

Ronksville Pier: A Mid-19th Century Commercial Pier in Ozaukee County, Wisconsin



State Archaeology and Maritime Preservation Program

State Historic Preservation Office

Wisconsin Historical Society

November 2020



WISCONSIN
HISTORICAL
SOCIETY

Ronksville Pier: A Mid-19th Century Commercial Pier in Ozaukee County, Wisconsin

*Tamara L. Thomsen**, *Amy L. Rosebrough**, and *Daniel Joyce***

November 2020

*Wisconsin Historical Society-State Historic Preservation Office

**Kenosha Public Museum

State Archaeology and Maritime Preservation Program

Technical Report Series #20-004

WHS #19-7715

Abstract

In 2019, a multi-disciplinary team composed of staff from the Wisconsin Historical Society, Kenosha Public Museum, Crossmon Consulting, LLC, and select members of the public conducted on-shore and off-shore investigations on the Lake Michigan shoreline northeast of Lake Church, Wisconsin, approximately nine miles north of Port Washington. Investigations resulted in the discovery of off-shore and on-shore remnants of a mid-19th century pier (OZ-0361, Ronk's Pier), operated by the Luxemburger Pier Company of "Ronksville," Wisconsin. Following survey, additional archival research regarding the pier and its history raised larger questions concerning the pier's historic and regional context, and the spatial extent of the community it served. Research reveals that the Ronksville pier was one of a number of privately owned and operated lakeshore piers or "ghost ports" along the southern Lake Michigan coastline in Wisconsin. Though often characterized as "lumber piers," the private piers served multiple roles beyond the lumber industry and facilitated the movement of agricultural products, manufactured goods, and raw materials to and from eastern Wisconsin during the periods of Euro-American settlement and industrialization. The piers and their associated "ghost ports" were key features within a coastal cultural landscape that incorporated both terrestrial and maritime components, extending inland for several miles. Additional work, including investigation of other pier sites recorded along the Lake Michigan shore, terrestrial survey to identify surviving portions of the Ronksville support complex, and ground-truthing of metal detector hits along the beach within OZ-0361 is recommended in the future to investigate and evaluate Ronk's Pier specifically and the coastal landscape in general.

All images, field notes, and data obtained during this survey, with the exception of GPR data and notes, are curated in the State Historic Preservation Office at the Wisconsin Historical Society. GPR data and notes are curated at the Kenosha Public Museum.

For David Hirn



Figure 1: David Hirn (far left), Jonathan Ronk (center) and John Altstadt (far right) at dinner in the Lake Church Tavern, formerly the Ronk Mercantile, in 2017. Photo by Tamara Thomsen.

Acknowledgements

The authors of this report relied heavily on the good will and research of members of the extended Ronk family—most particularly David Hirn, Jonathan Ronk, and David Alstadt. Without their assistance and support, this project would not have been possible. The Ronk descendants have maintained the memory of the Ronk brothers and the Luxemburger Pier Company and have been stellar partners in the Wisconsin Historical Society's efforts to relocate Ronksville. Words are not enough to express the gentle humor and kindness with which they have treated our staff. "Mrs. Ronk's keys" will forever hang near our desks to remind us that we work to unlock the stories of Wisconsin's families.

The authors would also like to thank the residents of Jay Beach Road South. Not only did the current residents of Ronksville permit staff and visitors access to the beach through their properties, but they provided valuable information concerning past discoveries and the current location of timbers relating to the pier.

Daniel Joyce of the Kenosha Public Museum lent his expertise and GPR equipment to the endeavor and provided valuable company during the lake-going portion of the expedition. Dr. Joyce's report is reproduced as Appendix A of this volume. We thank him for continuing his ongoing partnership with the Society's Maritime Preservation Program and hope that we can collaborate on many more such adventures.

A special thank you goes to Tom Crossmon of Crossmon Consulting, LLC for adding time onto the end of an otherwise long and full workday to help with this project. With his sidescan sonar and chart plotter he was able to locate and mark the anomalies offshore for us. Additional thanks go to "Radio" Rick Krueger for his willingness to perform last-minute, early-morning repairs on our metal detector electronics. Also, he loaned additional machines to us so that we would be ensured a successful beach search.

