

HISTORY AND SYSTEM OVERVIEW

Throughout history, waterways have been the lifeblood of many people and civilizations. In prehistoric times, rivers provided hunter-gatherer societies with a reliable source of drinking water and fish. Over time humanity progressed away from the hunter-gatherer lifestyle to one centered around agriculture. The fertile lands along the banks of rivers provided for greater yields; additionally, early farmers manipulated the land through irrigation to expand the areas in which they could farm. These advancements led to the development of some of the great early civilizations which built large cities along river banks. With the expansion of civilizations, commerce between cities grew; once again rivers played an important role. Farmers and merchants could easily load their goods onto boats and sell their goods to buyers up and downstream. Waterways played an important role in the progress of humanity; in Illinois this was no different.



2.1 HISTORICAL TIMELINE

The following are important events in the history of Illinois' waterway system dating back to the previous millennia.

FIGURE 2.1 A Brief History of Illinois Waterways

1050-1150 A.D.



Cahokia Mounds

The Mississippian Culture builds Cahokia, the largest pre-Columbian city in North America, with 15,000 inhabitants. Located near the Mississippi River, a massive pyramid-like temple platform stood at the city's center.

1673



First Europeans Explore Illinois

Jacques Marquette and Louis Jolliet (aka Joliet) explore what is modern day Illinois. They traversed the Mississippi, Illinois, and the Chicago rivers. Along the way they interacted with many Native American tribes.

1779



DuSable Settles Chicago

Jean Baptiste DuSable settles along the banks of the Chicago River near Lake Michigan, where modern day Chicago is located. DuSable is widely attributed to be the founding father of Chicago.

1818



Illinois Statehood

Illinois is granted statehood. The Mississippi, Ohio, and Wabash rivers, as well as Lake Michigan create its distinct shape.

1848



Illinois & Michigan Canal Complete

The Illinois & Michigan Canal is completed; it connects the Illinois River to the Chicago River providing a direct route to the Great Lakes from the Mississippi River.

1878



4 1/2 Foot Channel Project

Congress authorizes the 4 1/2-foot channel project on the Upper Mississippi River. This would ensure there was a consistent depth along the river, allowing reliable navigation for vessels.

1900



Chicago Sanitary and Ship Canal Complete

The Chicago Sanitary and Ship Canal is officially opened. It replaced portions of the Illinois & Michigan Canal. It was not until 1907 that the canal was extended from Lockport to Joliet, connecting it to the Des Plaines River. Construction of the new canal required reversing the flow of the Chicago River.

1931



9-Foot Channel Navigation Project

Congress authorizes the 9-foot channel project on the Upper Mississippi River and Illinois River to encourage commerce along the river. A series of locks and dams were constructed to ensure a 9-foot depth.

1941



Navy Pier Transformed for Training

Navy Pier is used as a military training facility during WWII. By the end of the war a total of 60,000 troops were trained at the pier. Included in the 60,000 were 15,000 fighter pilots who trained landings and takeoffs on freshwater aircraft carriers that were stationed at the pier.

1942



Prairie Shipyard

The Prairie Shipyard in Seneca Illinois is commissioned to build Landing Ship Tanks. These watercrafts were used in the D-Day assault at Normandy, France.

1959



St Lawrence Seaway Opens

The St. Lawrence Seaway opens, officially linking the Gulf of Mexico to the Atlantic Ocean via the Illinois and Mississippi rivers and the Great Lakes.

2.1.1 PRE-EUROPEAN

For some 13,000 years before the State of Illinois was established, Native Americans occupied this region. The floodplains of the Mississippi, Illinois, and Ohio rivers and their tributaries offered abundant seed-bearing plants, game animals, fish, and waterfowl for hunter-gatherers. About 10,000 year ago, this secure food supply sustained the inhabitants of one of the first permanent villages in North America, at the Koster site near Kampsville in the “American Bottom” of southern Illinois. Millennia later, when Native people began cultivating maize (corn), the rich soil of the American Bottom was an ideal setting for the new way of life. Maize served as a staple food for the rapidly increasing population of the Mississippian culture, which created a complex chiefdom centered at the city of Cahokia, across the river from modern Saint Louis. A massive pyramid-like temple platform, known today as Monks Mound, loomed over the center of the largest Native city in North America. At its height (AD 1050-1150) Cahokia was inhabited by about 15,000 people—farmers, artisans, warriors, priests and chiefs.

2.1.2 EUROPEAN SETTLEMENT

In the late 1600s, a Jesuit missionary, Jacques Marquette, and Canadian fur trader, Louis Jolliet, embarked on an expedition commissioned by the Governor of New France (at this point in history, modern day Illinois was a French territory) to find a Northwest passage across North America¹. The expedition took them down the Upper Mississippi River. While on the expedition they encountered many Native American tribes. During their return trip, they were informed by Native Americans of a quicker route to Lake Michigan via the Illinois, Des Plaines, and Chicago rivers; however, they would need to go through the Chicago Portage (a swampy area that divides the Des Plaines and Chicago rivers). They crossed the portage and reached Lake Michigan where modern day Chicago is located². Jolliet had the foresight to recognize the potential of the Chicago Portage and reported “it would only be necessary to cut a canal through half a league of prairie to go in a bark by easy

navigation from Lake Erie to the Gulf of Mexico”³. Nearly 150 years later, his idea would come to fruition with the construction of the Illinois & Michigan Canal. Marquette and Jolliet were the first Europeans to explore the Illinois Country.⁴ In the years that followed many European traders settled along Lake Michigan and the rivers throughout Illinois.⁵

In the 1770s, Jean Baptiste DuSable, a man of French and African descent, would sail from France to New Orleans. He would follow the Mississippi River north and by 1779 finally settle on the northern banks of the Chicago River by Lake Michigan in modern day Chicago. Due to its strategic location along the river and lake, the settlement became an important trading post serving Native Americans, British, and French explorers. DuSable is widely viewed as the founder of Chicago. The city would be incorporated in 1837.



2.1.3 19TH CENTURY

Prior to the advent of railroads and the interstates, Illinois' rivers were the "highways" of their times. People from all backgrounds, origins, and ethnicities were able to thrive in part because of access to essential marine resources and waterways. For example, the Mississippi River was an important trade route allowing merchants to ship their goods. Mass produced commodities, specialized trades, and people from all nationalities became widely distributed as a result of an active network of river systems. These same routes that shipped goods, provided a key resource for enslaved, migrant, and immigrant populations in search of new opportunities. In this way, Illinois' waterways were particularly essential to the success of the newly formed state.

