Ships bearing the colors of over 50 nations regularly ply the waters of the Great Lakes, making economists and geographers alike call the Great Lakes and their connecting waterways the most important inland water transportation system in the world.


You’ve often heard me say that the St. Lawrence Seaway may well be the best kept secret in our hemisphere. I think now that it has been the best kept secret in the world.


In the quiet stillness of a summer night, the long freighter glides slowly under the Ambassador Bridge on its trip down the Detroit River. As the freighter clears the bridge, a 45-foot boat departs its dock just south of the bridge on the Detroit side of the river and steers toward the freighter, the throaty rhythm of its engine drowned out by the deep rumble of the big ship’s powerful diesels. As it draws alongside the moving freighter, the speed of the small boat, the *J. W. Westcott II*, is matched to that of the massive ore boat, the distance between the two slowly diminishing until their hulls touch and they begin to move down the river together, the *Westcott* almost invisible in the shadow of the freighter.

From the deck of the freighter, the mate of the watch pays out on a rope to lower a plastic 5-gallon pail to the two figures on the deck of the *Westcott*, whose heads are 10 feet below the deck of the ore boat. One of the men grabs the pail, places an armload of newspapers and letters in it, and yanks twice on the rope. Feeling the rope jerk, the mate hoists the pail from the blackness below and swings it onto the steel deck of the freighter. Next to him, two crewmembers begin dropping bulky white laundry bags to the deck of the small boat.

When the last of the bags of dirty laundry has been stacked on the aft deck of the *Westcott*, its engine roars as it speeds up and turns away from the freighter to head back to its moorings. Its horn emits one long and two short toots, the salute piercing the quiet of the night. On the deck of the freighter, the mate tucks the bundle of newspapers and letters under his arm and waves at the two crewmen stand-
ing at the stern of the mailboat. Before the two figures on the Westcott can return the wave, the night is shattered by the deep roar of the freighter's own air horn as it grows out one long and two short blasts in reply to the salute from the mailboat.

This scene is repeated thousands of times during each shipping season as the J. W. Westcott II delivers mail to every ship that passes the Westcott Company's facility on the Detroit waterfront. The Marine Post Office at Detroit was established in 1895 as an adjunct to the Detroit Post Office and is today the only post office in the country that exists solely to deliver mail to ships. The Westcott has even been assigned its own zip code—48222—underscoring the importance of the Marine Post Office to the sailors who crew the big freighters.

When the Marine Post Office first began at Detroit, vessel traffic on the river was so heavy that the service's one steam launch could not manage to call on every passing ship. In those days, the launch towed a small fleet of rowboats with it. When a ship approached and called out its name, a carrier would grab the mail addressed to that vessel and row over to it in one of the rowboats. In that way, several passing ships could be served simultaneously by a single steam tug.

During the first year of service, 46,994 pieces of mail were handled by the Marine Post Office at Detroit. As people became familiar with the new service, use of the post office increased rapidly. During the second year of operation, the volume of mail handled increased by almost 400 percent with a total of 175,850 letters delivered to more than 19,000 ships that passed Detroit that season. In addition to delivering the mail, personnel of the Marine Post Office recorded the name of every vessel that passed Detroit upbound or downbound. Their traffic logs provided shipowners with vital information on the whereabouts of their ships in the days before ship-to-shore radio communications.

Today, the Westcott Company provides a variety of other services to personnel aboard the U.S., Canadian, and foreign-flag ships that pass Detroit. In addition to processing inbound and outbound mail, the firm operates a chandlery that supplies ships with groceries, cleaning supplies, navigational charts, and other things needed to keep the vessels operating between ports.

Crew changes are often made at the mailboat, a service that has grown in importance since many vessel personnel have been entitled to vacations every couple of months. It is not always convenient for sailors to get on or off their ships at loading or unloading ports because they are often located far from public transportation services.

Westcott Company personnel also handle laundry for many of the ships. Bags of dirty linens dropped off at the mailboat are sent out to a commercial laundry for cleaning and are returned to the ship on its return voyage.

The Marine Post Office is just one of many vital support services necessary to keep the big freighters moving up and down the lakes, part of an elaborate industry infrastructure that has developed over the past two centuries. In addition to the Westcott operation, the infrastructure includes a wide range of government agencies and private firms that provide important, often essential, services to the ships. While it is difficult to single out one support service as being more important than the others, there are a number of government agencies in both the U.S. and Canada that are responsible for maintaining the most essential element of the system—the waterway itself. Included are the U.S. Army Corps of Engineers, the U.S. and Canadian agencies that manage the St. Lawrence Seaway and Welland Canal, and the U.S. and Canadian Coast Guards.

The Corps of Engineers is responsible for maintaining the navigable waterways of the United States, including the Great Lakes. The agency's early involvement with the nation's waterways was in support of the U.S. Navy, but since the War of 1812, its emphasis has gradually shifted to support of the commercial maritime industry, which is considered to be essential to both the economic well-being and national defense of the country. The Corps' primary function is dredging. An ongoing program of dredging is necessary to maintain channels and harbors at the prescribed depths. Without regular dredging, many of the channels and harbors used by commercial vessels would eventually fill in with silt and sand to the extent that they would become unnavigable.

The Corps is also involved in an ongoing program of dredging that is intended not just to maintain, but to improve the waterways used by commercial vessels. Channel improvement programs include both the widening and deepening of channels. Widening
of channels is often intended to make them safer, to give ships more room to pass each other, and to eliminate hazardous turns that can cause problems for the personnel who navigate commercial vessels. Some of the Corps’ widening and deepening operations, however, are designed to allow larger ships to utilize the waterways. In the Great Lakes system, each successive generation of longer, wider, and deeper freighters has led to extensive dredging of channels and harbors to allow the ships to operate safely and efficiently.

On the Great Lakes, pressure on the Corps to deepen harbors and river channels has declined somewhat during the past few years. This is a result of high water levels being experienced on the lakes because of an extended period of above average precipitation in the region. Lake levels 3 to 5 feet above the historic mean have allowed shipping companies to establish new iron ore cargo records that are almost 10,000 tons higher than those set five or six years ago. On a thousand-footer, each extra inch of water depth allows the ship to carry about 200 additional tons of iron ore; each additional foot of water depth, then, means 2,400 extra tons each trip. Spread over an entire season, the additional tonnage would total 120–150,000 tons and represent significant additional income for the shipping company.

As water levels in the lakes begin to recede, however, the Corps can expect shipping company executives to increase their lobbying for extensive dredging programs. While both the Poe and Mac Arthur Locks at the Soo can accommodate ships with drafts of up to 31 feet, channel depths in the St. Marys River and many of the harbors around the lakes are limited to a maximum of about 27 feet at normal water depths. Dredging harbors and channels to the 31-foot maximum draft of the locks would add substantial carrying capacity for most ships in the fleet. The 48 inches of additional draft the largest ships would gain would mean that they could carry an extra 10,000 tons each trip, 500–600,000 more tons each season.

Since 1881, the Corps has also been responsible for operation of the St. Marys Falls Canal, commonly referred to as the Soo Locks. Located on the St. Marys River at Sault Ste. Marie, Michigan, the locks raise or lower ships 21 feet to compensate for the difference in water levels between Lake Superior and the lower lakes. The rapids at the Soo caused by
the difference in elevation between Lake Superior and the lower lakes have always created an obstacle for commerce on the lakes. The first lock at the Soo was actually constructed by the Northwest Fur Company in 1797. Located on the Canadian side of the river, the 38-foot-long lock was designed for use by the large freight canoes used by fur trappers and traders. It eliminated the strenuous and time-consuming practice of portaging canoes and cargoes around the rapids.

