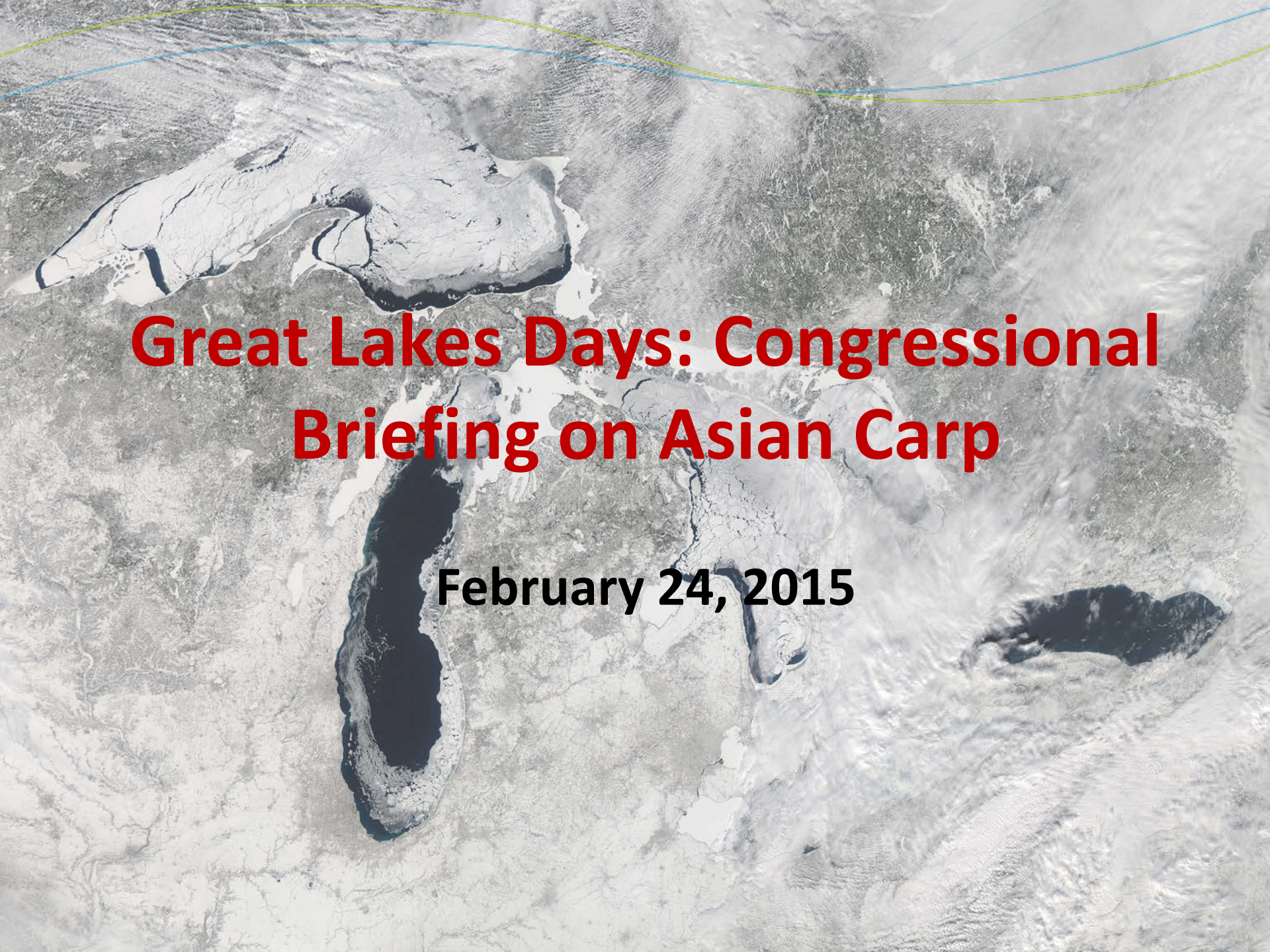
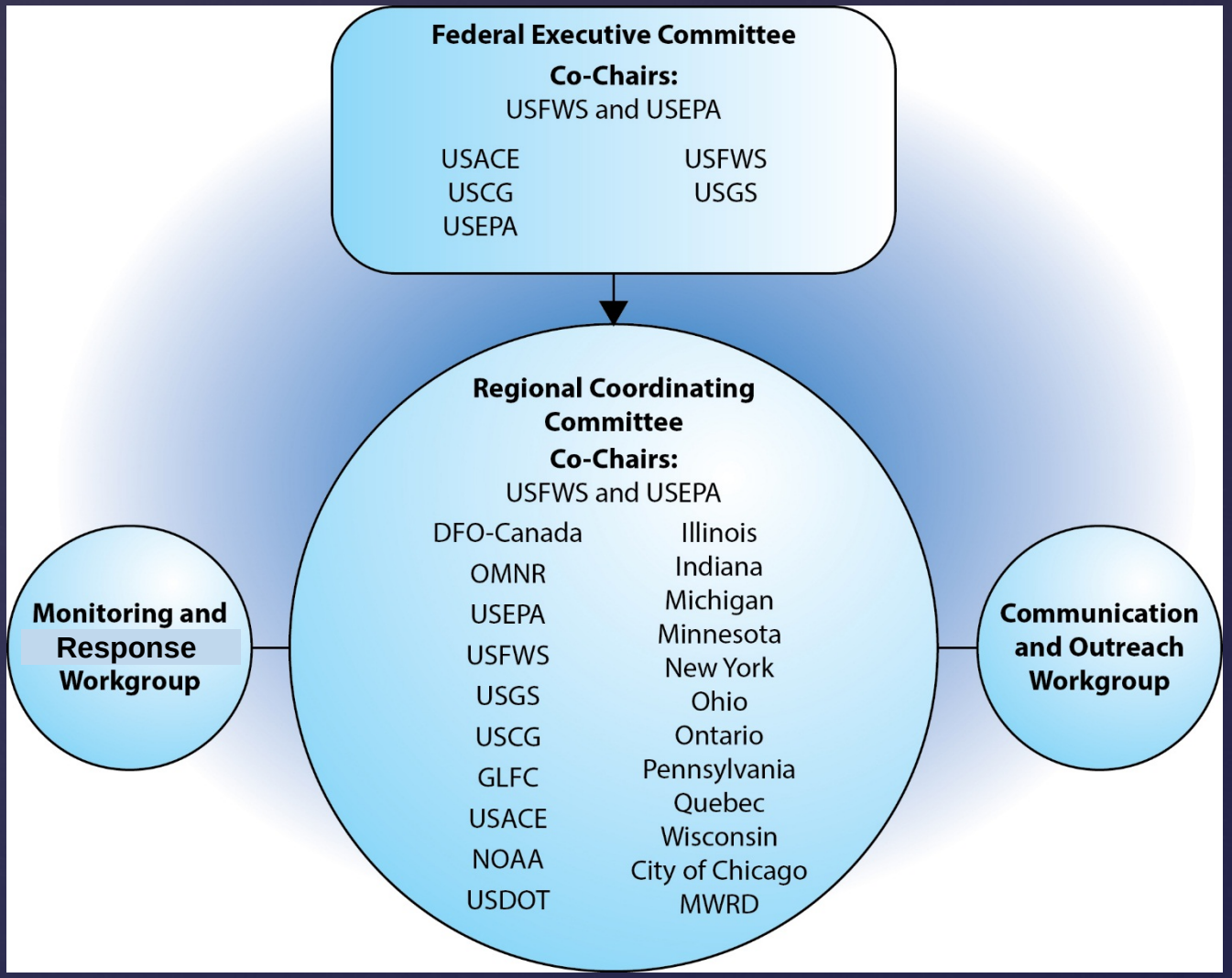


Great Lakes Days: Congressional Briefing on Asian Carp

February 24, 2015

Agenda

- Welcome and Introductions
- ACRCC Organization
- WRRDA Report to Congress
- GLRI Update/CAWS Advisory Committee
- USACE Actions including GLMRIS
- USGS Technology Update
- USFWS Monitoring Update
- USEPA Framework Update
- Q&As



ACRCC Organization

Water Resources Reform & Development Act of 2014:

Supporting Asian Carp Management in the Ohio River Basin

U.S. Fish and Wildlife Service

WRRDA 2014

WRRDA and Asian Carp Prevention (PL 113–121, June 2014)

- Provides direction from Congress to the U.S. Fish and Wildlife Service on Asian carp prevention in Upper Mississippi and Ohio River basins
- FWS to:
  - Submit annual report to Congress on AC prevention and expenditures in UMR/OR basins for prior 2 years
  - Lead a collaborative multiagency effort to slow the spread of Asian carp in UMR/OR basins

WRRDA 2014

WRRDA Report to Congress: Components

I. **Observed changes in the range of Asian carp** during the previous 2 years;

II. **Summary of Federal agency and non-Federal partners efforts** to control the spread of Asian carp during the previous 2 years;

III. **Research** that could improve the ability to control the spread of Asian carp;

IV. **Quantitative measures** proposed for use to document progress in controlling the spread of Asian carp; and

V. **Cross-cut accounting of Federal and non-Federal expenditures** to control the spread of Asian carp during the previous 2 years.

