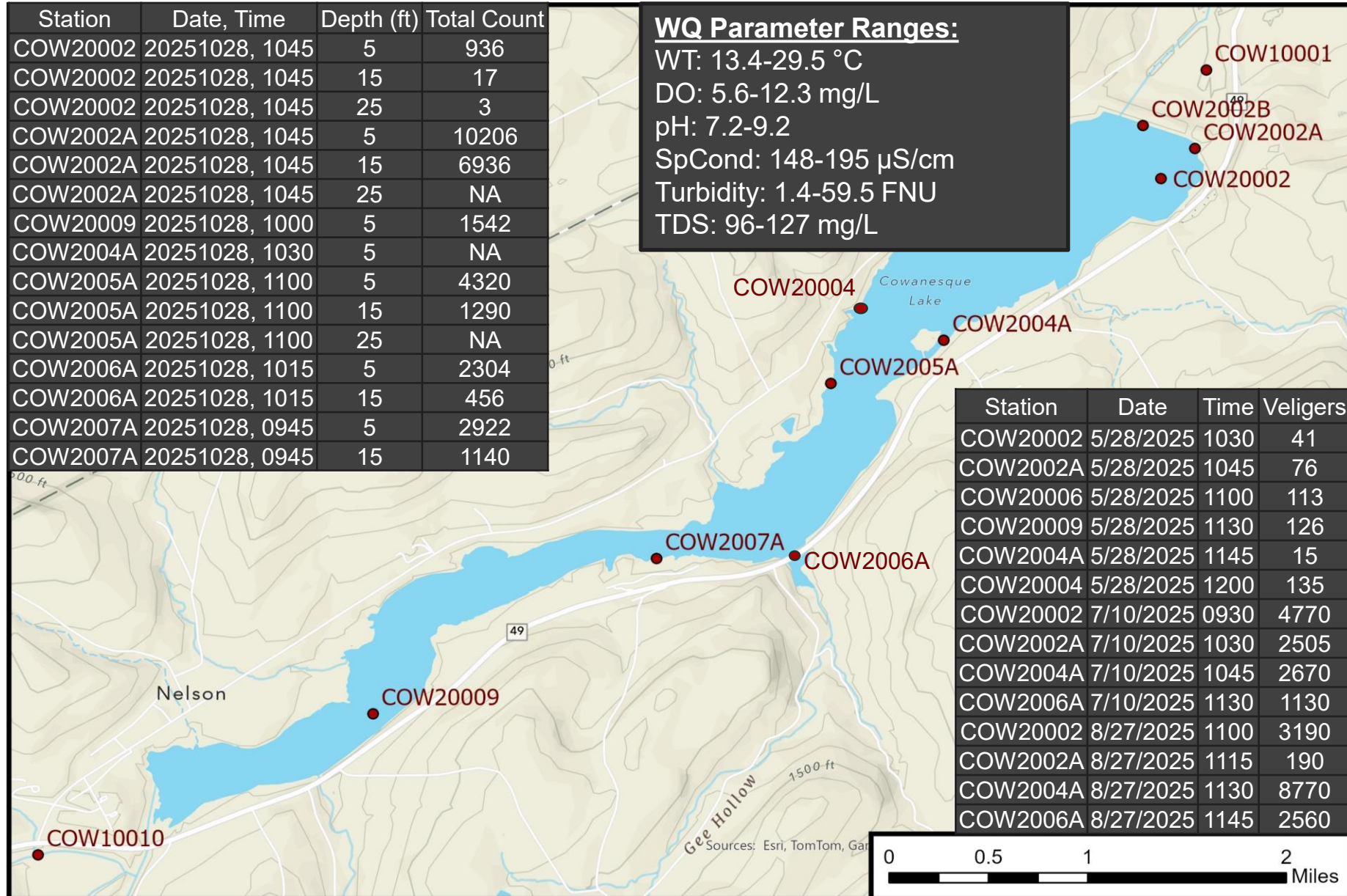




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# COWANESQUE RESULTS





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# COWANESQUE LESSONS LEARNED

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# RAYSTOWN/ERDC COLLABORATION

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- Aquatic Invasive Species Display for Visitor's Center
- Water Operations Technical Support (WOTS)
- Primary Focus Areas
  - Beach, Water Intake Structure, Spillway Gates
  - ERDC Site Visit
- Possible Treatment Options
  - Copper-based Molluscicides
  - Anti-Fouling Paint
  - Dye Study
- Other Prevention Efforts
  - Pressure washers and Use Signage
  - Educational Signage

## INVASIVE INVADERS!

### WHAT IS AN INVASIVE?

Invasive species are non-native plants or animals that disrupt local ecosystems by outcompeting native species for resources. They can be aquatic (found in water) or terrestrial (found on land) and are often characterized by their ability to...