Much of our background research followed the lines of an earlier ghost port study conducted by Wisconsin Underwater Archaeology Association historians Dr. Dick Boyd and Russel Leitz. We thank them for the advance copy of their report *Ghost Port Settlements and Shipwrecks in Door County's Clay Banks Township, Door County, Wisconsin: A Wisconsin Maritime Study*. Their work helped us to formulate our evaluation of the Ronksville pier, its community, Ronksville's relationship with inland settlements, and its relationship with the other ports along mid-Lake Michigan's shoreline.

Special thanks are extended to State Archaeologist John Broihahn and State Historic Preservation Officer Daina Penkiunas, for approving and facilitating this project. John Broihahn advocated for a landscape approach, and endured much talk about piers as our research progressed. And thank you to Alexander Schneider and Michele Hagerman who helped to proof and debug this report.

This page left blank

Table of Contents

Abstract.....	i
Acknowledgements.....	iii
Table of Contents.....	v
List of Figures	vii
Introduction	1
Rediscovering Ronksville	2
Survey Methodology	4
Geomorphic Setting and Land Use	5
Lake Michigan and the Shoreline Environment	6
The Shoreline at Ronksville Pier	9
Historical Background	10
Human Occupation of the Lake Michigan Shoreline	10
Development of Wisconsin’s Mid-Lake Michigan Maritime Landscape	12
Lake Michigan’s Lumber Trade	14
Other Lakeshore Industries	17
The Ghost Ports of Western Lake Michigan	18
The Role of Landscape	18
Piers.....	19
The Ghost Ports of Manitowoc, Sheboygan, and Milwaukee Counties	21
Norheim	21
Yorkville	22
Centerville/Hika	22
Linzville	25
McCrea/Pigeon River Pier	25
Peterson’s/Wilson’s Pier.....	25
Amsterdam.....	26
Blakesville	26
Port Ulao	26
Kemper’s Pier.....	27
Ronksville	27
The Ronk Brothers	27
The Ronksville Pier Complex	38
Ronksville Pier Survey	45
Site Identification and Investigation	45
Shoreline Survey-Surface Survey and Metal Detector Sweep	45
Shoreline Survey-GPR (*see Appendix A).....	48
Side-Scan and Diving Results	50
Ronksville in Context: Lake Pier Communities and Directions for Future Research	54
Pier Communities and Cultural Landscapes.....	54
Landscape Type.....	55
Processes—Evolution of Wisconsin’s Ghost Ports	56
Landscape Components – Defining Pier Communities.....	60
Becoming Ghosts.....	61
Future Research	63
References Cited	65

