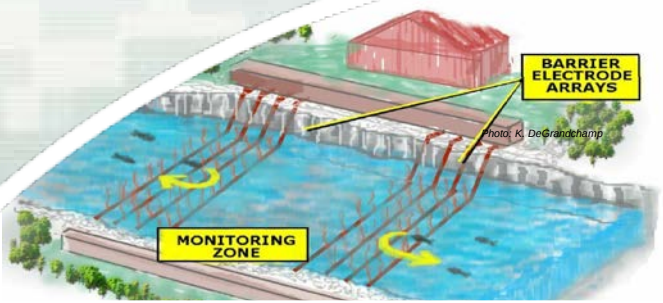
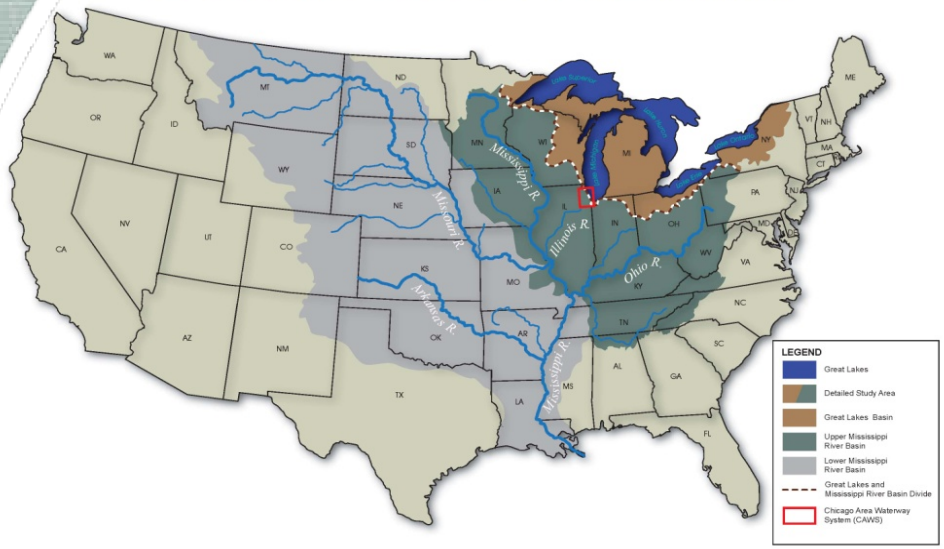
Great Lakes Commission



BG Margaret W. Burcham

Commander
Great Lakes and Ohio River Division
US Army Corps of Engineers

5 March 2013



US Army Corps of Engineers
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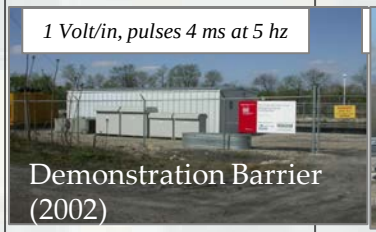
USACE Aquatic Invasive Species (AIS) Strategy

