NPS Form 10-900
(Expires 5/31/2012)
Wisconsin Word Processing Format (Approved 1/92)

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NAT. REGISTER OF HISTORIC PLACES
NATIONAL PARK SERVICE

464

United States Department of Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900A). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name *EMBA* Shipwreck (Self-Unloading Barge)
other names/site number *A.C. Tuxbury*

2. Location

street & number	5 miles East of North Point in Lake Michigan						N/A	**not for publication**	
city or town	Milwaukee						X	**vicinity**	
state	Wisconsin	**code**	WI	**county**	Milwaukee County	**code**	079	**zip code**	53211

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this X nomination request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property X meets _ does not meet the National Register criteria. I recommend that this property be considered significant _ nationally Xstatewide _ locally. (_ See continuation sheet for additional comments.)

Signature of certifying official/Title — Date: 5/9/13

State Historic Preservation Officer - Wisconsin

State or Federal agency and bureau

In my opinion, the property _ meets _ does not meet the National Register criteria.
(_ See continuation sheet for additional comments.)

Signature of commenting official/Title — Date

State or Federal agency and bureau

EMBA Shipwreck (Self-Unloading Barge)	Milwaukee County	Wisconsin
Name of Property	County and State	

4. National Park Service Certification

I hereby certify that the property is:

✓ entered in the National Register.
___ See continuation sheet.
__ determined eligible for the National Register.
___ See continuation sheet.
__ determined not eligible for the National Register.
___ See continuation sheet.
__ removed from the National Register.
__ other, (explain:)

Edson H. Ball — 7.3.13

for

Signature of the Keeper — Date of Action

5. Classification

Ownership of Property
(check as many boxes as as apply)

	private
	public-local
X	public-State
	public-Federal

Category of Property
(Check only one box)

	building(s)
	district
	structure
X	site
	object

Number of Resources within Property
(Do not include previously listed resources in the count)

contributing	noncontributing	
		buildings
1		sites
		structures
		objects
1	0	total

Name of related multiple property listing:
(Enter "N/A" if property not part of a multiple property listing.)
Great Lakes Shipwrecks of Wisconsin

Number of contributing resources previously listed in the National Register
0

6. Function or Use

Historic Functions
(Enter categories from instructions)
TRANSPORTATION/ Water-Related

Current Functions
(Enter categories from instructions)
LANDSCAPE/ Underwater

7. Description

Architectural Classification
(Enter categories from instructions)
OTHER- Self-unloading barge/schooner barge

Materials
(Enter categories from instructions)
foundation N/A
walls N/A
roof N/A
other N/A

Narrative Description
(Describe the historic and current condition of the property on one or more continuation sheets.)

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for the National Register listing.)

_ A Property is associated with events that have made a significant contribution to the broad patterns of our history.

_ B Property is associated with the lives of persons significant in our past.

_ C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

X D Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark "x" in all the boxes that apply.)

Property is:

_ A owned by a religious institution or used for religious purposes.

_ B removed from its original location.

_ C a birthplace or grave.

_ D a cemetery.

_ E a reconstructed building, object, or structure.

_ F a commemorative property.

_ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions)

ARCHAEOLOGY / HISTORIC-NON-ABORIGINAL
MARITIME HISTORY
ENGINEERING

Period of Significance

1890-1932

Significant Dates

1890
1923

Significant Person
(Complete if Criterion B is marked)

N/A

Cultural Affiliation

Euro-American

Architect/Builder

Wheeler, Frank W.
Williams, George F.

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographic References

(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous Documentation on File (National Park Service):
- _ preliminary determination of individual listing (36 CFR 67) has been requested
- _ previously listed in the National Register
- _ previously determined eligible by the National Register
- _ designated a National Historic landmark
- _ recorded by Historic American Buildings Survey #
- _ recorded by Historic American Engineering Record #

Primary location of additional data:
X State Historic Preservation Office
- _ Other State Agency
- _ Federal Agency
- _ Local government
- _ University

Other
Name of repository:

10. Geographical Data

Acreage of Property 1.62 Acres

UTM References (Place additional UTM references on a continuation sheet.)

	Zone	Easting	Northing
1	16	438967	4768316
2			
3			
4			

☐ See Continuation Sheet

Verbal Boundary Description (Describe the boundaries of the property on a continuation sheet)

Boundary Justification (Explain why the boundaries were selected on a continuation sheet)

11. Form Prepared By

name/title Tamara Thomsen and Keith Meverden
organization Wisconsin Historical Society **date** 11/26/2012
street & number 816 State Street **telephone** 608.221.5909
city or town Madison **state** WI **zip** 53705

Introduction

The remains of the early self-unloading barge *EMBA* are located 5 miles east of Milwaukee's North Point in Lake Michigan. Built as the schooner barge *A.C. Tuxbury* at the F.W. Wheeler shipyard in West Bay City, Michigan in 1890, the vessel was towed as a consort to the steamer *W.H. Sawyer* for thirty-three years of her career. Renamed *EMBA*[1] and converted to a self-unloader in 1923, she served the Milwaukee Electric Company for nine years lightering coal between Milwaukee's lakefront docks and power plants upstream on the Milwaukee River. In 1932, the *EMBA* was unceremoniously towed onto Lake Michigan and scuttled. Today, the vessel remains upright and intact in 170 feet of water with only minor damage to her bow and much of her unloading machinery extant. With excellent integrity, the *EMBA*'s hull is an important site to study construction techniques used by one of the Great Lakes most important shipyards, as well a superb site to study the development and adaptation of self-unloading technology on the Great Lakes. As such, the *EMBA* has significance under criterion D in the area of Engineering.

Site Description

The *EMBA* lies upright and mostly intact in 170 feet of water five miles east of Milwaukee's North Point on a heading of 005 degrees with a five degree port list. The weather deck lies at a water depth of 156 feet, and the top of the unloading tower rises to a water depth of 136 feet. The vessel was stripped and intentionally scuttled in 1932, but the hull and much of her self-unloading gear are extant with the exception of the unloading boom, which was removed prior to scuttling. The hull struck the bottom bow first, which resulted in the only damage to the hull in a broken upper stem and cant frames that caused the windlass deck to collapse and the windlass to fall into the forecastle area.

The hull's overall length is 190.0 feet with a beam of 34.6 feet. Invasive mussels cover nearly all exposed hull surfaces, but enclosed areas within the hull exhibit less mussel colonization. The hull is deeply filed with silt, which rises nearly to the bottom of the cargo hoppers and obscures much of the lower cargo conveyor system.

A number of large rocks lie within the cargo hoppers beneath the deck beams. These rocks are much too large to be handled by the self-unloading gear, which was designed to handle small diameter bulk cargoes such as coal, sand, or gravel. These rocks were most likely added as ballast to ensure a proper scuttling of the abandoned hull.

Little of the *A.C. Tuxbury*'s hull structure was altered in the vessel's conversion to a self-unloader. With the exception of the bucket tower that rises from her deck, her hull is easily recognized from the

[1] The name of the barge is always referred to in all capital letters. Certain references use *E.M.B.A.* The name comes from Employees' Mutual Benefit Association. The organization was chartered March 1, 1912 by the State of Wisconsin after the Milwaukee Electric Railway & Light Company announced its formation as an employee medical plan.

outside as one of the many large wooden schooner barges common to the Great Lakes during the latter half of the nineteenth-century. The only alteration to her hull was the removal of hull components that were unnecessary as a self-unloader whose use was limited to within the protective confines of the Milwaukee harbor break wall. This included the removal of her standing and running rigging, the aft cabin and living quarters, and components of her deck that included the cargo hatches, deck planks, and several deck beams above the cargo hold. Once these items were removed, the unloading mechanism was built within the existing hull and constructed to fit the *A. C. Tuxbury*'s dimensions.

Although removal of the weather deck made the vessel vulnerable to swamping in large waves, this vulnerability was of no concern as she was to remain within protective confines of the Milwaukee River and harbor area in her new role. Instead, the removal of the hatches, planks, and deck beams facilitated loading efficiency as well as allowed a greater cargo capacity to replace the capacity lost in building hoppers and a conveyor system within the hold. An increased cargo capacity could be achieved by piling cargo above the deck level, which would then settle into the cargo hoppers and onto the conveyor system as the vessel was unloaded.

The bow is the only part of the hull that exhibits structural damage. The collision with the bottom broke the stem and cant frames at the waterline, dislodging a section of hull on either side of the bow. A large steam-powered windlass was fastened to the forecastle deck for handling ground tackle, but the forecastle deck has collapsed and the windlass has fallen into the forecastle and now lies on its end in the port side of the bow.

A vertical steam pump rises from the vessel's floor within the forecastle, mounted to starboard of the keelson. A large, steel ventilation funnel lies below deck immediately aft of the collapsed windlass. The hawsepipes lie within the bow wreckage, but the anchors are not extant and were presumably removed prior to scuttling.

