Great Lakes Mississippi River Interbasin Study (GLMRIS)

Baseline Assessment of Non-Cargo CAWS Traffic

November 2011

Product of the GLMRIS Team

The Great Lakes and Mississippi River Interbasin Study (GLMRIS) Team consists of a regional, collaborative effort led by the U.S. Army Corps of Engineers (Corps), including various District and Division offices, as well as Corps Centers of Expertise and Research Laboratories. Products of the GLMRIS Team are also made possible in collaboration with various federal, state, local, and non-governmental stakeholders.

GREAT LAKES MISSISSIPPI RIVER INTERBASIN STUDY (GLMRIS)
BASELINE ASSESSMENT OF NON-CARGO CAWS TRAFFIC

Contents

FIGURES

TABLES

I. GLMRIS STUDY INFORMATION

This document is intended to serve as a baseline assessment of lock traffic by commercial passenger, recreation, and governmental vessels. The assessment includes an appraisal of historical traffic through the locks and a description of the lock operations. This assessment includes non-cargo-related traffic only as cargo-related traffic will be identified under a separate endeavor. This effort serves as the basis from which to compare possible changes as a result of aquatic nuisance species transfers to and from the Great Lakes system.

A. Introduction

An aquatic nuisance species (ANS) is a nonindigenous species that threatens the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural, aquacultural or recreational activities dependent on such waters. See 16 U.S.C. § 4702(1) (2010).

As a result of international commerce, travel and local practices, ANS have been introduced throughout the Mississippi River and Great Lakes basins. These two basins are connected by man-made channels that, in the past, exhibited poor water quality, which was an impediment to the transfer of organisms between the basins. Now that water quality has improved, these canals allow the transfer of both indigenous and nonindigenous invasive species.

The United States Army Corps of Engineers (USACE), in consultation with other federal agencies, Native American tribes, state agencies, local governments and non-governmental organizations, is conducting the Great Lakes and Mississippi River Interbasin Study (GLMRIS). In accordance with the study authorization, USACE will evaluate a range of options and technologies (collectively known as "ANS controls") to prevent the spread of aquatic nuisance species between the Great Lakes and Mississippi River by aquatic pathways. In this context, the term "prevent" includes the reduction of risk to the maximum extent possible, because it may not be technologically feasible to achieve an absolute solution. As part of this study, USACE will conduct a detailed analysis of various ANS controls, including hydrologic separation.

USACE is conducting a comprehensive analysis of ANS controls and will analyze the effects each ANS control or combination of ANS controls may have on current uses of: i) the Chicago Area Waterway System (CAWS), the only known continuous aquatic pathway between the Great Lakes and Mississippi River basins; and ii) other aquatic pathways between these basins. Following the *Economic and Environmental Principles and Guidelines for Water and Related Land Resource Implementation Studies*, Water Resource Council, March 10, 1983, USACE will:

- Inventory current and forecast future conditions within the study area;
- Identify aquatic pathways that may exist between the Great Lakes and Mississippi River basins;
- Inventory current and future potential aquatic nuisance species;

- Analyze possible ANS controls to prevent ANS transfer, to include hydrologic separation of the basins;
- Analyze the impacts each ANS control may have on significant natural resources and existing and forecasted uses of the lakes and waterways within the study area; and
- Recommend a plan to prevent ANS transfer between the basins. If necessary, the plan will include mitigation measures for impacted waterway uses and significant natural resources.

Significant issues associated with GLMRIS may include, but are not limited to:

- Significant natural resources such as ecosystems and threatened and endangered species;
- Commercial and recreational fisheries;
- Current recreational uses of the lakes and waterways;
- ANS effects on water users;
- Effects of potential ANS controls on current waterway uses such as flood risk management, commercial and recreational navigation, recreation, water supply, hydropower and conveyance of effluent from wastewater treatment plants and other industries; and
- Statutory and legal responsibilities relative to the lakes and waterways.

B. GLMRIS Study Area

The GLMRIS study area includes portions of the Great Lakes and Mississippi River basins that fall within the United States.

