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

OMB No. 10024-0018

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 *Lakeland* Shipwreck (Steam Screw)
other names/site number *Cambria*

2. Location

street & number Lake Michigan, 6 miles east of Sturgeon Bay Canal, Wisconsin N/A **not for publication**
city or town Sturgeon Bay X **vicinity**
state Wisconsin **code** WI **county** Door **code** 029 **zip code** 54235

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 X statewide _ locally. (_ See continuation sheet for additional comments.)

Signature of certifying official/Title — Date 5/19/15

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

Lakeland Shipwreck (Steam Screw)	Door County	Wisconsin
Name of Property	County and State	

4. National Park Service Certification

I hereby certify that the property is:

X 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:)

by Barbara Wyatt — 7-7-15

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: Steel-hulled Steam Screw

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.)

X 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- ABORINGINAL
MARITIME HISTORY
COMMERCE
ENGINEERING
SCIENCE

Period of Significance

1886- 1925

Significant Dates

1886
1910
1920
1925

Significant Person
(Complete if Criterion B is marked)

N/A

Cultural Affiliation

Euro-American

Architect/Builder

Globe Iron Works Company

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 6.5 acres

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

	Zone	Easting	Northing
1	16	473854	4976246
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, Paul Reckner, and Mackenzie Stout				
organization	Wisconsin Historical Society			**date**	3/1/2014
street & number	816 State Street			**telephone**	608.221.5909
city or town	Madison	**state**	WI	**zip code**	53706

Summary

Located six miles east of Sturgeon Bay, Wisconsin, the *Lakeland* wreck site (47-DR-212) lies in 205 feet of water on the bottom of Lake Michigan. The site was relocated in the 1960s and documented by the Wisconsin Historical Society in 2013. The *Lakeland* (aka *Cambria*) is one of the most storied wrecks on the Great Lakes and has retained this mystique to the present day. Her hull is somewhat broken, but all of the hull structure and machinery is extant. The *Lakeland* wreck site has yielded significant information on Great Lakes steam screw construction, but due to the extreme depth of the site, the *Lakeland* has great potential to yield further information in future years as diving technology improves.

The *Lakeland* meets the registration requirements under Criterion D at the state level as a good example of the steam screw vessel property type under the area of Engineering as described in the Multiple Property Documentation *Great Lakes Shipwrecks of Wisconsin* (Cooper and Kriesa 1992). A steam screw is a ship propelled by a steam engine and a propeller. The *Lakeland*, in a larger sense, is a bulk freight and passenger carrier. The *Lakeland* represents multiple eras of ship construction and use on the Great Lakes. She began as a bulk freighter in 1886, was converted to a passenger steamer in 1910; and finally was converted to a car carrier in 1920. Because of her operational history, she is also eligible under Criterion D in the area of Commerce for her role in the grain and ore transport trade and in the automobile transport trade.

The *Lakeland* site is also significant under National Register Criterion A in the areas of Science and Maritime History for contributions to the development of deep diving technology.

Vessel Description

The Marine Record (1887a) reported a description of the ship's original appearance:

> Length of keel 280 feet and 5 inches; over all 297 feet; breadth of beam, 39 feet; depth of hold, 24 feet; between the spar deck and the main deck, 8 feet; and the lower hold about 13 feet. The plate on the bottom and up to the second strake above the turn of the bilge is steel. There are five strakes of iron on her sides, her sheer strakes being double, 44 inches wide and of 11.16 and a half inch steel width through and through. The plating on the boat is all 11.62 and a half inch thick. Half-inch iron is the lightest on the boat, and she carries this thickness throughout, although it might be lessened on one-third of her length. All steel frames, 24 inch centers, run to the luff of the bow. Then they begin to narrow up at 22 and 20 inches, and from the collision bulkheads to the stem they are 13 inch centers. The depth of the water bottom is 3 feet 4 inches, and is divided into six compartments, three on each side, with five bulkheads in the lower hold. The collision bulkhead runs to the spar deck. The others run to the main deck,

with the exception of the boiler room bulkhead extending to the spar deck and terminating in an iron boiler house. In case of a collision the boat is provided with three iron decks in the fore side of the collision bulkhead and four tiers of keelsons on each side. Another very heavy stringer, 18 inches wide, runs parallel 8 feet from the main deck. The space between the stringer and the top of the water bottom is divided, and another 9 inch deck beam is put in as a side stringer. A wooden deck extends the width of the hatches, being encircled by a 6 foot 6 inch plate of half-inch steel. Iron bulwarks extend 70 feet aft from the stem, and the same is the case from the stern to the fore side of the boilers. The remaining bulwarks are of wood, with iron stanchions. There are no stanchions aft or headgear forward. The CAMBRIA will have three spars, with standing gaffs, to be used as derricks in handling cargo, but will carry no canvass. Her fitout will be furnished by Grover & Son although the American Ship Windlass Company will furnish her with the favorite Providence steam windlass, new style, and capstans...The engine is a triple expansion 24, and 61 by 42. The three cranks are set at an angle of 120 degrees which makes almost a perfect rotary motion. The engine will have a working pressure of 150 pounds and develops 1500 horse power. The bed plate is of box pattern, and weighs about 17 tons. This is the first triple expansion on the lakes and the Globe Company have gone to the expense of making a boring bar that will bore all the journals at one time, by this means, making them perfectly true. The columns are of box pattern, two to each cylinder, with a large slide service and a water back to keep them cool. Another new feature is the bolting of all three cylinders in a line. In working the engine at the docks the steam reverse is such that it could be handled by a child.

The CAMBRIA will have two boilers, each 12 feet in diameter and fourteen feet long, with horizontal steam drums fourteen feet in diameter. The shells are of Otis steel, 1 and one eighth inch thick and are allowed 225 pounds pressure. Each boiler has three Aetna shaking grate furnaces.

The CAMBRIA has a Globe sectional wheel, and when her machinery and boiler are in place, the boiler house and cabin built, and the outfit aboard, will draw about 7 feet 6 inches aft and 5 feet forward, light, and carry 2680 tons on fifteen and a half feet draft. The wheel is 13 feet diameter with 16 feet lead.

The ship was also equipped with seven hatches, permitting its bulk holds to be fully unloaded in a single day (MDMJ 1887b).

Details of the ship's interior appointments were provided by the *Marquette Daily Mining Journal* (MDMJ 1887b):

> The cabins and quarters of the Cambria being made elegant, and everything about her is substantial and neat. Her forward cabin and all of the adjoining rooms are certainly not equaled in any other freight boat on the lakes. Everything is finished in hard wood and the diningroom, aft, is equally attractive. Stained glass windows, brass railings and brass door fixtures seldom go with the seaman's humble quarters, but they are all to be seen on the Cambria.

The *Lakeland*'s steel-hull and ship lines remain as in her original 1886 appearance. Everything from the waterline down, including deck features involved in the bulk cargo handling, such as the grain hatches are extant on the wreck site. With the *Lakeland*'s 1910 conversion to handle passenger traffic, additional cabins were added as well as chambermaid and bellboy quarters. The cabins walls are not extant on the wreck site; however, the cabin location can be determined from the combings that remain extant. In 1920 *Lakeland* was outfitted with a cargo elevator, added to assist moving automobile cargo between decks. This feature remains extant on wreck site

The *Lakeland*, in a larger sense, is a bulk freight and passenger carrier. The *Lakeland* represents multiple eras of ship construction and use on the Great Lakes. She began as a bulk freighter in 1886, was converted to a passenger steamer in 1910; and finally was converted to a car carrier in 1920. Because of her operational history, she is also eligible under Criterion D in the area of Commerce for her role in the grain and ore transport trade and in the automobile transport trade.

At the time of the Lakeland's sinking, its appearance was as a car carrier; the specifics of this final configuration, as it appears at the wreck site, are described in detail below.

Site Description

The *Lakeland* rests in 205 feet of water, broken nearly in half, aft of her cargo elevator. Both bow and stern sit upright, disarticulated, separated by 10.6 feet on the port side and 36.7 feet on the starboard side. The two sections of wreckage are aligned but at a 36 degree angle. Two baselines were installed during the survey. The bow baseline (BLA) ran 184° from the forepeak of the bow, stretching 137 feet through the elevator structure to the break. The stern section was divided for survey purposes into two sections. The stern baseline (BLB) ran 220° from the bulkhead at the forward edge of the coalbunker hatch 95.3 feet along the centerline of the vessel to the top of the stern rail. The 47.7-foot area of wreckage and central debris field aft of BLA and forward of BLB was catalogued separately due to a depth difference of nearly 40 feet from the baseline heights, which were installed at 160 feet of water to this area including cargo, debris and some hull structure that lay directly on the lakebed. Given that the ship sank at the stern with the stern striking the bottom first and breaking the ship in two, it can be assumed that the stern would represent the course of the ship at the point of sinking (004°). The *Lakeland* was at anchor facing north away from the Sturgeon Bay Canal when she sank.

As the ship went down, air trapped in the upper deck structures blew wooden deckhouses from the steel hull. These were thrown more than 40 feet into the air as the vessel sank stern first listing to port. Looking down upon the shipwreck, the cabin deck is exposed; pilothouse and cabins forward, dining saloon and officers' quarters aft are not extant. Several panels that comprised the wooden cabin walls above the deck remain astride of the cargo elevator in the bow section, and along the upper level of the boiler room on the stern section. One partially intact section of the cabin walls on the port side, adjacent to the crane, is constructed of wood over steel framing and has two windows. There is overlapping metal on the base of this section that connects it to the hull, suggesting that this composite construction was likely pre-fabricated before installation.

The upright supports (frames) for these wooden panels are made of steel I-beams 7.3 feet high, 0.55 feet wide and 0.3 feet thick. Horizontal support beams top the frames and are 2.3 feet in length with a hanging knee of sorts, an angle iron welded to support the frame at the boat deck junction. Also made of steel, the knee is 3.6 feet long by 1.1 feet tall. Many of these panels have fallen away from the wreck and lie on the lakebed outside of the vessel, this likely occurred after sinking or through improper anchoring of dive vessels. Seven frames for the composite panels remain extant on the starboard side of the bow section, and seven frames remain extant on the port side of the bow section.

The *Lakeland*'s starboard side anchor chain exits the hawsepipe, crosses over the bow and runs off the port side of the vessel at 320°. The chain extends from bow 262 feet and ends in the sand. The anchor has been removed. The portside anchor chain runs out of the hawespipe and under the keel. The chain exits the starboard side from under the vessel but disappears in the sand alongside the ship. The portside anchor was not located on the site and is either under the wreckage or was salvaged. Hawsepipes are extant on both port and starboard sides located 3.0 feet aft of the stem, and 16.8 feet below the rail. From top to bottom the outer dimensions of the hawsepipes measure 3.6 feet across and horizontally, 1.3 feet. The pipe thickness is 0.5 feet as it protrudes 0.3 feet from the hull.

The top of the bow railing is in 155 feet of water, rising 50 feet off the lakebed. Her stempost lists one degree to starboard and one degree aft. The stempost measures 35.6 feet tall, and 0.45 feet square, with 9.4 feet of sand scoured from below her bow leaving her keel exposed. The keel is 0.6 feet in width at the stempost and widens to 1.2 feet moving aft. At the time of the survey, 40 feet of the keel was exposed. Behind the stempost is a remnant of the ship's flagpole.

The bow section of wreckage contains several cracks in the cabin deck that allowed access to the main deck and cargo hold of the vessel. There are three main athwartship cracks in the cabin deck. Noted on BLA a small crack from the centerline of the ship to the portside is at 23.5 feet, two large cracks nearly across the entire vessel have formed along seams in the metal deck plates; these are located at 51.1 feet and 81 feet. Moving aft from stempost to the first crack, the deck remains relatively level. After the first crack, the deck pitches downward. A row of deck stanchions runs down the center of the vessel

and continues to support the cabin deck as the deck is beginning to cave in on the outer edges, forming a pup tent shape. Steel I-beam deck stanchions measure 6.3 feet tall, 0.65 feet wide and 0.35 feet thick. The stanchion supporting the deck at the third crack is bent considerably; angled 14° forward and slightly twisted clockwise. Deck stanchions are regularly spaced 5.4 feet and support a longitudinal beam, or deck stringer, 0.7 feet wide and 0.3 feet thick. Athwartship deck beams are 0.8 feet wide by 0.3 feet thick and spaced 1.5 feet. At the break, at 137 feet on BLA, the decks are folded down on top of one another.

The bulwark on the bow is 5.0 feet tall, measured from the deck, and steps down to 4.0 feet tall 7.5 feet aft of the stempost. The bulkwark extends aft 50 feet to the point where the upright frames for the wood and steel composite paneling for the cabins begin. Wooden bulwark stanchions are uniform in dimension but the first three do not touch the deck, and seem to be decorative in nature, more so than for support or reinforcement. Bulwark stanchions measure 0.25 feet in width, 0.3 feet thick and 4.0 feet tall. The distance from the stem to the first stanchion is 2.3 feet, and subsequent stanchions are spaced 1.9 feet. The bulwark is capped with a wooden rail 0.3 feet wide and 0.1 feet thick. Measuring from the rail down to the sheer strake (a thin piece of metal 0.1 feet tall and 0.2 feet thick) is 1.9 feet. From the sheer to the first wale strake is 1.9 feet, and from the first wale strake to the deck-hull joint is 0.9 feet. The *Lakeland* carried two wale strakes over the length of the vessel.

Many of the hull and cabin deck features, as well as extant pieces of machinery on the bow section of the wreckage, were recorded as to their position on BLA. Pairs of deck bits are located 7.0 feet aft of the stem on both port and starboard. The individual bits are spaced 0.6 feet apart and stand 1.6 feet tall; they measure 1.0 feet across the top. The pairs are welded to a 0.3 feet thick base plate.

A combing for ladder access from the cabin deck to windlass room (on the main deck) is located along the starboard bulwarks, 5.0 feet aft of the bow. The combing measures 1.9 feet square, and rises 0.55 feet above the deck with a 0.6 feet interior height and 0.1 feet thickness. The ladder between decks is extant.

Archaeologists accessed the windlass room in the forepeak on the main deck through a central doorway in the bulkhead. Just inside the door, and along the bulkhead on the port side, is a double acting bilge pump and two bilge pump handles. Incredibly, a mousetrap to catch mice aboard ship remains on the wreck and can be seen above the bilge pump and along the joint in the bulkhead. In the center of the room is the ship's windlass. It is surrounded by a safety railing constructed of pipes at waist-level that form a perimeter around the windlass. The machinery was painted green with yellow gypsy heads. A maker's plate was located, but the green paint obscured the embossed information. To the starboard side of the windlass and along the bulkhead is an open 55-gallon drum. Along the forward walls of the windlass room are two deck pipes, and two portholes with glass and frames extant, on both port and starboard sides. Coils of deck lines are hung from hooks on the wall. In the

floor on the starboard side of the windlass is a scuttle, a ladder access to two decks below. A hawser lays partially over the opening. Archaeologists were not able to physically access the room below and chain locker, but were able to position a video camera to view into the room. Three valves associated with the seacocks were observed as well as a deck stanchion with the anchor chain oddly wrapped twice around it and the chain extending taut through the hawseholes.

On the cabin deck, a capstan is located 11.5 feet aft of the stem. No cover is extant. The capstan stands 3.6 feet above the deck with a 1.6 feet diameter at the top. Just aft of the capstan is a remnant of a cabin combing running from the portside of the ship to 2 feet to port of the capstan and longitudinally to 18.0 feet on BLA. This combing demarks what would have been the location of the Bell Boy's room. A small remnant of the cabin combing separating the Chambermaid's room from a forward water closet is opposite that on the starboard side.

A between-decks stairway opening is located 18.5 feet from the stem. The stairs are no longer extant. The opening measures 4.6 feet long x 2.7 feet wide with no combing. Located 33.1 feet on BLA is the leading edge of the steering engine. The machinery, winch and cable, sits on a 4.7-foot square platform and rises 3.6 feet above the deck. Sitting on the edge of a longitudinal crack in the cabin deck, the engine lists 14° to the portside as the deck buckles under its weight. Forward of the steering engine on the main deck below is the hoisting engine. Archaeologists entered the cabin deck crack at this location. Traveling forward along the main deck, on the port side of the vessel, are the remains of another Bell Boy's quarters, just aft of the windlass room bulkhead. A portion of the frame surrounding the head (water closet) remains extant, as does a sink and a lath-affronted bench that may have doubled as storage or supported a mattress. Also in this area are pieces of hawser and block and tackle, suggesting some gear storage occurred in this compartment. Around the hoisting engine and on the starboard side of the ship just aft of the windlass room bulkhead is the main deck's Chambermaid's quarters. The cabin walls, a sash window to the interior of the ship, and the door remain extant. Inside the compartment amongst fallen debris is a 55-gallon drum, and a masthead light with a white lens and brass body.

On the cabin deck, the mast hole for the foremast is centered at 39.2 feet on BLA aft of the steering engine. The hole is 1.8 feet in diameter with a mast partner for reinforcement 0.15 feet thick that protrudes 0.55 feet above the deck. The foremast has toppled and lays angled to port on the cabin deck aft of the mast hole. The base of the 52.9 feet long foremast is located at 47.0 feet on BLA. Its diameter is 1.3 feet at the base. A deck scuttle is located at 45.0 feet on BLA, 2.2 feet to the portside of center, measuring 1.9 feet in diameter.

Several pieces of the pilothouse and observation deck railing lay disarticulated on the cabin deck aft of the third crack and forward of the cargo elevator. Some pieces, additionally, were found on both port and starboard sides of the vessel on the lakebed. This railing, comprised of pipe (non-brass), with a

diameter of 0.1 feet, would have stood 2.4 feet above deck at its top, with a middle rail up 1.3 feet. Uprights were spaced 4.4 feet on center.

Grain hatch #1 is located 62.5 feet on BLA and centered 2.2 feet to the port side of the baseline, measuring 6.5 feet long by 5.5 feet wide. A deck stringer divides the hatch, through which one of the Nash automobiles of *Lakeland*'s cargo is visible. At this point, the deck has collapsed, rests atop and is supported by this vehicle. Grain hatch #2 is immediately to the portside of the larger opening for the cargo elevator and mostly covered with debris. The cabin deck that would have contained grain hatch #3 forward of the coalbunker bulkhead blew off during sinking and is not extant on the wreck site.

The cargo elevator added during the 1920 rebuild of *Lakeland* is centered over an opening in the cabin deck 10.0 feet long by 17.0 feet wide that is located 115 feet aft of the stem. The elevator crane straddles the opening oriented longitudinally (12 feet overall in length) and stands 13.0 feet above the deck. The crane structure leans 1.5° forward and 2° to port. The uprights are constructed of three I-beams forward, and three aft of the opening; each measuring 0.8 feet long and 0.3 feet wide. Atop the elevator are two pulley wheels 2.5 feet in diameter; one is centered, the other is located aft. On the lift itself there are two more pulley wheels of the same dimensions on either side of the lift car at the top. The platform on the lift car is 9.0 feet long, 16.0 feet wide, and has 14 beams that are spaced 1.6 feet on center. Planking on platform floor is 0.55 feet wide by 0.13 feet thick. The elevator was worked by two identical motors, one forward to lift the platform and one aft to lower it. Bases that measure 3.5 feet square, and 1.7 feet thick support the motors; motors on bases stand 3.5 feet above the deck.

There are four side-loading cargo doors, two on each side of the ship. One set is 62 feet aft of the bow and the other set is opposite the cargo elevator. Doors measure 7.0 feet wide by 6.5 feet tall and allowed access from a dock by ramp to the main deck of the vessel. By loading cars at the second set of cargo doors, vehicles could be moved between the main deck and cabin deck. The elevator could not be lowered beneath the main deck level to access the cargo hold. This suggests that in the 1920 rebuild, adaption for carrying cars probably saw the removal of some of the passenger cabins or of the dining area to accommodate vehicles on the cabin deck.

The *Lakeland's* cargo hold could be compartmentalized into two decks - an upper cargo hold and a lower. This could be achieved through removable deck beams that could be fitted onto a longitudinal deck shelf fastened to the central row of deck stanchions and to the deck shelf along the sides of the ship. Also removable was deck planking that could be placed as needed to create a deck once the beams were installed. Iron deck knees supported the main deck above, as well as the deck shelf for the cargo hold decks. Layers of green and white paint were evident on the cargo hold walls. The ship was set up with two cargo decks installed from the second cargo hatch forward to the chain locker bulkhead, and one cargo deck with the hold fully open from the second cargo hatch to aft of the cargo elevator.

The *Lakeland* carried no cargo in her cargo hold at the time of sinking. Archaeologists found two handcarts stacked next to deck stanchions aft of cargo hatch #1 and one other along the starboard hull. In the area where the cargo deck was not installed, silt covers the bottom of the wreck to a depth of 1.5 feet. Three square "manholes" through the floor of the ship's lower hold were noted with no covers extant and open to the bilge as silt has fallen like sand through an hourglass through these openings exposing the features. The chain locker could not be accessed through the cargo hold forward bulkhead; there were no doors installed on this feature. Temporary deck planking has piled forward along the bulkhead. Other artifacts of note are within the cargo hold. Forward of cargo hatch #1 a ceramic stoneware bowl filled with silt sits upright atop several stacked boards of deck planking. There were six Pyrene-brand, brass, pump-style fire extinguishers fastened to deck stanchions or lying on the cargo deck throughout the cargo hold. A pile of automobile steering wheels is aft of cargo hatch #1 on the port side, and there are several intact light bulbs within brass overhead fixtures throughout the hold. Three of the deck stanchions forward of the hull break in the cargo hold are broken and twisted.

The *Lakeland* sank with at least twenty-two 1925 model-year vehicles aboard from Nash, Kissel, and Rollin motor companies. Twenty-one vehicles are extant on the wreck site. Recreational divers recovered one Rollin Motor car in 1979. Several of the vehicles are visible through the hatches and cracks in the deck or exposed where the overhead decks blew away during sinking. Archaeologists penetrated deep within the *Lakeland*'s hull to document many of the vehicles. To document and identify the historic automobiles, eleven of which are contained on the main deck of the bow section, two are stacked just aft of the bow break, one located in the sand off the starboard side of the vessel, and six lined up along the coal bunker bulkhead, archaeologists videotaped the cars on as many angles as were accessible and worked with experts from Wisconsin Automobile Museum, Western Reserve Historical Society (Cleveland, Ohio), and the Nash Automobile Club of America to identify them, in many cases, down to both the make and model. Each of the cars of *Lakeland*'s cargo is referenced by number in Figure 2.