The outer hull planking is intact throughout the vessel, with the exception of either side of the bow. Outer hull planks are 0.25 feet thick. A whale strake is located at the sheer and is constructed of two planks; the upper plank is 0.4 feet in width and the lower plank is 0.75 feet in width. The outer hull was sheathed with iron or steel plates below the waterline for the length of the hull. The sheathing begins 14.0 feet from the top of the rail and continues below the turn of the bilge, where it disappears into the lake bed. The sheathing is constructed from panels 2.0 feet wide by 8.0 feet in length. Several panels are bent outward from the hull at 90 degree angles so they resemble bilge keelsons, but are actually sheathing panels that were not well fastened and bent outward as the vessel descended to the bottom, or possibly pried upward for access to the hull planks in order to breach the hull for scuttling.

The main rail is intact for the vessel's perimeter and is 1.35 feet wide by 0.4 feet thick. The top of the

rail is 4.1 feet above the deck, and the bulwarks are planked both inside and out. A monkey rail is fastened atop the mail rail at both the bow and stern. Both the bow and stern monkey rails are 0.55 feet wide by 0.15 feet thick, and rise 0.75 feet above the main rail. At the bow, the monkey rail terminates at 26.3 feet aft of the stem (measured on the baseline), and the stern monkey rail terminates at 36.0 feet forward of the transom.

The deck beams remain intact, but several have been removed. The locations of the removed deck beams is not consistent, as some areas have two adjacent beams removed while in other areas every other beam has been removed. Deck beams are 0.8 feet square, and due to the removal of some beams, vary in spacing at 4.0, 5.0, and 6.5 feet between beams. Deck stanchions are 0.55 feet square, and some have a strongback fastened between the stanchion and deck beam to provide reinforcement. These strongbacks are 7.5 feet long and 0.55 feet square. Not all stanchions are reinforced with strongbacks, and some of the stanchions are fastened directly to the underside of the deck beam.

Areas of the weather deck not over the cargo hold have their deck planks intact, including the bow forward of the hold and the stern aft of the unloading tower. Individual deck planks are 0.5 feet wide by 0.2 feet thick.

The hull's port side has four sets of mooring bitts fastened to the inside of the bulwarks. All bitts are 0.8 feet square, and the double bitt sets have a space of 1.4 feet between bitts. The forwardmost is a set of double bitts whose center is located at 26.3 feet on the baseline. A single bitt is located approximately amidships, its center located at 81.2 feet on the baseline. The raised quarterdeck has a set of double bitts on either end of the deck; the center of the forward set is located at 156.5 feet on the baseline and the center of the aft set is located just forward of the transom at 183.7 feet on the baseline.

The mooring bitts on the starboard side are somewhat different. The bitts nearest the bow are a set of double bitts whose center is located at 26.5 feet on the baseline. The next is a single bitt approximately amidship, centered at 82.2 feet on the baseline. The next, on the forward end of the quarter deck, is not a mooring bitt but a single iron bollard that is fastened at 155.5 feet on the baseline. The starboard quarter bitts are likewise absent, and instead, replaced with a single wooden bitt that is not fastened to the bulwark but protrudes from the quarter deck between the steering gear and the bulwark.

The deck shelf is supported by hanging knees that are 0.4 feet square at the toe, 2.5 feet in length on the body, 2.2 feet in length on the arm, and 0.9 feet from the toe to the bosom. The hanging knees support a deck shelf that is 0.8 feet wide and 0.4 feet thick. The deck beams are fastened atop the deck shelf, with a waterway fastened atop the deck beams that is .08 feet wide by .02 feet thick.

Much of the self-unloading apparatus was left in place with the exception of the unloading boom,

which was removed prior to scuttling. The self-unloading gear was designed to handle small diameter bulk cargoes that could pass through the doors at the bottom of the gravity-fed hoppers. The hoppers limited the vessel's cargo carrying capacity to the upper half of the cargo hold, but the removal of the deck planking also allowed a deck load to be carried that would pass through the deck beams as the cargo settled during unloading.

The hold was divided into two longitudinal hoppers, one on the port side and one on starboard. The hoppers ran from 32.2 feet on the baseline to the base of the unloading tower. The top of each hopper spanned the width between the side hull and the deck stanchions – 15.6 feet wide at the top of each hopper. The sides of the hopper are angled at 45 degrees and extend below the deck beams in a V-shape to a depth of 8.8 feet from the top of the deck beams. The sides of the hopper are constructed from vertical planks 10.0 feet in length that vary in width between 0.4 to 0.8 feet wide and are 0.15 feet thick. The hopper walls were then covered with sacrificial planking of slightly smaller dimensions that vary in width between 0.2 feet to .8 feet and are 0.08 feet thick. The sacrificial planks were also fastened vertically.

The top of the hopper wall planks are fastened to a longitudinal timber that is 0.65 feet square. This timber is fastened to the deck stanchions 1.1 feet below the top of the stanchions. Where the hopper wall planks are fastened to this beam, the beam's upper, outboard corner is chamfered to the angle of the hopper wall. An identical timber, fastened to the ceiling planking of the outer hull, supports the top of the opposite hopper walls. At the bottom of the hopper, a similar longitudinal timber supports the bottom of the wall. This lower timber is also 0.65 feet square and is held in position by strongbacks, 3.8 feet in length, that are fastened to the bottom of the deck stanchion at angle of 50 degrees.

The hoppers were emptied through iron doors located on the bottom of the hopper's inner wall. The doors were constructed of iron or steel plate and slide upward in a steel track that is fastened to the hopper wall on either side of the door. The hopper doors are 1.5 feet wide with a space of several inches between doors. Crew members would have walked along either side of the vessel's keelson to manually open and close the hopper doors.

The doors emptied the hoppers onto two longitudinal conveyers that were located directly beneath either hopper. The belts of these conveyors have been removed, but the wooden framing remains extant. The longitudinal conveyors moved the cargo aft to where they emptied onto two lower, athwartship conveyors that moved the cargo to the center of the vessel behind the bucket tower. There, each of the athwartship conveyors emptied into the tower's buckets to be carried up onto the deck. The framing for the athwartship conveyors remains in place, but it is uncertain if the conveyor belts themselves are extant, as these conveyors are quite low within the hull and thus deeply buried in the silt that has accumulated within the hull. Any disturbance of this silt quickly eliminates any visibility

within the hull.

The bucket tower is angled forward as it protrudes from the weather deck and rises 20 feet vertically above the deck. The tower is supported by four legs and four guy wires. The guy wires connect the top of the tower with the vessel's rail on either side. The four support legs are tied to one another via an A-shaped base. This base is constructed of I-beams and connects the unloading tower with the weather deck and provides a wide footprint for resistance to leveraging the deck. The A-shape of the base is wider at the forward end than aft. Each leg of the base is 25.5 feet in length, beginning at 132.8 feet on the baseline and ending at 157.6 feet on the baseline. The base is constructed of I-beams 0.9 feet tall by 0.35 feet wide. The forward leg is fastened to the base 4.4 feet from the forward edge of the I-beam, and the aft leg is fastened 4.0 feet from the aft edge of the I-beam. Athwartship I-beams are fastened between the forward legs, as well as between the aft legs.

The A-shaped base is clamped to the deck beams with 1.8 foot-long iron rods that connect two iron plates – one plate is atop the I-beam and the other is beneath the deck beam. There are two clamps on either side forward of the forward legs, two on either side between the forward and aft legs, and two on the athwartship I-beam that forms the bottom of the "A".

The tower's two forward support legs are constructed from doubled iron I-beams that are fastened to the top of the A-shaped base. The aft legs are constructed from a wood timber, 0.85 feet by 0.2 feet, that are reinforced on each edge with an iron strap that is 0.25 feet wide by .025 feet thick to form a composite I-beam.

The top of the tower has a wooden platform that is 4.6 feet long, 8.0 feet wide and 0.2 feet thick. This platform holds the winch that raised and lowered the unloading boom. The winch is driven via a drive chain which passes through the upper deck to a drive gear located on the port side of the tower's conveyor system, beneath the conveyor belt's upper drum. The boom winch consists of two gear shafts that provide a significant gear reduction for the cable drum, which is located on the forward gear shaft. The boom cable ran from the winch drum over a pivoting pulley on the forward edge of the platform. This pulley would swing port to starboard as the unloading boom was moved. The winch drum is 1.6 feet in diameter and 1.3 feet wide.

Cargo was carried up the tower in conveyor buckets with mouths 2.25 feet wide by 1.15 feet long and 1.05 feet deep. There are 36 buckets fastened to the conveyor that ran in a circular route up the backside of the tower and down the forward side. The buckets were connected to one another with a chain on either end and driven by the upper drum with a drive gear 2.8 feet in diameter and 0.2 feet wide located on the starboard side of the unloading tower.

As the buckets came over the top of the conveyor, they dumped cargo into a large iron hopper that is 6.0 feet wide by 2.4 feet long at the top. The bottom of the hopper is formed into a funnel with an opening diameter of 1.4 feet, which deposited the cargo onto the unloading boom.