By 1848 the Illinois and Michigan Canal was complete. It connected the Chicago River with the Illinois River at LaSalle 96 miles away.⁶ When complete the Canal provided the first direct water route from the East Coast (via Erie Canal and Great Lakes) to the Gulf of Mexico.⁷ The canal helped make the City of Chicago a major freight hub due to the large amount of commerce it supported. By 1882, over a million tons of commodities flowed through the canal annually.⁸

In 1878, Congress authorized the 4 ½-foot channel project. This project tasked the Army Corps of Engineers to make navigation improvements along the Upper Mississippi River. This project changed a lot of the river's natural character. Despite the efforts, commerce along the Upper Mississippi River declined in years the followed.⁹

Construction on the Hennepin Canal (Illinois and Mississippi Canal) began in 1892 and was finished by 1907. The canal linked the Illinois River at Hennepin, to the Mississippi River at Rock Island. The motivation behind this was to provide a faster route for the industrial areas of the Upper Mississippi River to Chicago. The canal reduced the traveling distance between Chicago and Rock Island by 419 miles.¹⁰ However by the time the canal was opened, it was already obsolete due to railroad competition and its small size. By 1951, the canal was closed and today is used as a recreational area administered by the Illinois Department of Natural Resources.¹¹



2.1.4 20TH CENTURY

In 1900, the Chicago Sanitary and Ship Canal officially opened. There were two major motivations behind building the canal, one was to replace the Illinois & Michigan Canal, which by this time was all but obsolete due to its size. The building of the Chicago Sanitary and Ship Canal would once again provide Illinois a distinct competitive advantage in shipping as was done with the Illinois & Michigan Canal half a century earlier.

By the latter half of the 19th century, advances in ship design made the Illinois & Michigan Canal obsolete.¹² The existing Illinois & Michigan Canal was neither deep or wide enough to accommodate the new vessels size. The new Chicago Sanitary and Ship Canal was built nearly parallel to the Illinois & Michigan Canal. However, when complete the new canal did not allow for commercial navigation to the Illinois River¹³. At this point commercial navigation was only possible to Lockport from Chicago. In 1907, an extension of the

Canal was complete to make the Canal commercially navigable to the Des Plaines River. The Canal was an overall success and is still in use by commercial vessels to this day.

The other motivation behind the building the Canal was to reverse the flow of the Chicago River. During this time, raw sewage and industrial waste was discharged into the Chicago River. The river would then flow into Lake Michigan polluting the city's source of clean drinking water. By reversing the river's flow the sewage and waste would flow downstream ultimately into the Mississippi River.

While the Chicago Sanitary and Ship Canal provided relief to navigation and sanitation challenges that Chicago faced, in the years that followed it became apparent that the City still faced these issues. To address these issues, work on the Calumet- Sag

Channel (Cal-Sag Channel) began in 1911, the Cal-Sag Channel was complete by 1922. The Channel would provide relief to the to Chicago's sanitation challenges and provide commercial navigation to the industrial Calumet area, linking it to the Illinois Marine Transportation System (IMTS).¹⁴

In 1931, construction of the 9-Foot Channel Navigation Project on the Upper Mississippi River began. The project would channelize the Mississippi River 9 feet deep from St. Louis to Minneapolis. This was done to encourage commerce along the river. Prior to that point barges would need to unload their goods at St. Louis on to smaller boats. Besides dredging of the river, a series of locks and dams were built to ensure a 9-foot depth. Additionally, the 9-Foot Channel Navigation Project also channelized the Illinois Waterway from the Chicago Area Waterway System to the Illinois River's confluence with the Mississippi River.

SS EASTLAND DISASTER

One of the deadliest maritime disasters in U.S. history happened on July 24, 1915, along the banks of the Chicago River. The SS Eastland was docked near the Clark Street bridge and set to sail to Michigan City, Indiana, with nearly 2,500 passengers for a picnic hosted by Western Electric Company for employees, family, and friends. Moments before the Eastland was scheduled to depart, the crowded ship began to list back and forth and ultimately rolled over on its side just feet from the wharf and resulted in the loss of 844 lives.



IDOT AND THE WATERWAY SYSTEM, PAST, PRESENT, AND FUTURE

The Illinois Department of Transportation (IDOT) can trace its roots with the Illinois waterway system back to 1823. In 1823, the Third General Assembly passed legislation to create the Illinois and Michigan Canal Commissioners. Their role was to survey possible canal routes for the Illinois and Michigan Canal.¹⁷ Between 1829 and 1917 the commission was dissolved, assembled, and reorganized several times under new names.¹⁸

In 1917, the Fiftieth General Assembly passed, and the governor signed, “The Civil Administrative Code of Illinois” more commonly known as the Consolidation Bill. The bill consolidated a number of state agencies into nine departments, one of which was the Illinois Department of Public Works and Buildings which would become the Illinois Department of Transportation 55 years later. Included in this consolidation were the Illinois Waterway Commission, Canal Commission, and River and Lakes Commission, which created the Division of Waterways, the second largest division within the Department behind the Division of Highways.¹⁹

During the 1920s and 1930s, the Division of Waterways was responsible for several activities including building levees, surveying the boundaries of Lake Michigan, compiling information on river and stream flows, approving plans for sewage discharge,

supervising the sale of water and electric power in Chicago, and working with the federal government on designing harbors along Lake Michigan.²⁰

On December 7th, 1941, Japan attacked Pearl Harbor and in an instant brought the United States into World War II. Thousands of brave men and women joined the armed forces to protect the country. Included in these were over 600 employees of the Department of Public Works and Buildings.²¹ The Department quickly joined the war effort. Director of Public Works and Buildings Walter A. Rosenfield estimated that 90 percent of departmental activities between 1942 and 1945 were related to the war effort.

The Division of Waterways played a crucial role in the Department’s efforts. Enemy warships stalked the nation’s east and west coasts. This made inland water routes and shipyards ever more important. Throughout the war millions of military personal and materials flowed through IMTS. The Division of Waterways was responsible for maintaining the bridges and lock systems along the rivers. Additionally, the Division was responsible for bridge blackouts. While enemy aircraft never attacked the United States mainland, these blackouts were conducted in an abundance of caution and to provide training for such an event.²²

On January 1st, 1972, the IDOT officially became a state agency. IDOT took over many of the transportation

responsibilities from the Department of Public Works and Buildings, including the Division of Waterways. In 1973, the Division of Waterways officially became known as the Division of Water Resources. The Division of Water Resources would continue to serve under IDOT for the next two decades.

In March 1995, the Division of Water Resources was transferred to the newly created Illinois Department of Natural Resources (IDNR). By transferring the Division to the IDNR, IDOT moved hundreds of employees to IDNR and in the subsequent decades became less involved in the IMTS.

In 2016, IDOT and IDNR staff met to discuss the two agencies roles in the IMTS. It became understood that IDOT would oversee the transportation aspect of the IMTS and IDNR would continue to oversee the recreational and flood control aspect. Since 2016, IDOT has begun creating a dialog with public and private sector IMTS stakeholders. Currently (2020), IDOT does not have an official division or bureau that is dedicated to the IMTS. The Department’s goal is to work toward reinvigorating its waterway activities. The Office of Planning and Programing has been taking the lead on waterway activities. This plan and its recommendations are setting the foundation for IDOT and its relationship with the IMTS.