**Outspread:** They can spread to new areas more rapidly than natives  
**Outgrow:** They can grow faster than natives  
**Outbreed:** They can reproduce quicker and in larger numbers than natives  
**Outmaneuver:** They can easily adapt to different soil types, climates & food  
**Out-Eat:** They can quickly exhaust food sources, leaving little for natives  
**Outcompete-** They have no natural predators to keep their populations in check, so they easily **outcompete** native species for water, sunlight, space, etc.

Below: Zebra Mussels (dreissena polymorpha) clustered on hydrilla (hydrilla verticillata), both of which are aquatic invasive species at Raystown Lake.

Below: Zebra Mussels have fingernail-sized (less than 2 inches), D-shaped shells with alternating light and dark brown, zig-zag bands.

### WHAT IS THE BIG DEAL?

Invasive species have negative impacts on the environment, economy, community, and YOUR recreation experience.

Hydrilla, one of the most infamous aquatic invasive at Raystown, illustrates this well. Hydrilla grows in dense mats that (initially) provide fish habitat, but quickly grows so thick that it depletes oxygen in the water, creating an unlivable environment where fish once thrived. Not to mention, you can't move a boat through it, let alone a fishing lure... Say goodbye to your favorite fishing and swimming spot!

### WHAT CAN YOU DO TO HELP?

Once rooted in a suitable habitat, eradication of invasive species is virtually impossible. Management techniques and treatment methods focus on **REDUCTION & PREVENTION**, with the long-term goal of decreasing population size to minimize negative impacts and prevent the spread within the lake & other bodies of water. **Preventing the spread depends on YOU.**

Before leaving the lake, remember to...

**CLEAN**

all plants, mud, debris off your boat, trailer, and gear

**DRAIN**

all water from boat, motor, live wells, and any compartments.

**DRY**

all equipment for at least 1 week or wash with hot, soapy water before visiting another water body

**& THOROUGHLY INSPECT THESE PARTS OF YOUR BOAT!**



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# 2026 DISTRICT-WIDE MONITORING

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- Joint effort between EN and Ops
  - EN leading with support from project staff
- Level of Effort
  - CY26 is investigative
    - Cowanesque and Raystown
- District-wide Consistency
  - SOP
  - Monitoring
    - EM 1110-2-1201 and ER 1110-2-8154
    - Data Management
      - Field Sheets
      - FY28 Enterprise WQ Database
  - Project Specific Management Plans
- CY26 Investigation Details
  - At least one set of settlement plates at each reservoir
    - Near dam or intake structures
  - NLT 15 May
    - Settlement plate deployment
  - Late September/Early October
    - Settlement plate retrieval
  - October thru December
    - Sample analysis
    - Pedrick and Mai
      - Future training for project staff



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# 2027/2028 DISTRICT-WIDE MONITORING

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## ➤ 2027

### ➤ Division Policy Rollout

- Shoreline Monitoring at All Projects
- Early Detection and Rapid Response (EDRR)
- Educational Efforts

### ➤ Level of Effort

- Shoreline Survey Training
- Review 2026 Results and Budget
  - Settlement Plates where ZMs are Present

### ➤ District-wide Consistency

- SOP
- Field Sheets
- Project Specific Management Plans

## ➤ 2028

### ➤ Potential Budgets to Expand Efforts

- \$5,000 to \$10,000

### ➤ Level of Effort

- Shoreline Surveys
- Settlement Plates
- Potential Veliger Sampling
  - Trends

### ➤ District-wide Consistency

- SOP
- Field Sheets
- Project Specific Management Plans
- FY28 Enterprise WQ Database