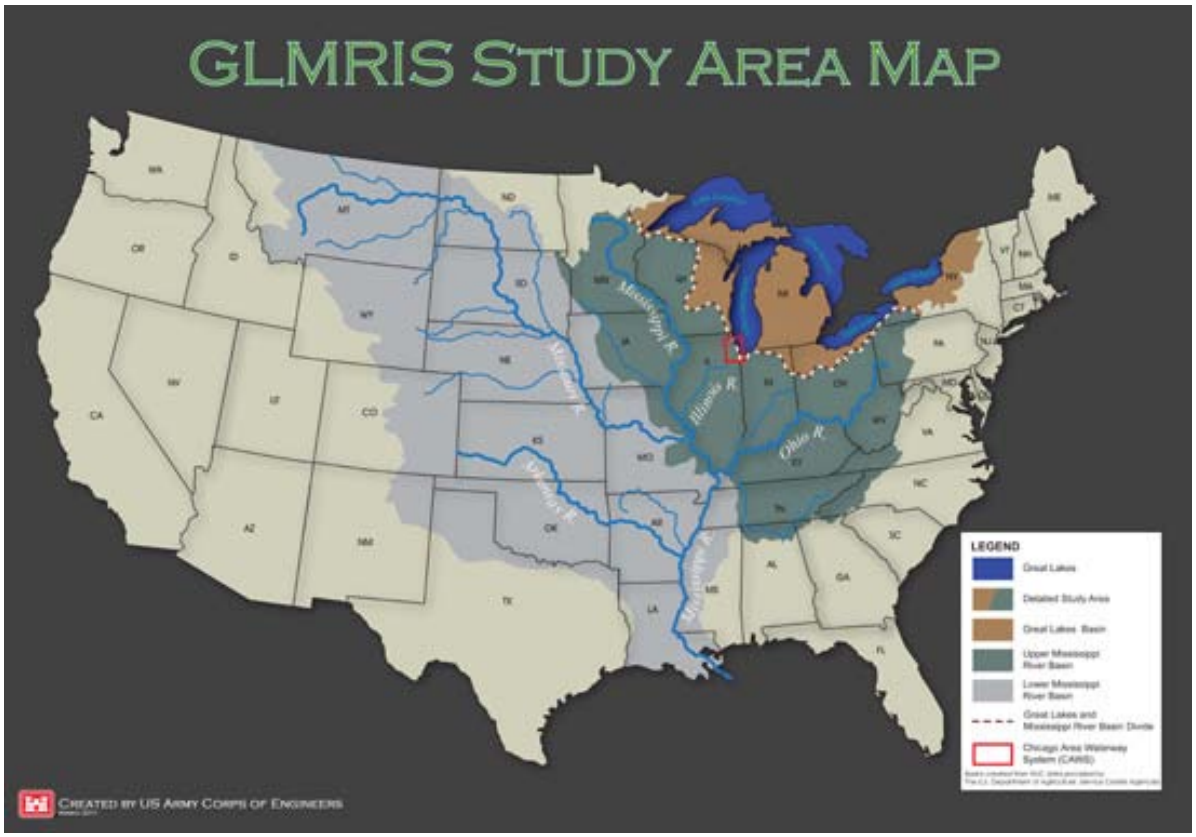

Figure 1. GLMRIS Study Area Map

Potential aquatic pathways between the Great Lakes and Mississippi River basins exist along the basins' shared boundary (illustrated as "▬ ▬ ▬" in Figure 1). This shared boundary is the primary concentration of the study.

The *Detailed Study Area* is the area where the largest economic, environmental and social impacts from alternative plans are anticipated to occur. The *Detailed Study Area* consists of the Upper Mississippi Basin (▬) and the Great Lakes Basin (▬). See Figure 1.

Future ANS may transfer beyond the *Detailed Study Area*; this pattern was observed by the spread of zebra mussels, which originated in the Great Lakes and spread throughout the Mississippi River Basin. Therefore, the *General Study Area* encompasses the lower Mississippi River Basin (▬). While the majority of GLMRIS tasks will be completed within the *Detailed Study Area*, USACE will consider specific ANS impacts in the larger *General Study Area*.

a. GLMRIS Focus Areas

The U.S. Army Corps of Engineers is conducting GLMRIS along two concurrent tracks: Focus Area I, the Chicago Area Waterway System (CAWS), and Focus Area II, Other Pathways.

(1) Chicago Area Waterway System (CAWS)

Focus Area I, the Chicago Area Waterway System, as shown in the map below, is the only known continuous aquatic pathway between the Great Lakes and Mississippi River basins and, therefore, poses the greatest potential risk of aquatic nuisance species (ANS) transfer between the basins, via an aquatic pathway.

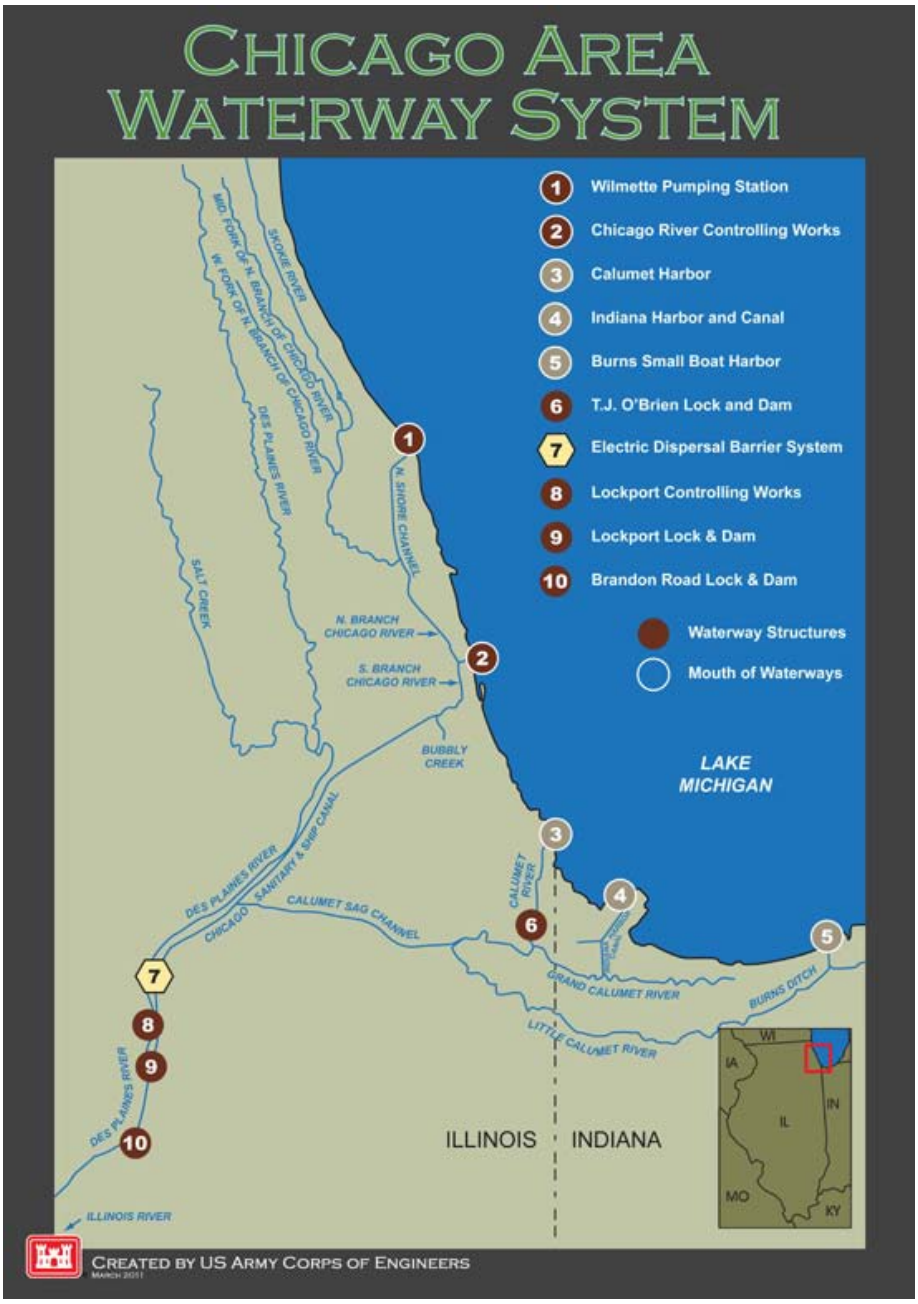

Figure 2. Chicago Area Waterway System

(2) Other Pathways

Focus Area II addresses remaining aquatic pathways. For this focus area, the U.S. Army Corps of Engineers completed a document entitled *Other Pathways Preliminary Risk Characterization Report* that identified other potential aquatic pathways outside of the Chicago Area Waterway System, as well as included a screening-level assessment of potential ANS that may transfer via these connections.