WRRDA Report to Congress: Results

- ~ $94.5M spent on Asian carp prevention from June 2012 to June 2014 (~$12.2M outside of CAWS and Great Lakes)
- AC management strategies developed for portions or all of both UMR and OR basins
- Many prevention activities being conducted in both basins: early detection/monitoring; rapid response; risk assessment; public outreach; law enforcement; and research/development of new control tools)

WRRDA 2014

WRRDA Report to Congress: Results

- Research and development underway on a broad array of control tools and science
  - Some implemented in pilot stages - USGS, COE, FWS, University of Minnesota
- Data analysis shows new detections of Asian carp, with some range expansion (varies by species)
- Draft measures of progress developed:
  - e.g. Changes in numbers or range of current verified spawning areas in the rivers and tributaries; Number of stream miles assessed for presence of Asian carp
- Good interbasin collaboration but opportunities exist to strengthen and broaden

WRRDA 2014

WRRDA Report to Congress: Recommendations on Basinwide Collaboration

Through basinwide interagency partnerships:

- Identify and quantify agency resources available to implement AC prevention and control strategies
- Develop interagency agreements to enhance the coordination of efforts
- Develop and implement collaborative prevention strategies, and prioritize and sequence projects
- Develop annual basinwide work plans

WRRDA 2014

WRRDA Report to Congress: Recommendations on Basinwide Collaboration

- Identify research and development needs and associated costs and timelines for development
- Identify and apply lessons-learned from other prevention efforts
- Prepare annual reports describing accomplishments, measurements of progress, and strategies for moving forward

WRRDA: Moving Forward

Report to Congress

- Transmitted 2014 Report to Congressional committees week of February 2nd
  - Now available online: **http://www.fws.gov/midwest/fisheries/asian-carp/WRRDA2014.pdf**
- Identify refinements needed to report for 2015 Report
- Begin development of 2015 Report (to be delivered to Congress by December 31, 2015)

WRRDA: Moving Forward

Interagency Coordination

- Convene basinwide meetings for ORB and UMRB
  - ORB meeting – held February 3/4 (Indianapolis)
  - UMR meeting – planned for March 10/11 (Dubuque)
- Refine/finalize collaborative basinwide strategies
- Identify, prioritize and implement prevention actions in 2015 and outyears
- Develop shared communications and messaging (including WRRDA annual Report to Congress)

WRRDA 2014

Contributors to Report to Congress

Federal Partners

- U.S. Forest Service
- National Park Service
- U.S. Geological Survey
- Corps of Engineers
- NOAA - GLERL
- EPA - GLNPO
- U.S. Coast Guard

State Partners

- Illinois
- Indiana
- Iowa
- Kentucky
- Michigan
- Minnesota
- Missouri
- New York
- North Carolina
- Ohio
- Pennsylvania
- Tennessee
- West Virginia
- Wisconsin


Great Lakes
RESTORATION
Great Lakes Restoration Initiative
Action Plan II
September 2014

Chicago Area Waterway System

Courtesy of USACE

CAWS Advisory Committee

- Formed in 2014, based in part on efforts by the Great Lakes Commission and Great Lakes and St. Lawrence Cities Initiative to advise on *Restoring the Natural Divide* Report (released in Jan. 2012)
- Aim to reach consensus on solution by December 2015
- Neutral facilitation/mediation team guiding committee efforts

CAWS Advisory Committee

- Adopted charge, operating principles and strategy
  - Continue current actions and initiate new where necessary
  - Evaluate and implement lock treatment options
  - Advance near-term control measures at Brandon Rd. lock and dam
  - Evaluate long-term solutions
  - Develop cost-sharing partnerships
- Recommended near-term control measures to Congress
- Working on framework for L-T solution and key technical issues to address
- 15 Great Lakes Senators recognize and invite input from Advisory Committee

CAWS Advisory Committee Members

- Alliance for the Great Lakes
- American Waterways Operators
- Chemical Industry Council of Illinois
- Chicago Metropolitan Agency for Planning
- Council of Great Lakes Industries
- Environmental Law and Policy Center
- Friends of the Chicago River
- General Iron Industries, Inc.
- Great Lakes and St. Lawrence Cities Initiative
- Great Lakes Commission
- Great Lakes Panel on Aquatic Nuisance Species (GLP)
- Great Lakes Sport Fishing Council
- Healing Our Waters – Great Lakes Coalition
- Illinois Chamber of Commerce
- Illinois Farm Bureau
- Illinois International Port District
- Illinois River Carriers Association
- Lake Erie Charter Boat Association
- Metropolitan Mayors Caucus
- Metropolitan Planning Council
- Metropolitan Water Reclamation District of Greater Chicago
- Mississippi Interstate Cooperative Resource Association (MICRA)
- Mid-West Truckers Association
- National Wildlife Federation
- Natural Resources Defense Council
- The Nature Conservancy
- Northeast Ohio Mayors & City Managers Assoc.
- Northwest Indiana Forum
- Ontario Federation of Anglers and Hunters
- Passenger Vessel Association & Wendella Sightseeing
- Prairie Rivers Network
- Sierra Club - Illinois Chapter

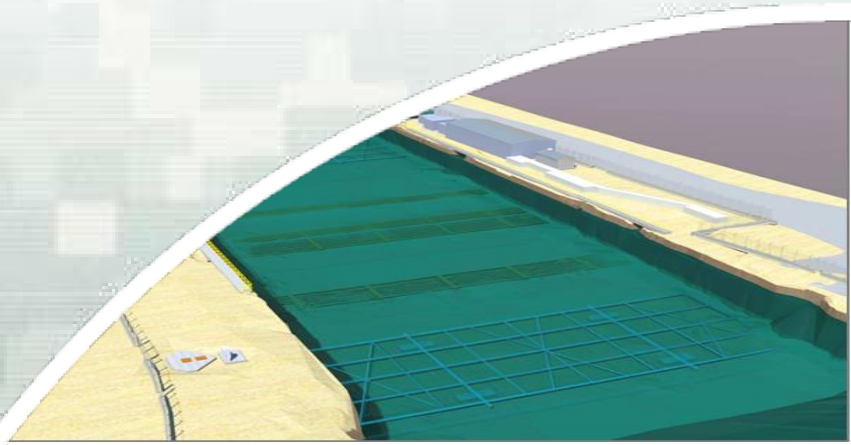
USACE Aquatic Invasive Species (AIS) Program

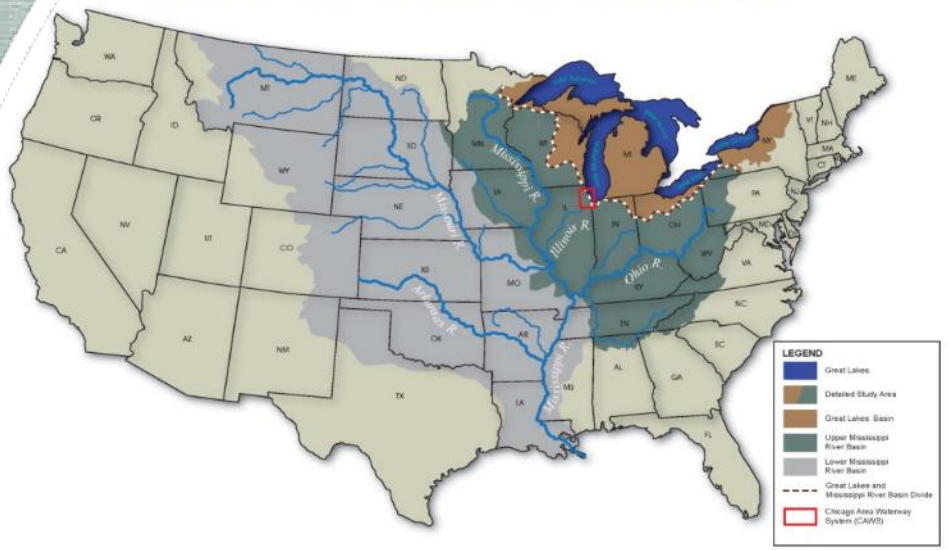
COL Christopher T. Drew

Commander, Chicago District

US Army Corps of Engineers

24 February 2015





US Army Corps of Engineers

BUILDING STRONG®

USACE Aquatic Invasive Species (AIS) Strategy

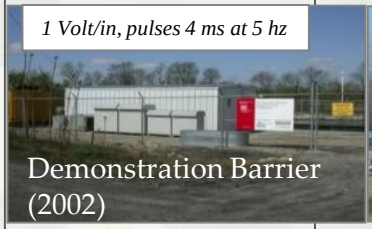
FY10 FY11 FY12 FY13 FY14 FY15 FY16 FY17

LINES OF OPERATION

1 **Operation of Electric Barriers**

Barrier I Design | **Barrier I Site Prep** | **Barrier I Building & Electronics** | **Barrier I Testing & Commissioning** | **Project O&M Funded**

1 Volt/in, pulses 4 ms at 5 hz



2.3 Volts/in, pulses 2.5 ms at 30 hz

2 **Asian Carp Monitoring**

eDNA Monitoring and Calibration ✓ | ✓ **eDNA Monitoring by USFWS**

Telemetry

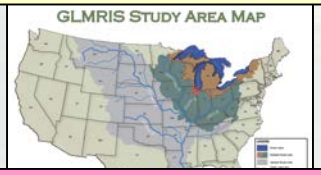
3 **Efficacy Study: Implement Solutions as Funding and Authority Permit**