The unloading boom was fastened to the deck beams forward of the unloading tower. Although the boom was removed, its pivoting mount is extant on the deck. The mount allowed the boom to be swung over either rail to unload cargo onto the shoreline. Both the bottom of the funnel and the center of the pivoting base are located at 134.0 feet on the baseline.

The base of the unloading boom is constructed of four longitudinal timbers, 0.7 feet wide, 1.0 foot tall and 7.3 feet long, that are fastened directly to the deck beams with a space of 1.0 foot between timbers. Four athwartship timbers, 0.7 feet wide, 1.0 foot tall, and 6.0 feet long, are fastened atop the lower timbers with a space of 0.4 feet between timbers. The pivoting base of the unloading boom is fastened atop the athwartship timbers. The pivoting base consists of two iron plates with 8 bearings between them that allowed the boom to swing. Each bearing is 0.9 feet in diameter by 0.3 feet wide, and is connected to an axle attached to a center hub. The top plate is 4.8 feet in diameter and 0.3 feet thick, and with the bearings and lower plate the mount is 1.0 foot tall. Atop the uppermost plate, two boom hinges are extant into which the axle of the unloading boom attached.

The stern cabin was removed during the vessel's conversion, but the cabin's coaming was left in place around the perimeter of the quarter deck. This coaming is 0.35 feet thick and is constructed of two timbers that are fastened back to back – the inner timber is 0.20 feet thick and the outer timber is 0.15 feet thick. The three extant sides of the coaming are 1.3 feet tall and rise 0.55 feet above the quarter deck. On the port side only, the upper, inside edge of the coaming is mortised for some type of frame or strongback. The three sides of the coaming vary somewhat in their height above the cabin sole, with the top of the coaming rising 4.85 feet on the starboard side, 5.15 feet on the port side, and 5.6 feet on the aft coaming.

The entire forward bulkhead of the cabin was removed, and the self-unloading tower extends into the cabin's former footprint. The cabin's aft bulkhead was 19.2 feet wide and 12.7 feet forward of the transom. The cabin was 25.5 feet in length, as measured by the cabin opening. There was 3.3 feet between the cabin's port bulkhead and the bulwark, and 3.5 feet between the cabin's starboard bulkhead and the bulwark.

There is a rectangular scuttle in the cabin sole with a staircase leading below deck located near the port quarter of the cabin sole. The center of the scuttle is located at 169.55 feet on the baseline, and the scuttle dimensions are 3.7 feet long by 1.5 feet wide. The staircase descends towards the center of the vessel.

On the quarterdeck aft of the cabin, the center of the rudder post is located 6.8 feet forward of the transom rail, with 4.9 feet between the steering gear box and the transom and 2.0 feet between the steering gear and the cabin's aft bulkhead. Beneath the steering gear, there is a height of 4.3 feet between the quarter deck and the cabin sole. The rudder box is visible between decks, and is 3.5 feet long by 1.8 feet wide and constructed of planks that are 0.6 feet wide by 0.15 foot thick. An iron auger lies on the cabin sole between decks on the port side. The auger shaft has an outside diameter of 0.5 feet and the auger blade's diameter is 1.5 feet.

The transom is 21.3 feet wide and 10.6 feet tall. Two port lights were located in the transom, but only the port side light is extant. The port light is non-opening, with a 0.35 foot diameter glass housed in a brass ring with a 0.5 foot outside diameter. The rudder is completely exposed and reaches a water depth of 170. The rudder blade is 13.0 feet tall, 5.0 feet long at its widest point, and 1.2 feet wide.

Summary
The remains of the self-unloading barge *EMBA* lie in 170 feet of water 5 miles off Milwaukee's North Point in Lake Michigan, upright and intact on a sand bottom. Built in 1890 at the Frank W. Wheeler & Company shipyard in West Bay City, Michigan, the 181-foot long *EMBA* was launched as the schooner barge *A.C. Tuxbury*. During her first thirty-three years the *A.C. Tuxbury*, and her sistership the *C.E. Redfern*, carried bulk cargoes across the Great Lakes as consorts to the steamer *W.H. Sawyer*. Sold in 1923 to the Milwaukee Electric Company and renamed *EMBA*, the vessel was refitted as a self-unloading barge and spent her final nine years lightering coal on the Milwaukee River.

The *EMBA* meets the registration requirements of criterion D of the property type schooner barge as described in the Multiple Property Document *Great Lakes Shipwrecks of Wisconsin* (Cooper and Kriesa 1992). The *EMBA* site retains much of the original hull integrity of the schooner barge *A.C. Tuxbury*. During her refit as the self-unloader *EMBA*, the original hull was kept intact and the self-unloading apparatus was constructed to fit within the existing hull structure. The original hull of the *A.C. Tuxbury* is the work of an acknowledged master shipbuilder and one of the most prolific Great Lakes shipyards in the late nineteenth-century, the F. W. Wheeler yard. In this capacity, the *EMBA* site has yielded important information on the construction and use of wooden schooner barges during the nineteenth century.

Additionally, the adaptation of self-unloading apparatus to the existing *A.C. Tuxbury* hull makes the *EMBA* site particularly significant for the archaeological documentation of adaptive reuse of aging wooden vessels during the twentieth century. The *EMBA* site is also extremely valuable as archaeological documentation of the development of self-unloading technology. Self-unloading vessels originated on the Great Lakes in 1902, and because the *EMBA* was converted as self-unloader technology was developing, the *EMBA* site exhibits transitional traits between the earliest self-unloaders that those that are in common use today. Significant information on the engineering and development of self-unloaders has been gathered from the *EMBA* site, and the site holds vast potential to yield addition information in future years making the *EMBA* eligible at the state level under Criterion D.

Vessel History
The self-unloading barge *EMBA* began her Great Lakes career as the three-masted schooner barge *A.C. Tuxbury*. The *A.C. Tuxbury* was launched on 18 March 1890 from F.W. Wheeler & Co.'s West Bay City, Michigan, shipyard. She was the 62nd vessel launched from the Wheeler yard, and the second vessel launched in 1890. The *A.C. Tuxbury* was the product of Master shipbuilder George F. Williams. She was 181 feet long, 35 feet in beam, and 13 feet in depth of hold with a capacity of 645.54 net tons of bulk cargo. Designed as a tow barge, she was rigged as a schooner with three masts, one deck, a plain head and square stern. Although she carried masts and sails,

her sails would only be raised to stabilize the boat in a heavy sea or as propulsion only in emergency situations. Under normal conditions she was towed behind a steamer, either singularly, or most often in consort with another schooner barge, the *C.E. Redfern*. The *C.E. Redfern* was a sister ship to the *A.C. Tuxbury*. She was of equal tonnage and was launched from the F.W. Wheeler yard ten days after the *A.C. Tuxbury* on 28 March 1890. *S*hortly thereafter, the 747-ton wooden steamer *W.H. Sawyer* came down the ways. The *W.H. Sawyer* would be the primary tow vessel for the *A.C. Tuxbury*'s and the *C.E. Redfern* for the next thirty-three years (Bureau of Navigation 1890; Mansfield 1899b*; Port Huron Daily Times* 1890a, 1890b).

The *A.C. Tuxbury* was built for parties involved with the W.H. Sawyer Lumber Company of Wheatfield, New York. Alfred C. Tuxbury, the vessel's namesake, lived in Tonawanda, New York, and served as the managing owner for the *W.H. Sawyer, A.C. Tuxbury*, and the *C.E. Redfern*. A lumber baron in his own right, Alfred C. Tuxbury was an executive on the board of the W.H. Sawyer Lumber Company and later became president of the Northern Lumber Company of North Tonawanda, New York. Alfred C. Tuxbury owned 2/24 of the *A.C. Tuxbury*. Other owners included: W.H. Sawyer of Worchster, Massachusetts, who owned 18/24 - the bulk of the vessel; P.W. Wood of Worchster, Massachusetts, who owned 1/24; George A. Sawyer of Worchester, Massachusetts, who owned 1/24; and the vessel's Master, R.E. Gaiu of Port Huron, Michigan, owned 2/24. The *A.C. Tuxbury* was enrolled on 16 April 1890 at the port of Suspension Bridge, New York, near Niagara Falls. She was assigned the official number 106706 and her homeport was listed as Tonawanda, New York (Beeson 1891; Bureau of Navigation 1890; *Buffalo Morning Express* 1905d, 1905f; Mansfield 1899b).

During their inaugural season, the *W.H. Sawyer, A.C. Tuxbury* and *C.E. Redfern* primarily carried westbound coal to Milwaukee and Chicago, and returned with grain bound for Buffalo. Occasionally, the trio would unload their coal and run light to Sturgeon Bay, Wisconsin, Menominee, Michigan, or Escanaba, Michigan, to load lumber consigned to Tonawanda. Each of the schooner barges could carry approximately 900,000 feet of dry lumber or 800,000 feet of green lumber, and the loading of these crafts to capacity took about twenty-four hours and the labor of seventy men. The consort made eight round trips during the 1890 season (*Buffalo Morning Express* 1890a, 1890b, 1890c, 1890d, 1890e, 1890f, 1890g, 1890h, 1890i, 1890j, 1890k, 1890l, 1890n, 1890m, 1890o, 1890p; *Door County Advocate* 1890).