As shown on the *Other Pathways* map below, 18 potential aquatic pathways have suggested that there is significant uncertainty about the relative risks of ANS transfer. Eagle Marsh, located in Fort Wayne, Indiana was identified as having the highest potential risk of ANS transfer. The Indiana Department of Natural Resources has implemented interim measures to mitigate this risk, and USACE is further studying this pathway to determine whether a long-term ANS control should be implemented. For the remaining 17 sites, USACE is coordinating further study to finalize the risk characterization and determine whether ANS controls are recommended.

Figure 3. Other Pathways Map

II. DESCRIPTION OF CAWS INFRASTRUCTURE

Direct water diversions occur at multiple locations - the Chicago River Controlling Works (CRCW), the O'Brien Lock and Dam, Lockport Lock and Dam, Brandon Lock and Dam, and the Wilmette Pumping Station. Diversion at these locations consists of four components; lockage, leakage, discretionary flow, and navigation makeup flow. The lockage component is the flow used in locking vessels to and from the lake. The leakage component is water estimated to pass, in an uncontrolled way, through or around the lakefront structures. The purpose of the discretionary diversion is to dilute effluent from sewage discharges and improve water quality in the canal system.

Water levels in Lake Michigan are typically higher than water levels in the channels, however during high rain events this is not always the case. The fourth component of water diversion is navigation makeup water. When large storms are forecast, the canal is drawn down before the storm to prevent flooding, and navigation makeup water is used during this draw down period to maintain navigation depths. If the runoff is not enough to refill the canal, additional navigation makeup water is allowed to pass from Lake Michigan to return the canal system to its normal operating stages.[1]

A. Chicago River Controlling Works Lock

The Chicago River Controlling Works Lock (also known as the Chicago Lock and Chicago Harbor Lock) is located in the City of Chicago adjacent to Navy Pier, and it separates the waters of the Lake Michigan basin from the waters of the Chicago River. The lock was originally designed and built between 1936 and 1938 by the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC).

The lock was constructed as a component of the historic engineering project that reversed the flow of the Chicago River to prevent river water containing sewage from flowing into the lake and contaminating the city's drinking water. Today, the Chicago River is much cleaner but the lock continues to perform the environmental function of separating Chicago River storm water from Lake Michigan. MWRDGC operated and maintained the lock until 1984, when responsibility for operation and maintenance was transferred to the U.S. Army Corps of Engineers.[2] It takes about 15 minutes to cycle though the lock, and on a busy day 50-100 vessels can be locked at once.[3]

[1] USACE Chicago District, Lake Michigan Diversion Accounting Water Year 2003 Annual Report

[2] USACE Press Release Dated September 29, 2010. http://www.lrc.usace.army.mil/chicagolock/press_release9-29-10.pdf

[3] Personal Interview with Al Polus (PM) and Steve Hungness – Chicago Lock Operators, March 2011

Table 1. Chicago River Controlling Works Lock Characteristics

River/ Lock	Chamber	River/ Mile	Year Open	Length	Width	Lift	Status	Owner/Operator	Gatetype
Chicago	Main	327.2	1938	600	80	4	Operational	Corps/Contractor	Sector

Source: http://www.ndc.iwr.usace.army.mil/lpms/pdf/lkgenrl.pdf

Figure 4. Chicago River Controlling Works Lock
Source: U.S. Army Corps of Engineers/Jessica Vandrick

B. T.J. O'Brien Lock & Dam

T. J. O'Brien Lock and Controlling Works were placed into operation in 1960. The project is located at the entrance to Lake Michigan (River Mile 326.0), in Chicago, Illinois. The facility is a unit of the Inland Waterway Navigation System and is one of nine such facilities between Chicago, Illinois, and La Grange, Illinois.

O'Brien Lock is a low lift sector gate lock. It provides a maximum lift of 5.0 feet for traffic passing from Lake Michigan to the Little Calumet River. The lock chamber is 1000 feet long by 110 feet wide. The adjacent dam is 257 feet in length and comprised of two sections. The fixed section is 204 feet of steel sheet pile cellular construction. The controlling segment, a reinforced concrete structure with four slide gate sections, is 53 feet in length. It takes approximately 15 minutes to cycle through the lock.[4]

[4] Personal Interview with Bob Balamut, Lockmaster, O'Brien Lock, March 2011

Table 2. T.J. O'Brien Lock Characteristics

River/ Lock	Chamber	River/ Mile	Year Open	Length	Width	Lift	Status	Owner/Operator	Gatetype
Thomas J O'Brien	Main	326.5	1960	1000	110	4	Operational	Corps/Corps	Tainter

Source: http://www.ndc.iwr.usace.army.mil/lpms/pdf/lkgenrl.pdf

Figure 5. T.J. O'Brien Lock & Dam
Source: U.S. Army Corps of Engineers Digital Visual Library

C. Lockport Lock & Dam

Lockport Lock and Dam is located 291 miles above the confluence of the Illinois River with the Mississippi River at Grafton, Illinois. The complex is two miles southwest of the city of Lockport, Illinois.