The Northwest Fur Company lock was destroyed during the War of 1812 and not replaced until 1855. During that forty-three-year period, the bottleneck at the Soo became an increasingly serious problem for commercial interests in the region. Lake Superior was literally cut off from the lower lakes. Vessels from the lower lakes could navigate only as far as the lower end of the rapids at Sault Ste. Marie. Conversely, ships on Lake Superior could operate only above the rapids. Cargo had to be portaged around the rapids using freight wagons. A tramway was eventually built around the rapids, along what is now known as Portage Avenue in the Soo. Designed primarily to speed up the movement of cargo, the tramway was even used to move some smaller ships around the rapids, eliminating the time-consuming task of unloading them.

With the discovery of copper and iron ore in the Lake Superior region, however, even the tramway proved inadequate to handle the growing commerce between Lake Superior and the lower lakes. In 1852, Congress passed legislation granting 750,000 acres of federal land to the state of Michigan to be used to compensate any company that would build a viable lock at the Soo. Support for the legislation was not unanimous, however. Among the leaders of the opposition was the great orator Henry Clay. The distinguished senior senator from Kentucky opposed building a lock on the northern frontier of the U.S., arguing that “it is a work beyond the remotest settlement of the United States, if not the moon.”

Despite Clay’s vehement objections, the legislation passed, and the franchise to build the lock was subsequently awarded to the Fairbanks Scale Company, a Vermont firm that had extensive mining interests in Michigan’s Upper Peninsula. The task was of epic proportions for that time. Much of the two locks and more than a mile of approaching channels had to be hewn out of solid rock by gangs of laborers working with almost primitive tools. The success of the project was made even more astounding by the fact that the excavations and construction were managed by Charles T. Harvey.

Harvey was a young accountant who worked as western regional manager for Fairbanks. He had come to the Soo in 1852 to recuperate from a bout with typhoid, and he quickly grasped both the need for the lock and the potential economic gain in store for the company that would build it. Harvey convinced his employers to take on the venture and was designated their manager for the project. When construction began in June 1853, Harvey was only twenty-four years old. More significantly, the eager and energetic young man had no prior construction experience.

By the first winter, Harvey had two thousand workers employed on the project, primarily recent Irish and German immigrants who were recruited in Detroit and New York. Although numerous obstacles were encountered during construction, Harvey proved to be a brilliant manager. The project was completed in less than two years and at a cost of just under $1 million.

The first canal consisted of two locks, each 350 feet long and 70 feet wide. The upper lock raised or lowered vessels 8 feet, the downstream lock 10 feet. The depth over the lock sills was only 9 feet, meaning that when the locks were flooded to the level of the lower lakes they could accommodate only ships with drafts of less than 9 feet. The approach canal was more than a mile long, 100 feet wide, and 12 feet deep.

The completed locks were turned over to the state of Michigan on May 31, 1855, and officially opened to commerce on June 18 in ceremonies presided over by numerous Michigan officials. The first vessel to transit the locks was the Str. Illinois, which was en route to Lake Superior. The first downbound vessel to use the locks was the Str. Baltimore. One month later, the two-masted brig Columbia carried the first load of iron ore through the locks. In only five years, the locks at the Soo were to play an important role in support of Union efforts in the Civil War by insuring a steady flow of iron to meet the nation’s war needs. By then, a virtual river of red was flowing from the iron mines on the Lake Superior ranges to the smelters and mills in Ohio and Pennsylvania.

As payment for construction of the locks, the Fair-
banks company was allowed to claim 750,000 acres of federal lands in Michigan. They chose approximately 40,000 acres of land in the iron ranges, 150,000 acres in the copper region of the Keweenaw Peninsula, and 560,000 acres of prime timberland in Michigan's Lower Peninsula.5

Boats that passed through the State Lock, as it was then known, were required to pay a toll of four cents per ton until 1877, when the toll was reduced to three cents per ton. By the time control of the locks was transferred to the federal government in 1881, virtually the full cost of building the locks had been recovered through the tolls. Since the locks have been under the jurisdiction of the Corps of Engineers, vessels have been able to transit the locks toll free.

Today there are four locks at the Soo, though only two are generally in use. The largest of the locks is the massive Poe Lock, the second lock named for the Corps of Engineers colonel who served as Detroit district engineer from 1870–73 and 1883–95. Opened in 1968, the Poe is 1,200 feet in length, 110 feet wide, and 32 feet deep. The lock could accommodate ships of up to 1,100 feet in length, although the longest vessel on the lakes at present is just over 1,000 feet long.

The second lock in operation at the Soo is the MacArthur, opened in 1943 and named for the popular World War II general. The “Mac,” as it is commonly called, is 800 feet long, 80 feet wide, and 31 feet deep. It can handle ships of up to about 730 feet in length, with beams of up to 75 feet.

The other two U.S. locks at the Soo, the Davis and Sabin, were put into operation in 1914 and 1919, respectively. They are identical in size, both being 1,350 feet long, 80 feet wide, and 23 feet deep. While the length and width of the two locks is adequate to accommodate most ships operating on the lakes today, their limitation to a 23-foot draft makes them essentially obsolete.

The Corps and commercial interests on the lakes are awaiting final budgetary approval for the construction of a new lock at the Soo, to be built on the site of the present Sabin and Davis locks. The new lock will be a twin to the Poe, built primarily to handle thousand-footers. At present, if the Poe Lock were to be disabled for some reason, thousand-footers would not be able to operate between Lake Superior and the lower lakes. With the thirteen thousand-footers on the lakes accounting for a large share of the U.S. fleet's carrying capacity, closure of the Poe Lock would seriously impair the industry. Not only would the U.S. shipping companies suffer, however, so too would the U.S. steel industry which benefits from the lower transportation costs that result from use of the highly efficient thousand-footers.

As important as they are, the locks at Sault Ste. Marie were not the first locks built on the Great Lakes and St. Lawrence River system. In 1783, more than seventy years before the opening of the State Lock, Royal Engineers in Canada completed work on a series of four canals between Montreal and Lachine on the St. Lawrence River. The canals allowed freight canoes and bateaus to bypass rapids on the St. Lawrence River without portaging. The size of those first locks were eventually enlarged and, in 1825, the Lachine Canal at Montreal was opened for navigation. The Lachine Canal consisted of twelve locks, each 100 feet long and 25 feet wide, with a depth over the sills of 5 feet. They allowed vessels to bypass the turbulent Lachine Rapids on their travels between the upper St. Lawrence and Lake Ontario.6

While the route between the Atlantic and Lake Ontario was gradually being improved, vessel travel west of Lake Ontario was impossible because of Niagara Falls, which blocked the way to Lake Erie and the upper lakes. In the fall of 1829, that last barrier to travel on the Great Lakes and St. Lawrence System was finally broached with the opening of the first Welland Canal by a group of private entrepreneurs.