On 4 March 1891, the enrollments for all three vessels were surrendered at the port of Boston, Massachusetts, for a change of owners and homeport. It is uncertain which owners changed, as the *A.C. Tuxbury*'s new enrollment, No. 187, has not been located. What is known, however, is that W.H. Sawyer became the managing owner of all three vessels and that all other registered

owners were from Worcester, Massachusetts (ADGNFPL 2005a, 2005b, 2005d; Bureau of Navigation 1890). Although the new enrollments was entered at the ocean port of Boston, the *W.H. Sawyer, A.C. Tuxbury*, and *C.E. Redfern* continued sailing the Great Lakes and made seven round trips during the 1891 season. During this season coal was carried to Milwaukee and Chicago on Lake Michigan, as well as Marquette, Michigan, and Ashland, Wisconsin, on Lake Superior. Corn and wheat were carried eastbound to Buffalo and Tonawanda, New York. On 19 November 1891, the *A.C. Tuxbury* experienced problems with her steering gear and was forced to put in at Tawas City, Michigan. The shipyard at Bay City was telegrammed and a new wheel was sent (*Buffalo Morning Express* 1891a, 1891b, 1891c, 1891d, 1891e, 1891f, 1891g, 1891h, 1891i, 1891j; *Oswego Daily Times* 1891a, 1891b, 1891c).

An incomplete record exists for the 1892 shipping season. The trio is reported as arriving at Tonawanda, New York, and Marquette, Michigan, with trips in July, September, and two in October. There is no information on cargoes (*Buffalo Morning Express* 1892a, 1892b, 1892c, 1892d).

Disaster struck on the first trip of the 1893 season. The *W.H. Sawyer, A.C. Tuxbury*, and *C.E. Redfern* departed Toledo, Ohio, on 19 April 1893 loaded with coal bound for the upper lakes. A gale was blowing as they departed, and the trio grounded near Turtle Island soon after departing. The *W.H. Sawyer* suffered damage as waves began breaking over her, and the *C.E. Redfern*'s steering gear was carried away. The *A.C. Tuxbury* suffered the most damage, as she quickly swamped and sank until her decks were even with the water. The *W.H. Sawyer* and *C.E. Redfern* were easily freed, and a pump was sent from Toledo on 22 April to refloat the *A.C. Tuxbury*. Once again on the surface, she was taken to Detroit for repairs (*Buffalo Morning Express* 1893a, 1893b; Mansfield 1899a; *New York Daily Tribune* 1893). As a result of this and other accidents and losses near Turtle Island, mariners petitioned for the establishment of a Life-Saving Station at the island. For unknown reasons, the station never came to fruition (*Buffalo Morning Express* 1895a).

All three vessels were back on their regular routes by mid-May 1893. The 1893 shipping season had arrivals at Tonawanda, Cleveland, Milwaukee, Green Bay, and Marquette. On 24 October, a northwest gale with 42 mile per hour winds blew across Lake Superior and caused the *W.H. Sawyer, A.C. Tuxbury*, and *C.E. Redfern* to seek shelter at Marquette. When the trio came into port, the *A.C. Tuxbury* was reported to be leaking badly (*Buffalo Morning Express* 1893c, 1893d, 1893e, 1893f, 1893g; *Oswego Daily Palladium* 1893).

For the 1894 shipping season, arrivals were reported at Tonawanda, Oswego, Ashtabula, and Milwaukee, with round trips between the upper and lower lakes in May, June, August, and

November with cargoes of coal and lumber (*Buffalo Morning Express* 1894a, 1894b, 1894c; *Door County Advocate* 1894; *Oswego Daily Times* 1894).

By July 1895, the *A.C. Tuxbury*'s deck needed recaulking. The repair was performed at the J.B. Bates & Co. Shipyard in Chicago upon her second arrival there that season from Cleveland (*Marine Record* 1895). For the remainder of the 1895 season, the *W.H. Sawyer, A.C. Tuxbury*, and *C.E. Redfern* moved cargoes of coal and iron ore between the ports of Buffalo, Chicago, Ashland, Marquette, Detroit and Milwaukee (*Buffalo Morning Express* 1895b, 1895c; 1895d; 1895e; 1895f; 1895g; 1895h; 1895i; 1895j).

Captain J.C. Angell took command of the *A.C. Tuxbury* at the beginning of the 1896 season (*Marine Review* 1896a). The three vessels called on the ports of Ashland, Marquette, Milwaukee, Buffalo, and Ashtabula during the 1896 season, with trips reported in May, June, August and November. It is uncertain if this is a complete listing of arrivals and clearings that season (*Buffalo Morning Express* 1896a, 1896b, 1896c, 1896d, 1896e, 1896f). At the end of the season, the *A.C. Tuxbury* overwintered at Marine City, Michigan (*Marine Record* 1896).

Little is known of the 1897 shipping season. The *A.C. Tuxbury* was only mentioned twice in newsprint. One article recorded her down bound passage at Sault Ste. Marie in June, and another marked a departure from Marquette bound for Tonawanda in early September (*Buffalo Morning Express* 1897a, 1897b).

In February 1898, the W.H. Sawyer Lumber Company announced that season's appointments for Masters. There was only one change about the *A.C. Tuxbury*'s trio, with Captain Wyman Powers replacing Captain Angell aboard the *C.E. Redfern* (*Marine Review* 1898). Similar to the previous year, only two mentions of the *A.C. Tuxbury* appeared in newsprint for the 1898 season. One recorded a departure from Duluth in late May, and another acknowledged an upbound passage at Sault Ste. Marie in early November (*Buffalo Morning Express* 1898a, 1898b).

For the 1899 season, the three vessels kept a regular schedule between Tonawanda and Duluth, making the round trip once a month in May, June, July, August and September (*Buffalo Morning Express* 1899a, 1899b, 1899c, 1899d, 1899e, 1899f). On 3 December 1899, the *W.H. Sawyer* experienced machinery problems while downbound and was forced to drop her consorts at Marine City. The steamer then sailed on to Tonawanda for repairs and later returned for her consorts (*Buffalo Morning Express* 1899g).

At the beginning of the 1900 season, Captain J.C. Angell returned to the *A.C. Tuxbury* and Captain Powers went back to the *C.E. Redfern* (*Marine Review* 1900, 1901). Only three early-season

passages are known for the three vessels in 1900. An arrival at Cleveland was recorded on 19 April, and on 22 May the vessels cleared Marquette with the *C.E. Redfern* and *A.C. Tuxbury* bound for Lorain, Ohio, and the *W.H. Sawyer* bound for Cleveland. The third arrival was reported at Ashland on 20 June (*Buffalo Morning Express* 1900a, 1900b, 1900c).

In 1901, the trio arrived at Ashland and Duluth with coal, and both times returned to Tonawanda with lumber. Trips were reported in May, June, and October, which is likely an incomplete sailing history for that season (*Buffalo Morning Express* 1901a, 1901b, 1901c).

The 1902 season began with a mid-April trip to Lake Superior. On 21 April, the *C.E. Redfern* and *A.C. Tuxbury* both took on iron ore at Ashland while the *W.H. Sawyer* loaded lumber at Duluth; all three cargoes were bound for Tonawanda (*Buffalo Morning Express* 1902a, 1902b). On the upbound return on 8 May, the trio was forced to seek shelter at Harbor Beach, Michigan, from a strong westerly gale. Additional trips to Lake Superior were made in late May and mid-June to load iron ore bound for Toledo and Tonawanda (*Buffalo Morning Express* 1902c, 1902d, 1902e). In July, August, September and October of 1902, lumber was loaded at Menominee, and lumber and iron ore at Escanaba, all bound for Tonawanda and consigned to either the W.H. Sawyer Lumber Company or the Tonawanda Iron Company. On their upbound passage in October, the ships were again forced to seek shelter along with sixteen other vessels at Harbor Beach (*Buffalo Morning Express* 1902f, 1902g, 1902h, 1902i, 1902j, 1902k, 1902l, 1902m). The October trip was the last of the season for the *A.C. Tuxbury*, and she went into winter quarters at the W.H. Sawyer Lumber Company's dock in North Tonawanda on 8 November. The *W.H. Sawyer* and *C.E. Redfern* stayed in service for one more trip, tying up for the winter on 26 November (*Buffalo Morning Express* 1902n, 1902o, 1902p; *The Evening News* 1902a, 1902b, 1902c).

At the start of the 1903 season, Captain Peter Ward was appointed Master of the *A.C. Tuxbury* (*Oswego Daily Times* 1903). The only known voyage of the three vessels during that season was to Duluth with a return to Tonawanda loaded with lumber for their owners in May of that year (*Buffalo Morning Express* 1903; *The Evening News* 1903). Nothing is known of her sailing history for the 1904 season.