Car #1 remains chained facing the stern of the ship along the starboard hull of the vessel forward of the heaved deck at the third crack on the main deck level. Its body sheet metal is in good condition. Evident is a louvered hood, disk wheels, drum headlights, and single cross members (front and back) to attach bumpers (the vehicle was shipped without bumpers, a practice typical of Nash). The front passenger side wheel is disarticulated suggesting the axel was broken during the wrecking process, and the passenger side headlight is askew. This vehicle is likely a 2-door Nash sedan.

Car #2 is mostly covered by hull associated with the stern section of wreckage just aft of the break with the bow. Only the front diver's side fender area is visible but allows that the vehicle is facing the bow of the ship and is now lying on its side. The vehicle has wooden-spoke wheels with whitewall tires. The observed forward cross member bar for the bumper, which is set back, the fender, and the

front spring are features of a Kissel vehicle.

Car #3 is located 43 feet off the starboard side of the ship, sitting upright on the lakebed near the break. Much of the upper body sheet metal has deteriorated away, exposing the 6-cylinder overhead valve engine. The vehicle has disk wheels. The grill is extant, as is one drum headlight, and a spare tire mount, rim only, which has fallen away from the frame, aft to the sand. Based on the shape of the grill, the rim spare tire mount, engine and wheel type, this vehicle is thought to be a Nash.

Car #4 and #5 are hanging from the aft end of the break on the bow section, with car #4 resting on top of car #5. Car #4 was a closed body vehicle, although much of the body sheet metal is not extant. The driver's side door has fallen outward and dangles from the wreckage. The vehicle is upright although the front end points downward toward the sand. The car has disk wheels with five lug nuts indicating a "Special Six" design. Drum taillights and a spare tire carrier with no rubber is mounted on the back of the vehicle. The steering wheel has aluminum spokes and rubber grip. The seat springs for the two individual front seats are extant. The front windscreen retains its glass. It is believed this is a 2-door Nash sedan.

Car #5 is upside down on the lakebed under Car #4 just aft of the break on the bow section of wreckage. Much of the sheet metal on this car is no longer extant. This vehicle has disk wheels and a spare tire carrier with no rubber. The carrier has fallen aft of the vehicle and lies on the sand. As the undercarriage of the vehicle is exposed, a longitudinal rear axel spring indicates this is a Nash vehicle. Two kick plates remain on the passenger side running board. This vehicle is thought to be a 4-door Nash sedan.

Car #6 is a forward facing under the cabin deck just aft of the heaved deck at the third crack. Its back end is aligned with the starboard side of hatch #2. The deck stanchion is the only thing preventing the deck from crushing the car. Much of the sheet metal remains intact, however the engine hood is missing exposing its 6-cylinder overhead valve engine. The vehicle is of closed body type with disk wheels with five lug nuts- a Nash "Special Six" design. The car was shipped without bumpers. There is a single kick plate along the driver's side running board. It is believed that this car is a Nash Victoria coup or a 2-door sedan.

Car #7 is visible through grain hatch #1. It is forward facing along the port hull. The car is a wooden frame, closed body type and the deck rests directly on the vehicle's roof. It has disk wheels and a spare tire carrier on the back with no rubber. The sheet metal is not extant over the motor exposing a 6-cylinder overhead valve engine. There is a single kick plate along the passenger side running board. It is believed that this vehicle is a Nash 2-door sedan.

Car #8 is forward facing along the starboard hull of the ship alongside cargo hatch #1. It is of open

body type with disk wheels, and was not shipped with bumpers. All of the body sheet metal is extant and in good condition. It has a spare tire carrier on the back with no rubber. There is a single kick plate along the driver's side running board, suggesting that this vehicle is Nash Roadster.

Car #9 is forward facing along the starboard hull of the ship next to cargo hatch #1 and aft of car #8. The front axle remains chained down, but the rear axle broke free allowing the driver's side rear wheel to slip into cargo hatch #1. The vehicle has 12-spoke wooden wheels with whitewall tires. It is of closed body type and the deck rests directly on the vehicle's roof. The front of the car is obscured by car #8 and fallen debris. There is a double flat bar bumper at the back and taillights typical of a Kissel vehicle. Along the driver's side is evidence of four doors backed up by two kick plates on the running board. It is believed that this car is a Kissel 4-door sedan.

Car #10 is located forward of cargo hatch #1 with its rear wheels hanging into the hatchway. Not much of car #10 remains. It is little more than the frame, engine, wheels and battery box. The remains of the back seat, the spare tire carrier and both flat bar bumpers remain connected to the frame. The drivers side front fender and windshield are forward of the vehicle along the port side hull. The passenger side front fender is forward of hatch #1. The splash apron is disarticulated. The vehicle has wooden-spoke wheels and double, interior and exterior white wall tires. The drive shaft and battery box is exposed as is the flathead engine. These features are indicative of a Kissel.

Car #11 and #12 have fallen into the cargo hold at hatch #1 and came to rest with car #11 resting on top of car #12. Much of the sheet metal is missing from car #11, exposing the 6-cylinder overhead valve engine. The driver's side door, steering wheel and dashboard remain intact with two oval gauges for light switch and oil gauge, and the round speedometer in the center. Parts of the cowl, the cowl light, and ventilation door are extant. The car has disk wheels. It is believed that this is a Nash.

Car #12 is upside down under car #11. This vehicle has disk wheels and a spare tire carrier with no rubber that has become caught and twisted on the hatch combing of the first level of the cargo hold. The gas tank and a longitudinal rear spring are visible on this vehicle's under carriage. These features are indicative of a Nash.

Car #13 remains chained facing the stem of the ship along the port side of cargo hatch #2 forward of the cargo elevator. The deck has collapsed on top of it. The vehicle is of closed body type with wooden spoke wheels, double flat bar bumpers, and a double spare tire carrier on the back. Sheet metal is intact on much of the car. The passenger side front door has fallen outward toward the portside hull exposing the oilcloth (imitation leather) on the door's interior. The dashboard was indicative of a Kissel. The car has the Kissel-specific continuous fender forward, sweeping into the running board that was outfitted with a toolbox on the driver's side. The vehicle has drum headlights connected by a headlight bar for stabilization. This car is a 4-door Kissel sedan.

Car #14 remains chained along the portside hull alongside the cargo elevator facing the bow of the ship. The vehicle is a four door, open body type with the sheet metal intact. It has double flat bar bumpers, drum headlights, whitewall tires and wooden spoke wheels. The deck above has collapse onto the vehicle folding the windshield back and into the car. The radiator shell possesses the indicative horse collar shape of a Kissel. This vehicle was identified to likely be a Kissel 4-door Phaeton.

Car #15 is forward facing in the line of cars aft of car #9, forward of car #1 along the starboard hull of the ship aft of cargo hatch #1. The rear axle remains chained down, but the front axle has broken free allowing the front end to swing inbound. The vehicle has a closed body and supports the deck, which has collapsed down upon it. The vehicle has disk wheels with five lug nuts identifying it as a Nash "Special six" design. One kick plate was observed along the running board, suggesting this is a 2-door vehicle. This car is likely a Nash Roadster.

Car #16, #17, #18 and #19 are lined up with their back ends against the coalbunker bulkhead. Car #16 has flipped upside down and rests along the port side hull. Little of the body sheet metal remains. This vehicle has disk wheels; front fenders and grill are extant. On the underside of the car, the shape of the oil pan, the location of the battery box, engine mounts, the brake actuating rod and transverse spring are exposed and match with those of cars manufactured by Rollin Motor Company of Cleveland, Ohio. Rollin Motors was one of the earliest American vehicles to use four-wheel brakes, which are seen on this vehicle. Rollin Motor Company was in operation from late 1923 to early 1925. Many of company documents and ephemera are retained in the archives of the Western Reserve Historical Society and were used for comparison.

Car #17 sits upright in between car #16 and car #18. No sheet metal is extant. The vehicle has disk wheels, a spare tire carrier on the back of the car with no rubber. The axle radius rod and transverse spring are exposed and match with those of cars manufactured by Rollin Motor Company.

Car #18 sits upright in between car #17 and car #19. Little remaining sheet metal is extant. The vehicle has disk wheels and a spare tire carrier on the back of the car with no rubber. The axle radius rod and transverse spring are exposed and match with those of cars manufactured by Rollin Motor Company.

Car #19 sits upright next to car #18 and rests along the starboard side hull. Most of the body sheet metal is not extant. The vehicle has a unique flathead engine (Rollin Motors produced their own engine) that can be observed under hull debris. The vehicle has disk wheels with four-wheel brakes, and a spare tire carrier on the back end with no rubber. Many features match those of cars manufactured by Rollin Motor Company.

Car #2, car #20 and car #21 are forward of the line of cars that back up against the coalbunker bulkhead (cars # 16-19). Car #20 faces forward between car #2 and car #21, is turned onto its passenger side, and covered with hull debris. Visible are the front fenders, running board and disk wheels on the driver's side. A bit of the grill is exposed. It is likely, though unconfirmed, that this vehicle was also a Rollin Motor car.

Car #21 sits upright, forward facing and on the starboard side of car #20 covered with a good amount of debris. Evidence of three of the tires, disk wheels with fenders, and a spare tire carrier (no rubber) on the back are extant. This vehicle was of closed body style. The windshield and three body panels lay across the frame. Originally thought to be a Kissel bus, or funerary car as told to archaeologists by local divers, it is likely yet another Rollin vehicle. The recovered vehicle from 1979 was taken from the starboard side of this car and that was a Rollin Motor car as well.

The ship's double bottom bilge can be studied at the break in the wreckage on both the bow and stern sections. The lakebed on either side of the break is littered with car parts, pieces of the air scoops and their uprights, and ladders.

The *Lakeland*'s coalbunker is 10.8 feet long and 30.0 feet wide; the tallest feature on the stern, it towers over the wreckage in 157 feet of water. The coalbunker is topped with a hatch combing 2.2 feet wide and divided at the center to create two coal chutes. Access through the coal chutes gives way to the boiler room below. Two Scotch boilers are 11.6 feet wide and spaced 3.4 feet apart and span the cargo and main deck in height. A catwalk runs around and between the boilers, 5 feet down from their top. Aft of the starboard boiler, three pail-style buckets with handles have fallen on the catwalk along with wood and other small bits of debris; between boilers is the frame of a chair.

Archaeologists attempted to access aft compartments on the main deck from the boiler room. Working aft along the passageway on the starboard side of the engine room, it was observed that the wall structures of the Chief and Second Engineer's cabins were standing, but wooden lath from the walls and ceiling has fallen away from the support structures. A ceramic basin was observed within the Chief Engineer's quarters. The passageway was too filled with debris to gain access aft of the engine room. Archaeologists then attempted the passageway on the port side of the engine room along the Deckhands' quarters. The cabin framing remains intact. The wall along the companionway is intact with a sash window opening to the interior of the ship, but the forward wall has fallen inward in a pile of the lath that comprised it. Along this passageway is a drinking fountain that is labeled with a green sign with white painted letters reading, "Drinking Water Only"; the ceramic basin for the fountain lies on the deck just forward. This companionway proved impassable as well, so no observations were taken in the Firemen or Oiler's quarters, which were aft of the engine room.

Centered on the roof 18.8 feet aft of the coalbunker bulkhead over the boiler room is the double walled smokestack. The smokestack's inner diameter is 5.5 feet. The metal composing each wall is 0.5 feet thick with a 0.2 feet space between the layers. A reinforcing, angular flange supported the stack where it entered the roof, but was ripped free when the smokestack fell over backwards angling to port and collapsed the aft end of the boiler room roof. Seven and a half feet of the smokestack was pulled through the roof when it separated from the boiler's airbox. The smokestack would have stood 25 feet above the *Lakeland*'s boiler room roof. Multiple guy wires remain attached to the smokestack.

Two pipes, one foot in diameter that supported the boiler room air scoops, are on either side of the smokestack 16.0 aft of the coalbunker bulkhead. The two air scoops that likely were atop these pipes lay in the sand; one on the starboard side and one on the port side of the vessel near the break. The air scoops measure 4.9 feet across the face and 5.8 feet tall.

A companionway runs on the cabin deck 36 feet along either side of the boiler trunk 5.0 feet wide and 7.2 feet tall, capped by remnants on both port and starboard side of the boat deck that would have formed its roof. Thirty-two feet aft, within the companionway on the port side along the hull is what is thought to be an early electric condenser-compressor, part of the refrigeration unit for the icebox that according to ships plans, would have been located aft of this machinery. The condenser stands 2.2 feet above the deck and measures 3.1 feet long by 1.7 feet wide. A series of three low temperature compressors measure 2.2 feet tall, and 0.9 feet in diameter. Liquid tubes and wires connect them through the center top of the cylinders. The forward-most cylinder has fallen forward. The ice scuttle through the cabin deck is located at 74.0 feet on BLB and to the portside of center; this would indicate the aft edge of the icebox which would have stood on the cabin deck and served ice to the officer's dining quarters below.

The ship's oven is extant on the cabin deck's starboard side at 43.2 feet on BLB, an indication of the area that would have been the ship's galley. The oven stands 2.8 feet above the deck. Its top is 5.0 feet long by 3.0 feet wide, with an oven door on the front. There are two bar handles that are 0.2 feet thick on either side and also a handle on the front to open the door. The oven door opens to the stern of the ship. The front side of the oven is damaged and several bricks can be seen inside. Remnants of the combing delineating the galley space are extant. Additionally, combing remnants can be found aft of this area on this deck associated with the cabin structures that accommodated the Waiters and Dishwasher's cabins from her previous rebuild. The combings are all that remain as the cabin walls blew away during sinking.

The engine room skylight is not extant, but the combing surrounding the engine heads is. The leading edge of engine trunk combing is at 44.6 feet on BLB. The center of the forward, high-pressure cylinder is located at 45.7 feet on BLB. The cylinder head has a diameter of 3.8 feet. There are steps forged into the front of the high-pressure cylinder presumably to access an oiler that was at one time located

on top. The intermediate-pressure cylinder is located at 49.8 feet on BLB with a diameter of 4.6 feet. The low-pressure cylinder is located at 54.9 feet on BLB with a diameter of 5.5 feet. The engine overall is 13.9 feet long and 5.2 feet wide with the exception of the low-pressure cylinder where it is slightly wider. There is a 3-foot wide catwalk around the engine cylinders, with a piece of grate missing on the starboard side of intermediate pressure cylinder. This grate had been removed and entry gained for seacock inspection by the salvage divers in 1925. Archaeologists wearing rebreathers, even stripped down of extraneous equipment, were unable to squeeze into the engine room through this missing grate. During the 2013 survey, to peer into the room, a camera was lowered and turned to get a full view. Below deck, the engine's receiver pipes remain intact that connect the pressure cylinders. Two brass gauges remain on the low-pressure cylinder, two on the intermediate-pressure cylinder as well as the high-pressure cylinder. Two brass oilers remain on the low-pressure cylinder. The walls of the engine room retain white paint, and the engine legs and eccentric rods remain yellow. Eccentric sheaves and counter weights could not be viewed as the floor was heavily silted.

A 1.7-foot diameter steam pipe has fallen aft of the engine along the engine trunk bulkhead at 60.1 feet on BLB. An aft facing stairway is extant on the portside of the engine trunk descending from the cabin deck to the catwalk surrounding the cylinder heads. The stairway leads to a doorway through the engine room bulkhead into stern compartments comprised of the Crew's Mess, Officer's Mess, Storage, and the Head Waiter, Steward and Cook's rooms.

Archaeologists entered through the doorway to the aft compartments. Much of the wooden structures, uprights and walls have collapsed into a jumble making it difficult to discern the different individual rooms. Evidence of a stained glass window was found near what was the Crew's Mess. The four portholes along the portside hull next to the Crew's Mess are extant and open fully inward into the room. Wood lath adorned the walls, likely to help with noise deadening so near to the engine. Stairs that would join the mess area with the galley on the deck above have fallen away from a hatch above. At the stern on this deck, a portion of the ship's steering quadrant is exposed as well as the rudder shaft. The starboardside compartments are in better condition, with many of the uprights intact and portions of the lath walls attached. Presumably a safety poster and frame remains attached to one wall. Alongside the Officer's Mess, all four portholes are extant and open to the interior of the cabin. Moving forward into a stores room, two metal drums one with green and one with red paint and unreadable lettering have fallen over. Shelving and remnants of chairs remain and overhead is an alarm bell that hangs from the ceiling in the companionway between the storage room and the engine trunk wall. Several intact light bulbs in brass fixtures remain hung along the starboard side hull in this area.

Through the bulwark on both port and starboard sides 78.4 feet on BLB are closed chocks measuring 1.5 feet wide, 0.7 feet tall and 0.6 feet up from the deck. The framing around the chocks measures 0.4 feet thick. Deck scuttles through cabin deck are located 83.0 feet on BLB. These scuttles are 7.3 feet to

the port and starboard of the centerline of the vessel and measure 1.2 feet in diameter. The deck has buckled in the area of the scuttles due to impact with the bottom in sinking.

Double iron bits are located on the port and starboard side of the ship, with their leading edge at 84.0 feet on BLB. The portside bits are upright; the starboard side bits have fallen away toward the stern. The bits stand 2.0 feet above the deck. The top of each individual bit measures 1.0 feet wide and tappers down to 0.8 feet at the base. The sets are 2.3 feet inside of the bulwark and are welded atop an iron base 0.3 feet thick. A bilge pump remains upright on the deck at 85.8 feet on BLB just forward of the stern deck winch that is located 86.9 feet on BLB. The winch measures 4.0 feet long, 3.6 feet wide, and stands 4.8 feet above the deck nearly at the stern of the vessel. It has a gypsy head forward that is 1.1 feet long and 0.9 feet in diameter at its widest point.

A spare propeller blade rests along the bulwark aft of the deck winch. The single blade is 5.1 feet long by 3.4 feet wide. The diameter of the collar is 1.9 feet with a thickness of 0.4 feet. The propeller shaft is 27.0 feet down from the rail atop the bulwarks. The propeller shaft is bent upward at a 1.5° angle, likely caused by striking the bottom while sinking. The propeller is not extant and was likely removed by sport divers in the late 1970s, but a salvage date could not be determined. A thrust bearing remains on the propeller shaft. The ship's rudder has also been salvaged, however a small fragment of the rudder shaft remains extant and measures 0.8 feet in diameter and 0.8 feet in length.

On the outside of the stern there is a large hole in the bottom of the hull just below where the propeller shaft is located. Society archaeologists entered the void in the hull and followed the propeller shaft approximately twenty feet up to the bulkhead. The engine's jacking gear could be seen through damage to the bulkhead.

Aft of the stern in the sand, is a milk bucket, pots, and what appears to be other debris from the galley or stores. Because of sand scouring at the stern, the stern rail to sand measurement was 31.7 feet.

Integrity
The *Lakeland* site retains excellent archaeological integrity. The features that define each period of construction are extant and are now part of the archaeological record. Furthermore, the cargo of automobiles that were onboard at the time of the Lakeland's sinking remain extant as part of the wreck site.

Summary of Significance

Criterion D – in the areas of Engineering and Commerce
The *Lakeland* meets the registration requirements for Criterion D at the state level as a good example of the steam screw vessel property type under the area of Engineering as described in the Multiple Property Documentation *Great Lakes Shipwrecks of Wisconsin* (Cooper and Kriesa 1992). A steam screw is a ship propelled by a steam engine and a propeller. The *Lakeland*, in a larger sense, is a bulk freight and passenger carrier. She was built in 1886-87 by a historically significant Great Lakes ship builder, the Globe Iron Works (GIW) Company of Cleveland, Ohio, during an important period in the technological development of maritime engineering. In her first incarnation as the *Cambria*, she was only the second GIW freighter built with steel hull plates, and was the first vessel on the Great Lakes powered by a triple expansion steam engine (still extant within the wreck). Both technologies became standard equipment on the generation of bulk freighters that followed in her wake. The *Cambria* briefly held the record as the longest bulk freight vessel on the Lakes, and during her first years of service she set new speed and cargo tonnage records. Aesthetically, the ship was also unusually well-appointed for a working vessel, with hardwood details, brass cabin fittings, and stained glass windows in the crew's dining room.

The vessel meets the registration requirements for Criterion D at the state level in the area of Commerce for its role in the grain and ore transport trade as described in the Multiple Property Documentation *Great Lakes Shipwrecks of Wisconsin* (Cooper and Kriesa 1992). Records of the vessel's trading routes and cargoes spanning its 23 year career as a bulk freighter offer insights into long-term trends in the industry and economy of the Great Lakes region. The *Cambria's* association with the massive U.S. Steel commercial fleet, the largest collection of U.S. vessels sailing under the same flag during the early-twentieth century, also contributes to understandings of the expansion of corporate shipping during this period.

The *Lakeland* also meets the registration requirements for Criterion D at the state level in the area of Commerce for its role in the automobile transport trade. After conversion to a car carrier in 1920, the *Lakeland* became associated with the early development of the Great Lakes region's burgeoning automotive industry. This industry later came to define the region's economy, but the practice of over-lakes shipping by early auto manufacturers is not well understood at present. Further study of the *Lakeland* will contribute to our knowledge of this facet of the automotive industry. Additionally, the *Lakeland* is one of only two known wreck sites in Wisconsin waters to have sunk with a cargo of vehicles aboard (the other is the *Wisconsin*, listed in the NRHP in 2009). The vehicles the *Lakeland* took with her to the bottom of Lake Michigan represent such early and innovative regional

manufacturers as Kissel, Nash, and Rollin. The Kissel Motor Car Company was a Wisconsin-based firm established in 1906 and known for producing high-end personal cars favored by period cultural icons such as Fatty Arbuckle and Amelia Earhart. The Nash Motor Co. was founded by a former president of General Motors, and eventually evolved into the American Motors Corporation.

Criterion A – in the areas of Science and Maritime History
Much of the *Lakeland's* enduring fame stems from the circumstances of her sinking, the novel investigation of the wreck, and the lengthy court case that followed. The 1924 "*Lakeland* disaster" as some newspapers dubbed it, was one of the earliest Great Lakes losses to actually be photographed in the process of going down. The *Lakeland* meets the registration requirements for Criterion A at the state level in the areas of Science and Maritime History for contributions to the development of deep diving technology. The *Lakeland* became the subject of the first forensic investigation of a deep water wreck site on the Great Lakes, and served as a testing site for experimental diving technologies developed by the U.S. Navy and Bureau of Mines. These well-documented tests involved the first field use of an artificial breathing medium composed of helium and oxygen, and associated decompression timetables. The experiments were not entirely successful, however, and perhaps because of these mixed results they have been consistently overlooked in published historical narratives of the development of deep-sea diving. Importantly, the methods pioneered on the *Lakeland* investigation have since become mainstays of modern deep diving. The wreck of the *Lakeland* serves as a tangible reminder of this early chapter in diving history, and of the research and development of diving technology carried on in the Great Lakes region generally, and Milwaukee, Wisconsin in particular. As an important post-script to the *Lakeland* investigation, several members of the dive team were later called to work on the 1925 rescue and salvage effort following the tragic sinking of the U.S. submarine S-51 near Block Island off the coast of Rhode Island.