Des Plaines River Bypass (Int. I) ✓

Modified Structural Operations (Int. III) ✓

Optimum Parameters Research (Int. II) ✓

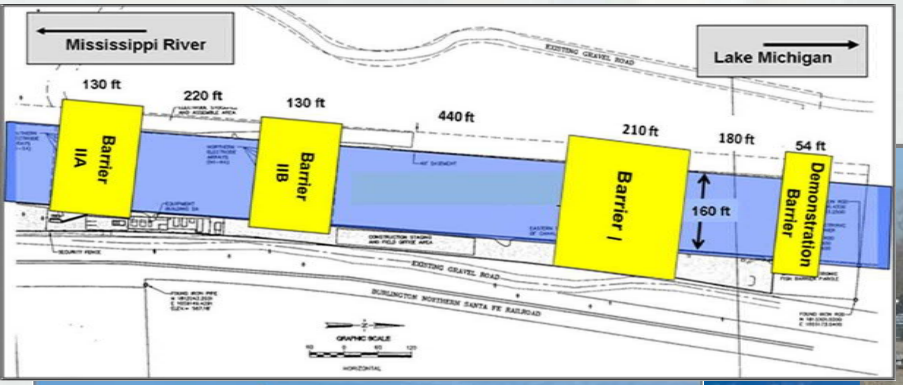
Barrier Risk Reduction Study and EA (Int. IV) | **Additional research and reports as needed**



GLMRIS Report

4 **Great Lakes and Mississippi River Interbasin Study (GLMRIS)** ✓ | **Brandon Road Feasibility Study**

CSSC Barriers



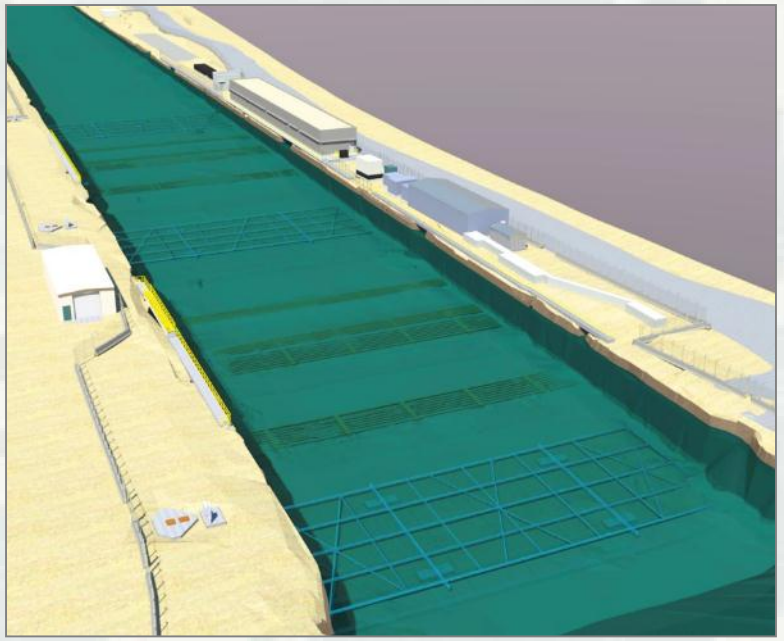
CSSC Barriers

Barrier	Date of Activation	Construction Cost	Voltage (volts/inch)	Frequency (Hz)	Pulse Duration (ms)
Demo	2002	$2M	1.0	5	4
I	2017*	TBD	2.3	33.5	2.3
IIA	2009	$7M	2.3	33.5	2.3
IIB	2011	$21M	2.3	33.5	2.3

* planned

FY 2015 Work:

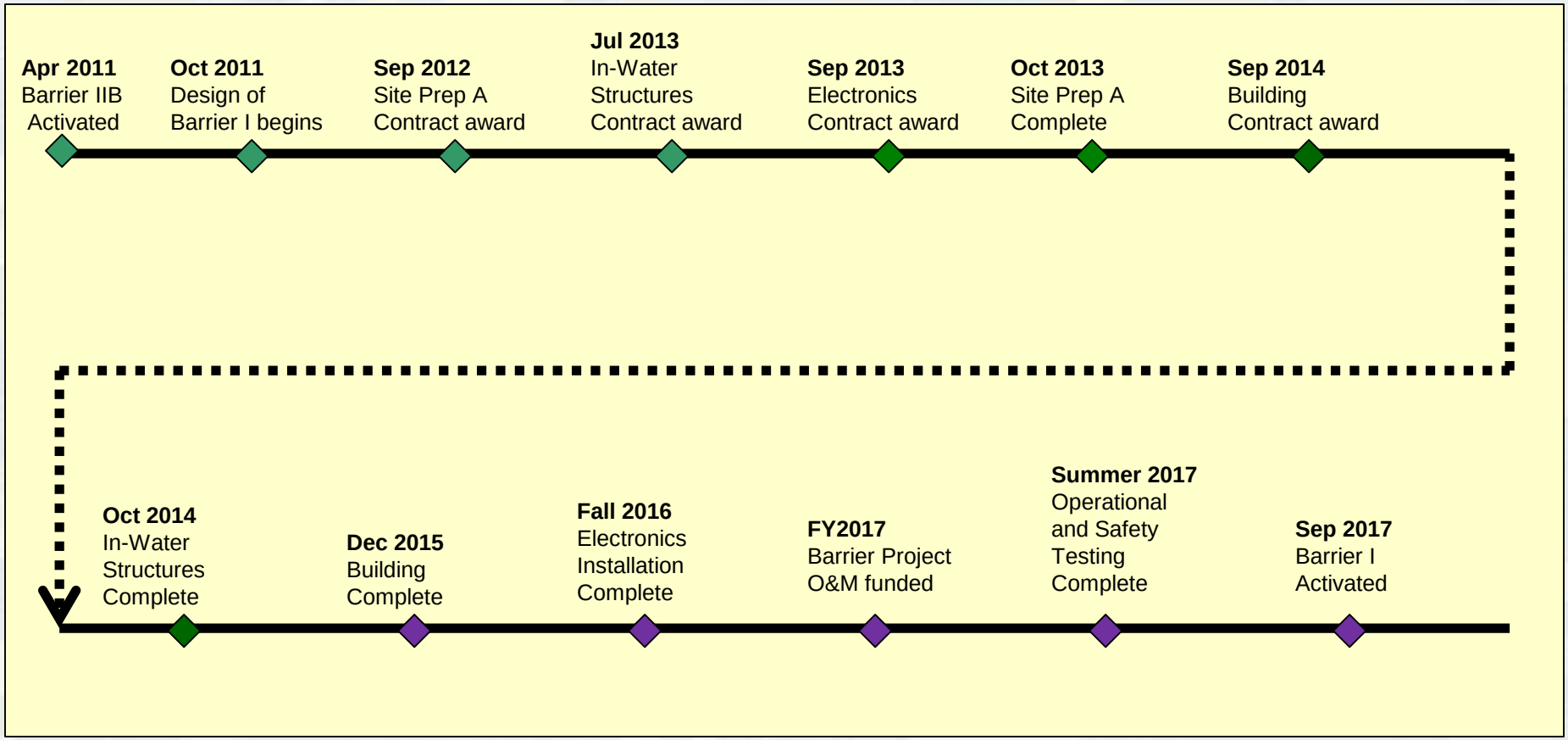
- Continue design & construction of Permanent Barrier I
- Complete the Efficacy Study Interim Report IV
- Continue lab and field studies of barrier effectiveness
- Continue operation & maintenance of electric barriers
- Continue maintenance of Des Plaines River barrier
- Continue Asian carp monitoring in the CAWS with ACRCC partners



FY 2016 Planned Work:

- Continue construction of Permanent Barrier I
- Continue operation & maintenance of electric barriers
- Continue maintenance of Des Plaines River barrier
- Continue Asian carp monitoring in the CAWS with ACRCC partners

Permanent Barrier I Timeline



Project Goals:

- Continue application of lessons learned from existing barriers to improve reliability and performance
- Provide redundancy