The original route around Niagara consisted of a series of canals and forty locks that connected several rivers between Lake Ontario and Lake Erie. The locks were built of wood and each was 110 feet long, 22 feet wide, and 8 feet deep. Boats were towed through the narrow canal by teams of horses. In 1842, the Ontario government purchased the canal and began a series of improvements. The forty original wooden locks were replaced by twenty-seven locks of cut stone, each being 150 feet long, 26 feet wide, and 10 feet deep. A canal was also dug between the towns of Welland and Port Colborne on Lake Erie, much of it through solid rock, which provided a more direct route than the original canal. In 1867, the canal was taken over by the new federal government of Canada. Major improvements were again made on the canal between 1881 and 1887, resulting in the enlargement of locks to 270 feet in length, 45
The *Str. Benson Ford* enters the lowest of three adjoining “flight locks” in the Welland Canal. The Monrovi-registered *Federal Saguenay* can be seen in the lock above the *Ford*. (Author’s collection)
feet in width, and 12 feet in depth. The present Welland system was completed in 1932 at a cost of $132 million. The number of locks was reduced to eight, each of which is 820 feet long, 80 feet wide, and 30 feet deep.7

For the first time, the five Great Lakes were open to virtually unrestricted vessel traffic. Travel between Lake Ontario and the St. Lawrence River, however, continued to be limited to canallers, ships that were under 260 feet in length, with beams of about 44 feet and drafts under 12 feet, the maximum dimensions that could be accommodated by the St. Lawrence canals and locks.

Only the smallest saltwater vessels were able to enter the Great Lakes because of the restrictive size of the locks between Montreal and Lake Ontario. People around the lakes who were unfamiliar with the limitations of the St. Lawrence system often commented on how much smaller the saltwater ships were than the 600-foot lakers then a common sight on the lakes. They didn’t realize that the larger saltwater vessels, every bit the equals of the bulk freighters that operated on the lakes, were forced to discharge their cargoes at Montreal and other deep-water ports on the upper St. Lawrence. Those cargoes were then either shipped overland or carried into the lakes by the canallers. For all intents and purposes, the Great Lakes were still cut off from the ocean, at least for normal marine commerce.

The irony of the lakes draining into the ocean by way of the St. Lawrence River, but that route not being open to full-sized ships, had not gone unnoticed. As early as 1892, a congressman representing the farm areas of Minnesota, Swedish immigrant John Lind, had sponsored a resolution calling for establishment of a joint U.S.–Canadian committee to study the possibilities of opening a water route from the head of Lake Superior to the sea. Two years later, the Deep Waterways Association was formed in Canada. They supported Lind’s call for a binational group to study improving the St. Lawrence waterway. The study group that was subsequently formed took little time in reaching the conclusion that a viable route to the Atlantic—a “seaway”—could be established via the St. Lawrence River. The seaway proposal was endorsed by President Grover Cleveland. A series of engineering studies were conducted, but no further significant action occurred until after World War I when the Great Lakes—St. Lawrence Tidewater Association was formed. The new association, the brainchild of a Duluth lawyer named Charles Craig, was made up of representatives of a number of the Great Lakes states. For sixteen years the group lobbied unsuccessfully for construction of a seaway, opposed by public and private utility companies that wanted to reserve the river for production of hydroelectric power.

In 1932, a treaty was signed by Canadian Prime Minister R. B. Bennett and U.S. President Herbert Hoover that committed the two nations to working together to construct a seaway to a draft of 27 feet. Under terms of the treaty, the two nations were to share in the costs of constructing the needed locks and channels in the International Rapids section of the river, bounded on the north by Quebec and on the south by the state of New York. There was immediate, strong opposition to the Hoover-Bennett Treaty by the railroads, privately owned utility companies, coal interests, and Eastern and Gulf Coast ports. A number of Great Lakes interests even objected to the seaway proposal, including the powerful Lake Carriers Association and port authorities in Chicago and Cleveland.

The most-often-cited argument against the seaway was cost. Those allied against the project argued that costs would total over $1 billion for the U.S. and Canada and that much of the U.S. share would have to be paid by taxpayers living outside the Great Lakes area who would not benefit from the seaway. Others objected to the possible diversion of business from U.S. ports and shipping companies. They even argued that construction of the seaway would open inland markets to unfair foreign competition by allowing tramp steamers to dump cheaply produced commodities on the Great Lakes market.

The Hoover-Bennett Treaty was finally brought up for a vote before the U.S. Senate in the spring of 1943, but failed to get the necessary two-thirds vote needed for ratification. At a White House press conference held the day of the vote, President Franklin Roosevelt, long an advocate of seaway construction, stated unequivocally: “Whether the thing goes through this afternoon or not makes no difference at all. The St. Lawrence Seaway is going to be built, just as sure as God made green apples.” Roosevelt was right, of course, but he did not live to see positive action taken on the seaway proposal.

While U.S. officials again put the seaway on the
Support Services

back burner, the Canadians grew impatient, announcing that they would proceed with the construction on an all-Canadian seaway. The Canadian St. Lawrence Seaway Authority was established and empowered to build the seaway from Montreal to Lake Erie with or without U.S. participation. As the Canadians proceeded unilaterally with their seaway plans, members of the U.S. Congress became alarmed. They realized that without U.S. participation, Canada would control access into the heart of North America, and they feared that American shippers would be charged exorbitant tolls to use the route. President Truman exorted Congress to commit the U.S. to participation in the seaway's construction. It was no longer a question of whether the seaway would be built, he argued, but whether the U.S. would participate in the project and share in operation and control of the route. A seaway proposal sponsored by congressman John Blatnik of Duluth was put before the Congress, but it was defeated in the Senate during the 1952 session on a 43–40 vote. After Dwight Eisenhower assumed the presidency in 1953, new seaway legislation was introduced in the congress by Senator Alexander Wiley of Wisconsin and Representative George Dondero of Michigan. After another bitter battle, the legislation was finally enacted in the spring of 1954.

The massive construction project began in November of that year. Stretching for 190 miles, much of it through bedrock, the St. Lawrence Seaway presented a monumental challenge for builders. The scope of the project dwarfed the earlier construction of the 100-mile Suez Canal and the 50-mile Panama Canal. In Canada, eight thousand residents of seven communities were dislocated by the project, while over a thousand had to abandon their homes on the New York shore of the waterway. Three new communities were established in Ontario. Homes, churches, schools, factories, businesses, and even cemeteries were transplanted from the areas that would eventually be flooded by the new hydroelectric dams that were being built as part of the total seaway project.

Seven new locks were built to compensate for the 484-foot difference in elevation between Lake Ontario and the upper St. Lawrence River. Five of the locks are in Canada, built by the St. Lawrence Seaway Authority. The other two are in the U.S., constructed by the U.S. St. Lawrence Seaway Development Corporation.

To carve out the seaway, over twenty-two thousand workers moved 210 million cubic yards of rock and dirt and poured more than 6 million yards of concrete. Total costs for the project were just over $1 billion, including $600 million for U.S. and Canadian hydroelectric development, $322 million for the Canadian locks and channels, and $124 million for the U.S. locks and channels. The Canadian Seaway Authority went 80 percent over its budget; the U.S. Seaway Corporation 42 percent.

With President Eisenhower and Queen Elizabeth II presiding, the monumental link between the waters of the Great Lakes and the Atlantic Ocean was officially dedicated on June 26, 1959. Over 20 million tons of cargo moved through the system the first year it was in operation as the previously landlocked ports of the Great Lakes became international ports. In 1970, the international character of the Great Lakes ports was officially recognized when President Richard Nixon signed legislation that gave the Great Lakes and St. Lawrence Seaway status as “America's Fourth Seacoast.”