The lock is 110 feet wide by 600 feet long. Maximum vertical lift is 42.0 feet, with an average lift of 39 feet. It averages 22.5 minutes to fill the lock chamber; 15 minutes to empty.[5]

Table 3. Lockport Lock Characteristics

River/ Lock	Chamber	River/ Mile	Year Open	Length	Width	Lift	Status	Owner/Operator	Gatetype
Lockport	Main	291.1	1933	600	110	39	Operational	Corps/Corps	Miter

Source: http://www.ndc.iwr.usace.army.mil/lpms/pdf/lkgenrl.pdf

[5] Waterways Council, Inc. http://www.waterwayscouncil.org/WWSystem/Fact%20Sheets/lockport.pdf

Figure 6. Lockport Lock & Dam
Source: U.S. Army Corps of Engineers Digital Visual Library

D. Brandon Road Lock & Dam

Brandon Road Lock and Dam (also known as Brandon Road Pool and Brandon Lock) is a gravity dam. The core is homogeneous, earth, concrete, and metal with a rock foundation. Though originally completed in 1933, the structure was modified in 1985.[6]

Table 4. Brandon Road Lock Characteristics

River/ Lock	Chamber	River/ Mile	Year Open	Length	Width	Lift	Status	Owner/Operator	Gatetype
Brandon	Main	286	1933	600	110	34	Operational	Corps/Corps	Miter

Source: http://www.ndc.iwr.usace.army.mil/lpms/pdf/lkgenrl.pdf

[6] http://findlakes.com/brandon_road_lock_and_dam_illinois~il00001.htm

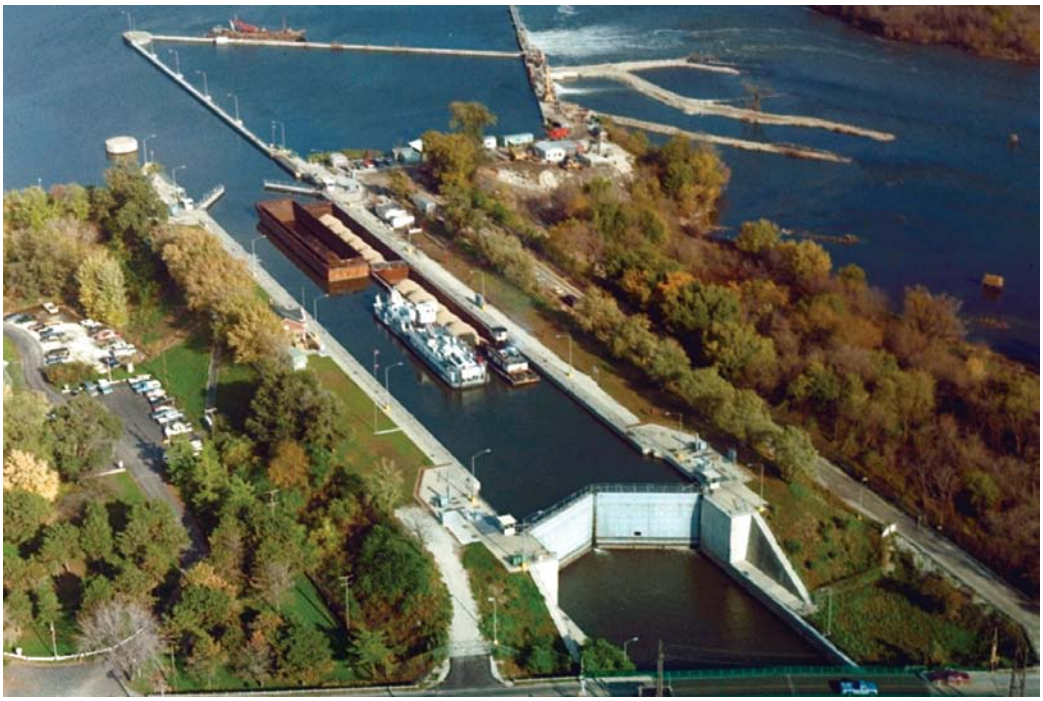

Figure 7. Brandon Road Lock & Dam
Source: U.S. Army Corps of Engineers

E. Wilmette Pumping Station

Between 1907 and 1910, the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) constructed a canal called the North Shore Channel. It extended from Lake Michigan at Wilmette in a southerly direction 6.14 miles to the north branch of the Chicago River. The Wilmette Pumping Station, also known as the Wilmette Controlling Works, regulates the amount of Lake Michigan flow allowed down the North Shore Channel through the use of one vertical lift gate. The four abandoned 250 cfs pumps have not been used for diversion since the 1970's.[7] The sluice gate is a means by which excess storm water is reversed to Lake Michigan.

The Wilmette Pumping Station is the gateway between the North Shore Channel and Lake Michigan. The pumping station and the bridge are a single integral structure. In addition to going over the pumping station, the bridge features two spans that pass over the access roads and open paved space that provides access to the pumping station facility.

[7] USACE Chicago District, Lake Michigan Diversion Accounting Water Year 2003 Annual Report

This bridge is historically significant as an unusual bridge that was designed as a part of a building, and also for its association as an unaltered part of the canal that plays an important role in regulating the flow of the Chicago River.[8]

MWRDGC, not the US Army Corps of Engineers, owns and operates the Wilmette Pumping Station.

Figure 8. Wilmette Pumping Station
Source: Public Domain, http://commons.wikimedia.org/wiki/File:Wilmette_Pumping_Station2.JPG

[8] www.historicbridges.org

III. NON-CARGO CAWS USERS

Multiple groups utilize the Chicago Area Waterway System. Some of these user groups include: passenger boats and ferries, non federal government vessels, commercial fishing vessels, federal government vessels, and recreation vessels. A brief description of some of the major user categories are below. Traffic data for each of the CAWS lock user groups is in Section IV: Non-Cargo CAWS Traffic.

A. Passenger Vessels

Passenger boats primarily serve the tourist industry, an element of Chicago's economy.

Newly constructed passenger vessels that are added to the existing fleet are frequently transported through the lock system to reach their home port. Passenger vessel access for both daily operations and fleet expansion would be directly affected in the event of a lock closure.