2.2 THE ILLINOIS MARINE TRANSPORTATION SYSTEM (IMTS)

The IMTS is a vital part of Illinois' transportation network and is also an important part of the nation's waterway network. Illinois has a total of 87,110 miles of rivers and streams, of which 1,118 miles are commercially navigable waterways. The system transports 90.6 million tons of goods annually. The IMTS is made up of five commercially navigable waterways and Lake Michigan with 27 locks and dams throughout the system.²³

2.2.1 MARINE HIGHWAY SYSTEM

The U.S. Maritime Administration (MARAD) is the agency within the U.S. Department of Transportation (DOT) tasked with supporting the United States marine transportation network. Their role is to support shipping, port and vessel operation, national security, environment, and safety as it relates to marine transportation infrastructure. One of the key programs MARAD oversees is the Marine Highway Program. The program's goal is to expand the use of the nation's navigable waterways through the promotion of their benefits. The program's goals specifically are to:

- Develop and expand marine highway service options and facilitate their further integration into the current U.S. surface transportation system, especially where water-based transport is the most efficient, effective and sustainable option.
- Highlight the benefits, increase public awareness and promote waterways as a viable (in some cases a superior) alternative to "landside" shipping and transportation options.²⁴

The Marine Highway Program was created through the Energy Independence and Security Act of 2007. The Act required the DOT to create a program that would work to mitigate landside congestion. MARAD's 2011 report to Congress on the program stated that the program is "intended to expand the use of [the] inland, Great Lakes

Saint Lawrence Seaway System, intercostal, and coastal waterways for the transportation of freight (loaded in containers and trailers) and passengers to mitigate landside congestion, reduce greenhouse gas emissions per ton-mile of freight moved, and accomplish other objectives."²⁵

Today there are 25 designated Marine Highway Routes within the U.S. and overseas territories, 22 of which are in the continental United States. Within Illinois there are four designated routes including M-35, M-55, M-70, and M-90. The Marine Highway routes serve as relievers for landside routes. Their designated route name corresponds with the major interstate highway they compliment. **Figure 2.2** below shows the continental U.S. Marine Highway System.

FIGURE 2.2 National Marine Highway System



Source: WSP From USDOT Maritime Administration: Marine Highway Route Descriptions

MISSISSIPPI RIVER

The Mississippi River flows 2,350 miles from its source at Lake Itasca in Minnesota to the Gulf of Mexico. The river defines the western border of Illinois flowing 580 miles from East Dubuque in the North, to Cairo in the South. Most the land along the river is rural farmland with large metropolitan areas of St. Louis, the Quad Cities, and Quincy being located along its shores. There are times when the river closes during major flood events and in winter months when the river freezes. However, while the river freezes in the northern and central parts of the state, it rarely freezes south of St. Louis.

The river is commercially navigable largely in part due to the 1930's River and Harbor Act that required a depth of 9 feet.²⁶ The 9-foot depth was created in part due to the lock and dam system built along the river. There are a total of 15 locks and dams along the Mississippi River. These locks and dams frequently require maintenance due to their age and condition. The Mississippi River moves 27 percent of the state's water borne freight tonnage, as shown in the table below.

MISSISSIPPI RIVER TONNAGE

Direction	Tonnage (000)	Percent of Statewide Total
Inbound	3,019	15%
Outbound	21,206	34%
In-State	348	4%
TOTAL	24,573	27%

The river could fill over two Olympic-sized swimming pools each second. Average annual discharge is 204,800 cubic feet per second at Thebes, Illinois.²⁷

MISSISSIPPI RIVER FACTS

⇒ **15** Locks & Dams Total

⇒ **133** river miles

⇒ **9** feet deep (minimum depth)

⇒ **89** terminals

OHIO RIVER

The Ohio River flows 981 miles from its source at the confluence of the Allegheny and Monongahela Rivers in Pittsburgh, Pennsylvania, to its confluence with the Mississippi River at Cairo, Illinois. The river defines the southern border of Illinois following 128 miles from the confluence of the Wabash River to its confluence with the Mississippi River. The Ohio River is maintained to hold a 9-foot minimum depth channel. In addition, there are two locks and dams along the Ohio River that border the state. There is a great deal of coal that flows on the river due to large mining operations throughout Southern Illinois; however, in recent years there has been a decline in coal shipments due to industry changes, resulting in less demand, and forecasts show this decline will continue. Due to its location, the river does not close in winter months due to freezing. The Ohio River moves 13 percent of the state's water borne freight tonnage, as shown in table below.

OHIO RIVER TONNAGE

Direction	Tonnage (000)	Percent of Statewide Total
Inbound>	112	1%
Outbound <.....	11,349	18%
In-State <.....>	150	2%
TOTAL	11,611	13%

OHIO RIVER FACTS

- ⇒ **2** Locks & Dams Total
- ⇒ **128** river miles
- ⇒ **9** feet deep (minimum depth)
- ⇒ **34** terminals

ILLINOIS RIVER

The Illinois River flows 273 miles through the state. It forms at the confluence of the Des Plaines and Kankakee Rivers and joins the Mississippi River near Grafton, Illinois. The Illinois River connects the Gulf of Mexico via the Mississippi River to the Great Lakes and St Lawrence Seaway via the Chicago Area Waterway System (CAWS). The Illinois River is maintained to have a 9-foot channel. In addition, there are a total of five locks and dams along the Illinois River. These locks and dams often require maintenance due to their age and condition. Maintenance occasionally will require a lock to close disrupting the movement of goods. Additionally, there are times when the river closes due to natural events such as flooding and freezing. The Illinois River moves 29 percent of the state's water borne freight tonnage, as shown in table below.

ILLINOIS RIVER TONNAGE

Direction	Tonnage (000)	Percent of Statewide Total
Inbound>	5,814	29%
Outbound <.....	18,560	30%
In-State <.....>	1,699	20%
TOTAL	26,073	29%