Costs of operating and maintaining the Seaway are paid for by tolls charged to vessels transitting the system. Seventy-one percent of the revenues go to the Canadian Seaway Authority, with the balance to the U.S. Seaway Corporation. For a maximum Seaway-size vessel, tolls for transitting the Montreal to Lake Ontario section of the Seaway total about $1,600 for a vessel in ballast to approximately $15-$56,000 for a loaded ship, depending on the type of cargo being carried. Tolls for the Welland Canal portion of the system would run from about $1,400 for an empty ship to $10-$15,000 for a laden vessel.

Supporters of the system have long claimed that the tolls are exorbitant and constitute an impediment to use of the system, primarily by foreign-flag shipping companies. They note that the U.S. portion of the St. Lawrence is the only navigational system in the country required to support itself from tolls collected on users. Of the 27,000 miles of navigable waters in North America, the only tolls in existence are on the 124 miles of the seaway and the 27 miles of the Welland Canal. The toll requirements for the seaway were written into the Wiley-Dondero legislation to help eliminate some opposition in the Congress, but other waterways constructed with federal funds have not been similarly burdened with toll
An aerial photo showing construction on the Eisenhower Lock of the St. Lawrence Seaway in 1956. One of two U.S. locks in the system, the Eisenhower is located at Massena, New York. (St. Lawrence Seaway Development Corporation)
In August 1957, the towering concrete walls of the Eisenhower lock are nearing completion. Like the other seven locks in the 190-mile system, the Eisenhower is capable of handling ships up to 730 feet long and 75 feet wide. (St. Lawrence Seaway Development Corporation)
requirements. That includes the extensive Mississippi River system and the newer Tennessee-Tombigbee Waterway, both of which are in competition with the Great Lakes–St. Lawrence system for cargo moving out of the U.S. Midwest.

In the closing days of 1986, legislation was pushed through just hours before the adjournment of the Ninety-ninth Congress to eliminate tolls on the U.S. portion of the seaway and authorize the spending of $39 million in general fund revenues for repair of the two aging U.S. locks. Enactment of that legislation was followed several months later by word from the Canadian Seaway Authority that it intended to hike tolls on its portion of the Seaway, significantly diminishing the value of the U.S. action to gain equitable treatment for the seaway and help encourage its use by international shippers. U.S. officials, along with many Canadian port and maritime officials, immediately began pressing for the reduction or elimination of Canadian tolls. That campaign is still raging. It has united industry leaders on both the U.S. and Canadian sides of the system in much the same way they worked together to build the seaway originally.

From its opening in 1959, tonnages moving through the seaway rose steadily, reaching a high of more than 57 million tons in 1973. Studies projected that the seaway would reach its maximum capacity by 1990. While the Corps of Engineers studied the possibility of building an all-American canal to bypass the anticipated bottleneck at the Welland, a project the Corps' budget analysts calculated would cost more than $2 billion, traffic began to slowly decline on the seaway. By the 1986 season, traffic had fallen to under 40 million tons, well below the maximum design capacity of the system.

While the potential problem of overcapacity on the system was averted, industry leaders began to fear that the system was rapidly becoming obsolete. The most modern and efficient ocean vessels are too large to fit into the seaway locks, so cargo that could move in and out of the lakes by water is being handled at ports on the upper St. Lawrence River and the east coasts of the U.S. and Canada. The major U.S. and Canadian railroads have established efficient systems to move cargo overland between the industrial and agricultural areas of the Great Lakes region to the coastal ports, what is referred to in the industry as the landbridge.

Ports east of the seaway locks on the St. Lawrence, including Montreal and Quebec City, have also experienced significant increases in traffic concurrent with the decline in traffic through the seaway system. Much of the container traffic originating at Great Lakes port cities, such as Detroit and Chicago, now moves overland to Montreal by rail. Incoming cargo often follows the same route, being offloaded at Montreal, Quebec City, or East Coast ports and railed to its final destination.

In evaluating the state of the seaway system in 1966, William O'Neil, president of the Seaway Authority said, "It is difficult to be optimistic about the prospects for significant improvement in seaway traffic but, at the same time, we should recognize that this present malaise is not something peculiar to the region. The shipping industry worldwide is going through a difficult period as a result of the effects that the recent recession had on international trade. Other transportation modes are also suffering."

In an attempt to counter falling tonnages on the seaway system, U.S. and Canadian seaway officials, Great Lakes port administrators, executives of shipping companies, union officials, and heads of terminal and stevedoring firms have attempted to expand their program to market use of the system. Since 1985, they have visited annually key European cities on trade missions designed to familiarize European shipping executives with the seaway system and its advantages to firms shipping in or out of the Great Lakes region. Industry leaders who have participated in the trade missions have indicated that they were well received in Europe and their efforts may result in some additional cargo movements through the seaway. For the most part, however, shipping decisions are made largely on the basis of cost competitiveness. Shippers will choose the least expensive route and mode of transportation. In that respect, the seaway's size restrictions often mitigate against use of the St. Lawrence—Great Lakes route. As ocean vessels continue to increase in size, the seaway route will become even less competitive.

Another impediment to growth in the amount of traffic through the system is the fact that it is only in operation for about nine months of the year. Firms using the seaway must switch to a different route during the winter months when the system is shut down and vessels can only travel down the St. Lawrence River as far as Montreal. Like the interna-
tional shipping business, the interlake bulk cargo
trade is similarly adversely affected by the winter
shutdown. Firms that rely on the bulk freighters to
supply them with coal, iron ore, stone, or petroleum
products are forced to stockpile large quantities of
the materials before the close of the shipping season,
an expensive proposition, or they must arrange to
have the raw materials they need shipped overland
by rail, also an expensive alternative.

The length of the season on the Great Lakes has
always been dictated by “Mother Nature.” Somewhere
between the middle of December and first of
January each year, a curtain of snow and ice de-
scends on the lakes, bringing shipping to a halt.
Over the years, the industry has learned to anticipa-
tate when the onset of bitter winter weather would
bring the season to a close, and companies have
managed to get their ships off the lakes before the
rivers and harbors have been covered with their
first patina of unyielding ice. There are many
instances, however, when nature has surprised the
industry by lowering that icy curtain earlier than
industry officials anticipated.

In 1926, the early onset of winter took the indus-
try completely by surprise, stranding 150 ships in
the ice at Sault Ste. Marie. The Chief Wawatam,
a large railroad ferry that normally operated between
St. Ignace and Mackinaw City, and five tugs worked
night and day for three weeks to free the ships from
the ice. While the frantic icebreaking activity was
successful in freeing most of the ships, twenty-six re-
mained locked in the ice of the St. Marys River all
winter.

The following year, another early winter storm
descended on the upper lakes. As temperatures hov-
ered at 40° below zero, more than twenty Canadian
freighters were trapped in the St. Marys. The convoy
carried more than 6 million bushels of grain des-
tined for storage facilities in eastern Canada. The
ships were not able to complete their voyages until
they were freed from the ice the following April.
A total of 247 ships and 5,000 sailors were trapped at
the Soo by that early December freeze in 1927. It
took ten days of icebreaking and a lull in the harsh
weather to free the ships so they could finish the last
voyage of the season. Those must have been exciting
days for the residents of the Soo. Local farmers and
shipkeepers used sleds to haul groceries and other
provisions to the icebound ships, and many of the
sailors walked ashore over the ice to buy tobacco. 

