



CHICAGO SANITARY AND SHIP CANAL DISPERSAL BARRIER SYSTEM

U.S. ARMY CORPS OF ENGINEERS

BUILDING STRONG®

A unique technology

This technology has been used in other places, but typically in smaller, shallower waterways. The Chicago Sanitary and Ship Canal (CSSC) barriers are in waters that are typically 20 to 25 feet deep and approximately 160 feet wide. To our knowledge, our barriers are the largest of their kind in the world and the only one on a highly-trafficked, commercially-navigable waterway.

- It was a proven an effective technology on a smaller scale.
- It does not kill the fish.
- It does not block the flow of water or the movement of vessels. Therefore, the canal can continue to serve intended purposes for wastewater and storm water management and navigation.

Location

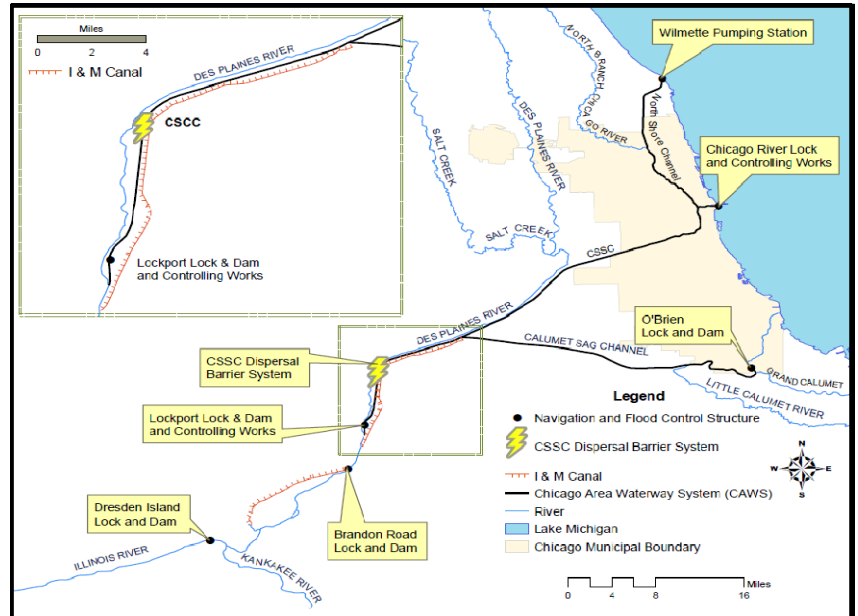
In the CSSC, which is a man-made hydrologic connection between the Great Lakes and Mississippi River basins that was completed early in the 20th century to carry sewage away from Chicago and to provide a navigation connection between Lake Michigan and the Mississippi River basins.

Purpose

To reduce the risk of inter-basin transfer of fish between the Mississippi River and Great Lakes via the CSSC.

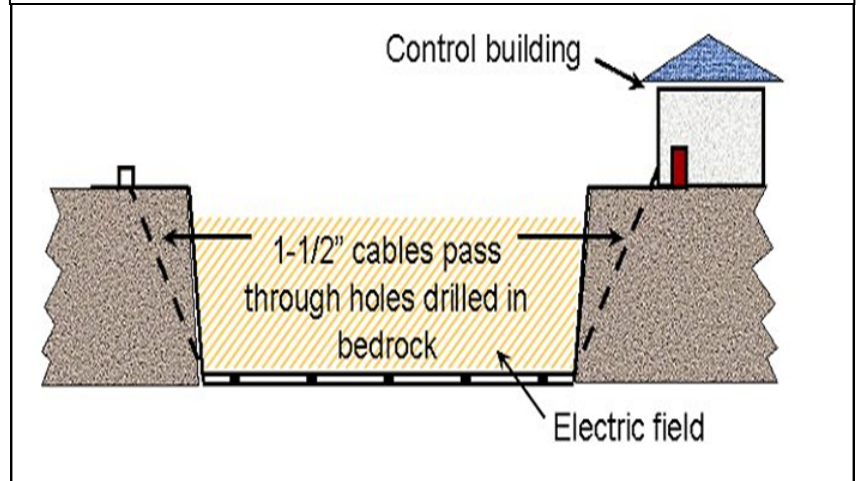
Operation

- Steel cables are secured to the bottom of the CSSC.
- Electrical cables connect the electrodes to the control building.
- Equipment in the control building generates a DC that is pulsed through the electrodes, creating an electric field in the water.
- At Barrier IIA, the electric field covers 130 feet of the canal upstream to downstream. At Barrier I, the electric field covers 54 feet of the canal upstream to downstream.
- The electric field is uncomfortable for the fish and they do not swim across it.



Above: Chicago Area Waterway System (CAWS)

Below: Barrier Operations



U.S. ARMY CORPS OF ENGINEERS, CHICAGO DISTRICT

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WWW.LRC.USACE.ARMY.MIL



Aquatic Invasive Species Dispersal Barriers

Barrier I (Demonstration):

- In continuous operation
- since 2002 @ 1 volt/inch, 5 hertz (cycles per second), 4 ms (pulse duration in milliseconds)
- Rehabilitated in October 2008

Barrier I (Permanent):

- Located at river mile 296.5 of the Illinois waterway
- Upgrade to a permanent barrier authorized

Barrier IIB:

- Goal is to be operated concurrently with Barrier IIA.
- Construction Ongoing
- Activation in 2010

Other Ongoing Efforts:

- Asian Carp Monitoring (electrofishing, eDNA, netting, ultrasonic telemetry)
- Barrier Safety Testing
- Research on Optimum Operating Parameters
- Implementation of Solutions to Potential Barrier Bypasses During Flood Events

Barrier IIA:

- Located 1,150 feet downstream of Barrier
- In continuous operation since April 2009 @ 1 volt/inch, 5 hertz, 4 ms
- Increased to 2 volts/inch, 15 hertz, 6.5 ms in August 2009

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Efficacy Studies

- USACE was directed in the Water Resources Development Act of 2007 to conduct a study of a range of options or technologies for reducing impacts of hazards that may reduce the efficacy of the Electrical Dispersal Barriers through analyzing various technical, environmental and biological factors. The dispersal barriers focus on the largest, most direct pathway, while the efficacy studies address other potential pathways.
- Interim Report I: Identified areas of potential bypass and recommended construction of fence and concrete barriers along the Des Plaines River and a stone blockage in the I & M Canal. These measures reduce the risk of Asian carp bypassing the barriers via flanking waterways.
- Interim Report II: Ongoing research to determine optimum operating parameters for the dispersal barriers.
- Interim Report III: Presents an evaluation of the potential for risk reduction that might be achieved through changes in the operation of the CAWS structures, such as locks, sluice gates and pumping stations. The report recommended the construction and installation of bar screens for two sluice gates at the O'Brien Lock. Similar screens were installed on two gates by the Metropolitan Water Reclamation District (MWRD) at the Chicago Lock/ Chicago River Controlling Works.
- Interim Report IIIA: Considered how technologies such as bubbles, lights and sounds can inhibit Asian carp movement and recommended construction of an acoustic bubble curtain with strobe lights (ABS fish deterrent) as a demonstration project.
- Efficacy reports are available on the Chicago District Web site, and the final efficacy report will be available in 2011.