ILLINOIS RIVER FACTS

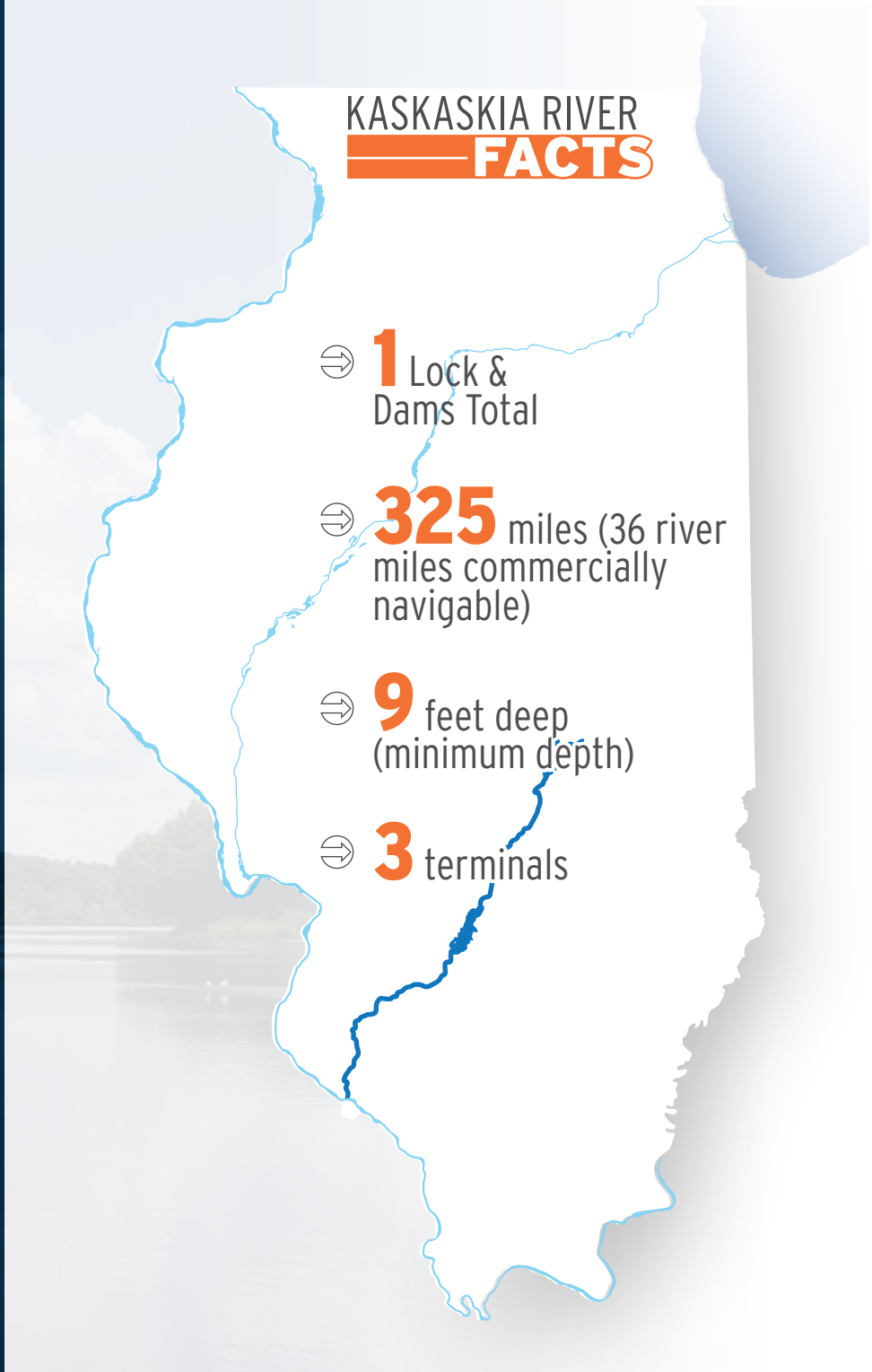
- ⇒ **5** Locks & Dams Total
- ⇒ **273** river miles
- ⇒ **9** feet deep (minimum depth)
- ⇒ **137** terminals

KASKASKIA RIVER

The Kaskaskia River is the second longest river within Illinois and flows 325 miles from near Champaign, Illinois, to its confluence with the Mississippi River in southeastern Illinois; however, only 36 miles of the river is commercially navigable. The commercially navigable segment is maintained to have a 9-foot channel from the Mississippi River to Fayetteville, Illinois, and includes one lock and dam. In years prior, the Army Corps of Engineers considered closing the river permanently to commercial navigation due to costs of maintaining the channel. However, such a closure would result in significant economic impacts to the region, therefore the river has remained open. This is the case because the river is the only economically viable means of transporting certain commodities to the region. Certain industries would not be able to operate in the region if they needed to rely on other modes of transportation. The Kaskaskia River moves 2 percent of the state's water borne freight tonnage, as shown in table below.

KASKASKIA RIVER TONNAGE

Direction	Tonnage (000)	Percent of Statewide Total
Inbound>	786	4%
Outbound <.....	599	1%
In-State <.....>	--	0%
TOTAL	1,385	2%



KASKASKIA RIVER FACTS

- ➞ **1** Lock & Dams Total
- ➞ **325** miles (36 river miles commercially navigable)
- ➞ **9** feet deep (minimum depth)
- ➞ **3** terminals

CHICAGO AREA WATERWAY SYSTEM

Six separate waterways create the Chicago Area Waterway System (CAWS). These include the Des Plaines River, Chicago River (South and North Branches), Chicago Sanitary and Ship Canal, Calumet Saganashkee Channel, Little Calumet River, and Calumet River. Being in the Chicago metropolitan area the system provides waterway access to large intermodal facilities and many existing industrial areas.²⁸ Additionally, due to it flowing through the heart of Chicago, there are also many recreational and tourism opportunities along the system.

Additionally, it is important to note that Asian Carp (invasive species) have low populations below Brandon Road Lock and Dam circa Joliet Illinois. These carps compete with native species in waterways where they are already present. Three repetitive electric barriers in the Waterway near Romeoville Illinois and miles of fencing assist in preventing any further spread.

The State of Illinois has and continues to work with federal and state partners to further reduce populations of Asian carps throughout the Illinois River and CAWS to prevent their spread to, and beyond, Brandon Road Lock and Dam which is approximately 15 miles downstream from the electric barrier system.

CHICAGO AREA WATERWAY SYSTEM TONNAGE

Direction	Tonnage (000)	Percent of Statewide Total
Inbound	7,891	39%
Outbound	4,822	8%
In-State	4,903	59%
TOTAL	17,616	19%

CHICAGO AREA WATERWAY SYSTEM FACTS

- ⇒ **3** Locks & Dams Total
- ⇒ **1** Lock*
- ⇒ **95** river miles
- ⇒ **9** feet deep (minimum depth)
- ⇒ **141** terminals

*Chicago Harbor Lock

LAKE MICHIGAN

Lake Michigan is the second largest by volume of the five Great Lakes and through the Great Lake System provides access to the Atlantic Ocean via the Saint Lawrence Seaway. Illinois has 63 miles of coastline along the south-western portion of the lake²⁹. Additionally, the state's jurisdiction extends into the lake and covers 1,500 square miles of the lake. Shipping of goods is limited in winter months due to large portions of the lake freezing. The vessels that travel on Lake Michigan are larger than the ones on the inland river system. However, unlike coastal ports, the size of vessels that can access Lake Michigan is limited due to the size of the locks along the Saint Lawrence Seaway. In addition to large vessels that move commodities through the lake, there are also recreational and tourism vessels that provide cruises throughout the Great Lakes.