This page left blank

List of Figures and Tables

Figure 1: David Hirn (far left), Jonathan Ronk (center) and John Altstadt (far right) at dinner in the Lake Church Tavern, formerly the Ronk Mercantile, in 2017. Photo by Tamara Thomsen.	ii
Figure 2: 2010 Wisconsin Archaeology Month poster featuring the Northerner.	2
Figure 3: David Hirn (left) and John Altstadt (right) attend Luxembourg Fest in Belgium, Wisconsin, in August 2015. The Ronk family was an “honored family” at the festival (image submitted by Jonathan Ronk).	3
Figure 4: 2019 survey area, superimposed on the 1974 Cedar Grove U.S.G.S. 7.5’ topographic map.	5
Figure 5: 2019 survey area, showing extent of beach in summer of 2019, Lake Michigan (left), and current lake escarpment (right).	6
Figure 6: Vegetation cover on current lake escarpment (right), showing an approximate four-foot rise from the current beach, looking southwest.	6
Figure 7: Modifications to the current high water escarpment in the form of rip-rap (foreground). Note narrowness of beach and pebble concentrations at surf line. Photo taken looking north from 6878 Jay Beach Road South	7
Figure 8: LiDAR image of Ronksville area, showing relict shoreline bluff west of current shoreline, the current lake escarpment, and indications of reworked sediments between the relict shore and the current shore.	8
Figure 9: Changes in the shoreline in the vicinity of Ronksville since 1873.	10
Figure 10: One of the twin piers at Centerville (also called Hika, and now within the municipal boundaries of Cleveland, Wisconsin), ca 1895-1910 (adapted from Village of Cleveland 2020). Note evidence of repair/rebuilding in the form of older pilings.	20
Figure 11: Ghost ports (black text) of Ozaukee, Sheboygan, and Manitowoc Counties.	23
Figure 12: Details from the 1866/1877 Lake Michigan Coastal chart showing pier complexes (USCOE 1866/1877).	24
Figure 13: Nicholas and Mary Ronk. Photo	28
Figure 14: Ronk holdings at their maximum extent, in 1873 (OCHS 1994).	29
Figure 15: Deed for the “forever road” gifted to the town. Document provided by Jonathan Ronk.	30
Figure 16: 1870 (top) and 1872 (bottom) Tax Rolls for the Town of Belgium indicates the pier within Lot 1 jointly owned by the Ronk brothers. Documents provided by Jonathan Ronk.	31
Figure 17: Detail from 1866/1877 navigational chart with Ronksville, its pier, and support buildings shown. A structure is depicted at the end of the pier, with others on land in a line leading back along the “forever” road.	32
Figure 18: Detail of 1873 Town of Belgium plat map with the Nicholas and Paul Ronk lakefront properties highlighted (OCHS 1994). The line between the properties is the location of the “forever road.”	32
Figure 19: 1865 vessel enrollment for the schooner Northerner. (U.S. Bureau of Navigation 1865).	33
Figure 20: 1866 vessel enrollment for the schooner Northerner listing Nicholas Ronk as sole owner (U.S. Bureau of Navigation).	34

Figure 21: 1867 vessel enrollment for the schooner Northerner (U.S. Bureau of Navigation).	36
Figure 22: Northerner’s final vessel enrollment in 1868 (U.S. Bureau of Navigation).	37
Figure 23: Nicolas Ronk headstone at St. Mary Cemetery in Lake Church. Photo submitted by David Hirn.	38
Figure 24: 1937 aerial photograph of the Ronksville area, showing the line of the “forever road” linking Ronksville to Sauk Trail Road. The “forever road” is clearly visible between Sauk Trail Road and the Ronk residences, and another section nearer the lake may be visible, though repurposed as a driveway to newer homes along the lakeshore.	39
Figure 25: Georeferenced features as depicted on 1873 plat map (yellow) and 1877 maritime chart (green) superimposed on modern aerial photo. Modern property lines are shown in red. The 1873 shoreline is depicted as well, as darker brown shading offshore.	39
Figure 26: Hypothesized layout of Ronksville pier support complex and environs, based on a georeferenced hybrid of the 1873 plat map, deeds, and 1866/1877 chart. Ca. 1866/1877 structures shown in pink.	40
Figure 27: Ronksville pier, with rail system, truss, and buildings at the lake terminus of the pier readily visible. What may be cordwood or lumber is stacked near the frame building. Date of photo unknown. Photo submitted by David Hirn.	41
Figure 28: Ronksville pier, with Ronk brothers (foreground) and workers (background). Truss system is present rather than the building that appears in Figure 27. Railcart and rail system readily apparent. Date of photo unknown. Photo submitted by Jonathan Ronk.	42
Figure 29: Walkover, metal detector, and GPR survey limits. Metal detector hits are marked with yellow dots. Location of pier fragment at north end of walkover area identified by yellow sunburst symbol. Beach in this aerial photo is considerably wider than it was at the time of the 2019 survey.	46
Figure 30: Cluster of metal detector hits along beach marked by blue plastic pin flags, photo taken looking south. Note small rock ledge along lake escarpment far lower right.	47
Figure 31: GPR unit and cart sitting at the boundary between GPR Survey Grid 1 and GPR Survey Grid 2, looking northeast.	48
Figure 32: Pier fragment at the time of its discovery, north of the Jay Road terminus. Left to right, Dr. Dan Joyce of the Kenosha Public Museum, WHS Maritime Archaeologist Tamara Thomsen, and Ronk descendant Mr. David Hirn.	50
Figure 33: Detail of drift pins on exposed pier fragment.	51
Figure 34: Plan view of pier fragment located north of the Jay Road terminus.	51
Figure 35: Offshore survey results, showing limits of survey area (blue box) and sonar anomalies (yellow dots). Hypothesized pier line based on deeds/property boundaries depicted as tan line. Southernmost anomalies are all in deeper water and roughly fall along the hypothesized pier line.	52
Figure 36: Pier cribs and workers, possibly recording construction of an iteration of the Ronksville pier. Photo provided by the Lake Church Tavern.	54
Figure 37: Idealized evolutionary trajectory of southwestern Lake Michigan coastal landscapes, from establishment to coastal landscape collapse.	58