The two year legal battle over the *Lakeland* that ran from 1925-1927 was the most prominent Great Lakes "scuttling" trial of the early-twentieth century. In part because of this court case, the ship's history has been richly documented. The wreck of the *Lakeland* continues to fascinate Great Lakes historians and recreational divers alike, and its cargo of (now rare and antique) automobiles still inspires new propositions for salvaging the wreck.

Criterion D – in the areas of Engineering and Commerce:

Vessel History: Building a First Generation Steel-Hulled Great Lakes Freighter
The vessel eventually known as the *Lakeland* began as Hull Number 12 in the shipyards of the Globe Iron Works (GIW) Company of Cleveland, Ohio. GIW traces its origins back to 1869 when Henry

Coffinberry, Robert Wallace and John Pankhurst purchased the Sanderson and Company foundry, itself dating back to 1853. In 1880, the three partners started a new shipyard to build steel ships, and this company was originally named the Globe Shipbuilding Company. Later, the firm was renamed the GIW. The GIW launched its first iron-hulled bulk freighter, the *Onoko*, in 1882 (Lake Carriers' Assoc. 1911:109). The *Onoko* was also the first of its kind built on the Great Lakes (Lake Carriers' Assoc. 1911:109). Four years later, in 1886, GIW launched the first steel-hulled bulk freighter to ply the Great Lakes, the *Spokane* (Lake Carriers' Assoc. 1911:109). The company grew rapidly, building eight vessels (including the *Onoko* and *Spokane*) between 1880 and 1886 (Anon. 2010). By the close of the century, GIW was recognized as one of the foremost shipyards on the Great Lakes:

> In amount of high class tonnage already turned out the Globe Iron Works of Cleveland undoubtedly leads all the lake shipyards. Among the first class steel vessels turned out by this company are the six boats of the Menominee Transit Company, the three boats of the Mutual Transportation Company [including the *Cambria*], the six boats of the Northern Steamship Company, the five new steel steamers of the Lehigh Valley Transportation Company, four large freighters for the Minnesota Steamship Company, and the $300,000 twin screw passenger steamer Virginia owned by the Goodrich Transportation Company. During 1890 the Globe Company turned out a first class steel freighter every month and their aggregate value was $2,500,000.
>
> (U.S. Congress 1892:49)

Hull Number 12 was the first of several bulk freighters ordered from GIW by the Mutual Transportation Company (MTC), of Rockport, Ohio. The MTC was established in 1886 with a capital stock of $1,000,000.00, and with prominent Cleveland businessman L.C. Hanna as company president, and Captain George McKay serving as manager (*Plain Dealer* 1887a; MDMJ 1887a; *Marine Record* 1887a; OSS 1887:153). The new firm was associated with M.A. Hanna and Company, of Cleveland, Ohio, which owned a variety of interests in the mining and shipping sectors, including a substantial ownership share of GIW (*Plain Dealer* 1887a; Van der Linden 1979:64). This latter company's owner, Marcus Alonzo Hanna, was extremely wealthy and wielded a great deal of political influence in his home state of Ohio as well as in national circles. He served as President William McKinley's campaign manager, and was later appointed (with considerable controversy) to represent Ohio in the U.S. Senate when McKinley tapped one of the state's sitting senators for his administration (Anon. 2013).

GIW began work on Hull Number 12, only the second bulk freighter built by the company using steel hull plates, on 1 September 1886 (*Plain Dealer* 1887a). Only the lower portion of the hull was actually steel, however, while the upper strakes (horizontal rows of hull plates) were composed of iron

(*Marine Record* 1887a:5). The partially completed vessel, christened the *Cambria*, was officially launched on 1 February 1887 (*Plain Dealer* 1887a; MDMJ 1887a; *Marine Record* 1887a). John Smith, shipyard superintendent for GIW, was credited with overseeing the project (*Plain Dealer* 1887a). The ship was described as the "best as yet turned out by the Globe company" (MDMJ 1887a), and on the eve of the launch the *Plain Dealer* (1887a) went so far as to opine that "a finer piece of vessel property never sailed fresh water". The launch was a major social event, with a crowd of 2,000 people attending despite the frigid weather (*Plain Dealer* 1887b; *Marine Record* 1887a). Two hundred attendees were actually aboard the hull when it was launched (*Plain Dealer* 1887b). MTC spared no expense to "have her provided with the latest and most approved appliances of the modern ship" (*Marine Record* 1887a). Significantly, it was to be the first Great Lakes vessel to be powered by a triple expansion steam engine (*Plain Dealer* 1887a; MDMJ 1887a; *Marine Record* 1878a). Newspaper reports provided a wealth of detail on the construction and outfitting of the new vessel. The *Marine Record* (1887a) reported on the launching of the massive hull as follows:

> Notwithstanding the keen, frosty wind on Tuesday afternoon, quite two thousand people assembled to witness the launch of the steel steamship CAMBRIA, built for the Mutual Transportation Company by the Globe Iron Works Company. No accidents of any nature marred the event, and the symmetrical hull glided into the waters of the river on time. This is one of four steel steamers to be built for the same line by the Globe Company, and, although the CAMBRIA is beyond reproach, new features will be added to the others. They will be twelve feet longer. It is the intention to make the next steamer, which will be laid down during the summer, the standard of the line. The material entering into the construction of the CAMBRIA is all of Cleveland production, Otis furnished the iron and steel plates and the Cleveland Rolling Mill Company the forging…
>
> The cost of the CAMBRIA will be about $160,000 and she will be commanded by Captain William Cummings, last season master of the propeller SPARTA, and H.F.McGinnis, Chief engineer of the line, will be engineer.

After launch, the hull was towed to a nearby location where the GIW-built engine and boilers were installed, and portions of the wooden cabin were completed (*Plain Dealer* 1887a). The *Marquette Daily Mining Journal* reporter expected the vessel to be completed in "a few days", when it would begin making a weekly trip between Escanaba and various Ohio ports, hauling 2,300 to 2,490 tons of ore on each trip (MDMJ 1887b). The *Cambria* was captained by William Cumming, with First Mate Beach, Second Mate Ames, and engineer McGinnis (MDMJ 1887b; *Marine Record* 1887c).

The *Cambria* was likely completed in May of 1887, and enrolled at the Port of Cleveland on 1 June 1887 under the U.S. registry number 126420. At enrollment, she was described as a propeller with a plain bow and round stern, two decks and three masts (Bureau of Navigation 1887). Official measurements were as follows: Length 280 ft; Breadth 40 ft; Depth 20 ft. Her gross carrying capacity was rated at 1,878.1 tons, consisting of 1,773.61 tons "under deck" and 94.49 tons within cabin space on the upper deck. With a statutory deduction of 500.77 tons, her net tonnage was 1,377.33 tons. Cleveland was the vessel's homeport. For a brief period of time, until the completion of the *Corsica* in 1888, the *Cambria* was considered the longest bulk freighter on the Great Lakes (Berry 2013). Just a few days after her enrollment and while still in the Port of Cleveland, she was rammed by a barge, ripping a sizable hole in her stern (*Plain Dealer* 1887c). The hole was hurriedly patched to allow the freighter to depart for Escanaba, Michigan, probably the vessel's maiden voyage, on 4 June 1887 (*Plain Dealer* 1887c).

Operational History

The Bulk Carrier Years: From Record-Setting Flagship to Step-Child of the U.S. Steel Fleet

As early as mid-June of 1887, the *Cambria* appeared in listings of ships' passages for Lake Michigan ports. She cleared Ashtabula, Ohio, on 15 June 1887 bound for Escanaba, Michigan, with no cargo, and passed through the Port of Detroit, Michigan, on the following day (*Plain Dealer* 1887d, 1887e). The vessel departed Escanaba, Michigan, on 18 June 1887 to begin its return journey (*Plain Dealer* 1887f). It was on one of its Escanaba-to-Ashtabula-and-back runs that the *Cambria* set a new record, making the round trip in four days and 12 hours (*Plain Dealer* 1887g). She carried 2,387 tons of iron ore from Escanaba and completed unloading at Ashtabula in eleven hours. On the return leg of the trip, the *Cambria*, with empty holds, reportedly outpaced a passenger steamer, the *City of Alpena*, that was capable of running at 19 miles per hour (*Plain Dealer* 1887g). The description of this trip suggests that during this era the *Cambria* occasionally, perhaps regularly, carried no cargo on the upbound leg of its route from Ashtabula to Escanaba.

In her first year of service, on a run from Escanaba to Ashtabula carrying 2,334 tons of iron ore, the *Cambria* struck a submerged obstacle that tore a hole through the steel hull (*Marine Record* 1887b). The resulting slow leak was initially handled by the vessel's onboard pumps, but an auxiliary steam pump was also acquired from Detroit. She put in at Amherstburg, Ontario, where a portion of her cargo was off-loaded to another vessel, and was expected to complete the journey to Ashtabula. Within a week, the *Cambria* had returned to her homeport of Cleveland, apparently under her own power, where she underwent substantial hull repairs (*Marine Record* 1887d). The cost of repairs

totaled $3,500.00 (*Marine Record* 1887e).

The *Cambria* continued to ply the Escanaba route for several years with no major incidents. In 1890, however, the schooner *Verona* was pushed into the path of the *Cambria* by a powerful gale outside the Ashtabula, Ohio, harbor (*Buffalo Evening News* 1890). The *Cambria* struck the smaller vessel and the *Verona* sank, although no lives were lost in the collision. There was no report of damage to the *Cambria*. In 1892, the *Detroit Free Press* reported that the *Cambria* would be captained by John Dunn during the upcoming season, with Thomas Drysdale serving as engineer (*Detroit Free Press* 1892). In the same article, the *Cambria's* former captain, William Cumming, was Master of the *Corsica*, another vessel in the Mutual Transportation Co.'s fleet. It is unclear whether or not this change of personnel was related to the incident with the *Verona* in 1890, and the MTC did not re-enroll the vessel under its new Master. It was during this period, however, that the *Cambria* made a list of record cargoes for 1890-1896, compiled by *Beeson's Marine Directory*, reportedly hauling 2,468 tons of iron ore with a draught of 14 ft., 9 in., and 71,193 bushels of wheat with a draught of 13 ft., 10 in. (Beeson 1896:105). The *Cambria* also hauled coal during this era, running from Ashtabula to Chicago, Illinois, on at least one trip in 1896 (*Plain Dealer* 1896).

On 16 April 1897, the MTC filed for a new enrollment for the *Cambria* as a result of a change in both the ship's rigging and Master (Bureau of Navigation 1897). One spar/mast was removed from the ship for unspecified reasons, and the Master was listed as Captain Martin Johnson (Bureau of Navigation 1897). No other significant changes were noted on the new enrollment, but the 1897 document was the first to note that the vessel was constructed of steel. This notation was entered despite the fact that her hull was a composite of both iron and steel plates. Later that same year, the *Cambria* was bound from Escanaba, Michigan, to Fairport, Ohio, with a cargo of 3,000 tons of iron ore, and was driven into shallow water during a storm and grounded near Port Huron's Corsica Shoals (*Buffalo Evening* News 1897). Apparently, the ship was freed from the shoals, but no additional reports of this incident could be located.

During the 1890s, the pace of corporate expansion and consolidation in the steel, mining, and shipping industries accelerated rapidly. The *Cambria* and the other ships of the MTC fleet were caught up in this wave of mergers and take-overs, changing ownership several times (on paper) over the course of the decade. Due to the rapidity and complexity of the consolidations, the trail of ownership of the MTC fleet becomes murky at this point. The first of these deals that may have involved the MTC fleet occurred ca. 1897 when MTC was acquired by the Illinois Steel Company of Chicago, owned by Marshall Field, H.H. Porter, and Nathaniel Thayer (Miller 1999:16-17). There is some ambiguity in the secondary sources on this period in the MTC's history, however. Miller (1999:17) refers to the company acquired by Illinois Steel Co. as the "Mutual Steamship Company" (as opposed to the Mutual

Transportation Co.), but goes on to specifically name the vessels involved in the transaction as the *Cambria*, *Coralia*, *Corona*, and *Corsica* (all ships of the Mutual Transportation Co. fleet). The confusion in the MTC fleet's ownership during this period arises from a claim by Miller (1999:25-26) that in 1898, the Illinois Steel Company merged with several other firms to create the Federal Steel Company, financed by J.P. Morgan and orchestrated by Elbert H. Gary. There is, however, clear primary documentation that in 1899 the holdings of the MTC, including its fleet of four bulk freighters, came under the control of a competitor of the Federal Steel Co., the National Steel Company of Chicago, Illinois (*Marine Review* 1899b). It is possible that the MTC was simply excluded from the previous Federal Steel Co. merger and was later acquired by the National Steel Co., but this is unclear from the available records. In any event, the new National Steel Co. also included properties of the Chapin Mining Company, Winthrop Iron Company, and the Menominee Transit Company. The latter firm operated five freighters – the *Grecian*, *Roman*, *German*, *Saxon*, and *Briton* – that also came under the ownership of National Steel Co. through this arrangement (*Marine Review* 1899b).

Despite these mergers and acquisitions, the *Cambria's* enrollment records from this period do not indicate any change of ownership. This may reflect the claim that the management of the combined MTC and Menominee Transit Company fleets under the National Steel Co. umbrella continued to be overseen by the office of M.A. Hanna and Co., the previous operators of the MTC fleet (Marine Review 1899b). The deal also transferred MTC's partial interest in an ore dock at the Port of Ashtabula, and the mining properties included in the purchase used Escanaba as their entrepot (Marine Review 1899b). Records of ships' passages from 1899 and 1900 suggest that the *Cambria* continued to ply the Escanaba-to-Ashtabula route following its acquisition by National Steel Co. (*Plain Dealer* 1899, 1900a, 1900b).

Just two years after the National Steel Co. acquisition, the *Cambria* changed hands again. In 1901, U.S. Steel was formed through a combination of several large firms, including both the Federal Steel Co. and National Steel Co. (Miller 1999:28). This vast new company was larger and more complex than any previous enterprise, and quickly became known as the "Steel Trust", reflecting its near-monopoly control of the industry. Through this merger, MTC's vessels became part of U.S. Steel's Pittsburgh Steamship Line (PSL), based in West Virginia (Bureau of Navigation 1901; Marshall 1913:323; Berry 2013). By the middle of 1901, the PSL controlled 69 freighters, 43 barges, and 19 support vessels such as tugs and fireboats (Miller 1999:29). At the time, it was the largest fleet in the United States, and was in fact larger than the U.S. Navy's combined fleets (Miller 1999:29).

A new enrollment was filed for the *Cambria* on 3 June 1901 at the Port of Duluth, recording the Pittsburgh Steamship Line as the vessel's new owner, with Duluth, Minnesota, as her homeport, and A.B. Wolvin serving as the new Master (Bureau of Navigation 1901). The ship's material was

recorded as "iron" on this document, despite the fact that its hull was composed of both iron and steel plates.

In contrast to the continuity in the *Cambria's* operation under the Illinois and National Steel Companies, records show that the new management of the PSL imposed a number of changes. For the first time the *Cambria* cleared the ports of Mackinaw City, Port Huron, and Sault Sainte Marie towing a consort (on occasion a whaleback barge) during the 1901, 1902, and 1903 seasons (*Plain Dealer* 1901, 1902d, 1903a). She reportedly wintered over in the Port of Milwaukee after the close of the 1901 season (*Door County Advocate* 1901).

Because of its size and stature in the Great Lakes shipping industry, the PSL's annual appointment of ships' crews became a much-anticipated announcement. In 1902, Captain J.A. Walsh was appointed as Master of the *Cambria*, with William J. Story as First Mate (*Plain Dealer* 1902a). This change in Master was not reflected in enrollment records, however. Apparently, the new Master was also assigned a new route for the *Cambria.* In June of 1902, the vessel was reported arriving at the Port of Cleveland carrying a load of iron ore from Superior, Wisconsin (*Plain Dealer* 1902b). This suggests that under the PSL the *Cambria* had begun servicing Lake Superior ports as well as its former Lake Michigan entrepot of Escanaba. A month later, she departed the Lake Superior port of Duluth, Minnesota, with a load of iron ore that was probably downbound to one of the many steel-town ports on Lake Erie (*Plain Dealer* 1902c, 1902d, 1902e). The vessel made numerous trips to Lake Superior ports during the 1902 season, and transported at least one load of iron ore from Escanaba to Cleveland (*The Evening News* 1903a, 1903b; *Plain Dealer* 1903b, 1903c).

During the 1903 season, the American Association of Masters and Pilots, a labor union representing ships' captains, called a strike against PSL over the company's employment of non-union Mates (Hoagland and Debel 1917:58-60). The conflict continued into the 1904 season, with captains refusing to sign their 1904 season contracts with many Great Lakes shipping companies. Negotiations between the Lake Carriers' Association and the Masters and Pilots union took place in the early months of 1904, but failed to resolve the issue (Hoagland and Debel 1917:64-65). In mid-June of 1904, well into the regular shipping season, PSL management announced a "general shake up" in vessel assignments (*Plain Dealer* 1904a). PSL removed several long-serving captains from their posts, and the broad re-assignment of Masters was intended to discourage further job actions on the part of the captains (*Plain Dealer* 1904a; Hoagland and Debel 1917:58-60). H. Coulby, PSL's manager, publicly stated that he wanted the captains to "wipe the slate clean and forget about the recent trouble" and "gave the captains to understand that no sparring over the strike would be allowed" (*Plain Dealer* 1904a). Reflecting this "shake up", the *Cambria* was re-enrolled on 4 February 1904 with a new Master; L.W. Lowell (Bureau of Navigation 1904). The new enrollment did not list any other changes to the vessel, and Lowell did

not keep his post for long. The *Cambria* was among those ships that received a new Master in the June 1904 "shake up"; Captain John Gemmel (*Plain Dealer* 1904a). It is likely that Lowell was one of those captains who refused to sign a contract with PSL and eventually had his assignment taken away. No new enrollment was filed reflecting this change in the wheelhouse, however.

The *Cambria* resumed service by at least mid-July 1904, and was reported arriving in Fairport, Ohio, hauling iron ore out of Ashland, Wisconsin (*Plain Dealer* 1904b). It also made at least one trip to Duluth, Minnesota, steaming "light" out of Ashland, Wisconsin (*Plain Dealer* 1904c). As late as 16 November of that same year it was reported heading upbound past Sault Sainte Marie (*Plain Dealer* 1904d). The vessel was laid up in the Port of Milwaukee at the close of the 1904 season (*Door County Advocate* 1904). A sample of ships' passage reports suggest that the *Cambria* maintained a regular schedule hauling ore from Ashland to Fairport during the 1905 season, probably serving other Lake Superior and Lake Erie ports as well (Plain 1905a; *The Evening News* 1905; Plain Dealer 1905b, 1905c).

A new enrollment was filed for the *Cambria* in February 1906, listing Captain John H. McLean as Master (Bureau of Navigation 1906). It appeared on the list of arrivals for the Port of Cleveland in April 1906 carrying a load of iron ore from Duluth, and was listed leaving Marquette, Michigan, for Cleveland later that year (*Plain Dealer* 1906a, 1906b). A new Engineer, L.O. Wilcox, was appointed to the *Cambria* by PSL's Chief Engineer for the 1907 season (*The Evening News* 1907). Based on sample of ships' passage reports, she was still plying the Lake Superior to Lake Erie route in that same year (*Plain Dealer* 1907a; 1907b). No records of her activities during the 1908 and 1909 season could be located, but at the close of 1909 she was reported as being among a large number of vessels wintering over in the Port of Chicago (*Plain Dealer* 1909). The *Cambria's* captain at the close of the season was listed as F.H. Prince, but the ship was apparently never re-enrolled under the new captain's name (*Plain Dealer* 1909).

The Passenger and Package Freight Era: A New Lease on Life as the *Lakeland*

The year 1910 was momentous for the aging *Cambria*, marking a major turning point in her history. The PSL sold both the *Cambria* and another bulk freighter, the *Wolvin*, to the Port Huron and Duluth Steamship Company (PHDSC), based in Port Huron, Michigan, and managed by C.O. Duncan (Beeson 1909:268; *News Tribune* 1910a). Early in the 1909 shipping season, the company announced that it was converting the two ships into passenger steamers that would also carry package freight (*News Tribune* 1910a; *Door County Advocate* 1910a). The PHDSC was associated with a large cement producer in Alpena, Michigan, and they intended to run the ships on a regular schedule hauling cement and passengers from Alpena to the Lake Superior ports of Sault Sainte Marie, Marquette, Houghton, Hancock, Port Arthur, and Duluth (*News Tribune* 1910a). The reconstruction of the *Cambria* was to

take place at the south yards of the Milwaukee Dry Dock Company of Milwaukee, Wisconsin, and the ship was expected to be ready to resume service at the beginning of the 1910 season (*News Tribune* 1910a). The PHDSC filed a new enrollment for the *Cambria* on 14 February 1910, registering the company as the vessel's new owner, and establishing its homeport as Port Huron, Michigan (Bureau of Navigation 1910a). A new Ship's Master, Alex McGowan, took the helm of the *Cambria* (Bureau of Navigation 1910a). The PHDSC announced in March 1910 that the vessel's name would be changed to the *Lakeland*, and the same report claimed that the boat was in the process of being rebuilt by the Milwaukee Dry Dock Co. (*Plain Dealer* 1910a; also see *Inquirer* 1910 on name change).

Unexpectedly, in mid-April, the *Cambria* was towed out of the Port of Milwaukee by the tug *Favorite* (*Plain Dealer* 1910b). Two days later, the tug and its charge were reported arriving at the Port of Cleveland, where it was promptly transferred to an un-named shipyard (*Plain Dealer* 1910c). In mid-May the PHDSC announced that, much to the company's frustration, the Milwaukee Dry Dock Co. had not been able to complete the refit of the *Lakeland*, and they had been forced to tow the partially refurbished vessel to Cleveland to finish the conversion (*News Tribune* 1910b). The remaining work was expected to take at least an additional ten days (*News Tribune* 1910b). The next day, the PHDSC ran a "help wanted" advertisement seeking a "steward for freight and passenger steamer *Lakeland* trading between Port Huron and Duluth; capacity of steamer about 200 passengers" (*Plain Dealer* 1910d). Note that this route is slightly different from that described by the company in its earlier announcement (*News Tribune* 1910a).