In the spring of 1905, the Edward Hines Lumber Company of Chicago chartered the W.H. Sawyer fleet for the season (*The Evening News* 1905a, 1905b). In April and May, the vessels loaded lumber for Tonawanda at Ashland and Duluth (*Buffalo Morning Express* 1905a, 1905b, 1905c, 1905e). On 31 May, Edward Hines secured an option on the fleet with the intention of purchasing the vessels at the end of the season. For the remainder of that season, the vessels carried lumber from Manistee, Michigan, to North Tonawanda. The last run of the season was to Duluth in late

October (*Buffalo Morning Express* 1905f, 1905g; *Door County Advocate* 1905). Following this trip, the *W.H. Sawyer*, A.C. *Tuxbury*, and *C.E. Redfern* sailed for Chicago. On 27 October 1905, a new enrollment was issued for the *A.C. Tuxbury* at Chicago for a change in owner, Master, homeport, and rigging (Bureau of Navigation 1905). Edward Hines, President of the Edward Hines Lumber Company, registered the vessel as sole owner. Her homeport was changed to Chicago, Illinois, and C.F. Wicke became her new Master. The new enrollment also indicated that the *A.C. Tuxbury* had been cut down from three masts to two into what was commonly called a Grand Haven rig. By removing the main, or middle mast, the vessel could operate with less maintenance and cost, and allowed more room for loading and handling deck cargoes. Similar ownership and homeport changes occurred for the *W.H. Sawyer* and *C.E. Redfern* (Bureau of Navigation 1905; *Door County Advocate* 1906b). Captain Wicke only remained at the helm of the *A.C. Tuxbury* for one week. On 6 November, Captain Ward was returned to command when the vessel reached Superior, Wisconsin, on her final trip of 1905 (Bureau of Navigation 1905).

Edward Hines' entire fleet, the steamers *W.H. Sawyer*, *Cormorant*, and *L.L. Barth*, and schooners *C.E. Redfern*, *A.C. Tuxbury*, *Helvetia*, and *Foster*, all overwintered at Tonawanda. There, they were thoroughly gone over and rebuilt as needed. Captain W.D. Hamilton was placed in charge of the *A.C. Tuxbury* throughout the rebuilding (Bureau of Navigation 1905; *Door County Advocate* 1906a). With repairs complete, Captain Peter Ward resumed command of the *A.C. Tuxbury* at Tonawanda on 16 April and prepared for the 1906 shipping season (*Buffalo Morning Express* 1906a; Bureau of Navigation 1905). The *A.C. Tuxbury* continued sailing with the *W.H. Sawyer* and *C.E. Redfern*, but their arrivals/clearances appeared in newsprint only twice during the 1906 season. An arrival at Duluth was recorded on 28 September, along with an arrival at Tonawanda on 19 October with lumber; the three quickly unloaded at Tonawanda and cleared that same day for Superior (*Buffalo Morning Express* 1906b, 1906c).

The vessels again overwintered at North Tonawanda during the winter of 1906/1907, and were amongst the first vessels to leave port on 24 April 1907. Captain Peter Ward remained at the *A.C. Tuxbury*'s helm (*Buffalo Morning Express* 1907a; Bureau of Navigation 1905). Little is known of the 1907 season. The *W.H. Sawyer*, *C.E. Redfern*, and *A.C. Tuxbury* were recorded passing upbound at Sault Ste. Marie on 1 July. On 14 September, while in tow of the *W.H. Sawyer*, the *A.C. Tuxbury* ran hard aground at the head of Tonawanda Island while attempting to enter Tonawanda. After two hours of work, she was released by tugs and towed to the Wilson Box & Lumber Company's dock for inspection. It is unknown if she was damaged or if any time was lost due to repairs (*Buffalo Morning Express* 1907b, 1907c).

The *A.C. Tuxbury* got underway for the 1908 season on 2 May with Captain Peter Ward at the helm (Bureau of Navigation 1905). For the majority of the season, the *W.H Sawyer, C.E. Redfern* and *A.C. Tuxbury* were again employed in carrying lumber to North Tonawanda for both the Northern Lumber Company and the Eastern Lumber Company (*The Evening News* 1908a, 1908b, 1908c, 1908d, 1908e).

The vessels practically disappeared from the historical record in 1909, 1910, and 1911. Their only mention was the last week of November 1910 when the *A.C. Tuxbury* was brought into Duluth to stop a bad leak in her hull that was caused by ice (*Door County Advocate* 1910).

By 1912, the Edward Hines Lumber Company had grown their fleet to seven steamers (*W.H. Sawyer, Edward L. Hines, C.F Curtis, Oscoda, L.L. Barth, Louis Pahlow,* and the *Nikko*), twelve schooner barges (*C.E. Redfern, A.C. Tuxbury, J.I. Case, Ashland, Helvetia, Selden E. Marvin, Annie M. Peterson, Alice Norris, Delta, S.J. Tilden, D.L. Filer,* and the *Emma C. Hutchinson*), and chartered the steamer *P.J. Ralph* with consorts *Harold* and *Connelly Bros.*, the steamer *James Fowlett* and barge *Grace Holland*, and steamer *Alaska* and barge *Melvin S. Bacon*. Most of the cargoes carried were owned directly by the Edward Hines Lumber Company, which still owned vast tracts of timber. Additionally, the company was buying lumber products from other lumber companies. The bulk of their trade in 1912 was between Lake Superior and Georgian Bay ports to points on Lake Erie (*Door County Advocate* 1912; *The Evening News* 1912b). Captain Peter Ward remained in command of the *A.C. Tuxbury* for much of the season, with Captain William Smith replacing Captain Ward for one late season trip (Bureau of Navigation 1905). On 29 August 1912, while in the rapids of the St. Claire River, the towline parted between the *W.H. Sawyer* and her consorts *C.E. Redfern* and *A.C. Tuxbury*, leaving the barges adrift. The tug *Pallister*, which had been assisting in their navigation through the rapids, got a line to the barges and anchored them below the middle ground (*The Evening News* 1912a).

On 15 March 1913, the *A.C. Tuxbury*'s enrollment was surrendered at Chicago. A new enrollment was issued the same day indicating a new form was required because the vessel's licenses had expired. The new enrollment listed C.R. Diamond as the vessel's Master, but all other information remained the same (Bureau of Navigation 1913). The *W.H. Sawyer, C.E. Redfern* and *A.C. Tuxbury*, which had over wintered at Tonawanda, departed on their first trip of the season at the beginning of April. Captain Peter Ward took command of the vessel for the duration of the 1913 season. The 1913 season proved uneventful, and the *A.C. Tuxbury*'s yearly license was renewed at Chicago on 15 March 1914 (Bureau of Navigation 1913; *Door County Advocate* 1913).

Captain Charles Fournier was named Master of the *A.C. Tuxbury* for the 1914 season (*The Evening News* 1914a). On 15 May 1914, the *W.H. Sawyer, C.E. Redfern* and *A.C. Tuxbury* stopped at the shipyard in Sturgeon Bay on their way north from Chicago to Duluth. The *A.C. Tuxbury* waited while the *W.H. Sawyer* had a new after-spar installed and the *C.E. Redfern* received bottom caulking (*Door County Advocate* 1914a). On the return trip from Duluth, the trio was downbound of Sault Ste. Marie and passing through the cut on the western side of Neebish Island when the *C.E. Redfern* struck a crib. She hit with such force that a large hole was torn in her bow. An effort was made to keep her afloat with her pumps, but the barge filled so quickly the *W.H. Sawyer* was unable to reach her before she settled to the bottom in twenty-six feet of water. Luckily, the top of her cabins remained out of water, and the crew was not forced to abandon the boat. The lumber aboard the *C.E. Redfern* was lightered onto the *W.H. Sawyer* on 26 May, and the *A.C. Tuxbury* was left tied alongside the sunken craft.

The *W.H. Sawyer* proceeded to Detroit where Captain Michael Carnakery called Fleet Captain W.D. Hamilton at Chicago. Orders were issued to repair the hole in the *C.E. Redfern* and to proceed to raise her (*The Evening News* 1914b). The *W.H. Sawyer* quickly discharged her cargo at Tonawanda, loaded coal and returned to the upper lakes to pick up the *A.C. Tuxbury*. Having picked up the barge, the two proceeded to Green Bay to offload the coal. The *W.H. Sawyer* and *A.C. Tuxbury* then sailed to the Sturgeon Bay shipyard where the *A.C. Tuxbury* was to be temporarily placed in ordinary. The *W.H. Sawyer* deposited the *A.C. Tuxbury* alongside the wharf about 10:00 PM and was attempting to turn around when she grounded on the north end of Dunlap Reef. The fishing tugs *Sylvia* and *Coates* attempted to pull the steamer free without success. The *A.C. Tuxbury* was then brought alongside to lighter the *W.H. Sawyer*'s coal bunkers in order to lighten the steamer and aid in her removal from the reef.