1. Tour Boats and Ferries

Tour boat operators provide lectures on architecture, history, natural history, and on the city's unique collection of moveable bridges.[9] Tour passengers also indicate that cutting through the Chicago Lock is one of the highlights of a combined lake/river tour; and brief discussions of the history of the lock, its construction, and operation are frequently conducted by tour operators. Chicago area passenger boats and ferries provide services for hundreds of thousands of passengers every year.[10]

Product offerings include:

- water taxi services (in the CAWS, seven-day a week water transportation for thousands of commuters and tourists)
- sunset cruises (from Lake Michigan, viewing sunset and Chicago city lights)
- fireworks tours (through Chicago Lock to Lake Michigan, viewing of fireworks show from the Lake)
- skyline tours (from Lake Michigan, viewing Chicago from the lake)
- architecture tours (in the CAWS, river tour through the heart of Chicago with narrated education of Chicago architecture)
- combined lake/river tours (includes Lake Michigan and access to CAWS through Chicago Lock, for viewing Chicago skyline and architecture)

[9] The Electronic Encyclopedia of Chicago © 2005 Chicago Historical Society. http://www.encyclopedia.chicagohistory.org/pages/300014.html

[10] Personal Communication. Michael Borgstrom, President, Wendella Tours. March 2011.

- specialty cruises (multiple options including Wine Tasting, Pet Friendly Tours, Supernatural/Haunted Attractions, etc)
- charter services (for weddings, corporate events, or other private parties).

2. Cruise Ships

While large, ocean going cruise ships are not commonly seen in the Chicago area, smaller vessels do have itineraries featuring Chicago as a port of call.

The 100-passenger M/V Grande Caribe, M/V Grande Mariner, and M/V Niagara Prince, operated by the Great Lakes Cruise Company of Ann Arbor, Michigan, departs Chicago on a variety of tours including a 15-day tour that takes passengers to Warren, Rhode Island by way of lakes Michigan, Huron, Erie, and Ontario, the Oswego and Erie canals, and the Hudson River.[11]

MV Columbus, also operated by Great Lakes Cruise Company, was designed specifically to accommodate the locks of the Great Lakes. The ship contains 134 outside cabins, 63 inside cabins and 8 outside suites. Itineraries include voyages from Chicago to Toronto.[12]

B. Non-Federal Government Vessels

1. Chicago Police

Chicago Police Marine Operations personnel are responsible for all bodies of water within the City of Chicago. This includes 80 square miles of Lake Michigan, 27 miles of Lake Michigan shore line, 38 miles of Chicago River system, Wolf Lake, Lake Calumet and various ponds and lagoons throughout the City.

To complete their mission, Marine Operations personnel use seven patrol/rescue boats and a state of the art dive response truck for land based assignments. Marine Operations personnel (all of whom are public safety divers) are the first responders to any maritime incident. Marine Operations personnel have three areas of responsibility. They are Search/Rescue/ Recovery Operations, Law Enforcement, and Homeland Security. Incidents requiring marine response include everything from person(s) in the water to commercial airline crashes. Law Enforcement personnel assigned to Marine Operations are responsible for enforcing state statutes, City ordinances, and Chicago Park District ordinances. Marine Operations personnel

[11] http://www.greatlakescruising.com/

[12] http://www.greatlakescruising.com/

spend a large portion of their tour conducting homeland security checks and patrols. Several of the highest threat assessed targets within the City are on, or surrounded by, water.[13]

The Chicago Police utilize the locks in their daily operations for patrol and emergency response. The department currently houses two vessels on each side of the Chicago lock to reduce response time. When an emergency response requires vessels to utilize the lock, the lock operators have the ability to open both sets of lock gaits to allow expeditious access for the vessels.[14]

2. Illinois Department of Natural Resources

The Illinois Department of Natural Resources promotes the safe use and enjoyment of the waters of Illinois. Their mission is to manage, protect, and sustain Illinois's natural and cultural resources; further the public's understanding and appreciation of those resources; and promote the education, science, and public safety of our natural resources for present and future generations.[15]

C. Fishing Vessels

1. Commercial Boats

Commercial fishing has been part of the Chicago region since the 1830s. Through much of the nineteenth century, commercial fisherman mostly caught whitefish. By the 1890s trout had become the most valuable catch. Invasions of non-native fish, especially rainbow smelts and lampreys, decimated the lake trout population, and reduced commercial fishing.[16]

Commercial fishing continued, focused on perch, until a 1996 Illinois statute ended that fishery as well. There are limited small commercial fisheries in Lake Michigan. Commercial fishing boats typically no longer use the Chicago area locks. There are a number of commercial fishing endeavors on the river system but these boats typically do not use the Chicago area locks either.

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[13] Chicago Police. https://portal.chicagopolice.org/portal/page/portal/ClearPath/About%20CPD/Specialized%20Units/Marine%20and%20Helecopter%20Unit

[14] Personal Communication. Sgt Mazzola and Officer Doane, Chicago Police. March 2011.

[15] http://www.dnr.state.il.us/home.htm

[16] Please see the GLMRIS white paper "Non-Native Species of Concern and Dispersal Risk for the Great Lakes and Mississippi River Interbasin Study" for a further discussion on invasive species and transport mechanisms.

2. Sport Fishing

While commercial fishing has declined significantly over time, sport fishing on Chicago's rivers and lakes remains popular. The Illinois Department of Natural Resources stocks trout, salmon, and other fish (as do its counterparts in neighboring states).[17]

D. Federal Government Vessels (With and Without Barges)

Multiple federal agencies utilize the Chicago Area Waterway System including the U.S. Coast Guard and the U.S. Army Corps of Engineers, among others. These agencies are discussed below.

1. U.S. Coast Guard

Marine Safety Unit (MSU) Chicago is responsible for executing the Coast Guard's Port Safety and Security, Marine Environmental Protection, and Commercial Vessel Safety missions under the auspices of the Department of Homeland Security. These missions ensure a safe, secure, and environmentally sound maritime domain that continues to promote recreation and the free flow of commerce on Southern Lake Michigan, as well as the Chicago Area Waterway System and the Illinois River Watershed.