On 24 May 1910 the *Cambria* was officially re-enrolled under the name *Lakeland* (Bureau of Navigation 1910b). The document also included a general description of the alterations made to convert it into a passenger vessel. The ship's gross tonnage increased by 651.89 tons to a total of 2425.0 tons, resulting from the addition of cabins on the spar deck (574.24 tons), cabins on the upper deck (49.09 tons), and coal bunkers on deck (28.56 tons) (Bureau of Navigation 1910b). Statutory deductions in tonnage totaled 612.85 tons, including 24.38 tons for a "china" (probably "chain") locker, resulting in a net vessel tonnage of 1813.0 tons (Bureau of Navigation 1910b). The document also noted that she had been rebuilt and re-measured at Cleveland, Ohio, in 1910 (Bureau of Navigation 1910b). It is also likely that side loading doors were added during this refit, but they are not specifically described in the enrollment (Van Harpen 2006:23). The new enrollment made no mention of the vessel's time at the Milwaukee Dry Dock Co., and the name of the Cleveland company that completed the rebuilding project was also not recorded (Bureau of Navigation 1910b).

Work on the *Lakeland* continued until sometime between 6 June and 18 June 1910 (*News Tribune* 1910c, 1910d). No report of her departure from Cleveland on her "maiden" voyage could be located, but the *News Tribune* of Duluth, Minnesota, reported on 18 June that the boat was expected to arrive in

that port on 20 or 21 June on her first trip following the refurbishment (*News Tribune* 1910d). Several days later, she was reported passing through Sault Sainte Marie on the downbound leg of her first voyage (*Plain Dealer* 1910e).

September of 1910 was difficult for the newly rebuilt *Lakeland.* Early in the month, she ran aground on Avery Reef at the mouth of the Thunder Bay River near Alpena, Michigan (*News Tribune* 1910e). The vessel was eased off of the obstruction by several tugboats with negligible damage to the hull, and it was able to resume its course for Duluth after a short delay (*News Tribune* 1910e). Towards the end of the month, she was involved a much more serious incident while passing through Sault Sainte Marie in a thick fog (*Evening News* 1910). She was rammed by a barge operated by her former owners, the PSL, "cutting a hole six feet wide from below the water line to the upper deck" (*Evening News* 1910; *Sheboygan Press* 1910; *Door County Advocate* 1910b). The *Lakeland* was immediately beached as result of the crash, but no reports of the extent of her lay-up, or the cost for repairs could be located (*Sheboygan Press*1910).

Fortunately, 1911 seems to have been a relatively routine season for the *Lakeland.* No incident reports were located for this period, and she presumably maintained a regular schedule on her route from Alpena to Duluth. The vessel appeared in the 1911 list of merchant vessels registered in the U.S. with a reported crew of 30 and operating under passenger service (USDC 1911). The remainder of the vessel description was consistent with previous enrollment records. The PHDSC's Port Huron-to-Duluth route was apparently profitable because the company announced that it would add a second package freight and passenger vessel (the *Lakewood*, formerly the *Syracuse*), as well as another dedicated package freighter (the *Lakemere*, formerly the *Boston*) during the 1912 season (*News Tribune* 1912). The report also stated that the company intended to convert the *Lakemere* for passenger service for the 1913 season (*News Tribune* 1912). The *Lakeland* was re-enrolled early in 1913 due to a change in company officers at the PHDSC. Frank D. Jenks was listed on the document as the company president (Bureau of Navigation 1913). This was also the first enrollment that included a one-year license for operating on the "coasting and foreign trade" (Bureau of Navigation 1913).

A timetable for the PHDSC's passenger lines was published in 1915 showing the summer schedule for the company's two vessels, the *Lakeland* and *Lakewood*, running between Port Huron and Duluth with stops at Sault Sainte Marie and Houghton (Green 1915). The line offered service for "freight and passengers, local and thru", and a "vacation trip on a freight steamer" for a $30.00 round-trip fee, including meals and berth (Green 1915). The *Lakeland* was scheduled to make one trip upbound and back in late-June, five round-trips in July, four in August, and one in September (Green 1915). The *Lakewood's* schedule was identical in terms of ports, but it somewhat less frequently (Green 1915).

The timetable also noted that the steamer *Lakeport*, also made round trips to the same ports on an approximately eight-day cycle (Green 1915). No mention of the *Lakemere*, which the company had earlier planned to rebuild to accommodate passengers, appears on the 1915 timetable (Green 1915). The company's officers were listed as: F.D. Jenks, president, Port Huron; J.W. McLean, western agent, Duluth; and W.S. Jenks and G.F. & P.A., Port Huron (Green 1915). The company apparently advertised its services aggressively during this period. An even more elaborate advertisement, featuring a photograph of the *Lakeland*, appeared in the *Republican News* published out of Hamilton, Ohio, a small town near Cincinnati (*Republican News* 1915). It is worth noting that Hamilton is just over 300 miles from the PHDSC's southernmost port of Port Huron. This advertisement offered passengers the "finest fresh water cruise in the world" and assured them that "the steamers of this line are steel package freighters, and carry only the cleanest cargoes" (*Republican News* 1915). The *Lakeland's* season was interrupted when she snapped her crank shaft just after departing Port Huron on the upbound leg of her journey (*Marine Review* 1916). Repairs were reportedly made at Detroit, but it is unclear how long the vessel was laid up and how costly the repairs were. She resumed service at some point in the season, and reportedly continued her regular route well after the close of the scheduled passenger season. The *Lakeland* was reported departing the Duluth-Superior Harbor in November hauling "merchandise" (*News Tribune* 1915).

Despite the *Lakeland's* mechanical troubles, the 1915 season must have been a fairly successful one for the PHDSC. In 1916 they added a regular passenger schedule for the *Lakeport* as well as an additional late-season trip for the *Lakeland* (Green 1916:333). No changes were made in their ports of call, but the 1916 timetable does indicate several changes amongst company officers. The firm's Duluth agency was staffed by H.W. Cross, general agent, and a "general western agent", W.J. Buchanan, operating out of Minneapolis, Minnesota (Green 1916:333).

Bankruptcy: The First Legal Battle over the *Lakeland*

Following the 1916 season, however, the *Lakeland* entered another period of rapidly shifting ownership. Early in the 1917 season the PHDSC sold the *Lakeland* to the Northwestern Steamship Company (NSC) of Port Huron, Michigan (Berry 2013). It was re-enrolled under ownership of the NSC on 8 March 1917 with the number of crew listed as 20 (Bureau of Navigation 1917). Other data in the document conformed to previous enrollments. No references to the ship's activities could be located for 1917, and the NSC apparently went bankrupt sometime in 1918 (Berry 2013). The Minnesota Loan and Trust Company [MLTC] was appointed as the financial receiver for the company's remaining assets, and the *Lakeland* briefly became the property of the MLTC (Berry 2013). The MLTC attempted to liquidate the NSC's assets, but was temporarily blocked from selling the *Lakeland* by an injunction filed by Alexander McGowan, the captain of the *Lakeland* and a former stockholder in the NSC (MMFR 1919a). McGowan alleged financial mismanagement of NSC by

Frank D. Jenks, who was (not coincidentally) also the former president of the *Lakeland*'s former owners, the PHDSC.

Interestingly, during the period when the NSC bankruptcy and liquidation was being contested by Captain McGowan, a ship named the *Lakeland* briefly appeared in the Port of New Orleans, Louisiana (*Times-Picayune* 1919a, 1919b, 1919c). While it is far from certain that this was in fact the same vessel whose fate was being litigated, it is entirely possible that Captain McGowan sailed his vessel out of the Great Lakes region in order to avoid having it seized. It is unclear how McGowan's case was decided, but a deal was finally announced in May of 1919 in which all three former PHDSC and NSC boats – the *Lakeland*, *Lakewood*, and *Lakeport* – were sold to "Cleveland operators" Frank J. Peterson and George A. Collinge (MMFR 1919b; Bureau of Navigation 1919). A report of the settlement stated that the vessels would be used for passenger and freight service between Cleveland, Montreal, Quebec, and other Canadian ports (MMFR 1919b). The *Lakeland* was re-enrolled on 28 June 1919 under the names of its new owners, with Buffalo, New York, as its new homeport. Remarkably, Captain McGowan, who had filed the injunction against the original MLTC liquidation of the ship, remained as Master (Bureau of Navigation 1919).

Shortly after the ship's purchase by Peterson and Collinge was resolved, the *Lakeland* was chartered by the Crosby Line out of Milwaukee, Wisconsin (*Milwaukee Journal* 1919; Hilton 2002:289). The Crosby Transportation Company [CTC] was founded in the 1890s by several businessmen including Edward G. Crosby, who later perished in the 1912 sinking of the *Titanic*. After E.G. Crosby's death, his son, Fred Crosby, took over management of the company. One of Crosby's regular steamers, the *Holland*, had gone into dry dock for extensive repairs early in the 1919 season, so the company chartered the *Lakeland* for two months in order to complete the season (*Sheboygan Press* 1919b). Advertisements announced that the Crosby Line had "resumed service" commencing 11 July 1919, and the "big, new, steel steamer *Lakeland*" would make daily trips from Milwaukee to Muskegon, Michigan, "connecting for Grand Rapids, Detroit and all Michigan points" (*Milwaukee Journal* 1919; also see *Sheboygan Press* 1919a). The ship's route also included regular stops at Sheboygan, Wisconsin, and she made her last call at that port on 1 September (Labor Day) (*Sheboygan Press* 1919b). The *Lakeland* completed its final charter run to Milwaukee, and the next day sailed for Cleveland, no longer in the service of CTC (*Sheboygan Press* 1919b). In a newspaper article published mid-way through the 1919 season, the ship's owners claimed that she would be "going to the coast", possibly indicating that the *Lakeland* was slated to leave the Great Lakes after the close of the season to ply the Atlantic seaboard (*Daily Palladium* 1919). No other records could be found to document that the vessel actually engaged in the coasting trade in 1919-20, however. It is possible that the abrupt sale of the *Lakeland* in early-1920 altered her fate.

The Automobile Transport Era: The *Lakeland* and the Early Great Lakes Auto Industry Boom

On 5 February 1920, Peterson and Collinge filed a new enrollment for the vessel with Frank J. Peterson as the new Ship's Master and her homeport at Cleveland (Bureau of Navigation 1920). She was listed as operating freight service, and the document included the hand-written note "coal burner" (Bureau of Navigation 1920a). Two weeks later, however, she was re-enrolled under the ownership of the Tri-State Steamship Company, Mentor Special District, Lake County, Ohio (Bureau of Navigation 1920b). Captain W.R. Woodford was the new Master, and Fairport, Ohio, was listed as her homeport (Bureau of Navigation 1920b). The new enrollment also included passenger, in addition to freight, service (Bureau of Navigation 1920b). Relatively little is known about the Tri-State Steamship Co., but it was apparently established by Merwin S. Thompson and several partners in 1920 (USDC 1926:3; BGSU 2013).

In early-1920, after it was acquired by the Tri-State Steamship Co., the *Lakeland* underwent a conversion that allowed it to carry automobiles (*Daily Tribune* n.d. [1924]; USDC 1926:9). The passenger quarters on her spar deck were removed to make room for additional freight (USDC 1926:9). M.W. Thompson, the ship's owner, later claimed that two elevators were installed to allow vehicles to be moved from the spar deck to the lower decks (USDC 1926:9). Only one lift was observed during the 2012 survey of the wreck, however, so it is possible that he was mistaken in this detail. This refit was allegedly done at the Wolverine Dry Dock Company of Port Huron, and provided the ship with capacity for 250 cars (*Daily Tribune* n.d. [1924]; *Door County Advocate* 1924a). It is somewhat unusual that vessel enrollments from this period do not indicate any changes to the vessel, but conversions of the sort the *Lakeland* reportedly underwent were probably not uncommon during this period.

By this point in time the Great Lakes region was home to a large and diverse automotive industry, producing personal and commercial vehicles on a massive scale. Detroit, Michigan, and many other industrial cities, were home to such well-known companies as Ford, Buick, and General Motors, as well as a number of important early innovators like the Kissel Motor Car Company and Nash Motors Company (Quandt 1998). Many of the vehicles produced in the Great lakes region were transported by ship to domestic U.S. markets and as far away as Europe and beyond (Quandt 1998). Great Lakes vehicle builders experienced a major boom during World War I, providing ambulances, trucks, and other vehicles for the war effort (Quandt 1998). The rapid expansion of the consumer auto market following World War I provided freighter operators with a new, reliable source for cargo.

The *Lakeland's* movements during the 1920 and 1921 seasons were not well documented, but in mid-November of 1920 she was reported downbound for Buffalo, New York, hauling grain (*Plain Dealer* 1920). Her routine during this period was to carry bulk freight during the main part of the shipping

season, and then switch to transporting automobiles in the latter portion of the year (USDC 1926). It was not uncommon that she would still be out on the lakes as late as December. As an aside, in August of 1921, the *Lakeland* was involved in the rescue of a couple who had been adrift off of Cleveland Harbor in their small powerboat for more than a day (*Grand Forks Herald* 1921).

During the 1922 and 1923 seasons the *Lakeland* was reported making several deliveries of automobiles to Cleveland and Chicago (*Plain Dealer* 1922; *Courier* 1923). A photograph dated to the early 1920s shows the *Lakeland* tied up at the Port of Cleveland after unloading a shipment of cars (Van Harpen 2006:24). She also serviced Detroit and Milwaukee during this period (*Door County Advocate* 1924a). Late in the 1922 she was forced to seek shelter from a storm in the Manitowoc, Wiscosnin, harbor while enroute from Detroit to Chicago with "several hundered" Jewwett automobiles (*Door County Advocate* 1922b). The Jewwett automobile was manufactured between 1922 and 1926 by another small Great Lakes manufacturer, the Paige-Detroit Motor Car Company of Detroit, Michigan. The following year, she was again forced into Manitowoc Harbor by a late-season storm (*Door County Advocate* 1923). By the close of the 1923 season it was reported that the *Lakeland* and *Clifton* had jointly made 97 trips carrying a total of 23,000 automobiles (*Door County Advocate* 1923).

During the off season she underwent a major overhaul in the Port of Cleveland, totaling $38,000.00 (USDC 1926:11, 27, 28). Her boiler room was moved to a lower deck, a watertight bulkhead was added between the new boiler room and the hold, and two brand new Scotch boilers were installed (USDC 1926:11, 27, 28). The old pilot house was also replaced during this period, and repairs were made to the ship's ballast pump (USDC 1926:11, 27, 28, 109). Inspectors with the U.S. Steamboat-Inspection Service made multiple visits to the ship during this refit, and as part of her annual inspection (USDC 1926:26-27). The hull inspector reported finding multiple cracked frames, which he ordered repaired or replaced, and he also found that a concrete floor had been laid over the old metal floor of the lower hold, directly above the ballast tanks (USDC 1926:26-27). Despite this welter of re-enrollments that followed during the 1924 season (see below), none of these documents mentioned the structural changes and repairs made to the vessel at the beginning of the year.

In March of 1924, the *Lakeland* was once again enrolled under new ownership: the Thompson Transit Corporation, Mentor Special District, Lake County, Ohio (Bureau of Navigation 1924a). G.G. Moriarty was assigned as the new Master (Bureau of Navigation 1924a). The Thompson Transit Corporation was another corporate entity associated with Merwin S. Thompson, established in 1924 (USDC 1926:3). That same year, the Thompson Transit Corp. took over the assets of the Tri-State Transit Corp. and assumed a $165,000 mortgage on the *Lakeland* (USDC 1926:3). One month later, she was re-enrolled for a "service change"; passenger service was removed from her papers (Bureau of Navigation 1924b). A series of four enrollment addenda were also made over the course of the 1924

season, each one updating the Ship's Master. On 25 April at the Port of Cleveland Captain John T. McNeely was listed as Master (Bureau of Navigation 1924b). On 4 October at Detroit, the Ship's Master was Captain Henry L. Laffrey (Bureau of Navigation 1924b). Three days later, at the Port of Chicago, Captain Frank A. Elleson was at the helm, and on 14 October Captain J.T. McNeely had returned as Master at Detroit (Bureau of Navigation 1924b).

At some point in the fall of 1924, the *Lakeland* went into drydock at Detroit to repair a twisted rudder stock, and inspections of the repaired rudder and the entire hull were conducted at this time (USDC 1926:30). Although she had been profitable for several years, the 1924 shipping season had been a difficult one for the *Lakeland*; she reportedly operated at a net loss of over $12,000 that year (USDC 1926:14). This loss may have reflected the cost of the refit and numerous repairs undertaken during 1924.

The Sinking of the *Lakeland*: First Accounts

The *Lakeland's* final voyage took place at the close of the 1924 season, in late-November and early-December. Initial reports of that journey and the vessel's final moments disagreed on significant points, and omitted important details. These and other contradictions in the crew's story of the *Lakeland's* last trip quickly took on greater significance in the aftermath of the vessel's sinking, as suspicions grew regarding the true cause of the incident. A series of investigations and trials followed in which the crew's accounts of the sinking were challenged, and the ship's insurers attempted to prove that the vessel had been intentionally scuttled by the financially unstable Thompson Transit Corporation. This section presents the initial, somewhat flawed, accounts of the incident. A later section provides corrections to these early reports based on testimony and evidence presented during the legal storm that raged on through 1927.

On the upbound leg of the *Lakeland's* last trip of the 1924 season, she hauled 120 automobiles from Detroit to Chicago (*Door County Advocate* 1924a). Before arriving in Chicago, however, she called at Milwaukee to unload part of her cargo and take on a few additional cars bound for Detroit (USDC 1926:31). At Chicago, she again delivered some of her load and picked up another shipment of cars and a "tractor engine" (possibly a stationary steam engine) for Detroit (USDC 1926:31, 63). Initial reports of her return journey are somewhat contradictory.

Her cargo on that last trip consisted of automobiles and a stationary steam engine, but the precise number of vehicles onboard remains unclear. One source states that after off-loading at Chicago she turned around with a "light load" of "40 Nash and Kissel cars" making for an unspecified winter port (*Door County Advocate* 1924a). Another report of the sinking claimed that the *Lakeland* had been

carrying 50 automobiles (*New York Times* 1925a). A third article claimed that "her decks [were] full of new automobiles," but this was clearly an exaggeration (*Daily Tribune* n.d. [1924]). Other sources put the number of autos in the *Lakeland's* hold somewhere between 19 and 30 vehicles (USDC 1926:31, 63).

The Kissel cars aboard the *Lakeland* were fitted out as "show cars" and it is possible that they were to be delivered to Detroit for the annual auto show that would open in January of 1915. The *Lakeland* was already scheduled to make a stop at Detroit during its return voyage to deliver the vehicles picked up at Milwaukee, and to load additional cars bound for her homeport of Cleveland (USDC 1926:14). None of the early reports mentioned the small number of Rollin automobiles that were later discovered in the hold of the *Lakeland.* These vehicles were built by Rollin White's short-lived, Cleveland-based car company between 1923 and 1925.[1]

The *Door County Advocate* (1924a) claimed that the vessel had been suffering from persistent but manageable leaks, and when rough seas threatened during the return trip the captain decided to bring her into the Sturgeon Bay Canal to wait out the storm (*Door County Advocate* 1924a). On the morning of 3 December, despite continued warnings of bad weather, the *Lakeland* steamed out of the canal. A second source, the *Daily Tribune* (n.d. [1924]) reported that the *Lakeland* had left Chicago on 2 December she encountered heavy seas on Lake Michigan north of Chicago and "some of the steel plates [of her hull] buckled" causing a leak (*Daily Tribune* n.d. [1924]). The ship's pumps were able to keep up with the leak, but the Captain decided to seek shelter in the Sturgeon Bay Ship Canal to await calmer weather. Believing the storm had passed, the captain weighed anchor in the early morning of 3 December, but encountered "stiff northwest winds and seas" (*Daily Tribune* n.d. [1924]). According to both of the available primary newspaper reports, the minor leak worsened after the ship's departure from the Sturgeon Bay canal (*Daily Tribune* n.d. [1924]; *Door County Advocate* 1924a). Her pumps could no longer keep pace with the leak, and one of the holds rapidly filled. Captain

[1] The Nash Motor Company was established when Charlie Nash, former president of General Motors, left that company and purchased the Jeffery Motor Company of Kenosha, Wisconsin (Quandt 1998:41). By 1924, the Nash Motor Co. maintained factories in both Kenosha and Milwaukee, Wisconsin, and later became the American Motors Corporation (Quandt 1998:41-49). The Kissel Motor Car Company was established in 1906 in Hartford, Wisconsin, but by 1924 the company was also producing vehicles at a plant in Milwaukee (Quandt 1990, 1998:84-108). The Kissel Co. was known for producing high-end personal cars such as the Kissel Speedster, affectionately named the "Gold Bug," that became the car of choice for period cultural icons such as Fatty Arbuckle and Amelia Earhart (Quandt 1990). The firm also produced many utility vehicles such as ambulances, funerary cars, and fire engines (1998:84-108).

McNeely turned about and made for shallow water.

At 10:00 am, a lookout at the Sturgeon Bay Coast Guard station observed the *Lakeland* in apparent distress, although no actual distress signal had been received (Anderson 1924). The Coast Guard watchman also reported that two other vessels in the vicinity of the *Lakeland* were heading toward her location. Initial reports stated that the ship's engine could no longer provide motive power and still meet the power demands of her pumps when it was approximately nine miles east of the Door Peninsula, but this was later corrected to a distance of less than five miles (*Daily Tribune* n.d. [1924]; *Door County Advocate* 1924a, 1924b). By that time, the weather had calmed and the captain ordered the majority of the crew to escape in the ship's life boats, while he and four others remained on-board (*Daily Tribune* n.d. [1924]; *Door County Advocate* 1924a). Two private vessels, the *Ann Arbor No. 6* and the *Cygnus* (aka *Sygnus*), arrived on the scene shortly after deployment of the first life boats (*Daily Tribune* n.d. [1924]; *Door County Advocate* 1924a). A U.S. Coastguard cutter out of Sturgeon Bay Canal station reached the sinking vessel at 10:55 am, and they found one lifeboat in the water with five crewmembers aboard: Captain McNeely and the remaining four crew members. The other 22 crewmembers were already aboard the *Ann Arbor No. 6* (Anderson 1924).