Figure 38: Photograph by Harry Dankoler, ca. 1905, showing damage from storm and ice to a Lake Michigan pier in Door County, Wisconsin. WHS Image ID 69430..... 62

Figure 39: David Hirn (left) and Jonathan Ronk (right) on the fragment of their ancestor's pier..... 64

Table 1: Archaeological Sites reported within four miles of the survey area (WHPD 2020).12

This page left blank

Introduction

In 2019, a multi-disciplinary team composed of staff from the Wisconsin Historical Society, Kenosha Public Museum, Crossmon Consulting LLC, and select members of the public conducted on-shore and off-shore investigations on the Lake Michigan shoreline northeast of Lake Church, Wisconsin, approximately nine miles northeast of Port Washington. These investigations initially were undertaken in order to investigate reports of a mid-19th century lumber pier at or near the survey location, and to test the utility of a range of non-invasive survey techniques within shoreline environments. Following survey, additional archival research regarding the pier and its history raised larger questions concerning the pier's historic and regional context, and the spatial extent of the community it served.

For archaeologists used to working either on land or within the water, pier sites pose unique challenges regarding site preservation and interpretation. Active and energetic shoreline environments have altered and erased crucial site elements. Shoreline development, agriculture, and modern transportation infrastructure endanger archaeological deposits at higher elevations, where port communities and manufacturing/extraction facilities once stood. Off-shore, the wrecks of the ships that moved goods from pier to pier and port to port preserve information only about single moments in each pier's history. Historic records provide minimal detail concerning the piers, their immediate support complexes, and their role in regional cultural landscapes.

Though pier sites played important historical roles, facilitating Euro-American settlement, industrialization, and urbanization of the Upper Midwest, most are now no more than "ghost ports" commemorated by a local road name. In their heyday, however, each served as a nexus within a broader economic network that incorporated ships, roads, farmsteads, quarries, brickyards, fish net arrays, commercial structures, mills, and early Euro-American villages. Despite place names such as "Ronksville" or "Yorkville," which imply the existence of compact residential communities at pier locations, piers along the southwestern Lake Michigan shore served dispersed populations that lived and worked at support complexes and extraction facilities near the shoreline, residential and commercial centers and farmsteads further inland, in surrounding forest lands, and on board lake-going ships.

To date, research into early piers and ghost ports in Wisconsin has been scant and focused on sites further up the Lake Michigan coast, particularly the settlements of Jacksonport, Foscoro, Clay Banks, Brant's Pier, and Horn's Pier in Door County (Boyd, Leitz and Weimer 2020; Meverden, Thomsen, and Carter 2012). Differences in climate, soil, Euro-American settlement patterns, and proximity to major urban centers directed the development of these northern piers in a different way than their southern counterparts. Still, the northern piers served similar roles and were of similar design, and research on the northern piers broadly informs a better understanding of piers elsewhere along Wisconsin's coastline.

This report accordingly presents the results of both specific research on Ronk's Pier and its setting, and on the broader context of early piers and ghost ports between Two Rivers

and Milwaukee. Though many mysteries remain regarding the pier and its wider community, it is our hope that the directions for future research laid out here will guide additional investigation and result in a fuller appreciation of both Ronksville and our state's fascinating coastal history.

Rediscovering Ronksville

The roots of this survey and research effort extend back to 2008, when the Wisconsin Historical Society's Maritime Preservation and Archaeology program

conducted a Phase II underwater archaeological survey of the schooner *Northerner*. In order to list the site to the National Register of Historic Places, an extensive literature search was conducted into the service history of the ship. The last several of *Northerner's* vessel enrollment documents list its primary owner's place of residence as Ronksville, Wisconsin. Unable to find reference to this place, researchers wrote off the town as one of many ghost ports along Wisconsin's Lake Michigan coastline.