GLMRIS

Great Lakes and Mississippi River Interbasin Study

Aquatic Nuisance Species

Ecosystems

Navigation

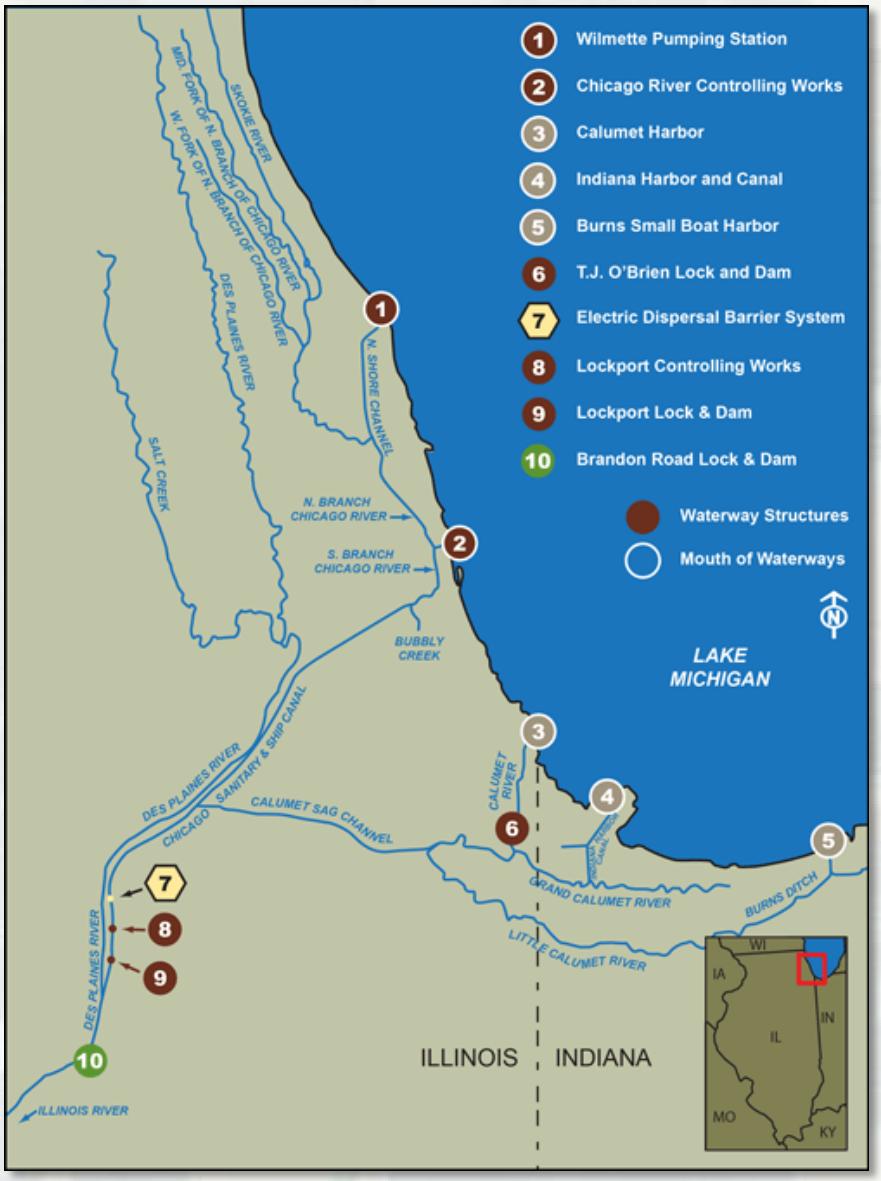
Recreation

Flood Risk Management

Water Use

GLMRIS - Brandon Road

- GLMRIS Report provides basis for further investigations
- Scope of work
  - Viability of establishing a one-way control point to prevent upstream transfer of ANS
  - Range of options
    - No additional action
    - Nonstructural measures
    - Various combinations of technologies
  - Determination of federal interest and
  - benefit to the nation
  - Recommendation – Decision document
- Goals
  - Reduce risk of one-way ANS transfer to the maximum extent feasible
  - Minimize impacts to existing uses/users
- Results can inform future action



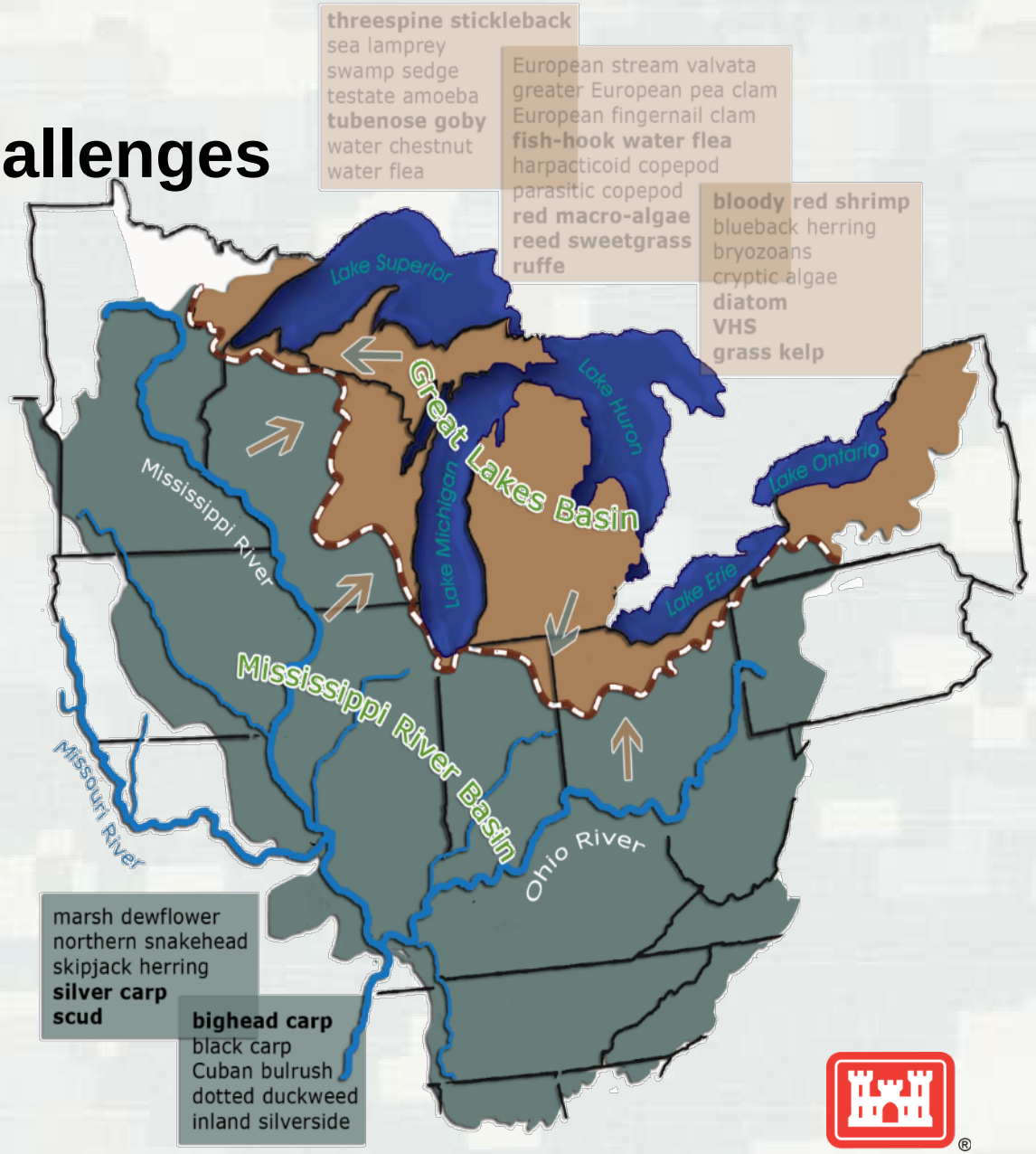
BUILDING STRONG®

Why Brandon Road?

- **Effective** – Control point can address upstream transfer of Mississippi River species through all CAWS pathways
  - Avoids bypass via Lower Des Plaines
  - Provides mechanical 'fail-safe' for controls
  - Most rapidly-achievable structural option
- **Relevant** - Identified in GLMRIS
  - Included in 3 of 6 structural alternatives
- **Valuable** - Opportunity to enhance effectiveness of existing technologies, demonstrate new concepts
  - Adaptive management → phased approach toward 2-way risk reduction
  - Serves as a control point for species of particular public & stakeholder concern: Asian carp
  - Adds defense in depth to existing controls at Romeoville
- **Minimum Impacts** - A project at Brandon Road control point will seek to minimize adverse impacts to existing waterway uses and users
- **Responsive** - Incorporates stakeholder input
  - Communicated urgency for action
  - Location-specific interest

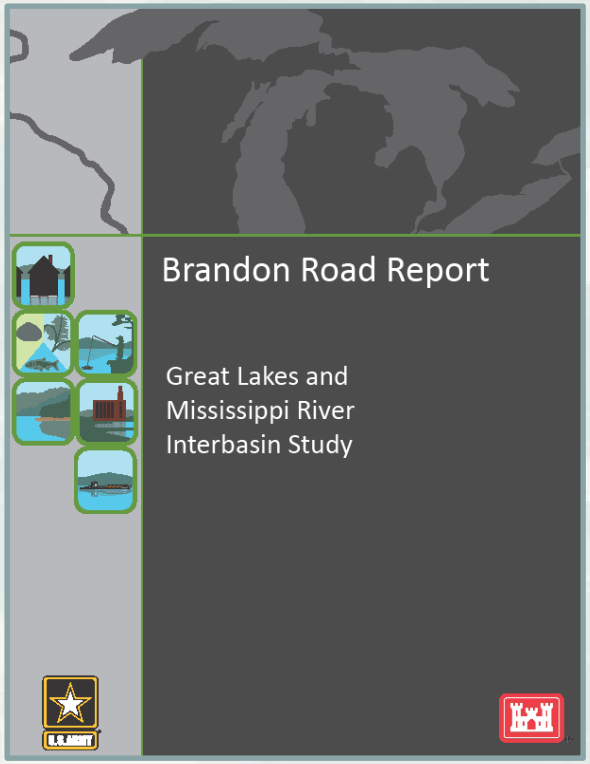
Technologies: Opportunities & Challenges

- Implementation of structural controls at Brandon Road site
  - Addresses one-way (upstream) transfer of ANS
  - Does not address
    - Other aquatic pathways
    - Non-aquatic pathways
- Enhances knowledge on ANS control technologies
  - Swimmers
  - Floaters
- Hull-fouling “hitchhikers” may remain uncontrolled
  - Exploring other technologies; biocides



Anticipated Outcomes

- Scoping the development of a feasibility-level decision document
  - Envisioned to support an agency decision
    - Congressional authorization and appropriations required for future implementation
  - Could serve as the basis for potential future action
- Environmental Impact Statement
- *Potential* Interim Products
  - Updates on analyses from GLMRIS Report
  - Engineering technical effort
    - ANS flushing lock
    - Engineered channel
- Dedicated stakeholder outreach
  - Executive Steering Committee
  - Engagements on demand
  - Regular updates through GLMRIS website
    - Quarterly newsletter
    - Social media



GLMRIS

Stay in Touch!