LAKE MICHIGAN TONNAGE

Direction	Tonnage (000)	Percent of Statewide Total
Lakewise	1,433	1.6%
Overseas	6,162	6.9%
TOTAL	7,595	8.5%

Lake Michigan volumes are a subset of freight moving into or out of Illinois ports on Lake Michigan and connecting waterways

LAKE MICHIGAN FACTS

- ⇒ **63** miles of coastline
- ⇒ State jurisdiction extends **1,500** square miles into the lake
- ⇒ **2** terminals

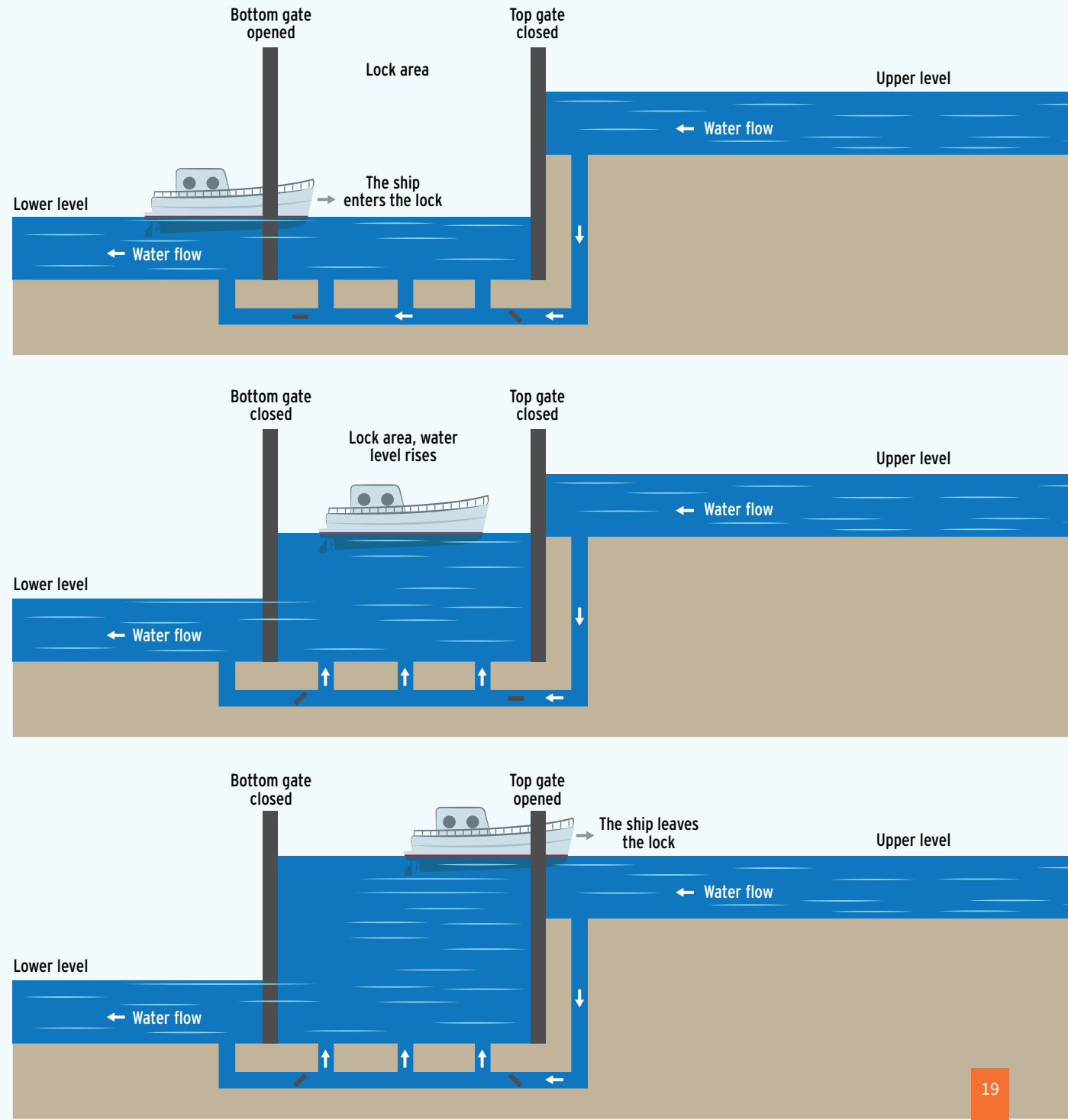
2.3 LOCKS AND DAMS

Locks and dams play a pivotal role in Illinois' waterway system, as they allow boats and barges to navigate along the system. River levels, especially along the Mississippi, Illinois, Ohio, and Kaskaskia rivers, constantly fluctuate. During times of flooding, rivers swell becoming fast and turbulent. On the opposite end of the spectrum, during times of droughts, water levels can drop to a point that the rivers become non-navigable. Most commercial inland river vessels require a minimum of a 9-foot-depth to navigate. Locks and dams were built along the Upper Mississippi, Illinois, Ohio, and Kaskaskia rivers, as well as the canal system to ensure that there is a constant 9-foot depth. It is important to note that the locks and dams along the navigable waterways within the state are not used for flood control.³⁰

2.3.1 HOW LOCKS AND DAMS WORK

Locks and dams are the main reason certain waterways are commercially navigable. They essentially create a step-by-step way to move vessels along the river system. By damming the river, water behind the dam creates a slack water pool which is higher than the river in front of it. This ensures a certain depth of that section of the river. Locks allows a vessel to move up to the height of the dammed pool. **Figure 2.3** illustrates a boat going up river through a lock.

FIGURE 2.3 Barge going through a Lock and Dam



2.3.2 LOCKS AND DAMS ALONG THE IMTS

The Army Corps of Engineers operates a total of 27 locks and dams within the IMTS. There are 15 lock and dam facilities along the Mississippi River. The Illinois River and CAWS have nine lock and dam facilities. The Ohio River has two lock and dam facilities, and the Kaskaskia River has one lock and dam. **Table 2.1** details all the locks and dams on navigable waterways in Illinois.