In 2010 the Wisconsin Archaeology Month poster featured an image from the 2008 underwater survey of *Northerner* (Figure 2). The Wisconsin State Historic Preservation Office received a request in 2013 from Milwaukee resident John Altstadt—asking as a relative of Nicholas Ronk, the last owner of the schooner *Northerner*—for a poster for his nephew (Altstadt is the great, great grandson of Nicholas Ronk from his marriage to his first wife, Maria Hemmer). That request was filled.

Then, in 2015 another request for the poster was made. In this instance, by Door County resident David Hirn—also a relative of the last owner of the schooner *Northerner*—seeking a poster for his nephew (Hirn was the great, great grandson of Nicholas Ronk and his third wife, Maria (Mary) Schumacher). Because the two requests were so similar

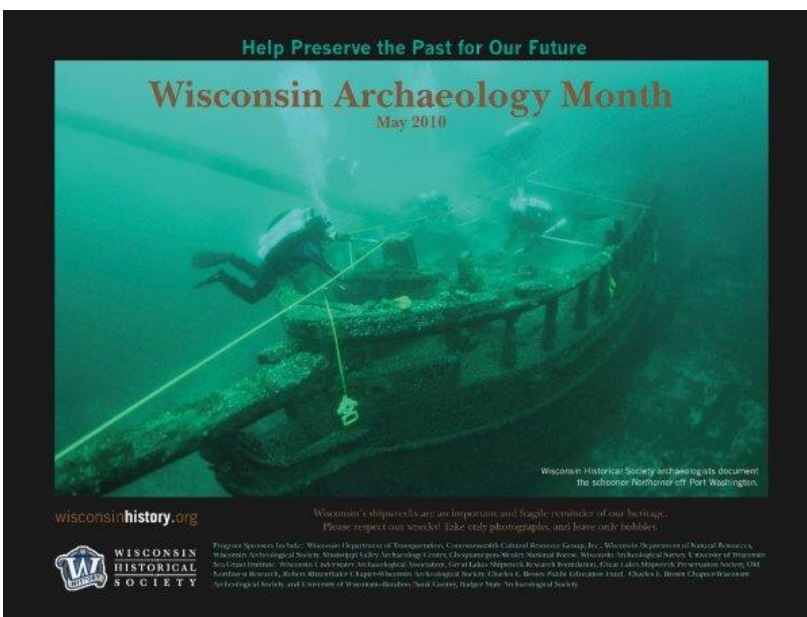


Figure 2: 2010 Wisconsin Archaeology Month poster featuring the *Northerner*.



Figure 3: David Hirn (left) and John Altstadt (right) attend Luxembourg Fest in Belgium, Wisconsin, in August 2015. The Ronk family was an “honored family” at the festival (image submitted by Jonathan Ronk).

in wording, Wisconsin Historical Society Maritime Program staff responded to Mr. Hirn by asking if he had not received the poster from his earlier request (confusing Hirn with Altstadt). When we discovered that these were separate requests from two different people, we shared the information with both parties. Not surprisingly, the two men knew of each other through genealogical research.

In 2017 the Wisconsin Historical Society received yet another request for information about the *Northerner* from an individual named Jonathan Ronk (Ronk is the great, great, great grandson of Paul Ronk, younger brother of Nicholas Ronk). Ronk had corresponded with Hirn and knew of Altstadt also through genealogy circles. In subsequent conversations with Jonathan Ronk, Wisconsin Historical Society staff learned that we shared a common interest in uncovering the whereabouts of Ronksville. Society staff suggested that he contact the Ozaukee County Register of Deeds Office to see if historic deeds identified which parcels were owned by his relatives, thus providing information that might lead to Ronksville. The Ronk relatives located property deeds for both Nicholas and Paul Ronk, as well as a deed of gift for a “forever road.” This “forever road” connected a pier owned by the Ronk brothers to county roads leading into the community of Lake Church, several miles inland in Ozaukee County, where Paul Ronk ran a mercantile store across from the settlement’s eponymous church.