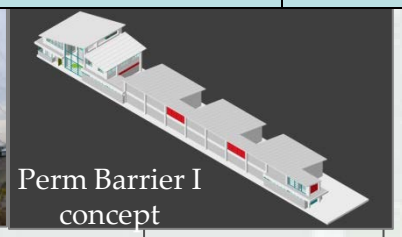
FY10 FY11 FY12 FY13 FY14 FY15 FY16 FY17

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





2 **Asian Carp Monitoring**

eDNA Monitoring and Calibration ✓

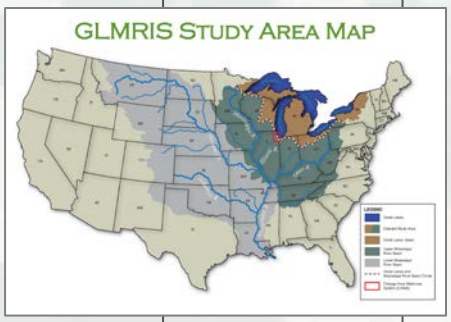
eDNA Monitoring by USFWS

eDNA Transition to USFWS

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)**

Comprehensive Report

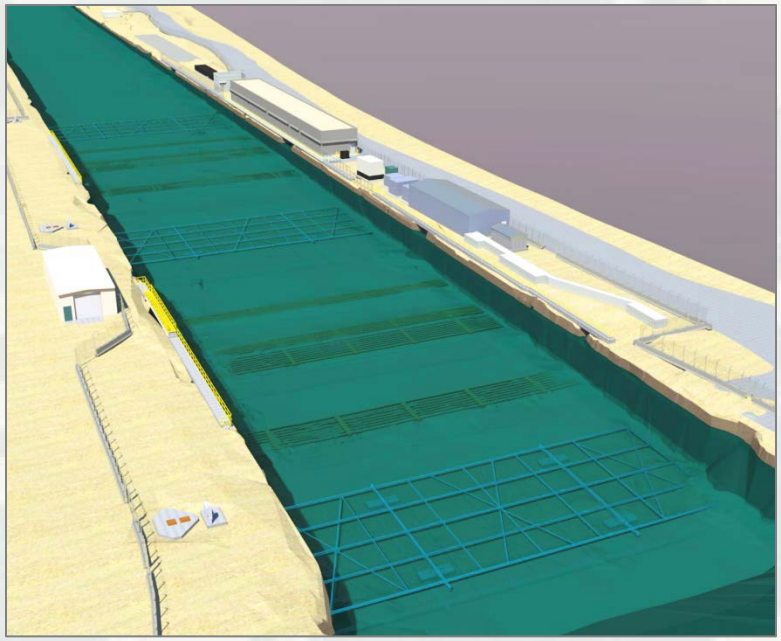
4 **Great Lakes and Mississippi River Interbasin Study (GLMRIS)** | **Continued efforts pending funding and authority**

CSSC Barriers

Barrier	Date of Activation	Construction Cost	Voltage (volts/inch)	Frequency (Hz)	Pulse Duration (ms)
Demo	2002	$2M	1.0	5	4
IIA	2009	$7M	2.3	30	2.5
IIB	2011	$21M	2.3	30	2.5

FY 2013 Work:

- Continue design & construction of Permanent Barrier I
- Complete the Comprehensive Efficacy Study
- Complete demo projects for fish monitoring system
- Continue 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