After bringing aboard the last evacuees, Captain R. Anderson of the U.S. Coast Guard discussed the possibility of towing the foundering vessel to shallow water with Captain McNeely and the captain of the *Cygnus*, who was willing to make the attempt (Anderson 1924). McNeely felt that the ship was already too far gone, however, and advised against it (Anderson 1924). Fifteen minutes later, at 11:30 am, the *Lakeland* abruptly went down (Anderson 1924). Observers reported that her stern went under first, and both the *Door County Advocate* and Captain Anderson reported that the hull probably "telescoped" or broke in two (Anderson 1924; *Daily Tribune* n.d. [1924]; *Door County Advocate* 1924a). Portions of the upper cabins and several of the ship's hatches were blown 40 feet in the air by the force of air pockets trapped in the hull as it went down (*Door County Advocate* 1924a). It was also believed that the ship's boilers had exploded during her decent, further splintering the vessel (*Door County Advocate* 1924b). Remarkably, a crewman aboard the *Ann Arbor No. 6* named Elliot Jacobson managed to take a series of photographs of the *Lakeland* spanning the nearly two hours between the arrival of the *Ann Arbor No. 6* and the sinking of the *Lakeland* (USDC 1926:139-140). The *Lakeland* tragedy is thus one of the earliest Great Lakes losses to be photographed.

The entire crew of the *Lakeland* escaped, but she took her cargo of automobiles to the bottom of the lake; a depth of approximately 200 feet. Very few intact items were found floating in the vicinity of the wreck, but some material later washed ashore near Algoma, Wisconsin (Anderson 1924; *Door County Advocate* 1924b).

A week after the sinking, attorney S.D. Foster arrived in Sturgeon Bay, Wisconsin, to investigate the incident on behalf of the insurance underwriters liable for covering the vessel's loss (*Door County Advocate* 1924b). He allegedly told local reporters that "as far as he knew, there would be no disputing of claims for loss of ship and cargo" insured for $350,000.00 (*Door County Advocate* 1924b; *New York Times* 1925a). The same newspaper also observed that "having sunk in 210 feet of water, no attempt will be made to salvage any of the forty cars" (*Door County Advocate* 1924b).

Criterion A – in the areas of Science and Maritime History:

Suspicious Circumstances: The First Field Tests of Mixed-Gas (Helium-Oxygen) Techniques for Deep-Sea Diving to Investigate the Wreck of the *Lakeland*

Several months after Foster's initial investigation, reports surfaced that a consortium of parties with an interest in the *Lakeland* intended to investigate the wreck site, despite the great depth at which it lay (*Door County Advocate* 1925a; *New York Times* 1925a). Apparently, Foster had collected statements from local fishermen claiming that the *Lakeland* was running in circles immediately before sounding its distress whistle, and then sank in calm waters. These circumstances raised the insurers' suspicions (*New York Times* 1925a). The consortium that backed the investigation included the National Association of Insurance Underwriters of New York, the Salvage Association of Cleveland, Ohio, and the New York-based maritime law firm of Bigham, Englar, and Jones (*Door County Advocate* 1925a; *New York Times* 1925a).

During the summer of 1925, numerous unsuccessful attempts were made to relocate the wreck site (Creviere 1997:273). Finally, a local fisherman, Albert Kalmbach, succeeded in snagging the sunken vessel using a drag device (Creviere 1997:273). Once the wreck had been relocated, the insurers' consortium contracted with Overseas Salvors, Incorporated, of New York, to conduct the underwater operations. The company was joined by several divers who were "on leave" from the U.S. Navy and had recently been involved in research and training on deep-sea diving techniques at the Bureau of Mines Experimental Station in Pittsburgh, Pennsylvania (*Door County Advocate* 1925a). The dive team was led by Navy diver Clarence L. Tibbals (aka Tibbles), who had established the Navy's diving school at Newport, Rhode Island (USDC 1926:266). The dive team consisted of three employees of Overseas Salvors – Harry "Big Harry" Reinhardson, H.A. Grove, and S.J. Drellishak (aka Drillishak) – and two Navy personnel – G.F. Smith and Joseph Eiven (aka Eibon) (*Door County Advocate* 1925a). Drellishak was himself a former Navy diver who had made a record-setting, oxygen-only dive to 306 feet during a 1915 effort to salvage the Navy's F-4 submarine from the bottom of Honolulu Harbor (*Door County Advocate* 1925a; Creviere 1997:273).

The experienced dive team would be the first to field test a new mixed-gas diving system utilizing a helium-oxygen mixture, which the Navy and Bureau of Mines had been experimenting with using guinea pigs since early-1924 (*Door County Advocate* 1925a; *Buffalo Evening News* 1925; Sayers et al. 1925; Sayers and Yant 1926; Creviere 1997:273; U.S. Navy 2000). The possibility of using helium as a component of a breathable mixed-gas medium had been proposed as early as 1919, but no published experiments had been conducted (Yant 1927:4; End 1937). Researchers at this time believed that replacing nitrogen, a naturally-occurring component of compressed air, with helium would reduce the amount of time divers would be required to spend in decompression after deep dives (Sayers et al. 1925). It was later discovered that helium prevented the serious problem of nitrogen narcosis during deep dives, but it also introduced new challenges.

Prior to the *Lakeland* dives, a decompression timetable for helium-oxygen diving had been developed by researchers working at the Bureau of Mines Pittsburgh Experiment Station through a joint program with the U.S. Navy Bureau of Construction. Decompression tables were critical because they were be used to time divers' assents from the depths in order to prevent the debilitating and potentially deadly problem of decompression sickness; "the bends". The experimental timetable developed by the Navy and Bureau of Mines was based solely on lab tests using guinea pigs, and it had not been field tested on humans (*Door County Advocate* 1925a; Sayers et al. 1925; Sayers and Yant 1926). There is one brief report of Navy diver C. Tibbals, who later served as Divemaster for the *Lakeland* investigation, diving to a depth of 150 feet using a helium-oxygen mixture in 1924, but it is unclear whether this was an actual open-water field test or a simulated dive in a pressure tank (Penzias and Goodman 1973:32).

Despite the fact that the Navy divers involved in the project were officially "on leave" and it is not entirely clear that it was viewed as formal Navy mission, newspapers claimed that Navy and Bureau of Mines officials saw the *Lakeland* investigation as an opportunity to field test, and perhaps refine, the new helium-oxygen diving techniques (*Door County Advocate* 1925a; also see Penzias and Goodman 1973:23 for a brief reference to the Navy's participation in the *Lakeland* investigation). The fact that the U.S. Bureau of Mines maintained near-monopoly control over the U.S. helium supply, considered a strategic resource at the time, also points to some degree of official sanction to the involvement of Navy divers Tibbals, Eiven, and Smith in the *Lakeland* investigation. All of the helium used by the divers could have only been acquired by requesting it directly from the Bureau of Mines (Phillips 1998:168). Since the three Navy men had been stationed at the Bureau of Mines Pittsburgh Experiment Station, they would have had the necessary contacts to make such a request.

The salvage barge *Chittendon* was called in to support the mission, and before leaving the Port of New York it was equipped with a diving platform or stage, as well as a decompression chamber on loan from the Brooklyn Navy Yard (USDC 1926:312, 331). If the untested decompression tables proved

inaccurate, or other emergencies arose, the chamber would be a critical life saving device (*Door County Advocate* 1925a). The team was also equipped with a new, high-intensity, electric underwater light developed by Westinghouse Electric Company (*Daily Star* 1915). The light was rated at 1,000 watts and allegedly lit the murky interior of the wreck "as bright as the average city living room...the men could even read the figures on the small gauges" (*Buffalo Evening News* 1925).

In mid-August, the *Chittendon* arrived from New York City, and several days were required to fully outfit it and anchor it in position at the wreck site (*Door County Advocate* 1925b; Creviere 1997:273). Over the next three weeks, from 20 August to 11 September, the dive team made multiple dives on the wreck to conduct their investigations (*Door County Advocate* 1925a, 1925b, 1925c). As the mission reached the stage of actually entering the broken hull of the *Lakeland*, each descent involved two divers; the first operated as lead diver and the second as an assistant or "tender" (*Door County Advocate* 1925a, 1925b, 1925c). The assistant diver remained outside of the wreck and ensured the safety of the lead diver, who penetrated the interior of the sunken vessel and risked having his supply lines tangled or damaged.

Within the first week of the operation, U.S. Navy diver Joseph Eiven suffered a case of "the bends", and had to be placed in the *Chittendon's* decompression chamber in order to alleviate his condition (*Door County Advocate* 1925b). By the final week of the investigation, all five divers had suffered from at least one bout of "the bends" (*Door County Advocate* 1925c). Newspaper reports claimed that none of these cases were serious, but their occurrence suggests that there were problems with the decompression tables developed at the Pittsburgh Experimental Station by the joint Navy-Bureau of Mines program. Despite these difficulties, the first effort to investigate a Great Lakes wreck at such a great depth was deemed a success, and the salvage crew was treated to a farewell party and dance at Sturgeon Bay's Grasshopper Pavilion (*Door County Advocate* 1925c; *Buffalo Evening News* 1925). The total cost of the diving operation was estimated at $60,000.00 (USDC 1926).

The investigators tried to maintain a degree of secrecy regarding their findings until 11 September 1925, when their attorney made an official announcement. William Day stated that the dive team had found evidence of barratry; they claimed the *Lakeland's* crew had intentionally opened certain valves to cause her to take on water and sink (*Sheboygan Press* 1925; *Manitowoc Herald-News* 1925; *Daily Star* 1925; *Buffalo Evening News* 1925). Diver "Big Harry" Reinhartsen was the first to reach the aft sea-cock valve that was allegedly left open (*Buffalo Evening News* 1925). This and other evidence contradicting the initial reports of the ship's sinking was later presented in agonizing detail by the insurance companies' lawyers to support their claim that the Thompson Transit Co.'s owners ordered the crew to scuttle the ship, and were thus not covered for the loss of their ship. The revelations of these court hearings are described below.

Before discussing the legal trials that came on the heels of the investigation, it is important to note a related watershed event in the development of American deep-sea diving that occurred just two weeks after the end of operations on the *Lakeland*, and further illustrates the significance of the underwater work conducted during the *Lakeland* investigation. On 25 September 1925, the U.S. Navy submarine U.S.S. S-51 was struck by a commercial vessel east of Block Island (lying between Long island, New York, and Martha's Vineyard, Massachusetts) and sank in 130 feet of water with 33 crewmen aboard (Ellsberg 1929). As the nation anxiously awaited word on the fate of the sub's crew, a rescue and salvage team was rapidly assembled, including four of the five *Lakeland* divers (*New York Times* 1925b; USDC 1926:293, 313, 317, 324). The S-51 salvage team also included Clarrence A. Tibbals of the *Lakeland* operation, and W.F. Loughman of the Bureau of Mines Experiment Station at Pittsburgh (*New York Times* 1925b). The Naval facility in New London, Connecticut, dispatched the a submarine salvage vessel, the U.S.S. *Falcon*, to support the S-51 salvage operation. This vessel, previously under Clarence Tibbals' command, had been outfitted with a helium-oxygen unit designed at the Bureau of Mines Experiment Station for treating "the bends" (Bartholomew and Milwee 1990:38).

The dive team discovered that all of the crewmen trapped on the S-51 perished, but Reinhartsen once again distinguished himself by recovering the first of many bodies from the sunken vessel (*New York Times* 1925b). After a long and dangerous effort, the salvage team eventually succeeded in the complex task of raising the wreck from the bottom (Ellsberg 1929). Diver Frank Smith, who also dove on the wreck of the *Lakeland*, recovered the S-51's bell and was allowed to take it back to Pittsburgh in recognition of his courageous work during the salvage phase of the project (Ellsberg 1933).

The results of the diving tests conducted during the *Lakeland* investigation were never formally published, but detailed newspaper reports and later descriptions given by the divers in later court testimony make it clear that they had in fact tested the helium-oxygen methods researched by the Navy and Bureau of Mines (*Door County Advocate* 1925a; *Buffalo Evening News* 1925; USDC 1926; End 1937:712). Relatively little additional research into the use of helium was conducted by the Navy after establishing its own Experimental Diving Unit in 1927 (Phillips 1998:169; although see Penzias and Goodman 1973:32 on a series of dives using helium-oxygen by the Navy Experimental Diving Unit in 1929). The Navy's initial lack of enthusiasm for further helium-oxygen experiments may have been informed by the apparent difficulties with "the bends" experienced by the *Lakeland* dive team in 1925.

A Milwaukee, Wisconsin, researcher was convinced of the usefulness of helium in deep diving, however, and continued to experiment with the technique (Phillips 1998:169). Dr. Edgar End was a physiologist at Marquette University, and an expert in hyperbaric medicine (Phillips 1998:169). Dr. End calculated a new set of helium-oxygen decompression tables based on the observation that helium

required divers to begin their decompression stops at much greater depths than standard compressed air (Phillips 1998:169). After testing the new tables on himself, he assisted another diver, Max G. Nohl, in setting a new world's record for open water deep diving by descending to a depth of 420 feet in Lake Michigan in 1937 (Phillips 1998:169). Using Dr. End's tables to time his decompression stops during the assent, Nohl suffered no ill effects during the record-setting dive (Phillips 1998:169). The previous record broken by the End-Nohl dive was actually the one set in 1915 by Steven Drellishak (one of the *Lakeland* divers) when he worked on the U.S.S. F-4 salvage operation.

As a result of this record-shattering dive, "the diving world came to Milwaukee" to learn about Dr. End's research and Nohl's designs for deep-sea diving equipment, and the city has hosted an important diving research and equipment supply industry ever since (Boyd 2014:pers. comm.). The Navy's Experimental Diving Unit also took a renewed interest in helium-oxygen following the End-Nohl dive. The Navy's first high-profile use of the mixture took place in 1939, during rescue efforts on the sunken U.S.S. *Squalus* (Phillips 1998:170). The submarine had gone down in 240 feet of water off the coast of New Hampshire, and a diver using the helium-oxygen mixture was able to guide a rescue chamber to one of the sub's hatches allowing 33 crewmen to escape. The U.S.S. *Squalus* dive team also immediately noticed the lack of impaired mental function, known as nitrogen narcosis, that typically affected deep-sea divers using standard compressed air (Phillips 1998:170). The so-called heliox mixture that was first field tested on the *Lakeland*, and the decompression calculations made by Milwaukee's Dr. Edgar End, opened the doors to dives of much greater depths in the following decades, and the same principles and techniques are now in regular use by military, commercial, and recreational divers.

The *Lakeland* Goes to Court: Two Years of Legal Limbo

The *Lakeland* and her crew became entangled in a series of hearings and court cases that dragged on through 1927. A brief timeline and summary is offered here to clarify the sequence of events. The first official inquiry into the circumstances of the wreck was conducted by investigators working for the United States Steamboat-Inspection Service (USSIS) in January and February of 1925. Following the public announcement of the results of dives on the wreck of the *Lakeland*, the USSIS investigators threatened to seek indictments of three members of the crew on federal charges (*Manitowoc Herald-News* 1925). No other reports or actual records of such charges could be located, so it is unclear whether they were ever pursued. The first civil case involving the *Lakeland* took place in the U.S. District Court for the Northern District of Ohio, Eastern Division in October 1925. The issue in this first trial, and those that followed, was simply whether or not the owners of the *Lakeland* had ordered the crew to arrange to sink her, in which case the insurance companies were not required to pay out on the various policies that covered the vessel. Due to a deadlocked jury, the judge declared a mistrial and a retrial was held in February 1926 in the same court (*Door County Advocate* 1926a). The second

civil trial led to a ruling in favor of the *Lakeland's* owners, but the insurance companies filed an appeal to the U.S. Circuit Court of Appeals for the Sixth District (USCCA 1927). The appellate court agreed with the insurance companies and ordered yet another retrial to be held in the U.S. District Court for the Northern District of Ohio, Eastern Division (USCCA 1927). Neither newspaper reports nor official transcripts of this third trial could be located, however, leaving the outcome of the entire case unclear. It is possible that the parties reached an out-of-court settlement before the third trial took place, but it is surprising that, given the high profile nature of the case, such a settlement was not reported. In terms of its bearing on the wreck as a historic site, however, the final resolution of the case is much less useful than the details of the vessel and its final voyage that were revealed during testimony.

The first official investigation was conducted by the USSIS immediately after the sinking, and in January and February of 1925 the inspectors convened a "trial" (more of a hearing) which found Captain McNeely guilty of violations of Section 4429 Revised Statutes of the Marine Safety Code (USSIS 1925a, 1925b). As punishment, McNeely's captain's license was suspended for one year (USSIS 1925b; USDC 1926:18). The *Lakeland's* Chief Engineer, James W. Hidden, also had his license suspended (USDC 1926:18). Interestingly, both men continued to be employed by the Thompson Transit Co. during the period of their suspensions, and despite not being allowed to work aboard ship they continued to receive their former salaries (USDC 1926:18).

In October of 1925, the *Lakeland* case (referred to in court records as Central National Bank Savings and Trust Co. et al, Plaintiffs, versus Automobile Insurance Company of Hartford, et al, Defendants) had its first hearing in the U.S. District Court for the Northern District of Ohio, Eastern Division (*Plain Dealer* 1925a, 1925b; *Door County Advocate* 1925e). The unusual nature of the trial, including the novel use of evidence collected by deep-sea divers, attracted international attention (*Plain Dealer* 1925a). The *Door County Advocate* (1926b) later noted that it was "one of the first 'scuttling' cases to appear in the courts along the Great Lakes since the 1870s." An editorial in a Liverpool, United Kingdom, newspaper opined that the *Lakeland* case may have implications for two similar cases in the English courts (*Plain Dealer* 1925a).

The 15 insurance companies with liabilities in the case, including such well-known firms as Aetna Insurance Co. and Northwestern Fire and Marine Insurance Co., had agreed to consolidate their individual claims into a single case under the Automobile Insurance Company of Hartford. The Thompson Transit Corporation (TTC) had gone into financial receivership (essentially bankruptcy) shortly after the sinking of the *Lakeland* (USDC 1926:14). The troubled firm was thus being represented in the case by the Central National Savings and Trust Co. which was serving as the receiving institution for TTC's assets and debts. The defendants argued that the owners of the TTC had directed the *Lakeland's* crew to scuttle the vessel, and were thus not entitled to the pay-outs on

their insurance policies totaling $350,000 for both the ship itself and co-called "disbursement" coverage to protect the company from associated operating losses in the event of the total loss of a vessel (USDC 1926). Their primary evidence consisted of divers' testimony regarding two sets of valves – the aft sea-cock valve and the port bilge valve – both of which were found to be open (*Plain Dealer* 1925a). The divers managed to take measurements of the valve stems in question using pieces of metal and wood to prove that the valves were in fact open, and these objects were submitted as evidence.

Initially, the plaintiffs claimed that the ship had been lost due to "perils of the sea" essentially consistent with the initial newspaper reports of the wreck. Following the release of the results of the divers' examination of the wreck, they added to their statement that the owners of the TTC had "no knowledge as to said valves being open, but allege that if they were open…it was by reason of the negligence of the master mariner or engineer…which are among the perils and risks insured to" (USDC 1926:2e-2f).

Detailed records of this first trial could not be located, but newspaper reports and testimony from later trials indicates that both parties brought forward numerous witnesses testifying on a wide array of subjects: from eyewitnesses who were aboard the boats that responded to the *Lakeland's* distress whistles on the night of the sinking, to the Coast Guard commander who arrived at the scene just before the vessel went down, to experts on the condition of the Chicago Municipal Pier, the location of obstructions in the Sturgeon Bay Canal, and the construction materials and methods used in early steel-hulled freighters (USDC 1926). It is worth mentioning that several of the divers who examined the wreck were unavailable during this first trial because they were serving on the dive team attempting to rescue/salvage the S-51 (see above). Unfortunately, in the wake of the evidence and testimony, the jury deadlocked and the judge declared a mistrial with no verdict reached in the case.

When the jury in the first trial could not reach a decision, the entire case was retried in the same court in February of 1926 (*Door County Advocate* 1926a; *Plain Dealer* 1926; *Door County Advocate* 1926b). Records from this trial, including transcripts of testimony, have been preserved at the National Archives and Records Administration (NARA) regional facility in Chicago, Illinois. The insurance companies' argument as defendants in this trial was substantially similar to their position in the original hearing. They claimed that the owners of the TTC had ordered the sinking of the *Lakeland* and were thus not entitled to the pay-outs of the insurance policies they had taken out on the vessel.

The insurance companies' lead lawyer, William Day, outlined the case in his opening remarks as follows: the Thompson Transit Corporation was in financial trouble in 1924, racking up an operating loss of approximately $250,000 (USDC 1926:2a-2b). In fact, they were in arrears with their premium

payments on the insurance policies covering the *Lakeland* for a period of time. The policies were actually cancelled and then reinstated after overdue balances were paid (USDC 1926:16). A man named Riley, who was involved in the management/ownership of the TTC, met with Captain McNeely of the *Lakeland* in September of 1924 (USDC 1926:2b). Shortly after this meeting, the vessel's Chief Engineer was reassigned and a new Chief Engineer, James W. Hidden, joined the *Lakeland* crew (USDC 1926:2b). Hidden had previously served with McNeely on other vessels (USDC 1926:2b). The insurance companies' dive team found a 10" sea-cock valve open in the stern of the *Lakeland*, and in such a state would have allowed water to enter the vessel more rapidly than the ship's pumps would be able to remove it (USDC 1926:2e). A U.S. government survey of the Sturgeon Bay Canal turning basin found no rocks where the *Lakeland* crew reported striking a hard obstruction when they attempted to shelter from rough seas on the night of 2 December 1924 (USDC 1926:2f). When the *Lakeland* left Chicago Harbor on 1 December 1924, they had allowed several feet of water into the vessel's lower hold because the ship needed additional ballast due to the very light load it was carrying (USDC 1926:2g). Before leaving the Sturgeon Bay Canal on the morning of 2 December 1924, the crew claims to have "sounded" the water levels in the ballast tanks and checked the water levels in the hold, and no evidence of leaks was observed (USDC 1926:2h). The crew reported that it noticed that the ship was listing approximately one hour after leaving Sturgeon Bay (USDC 1926:2h). The captain said he turned the boat back toward Door County, Wisconsin, and when the freighter *Cygnus* was spotted in the vicinity, the *Lakeland* sounded her whistle four times – a standard distress signal (USDC 1926:2h). Despite having a wireless radio onboard the *Lakeland*, the captain never ordered a radio distress call to be sent (USDC 1926:2h). Importantly, the crew of the *Cygnus* reported that as they approached the *Lakeland* it was bearing away from land and into deeper water, and continued that course for some time (USDC 1926:2i). The captain of the *Cygnus* offered the *Lakeland* a tow into shallow water, but Captain McNeely refused and dropped one of his anchors (USDC 1926:2i-j). After this offer of a tow, another three hours passed before the distressed vessel actually sank (USDC 1926:2i-j). Later, McNeely also refused a tow from another vessel that arrived on the scene, the *Ann Arbor No. 6* (USDC 1926:2i-j). The crew of the *Lakeland* escaped to the *Ann Arbor No. 6* in lifeboats, and one crewman rowed a separate boat from the sinking vessel carrying only the crew's baggage (USDC 1926:2j). Captain McNeely also evacuated the *Lakeland* but remained in a lifeboat tied to her side (USDC 1926:2k). Based on maritime law, he was thus still technically in command of his vessel, and the captains of the other vessels on the scene could not intervene without McNeely's assent (USDC 1926:2k).

