

# CO<sub>2</sub> Field Study Update

CAWS AIS Stakeholder Meeting

December 19, 2018

Chicago, IL

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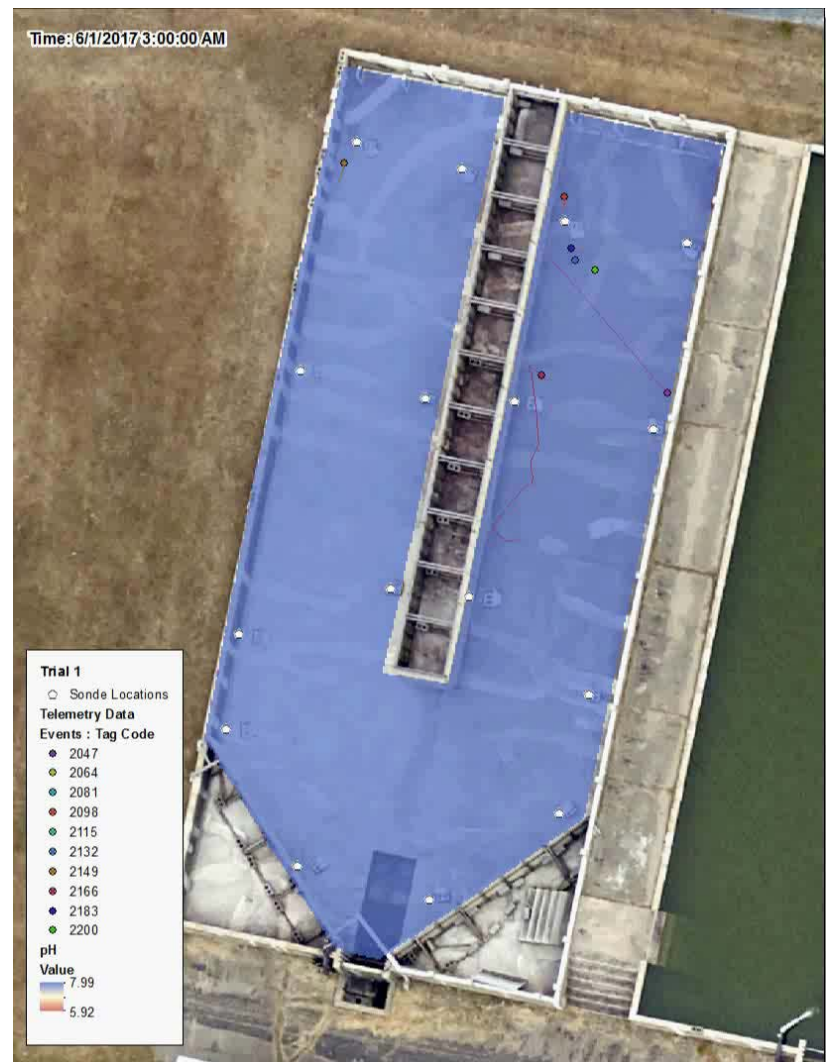
USGS Upper Midwest Environmental Sciences Center