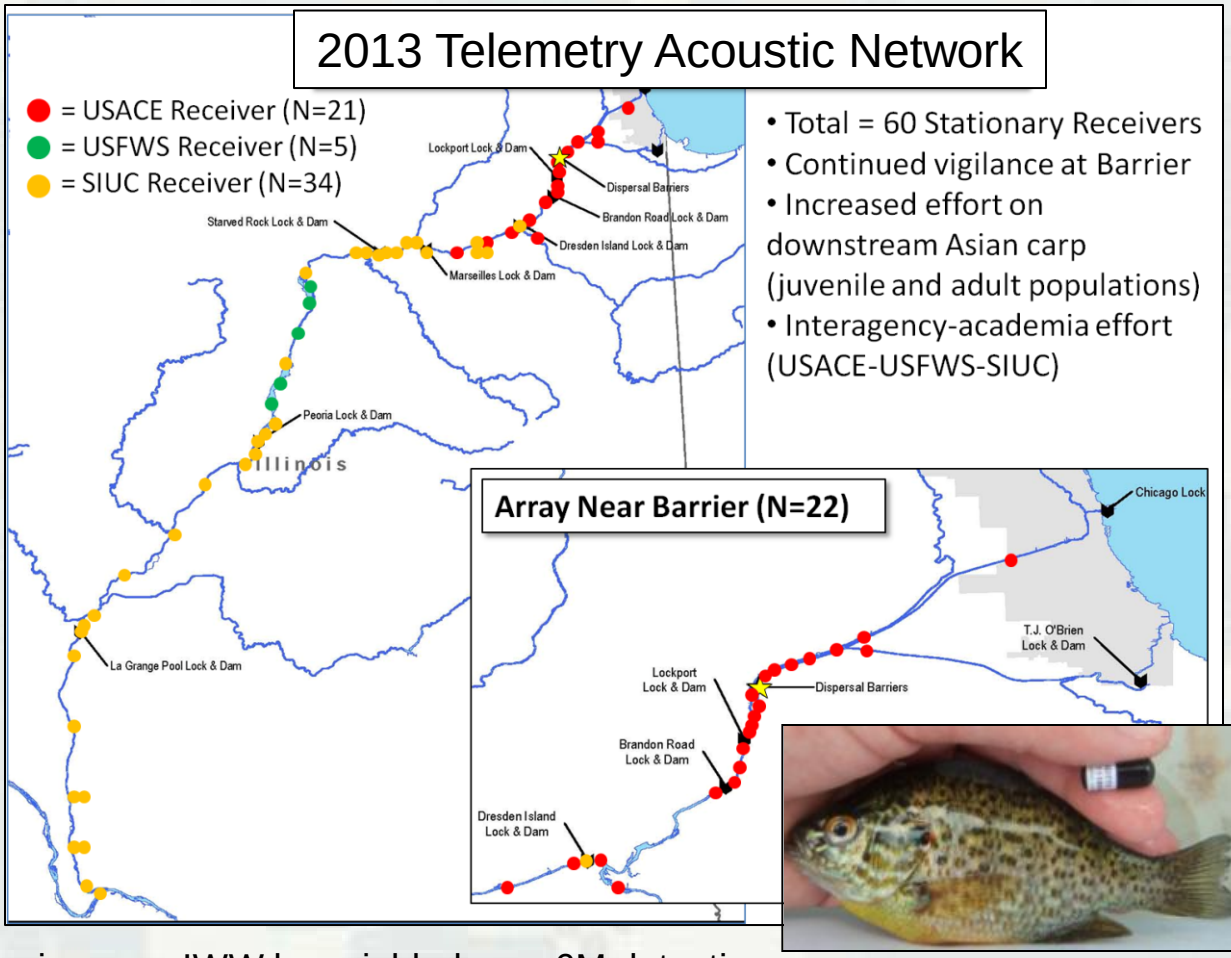


FY 2014 Planned Work:

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

USACE Telemetry: Assess Efficacy of Barriers

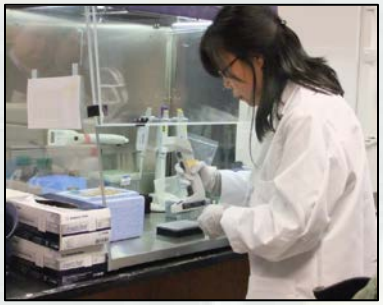
- Telemetry identified as *Barrier Effectiveness Evaluation tool* in ACRCC Monitoring and Rapid Response Plan
- Individually coded transmitters implanted into fish; locations detected by underwater receivers
- Primary objective: assess efficacy of barriers
- Secondary objective: examine movements of Asian carp at population leading edge and through lock and dams



- 238 active tags in upper IWW has yielded over 6M detections
  - 193 large fish: Asian carp below barrier; surrogate species above and below barrier
  - 45 small fish: surrogate species released in immediate vicinity of barrier
- **No tagged fish crossing the barrier in the upstream direction**
- Additional tags to be implanted this year starting in April/May

eDNA Calibration Study (ECALS)

ECALS is an interagency study (USACE-USGS-USFWS) that will improve our understanding and interpretation of eDNA positive detections



- What does a positive eDNA detection in the CAWS mean?
  - Where did it come from?
  - How long has it been there?
  - Did more than one Asian carp contribute to the sample?
- Improve sampling and analytical efficiency
  - Reduce the TIME and COST
- Provide context and improve confidence in conclusions based on eDNA monitoring as an effective tool for resource managers in decision making

ECALS is funded through the ACRCC Framework, with three major tasks:

1. Vectors:
   - Alternative sources of eDNA? (birds, barges, sewers, sediments, fishing gear)
2. Markers:
   - Develop new markers: estimate minimum numbers of individual Asian carp
3. Calibration:
   - Increase efficiency (sampling, lab analysis)
   - Determine eDNA degradation and influence of environmental factors (temperature, pH)
   - Hydrodynamic model: how eDNA moves through system
   - Assign probabilities to eDNA vectors based on all ECALS results

Efficacy Study

A study of a range of factors that could potentially reduce the effectiveness of the electric barriers

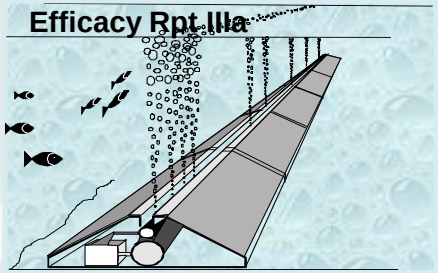
- Jan 2010 — ASA(CW) approval of Interim I report
- Jul 2010 — ASA(CW) approval of Interim III and IIIA reports
- Oct 2010 — Construction of Interim I bypass barriers Complete
- Jan 2011 — Installation of sluice gate screens complete
- Sep 2011 — Complete Interim IIA Report
- Oct 2011 — Increase Barrier II operational parameters
- Summer 2013 — Final Comprehensive Report to HQUSACE

Interim Report I: Measures to Eliminate Potential Barrier Bypasses

- Construct 13.5 miles of structures along Des Plaines River & block I&M Canal at natural flow divide
- Construction contract awarded 21 April 2010; complete as of 26 October 2010

Interim Report IIA: Determine Optimal Operating Parameters

- What are the optimal operating parameters based on lab research and field testing
- Settings changed to 2.3v/in, 30 Hz, 2.5 ms in October 2011