FIGURE 2.4 Locks and Dams in Illinois

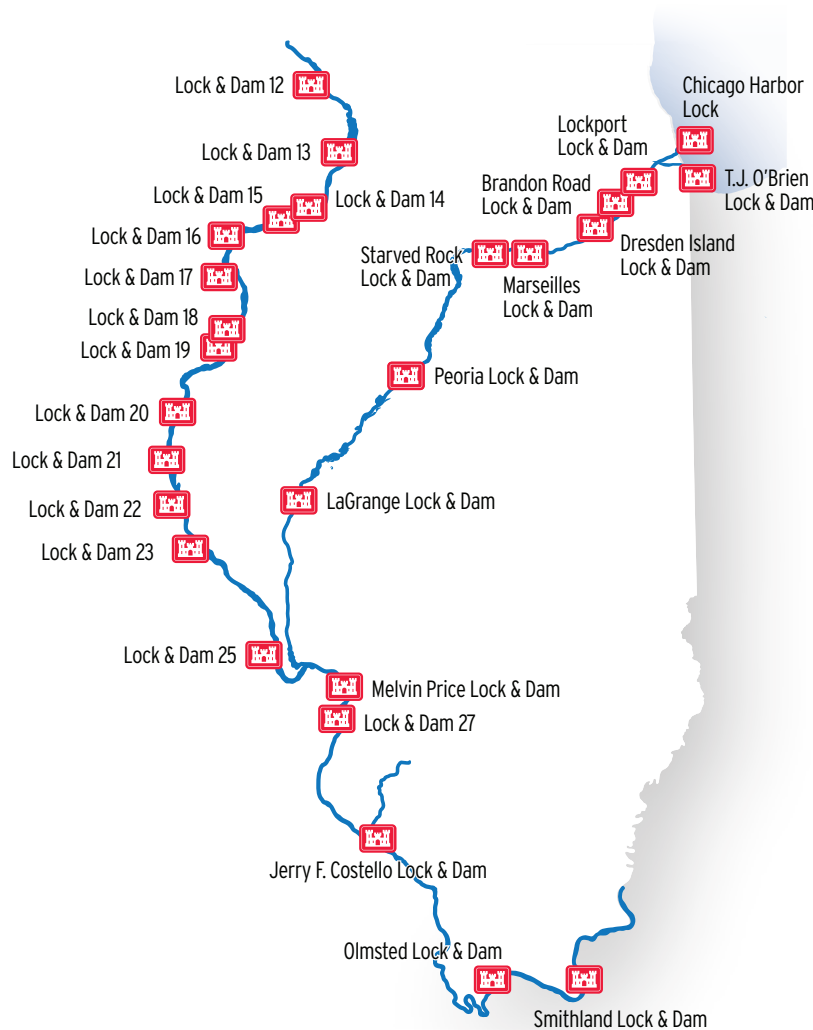


TABLE 2.1 Locks and Dams in Illinois

NAME	LOCATION [RIVER BANK]	RIVER MILEPOINT	CORP DISTRICT
Mississippi River			
12	Bellevue, Iowa [R]	567	Rock Island
13	Fulton, Illinois [L]	522	Rock Island
14	Pleasant Valley, Iowa [R]	493	Rock Island
15	Rock Island, Illinois [L]	483	Rock Island
16	Illinois City, Illinois [L]	457	Rock Island
17	New Boston, Illinois [L]	437	Rock Island
18	Gladstone, Illinois [L]	410	Rock Island
19	Keokuk, Iowa [R]	364	Rock Island
20	Canton, Missouri [R]	343	Rock Island
21	Quincy, Illinois [L]	325	Rock Island
22	New London, Missouri [R]	301	Rock Island
24	Clarksville, Missouri [R]	273	St. Louis
25	Winfield, Missouri [R]	241	St. Louis
Melvin Price	Alton, Illinois [L]	201	St. Louis
Chain of Rocks / 27	Granite City, Illinois [L]	185.5	St. Louis



NAME	LOCATION [RIVER BANK]	RIVER MILEPOINT	CORP DISTRICT
Illinois River and CAWS: River Milepoint from Grafton, Illinois			
Chicago Harbor	Chicago [R]	327 [Main]	Chicago
T.J. O'Brien	Chicago [R]	327 [South]	Chicago
Lockport	Lockport [L]	291	Chicago
Brandon Road	Joliet [R]	286	Rock Island
Dresden Island	Morris [L]	272	Rock Island
Marseilles	Marseilles [L]	245	Rock Island
Starved Rock	Ottawa [R]	231	Rock Island
Peoria	Creve Coeur [L]	158	Rock Island
LaGrange	Versailles [R]	80	Rock Island
Ohio River: River Milepoint from Pittsburgh Point			
Smithland	Hamlettsburg [L]	919	Louisville
Olmsted	Olmsted [L]	964	Louisville
Kaskaskia River			
Kaskaskia	Modoc [R]	0.8	St. Louis

Source: WSP from Army Corps of Engineers Rock Island, St. Louis, Louisville, and Chicago Districts Data



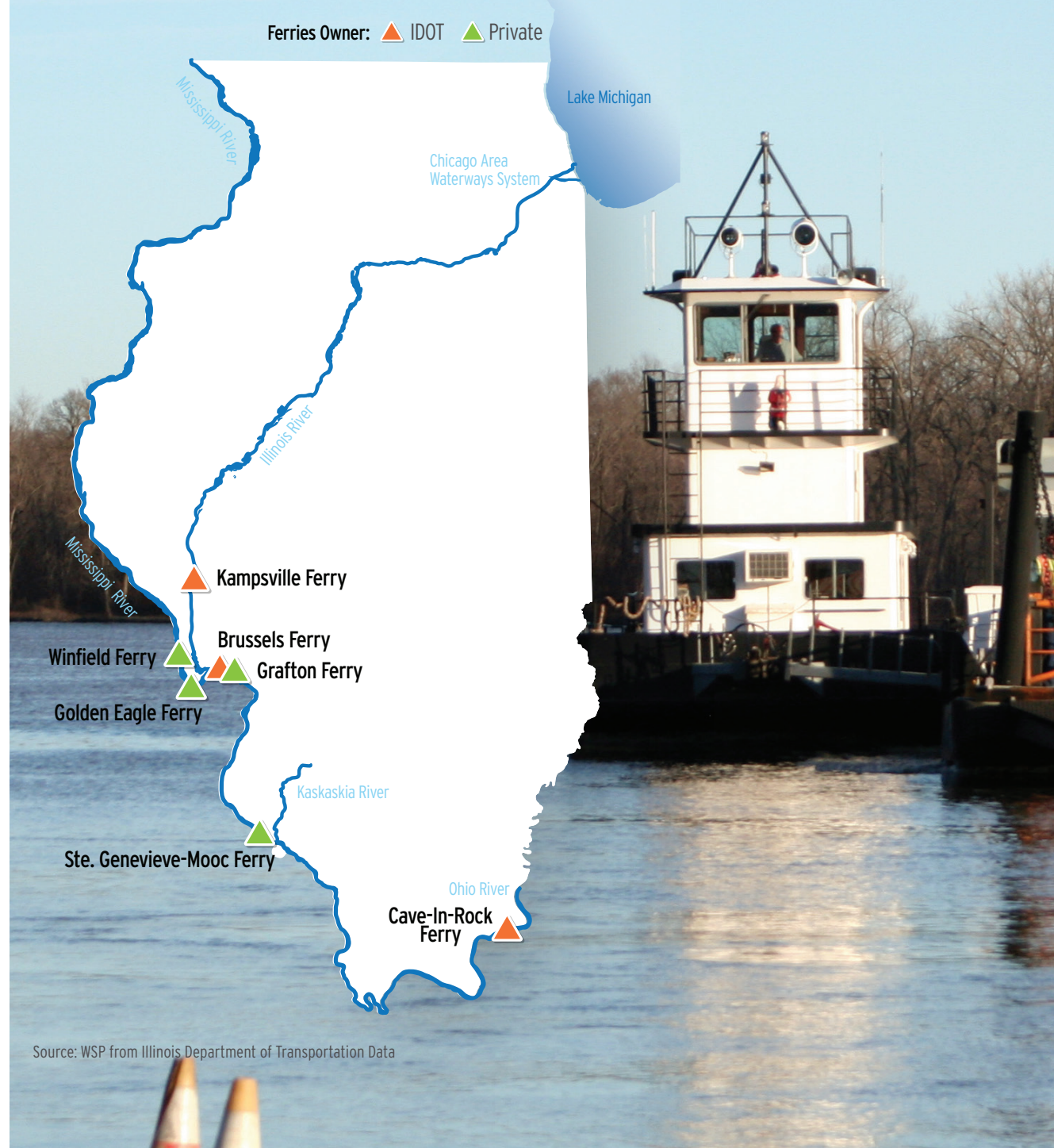
2.4 FERRIES AND CRUISES

While Illinois' vast waterway network is used for commercial shipping of materials and goods, it also plays a pivotal role in transporting people. Services such as ferries, cruises, and water taxis provide residents and visitors a means of transportation along the IMTS for logistical and recreational purposes. These services are located throughout Illinois from Chicago to the Metro-East and Savanna to Peoria. They are critical to local and regional economies; they connect communities which would otherwise be isolated from each other and provide an influx of tourism dollars along the rivers and Lake Michigan.