Armed with this information, over the following months, Wisconsin Historical Society staff (with the assistance of members of the Ronk family) utilized navigational charts and

historic plat maps to identify a block of lakeshore lots that best corresponded to the pier's potential location. With the enthusiastic support of the Ronk descendants, Society staff proposed to attempt to relocate the pier, and thus confirm the location of Ronksville itself.

Survey Methodology

While the primary goal of the subsequent survey was relocation of the pier, the project also was designed to test a variety of non-invasive survey techniques to see if they had utility within the transitional zone between shore and lake bottom. Side-scan sonar was utilized off-shore in combination with limited diving to visually examine promising targets. Metal detector sweeps were completed on the beach, in conjunction with surface survey and Ground Penetrating Radar (GPR) survey—the latter provided by Daniel Joyce of the Kenosha Public Museum. All metal detector hits, the corners of the GPR survey blocks, side-scan sonar targets, and other features of interest were recorded using GPS, allowing the results of the three surveys to be digitally combined into a single map of the site area.

Side-scan sonar survey was conducted on July 24, 2019, and GPR, metal-detector survey, walkover survey, additional sonar survey, and visual examination of sonar targets were completed on July 25, 2019. In addition, Society staff spoke to some residents of the lakeshore lots, obtaining information about the spatial distribution of timber finds along the beach.

Off-shore survey, informant interviews, and walkover survey proved to be the keys to site identification. A number of sonar anomalies were identified by side-scan sonar contractor Crossmon Consulting LLC. Visual examination by Maritime program archaeologist Tamara Thomsen disclosed the presence of what seems to be cribbing ballast along the likely line of the pier. Timbers that are consistent with 19th century pier construction were found north of the proposed pier location, washed ashore at the high-water mark. The timbers were fully uncovered, measured, photographed, and a 3-D model created using Agisoft Metashape software. Informants indicated that other worked timbers sometimes turned up both at the proposed pier location and some distance to the south.

The metal detector sweep identified a number of targets, some quite strong, that may represent fragments of the pier or associated items buried near the high water line. In the absence of ground-truthing through excavation, this pattern of “hits” must remain merely suggestive. The GPR survey found no anomalies that could be conclusively related to the pier, but some suggestive returns were noted and the survey block may have been situated slightly too far to the south to identify any major *in situ* remnants.