On the Web…
glmris.anl.gov

Facebook
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Twitter
Follow @GLMRIS

e-mail
glmris@usace.army.mil

Questions?

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  (312) 846-5452

Asian Carp Monitoring Update

February 24, 2015

U.S. Fish and Wildlife Service

Midwest Region

Characterizing Risk: Feb 2015

Distances from Lake Michigan

37 miles **Dispersal barriers** ★

55 miles **Adult population front**

62 miles **Presence of adults/potential spawning**

64 miles **Observed spawning activity (no larvae/YOY)**

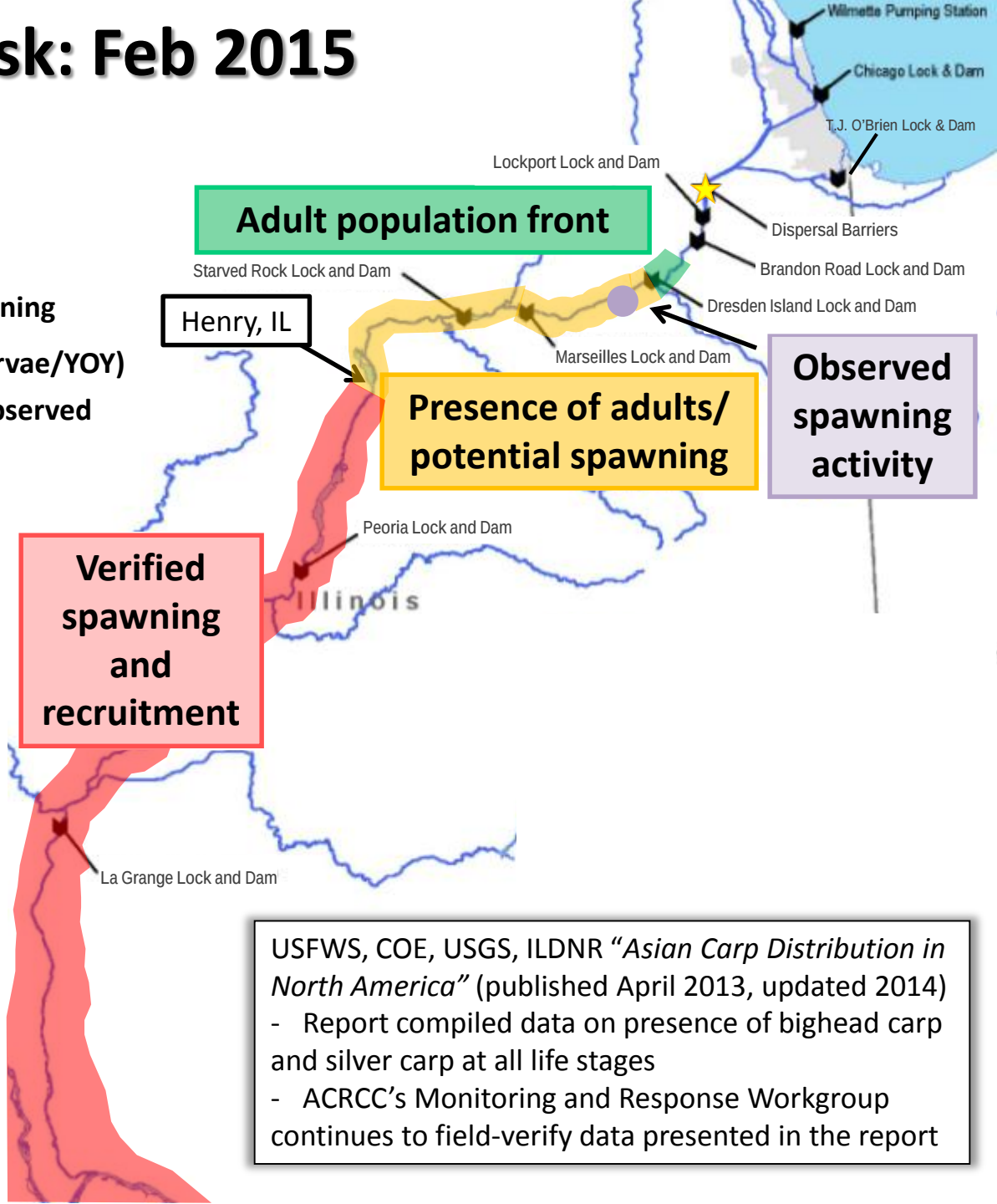
143 miles **Established population: Closest observed small Asian carp (Henry, IL in Peoria Pool)**

Areas of Concern

1) Observed spawning in Marseilles Pool

2) Verified identification of AC eggs and larvae near Henry, IL (Peoria Pool)

***Overall leading edge of Asian carp invasion has not changed since 2006 (Dresden Island Pool)**



USFWS, COE, USGS, ILDNR "*Asian Carp Distribution in North America*" (published April 2013, updated 2014)

- Report compiled data on presence of bighead carp and silver carp at all life stages
- ACRCC's Monitoring and Response Workgroup continues to field-verify data presented in the report

Asian Carp Monitoring at CAWS

- Maintain seasonal monitoring above barrier
- Increase efforts below the barriers:
  - focus removal efforts where Asian carp are in moderate abundances (>3M lbs removed through 2014)
  - increase monitoring where Asian carp are present in low numbers or not detected (leading edge)
- Heightened evaluations at Brandon Road Lock and Dam
- Alternate pathways investigations and enforcement
- Model response/monitoring for other basins and jurisdictions

Monitoring and Response Plan
and
Interim Summary reports

www.asiancarp.us

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

U.S. FISH & WILDLIFE SERVICE

Bighead and Silver Carp: Characterization of Relative Abundance in the Upper Mississippi River and Ohio River

0 50 100 200 300 400 Miles

N W E S

Legend

- Lock and Dam
- Established population/spawning
- Presence of adults/potential spawning
- Some adults present/individual captures

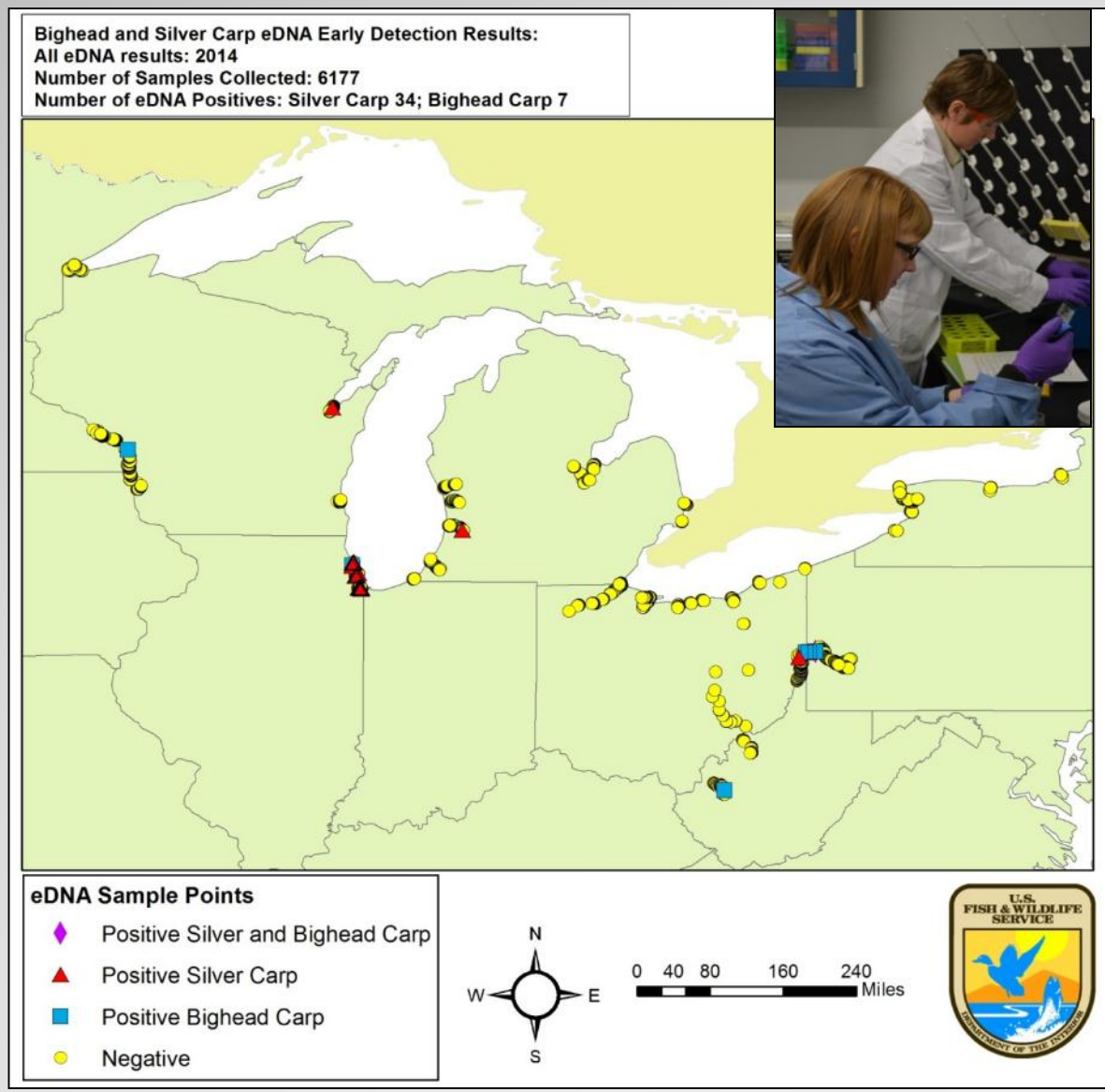
U.S. FISH & WILDLIFE SERVICE

Created: Nov 12, 2014

Figure 8 from FWS Asian Carp Report to Congress

eDNA Regional Monitoring

- Great Lakes tributaries, CAWS, Ohio River, Upper Mississippi River
- Over 6,000 samples in the Midwest in 2014
- State and tribal collaboration on sampling site planning
- Positive detections: CAWS, UMR (Pool 8), Ohio River, Fox River (WI), and Kalamazoo River (MI)
- Responses in Fox and Kalamazoo - No subsequent detections