The tug *Hunsader* arrived in Sturgeon Bay at 3:30 PM on 14 June and was immediately summoned to assist the *W.H. Sawyer*. Several tons lighter, the *W.H. Sawyer* was easily pulled into deep water and suffered no damage, as she had grounded on the gravelly part of the reef under slow speed. Following her inspection at the shipyard, the *W.H. Saywer* left port that evening, having only lost a day to the accident (*Door County Advocate* 1914b). While in ordinary at the shipyard, the *A.C. Tuxbury* received a bottom calking and other repairs as they were found necessary. Although the *A.C. Tuxbury* remained in Sturgeon Bay for at least a month, it is uncertain exactly how long she remained there (*Door County Advocate* 1914c).

The next record of the *A.C. Tuxbury* in contemporary newsprint was in November 1914 in association with the loss of the steamer *Oscoda*, also of the Edward Hines Lumber Company fleet (*The Evening News* 1914c). On 6 November 1914, the schooner barges *A.C. Tuxbury* and *Alice B.*

Norris were in tow of the steamer *Oscoda* as they departed Georgian Bay loaded with lumber for Chicago. They were forced to put in at St. Ignace, Michigan, on 7 November to seek shelter from a southwest gale. Early on the morning of 8 November, the wind had shifted to the northwest and the seas were relatively calm close to shore, so the three vessels departed St. Ignace for Chicago. The *Alice B. Norris* was leaking, so the captain of the *Oscoda* hugged the shoreline to keep the vessel from rolling and pounding in the heavy seas of the open lake. Entering Naubinway Bay, an area dotted with reefs and shoals, the Captain of the *Oscoda* had his crew take regular soundings and keep a sharp lookout to avoid grounding. By late afternoon a fog settled in, and flurries further obscured visibility.

At 3:00 PM, the *Oscoda* struck Pelkie Reef, a rock spire that rises from thirty feet of water to within four feet of the surface two miles off Epoufette Point. The *Oscoda* grounded hard, and with darkness coming on the two barges set their anchors to wait for daylight the next day. At daybreak the *A.C. Tuxbury*, the lead barge, came alongside the *Oscoda* to begin lightering the steamer's deckload. The previous night, however, the wind had again shifted to the southwest and the heavy sea made for difficult and dangerous work as waves washed over the deck and the vessels violently pounded against one another.

At 5:30 PM on 8 November, the *Oscoda*'s was still hard aground when she heeled over to starboard against the *A.C. Tuxbury* and lost her funnel overboard. The *Oscoda*'s crew quickly abandoned ship, and the Captain had to be picked out of the water. With both crews aboard the *A.C. Tuxbury*, she now began leaking badly due to the severe pounding, and soon a foot of water was washing over her deck. Helpless, both crews waited and huddled together in an attempted to outlast the storm.

At 3:00 AM on 10 November, a portion of the crew attempted to launch the yawl in an effort to reach shore. Shortly after the yawl was launched, however, the effort was abandoned and all crewmen were forced back onto the *A.C. Tuxbury*. At the first hint of daylight, the crew hoisted a tablecloth into the rigging in an attempt to signal assistance from the fishermen at Epoufette Point. With no assistance coming from shore and the barge settling deeper into the water, at 9:00 AM the crew fashioned a raft from the lumber cargo and bits of rope. Several of the men, doubtful the ship would survive the gale, lashed their clothing and possessions to lumber and cast it overboard, hoping to gather the items once they got ashore. Of the twenty-one crewmen aboard, six climbed aboard the makeshift raft and pushed off from the *A.C. Tuxbury* in an attempt to float through the breakers and over the reef to the *Alice B. Norris*, which lay at anchor inside the reef. Luckily, they made it. A second raft was built that carried six more of the crew to safety, and

finally the yawl was launched with the remaining crewmen. All made it safely to the *Alice B. Norris*.

On the morning of 11 November, a fisherman arrived in a gas boat to carry a portion of the crew ashore to seek shelter. When the crew made shore, they learned that the fishermen had collected their belongings and demanded $200 in compensation for its "safe keeping". That afternoon, the tug *Schenk* arrived from Sault Ste. Marie and took the *Alice B. Norris* back to St. Ignace. The next morning, the tug *Gifford* and the steamer *Robert Holland* arrived. The crews of the *Oscoda* and *A.C. Tuxbury* were taken aboard and the *A.C. Tuxbury* was taken in tow. The *Oscoda* was declared a total loss.

At 9:00 PM on 12 November the crews from the *Oscoda* and the *A.C. Tuxbury* arrived at Seul Croix Point, but the journey had not been without its problems. The gale had continued from the east with a driving snow, parting the towline to the *A.C. Tuxbury*. The *A.C. Tuxbury* was left adrift, but was eventually picked up the following afternoon near Barque Point by the tugs *Anabel* and *Burger* of the Coffey Line. She was unloaded at Manistique and towed to Sturgeon Bay where repairs were to be made over the winter at the shipyard of Rieboldt & Wolter (*Door County Advocate* 1914d, 1914e; *The Evening News* 1914c).

On 8 December 1914, however, the Hines Lumber Company sent the steamer *L.L. Barth* to Sturgeon Bay to bring the *A.C. Tuxbury* back to Chicago for repairs. Missing her rudder and with several four-foot-long holes at her waterline, the *A.C. Tuxbury* was placed between the *L.L. Barth* and another consort to keep her upright on the long, slow sail to Chicago (*Door County Advocate* 1914e). The trip was made in three segments, sailing from Sturgeon Bay to Kenosha, from Kenosha to Waukegan, and finally from Waukegan to Chicago. Upon their arrival on 30 December, the *A.C. Tuxbury* was inspected by divers Gunderson and Anderson, who discovered another ten-foot square hole in her bottom and significant damage to her sternpost and shoe. The divers put a temporary patch on the hull and the vessel was pumped free of water. Once clear of water, the remaining lumber was removed from her hold and she went into drydock where the total extent of her damage was revealed: her keel and deadwood were nearly torn off from the stem aft, her forefoot was gone, butts sprung, and her stern post, shoe and garboard strake were missing for about twenty feet forward of the stern post (*Door County Advocate* 1914f; 1915a).

Repairs on the *A.C. Tuxbury* were completed by early May 1915. A new enrollment was issued at Chicago on 4 May 1915, as her original paperwork was lost during the stranding (Bureau of Navigation 1913, 1915). On 6 May, the steamer *L.L. Barth*, with the barges *A.C. Tuxbury* and *S.J.*

Tilden in tow, arrived at Sturgeon Bay to have the barges caulked before being recommissioned for the season (*Door County Advocate* 1915b).

The *A.C. Tuxbury*'s luck did not hold out for the entire season. On 3 October 1915, the *W.H. Sawyer* and *A.C. Tuxbury* were battling a storm on Lake Superior for several hours while trying to make the lee of the Apostle Islands for shelter. Just short of their destination, the *A.C. Tuxbury*'s towline parted and the vessel was left adrift in the nighttime storm. The *W.H. Sawyer* searched throughout the night for the adrift schooner and nearly gave up hope, but eventually found her the next morning. During the night, the *A.C. Tuxbury* lost part of her deckload of lumber that was consigned to the Eastern Lumber Company of Tonawanda (*Door County Advocate* 1915c; *The Evening Express* 1915a).

A little over a month later, at 7:00 AM on 6 November 1915, the *W.H. Sawyer* was downbound in a fog on the Niagara River with the *C.E. Redfern* and the *A.C. Tuxbury* in tow. The *C.E. Redfern*, laden with 720,000 feet of lumber for Smith, Fassett & Co. of Tonawanda, ran out of the channel and went hard aground on the rocky shore just off Riverside Park in Buffalo. Fearing that the *A.C. Tuxbury*, which was first in the tow, would also become unmanageable and strike bottom in the seven-mile-an-hour current, the Captain of the *W.H. Sawyer* ordered the tow line cut between the two barges and the stranded *C.E. Redfern* was left grounded. The *C.E. Redfern* remained 200 feet off shore and was reported to be out of the water at least four inches fore and aft. Two canal boats owned by Seymour Lord of Tonawanda, and a gang of longshoremen working for Joseph Jordan, where sent to lighter the vessel. Following several attempts, she was finally pulled free the following day. Although the damage initially thought to be minor, it is unknown what happened to the *C.E. Redfern* following her release, as she did not rejoin her tow. On 20 November, the *W.H. Sawyer* arrived at Tonawanda with the *A.C. Tuxbury* and *Alice B. Norris* in tow. Upon arrival and unloading their lumber cargos, all vessels went into winter quarters (*The Evening Express* 1915b; *The Evening News* 1915).

Little is known of the *A.C. Tuxbury*'s history between 1916 and 1921. Edward Hines sold the *C.E. Redfern* to the Hamilton Transportation Company of Chicago in 1917 (ADGNFPL 2005b). In October 1919, the *A.C. Tuxbury* took on a load of 900,000 feet of lumber at Houghton, Michigan (ADGNFPL 2005a). On 26 October 1921, the *W.H. Sawyer* passed through Sturgeon Bay with the *A.C. Tuxbury* and the *Interlaken* in tow. All three vessels were southbound and loaded with lumber, but were forced to wait in the canal for favorable weather on the lake. The *Door County Advocate* (1921) fancied their passing with some nostalgia and noted that theirs was the first string of lumber barges to have passed though the bay all season (*Door County Advocate* 1921).