2.4.1 FERRIES

Ferries are an important part of Illinois' transportation network. They allow individuals to access areas that otherwise would not be accessible or would require a long route due to the lack of bridges in the area. All the ferries in the state are in Southern Illinois. Specifically, there are several ferries in and near Calhoun County, Illinois. Calhoun County sits in between the Mississippi and Illinois Rivers which makes it a peninsula, isolated from Missouri and Illinois. There are no bridges connecting the County to Missouri and only one bridge (Hardin, Illinois) connecting it to the state east of the Illinois River. Due to this lack of accessibility, there are several ferries that provide service to the county and areas nearby. Additionally, there are two other ferry services in southern Illinois as shown in **Figure 2.5**. There are a total of seven ferry services in Illinois, three are run or supported by IDOT and four are private services. Details on the ferries that service Illinois as of 2020, are indicated on the following page. Ferries can occasionally be closed due to unsafe conditions including high winds, flooding, and ice.

FIGURE 2.5 Ferries in Illinois



Source: WSP from Illinois Department of Transportation Data

IDOT-Supported Ferries

THE KAMPSVILLE FERRY

The Kampsville Ferry is located at Illinois River Mile 32 and is owned and operated by IDOT. The ferry spans the Illinois River providing a crossing for Illinois State Route 108 between Kampsville, Illinois, and Greene County, Illinois.

THE BRUSSELS FERRY

The Brussels Ferry is located at Illinois River Mile 3.5 and is owned and operated by IDOT. The ferry spans the Illinois River connecting Illinois State Route 100 in Jersey County, Illinois, to the tip of Calhoun County, Illinois.

CAVE-IN-ROCK FERRY

The Cave-in-Rock Ferry is located at Ohio River Mile 881. This ferry is operated privately by Lonnie Lewis but funded by both the Kentucky Transportation Cabinet and IDOT. The ferry spans the Ohio River connecting Illinois State Route 1 in Hardin County, Illinois, and Kentucky Route 91 in Crittenden County, Kentucky.

Non-IDOT Ferries

GOLDEN EAGLE FERRY

The Golden Eagle Ferry is located at Mississippi River Mile 228.5 and is privately owned and operated. The ferry spans the Mississippi River connecting Calhoun County, Illinois, with St. Charles County, Missouri.

WINFIELD FERRY

The Winfield Ferry is located at Mississippi River Mile 240.5 and is privately owned and operated. The ferry spans the Mississippi River connecting Calhoun County, Illinois, with Lincoln County, Missouri.

GRAFTON FERRY

The Grafton Ferry is located at Mississippi River Mile 218.5 and is owned by the New Bourbon Regional Port Authority, a port authority within Missouri, however it is privately operated. The ferry spans the Mississippi River connecting Jersey County, Illinois, with St. Charles County, Missouri. The ferry is located just south of the confluence of the Mississippi and Illinois Rivers.

STE. GENEVIEVE-MODOC FERRY

The Ste. Genevieve-Modoc Ferry is located at Mississippi River Mile 125.5 and is privately owned and operated. The ferry spans the Mississippi River connecting Modoc, Randolph County, Illinois, with Ste. Genevieve, Genevieve County, Missouri.





Cruises

The cruise industry is commonly associated with large ocean going vessels. However, there is an emerging market for Great Lakes and River cruises. Many companies offer several cruise packages ranging from 7 to 16 day trips with port of calls within Illinois. Cruises allow individuals to view the beauty Illinois has to offer from a perspective often not seen by many. The two main waterways that have cruise activity on them are Lake Michigan and the Mississippi River.

Additionally, throughout the IMTS there are many commercial watertaxies, passenger sightseeing and tour vessels. Unlike the cruises which can take multiple days, these services allow same day experiences and are located across the state and are specifically prevalent in the Chicago area. It is important to note that these services are a vital part of the local economies and encourage tourism.

GREAT LAKE CRUISES

Great Lake cruises depart or arrive in Chicago. Vessels that sail the Great Lakes range in size from being able to accommodate 80 to 200 guests. Cruises sail all five Great Lakes and provide connections to notable ports of call including Mackinac Island, Detroit, Niagara Falls (Port Colborne), Toronto, Montreal, and New York City among many others.

MISSISSIPPI RIVER CRUISES

Mississippi River cruises can span the entire river from St. Paul, Minnesota, to New Orleans, Louisiana, or portions of the river as in options to cruise the Upper Mississippi River departing from Alton, Illinois. These cruises make many stops at towns during trips.

2.5 RECREATIONAL USES

Illinois' waterways provide the state a great economic and logistical advantage compared to other states. The state has 1,118 miles of navigable waterways; however, this designation is for commercial vessels. In addition to the 1,118 miles, the state has 87,110 miles of rivers, streams, and additional bodies of water within its borders.³¹ While many of these bodies of water are not commercially navigable, they are utilized by recreational vessels. These lakes, streams and rivers add great value to Illinoisan's quality of life.

2.6 IMPORTANCE OF THE SYSTEM

The IMTS is an important part of the Illinois economy; however, it also has other direct and indirect benefits to the state as described in the following section.

Congestion Relief

The IMTS provides benefits to the State's transportation network that often goes unrecognized. For example, one 15 barge tow removes 1,050 large semi tractor-trailers off Illinois roads which is also the equivalent of the equivalent of 216 rail cars and six locomotives. As commerce continues to rise, truck traffic is expected to increase and the IMTS can serve an important role in continuing to mitigate congestion.