www.fws.gov/midwest/fisheries/eDNA

eDNA
Regional Surveillance Program

- Used as early detection monitoring tool in CAWS since 2009 (program led by USFWS since 2013)
- Informs holistic sampling efforts, in concert with traditional monitoring gears, to help verify presence of live fish and rule out other vectors
  - **Must be used in a monitoring context**
  - **Not a single indicator of fish presence**
  - **Identifies areas of concern to increase vigilance**
- eDNA results collected repeatedly over time in the same areas provide a baseline level of eDNA
- Updating tool with research and technology refinements
- 2015 eDNA sampling program planning now underway

USGS
science for a changing world

USGS Asian Carp Technologies Update

Leon Carl, Regional Director
USGS Midwest Region

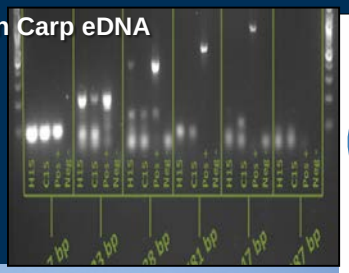
Congressional Briefing

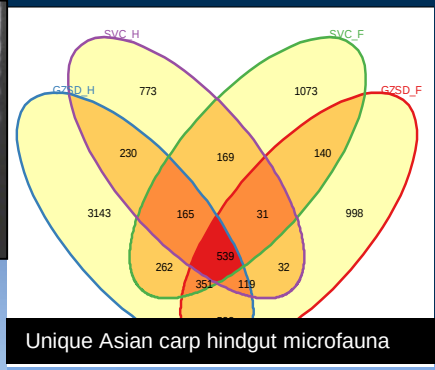
February 24, 2015

U.S. Department of the Interior
U.S. Geological Survey

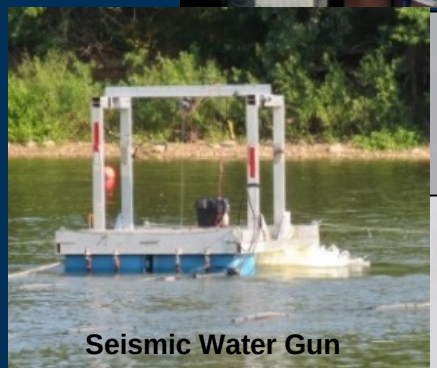
USGS Asian Carp Control Strategy

- Development of control tools and technologies
- Assessing risk of successful Asian carp reproduction and survival
- Development of methods for early detection
- Application and transferability outside Great Lakes basin and to other invasive species





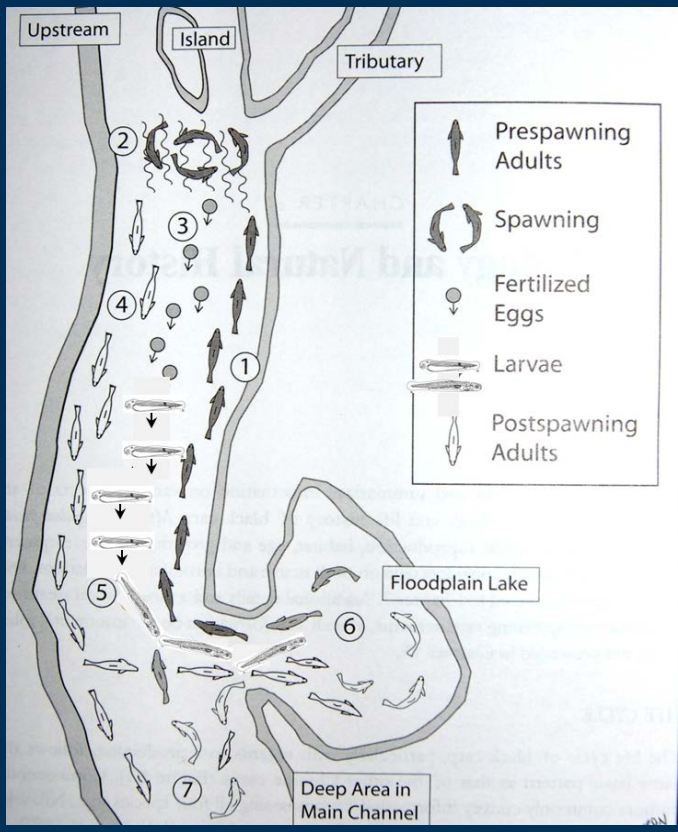
Unique Asian carp hindgut microfauna


Seismic Water Gun

USGS

Know Your Asian Carp to develop effective control strategies.

Asian Carp Life Cycle



USGS

"IPM is not a single pest control method but, rather, a series of pest management evaluations, decisions, and controls." (http://www.epa.gov/agriculture/tipm.html)

Control Tools and Technology

- Life history and river hydrology provide the foundation for informed tool development, testing, and use of:
- Waterguns
- Carbon Dioxide as a barrier
- Feeding attractants
- Microparticles
- eDNA early detection tools

USGS

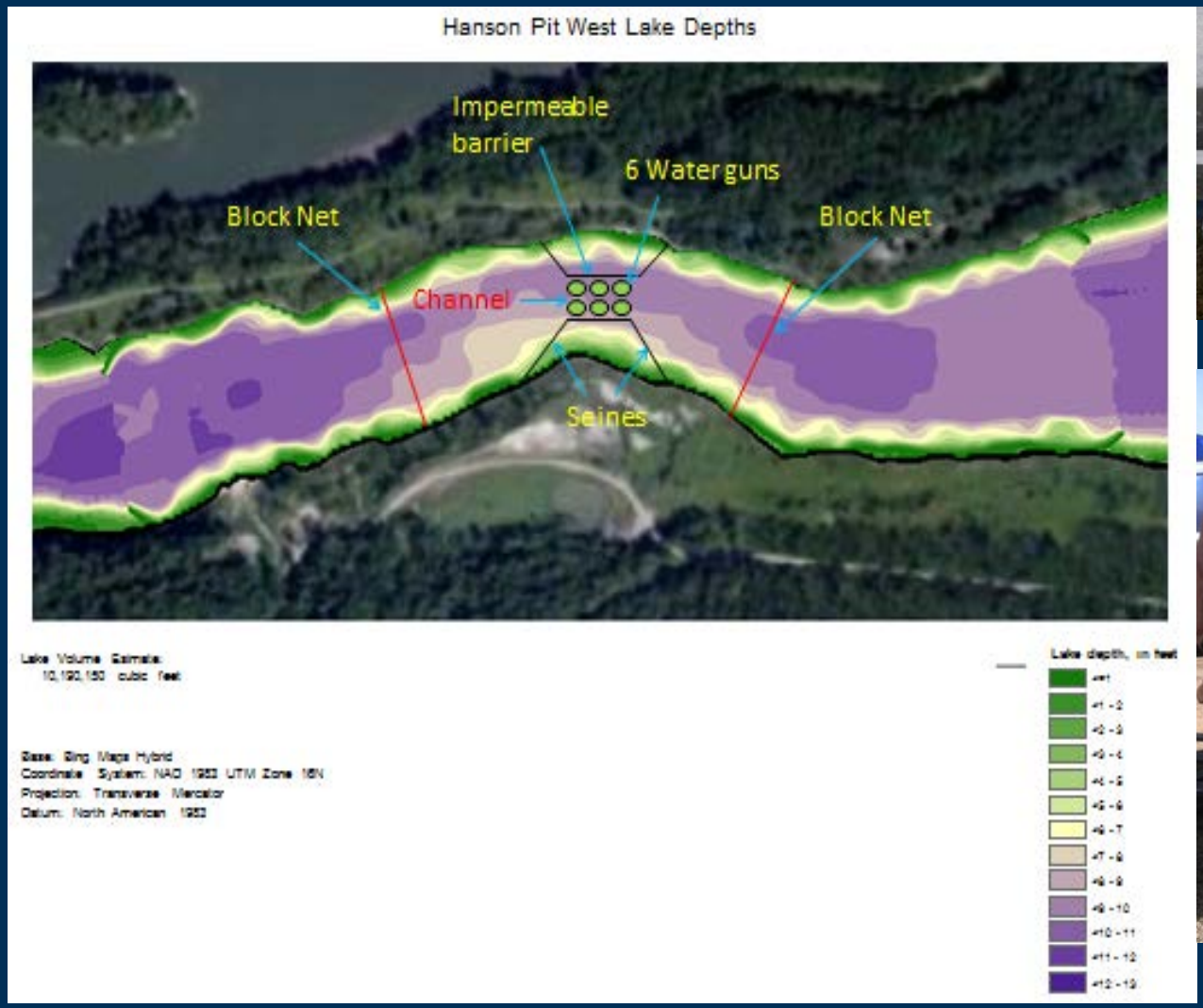
Watergun Results - 2014

- 2014 field tests showed waterguns alter fish behavior – fish avoid waterguns
- Lessons Learned:
  - Fish appeared to detect areas of low pressure (gradient) around the guns to bypass the barrier.