La Crosse, WI

# CO<sub>2</sub> Field Study Update

## Background

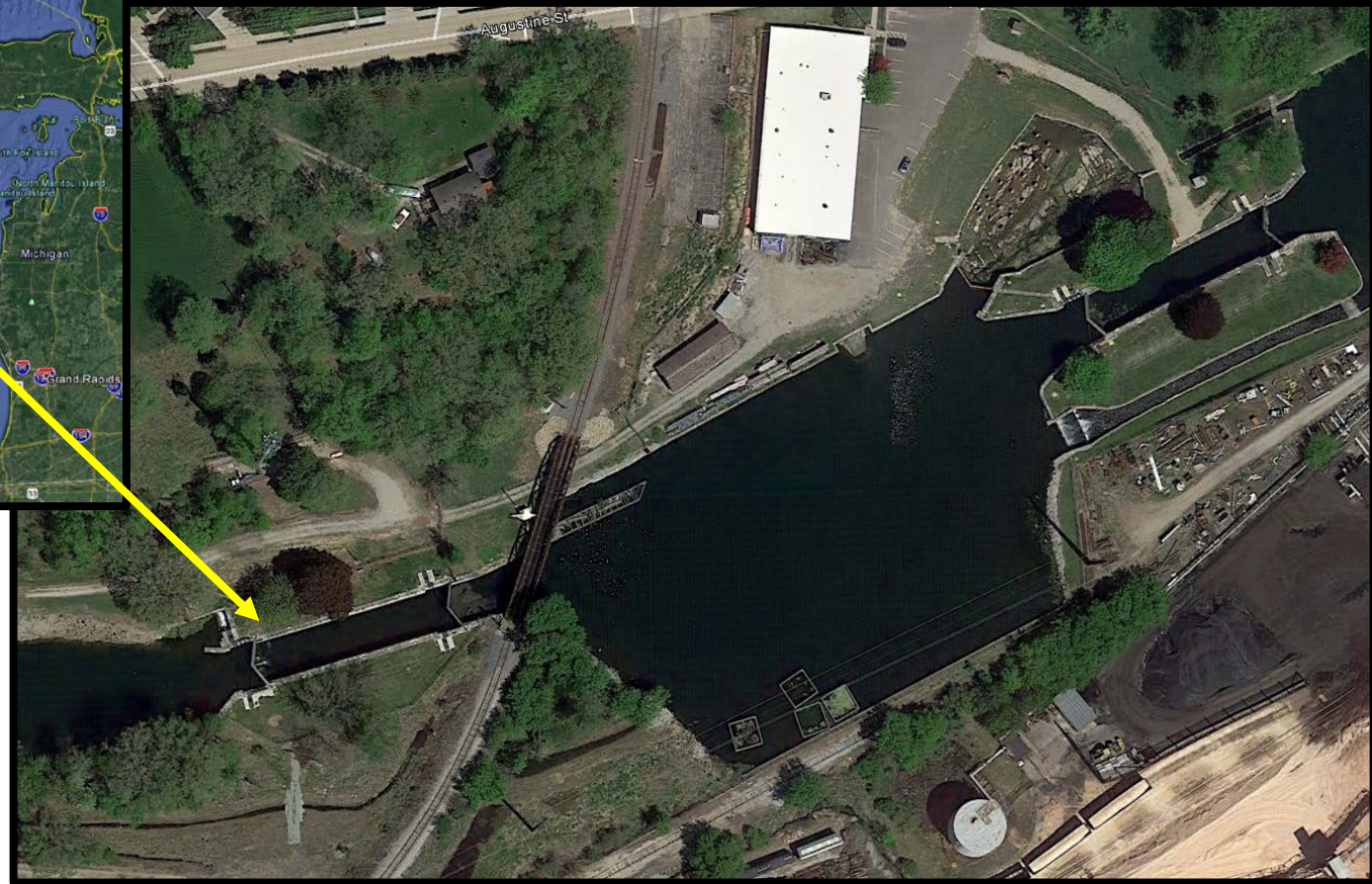
- Evaluating CO<sub>2</sub> as a fish repellent
  - Current focus on Asian carps
- Multiple published studies characterizing fish behavior during CO<sub>2</sub> exposure
- Next step is to evaluate feasibility at management scales



# CO<sub>2</sub> Field Study Update

- Objective: Evaluate the economic and engineering feasibility of infusing CO<sub>2</sub> within a navigational structure
- Identified locks on the Fox River in northeast WI as potential test sites
  - No impact to commercial navigation
- Proposed study to WDNR and USEPA R5 staff in Madison, WI (25-Jun-18)
  - Identified regulatory considerations
- Presented study to Fox River Navigational System Authority (FRNSA Board approved 28-Aug-18)
  - Approved test site: Kaukauna Lock #2 on Fox River near Kaukauna, WI

# Test Site Kaukauna Lock #2 (Fox River)



# Pesticide Registration

- Section 3 pre-submission meeting at EPA OPP (18-Jul-18)
- Section 3 registration submitted (12-Sep-18)
  - Currently under review
- Two different use patterns

Proposed Label for Carbon Dioxide – Carp

FRONT PANEL

For retail sale to and use only by certified applicators of the U.S. Fish and Wildlife Service, U.S. Geological Survey, U.S. Army Corps of Engineers, State natural resource managers, or persons under their direct supervision.



To deter Silver Carp, Bighead Carp, Black Carp and Grass Carp or as an under ice lethal control for aquatic nuisance species.