Nature also controls the start of the season in the
spring. Industry officials have learned that winter
normally gives up its icy grip on the lakes by April 1,
so that is when most of the fleets schedule their first
ships to leave the lay-up docks, although some limit-
ed shipping activity often begins on the lower lakes
in early March. It’s common for ships to experience
some ice problems in the rivers and harbors during
the early part of the season, but the Coast Guard
and private tug operators normally have their ves-
sels standing by to lend assistance so that freighters
don’t experience serious delays. On occasion, howev-
er, nature also asserts its dominance in the spring.

Just after the navigation season opened in April
1984, several days of strong northerly winds pushed
floating ice from Lake Huron down into the narrow
St. Clair River, turning it into what one Great Lakes
captain aptly described as a “giant Sno Cone.” From
the Blue Water Bridge at Port Huron to Lake St.
Clair, the river was packed with broken chunks of ice
that in some places extended all of the way from the
surface to the riverbed. Traffic on the lakes was
brought to a virtual standstill for a period of about
ten days.

The Coast Guard closed the river to vessel traffic,
forcing more than ninety ships to go to anchor, while
U.S. and Canadian icebreakers worked to break
through the ice jam. The largest concentration of
ships was caught on the southside of the jam, includ-
ing many freighters that had just left their lay-up
docks on Lake Erie and a number of saltwater ships
making their first trips of the season into the lakes.
Ships waiting to go up the river filled every available
anchorage in the Detroit River and along the north
shore of Lake Erie, all the way to the Welland Canal.
When the icebreakers finally broke the jam and the
ice began to flow down into Lake St. Clair, the river
flushed itself out in a matter of a few hours. Before
that happened, though, the delays had cost shipping
companies millions of dollars.

After succumbing to nature’s limits on season
length for a hundred years, Great Lakes shipping of-
icials began in the late 1960s to argue that extend-
ing the navigational season was feasible from both
the economic and engineering perspectives. While
there had been talk for decades of extending the season, the stage was finally set in the late sixties to do battle with the forces of nature. The 1967 shipping season was extended until January 3, 1968, ten days to two weeks longer than normal. It was a conservative beginning, but it launched a program that would become the central focus of the industry for the next decade, the most aggressive project ever undertaken by shipping interests on the lakes.

A number of factors converged to make the winter navigation project a reality: a healthy U.S. economy, the development of taconite, a belief that technology could overcome nature, a movement within the U.S. steel industry toward increased efficiency, and the emergence of a strong leader within the Great Lakes industry. While it is impossible to rank the factors in terms of their order of importance in bringing about winter navigation, it is safe to say that if any one of them had been absent the program would probably not have been implemented.

By 1967, the U.S. was deeply embroiled in Vietnam, and the war was stimulating the domestic economy. In addition to the high levels of military spending, billions were being poured into the economy each year by the extensive “Great Society” social programs that had emerged during the Kennedy and Johnson administrations. The budgets of government agencies swelled, including those of the Corps of Engineers and the Coast Guard. Government agencies, in fact, went looking for programs that would allow them to justify further staff and budget increases.

Buoyed by the war and record domestic auto sales, the steel industry was making a strong recovery from the slump it had experienced after the Korean War. Facing increasingly strong competition from foreign steel producers, however, the industry also began to search for opportunities to cut production costs. In the Great Lakes region, executives in the iron ore, steel, and shipping industries had long been aware of the costs that resulted from the lack of year-round shipping on the lakes. Expensive capital
equipment sat idle three to four months of the year, and companies incurred significant additional expense as the result of having to stockpile vital raw materials or ship by rail during the winter months.

Until 1955, it was virtually impossible to ship iron ore during the winter months because the moisture laden raw ore froze in stockpiles and couldn’t be loaded into ships. If you could load it, you faced the prospect that it would freeze in the hold of the ship while in transit. With the development of beneficitation technology in 1955, however, more and more ore began to be shipped as taconite, marble-sized pellets of concentrated ore that were almost totally free of moisture. Unlike raw ore, taconite was relatively easy to handle during the winter months, eliminating one of the historic impediments to year-round operations on the lakes.

While the development of beneficitation technology in the 1950s eliminated one stumbling block to year-round shipping on the lakes, the 1960s saw the emergence of a national mindset that was based on a belief that we were technologically capable of solving any problem. That belief was most clearly evidenced in the U.S. space program and our national commitment to go to the moon by the early 1970s. Our national fascination with the seemingly infinite capabilities of our technology triggered high levels of spending on research and development in both the public and private sectors. Government and business leaders operated on the conviction that given enough resources, we could solve any problem with our technology. In addition to our investments in the space program, billions were poured into research and development projects intended to find solutions
to a plethora of problems in fields like education, health care, unemployment, and poverty.

In that environment, the inherent difficulties of operating ships on the Great Lakes during the winter months became just one more example of a problem that could be solved through the application of our virtually unrestrained technological capability. What was needed, industry officials claimed, was a demonstration project that would allow us to identify the problems and develop solutions to them. Given the plentitude of federal resources, agencies like the Corps of Engineers and Coast Guard were very willing to get involved in projects that would allow them to dip deeper into the largess of the government coffers. New programs meant new personnel, more equipment, larger budgets, and greater prestige for the agencies involved, factors commonly associated with “success” within bureaucratic organizations.

What was needed was a strong leader to emerge within the Great Lakes maritime community—someone of vision who would realize that the unique circumstances of the time had set the stage for a program like winter navigation, someone who could muster the disparate resources available into a unified assault on the snow and ice that had for so long thwarted the industry on the lakes. That leader emerged during the 1960s in the person of Christian Beukema, vice president of U.S. Steel.

Beukema joined U.S. Steel in 1940 at its limestone quarry at Rogers City, Michigan. Moving steadily up through the management ranks, he became the giant steelmaker’s vice president for ore, limestone and lake shipping in the early sixties. From his office at corporate headquarters in Pittsburgh, Beukema controlled U.S. Steel’s iron ore and limestone mining operations and the U.S.S. Great Lakes Fleet, successor to the famous Pittsburgh fleet, at that time, the largest American fleet on the lakes.

Essentially, Beukema was responsible for insuring that adequate supplies of iron ore and stone were supplied to U.S. Steel’s mills. With mounting pressure to reduce operating costs, he was also saddled with the responsibility to see that the raw materials were delivered at the lowest possible cost. In a 1971 article in Seaway Review, Beukema told why he became an advocate of winter navigation:

The U.S. Steel dedication to extended season navigation has been born out of the necessity that has marked all recent cost reduction efforts in the domestic steel industry. One does not need to belabor the extreme competition posture of the steel industry as it battles against the inroads made even in Great Lakes markets by foreign steels produced by low-cost foreign labor and floated to this country by low-cost foreign flag operators.

One thing has become abundantly clear to U.S. Steel—it must maximize utilization of its most efficient facilities to attain optimum costs. The transportation of iron units from Lake Superior became a likely area for increased performance when U.S. Steel commenced operating its first taconite pellet plant in Minnesota late in 1967. For the first time in history we had tonnage of iron ore to move that was of sufficiently low moisture content that frozen cargo was no threat.11

Although lakes’ shipping companies were generally lukewarm about extending the navigation season, powerful U.S. Steel moved ahead unilaterally. Beukema and other U.S. Steel officials found both the Corps of Engineers and Coast Guard eager to participate in an extended-season demonstration project. Corps support was essential because the locks at Sault Ste. Marie would have to be kept open beyond the normal mid-December closing date, and the Coast Guard was needed to provide icebreaking support.

Following the modest extended-season success during the winter of 1967–68, ships were committed to winter operations at the end of the 1968 and 1969 seasons. The vessels operated until January 7 the first year and until around January 14 the second year with no significant problems.