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# WHAT'S NEEDED FOR NLT 15 MAY 2026

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- EN Water Quality Team
  - Permits
  - Settlement Plates
- Ops Project Staff
  - Buoy(s)
    - Labels
      - Monitoring: Do Not Disturb
      - Name, address, and permit number
  - Ropes
  - Anchors
- Together
  - Communication
  - Flexibility
- 2026 Sampling
  - Each project installs their own plates
    - Time Commitment: 1.5hrs or less
    - Grab at break
      - Settlement Plates
        - WQ Van
        - All projects except Tioga-Hammond and Cowanesque
    - Weights and Buoys
      - Bush's Truck
      - SRP projects only

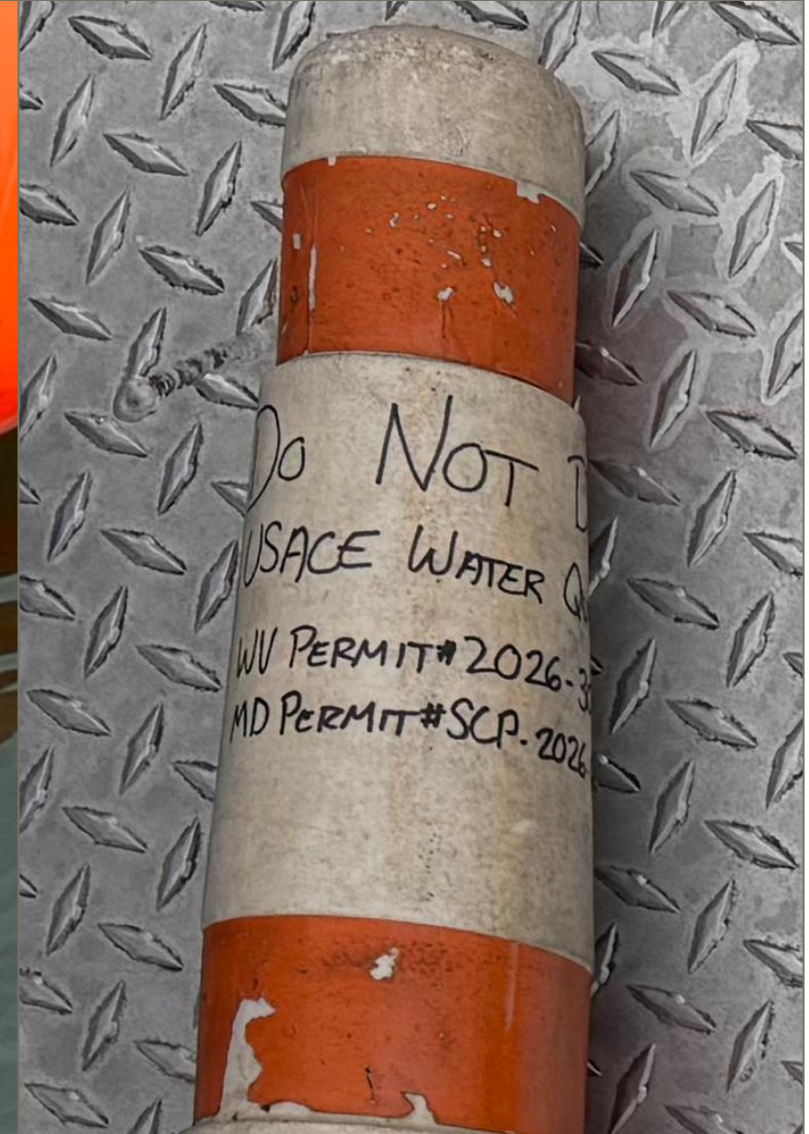
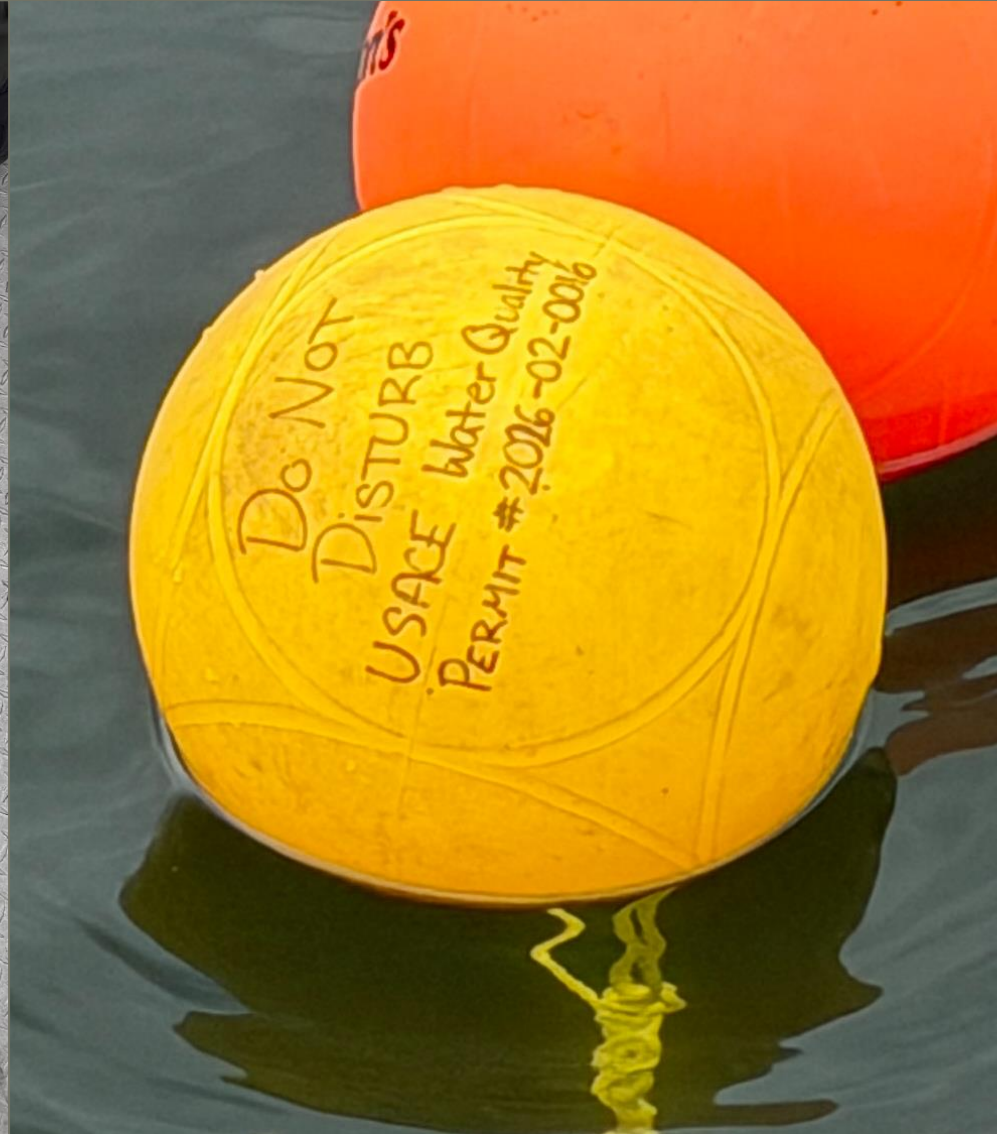