Interim Report III: Modified Structural Operations

- Screens installed on sluice gates at O'Brien Lock & Dam

Interim IIIA Report: Acoustic Bubble Barriers

- Recommends a demonstration acoustic-bubble-strobe (ABS) barrier near Brandon Road L&D
- Approved by ASA(CW) in July 2010, but currently no funding or authority to implement

"Comprehensive" Report: Evaluate Other Potential Emergency Measures to Deter Migration

- Evaluate other means of bypass & risk reduction measures
- Complete NEPA cumulative effects assessment

GLMRIS - Study Summary

- Authority – WRDA 2007

  (d) FEASIBILITY STUDY.-The Secretary, in consultation with appropriate Federal, State, local, and nongovernmental entities, shall conduct, at Federal expense, a feasibility study of the range of options and technologies available to prevent the spread of aquatic nuisance species between the Great Lakes and Mississippi River Basins through the Chicago Sanitary and Ship Canal and other aquatic pathways.

- Section 1538 - *Moving Ahead for Progress in the 21st Century* (MAP-21)

  Intervening legislation enacted in July 2012

  Modifies scope and duration of products in GLMRIS

  - Scope

    Expedite completion of the report authorized by WRDA 2007

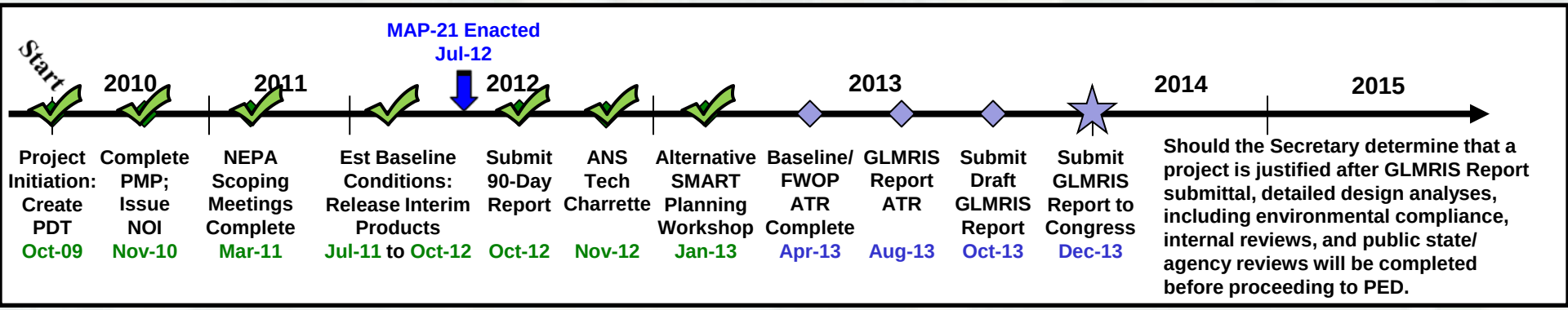
    Focus efforts on:

    Prevention of transfer of ANS using methods such as hydrologic separation;

    Region encompassing the watersheds/tributaries of the CAWS (Focus Area I)

    Allows the Secretary of the Army to move to preconstruction engineering & design (PED) if a project is determined to be justified

GLMRIS Report Timeline



- The GLMRIS Report will include:
  - Risk Assessment of ANS of Concern to support formulation
  - Screening Criteria and Screened ANS Controls based on ANS of Concern-CAWS
  - Baseline and Future without Project (FWOP) Conditions detailed assessment
  - General description of range of alternatives, including the No-Action Alternative
  - Location map(s) for each alternative
  - Conceptual design for each alternative and mitigation requirements
  - Cost estimate and Cost-Schedule Risks Analyses for each alternative
  - Environmental compliance information to help facilitate agency decision-making
  - General regulatory requirements and a listing of potential regulatory issues
  - Information to support evaluation of alternatives

GLMRIS Report - Current Status

- Alternative Formulation
  1. Hydrologic Separation Alternatives
     - Lakefront Separation – H&H, WQ, and NAV modeling underway
     - Mid-System Separation – H&H, WQ and NAV modeling underway
  2. Technology Alternatives
     - Utilizes refined list of ANS Controls from screening process
     - Combines control technologies to develop preliminary alternatives
     - Develop conceptual designs or treatment trains & delivery platforms
     - Evaluate impacts and need for mitigation
  3. Hybrids
     - Combine/mix physical barriers and technologies to optimize effects
  4. No-Action Alternative

- Stakeholder Engagement
  - Screening criteria comment period on GLMRIS website
  - Discussion of hydro-sep with Great Lakes Commission, et al.
  - Regular quarterly ESC meetings
  - Updates on Social Media & Web

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