The location of the sinking, and the refusal to allow her to be towed from that spot were critical to the defense's case. The position where the *Lakeland* eventually went down was conveniently just east of a steep escarpment on the bottom of the lake, where the depth of water increased from less than 100 feet to over 200 feet. While Day did not address it directly in his opening remarks, the chief difficulty that

the defendants had to surmount was that they had no material evidence that laid the responsibility for the sinking squarely in the laps of the owners of the TTC. This was precisely what the jury would have to be convinced of, however, in order for the insurance companies to be released from their liability. The defense's case was entirely circumstantial in nature.

As in the first trial, both parties called an extraordinary array of eye-witnesses and experts to testify (USDC 1926). Testimony and argument ran on for six days (USDC 1926:425). The most salient testimony is excerpted below, but it is important to note that during the trial there were very few definitive facts established. The jury was only tasked with making a judgment regarding the question of whether or not there was adequate evidence to prove that the company owners were involved in the sinking of the ship. Few "facts" and other claims testified to during the hearings were directly confirmed or challenged during cross-examination. Rather, individual claims, even where they contradicted other testimony, were generally left to stand on their own merits. As such, the findings in the trial do not clearly resolve many of the nagging questions surrounding the incident.

Captain McNeely testified that there were only 19 cars in the *Lakeland's* hold when she left Chicago for Detroit, although other members of the crew reported slightly different numbers (see below) (USDC 1926:31). Because of the light load, the ship's ballast tanks were filled to capacity before departing Chicago, and additional ballast water was pumped into the otherwise empty lower hold through two "man holes" in the floor of the lower hold that opened into the "water bottom" (lower ballast tank) (USDC 1926:31). According to the captain, this was not an unusual occurrence when the ship was traveling especially light. Heavy seas greeted them as the ship left Chicago on 30 November, however, and they quickly returned to the shelter of the port. They encountered trouble approaching the municipal pier in Chicago Harbor, however, and the hull was repeatedly slammed against the side of the pier by a powerful surge (USDC 1926:33-25). Even after successfully tying up, the surge continued to drive the ship against the pier.

The weather abated somewhat and the *Lakeland* once again left Chicago on 1 December, and headed uplake along the western shore. Bad weather resumed and the captain headed for shelter in the Sturgeon Bay Canal (USDC 1926:36-37). He attempted to tie up in the canal's turning basin, but in the course of maneuvering got hung up amid-ship on an obstruction (USDC 1926:36-37). After an hour of additional maneuvering he was able to free the vessel. The captain claimed that, based on the sound of the hull grating on the obstruction, it was rocky in nature. In the midst of attempting to free the ship, however, the engineer reported that the sea-cocks had become plugged with mud and he had to temporarily divert power from the engines to flush them out (USDC 1926:36-37). In the captain's original report of the sinking, he stated that while he did not know the cause of the sinking for certain, he believed that it was related to this incident in the turning basin. As a result, this issue received

considerable attention during the trial (see below).

The weather had improved by the following morning, so the *Lakeland* steamed out of the Sturgeon Bay Canal and resumed her uplake course. Before getting under way, however, the crew once again checked the ballast tanks and the additional ballast in the lower hold, noting no leaks (USDC 1926:36-37). About an hour out of the canal, the ship's Mate notified the captain that the ship was listing to port. Captain McNeely claimed that he ordered the chief engineer to level out the ship, and went to inspect the ballast tanks and the water level in the lower hold (USDC 1926:40). When he observed that the water in the hold looked higher, he conferred with the engineer and confirmed that all valves were properly adjusted (USDC 1926:40).

The captain decided to turn back towards Sturgeon Bay (USDC 1926:40). The steamer *Cygnus* came into view and the *Lakeland* sounded a distress call by blowing the whistle four times. Captain McNeely stated that the *Cygnus* did not immediately turn in response to the signal, so he turned the boat about again and followed the other vessel further out into the lake (USDC 1926:40). Another vessel, the *Ann Arbor No. 6*, was in the vicinity and heard the *Lakeland's* whistle, at which point it changed course to intercept. By this time the *Cygnus* had also turned and was closing in on the *Lakeland's* position. Captain McNeely ordered the crew off the boat, but her growing list to port and the prevailing swell was making it difficult to lower the lifeboats. He dropped an anchor in order to reorient her perpendicular to the roll of the swell, hoping that this would make it easier to release the lifeboats (USDC 1926:41).

Once the entire crew had gotten off the ship and were safely aboard the *Ann Arbor No. 6*, the chief engineer and two crewmen rowed back to the *Lakeland* to assist the captain. McNeely asserted that he refused the offer of a tow from the *Ann Arbor No. 6* because he thought that the *Lakeland* had already taken on too much water and there was no secure anchor point for a tow line (USDC 1926:42-43). He did not mention the earlier offer of a tow from the *Cygnus* during his testimony. The captain boarded the lifeboat that had returned with the chief engineer and held fast to the *Lakeland* by a "painter line" (a thin rope) for 15-20 minutes before releasing it and rowing to the recently-arrived Coast Guard boat (USDC 1926:43). Fifteen minutes after McNeely cut free of the *Lakeland*, it sank (USDC 1926:43).

Other *Lakeland* crewmen who testified during the second trial included Edward Starkey (First Mate), Walter E. Houser (Watchman), Elmer Schoup (Deckhand), George Nelson (Porter), William Flaherty (Watchman), James A. Hidden (Chief Engineer), Alfred Viola (Coal Passer), and Dennis Tobin (Coal Passer). Mr. Starkey recalled that there were "25-30" cars in the hold when they left Chicago (USDC 1926:63). Mr. Schoup did not recall experiencing a severe "jar" when the boat struck bottom while in the Sturgeon Bay Canal turning basin, but he did remember seeing a member of the crew rowing a

lifeboat full of baggage from the *Lakeland* to the *Ann Arbor No. 6* (USDC 1926:83). Chief Engineer Hidden's testimony generally agreed with that of McNeely, and he described the measures he took to try to right the ship once the listing problem became apparent (USDC 1926:91-94). Mr. Viola stated that he had gone off shift at 9:15 am the morning of the sinking, but had noticed the list to port and was too worried to sleep while back in his cabin (USDC 1926:101).

Former *Lakeland* Chief Engineer, Clarence Diersen, who was replaced by James Hidden shortly before the incident, was also called to appear. He was hired by the insurance companies' to advise the dive team during the investigation of the wreck, and during the trial he gave detailed testimony on the operation of the *Lakeland's* various pumping and ballast systems (USDC 1926:218-226). Frank Rice, who captained the *Lakeland* when she was still operating as the *Cambria*, testified regarding the method of opening the man-hole covers in the floor of the lower hold to allow additional ballast water into that compartment (USDC 1926:105). Charles Menke, a ship-builder who helped build the *Lakeland* (then the *Cambria*) at Globe Iron Works, testified to the brittle nature of the Bessemer steel used in the *Cambria* and other early steel-hulled vessels built in Cleveland (USDC 1926:108). Patrick Gerrity, foreman of the Detroit Shipbuilding Company, also described the problems they encountered with the *Lakeland's* brittle hull plates when she was drydocked at their facility for repairs in 1924 (USDC 1926:108-109).

Members of the crew of the *Ann Arbor No. 6* were also called to testify. The *Ann Arbor No. 6's* wireless operator, Elliot Jacobson, confirmed that the *Lakeland* did not send a radio distress call (USDC 1926:139). He also managed to take a series of photographs of the *Lakeland* spanning the nearly two hours between the arrival of the *Ann Arbor No. 6* and the sinking of the *Lakeland* (USDC 1926:139-140). These images were admitted as evidence and were frequently referred to in the trial. Prints and negatives of the photographs are still held in the collections of the National Archives and Records Administration's regional facility in Chicago, Illinois. The First Mate of the *Ann Arbor No. 6*, Axel Fredericksen, testified that the *Lakeland* sank at 11:25AM, and the *Ann Arbor No. 6* immediately left the scene to deliver the rescued crew to Sturgeon Bay (USDC 1926:155). They reached the entrance to the Sturgeon Bay Canal at 12:05PM, approximately 35 minutes after departing the location of the wreck (USDC 1926:155). He was adamant that in the nearly two hours that elapsed between his vessel's arrival at the scene and the eventual sinking of the *Lakeland*, the *Ann Arbor No. 6* could have succeeded in towing the *Lakeland* into shallow water (USDC 1926:155).

Captain Larsen of the *Ann Arbor No. 6* confirmed that his vessel was standing by the *Lakeland* from 9:50AM until she sank at 11:25 am, a span of one hour and 35 minutes (USDC 1926:196). He discussed at length his efforts to get Captain McNeely of the *Lakeland* to accept the tow line that had been made ready by the *Ann Arbor No. 6's* crew as they approached the other vessel's position (USDC

1926:196). Captain Larsen reiterated that he was not permitted to intervene without McNeely's permission while the other captain remained in control of his boat, even after McNeely fled to a lifeboat that was still tied to the ship (USDC 1926:196). He also noted that the *Lakeland's* starboard gangway was open during the entire incident, and denied reports that he maneuvered his own vessel to provide shelter from wind and waves for the escaping lifeboats (USDC 1926:196). Larsen clarified that there was in fact no need for this maneuver because the seas were not rough and the wind was light (USDC 1926:196).

The only crewman from the *Cygnus* who was available to testify at the second trial was the Second Mate, George Boyle. Mr. Boyle stated that the *Cygnus* was within sight of the *Lakeland* from 9:00AM until the latter vessel went down at 11:30AM, and confirmed that the *Lakeland* had turned eastward out into the lake and continued to run on that course for about a mile before it dropped its anchor (USDC 1926:204). Boyle claimed that, contrary to McNeely's earlier testimony, the *Cygnus* actually had to change its own course to pursue and eventually approach the *Lakeland* (USDC 1926:204). He also confirmed that Captain McNeely had in fact refused the offer of a tow line proffered by the captain of the *Cygnus* (USDC 1926:204). Like the members of the *Ann Arbor No. 6* who testified before him, Boyle was convinced that the *Cygnus*, a large and powerful bulk freighter, could have towed the foundering *Lakeland* into shoal waters had McNeely not prevented it (USDC 1926:204).

The results of a U.S. government-sponsored survey of the turning basin and other sections of the Sturgeon Bay Canal, conducted in late-1925, were presented in court in order to cast doubt on McNeely's and Hidden's claims that they struck a rock in the basin. McNeely was present for the sweep of the turning basin, and pointed out to the surveyors where he thought he had struck. According to O'Dee Skrukrud of the Army Corp of Engineers – Milwaukee District, no rock obstructions were located in the basin and the entire bottom was found to consist of deep silt and mud (USDC 1926:220-241).

Diving Team Testimony

Outside of the testimony given by the *Lakeland's* crew and other eyewitnesses, the most extensive testimony in the entire trial was presented by members of the diving team that investigated the wreck in mid-1925 (see above). Clarence L. Tibbals was the first to testify. He was technically an employee of Overseas Salvors, Inc. during the investigation, as he was officially on leave from his post at the joint U.S. Navy – Bureau of Mines project based out of the Bureau's Pittsburgh Experiment Station (USDC 1926:266). His previous work in the Navy included establishing the Naval Diving School at Newport, Rhode Island (USDC 1926:266). He had also arranged leave time for the two other Navy divers who accompanied him on the project. He served as Divemaster for the entire mission and participated in at least one dive as well (USDC 1926:267). Once it was discovered that the aft sea-

cock had been open when the vessel sank (see below) discussions took place among the investigators regarding the possibility of bringing the valve to the surface to submit as direct evidence in the trial (USDC 1926:269). The salvage barge had been equipped with an underwater cutting torch, but Tibbals testified that, due to the position of the valve in the wreck and the depth at which the work would take place, the valve could not have been cut out of the hull without placing the divers' lives at serious risk (USDC 1926:269). He stated that the duration of a typical dive included only about 15 minutes on the wreck itself, and the rest of the time in the water consisted of descending to the site and ascending with scheduled decompression stops (USDC 1926:270).

Diver Stephen J. Drellishak was the next to testify. He was a former Navy diver (Naval Reserve at the time of the investigation) who had been an instructor at the Naval Diving School at Newport, Rhode Island (USDC 1926:276). In 1915, during his Navy days, he set a deep diving record while working on the U.S.S. F-4 salvage operation in Honolulu Harbor, Hawaii (USDC 1926:277). He descended to 306 feet using a standard compressed air system (USDC 1926:277). At the time of the *Lakeland* operation, however, he was working as a regular employee of Overseas Salvors, Inc. (USDC 1926:276). He reported that while diving on the *Lakeland* he suffered from three to five episodes of "the bends" (USDC 1926:277). He was also one of three divers to inspect the aft sea-cock valve that was found to be in the open position (USDC 1926:280, 288).

Harry Reinhartsen was another regular employee of the salvage company who served as lead diver on numerous descents to the *Lakeland* (USDC 1926:293). He was also the first diver to reach the *Lakeland's* engine room and confirm that the aft sea-cock had been left open when the ship went down (USDC 1926:295).

Hubert A. Groves was the last of the Overseas Salvors, Inc. divers to take the stand. He was also a former Navy diver, and had run the Navy's diving school in New York (USDC 1926:299). Groves descended into the *Lakeland's* engine room carrying a small piece of wood which he laid up against the threaded stem of the open sea-cock valve in order to record a measurement of the extent to which the stem extended above the casing of the valve (USDC 1926:305). The piece of wood was marked by a notch to indicate the distance between the valve wheel and valve casing, and this object was submitted as evidence during the trial (USDC 1926:305). Amazingly, it is still part of the *Lakeland* case records held at the National Archives and Records Administration (NARA) regional facility in Chicago, Illinois.

U.S. Navy (on leave) diver Francis G. Smith made numerous dives on the *Lakeland*, generally as an assistant or "tender" for another diver (USDC 1926:317). Smith had not been available to testify during the first trial because he was working on the S-51 salvage and the Navy refused to release him

from that mission (USDC 1926:317). Smith was allowed to keep the salvaged bell from the S-51 in recognition of his exemplary service during the salvage operation (see above).

Joseph Eiven, U.S. Navy diver on leave, was the last of the dive team to testify. During the first trial he was working on the S-51 salvage project and was not given leave to attend (USDC 1926:324). His statements during the second trial were thus the only ones he gave regarding his work on the *Lakeland.* He was responsible for removing and recovering a grate on the exterior of the *Lakeland* that allowed the divers to access portions of the wreck (USDC 1926:318). The grate was hoisted to the surface and was actually submitted as evidence during the trial. The whereabouts of this object are no longer known, however. Eiven also discovered that the *Lakeland's* port bilge suction valve had been open at the time she sank (USDC 1926:321).

The jury in the second trial found in favor of the plaintiffs, and awarded the entire insured amount to the *Lakeland's* owners, plus accrued interest (USDC 1926; *Plain Dealer* 1926; *Door County Advocate* 1926b). The strong circumstantial evidence in the case was not sufficient to prove that the owners of the TTC had ordered the *Lakeland's* crew to sink her, and were thus entitled to the full pay-out of the insurance policies they had taken out on the vessel. Note that the jury's verdict did not include any findings regarding the actual cause of the sinking or the parties responsible for the incident (USDC 1926). While these issues surely arose during the jury's deliberations, they were technically outside the scope of the civil trial.

In the wake of this decision, the insurance companies' lawyers filed an appeal. After reviewing the records of the second trial in June 1927, a judge for the U.S. Circuit Court of Appeals for the Sixth District agreed (USCCA 1927). The appellate court observed that, among other issues, the judge in the second trial had given improper instructions to the jury prior to their deliberations (USCCA 1927). The third civil trial was scheduled for the fall 1928 session of the U.S. District Court for the Northern District of Ohio, Eastern Division (*Door County Advocate* 1927a, 1927b; *Buffalo Courier Express* 1927). These same newspaper articles also reported that a Milwaukee, Wisconsin, inventor named O. A. Tesch had developed a prototype of a remote-controlled, submersible camera system that he planned to use to photograph the *Lakeland* where it lay on the bottom of Lake Michigan (*Door County Advocate* 1927a; *Buffalo Courier Express* 1927). One report implied that if the efforts were successful, the photos would be used as evidence in the third trial (*Buffalo Courier Express* 1927).

Unfortunately, it is at this point in the story that the trail of evidence goes cold. No further reports or records related to the submersible camera experiment or the third trial could be located. The case does not appear in court dockets or annual reports of the U.S. District Court of Northern Ohio, Eastern Division, for 1927 or 1928. In the absence of a published, court-issued decision in the case, it is

almost certain that the insurance companies reached an out-of-court settlement with the *Lakeland's* owners prior to the scheduled retrial in 1928. The terms of this settlement remain entirely unknown, however. It is surprising that the resolution of this long-running and high-profile case received no newspaper coverage, suggesting that the parties involved made an effort to keep the settlement quiet.

The outcome of A. O. Tesch's attempt to photograph the wreck of the *Lakeland* using his submersible camera also remains unknown. The fact that Tesch chose the *Lakeland* as the subject of his experiments, with the hope of demonstrating his invention's capabilities to commercial filmmakers, indicates the extent to which the wreck had attained "celebrity" status over the course of three years of ongoing newspaper coverage of the sinking and the legal battle that followed. The sordid story of the sinking of the *Lakeland* still holds a prominent place in the annals and stories of Great Lakes shipping history, and it remains one of the most talked-about incidents on the Lakes.

The *Lakeland* Rediscovered: Sport Divers and Salvagers Revisit the Wreck

The wreck of the *Lakeland* with its cargo of 1924 automobiles remained undisturbed for nearly half a century, but, as recreational diving grew in popularity and technical sophistication in the 1960s and 1970s, stories of the vessel drew both sport divers and avocational salvage efforts. The fact that the ship lies in 200 feet of water still presented significant challenges and dangers to would-be explorers.

The location of the wreck site was probably rediscovered by well-known Great Lakes diver Franny Felhofer ca. 1960 (Boyd 2014:pers. comm.). In September of 1979 an attempt was made to raise one of the cars still lying in the hold of the sunken vessel (*Door County Advocate* 1979a). The team, led by Captain Robert Aznoe and Kent Bellrichard, successfully attached a salvage line to one to the *Lakeland's* cars, but encountered problems in raising the vehicle to the surface. The line attaching the car to a flotation tank broke when the car was about halfway up to the surface, sending it tumbling back to the bottom of the lake (*Door County Advocate* 1979b). The line was reattached, but a leak in the flotation tank left the vehicle hanging too low in the water, and it was further damaged as it was brought into shallow water (*Door County Advocate* 1979b). The battered remnants of the car, consisting of a twisted frame with wheels, engine, one headlight, and one fender, were finally hoisted ashore at Sturgeon Bay, Wisconsin (*Door County Advocate* 1979c). The car was identified as a 1924 Rollin, much to the surprise of the salvage team who had expected to find one of the Nash or Kissel cars reportedly aboard the *Lakeland* when she sank in 1924 (see above). The remains of the salvaged car were taken to a nearby garbage dump shortly after it was brought out of the water (Radovan 2013:pers. comm.).

The following year, Bellrichard returned to film parts of the wreck and to recover the ship's large, brass steam whistle (*Door County Advocate* 1980). The whistle was restored and is now part of the

collection of the Door County Maritime Museum, on permanent loan to the Stone Harbor Resort and Conference Center in Sturgeon Bay, Wisconsin, where it is on display. Another attempt to salvage cars from the wreck site was proposed in the mid-1990s (*Post Crescent* 1994). The salvage plan did not meet the requirements of the State Historical Society of Wisconsin – Division of Historic Preservation, however, and the permit application was denied. Several years later, a sport diver was lost while diving on the wreck, up to this point the only death associated with the vessel (*Milwaukee Journal-Sentinel* 1999). His body was not recovered until 2012, when it was found lying on the bottom of the lake near the wreck site by another group of recreational divers who were also exploring the *Lakeland* (*Medical Daily* 2012). The *Lakeland* remains a popular location for sport diving, but its depth makes it a technically difficult and potentially dangerous destination.

Concluding Summary

Integrity and Archaeological Significance
All of the *Lakeland*'s hull components are represented within the wreck site; although broken in half, the site retains excellent archaeological integrity, and sites such as the *Lakeland* present a rare opportunity to study and learn about historic steel-hull ship construction, and how these vessels were used in the bulk cargo, passenger, and package freight trades. Although rediscovered and explored by sport divers as early as the 1960's, because of the extreme depth of water in which the *Lakeland* lays, many areas within the shipwreck remain untouched by divers.

The *Lakeland* meets the registration requirements under Criterion D at the state level as a good example of the steam screw vessel property type under the area of Engineering as described in the Multiple Property Documentation *Great Lakes Shipwrecks of Wisconsin* (Cooper and Kriesa 1992). The *Lakeland*, in a larger sense, is a bulk freight and passenger carrier. The *Lakeland* represents multiple eras of ship construction and use on the Great Lakes. She began as a bulk freighter in 1886, was converted to a passenger steamer in 1910; and finally was converted to a car carrier in 1920. Because of her operational history, she is also eligible under Criterion D in the area of Commerce for her role in the grain and ore transport trade and in the automobile transport trade.

Many opportunities remain for future archaeological research at the *Lakeland* site as diving technology advances and archaeological recording methods become more efficient. Additional information from the site may significantly add to our understanding of Great Lakes steam-screw technology. The *Lakeland* is the only archaeologically investigated steel-hulled vessel in the Wisconsin waters of Lake Michigan and one of only two steel-hulled vessels investigated on all of Wisconsin's bottomlands. Data gathered on the *Lakeland* has significantly increased our understanding of steel-hull construction and early steam screw technology, and through additional archaeological investigation, holds the

potential to yield additional information essential to understanding late nineteenth, and early twentieth century maritime commerce.