# General Project Timeline

- **Phase 1: Design (2-Nov through 8-Feb)**
  - USGS awarded A/E contract to Bailey Edward/GEI Consultants (2-Nov-18)
  - Meeting at Lock #2 to scope designs (9-Nov-18)
  - Design and drawings ongoing (final submittal due 8-Feb-19)
- **Phase 2: Contracting and Construction (8-Feb through 26-Jul)**
  - Construction contract advertisement (award expected 19-Apr-19)
  - Site prep and construction (completed system expected 26-Jul-19)
- **Phase 3: Testing and demobilization (2-Aug through 18-Oct)**
  - Four weeks of active testing (2-Aug to 23-Aug-19)
  - Five weeks contingency testing (30-Aug to 27-Sep-19)
  - Final FRNSA site inspection (18-Oct-19)

# 5 Primary Data Objectives

## 1. **Engineering and economic assessment**

- Determine operational costs that can be scaled to other locations (e.g. BRLD)
- Lead: UW-Platteville, USACE ERDC

## 2. **Water quality**

- Determine CO<sub>2</sub> concentrations and mixing
- Lead: USGS CMWSC & UMWSC

## 3. **Air quality**

- Determine human health risk
- Lead: USCG RDC, USGS UMESC

## 4. **Fish behavior**

- Determine behavioral responses of fish to CO<sub>2</sub>
- Lead: USGS UMESC, U of Illinois

## 5. **Non-target toxicity**

- Determine the toxicity of CO<sub>2</sub> to non-target species (e.g. mussels)
- Lead: USGS UMESC