On 1 July 1923 the *A.C. Tuxbury* was towed from Racine to Milwaukee. She had been purchased by the Milwaukee Electric Company for service carrying coal from the docks at the mouth of the Milwaukee River to the company's generating plants upriver. By November 1923, the Milwaukee Electric Company had converted the *A.C. Tuxbury* to a self-unloading barge and renamed the vessel *EMBA* (*Door County Advocate* 1923a; 1923b).

Self-unloading vessels originated on the Great Lakes, and, at the time of the *A.C. Tuxbury*'s conversion, this vessel type was still quite new, but rapidly gaining in popularity and technological advancement (Bodden 2011). The first Great Lakes self-unloader was the wooden barge *Hennepin*, converted from a wooden steamer to a self-unloading barge at the Milwaukee Dry Dock Company in 1902. The 208-foot *Hennepin* was retrofitted with two longitudinal hoppers that took up all the space between the forward and after bulkheads. Beneath each hopper, a belt conveyor carried cargo aft to where it was discharged into a common hopper that then discharged onto another belt conveyor that ran up through the deck. This conveyor then discharged onto a boom conveyor suspended from a four-legged derrick located amidships. The boom could then be swung over the vessel's side to deposit cargo ashore. The entire apparatus was powered by a 40-horsepower steam engine, and was capable of discharging cargo at a rate of over 400 tons per hour, or able to discharge the vessel's entire cargo in about three hours with no labor except opening the hopper's trap doors (ADGNFPL 2005c; *Marine Review* 1902; Thompson 1991).

Early critics of self-unloaders pointed out the large amount of cargo space that was sacrificed for the installation of the self-unloading equipment, but despite a reduced cargo space the *Hennepin*'s owners were quite pleased with the vessel's operation. With no need for shore-based unloading machinery, the *Hennepin* could quickly and efficiently discharge cargo anywhere there was water deep enough to tow the vessel, which opened many new markets that previously did not exist (Thompson 1994).

Six years following the *Hennepin*'s conversion, the first purpose-built self-unloader was constructed, the 364-foot steel-hulled *Wyandotte.* Originally constructed with a series of belt conveyors like the *Hennepin*, in 1910, only two years following her launch, the *Wyandotte* had the belt conveyor that carried cargo topside replaced by a more vertical and compact bucket tower. The bucket tower could carry cargo at a much steeper angle than a belt conveyor, which took up much less room and allowed a greater cargo capacity (Lafferty and VanHeest 2009).

The earliest self-unloaders were considered specialized vessels that operated primarily in niche markets outside the mainstream of the Great Lakes bulk cargo trade. Slowly, however, the self-

unloader gained in popularity until the 1920s, when their numbers began increasing significantly (Thompson 1991). The *A.C. Tuxbury*'s conversion was on the cusp of this popularity, and like many of her predecessors her conversion was designed to fill a very singular role in moving coal up the Milwaukee River. Her conversion did take advantage of the latest developments in self-unloader technology, however, in that she was fitted with a nearly upright bucket tower rather than the earlier low-angle belt conveyor to bring the cargo topside.

Little of the *A.C. Tuxbury*'s hull structure was altered in the vessel's conversion to a self-unloader. With the exception of the bucket tower and unloading boom that replaced her stern cabin and masts, the newly-converted *EMBA* remained easily recognizable as the large wooden schooner barge she was built upon. Even her cargo changed little, as the vessel had often carried coal as the *A.C. Tuxbury*, except now her travels were limited to the Milwaukee River and she was now able to self-discharge her cargo with little effort.

Because the *EMBA* would remain within the confines of the Milwaukee River, she was declared "exempt" from registration in 1924 (Milwaukee Public Library 1959).

This also allowed another modification that both increased her loading efficiency as well as increased her cargo capacity – the removal of the weather deck above the cargo hold. The removal of the hatches, planks, and several deck beams allowed faster loading, as the cargo did not have to be loaded into the hold through cargo hatches and then moved forward or aft within the hold below deck. Instead, the cargo could be evenly loaded throughout the hold with no additional below deck handling. The lack of a planked deck also allowed a greater cargo capacity by allowing coal to be piled higher than deck level. As the coal was discharged onto the conveyors beneath the hoppers, the upper coal would settle through the deck beams and into the cargo hoppers. In this manner some of the vessel's cargo capacity that was lost to the unloading mechanism was regained.

The *EMBA* only remained in service on the Milwaukee River for nine years. By 1932, she had outlived her usefulness. Her unloading boom and some of her belt conveyors were removed, and she was quietly towed out onto Lake Michigan one last time where she was cut loose and scuttled northeast of the Milwaukee River (Milwaukee Public Library 1959).

Significance

Sitting upright in 170 feet of water in Lake Michigan, the *EMBA* site possess a wealth of archaeological data on nineteenth-century wooden schooner barges, the adaptive reuse of aging Great Lakes vessels, and the innovation and development of self-unloading vessel technology on the Great Lakes. Launched from the F.W. Wheeler & Company shipyard in 1890 as the *A.C. Tuxbury*, the vessel's original construction is characteristic of the large wooden schooner barges that were common to the consort system on the Great Lakes in the late nineteenth-century. Although the F. W. Wheeler shipyard was quite prolific, much of what we know of F.W. Wheeler's wooden vessels has come from the archaeological record that exists on the Great Lakes bottomlands. At the time of her launch in 1890, the F. W. Wheeler yard had already transitioned to steel vessel construction, but for reasons unknown the shipyard continued building large wooden vessels alongside steel hulls for several years. Few records or ships plans have survived from the Frank W. Wheeler shipyard, making the *EMBA* site particularly significant. Archaeological data collected from the *EMBA* site has provided significant information on wooden schooner barge construction, as the *EMBA* site retains significant hull integrity from her construction and use as the *A.C. Tuxbury*.

Additionally, the adaptation of self-unloading apparatus to the *A.C. Tuxbury*'s hull makes the *EMBA* site particularly significant in the archaeological documentation of the adaptive reuse of aging wooden vessels as well as the documentation of the engineering and development of self-unloading technology on the Great Lakes. Self-unloading vessels originated in Milwaukee in 1902; because the *EMBA* was converted while self-unloader technology was still developing in 1923, the *EMBA* site exhibits transitional traits between the earliest self-unloaders and those in use today. The *EMBA* site is one of only two wooden self-unloaders that lie in Wisconsin waters, and only one of three that are known to exist in Lake Michigan. The rarity of wooden self-unloaders, combined with the early age of the *EMBA*'s self-unloading apparatus, makes the site particularly significant in the archaeological documentation of the engineering and development of what has become the most common commercial vessel type sailing the Great Lakes today, the self-unloading bulk carrier. Significant information on schooner barges, adaptive reuse of vessels, and the development of self-unloader technology has been gathered from the *EMBA* site. The site holds vast potential to yield addition information in future years, making the *EMBA* eligible at the state level under Criterion D.

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Verbal Boundary Description:
The boundary for the *EMBA* site is marked by a circle with a radius of 150 feet centered on the UTM coordinates 438967 Easting, 4768316 Northing, Zone 16.

Boundary Justification:
This site boundary was chosen to encompass the wreck site and associated debris field.

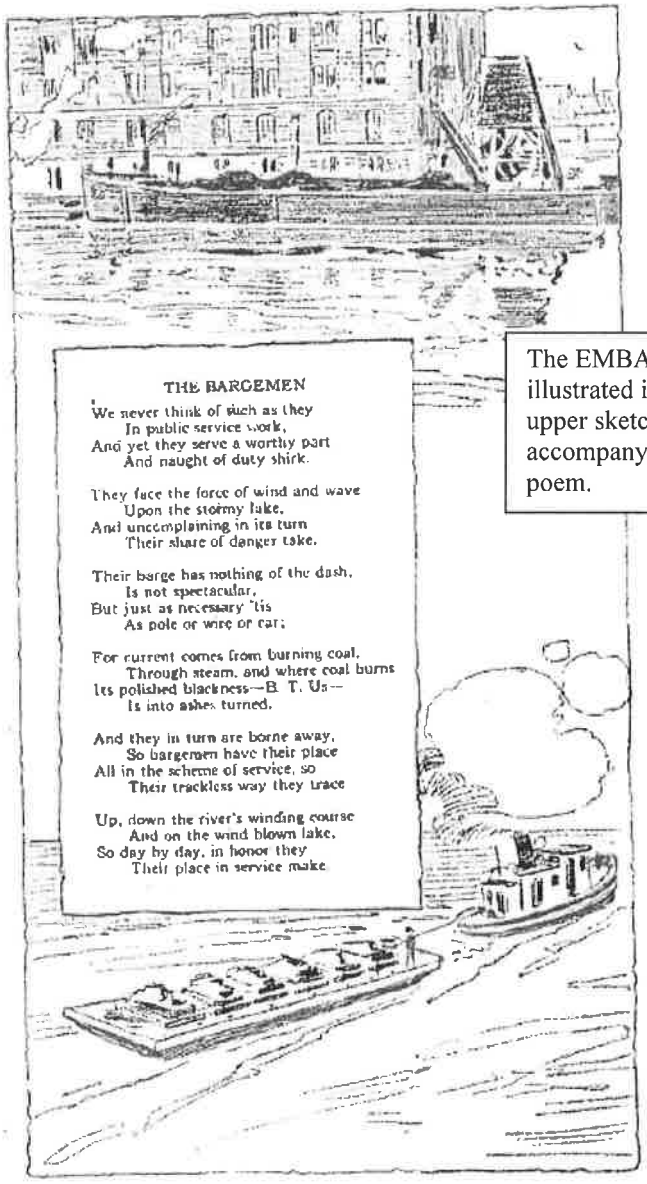
United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Photo #1 of 1
EMBA Shipwreck
Milwaukee County, Wisconsin
Photographer Tamara Thomsen
July 2012
Starboard side of self-unloading tower looking aft

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet



The EMBA is illustrated in the upper sketch accompanying the poem.