References Cited

Anderson, R.
1924 Record of Miscellaneous Events of the Day, 3 December 1924. Station Log Book, Sturgeon Bay Canal Coast Guard Station, Eleventh District. Records Group 26. Manuscript in the collection of the National Archives and Records Administration, Chicago, Illinois.

Anonymous
2010 Shipbuilding History: Construction Records of U.S. and Canadian Shipbuilders and Boatbuilders. Globe Iron Works (later AmShip Cleveland), Cleveland Ohio. URL http://shipbuildinghistory.com/history/shipyards/2large/inactive/globe.htm. Most Recent Update 20 August 2010. Accessed 12 December 2013
2013 United States Senate: The Election Case of Marcus A. Hanna of Ohio. URL http://www.senate.gov/artandhistory/history/common/contested_elections/086Marcus_Hanna.htm. Accessed 13 December 2013.

Bartholomew, C. A., and W.I. Milwee
1990 *Mud, Muscle, and Miracles: Marine Salvage in the United States Navy*. U.S. Naval History and Heritage Command, Government Printing Office, Washington, D.C.

Beeson, H.C.
1896 Beeson's Marine Directory. Harvey C. Beeson Publisher, Chicago, Illinois.
1909 Beeson's Marine Directory. Harvey C. Beeson Publisher, Chicago, Illinois.

Berry, S.
2013 Great Lakes Vessel History: The Vessel Histories of Sterling Berry. URL http://www.greatlakesvesselhistory.com/histories-by-name/c/cambria/. Accessed 12 December 2013.

Bowling Green State University [BGSU]
2013 Historical Collections of the Great Lakes: Great Lakes Vessels Online Index. URL http://ul.bgsu.edu/cgi-bin/xvsl2.cgi. Accessed 23 December 2013.

Boyd, R.J
2014 Personal communication regarding the rediscovery of the location of the *Lakeland*, and the End-Nohl experimental dive of 1937.

Buffalo Courier Express, The (Buffalo, New York)
1927 *The Buffalo Courier Express.* 1 October.

Buffalo Evening News, The (Buffalo, New York)
1890 *The Buffalo Evening News.* 18 July.
1897 *The Buffalo Evening News.* 21 October.
1925 *The Buffalo Evening News.* 18 September.

Bureau of Navigation
1887 *Cambria* Certificate of Enrollment No. 99 (Permanent), Port of Cleveland, Ohio, Cuyahoga Customs District, Record Group 41 (Permanent), U.S. National Archives, Washington, D.C.
1897 *Cambria* Certificate of Enrollment No.122 (Permanent), Port of Cleveland, Ohio, Cuyahoga Customs District, Record Group 41, U.S. National Archives, Washington, D.C.
1901 *Cambria* Certificate of Enrollment No.97 (Permanent), Port of Duluth, Minnesota, Duluth Customs District, Record Group 41, U.S. National Archives, Washington, D.C.
1904 *Cambria* Certificate of Enrollment No.41 (Permanent), Port of Duluth, Minnesota, Duluth Customs District, Record Group 41, U.S. National Archives, Washington, D.C.
1906 *Cambria* Certificate of Enrollment No.85 (Permanent), Port of Duluth, Minnesota, Duluth Customs District, Record Group 41, U.S. National Archives, Washington, D.C.
1910a *Cambria* Certificate of Enrollment No.11 (Permanent), Port of Port Huron, Michigan, Huron Customs District, Record Group 41, U.S. National Archives, Washington, D.C.
1910b *Lakeland* Certificate of Enrollment No.22 (Permanent), Port of Port Huron, Michigan, Huron Customs District, Record Group 41, U.S. National Archives, Washington, D.C.
1913 *Lakeland* Certificate of Enrollment No.14 (Permanent), Port of Port Huron, Michigan, Huron Customs District, Record Group 41, U.S. National Archives, Washington, D.C.
1917 *Lakeland* Certificate of Enrollment No.16 (Permanent), Port of Port Huron, Michigan, Michigan Customs District #38, Record Group 41, U.S. National Archives, Washington, D.C.
1919 *Lakeland* Certificate of Enrollment No.123 (Permanent), Port of Buffalo, New York, Buffalo Customs District, Record Group 41, U.S. National Archives, Washington, D.C.
1920 *Lakeland* Certificate of Enrollment No.8 (Permanent), Port of Cleveland, Ohio, Ohio Customs District, Record Group 41, U.S. National Archives, Washington, D.C.
1924a *Lakeland* Certificate of Enrollment No.58 (Permanent), Port of Cleveland, Ohio, Ohio Customs District, Record Group 41, U.S. National Archives, Washington, D.C.
1924b *Lakeland* Certificate of Enrollment No.79 (Permanent), Port of Cleveland, Ohio, Ohio Customs District, Record Group 41, U.S. National Archives, Washington, D.C.

Cooper, David J. and Paul P. Kriesa
1992 Great Lakes Shipwrecks of Wisconsin. National Park Service National Register of Historic Places Multiple Property Documentation Form. Division of Historic Preservation – Public History, Wisconsin Historical Society, Madison, WI.

Courier, The (Buffalo, New York)
1923 *The Courier*. 25 May.

Creviere, P.J, Jr.
1997 *Wild Gales and Tattered Sails: The Shipwrecks of Northwest lake Michigan from Two Creeks, Wisconsin to Dutch Johns Point, Michigan and all of the Bay of Green Bay*. Self published, De Pere, Wisconsin.

Daily Palladium, The (Oswego, New York)
1919 *The Daily Palladium*. 14 August.

Daily Star, The (Queens, New York)
1925 *The Daily Star*. 15 Sept.

Daily Tribune, The (Port Huron, Michigan)
n.d. [1924] *The Daily Star*.

Detroit Free Press (Detroit, Michigan)
1892 *Detroit Free Press*. 29 February.

Door County Advocate, The (Sturgeon Bay, Wisconsin)
1901 *The Door County Advocate*. 28 December.
1904 *The Door County Advocate*. 31 December.
1910a *The Door County Advocate*. 10 February.
1910b *The Door County Advocate*. 22 September.
1922 *The Door County Advocate*. 15 December.
1923 *The Door County Advocate*. 30 November.
1924a *The Door County Advocate*. 5 December.
1924b *The Door County Advocate*. 12 December.
1925a *The Door County Advocate*. 21 August.
1925b *The Door County Advocate*. 28 August.
1925c *The Door County Advocate*. 11 September.

1925d *The Door County Advocate*. 9 November.
1925e *The Door County Advocate*. 30 November.
1926a *The Door County Advocate*. 21 February.
1926b *The Door County Advocate*. 26 February.
1927a *The Door County Advocate*. 18 August.
1927b *The Door County Advocate*. 19 August.
1979a *The Door County Advocate*. 6 September.
1979b *The Door County Advocate*. 11 September.
1979c *The Door County Advocate*. 13 September.
1980 *The Door County Advocate*. 10 July.

Ellsberg, E.
1929 *On the Bottom*. Dodd, Mead, and Company, New York, New York.
1933 *Popular Mechanics Magazine*. 59(3):394-399.

End, E.
1937 Rapid Decompression Following Inhalation of Helium-Oxygen Mixtures Under Pressure. *American Journal of Physiology* 120(4):712-718.

Evening News, The (Buffalo, New York)
1910 *The Evening News*. 21 September.

Evening News, The (Sault Sainte Marie, Michigan)
1903a *The Evening News*. 15 May.
1903b *The Evening News*. 30 May.
1905 *The Evening News*. 29 April.
1907 *The Evening News*. 15 February.

Grand Forks Herald (Grand Forks, North Dakota)
1921 *Grand Forks Herald*. 31 August.

Green, F.W.
1915 *Green's Maritime Directory of the Great Lakes*. Cleveland, Ohio.
1916 *Green's Maritime Directory of the Great Lakes*. Cleveland, Ohio.

Hilton, G.W.
2002 *Lake Michigan Passenger Steamers*. Stanford University Press, Redwood City, California.

Hoagland, H.E. and N.H. Debel
1917 *Wage Bargaining on the Vessels of the Great Lakes*, Volume 6. University of Illinois Press, Urbana-Champaign, Illinois.

Huron Daily Tribune, The (Port Huron, Michigan)
n.d. [1924] Report on the sinking of the *Lakeland*.

Inquirer (Philadelphia, Pennsylvania)
1910 *Inquirer*. 1 May.

Lake Carriers' Association
1911 *Annual Report of the Lake Carriers' Association*. Cleveland, Ohio.

Manitowoc Herald-News (Manitowoc, Wisconsin)
1925 *Manitowoc Herald-News*. 11 September.

Marine Record, The (Cleveland, Ohio)
1887a *The Marine Record*. 3 February.
1887b *The Marine Record*. 27 October.
1887c *The Marine Record*. 28 October.
1887d *The Marine Record*. 3 November.
1887e *The Marine Record*. 15 December.

Marine Review, The (Cleveland, Ohio)
1899a Volume XIX(11):19.
1899b Volume XX(4):1.
1916 Volume 46(2):61.

Marquette Daily Mining Journal (Marquette, Michigan) [MDMJ]
1887a *Marquette Daily Mining Journal*. 2 February.
1887b *Marquette Daily Mining Journal*. 15 April.

Medical Daily
2012 Preserved Body of Diver Who Disappeared in 1999 Found Near Legendary Shipwreck. URL http://www.medicaldaily.com/preserved-body-diver-who-disappeared-1999-found-near-legendary-shipwreck-242110. 22 August. Accessed 27 Jan 2014.

Michigan Manufacturer and Financial Record [MMFR]
1919a Volume 23(2):37.
1919b Volume 23(22):20.

Miller, A.
1999 *Tin Stackers: The History of the Pittsburgh Steamship Company*. Wayne State University Press, Detroit, Michigan.

Milwaukee Journal, The (Milwaukee, Wisconsin)
1919 *The Milwaukee Journal*. 10 July.

Milwaukee Journal-Sentinel, The (Milwaukee, Wisconsin)
1999 *The Milwaukee Journal-Sentinel*. 7 September.

News Tribune, The (Duluth, Minnesota)
1910a *The News Tribune*. 21 February.
1910b *The News Tribune*. 20 May.
1910c *The News Tribune*. 6 June.
1910d *The News Tribune*. 18 June.
1910e *The News Tribune*. 2 September.
1912 *The News Tribune*. 28 March.
1915 *The News Tribune*. 19 November.

New York Times, The (New York, New York)
1925a *The New York Times*. 24 August.
1925b *The New York Times*. 4 October.

Ohio Secretary of State [OSS]
1887 *Annual Report of the Secretary of State to the Governor and General Assembly of the State of Ohio for the Year Ending 1887*. Columbus Printing Company, State Printers, Columbus Ohio.

Penzias, W., and M.W. Goodman
1973 *Man Beneath the Sea: A Review of Underwater Ocean Engineering*. Wiley-Interscience/John Wiley and Sons, Inc., New York, New York.

Phillips, J.L.
1998 *The Bends: Compressed Air in the History of Science, Diving, and Engineering*. Yale University press, New Haven, Connecticut.

Plain Dealer, The (Cleveland, Ohio)
1887a *The Plain Dealer*. 31 January.
1887b *The Plain Dealer*. 2 February.
1887c *The Plain Dealer*. 4 June.
1887d *The Plain Dealer*. 15 June.
1887e *The Plain Dealer*. 16 June.
1887f *The Plain Dealer*. 19 June.
1887g *The Plain Dealer*. 30 August.
1896 *The Plain Dealer*. 21 July.
1899 *The Plain Dealer*. 16 September.
1900a *The Plain Dealer*. 8 May.
1900b *The Plain Dealer*. 14 Sept.
1901 *The Plain Dealer*. 13 June.
1902a *The Plain Dealer*. 27 February.
1902b *The Plain Dealer*. 18 June.
1902c *The Plain Dealer*. 25 July.
1902d *The Plain Dealer*. 27 July.
1902e *The Plain Dealer*. 25 August.
1903a *The Plain Dealer*. 11 June.
1903b *The Plain Dealer*. 30 June.
1903c *The Plain Dealer*. 16 August.
1904a *The Plain Dealer*. 18 June.
1904b *The Plain Dealer*. 19 July.
1904c *The Plain Dealer*. 27 August.
1904d *The Plain Dealer*. 16 November.
1905a *The Plain Dealer*. 26 April.
1905b *The Plain Dealer*. 28 Jun.
1905c *The Plain Dealer*. 16 Aug.
1906a *The Plain Dealer*. 22 April.
1906b *The Plain Dealer*. 19 Sept.
1907a *The Plain Dealer*. 31 May.
1907b *The Plain Dealer*. 4 October.
1909 *The Plain Dealer*. 25 December.

1910a *The Plain Dealer*. 27 March.
1910b *The Plain Dealer*. 17 April.
1910c *The Plain Dealer*. 20 April.
1910d *The Plain Dealer*. 21 May.
1910e *The Plain Dealer*. 25 June.
1920 *The Plain Dealer*. 17 November.
1922 *The Plain Dealer*. 31 August.
1925a *The Plain Dealer*. 27 October.
1925b *The Plain Dealer*. 28 October.
1926 *The Plain Dealer*. 24 February.

Post Crescent, The (Appleton, Wisconsin).
1994 *The Post Crescent*. 9 June.

Quandt, V.V.
1990 *The Classic Kissel Automobile*. Kissel Graph Press, Hartford, Wisconsin.
1998 *Wisconsin Cars and Trucks: A Centenary*. Wisconsin Society of Automotive Historians, Green Bay, Wisconsin.

Radovan, S.
2013 Personal communication regarding the current whereabouts of the Rollin automobile lifted from the *Lakeland* in 1979.

Republican News, The (Hamilton, Ohio)
1915 *The Republican News*. 23 June.

Sayers, R., Yant, W., and J Hildebrand
1925 Possibilities in the Use of Helium-Oxygen Mixtures as a Mitigation of Caison Disease. *U.S. Bureau of Mines Report of Investigations* 1925, No. 2670, pp 1-15.

Sayers, R., and W. Yant
1927 The Value of Helium-Oxygen Atmosphere in Diving and Caison Operations. *Anesthesia and Analgesia* 5(1926):127-138.

Sheboygan Press, The (Sheboygan, Wisconsin)
1910 *The Sheboygan Press*. 12 September.
1919a *The Sheboygan Press*. 4 August.

1919b *The Sheboygan Press*. 5 September.
1925 *The Sheboygan Press*. 11 September.

Times-Picayune (New Orleans, Louisiana)
1919a *Times-Picayune*. 13 March.
1919b *Times-Picayune*. 17 April.
1919c *Times-Picayune*. 23 April.

United States Circuit Court of Appeals, Sixth Circuit [USCCA]
1927 Case Nos. 4709-4723: The Automobile Insurance Company of Hartford Connecticut, et al., Plaintiffs in Error, versus Central National Bank, Savings and Trust Company, as Trustee, et al., Defendants in Error. Record Group 276. Manuscript in the collection of the National Archives and Records Administration, Chicago, Illinois.

United States Congress
1892 The Executive Documents of this House of Representatives for the First Session of the Fifty Second Congress 1891-92, in Thirty-Eight Volumes. United States Congressional Serial Set, Issue 2948. Washington Government Printing Office, Washington, D.C.

United States Department of Commerce, Bureau of Navigation [USDC]
1911 Merchant Vessels of the United States (Including Yachts and Government Vessels) Year Ended June 30, 1911. United States Government Printing Office, Washington D. C.

United States District Court, Ohio, Northern District, Eastern Division [USDC]
1926 Central National Bank Savings and Trust Co, et al. versus Automobile Insurance Company of Hartford, Connecticut. Defendant's Narrative Form. Record Group 21, LAW 13039, Box 303(B). Manuscript in the collection of the National Archives and Records Administration, Chicago, Illinois.

United States Navy
2000 Diving in the U.S. Navy: A Brief History. URL http://www.history.navy.mil/faqs/faq100-1.htm. Last updated 20 November 2000. Accessed 23 December 2013.

United States Steamboat-Inspection Service [USSIS]
1925a Letter Dated 13 January 1925 from F.W. Van Patten and W.A. Collins to John T. McNeely. Manuscript in the collection of the National Archives and Records Administration, Chicago, Illinois. Record Group 21, LAW 13039, Box 303(A).

1925b Letter Dated 26 February 1925 from F.W. Van Patten and W.A. Collins to John T. McNeely. Manuscript in the collection of the National Archives and Records Administration, Chicago, Illinois. Record Group 21, LAW 13039, Box 303(A).

Van Harpen, J.P.
2006 *Door Peninsula Shipwrecks*. Arcadia Publishing, Chicago, Illinois.

Van der Linden, Rev. P.J., editor
1979 *Great Lakes Ships We Remember, Revised Edition*. Freshwater Press, Inc., Cleveland, Ohio.

Yant, W.P.
1927 Helium in Deep Diving. *Industrial and Engineering Chemistry* (News Edition) Vol. 5(5):4-5.

Verbal Boundary Description:

The boundary for the *Lakeland* site is marked by a circle with a radius of 300 feet, centered on the UTM coordinates 473854 Easting, 4976246 Northing, Zone 16T.

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 2
WI_DoorCounty_LakelandShipwreck(Steam Screw)_0001
Lakeland Shipwreck (Steam Screw)
Door County, Wisconsin
Photographer Tamara Thomsen
August 2013
Starboard side looking at the break
Location of original data file: Wisconsin Historical Society, 816 State Street, Madison, WI 53706

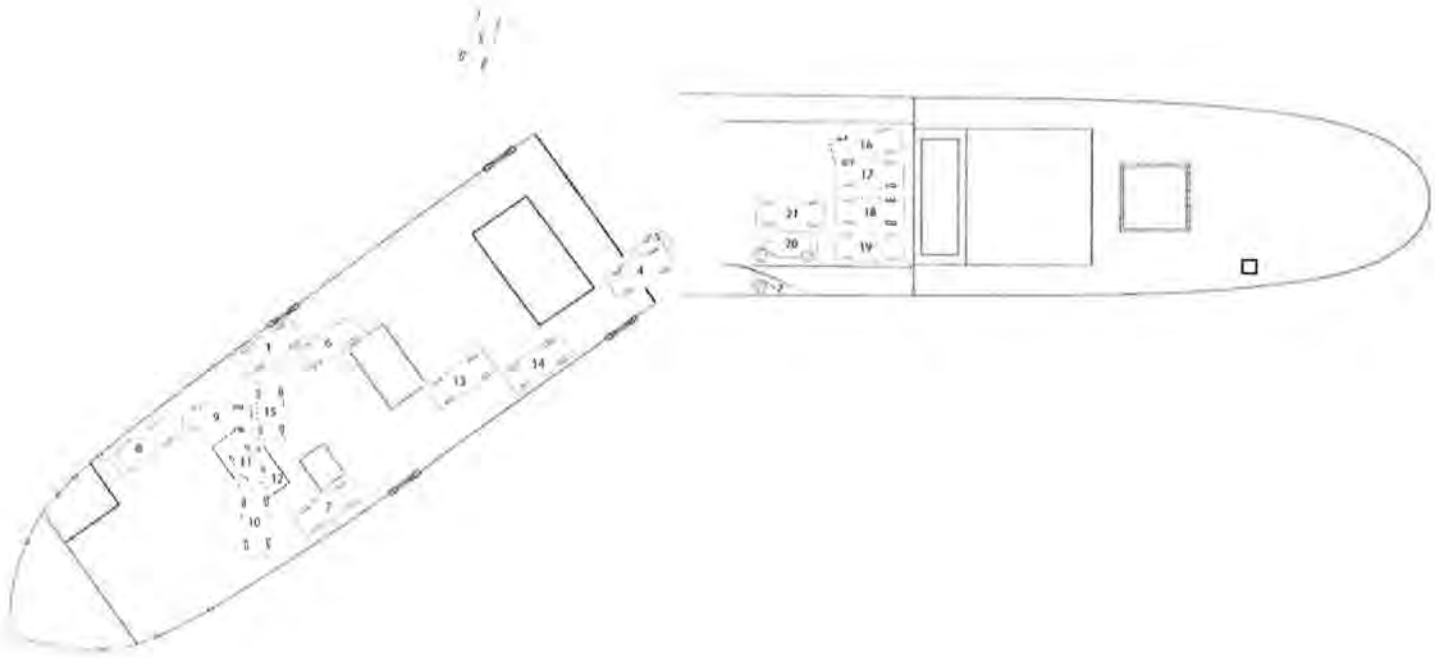
Photo #2 of 2
WI_DoorCounty_LakelandShipwreck(Steam Screw)_0002
Lakeland Shipwreck (Steam Screw)
Door County, Wisconsin
Photographer Tamara Thomsen
August 2013
Kissel vehicle on the main deck
Location of original data file: Wisconsin Historical Society, 816 State Street, Madison, WI 53706