Environmental Impact

Climate change is an ever-growing reality that is facing the nation. CO2 emissions are a leading contributor to climate change. Some point out that barges may be a cleaner mode of transportation, emitting 90% less grams of CO2 per ton mile than trucks and 27% less grams of CO2 per ton mile than rail.³²

Fuel Efficiency

Inland barges provide the best ton mile per gallon among all modes of transportation. Ton-miles per gallon is how many miles one ton of freight is carried per gallon. Inland barges are nearly 4.5 times more efficient than truck freight and 1.3 times more efficient than rail.³³

Safety

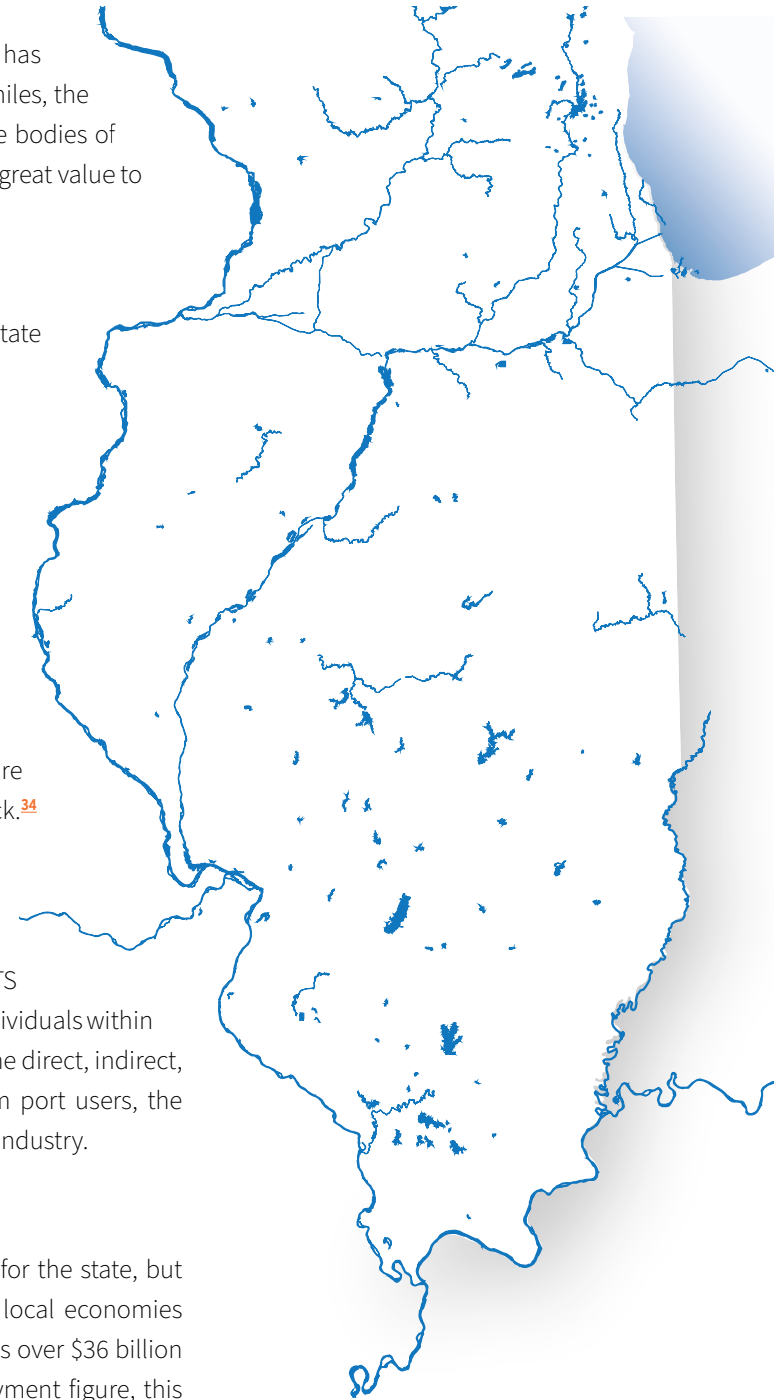
Inland barges are one of the safest means of moving freight for operators and the public. On a million ton-mile basis, there are 21.9 rail fatalities and 79.3 truck fatalities for every one fatality on the waterways system associated with the transportation of goods. Similarly, for every injury per million ton-mile on the waterways, there are 80.9 injuries on rail and 696.2 injuries on truck.³⁴

Employment

The IMTS supports a great deal of jobs throughout the state. In total, the IMTS contributes to the employment of 166,628 individuals within the state. This employment figure includes the direct, indirect, and induced employment by the IMTS from port users, the marine industry, and the marine supporting industry.

Economy

The IMTS is not only a big economic driver for the state, but it also has a large impact on regional and local economies within the state. Overall, the IMTS contributes over \$36 billion to the state's economy. As with the employment figure, this includes the direct, indirect and induced effect of the system on Illinois' economy.



2.6.1 CARGO TYPE

When it comes to cargo there are many different types, shapes, sizes, and physical characteristics. Depending on the type of cargo, specific vessels, terminals, and handling equipment may be required. In general, Illinois' waterborne cargo is classified into the following types:

||||||| Dry Bulk

Dry bulk cargo includes commodities that are consistent in nature, for example grain, coal, or iron ore. This type of cargo is transported unpacked in large volumes and must be stored separately from other commodities. Terminals usually only handle a couple of commodities due to the requirement not to cross contaminate products. In addition, barges that transport dry bulk are usually used specifically for that commodity. In the case where a barge is to be used to haul a different commodity, it often goes through a thorough cleaning to prevent contamination.

||||||| Liquid Bulk

Liquid bulk cargo includes commodities that are consistent in nature, for example petrochemicals, liquid fertilizer, and fuels. Terminals usually only handle a couple of commodities due to the requirement not to cross contaminate products. In addition, liquid bulk can be hazardous. In these cases, terminals are required to be outfitted with specialized equipment, security features, and staff to safely handle the material. Likewise, specialized barges are used to safely transport liquid bulk.

||||||| Break Bulk

Break bulk cargo are goods that are shipped as single units, for example precast concrete forms, large industrial machinery, and bulk steel. Terminals that handle break bulk require the use of fixed and mobile equipment to load and offload goods in a timely manner.

||||||| Container on Barge

Currently, container on barge is a relatively uncommon mode of transporting goods throughout the United States and Illinois. However, in recent years there has been a lot of discussion in the industry on implementing this means of shipping goods. Essentially, a vessel or barge is retrofitted to be able to transport a container. These containers are already a common means to transport goods via international ocean going vessels, rail, and trucks. Due to the benefits of shipping via inland waterway, there is promise that container on barge could become a reality in the near future.



Endnotes

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- 19..... History of the Illinois Department of Transportation, 1903-2013
- 20..... History of the Illinois Department of Transportation, 1903-2013
- 21..... History of the Illinois Department of Transportation, 1903-2013
- 22..... History of the Illinois Department of Transportation, 1903-2013, Pg28
- 23..... The tonnage figures shown in the following pages do not include Not Elsewhere Classified (NEC) volumes which represent the difference between state totals reported by the Army Corps of Engineers and volumes that can be attributed to specific waterways. A full breakout of statewide tonnage volumes with NEC volumes can be viewed in Chapter 4 and Appendix E.
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- 26.....<https://www.mvr.usace.army.mil/Missions/Navigation/NESP/The-9-foot-Channel-Project/>
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- 28..... The CAWS definition within this plan differs slightly from Illinois Administration Code title 35 § 301.247, which doesn't include the Des Plaines River as part of the CAWS.
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- 30.....<https://www.mvr.usace.army.mil/Media/News-Stories/Article/476805/why-do-we-have-locks-and-dams/>
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