  - Refining strategy for 2015 Field Season. 2015 tests will see an increase in watergun discharge frequency.

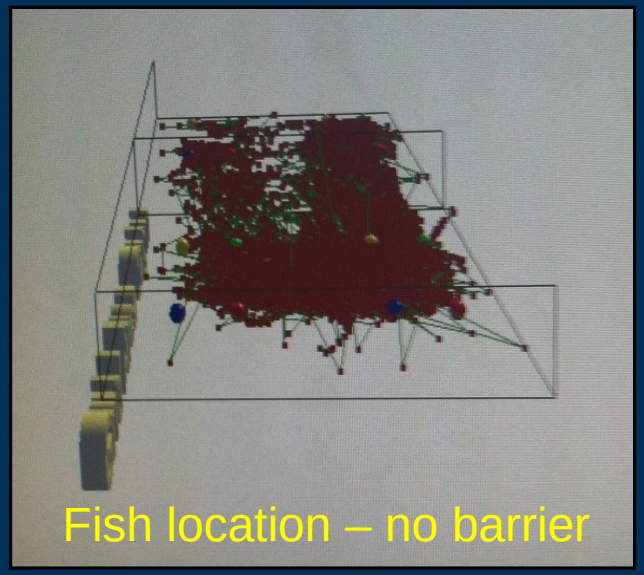
USGS

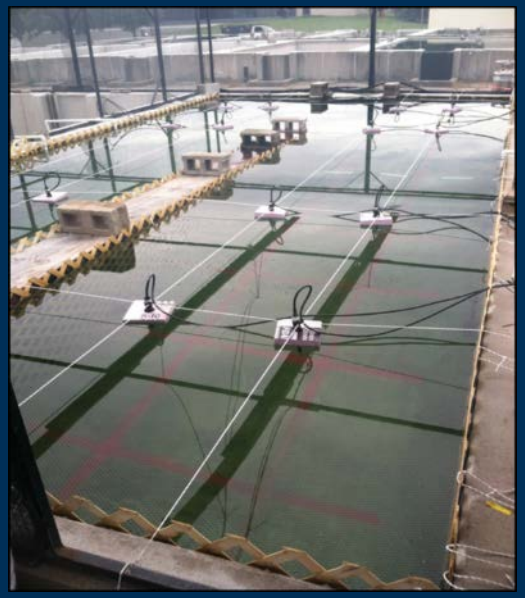
2015 Watergun Strategy:

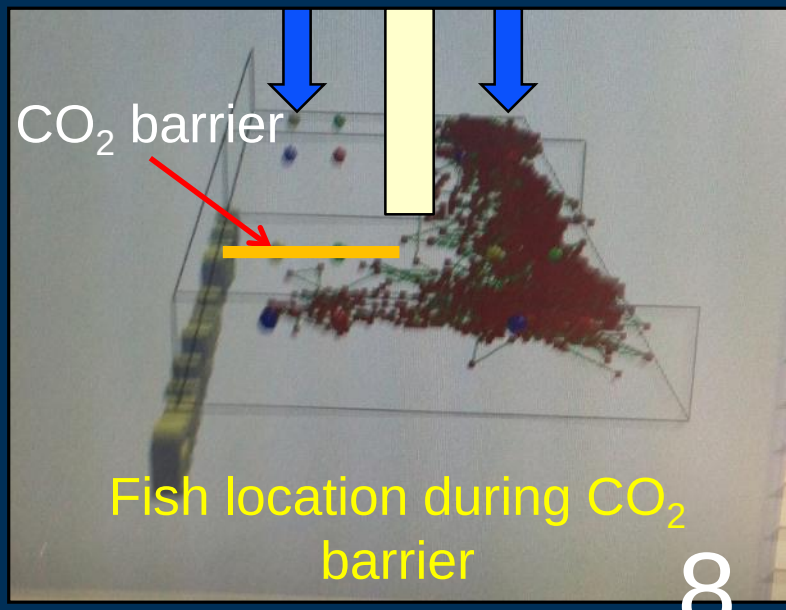


Carbon Dioxide Barriers Pond Trials 2014

- Set up represents lock chamber approach
- Infusion for 24 hours
- Algal and shade attractants added
- Fish moved away from the CO_2 barrier







CO_2 FIELD TESTING IN 2015

USGS

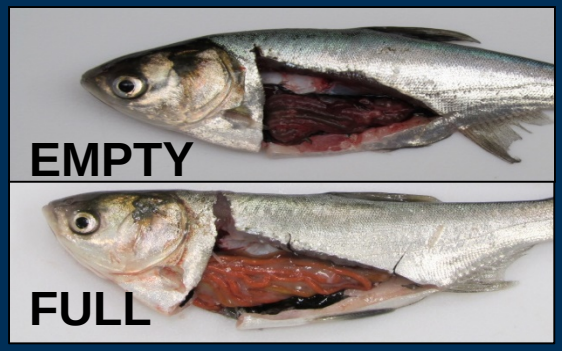
Asian Carp Feeding Attractants

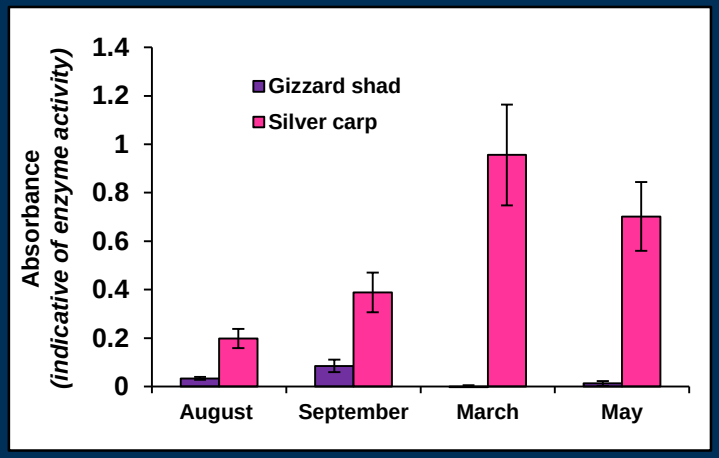
- Using algal attractants with fishing nets/traps
  - ID effective combinations that increase harvest
  - IL DNR, TN Wildlife Resources Agency
- Application with Microparticles
- Electrophysiology with other food attractants
- Use of sound as an attractant

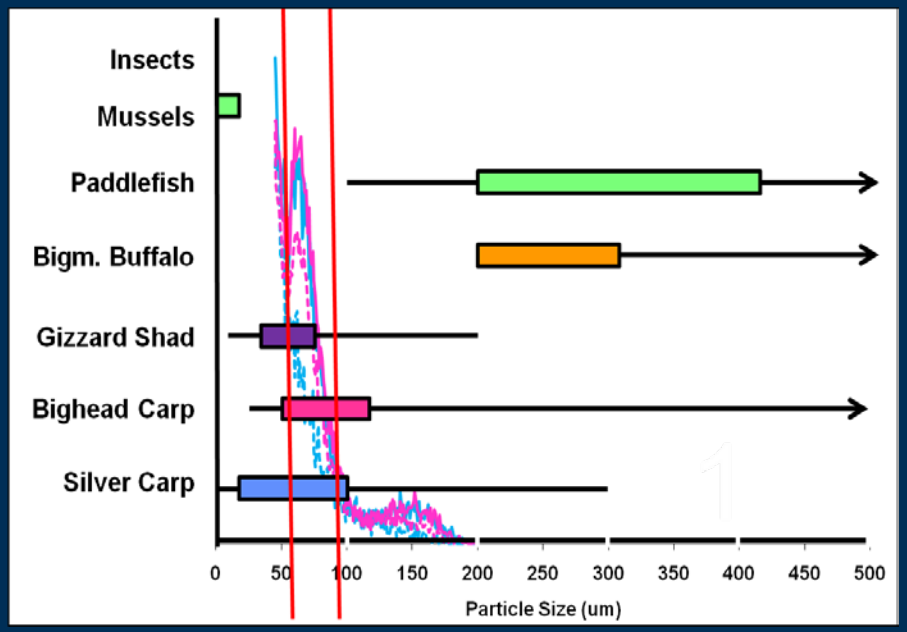
USGS

Microparticles - Prior Work

- Identified targeted size
- Verified consumption
- Identified release mechanism
- Identified potential application time (*spring*)



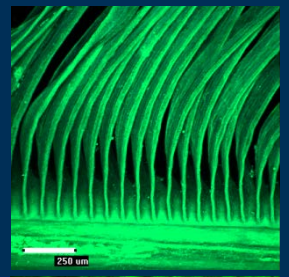


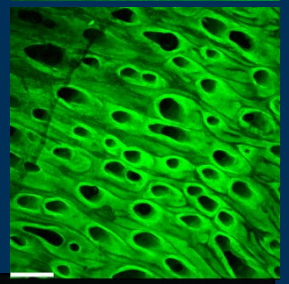


USGS

Microparticles – Current Work

- USGS is preparing microparticles in La Crosse, Wisconsin lab; lab results indicated 80-100% silver carp and big carp mortality with no bluegill or largemouth bass mortality.
- Pond trials spring 2015 with co-application of feeding attractants
- Fall field tests – backwater sites disconnected from the waterway