In 1970, the Lake Carriers Association joined with U.S. Steel to lobby for federal funds that would allow the demonstration program to be continued and expanded. An amendment to the Rivers and Harbors Act of 1970 appropriated $6.5 million to fund a three-year program to determine whether it was feasible and economical to extend the shipping season on the lakes. The program was not without its opponents. Utility companies operating hydroelectric plants feared that icebreaking activities would cause flows of broken ice to clog the water intakes of their power-generating dams. Environ-
mentalists around the lakes expressed concern that the fragile ecology of the shoreline areas would be damaged by ice flows and propeller wash concentrated under the shoreline ice cover. Labor unions representing personnel crewing the freighters, while not overtly opposing the demonstration project, had reservations based on safety considerations. They pointed out that the normal risks associated with vessel operations on the lakes were compounded during winter navigation.

Further concern about the program was expressed by residents of islands in the St. Marys River—Sugar, Lime, and Drummond—and of Harsens Island in the St. Clair River. During the normal navigational season, residents of the islands travel to and from the mainland by ferries. During the winter when ferries cannot operate, they drive to or from the mainland in cars or on snowmobiles, travelling across the solid ice cover of the rivers. Vessel operations in the rivers during the winter months would disrupt that ice cover. To allow island residents to get to and from the mainland while the extended-season operations were underway, a commitment was made to keep the ferries in service throughout the winter months. Significant problems were encountered, however, and there were many instances when the ferries could not operate or when they could not shuttle vehicles between the islands and the mainland. As a result, island residents were among the most vehement opponents of the winter navigation program.

Operation Taconite, as it was known, commenced at the end of the regular 1970 shipping season. The expanded project was under the control of a Winter Navigation Board, which consisted of officials of the Corps of Engineers, Coast Guard, St. Lawrence Seaway Development Corporation, National Oceanic and Atmospheric Administration, Maritime Administration, Department of the Interior, Environmental Protection Agency, Federal Power Commission, and the Great Lakes Commission. Some technical support was also provided by the National Aeronautics and Space Administration and the Atomic Energy Commission, while representatives of other interests, such as labor, were invited to participate in all board activities.

During the three years of the demonstration program authorized in the 1970 legislation, encompassing the winter seasons of 1971–72, 1972–73, and 1973–74, the season on the upper lakes was extended into the month of February for the first time in history. Tonnages hauled after the normal close of the shipping season ranged from 4 million tons in 1971–72 to more than 10 million tons in 1973–74. Iron ore accounted for more than half of the total. The demonstration program was eventually extended through the winter of 1978–79. Congress appropriated a total of $13.7 million for the program, although $2.3 million authorized for activities on the St. Lawrence Seaway was never spent.

The program’s greatest success came during the winter of 1974–75 when vessel operations never ceased on the upper lakes. For the first time in history, the lakes’ industry could claim a twelvemonth season. Industry officials began to shift from talking about winter navigation to using the terminology year-round shipping, subtle testimony to the industry’s optimistic vision of the program’s future. That optimism was reinforced during the 1975–76 season when, for the second year in a row, the system was kept open during the winter months, and ships participating in the program moved 15 million tons of cargo. A slight setback occurred during the 1976–77 season, however, when unusually severe weather forced the demonstration program to come to a halt during the month of February, resulting in only an eleven-month season. During the final two years of the program, the winters of 1977–78 and 1978–79, ships again operated continuously on the upper lakes, although tonnages failed to reach the record set during the 1975–76 season. The program was abandoned at the end of the 1978–79 season.

During the eight years of the congressionally authorized demonstration program, more than 4,000 winter transits were made through the Soo Locks. Extended season shipments through the locks totalled more than 41 million tons, averaging about 5 million tons a year. The program was also responsible for additional shipments on Lakes Michigan, Huron, and Erie, and some modest amounts of winter cargo moved through the Welland Canal, Lake Ontario, and the Lake Ontario-Montreal section of the St. Lawrence system. The Winter Navigation Board calculated that the additional cargo moved during the winter months had a market value of more than $2.5 billion.12
The icebreaker *Mackinaw* passing the U.S. Coast Guard station at Sault Ste. Marie, Michigan. Buoys that have been pulled from Lake Superior and the St. Marys River before the onset of winter can be seen on the dock and in the slip in the foreground. (Institute for Great Lakes Research, Bowling Green State University)
The end of year-round navigation came not because the program had proven to be unsuccessful, but as a result of a serious downturn in the U.S. economy. During 1980, the demand for iron ore, coal, grain, and stone declined dramatically. Total shipments of those commodities on the lakes fell by 32 million tons between 1979 and 1980. Iron ore tonnages dropped most precipitously, from 92 million tons in 1979 to 72 million tons in 1980. With many of the Great Lakes bulk freighters spending the 1980 season laid-up at docks around the lakes, the industry lost interest in operating ships beyond the normal close of the season.

Whether the program would have been continued if demand for raw materials had remained high, however, is questionable. Although the Winter Navigation Board labelled the program a success in their final report to Congress, it had come under increasing fire from critics. The loudest opposition to the winter navigation program came from residents of the islands in the St. Marys and St. Clair Rivers who experienced difficulty in getting to and from the mainland where they worked, shopped, or went to school; environmentalists who feared that the ecosystems of the rivers would be damaged as a result of winter operations; and some Great Lakes sailors who questioned the safety of operating vessels during the harsh winter months. In the final analysis, those groups of opponents banded together to challenge the program on economic grounds. The program, they charged, largely benefitted only the shipping and steel companies, while the costs were being borne by the American taxpayers.

Economic analyses of the winter navigation program done under contract for the Winter Navigation Board touted benefit-cost ratios of 6:1, meaning that six dollars in benefits resulted from each dollar spent on the program. Those claims were seriously challenged by opponents of the program, though, and in their final report to Congress, the Winter Navigation Board touched only briefly, and carefully, on the economic benefits of the program, preferring instead to tout the non-economic gains that resulted from the demonstration project—and there were many. For the first time ever, the shipping companies and government agencies involved in the project were able to demonstrate that cargo could be moved on the upper lakes on a year-round basis. We now know that we could keep the system open if we had to, such as in time of war.

We also learned a great deal about the technology needed to operate ships in the ice. Most of the project funds were used to develop bubbler systems to keep harbors and locks from icing over, ice booms to keep channels from being clogged by floating ice, buoys and other navigational aids that could survive in the ice, systems for improved ice and weather forecasting, and improved icebreaking techniques. Many studies were also conducted, including tests of a variety of sophisticated navigational systems and explorations into the impact of winter navigation on the environment. We now know what to anticipate if we ever again feel compelled to operate our ships in the winter. The knowledge we gained seems to have justified the costs of the project. Just knowing that we can operate year-round if we have to is probably worth the $11.4 million spent over the eight years.

On the other hand, the project fell short of proving that year-round shipping is economically feasible under normal circumstances. Most of the program's benefits accrued to the shipping and steel industries. Fleets participating in the program were able to carry some additional tonnage during the winter period that would otherwise have been moved by rail or not moved at all. They were also able to avoid the expense of laying-up their ships in the winter and paying unemployment compensation to their crews. The steel companies, though, were the real winners. They avoided the expenses of stockpiling raw materials on their docks prior to the end of the normal navigation season or paying the higher costs of shipping them during the winter months by rail, which is considerably more costly than using water transportation.