MSU Chicago serves an active network of domestic and international maritime interests covering the Lake Michigan shorelines of Illinois and Indiana, as well as 177 miles of the Illinois River System segmented by seven locks and over 250 bridges. The MSU Chicago area of responsibility includes nine Lake Michigan ports, a fleet of 235 inspected vessels, 101 regulated waterfront facilities, and eight permanent security zones. They also oversee the safety and security of more than 25 million passengers that frequent riverboat casinos and passenger vessels annually.

The unit's 53 active duty, reserve and civilian personnel perform a variety of tasks each day, ranging from conducting armed port security patrols, inspecting commercial vessels, conducting pollution and marine casualty investigations, enforcing safety zones and conducting waterfront facility exams for compliance with federal regulations.[18]

2. U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers utilizes the Chicago Area Waterway System to achieve its missions of flood control, environmental protection, shoreline protection, navigation, and

[17] The Electronic Encyclopedia of Chicago © 2005 Chicago Historical Society. http://www.encyclopedia.chicagohistory.org/pages/300036.html

[18] U.S. Coast Guard, http://www.uscg.mil/d9/msuchicago/

emergency management. Vessels within the U.S. Army Corps of Engineers fleet include debris collectors, tenders, dredge vessels, research vessels, survey and patrol vessels, towboats, and multiple types of barges.[19]

E. Recreational Vessels

The Chicago Park District has nine lakefront harbors that stretch from Lincoln Park in the northern part of the city to Jackson Park in the south. With accommodations for more than 5,000 boats, the Chicago Park District Harbors constitute the nation's largest municipal harbor system and feature state-of-the-art floating docks, moorings, star docks, fuel facilities and other amenities for Chicago boaters and their guests. The harbors are very popular with area boaters and have enjoyed occupancies in excess of 98 percent for the past several years.[20]

Many recreational boaters that utilize these harbors travel through the locks to access recreational areas further inland, to avoid severe weather of the Great Lakes, or to reach dry storage for off-season storing of their vessels. Off-season vessel storage is available from multiple companies, including several of the Chicago area harbors. Storage options include inside and outside dry storage.

1. Chicago Park District Harbors

From north to south, below is a description of the Chicago Park District Harbor facilities. The description below should not be considered an exhaustive list of marine facilities in Chicago. Boaters utilizing harbors outside the immediate Chicago area also utilize the CAWS for marine service and boat storage operations.

[19]USACE Vessel factsheets. http://www.nap.usace.army.mil/mdc/factsheets.htm

[20] http://www.chicagoharbors.info/

a. Montrose Harbor

Montrose Harbor is located on the northern edge of Lincoln Park, a short walk from Montrose Beach. There are 630 docks, mooring cans,[21] and star docks.[22] Transient docking is available. Waste pump-out equipment is provided on a no charge basis. Montrose Harbor is the home harbor of the Chicago Corinthian Yacht Club.[23]

Figure 9. Montrose Harbor
Source: http://www.chicagoharbors.info

b. Belmont Harbor

Belmont Harbor is located in Lincoln Park. There are 730 docks, mooring cans and star docks. Transient docking is available. Belmont Harbor has a fuel dock facility, with gas and diesel fuels.

The Ship's Store, located in the Harbor Building, offers refreshments, apparel and boating supplies. Additionally, there is a mast stepping/unstepping capability at the Harbor Building. Waste pump-out equipment is available on a no charge basis. Chicago Yacht Club (Belmont Station) and the Belmont Yacht Club are located at Belmont Harbor. [24]

Figure 10. Belmont Harbor
Source: http://www.chicagoharbors.info

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[21] Mooring cans are attached to anchors in the harbor – the owners must row out to their boats for access.

[22] Star docks are a circular configuration similar to the mooring cans but able to accommodate more than one boat – the owners must row out to their boats for access.

[23] Ibid

[24] Ibid

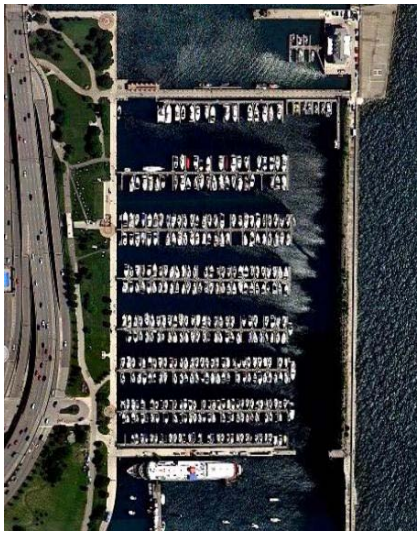
c. Diversey Harbor

Diversey Harbor is located in the heart of Lincoln Park. Within walking distance is the Lincoln Park Zoo and the Peggy Notebaert Nature Museum, Diversey Harbor has 714 docks and star docks. Transient docking is available.

There is a fuel facility at Diversey Harbor located at the Diversey Yacht Club. This facility dispenses gas and diesel fuels. Additionally, there is a public launch ramp with parking for approximately 67 vehicles with trailers. Waste pump-out equipment is provided on a no charge basis. [25]

Figure 11. Diversey Harbor
Source: http://www.chicagoharbors.info

d. DuSable Harbor



DuSable Harbor is located in the heart of downtown Chicago at the foot of Randolph Street. Entrance to the harbor is through the Monroe Harbor entrance with a turn to the north along the eastern breakwater, past the stern of the Columbia Yacht Club and into the harbor. There are 420 docks in DuSable Harbor. Transient docking is available. Waste pump-out equipment is provided on a no-charge basis.

The Ship's Store, located in the harbor building, offers refreshments, apparel and limited boating supplies.[26]

Figure 12. DuSable Harbor
Source: Google Earth

[25] Ibid

[26] Ibid

e. Monroe Harbor

Monroe Harbor is located in the heart of downtown Chicago. There are approximately 1,000 mooring cans in the harbor. Transient mooring is available. Monroe Harbor has a tender service, which provides delivery and pickup to boats in the harbor. Additionally, there is Waste pump-out equipment, which is provided on a no charge basis.