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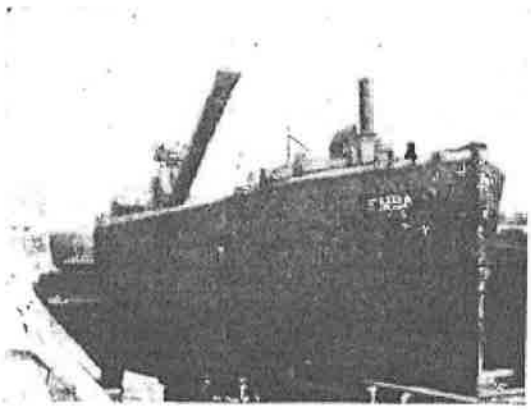
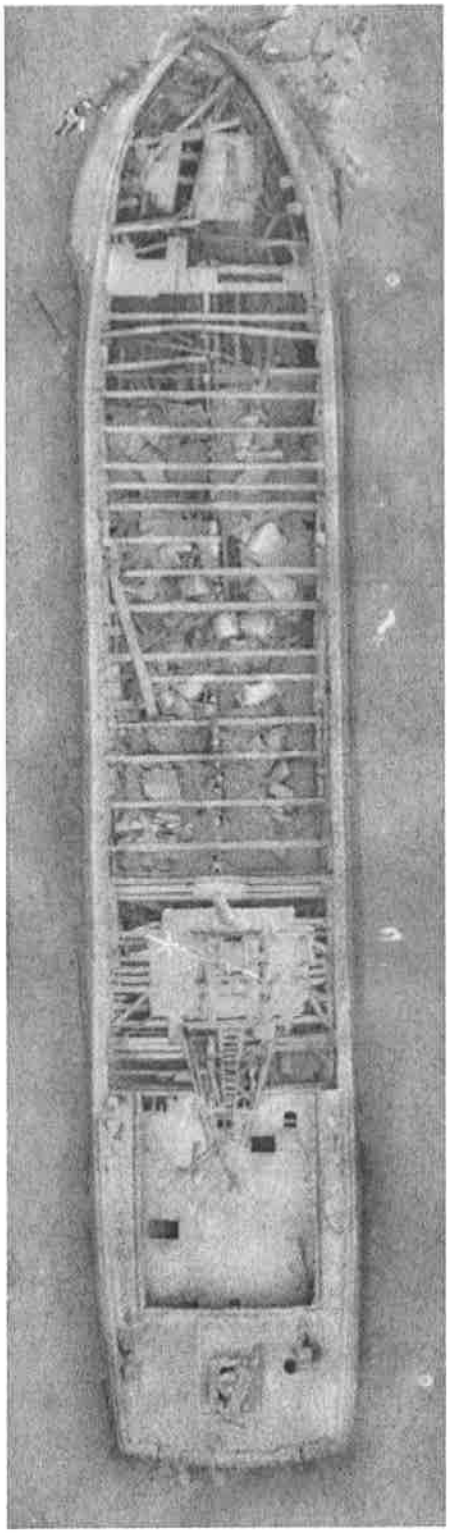


The EMBA

Rail & Wire, Monthly newsletter of the Employees' Mutual Benefit Association. August 1924.



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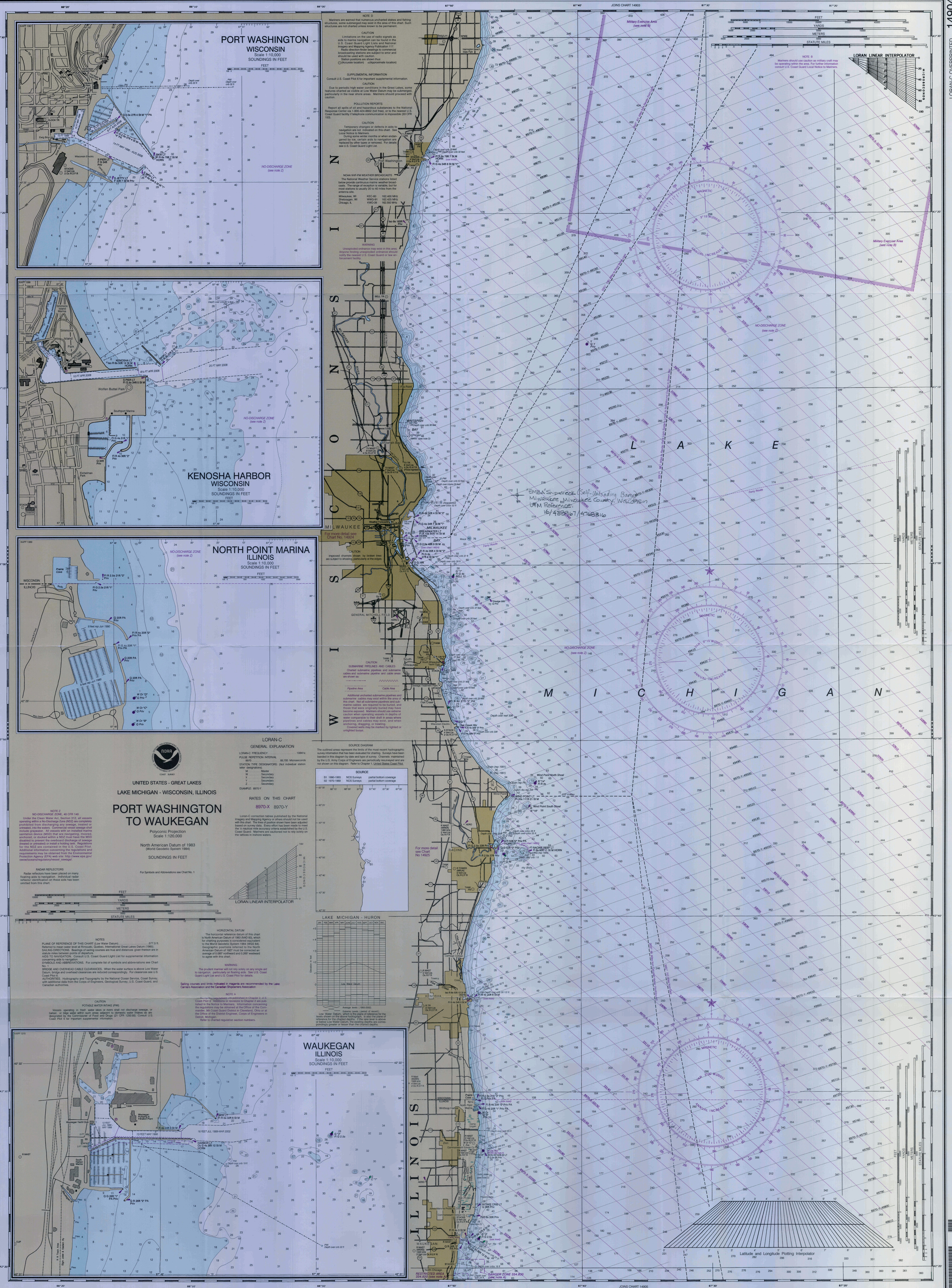
Formerly LS 74, 1st Ed., Sept. 1914 KAPP 1366

SOUNDINGS IN FEET

Nautical Chart Catalog No. 4, Panel B



26th Ed., Aug. /03 Revised reprint
Corrected through NM Sep. 05/09
Corrected through LNM Sep. 01/09

CAUTION
This chart has been corrected from the Notice to Mariners (NM) published weekly by the National Imagery and Mapping Agency and the Local Notice to Mariners (LNM) issued periodically by each U.S. Coast Guard district to the dates shown in the lower left hand corner.

SOUNDINGS IN FEET

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COAST SURVEY

FATHOMS / FEET / METERS

Port Washington to Waukegan
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