Implementation of the winter navigation program on an ongoing basis would constitute taxpayer subsidy of the shipping and steel industries. The program could not function without support from government agencies, like the Corps of Engineers and Coast Guard. If the shipping companies, in particular, had to pay for those services, either from government agencies or private businesses, winter operations would clearly be a losing proposition for them.

In the end, however, the question of whether winter navigation—year-round navigation—could be
economically justified was a moot issue. With tonnages on the lakes dropping to their lowest levels since the Great Depression of the 1930s, the shipping companies lost interest in the program. They had trouble just trying to find enough cargo to keep their ships operating during the normal April–December season.

While the Winter Navigation Board had been headed by the Corps of Engineers, no government agency was more involved in the program than the Coast Guard. The Coast Guard has a broad range of maritime responsibilities, and virtually all of them came into play during the extended shipping seasons. The Ninth Coast Guard District, headquartered in Cleveland, has responsibility for the entire Great Lakes area. The Ninth District was represented on the Winter Navigation Board by the district commander, who is always a rear admiral. During the eight years of the demonstration project, several different persons commanded the Ninth District and represented the Coast Guard on the board.

One of the Coast Guard’s primary areas of responsibility is marine inspection, which, in the case of the commercial shipping industry involves both the inspection of vessels and vessel personnel. Coast Guard personnel inspect all commercial vessels annually at the start of the shipping season to insure that they are seaworthy and in compliance with regulations. Every five years, they perform a more extensive inspection of commercial vessels, which requires that ships be drydocked so that a thorough hull examination can be performed.

Vessels selected for participation in the winter navigation program were given an additional Coast Guard inspection before the start of the winter season to make sure that they were prepared to face the rigors of ice navigation. Since the 1975 loss of the Str. Edmund Fitzgerald, Coast Guard inspectors have also performed pre-November checks on many vessels. To eliminate the need to delay the vessels during the busy fall sailing season, the pre-November inspections are conducted while the vessels are in operation by Coast Guard “riders.” Their primary interest is to insure that required lifesaving equipment is in good working order.

All merchant marine personnel are certificated or licensed by the Coast Guard for the positions they are authorized to hold aboard ship. Entry-level certificates, or tickets, for unlicensed sailors are issued basically on request, but upgrading to Able Bodied Seaman, Oiler, Qualified Member of the Engine Department, or officer’s status requires a combination of documented experience and passage of an exam administered by the Coast Guard. Officer’s exams are particularly comprehensive and are normally scheduled over a three- to five-day period.

The Coast Guard also operates a number of search and rescue (SAR) stations around the lakes, serving both commercial shipping and recreational boaters. The SAR stations are staffed on a twenty-four-hour basis during the boating season, with personnel monitoring VHF channel 16, the international distress channel. They operate rescue vessels that can be dispatched to aid vessels experiencing problems. The SAR stations can also call for assistance from Coast Guard air stations that operate both helicopters and fixed-wing aircraft in support of search and rescue operations. In addition, the Coast Guard operates Soo Control, a vessel traffic center that controls ship movements in the St. Marys River. Located on the riverbank just below the locks at the Soo, the station personnel are responsible for coordination of vessel traffic in the river channels. Ships transiting the river must report their positions to the Coast Guard at a number of specified points on the river. The radio operators at Soo Control then keep navigational personnel aboard the ships informed of other vessel traffic in the narrow and winding river, reducing the likelihood of collisions.

If a vessel becomes disabled in the river, Soo Control personnel are authorized to restrict vessel movements until the hazard has been eliminated. They can also shut the river down to vessel traffic during periods of inclement weather, such as fog, high winds, or snow. With the St. Marys River representing the primary bottleneck during the winter navigation operations, personnel at Soo Control played a crucial role in coordinating vessel movements. They provided ships with detailed information on ice conditions in the river, the availability of icebreaker assistance, locations and progress of other ships transiting the system, and the status of aids to navigation, such as buoys and range lights.

Aids to navigation were a particular problem area during the winter navigation program. Maintained by the Coast Guard, the aids to navigation define the narrow channels of the rivers and harbors around the lakes. Most of the aids are buoys that are an-
chored along the sides of the channels, indicating the limits of the deep water. Some of the buoys are lighted so they are visible at night; others are equipped with radar beacons, or racons, so they show up on a ship’s radar scopes.

The floating buoys are subject to being crushed and sunk or carried away by ice during the winter, so most of them are removed near the end of the sailing season and replaced in the early spring by Coast Guard buoy tenders stationed around the lakes. Because of the inherent danger of attempting to navigate the rivers without the assistance of buoys, however, one major aspect of the Coast Guard’s involvement in the winter navigation program was to develop a system of aids to navigation that could function during the winter months. This was a major challenge for the Coast Guard and led to the development and testing of a variety of buoys and anchoring systems specially designed to withstand the onslaught of ice. Maintaining adequate buoyage in the rivers and channels was a problem throughout the winter navigation program and led to the construction of additional permanent aids to navigation: lights located atop concrete platforms built on the riverbed along the edges of the channel at key locations.

Ships participating in the winter navigation program also relied heavily on the system of range lights and leading lights that the Coast Guard maintains along the river systems, the most extensive of which is on the St. Marys River. A leading light is merely a light mounted on a shore tower in line with the course for a particular stretch of river. Navigational personnel on the ships can line up on the light to help them stay on course and in the middle of the river channel. Range lights are an even more effective aid to navigation. They consist of two lighted towers located at the end of the course line for a section of river. The towers are spaced some distance apart, so that when the ship is properly lined up on the course the light farthest away appears right over the top of the closer light. If the ship strays to the left or right of the channel, the lights will appear to separate. If the front light appears to be to the right of the rear light, the navigator knows that the ship has strayed to the left side of the channel, and vice versa.

The range light system, in use worldwide, began on Lake Huron in 1860. Dewitt Brawn, the fifteen-year-old son of the keeper of the lighthouse located at the mouth of the Saginaw River, erected two towers in line with the channel of the river. At night, the young boy would hoist a lantern to the top of each tower so ship captains could line up with them when coming into the river. The idea caught on rapidly and soon spread throughout the world maritime community.

The U.S. and Canadian Coast Guards have also operated an extensive system of lighthouses around the lakes, the first of which was erected at the mouth of the Niagara River in 1804. More than 150 lighthouses were eventually put into operation along the coasts of the five lakes. Once manned by Coast Guard lighthouse keepers, all of the lights have now been converted to automatic operation.

Until 1971, the Coast Guard also operated lightships, or floating lighthouses, at key locations along the Great Lakes shipping channels. The last of the lightships, the Huron, was retired from service in 1971 after marking the approach to the St. Clair River at the southern end of Lake Huron for thirty-five years. The last of twenty-two such ships that once served Great Lakes mariners, the 97-foot ship is now permanently moored at Port Huron, a relic of bygone days of proud service to the ships and sailors on the lakes.

The most impressive vessel in the Coast Guard fleet on the lakes is the venerable icebreaker Mackinaw, launched in 1944. Stationed on the Cheboygan River, just south of the Straits of Mackinac, the 290-foot “Mac” was the only icebreaker assigned to the lakes for a period of thirty-five years, although many other Coast Guard vessels have ice-strengthened hulls and can perform some limited icebreaking. With a beam of 75 feet and 10,000 horsepower, the Mackinaw is capable of opening a track through several feet of solid ice wide enough for most Great Lakes freighters to pass through. During winter navigation, the Mackinaw was regularly assisted by polar-class icebreakers temporarily assigned to the lakes from the Coast Guard’s saltwater fleet, including the Edisto, Westwind, and Southwind.