Monroe Harbor is home to the Chicago Yacht Club and the Columbia Yacht Club. [27]

Figure 13. Monroe Harbor
Source: Google Earth

f. Burnham Harbor

Burnham Harbor is located within walking distance of the Chicago downtown area and is situated on the Museum Campus. The Museum Campus is home to the Field Museum, the Shedd Aquarium and the Adler Planetarium. Soldier Field is on the west side of Burnham Harbor and McCormick Place is to the south. There are 1120 docks, mooring cans and star docks. Transient docking is available.

Burnham Harbor has a fuel dock facility which dispenses gas and diesel fuels. The Ship's Store, located in the harbor building, offers refreshments, apparel and boating supplies and there is a laundry facility in the building. Waste pump-out equipment is available at no charge. There is a launch ramp at the harbor with parking for approximately 43 vehicles with trailers. There is a mast stepping/unstepping capability at the Burnham Park Yacht Club, located on the east side of Burnham Harbor. [28]

Figure 14. Burnham Harbor
Source: Google Earth

[27] Ibid

[28] Ibid

g. 31st Street Harbor

The Chicago Park District's newest harbor is now under construction and is scheduled to open in May 2012 with 1000 new slips. It will feature a parking garage, fuel dock, harbor store, launch ramps and winter storage. The harbor is located just one mile south of Burnham Harbor and has a beach and playground.[29]

Figure 15. 31st Street Harbor Conceptual Rendering
Source: http://www.chicagoharbors.info

h. 59th Street Harbor

59th Street Harbor is located in Jackson Park, a very short walk to the Museum of Science and Industry and the 63rd Street Beach. There are 125 docks located in the harbor. Transient docking is available. Waste pump-out equipment is provided on a no-charge basis. 59th Street Harbor is the home harbor of the Museum Shores Yacht Club. [30]

Figure 16. 59th Street Harbor
Source: http://www.chicagoharbors.info

[29] Ibid

[30] Ibid

i. Jackson Park Inner Harbor

Jackson Park Inner Harbor is located in the heart of Jackson Park. There are 165 docks and star docks. Transient docking is available. Waste pump-out equipment is available on a no charge basis. There is also a launch ramp on the east side of the harbor with parking for 40 vehicles with trailers.

Jackson Park Inner Harbor is the home to the Southern Shore Yacht Club. [31]

Figure 17. Jackson Park Inner Harbor
Source: Google Earth

j. Jackson Park Outer Harbor

Jackson Park Outer Harbor is located in the heart of Jackson Park of 63rd Street Beach. There are 169 docks, mooring cans and star docks. Transient docking is available.

Jackson Park Outer Harbor has a fuel dock facility, which dispenses gas and diesel fuels. The Ship's Store, located in the Harbor building, offers refreshments, apparel and boating supplies. There is a privately operated restaurant at the south end of the building. Waste pump-out equipment is available on a no charge basis.

The Jackson Park Yacht Club is located in the harbor; the club offers a mast stepping/unstepping capability.[32]

Figure 18. Jackson Park Outer Harbor
Source: Google Earth

[31] Ibid

[32] Ibid

2. Chicago Area Marine Events

Yacht clubs in the Chicago area host over 125 races during a season, including the Race to Mackinac, the Sailing World Chicago National Offshore One Design Regatta, and the Chicago Yacht Club Verve Regattas. Other racing events include the the North American Challenge Cup for Disabled Sailors, One Design Seasonal Championship Racing, Wednesday night "Beer Can" racing, and "Frostbiting" in both the spring and fall.

Fishing tournaments, fireworks displays, and other marine events sponsored by a variety of organizations also draw local boaters and visitors to the area.

IV. NON-CARGO CAWS TRAFFIC

Lock data was obtained from the US Army Corps of Engineers Institute of Water Resources Navigation Data Center for the years shown. This data is included to show the magnitude and distribution of non-cargo lock usage in the CAWS area. Some of these passengers and vessels are likely to be making a round trip through the lock during the calendar year. All data should be considered preliminary and is subject to updates.

A. Chicago River Controlling Works Lock

The Chicago River Controlling Works Lock is heavily utilized. The lock sees an average of 711,902 commercial passenger one-way trips and 41,071 non-cargo vessel one-way trips (based on averaging 2000 through 2010 data). See Table 5 and Table 6 for further information.

Table 5. Chicago River Controlling Works Lock Usage, Calendar Year 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total Cuts (#)	12,261	11,288	11,504	10,514	11,028	12,623	12,030	12,442	11,599	11,334	11,699

Source: USACE NDC, LPMS
Note: Preliminary Data, Subject to Updates
Includes Non-Vessel Lockages

Table 6. Chicago River Controlling Works Lock Non-Cargo Traffic, Calendar Year 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Passenger Boat or Ferry	11,967	9,582	10,521	9,665	9,835	11,069	10,832	10,893	10,195	9,934	11,306
Non-Federal Govt Vessel	1,461	1,193	1,078	1,024	2,162	2,297	1,434	1,569	1,399	1,135	921
Commercial Fishing Vessel	93	-	-	-	-	-	-	-	-	-	-
Federal Govt Vessel (no barge)	137	220	194	335	354	529	701	552	606	472	442
Federal Govt Vessel (w/barge)	1	11	16	11	11	-	1	1	2	-	4
Recreation Vessel	38,418	35,898	37,126	30,676	27,699	26,189	22,486	26,661	23,886	23,298	23,284
Total Non-Cargo Vessels	**52,077**	**46,904**	**48,935**	**41,711**	**40,061**	**40,084**	**35,454**	**39,676**	**36,088**	**34,839**	**35,957**
Commercial Passengers	821,840	678,108	694,323	616,254	606,263	728,591	687,567	774,950	732,438	685,012	805,575

Source: USACE IWR, WCSC
Note: Preliminary Data, Subject to Updates.
Does not include vessels listed in the "Other" category as it is unknown whether or not those vessels would be considered cargo or non-cargo vessels.

B. T.J. O'Brien Lock & Dam

The T.J. O'Brien Lock sees an average of 479 commercial passenger one-way trips and 19,274 non-cargo vessel one-way trips (based on averaging 2000 through 2010 data). See Table 7 and Table 8 for further information.