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

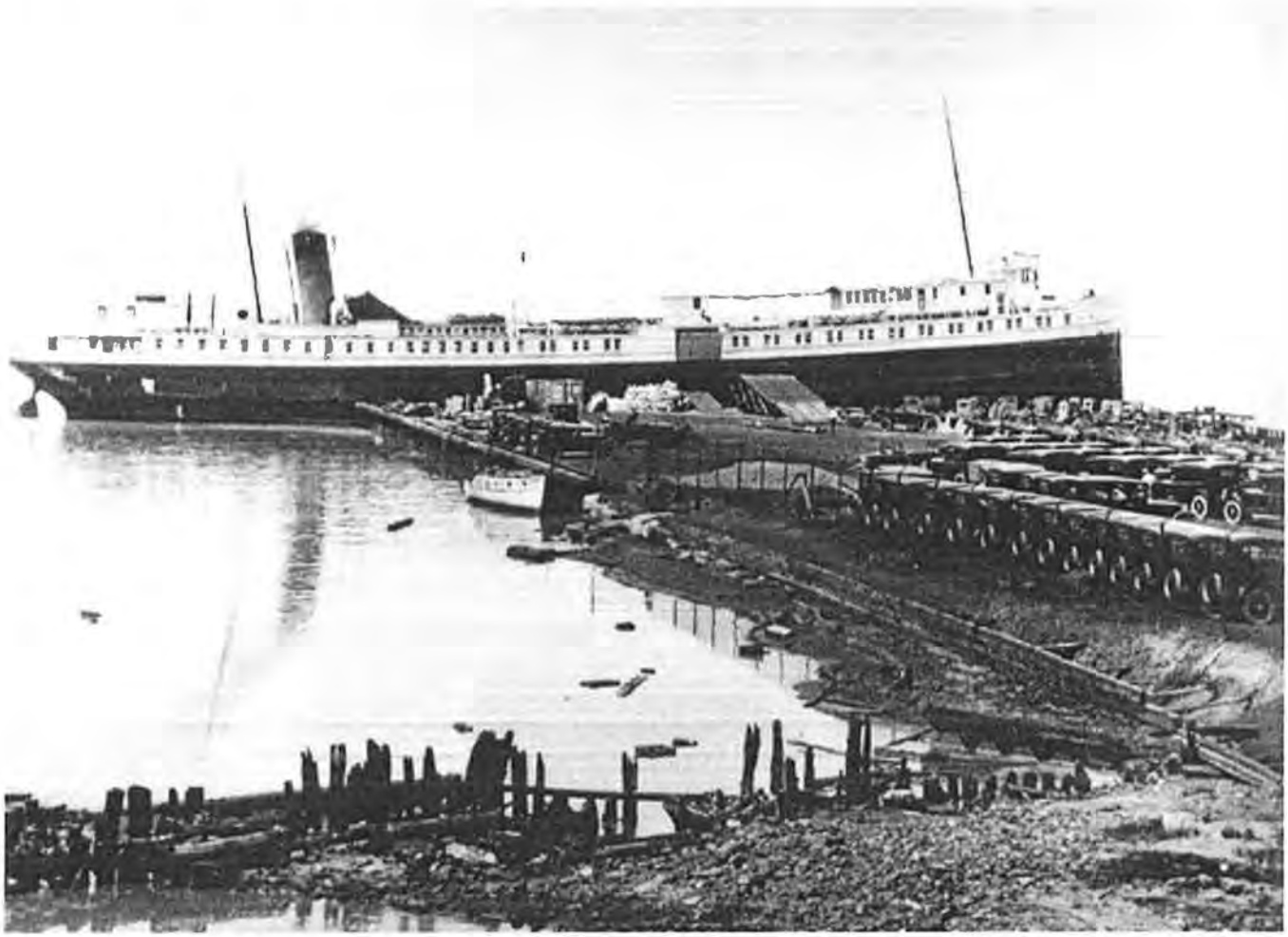
Figure #1 of 2
Lakeland Shipwreck (Steam Screw)
Photo mosaic of the shipwreck
July 2010

Figure #2 of 2
Lakeland Shipwreck (Steam Screw)
Car layout on the *Lakeland*
2013

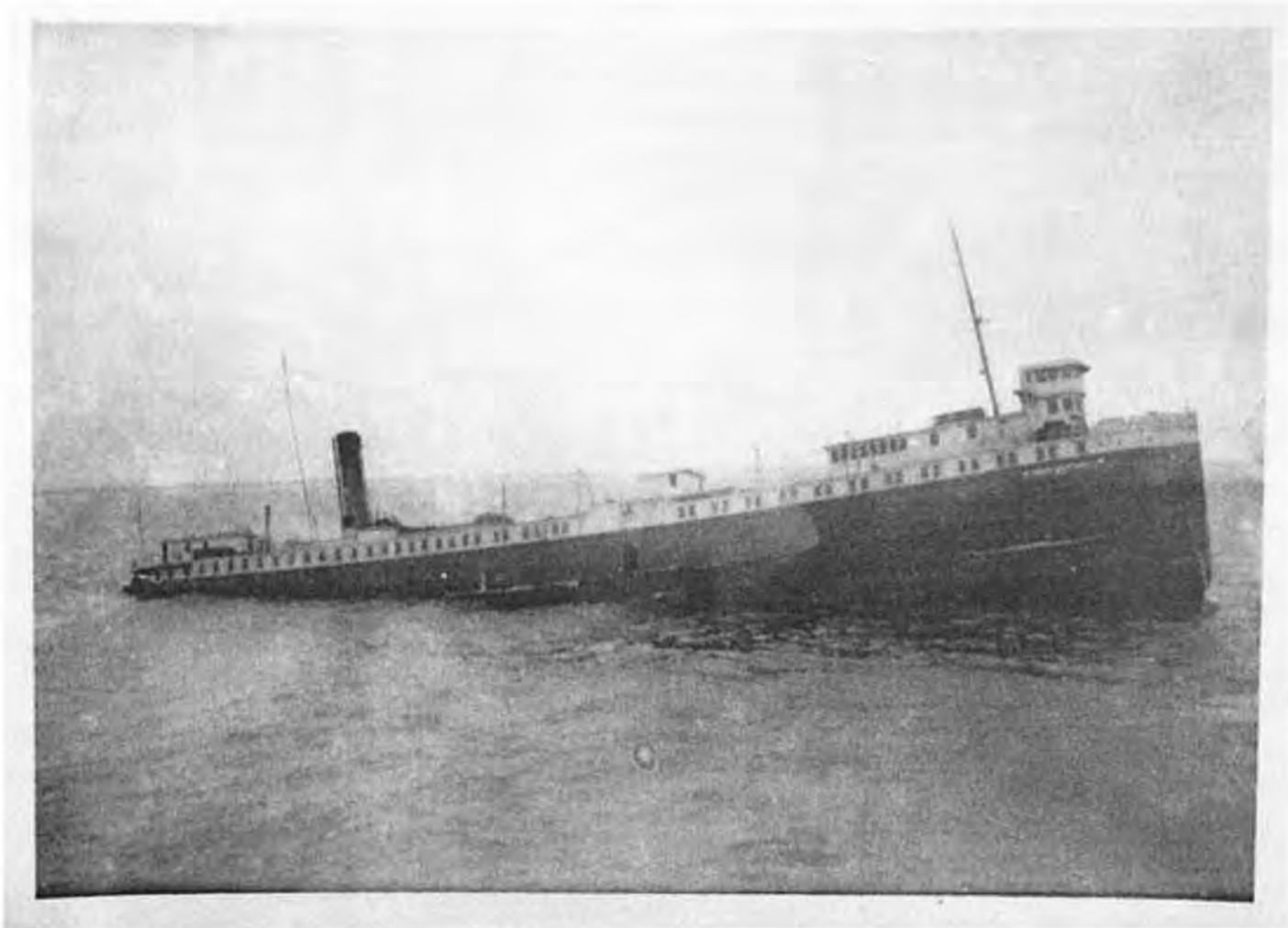


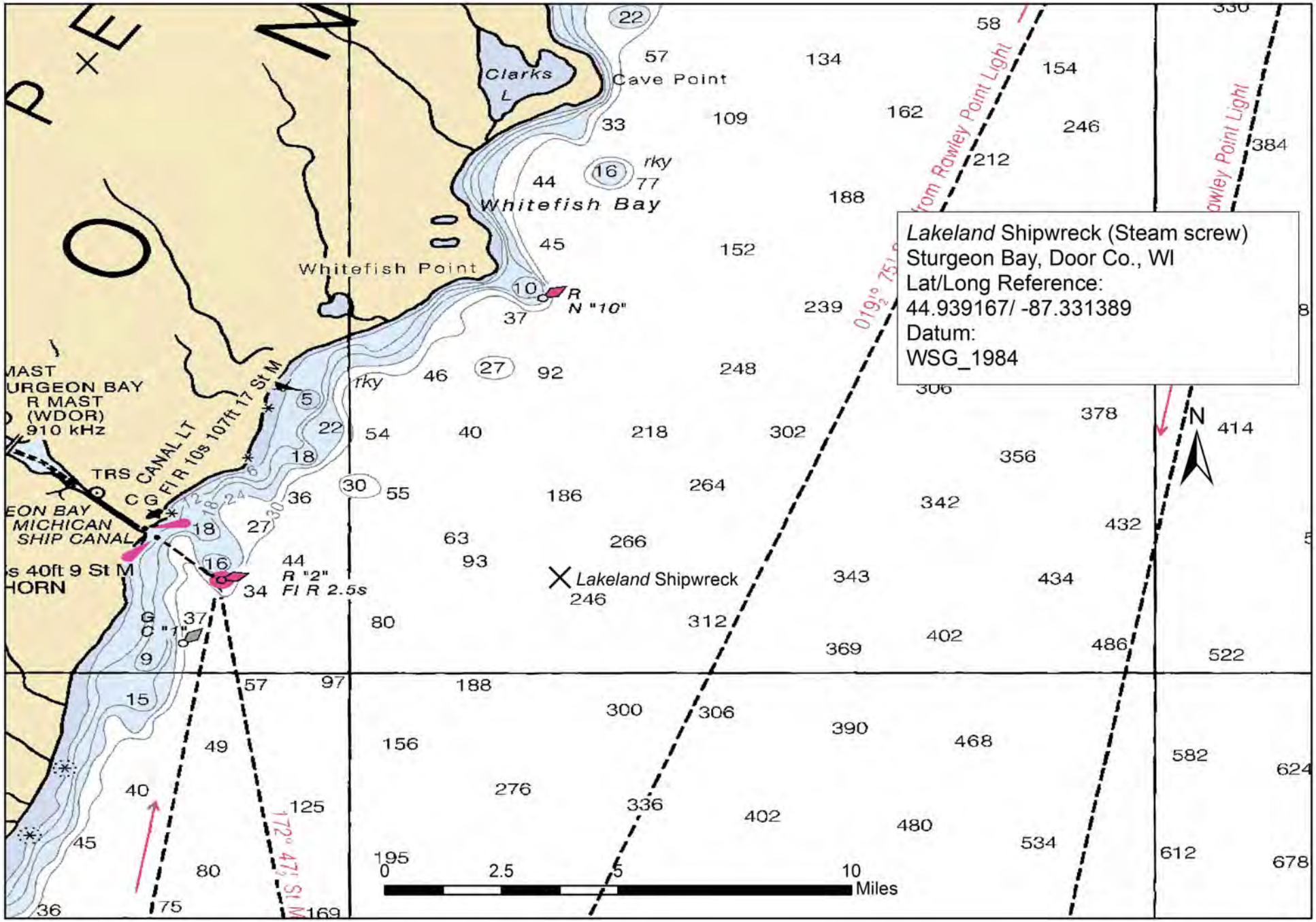
Historic Photo #1 of 3
Lakeland Shipwreck (Steam Screw)
Great Lakes (Unknown Location)
Photographer Unknown
1897-1910
Historical Collections of the Great Lakes, Bowling Green State University, Bowling Green, Ohio
Starboard side of vessel during the period when it operated as a bulk freighter under the name *Cambria.*

Historic Photo #2 of 3
Lakeland Shipwreck (Steam Screw)
Cleveland Harbor, Cleveland, Ohio
Photographer Unknown
1920-1924
Thunder Bay National Marine Sanctuary Research Collection, Alpena, Michigan
Starboard side of vessel during the period when it operated as an automobile carrier.



Historic Photo #3 of 3
Lakeland Shipwreck (Steam Screw)
Lake Michigan, approximately 6.0 miles east of Sturgeon Bay, Wisconsin
Photographer Elliot Jacobson
3 December 1924
National Archives and Records Administration, Regional Facility, Chicago, Illinois
Starboard side of vessel approximately 30 minutes prior to sinking.




Lakeland Shipwreck (Steam screw)
Sturgeon Bay, Door Co., WI
Lat/Long Reference:
44.939167/ -87.331389
Datum:
WSG_1984
Clarks L
Cave Point
Whitefish Bay
Whitefish Point
R N "10"
rky
TRS CANAL LT
C G Fl R 10s 107ft 17 St M
EON BAY
MICHICAN
SHIP CANAL
s 40ft 9 St M
HORN
R "2"
Fl R 2.5s
Lakeland Shipwreck
246
C "1"
172° 47½ St M
019½° 75½ St M
Rowley Point Light
N
0
2.5
5
10
Miles

Lakeland Shipwreck (Steam Screw)

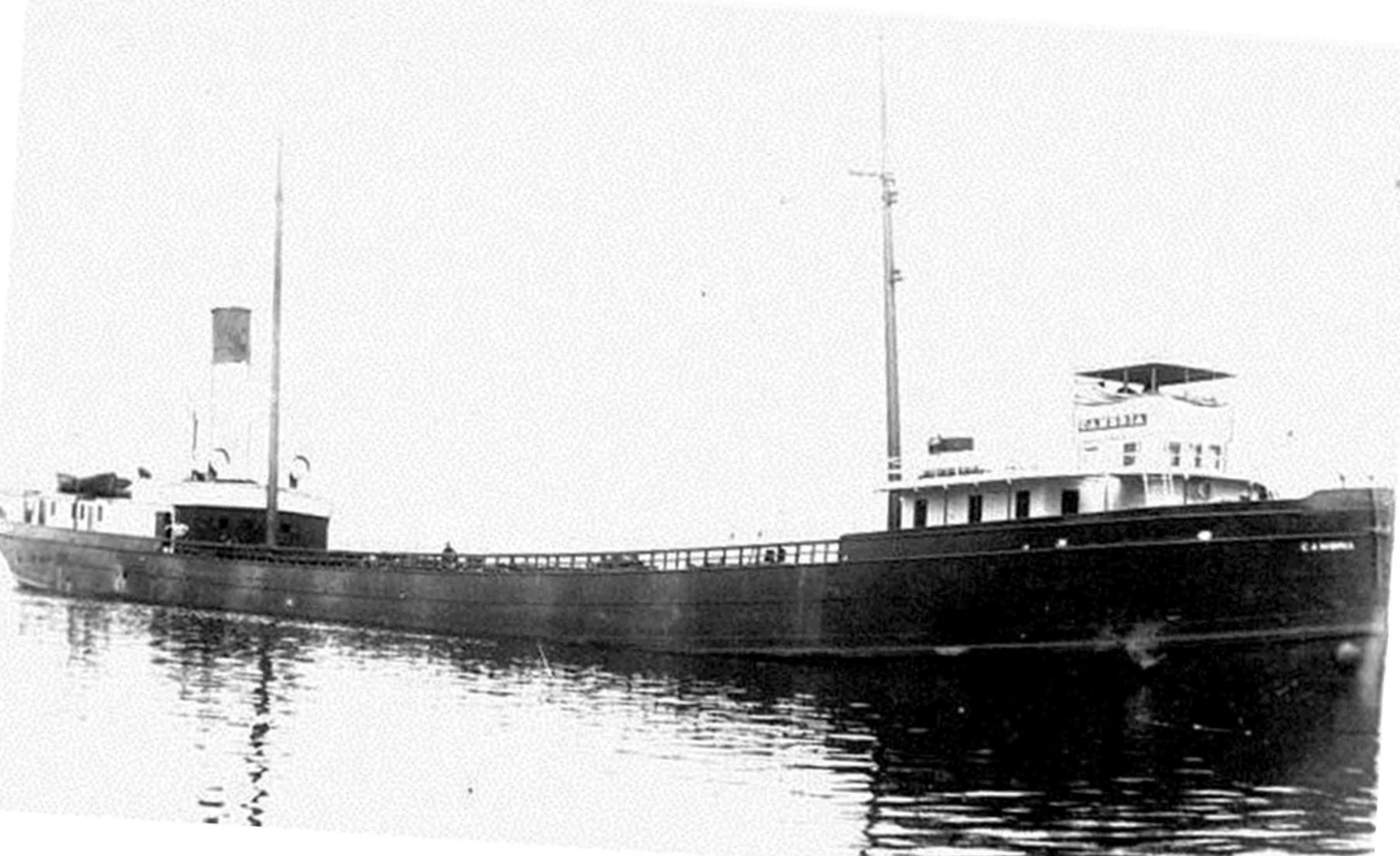
Sturgeon Bay, Wisconsin

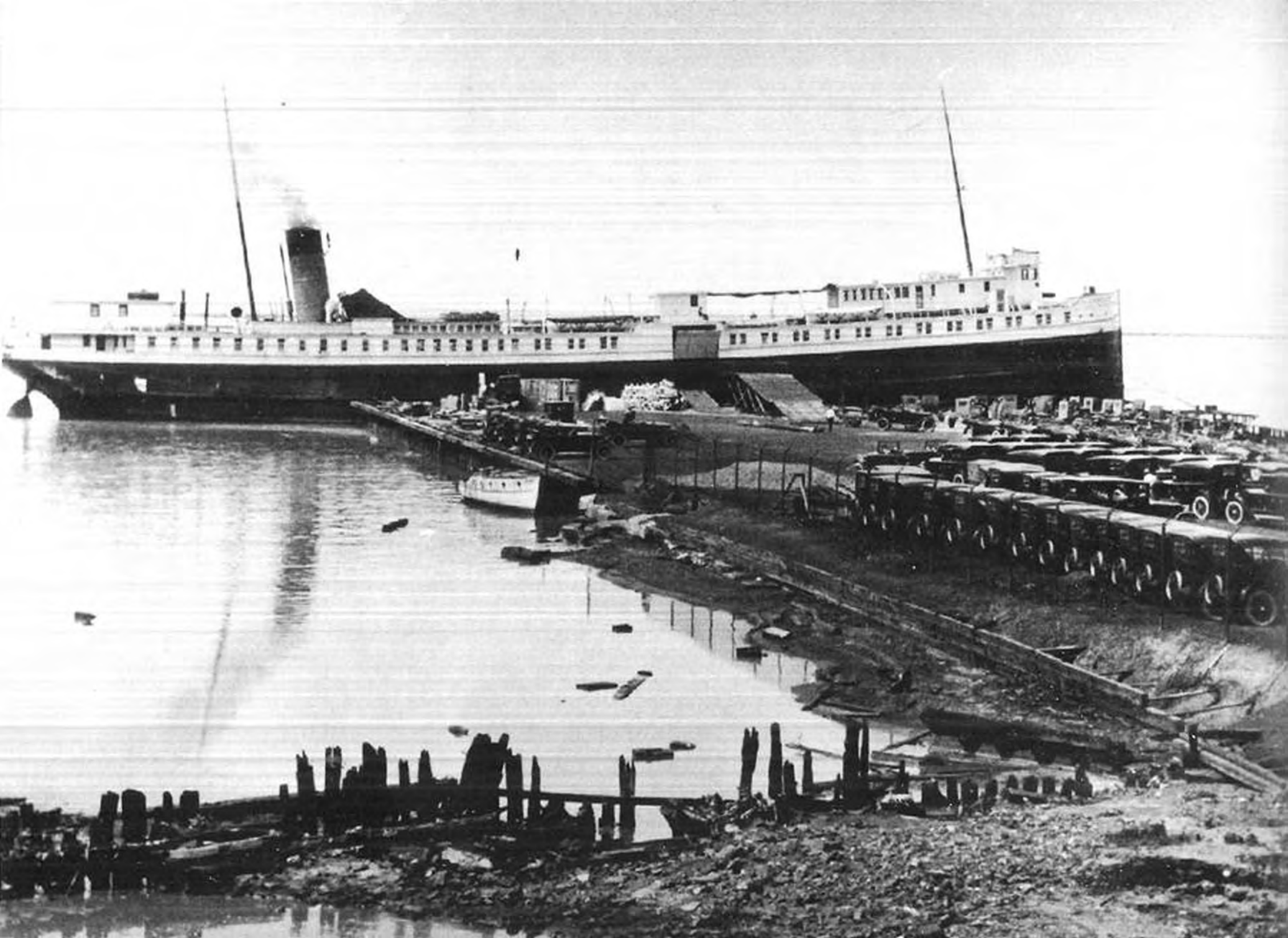
July 2010

Advanced Imaging and Visualization Laboratory

Sea Grant
University of Wisconsin

Wisconsin Historical Society
Maritime Preservation and Archaeology Program





UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: NOMINATION

PROPERTY NAME: LAKELAND (steam screw) Shipwreck

MULTIPLE NAME: Great Lakes Shipwreck Sites of Wisconsin MPS

STATE & COUNTY: WISCONSIN, Door

DATE RECEIVED: 5/22/15 DATE OF PENDING LIST: 6/12/15
DATE OF 16TH DAY: 9/27/15 DATE OF 45TH DAY: 7/07/15
DATE OF WEEKLY LIST:

REFERENCE NUMBER: 15000403

REASONS FOR REVIEW:

APPEAL:	N	DATA PROBLEM:	N	LANDSCAPE:	N	LESS THAN 50 YEARS:	N
OTHER:	N	PDIL:	N	PERIOD:	N	PROGRAM UNAPPROVED:	N
REQUEST:	N	SAMPLE:	N	SLR DRAFT:	N	NATIONAL:	N

COMMENT WAIVER: N

X ACCEPT RETURN REJECT DATE

ABSTRACT/SUMMARY COMMENTS:

~~The~~ shipwreck *Lakeland* ~~is~~ is eligible for the ~~National Register under Criterion D~~ at the state level of significance as a ~~good~~ example of the steam screw vessel property type, as defined in the multiple property documentation form "Great Lakes Shipwrecks of Wisconsin." The ship was built by the Glove Iron Works Co. of Cleveland, Ohio, in 1886-1887. It significant in the area of Engineering as the first vessel on the Great Lakes powered by a triple expansion steam engine (extant within the wreck); it briefly held the record as the longest bulk freight vessel on the Lakes, setting speed and cargo tonnage records during her first years of service. The wreck is also significant in the area of Commerce under Criterion D, for its role in grain and ore transport and automobile transport. The ship was adapted for vehicle transport in 1920 and sank in 1924 with a full load of Kissel, Nash, and Rollin cars. The wreck is also significant under Criterion A in the area of Science and Maritime History for contributions to the development of deep diving technology.

RECOM./CRITERIA A and D

REVIEWER Barbara Wyatt DISCIPLINE Historian

TELEPHONE 202-354-2252 DATE 7-7-15

DOCUMENTATION see attached comments Y/N see attached SLR Y/N

If a nomination is returned to the nominating authority, the nomination is no longer under consideration by the NPS.

WISCONSIN HISTORICAL SOCIETY

RECEIVED 2280
MAY 22 2015
Nat. Register of Historic Places
National Park Service

TO: **Keeper**
National Register of Historic Places

FROM: **Peggy Veregin**

SUBJECT: **National Register Nomination**

The following materials are submitted on this 19th day of May 2015, for the nomination of the *Lakeland* Shipwreck (Steam Screw) to the National Register of Historic Places:

1 Original National Register of Historic Places Nomination Form

1 CD with NRHP Nomination Form Word Document

_____ Multiple Property Nomination form

2 Photograph(s)

1 CD with electronic images

1 USGS map(s)

5 Sketch map(s)/figure(s)/exhibit(s)

_____ Piece(s) of correspondence

_____ Other_____

COMMENTS:

_____ Please insure that this nomination is reviewed

_____ This property has been certified under 36 CFR 67
_____ The enclosed owner objection(s) do_____ do not_____ constitute a majority of property owners.
_____ Other: _____
_____