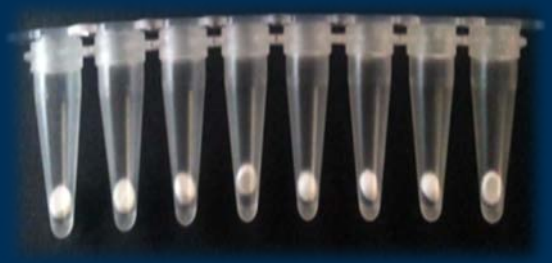


Brandon Road Lock and Dam

- Intensive water velocity mapping in lock (2014) and in channel downstream from lock (Mar 2015)
- Dye tracking through lock to document mixing zones and rates within and downstream of lock (spring 2015)
- Data Collection:
  - Water-quality data for CO2 system design
  - 2014 - Assessed effects of watergun pressure waves on structures

Hand Held eDNA Kit – Law Enforcement Use

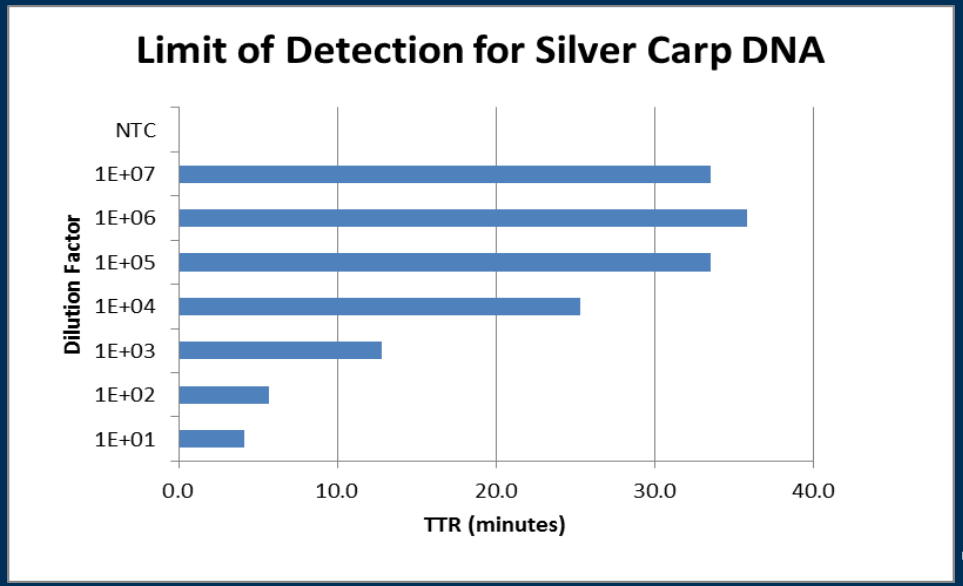
Filter up to 1 L



- Process 4 individual samples
- Includes + / - controls

- Isothermal amplification
- Results displayed (export to USB)

Bars on graph represent the time to positive detection based on DNA quantity in the sample (more DNA = short reaction time; little DNA = long reaction time)



USGS

Integrated Pest Management Approach

It means we use a strategic approach, integrating the tools, knowledge, and information we have to:

- **Detect**
- **Aggregate**
- **Remove**
- **Control and Exclude Asian Carp**

Successful effort in 2014 with IL DNR, FWS, SIU integrated waterguns, attractants, fish telemetry and commercial fishing

USGS

Potential Control Action – Diversion Tactics

★ = attractive spawning site

Impoundment

Attractant

Behavioral barrier or weir – tuned to carp, turned on during spawning periods

Partner Outreach - Tech Transfer

- Work with USACE to address GLMRIS related science needs
- Reach out to Great Lakes, Upper Mississippi, and Ohio River Basin states to understand their priorities and discuss integrated control strategy ideas for meeting their needs.
- Develop a communication strategy to effectively provide our partners with information about our control tools, uses, and findings.

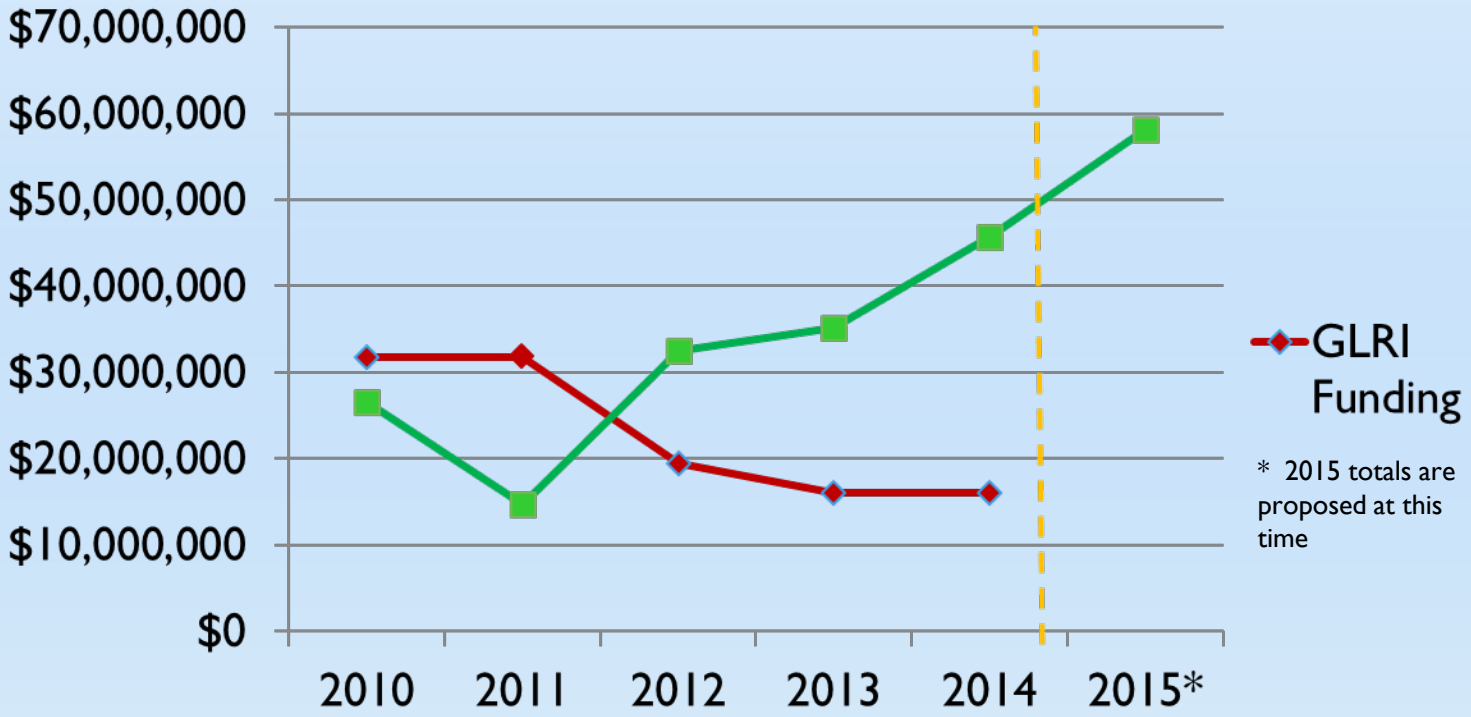
USGS

Asian Carp Funding

FY 2010 – FY 2015 (by Agency)

Agency	FY 2010 Total Funding	FY 2011 Total Funding	FY 2012 Total Funding	FY 2013 Total Funding	FY 2014 Total Funding	FY 2015 Base (Planned)	FY 2015 GLRI (Requested)
USGS	$5,335,000	$5,225,934	$4,690,700	$4,125,000	$6,788,174	$5,219,000	$5,245,301
USACE	$39,135,000	$20,853,680	$32,510,000	$32,841,500	$40,830,740	$50,200,000	TBD
USEPA	$400,000	$147,200	$2,109,983	$0	$0	$0	TBD
Coast Guard	$500,000	$380,000	$458,000	$0	$0	$4,600	$0
USFWS	$19,320,000	$11,118,444	$5,090,000	$6,377,000	$7,708,122	$2,697,088	$4,139,000
NOAA	$497,846	$1,663,291	$845,617	$977,480	$0	$0	$0
CEQ		$253,329	$123,000	$340,000	$0	$0	$0
States	---	---	$5,837,417	$5,373,000	$5,728,000	$0	$4,400,000
USDA-NRCS	$0	$0	$0	$1,200,000	$0	$0	$0
Total cost	**$65,187,846**	**$39,641,878**	**$51,664,717**	**$51,233,980**	**$61,055,036**	**$58,120,688**	**$16,000,000**

Fiscal Years in Review



Overview of FY 2015 Control Strategy Framework

Framework Overview

- Asian Carp Risk Assessment Efforts and Threats to Basin Areas
- Asian Carp Program Activities in the Great Lakes and Other Pathways
- U.S. and Canadian Strategy for Control
- Grass Carp and Black Carp Control Efforts

FY 2015 Program Focus:

- Increased Control Technologies
- Brandon Road Activities
- GLMRIS

THANK YOU

For more information

Please visit www.asiancarp.us

ACRCC

Great Lakes RESTORATION