Table 7. T.J. O'Brien Lock Usage, Calendar Year 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total Cuts (#)	9,133	8,680	8,379	8,353	7,800	7,893	7,274	7,352	6,310	5,898	5,796

Source: USACE NDC, LPMS
Note: Preliminary Data, Subject to Updates
Includes Non-Vessel Lockages

Table 8. T.J. O'Brien Lock Non-Cargo Traffic, Calendar Year 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Passenger Boat or Ferry	9	12	20	19	22	16	14	19	20	29	21
Non-Federal Govt Vessel	7	43	25	23	3	19	33	27	11	21	16
Federal Govt Vessel (no barge)	42	49	104	180	172	149	168	160	65	86	48
Federal Govt Vessel (w/barge)	1	2	6	7	2	-	-	2	-	1	1
Recreation Vessel	26,467	23,543	24,344	21,038	18,699	20,354	16,267	18,381	15,184	13,923	12,142
Total Non-Cargo Vessels	**26,526**	**23,649**	**24,499**	**21,267**	**18,898**	**20,538**	**16,482**	**18,589**	**15,280**	**14,060**	**12,228**
Commercial Passengers	341	744	677	845	719	442	292	314	220	423	254

Source: USACE IWR, WCSC

Note: Preliminary Data, Subject to Updates
Does not include vessels listed in the "Other" category as it is unknown whether or not those vessels would be considered cargo or non-cargo vessels.

C. Lockport Lock & Dam

The Lockport Lock sees an average of 164 commercial passenger one-way trips and 1,021 non-cargo vessel one-way trips (based on averaging 2000 through 2010 data). See Table 9 and Table 10 for further information.

Table 9. Lockport Lock Usage, Calendar Year 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total Cuts (#)	4,207	4,161	4,254	4,039	4,138	4,116	4,207	3,719	3,379	3,239	3,176

Source: USACE NDC, LPMS

Note: Preliminary Data, Subject to Updates
Includes Non-Vessel Lockages

Table 10. Lockport Lock Non-Cargo Traffic, Calendar Year 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Passenger Boat or Ferry	5	8	14	10	13	4	4	3	-	2	5
Non-Federal Govt Vessel	-	-	-	6	2	3	2	1	3	1	1
Federal Govt Vessel (no barge)	16	5	2	27	93	16	2	13	6	29	7
Federal Govt Vessel (w/barge)	12	10	11	3	14	11	8	2	6	4	5
Recreation Vessel	1,172	1,212	1,227	1,189	1,081	1,112	912	896	721	720	602
Total Non-Cargo Vessels	**1,205**	**1,235**	**1,254**	**1,235**	**1,203**	**1,146**	**928**	**915**	**736**	**756**	**620**
Commercial Passengers	82	213	459	235	286	58	78	2	-	111	284

Source: USACE IWR, WCSC
Note: Preliminary Data, Subject to Updates
Does not include vessels listed in the "Other" category as it is unknown whether or not those vessels would be considered cargo or non-cargo vessels.

D. Brandon Road Lock & Dam

The Brandon Road Lock sees an average of 148 commercial passenger one-way trips and 1,242 non-cargo vessel one-way trips (based on averaging 2000 through 2010 data). See Table 11 and Table 12 for further information.

Table 11. Brandon Road Lock Usage, Calendar Year 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total Cuts (#)	4,453	4,438	4,405	4,257	4,307	4,312	4,400	3,848	3,464	3,417	3,297

Source: USACE NDC, LPMS
Note: Preliminary Data, Subject to Updates
Includes Non-Vessel Lockages

Table 12. Brandon Road Lock Non-Cargo Traffic, Calendar Year 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Passenger Boat or Ferry	10	15	12	8	9	3	2	2	-	2	3
Non-Federal Govt Vessel	-	-	-	2	2	4	2	2	5	6	2
Federal Govt Vessel (no barge)	8	20	9	40	82	7	4	19	6	28	12
Federal Govt Vessel (w/barge)	36	11	19	17	36	45	19	43	14	14	12
Recreation Vessel	1,556	1,480	1,621	1,488	1,323	1,289	1,018	1,013	755	808	718
Total Non-Cargo Vessels	**1,610**	**1,526**	**1,661**	**1,555**	**1,452**	**1,348**	**1,045**	**1,079**	**780**	**858**	**747**
Commercial Passengers	187	226	211	242	298	97	119	2	-	111	137

Source: USACE IWR, WCSC

Note: Preliminary Data, Subject to Updates
Does not include vessels listed in the "Other" category as it is unknown whether or not those vessels would be considered cargo or non-cargo vessels.

E. Wilmette Pumping Station

The Wilmette Pumping Station is the gateway between the North Shore Channel and Lake Michigan. While water does pass through this location, vessel traffic does not. Therefore a non-cargo vessel traffic analysis was not conducted at this location.

V. ADDITIONAL INFORMATION

The data for this report was derived from a variety of sources as noted in footnote references. The primary source of the data was taken from the Lock Performance and Monitoring System (LPMS) and the Waterborne Commerce Statistics Center (WCSC). LPMS tracks vessels and barges locked; type and dates of cuts; durations of, and causes for, periods of lock unavailability; barge type, size, and commodity type; and tonnages carried. WCSC tracks vessel operating companies that transport waterborne commerce. Domestic and foreign vessel trips and tonnages by commodity for ports and waterways are tracked. All data should be considered preliminary and is subject to updates. Movement data acquired by the Center is primarily for the use of the Corps and other government agencies; however, summary statistics, which do not disclose movements of individual companies, are also released to private companies and to the general public.

Additional information and analysis will be included in a subsequent deliverable entitled "Economic Evaluation of Non-Cargo CAWS Traffic." This document will include an economic evaluation of expected increases in costs to businesses and services from basin separation alternatives as well as the degradation in value associated with the recreational experience. The evaluation will summarize survey and personal interview information gathered from lock users. Final deliverable is expected in the first quarter of 2012.

Information is also available on the Great Lakes Mississippi River Interbasin Study Web Site located at: http://glmris.anl.gov/