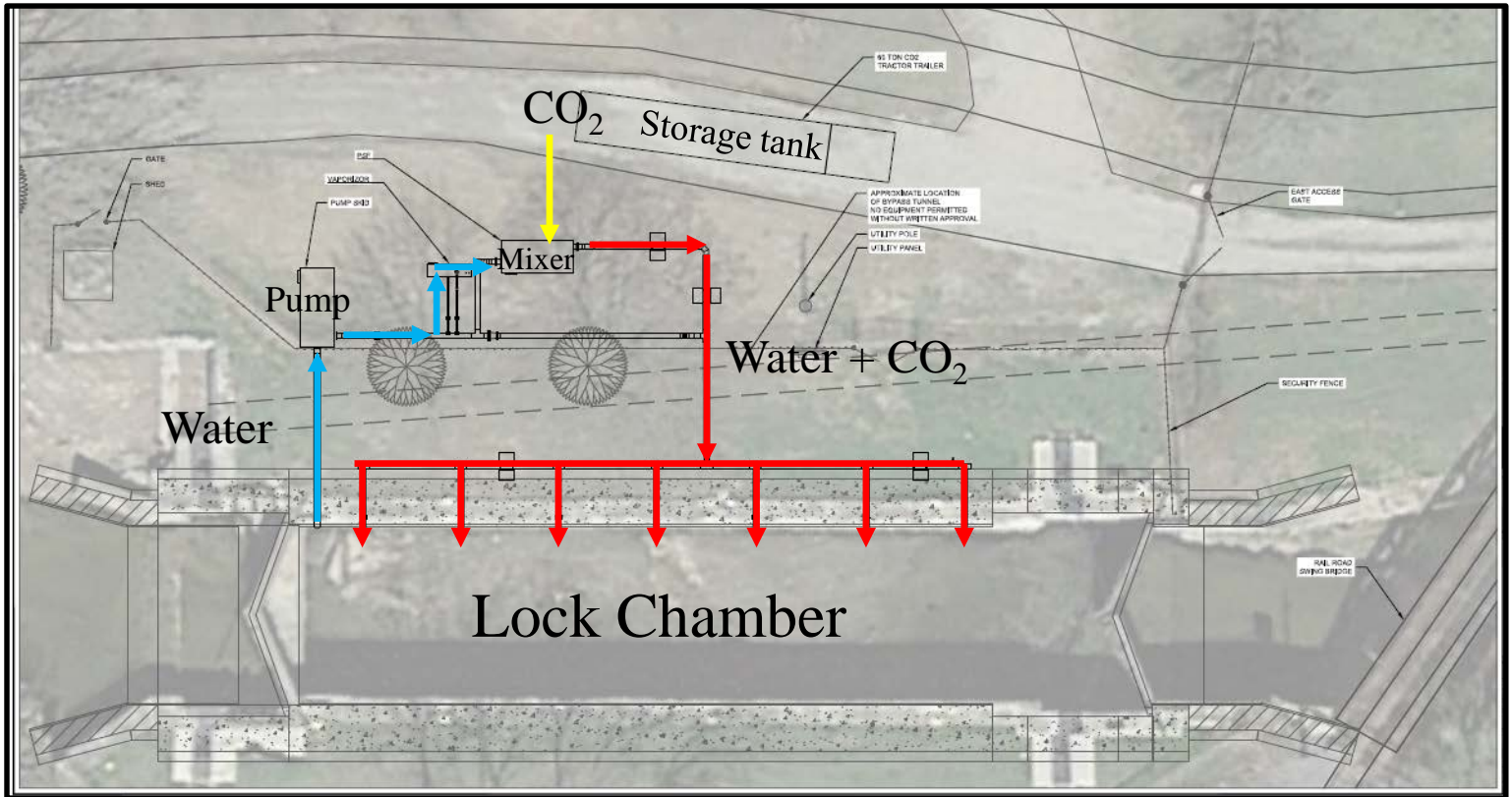
# Critical Decision Points

- Section 3 registration
  - Decision expected soon (early CY19)
- Other permits
  - WI EUP, NR107/109, WPDES, Section 106, WI Collectors, NEPA, Section 7, Section 408, Section 10
- Contracting
  - Bids
  - Budget
- Equipment availability
  - Backordered or long lead-time items

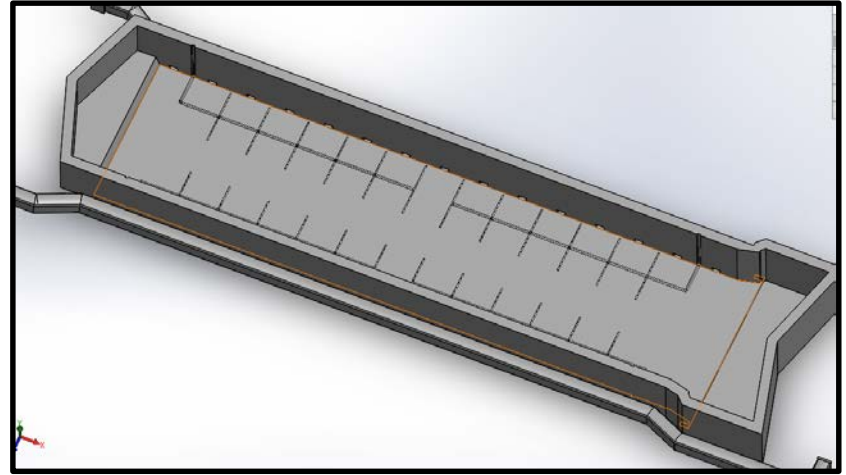
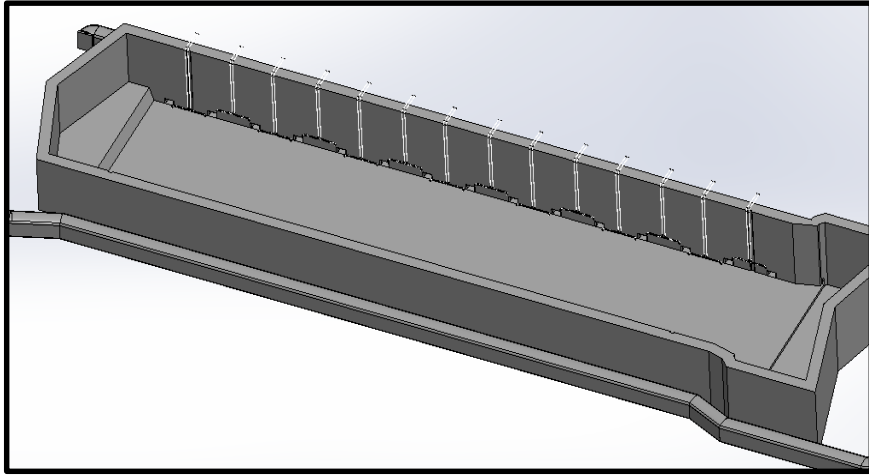


# Conceptual Site Layout

- 35% submittal received 6-Dec-18



# Questions?



Side (left) and bottom (right) mounted CO<sub>2</sub> delivery manifold prototypes  
Zolper T, Cupp A, and Smith D (2018) Journal of Fluids Engineering