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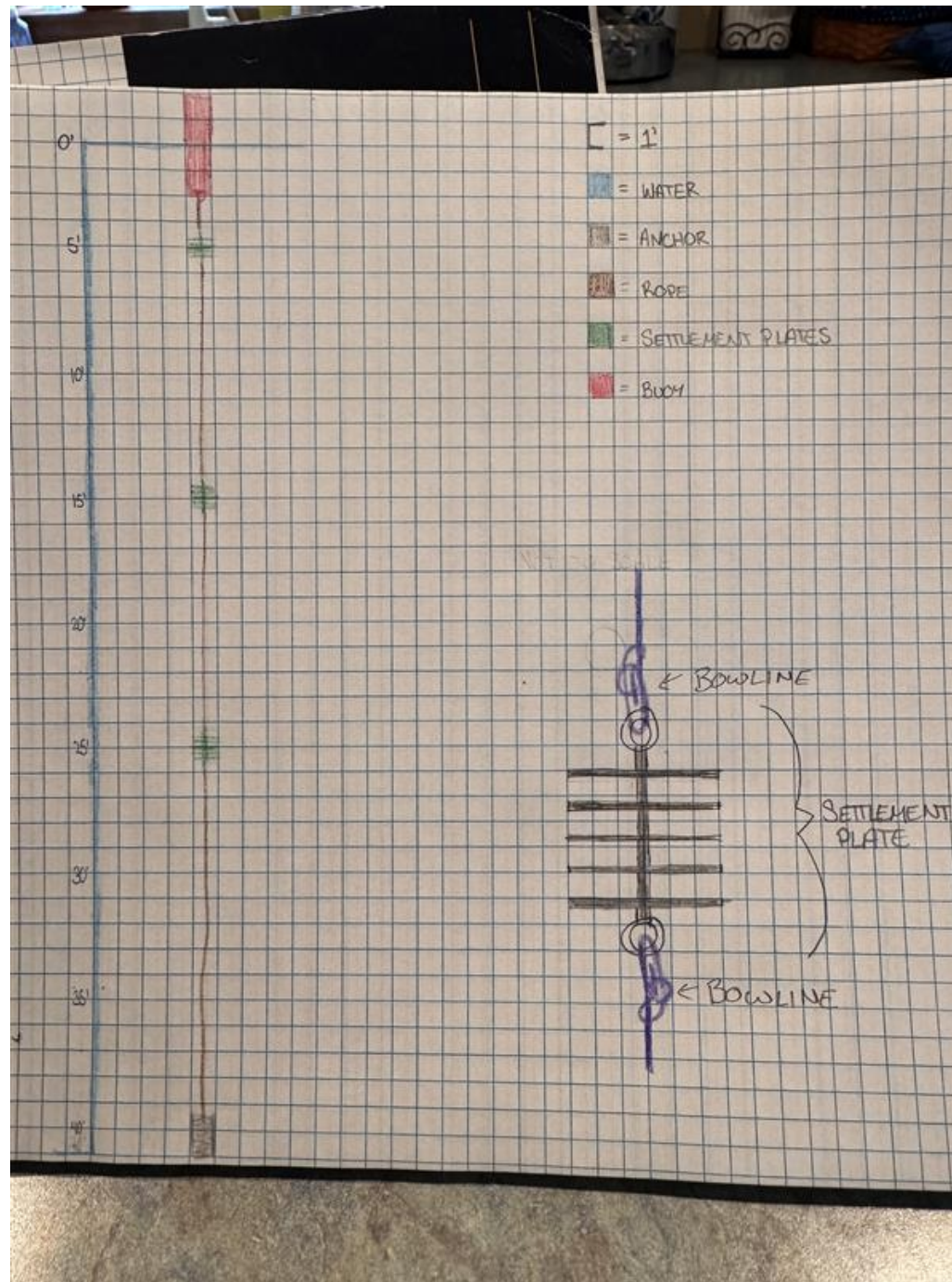
# JENNINGS AND RAYSTOWN DEPLOYMENT

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# WHAT'S NEEDED FOR SEPTEMBER/OCTOBER 2026



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- EN Water Quality Team
  - Permits
  - Equipment for preservation
- Ops Project Staff
  - Workspace for sample preservation
    - Table
    - Sink
  - Boats at Raystown, Cowanesque, Bush, Almond, Stillwater, and Aylesworth
- Together
  - Communication
  - Flexibility
- 2026 Sampling
  - Considerations
    - Timing
    - Weather
    - Fatigue Management Plan
  - Tentative Schedule
    - 28 September (M): Jennings (1100)
    - 29 September (T): Raystown (0900)
    - 30 September (W): Curwensville (0800), Sayers (1200)
    - 01 October (Th): Bush (0900)
    - 02 October (F): Tioga (0800), Hammond (1200)
  
    - 05 October (M): Almond (0900), Cowanesque (1300)
    - 06 October (T): East Sidney (0830), Whitney Point (1230)
    - 07 October (W): Stillwater (0830), Aylesworth (1230)

# QUESTIONS/COMMENTS