During the final year of the demonstration project, the Ninth District also acquired the first of five new bay-class icebreakers, which are now stationed around the lakes. The bay-class boats are really ice-breaking tugs, only 140 feet long, 38 feet wide, and
The now-retired Coast Guard lightship *Huron* on-station at the lower end of Lake Huron, near the entrance to the St. Clair River. The *Huron*, officially Lightship 103, was the only U.S. lightship with a black hull. (Institute for Great Lakes Research, Bowling Green State University)

Shortly after its launching in 1945, the Coast Guard ice-breaker *Mackinaw* assists four ocean freighters making a passage from Duluth to Chicago through moderate ice. The “*Mac*” is capable of forcing a channel through solid ice up to three feet thick. (Institute for Great Lakes Research, Bowling Green State University)
powered by 2,500 horsepower diesel engines. While the new icebreakers can’t tackle ice as thick as the Mackinaw can, they do represent state-of-the-art technology in small vessel icebreaking. Each of the bay-class vessels can break through 18 to 20 inches of hard ice. Their hulls are lubricated by air that is forced out of holes along their keels, reducing friction between their hulls and the ice they encounter.

While the new generation of icebreakers were a welcome addition to the Coast Guard arsenal on the lakes, they are dwarfed by the newest icebreakers added to the Canadian Coast Guard fleet on the lakes. The Pierre Radisson, launched in 1978, and the Des Groseilliers, built in 1982, are arctic-class III icebreakers, among the most powerful in the world. The two ships are 322 feet long, with beams of 65 feet. Each is powered by six 16-cylinder diesel engines that generate a total of 13,600 horsepower. The only ships on the lakes more powerful are 1,000-foot long freighters, and they are more than three times longer than the two icebreakers. For their size, then, the Radisson and Des Groseilliers are the most powerful ships on the lakes.

The two ships can cruise at more than 14 miles an hour and can move steadily through 3 feet of solid ice. They are equipped with the latest navigational equipment, and both carry helicopters on board for ice surveillance and search and rescue work. The two new vessels are part of a Canadian icebreaker fleet that includes a total of nine vessels. They range in size from 109 feet up to the 322 feet of the Radisson and Des Groseilliers.

Some icebreaking on the lakes is also done by private tug companies that operate out of the major ports, although their efforts are primarily restricted to work in private harbors and channels. Before the advent of bowthrusters, the harbor tug business flourished around the lakes, providing maneuvering assistance to ships in rivers and harbors. In recent years, however, U.S. and Canadian lakers seldom take tugs, so most of the tug companies are primarily involved in assisting saltwater vessels that have less maneuverability than their Great Lakes counterparts.

The largest of the U.S. tug companies include: the Great Lakes Towing Company, a Cleveland-based firm that dates to 1899 and operates forty-four tugs at ten Great Lakes ports; Republic Towing, with six tugs stationed at Chicago and Duluth; Gaelic Tug Boat Company, operating ten tugs at Detroit and Toledo; and Selvick Marine, with nine tugs serving Milwaukee, Sturgeon Bay, and Green Bay, Wisconsin. Several other U.S. tug firms, including Canoeie at Muskegon, Michigan, and Hannah Marine in Chicago, are primarily engaged in towing cargo barges between Great Lakes ports.

In addition to the mailboat and the icebreakers and tugs that provide vital support services to the bulk industry on the lakes, one other category of vessels deserves to be mentioned—the bum boats. Once a common sight at virtually every major port on the lakes, only one of the floating general stores remains in service today, at the twin ports of Superior, Wisconsin, and Duluth, Minnesota. Bum boats are so named because off-watch sailors often “bum around” on them. They tie up alongside freighters at the loading and unloading docks. On board, sailors can purchase everything from cold beer to work clothes, magazines, snacks, jewelry, film, and toilet articles. With docks often located miles from shipping areas and crewmembers not always able to get away from their ship, the bum boats have provided a vital service to sailors for many years. The remaining bum boat operators are barely eking out a living, however, and they may soon disappear from the lakes altogether.

One final support service of vital importance to the shipping industry on the Great Lakes is provided by the shipyards that service the freighters. While there were once dozens of shipyards scattered around the lakes, only five yards currently serve the large ships. On the American side there are three shipyards. The largest is Bay Shipbuilding in Sturgeon Bay, Wisconsin, which is also the only yard on the lakes with a drydock large enough to handle thousand-footers. The last lakes’ ships built at Bay were the thousand-foot Columbia Star; launched in 1981, and the tug-barge tanker built for Amoco’s Great Lakes operations in 1982. Since then the firm has been involved in repair work on lakers, conversions of several straight-deckers to self-unloaders, and the construction of ships for ocean service. No new vessels have been launched at Bay since 1987. Other shipyards on the U.S. side of the lakes include Toledo Shipbuilding in Toledo, Ohio, and Fraser Shipyard in Superior, Wisconsin. Both yards are primarily involved in repair work on lakers, rather than new construction.
The “bumboat” *Kaner I* alongside the cement boat *S. T. Crapo* at LaFarge Corporation’s terminal in Superior, Wisconsin. The bum boat is a floating general store that serves merchant seaman. (Author’s collection)
Bay Shipbuilding at Sturgeon Bay, Wisconsin, during the winter of 1989–90. The ten ships undergoing repairs include, from left to right, the Burns Harbor, Joseph L. Block, U.S.C.G.C. Mackinaw, Kiisla, John G. Munson, American Mariner, Sam Laud, Sparrows Point, Paul H. Townsend, and Herbert C. Jackson. The Sparrows Point and the Finnish tanker Kiisla had both suffered serious bottom damage while operating in the ice late in the 1989 season. (Bay Shipbuilding)
Only two Canadian yards survive on the Great Lakes: Port Arthur Shipbuilding at Thunder Bay, Ontario, and Port Weller Dry Docks, located at St. Catherines, Ontario, on the Welland Canal. The last new Canadian laker, the M/V Paterson, was launched in 1985 at the now-defunct Collingwood Shipyard in Collingwood, Ontario.

With no new freighters on the drawing boards, and only limited repair and retrofit projects available each year because of the reduced number of ships in operation, the remaining Great Lakes shipyards are struggling to survive. The demise of the once strong shipbuilding industry on the lakes is beginning to cause problems for the U.S. and Canadian fleets, particularly those U.S. fleets operating thousand-footers, who are finding it increasingly difficult to schedule their ships for drydockings. Like the fleets on the lakes, the shipyards, bum boat operators, tug companies, and even the firm operating the mailboat are experiencing rough sailing because of the downturn in trade on the lakes. Even the Corps of Engineers and the Coast Guard have faced sizable budget cuts as a result of concern over the federal deficit and reduced demand for their services on the lakes.

In the heyday of the Great Lakes industry, thousands of persons made good livings, or even got wealthy, providing services to the freighters. Few of them remain in business today, and those who have weathered the decline in the industry are unsure about the future. Next year, they too may disappear from the scene.

Notes

2. Ibid., 263.
3. Ibid.
12. Details regarding the winter navigation program were drawn from the following publications: Final Survey Report on Navigation Season Extension for the Great Lakes and St. Lawrence Seaway (Fort Belvoir, VA: U.S. Army Corps of Engineers, 1981), and Final Survey Study for Great Lakes and St. Lawrence Seaway Navigation Extension (Detroit: U.S. Army Corps of Engineers, 1979).