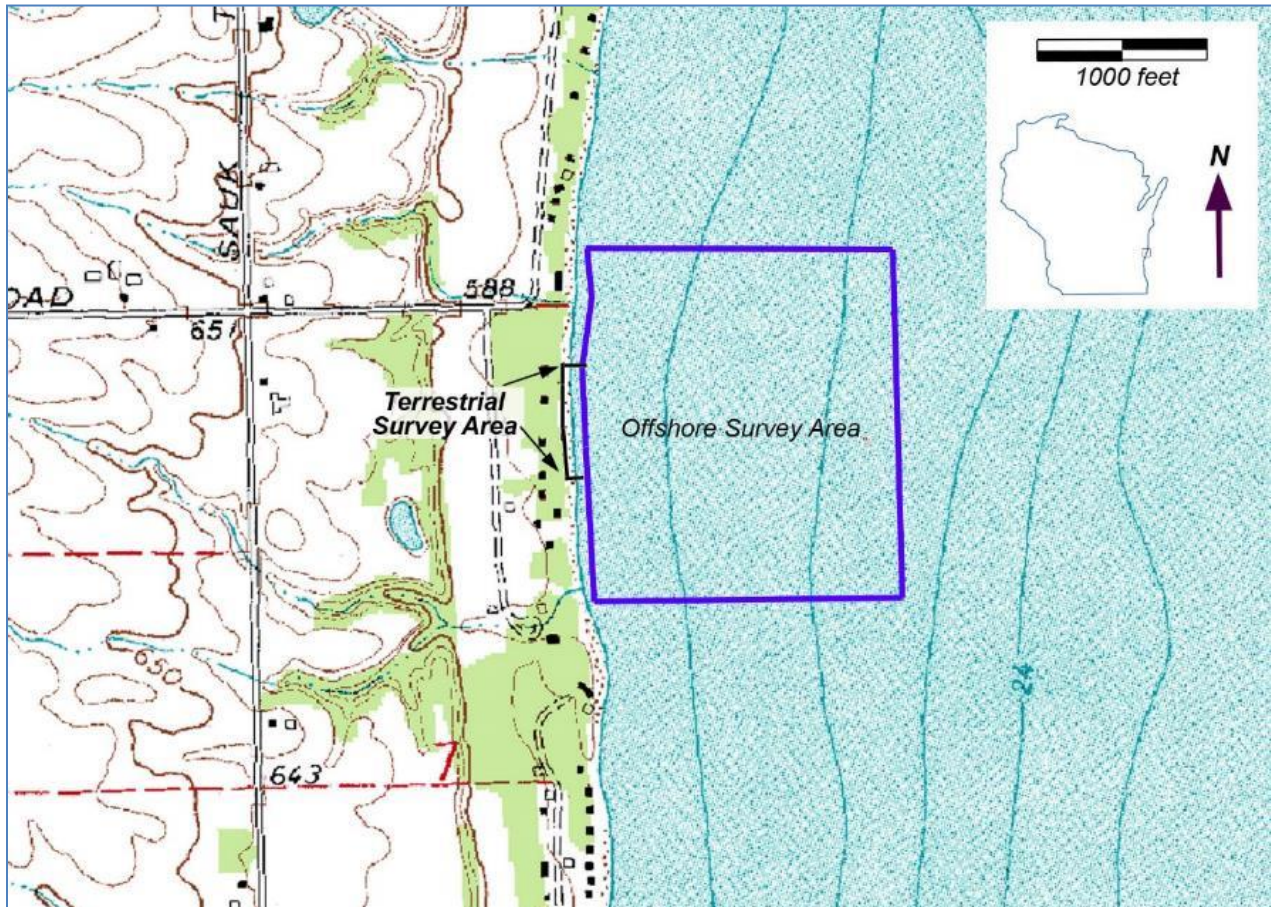


Figure 4: 2019 survey area, superimposed on the 1974 Cedar Grove U.S.G.S. 7.5' topographic map.

Geomorphic Setting and Land Use

The survey area is located just over three miles northeast of the communities of Belgium and Lake Church, Wisconsin, in Town 12 North, Range 23 East, Section 7, in the Town of Belgium, Ozaukee County, Wisconsin (Figure 4). The survey parcel is specifically located at the eastern end of Jay Road, east of its intersection with Sauk Trail Road, extending both northward and southward along the beach from that intersection, and out into Lake Michigan. Submerged portions of the survey block were characterized by a shallow (< 9.1 meters/30 feet) sandy bottom with evidences of current-driven sediment transport.

The terrestrial portion of the survey block was limited to a narrow (< 10 meter) strip of public beach bounded by the surf zone of Lake Michigan to the east and an approximately one meter-high sandy escarpment marking the current high water mark to the west (Figures 5 and 6). At the time of survey, the beach was composed of fine to coarse sand. Patches of small (< 5 cm to < 1 cm) rounded pebbles were found along



Figure 5: 2019 survey area, showing extent of beach in summer of 2019, Lake Michigan (left), and current lake escarpment (right).



Figure 6: Vegetation cover on current lake escarpment (right), showing an approximate four-foot rise from the current beach, looking southwest.



Figure 7: Modifications to the current high water escarpment in the form of rip-rap (foreground). Note narrowness of beach and pebble concentrations at surf line. Photo taken looking north from 6878 Jay Beach Road South

the surf line and where a small freshet emerged from a low dolomite ledge at the base of the escarpment and crossed the beach to Lake Michigan in the southern-most portion of the survey area. Informants indicated that the beach was submerged during storms only a few days prior to our survey, and the beach was submerged again only a few days afterwards.

A series of east-west-oriented residential lots occupies the higher ground above the escarpment, extending from the southern terminus of Jay Beach Road South north to Jay Road. Development of these lots was initiated the late 1930s. Lot development does not seem to have impacted the beach to any significant degree, with the exception of adjoining lots just north of the GPR survey blocks. At that location, signs of attempts at erosion control were observed—rip-rap, a fallen (modern) cut stone retaining wall, and chain link fencing laid flat along the sand (Figure 7).

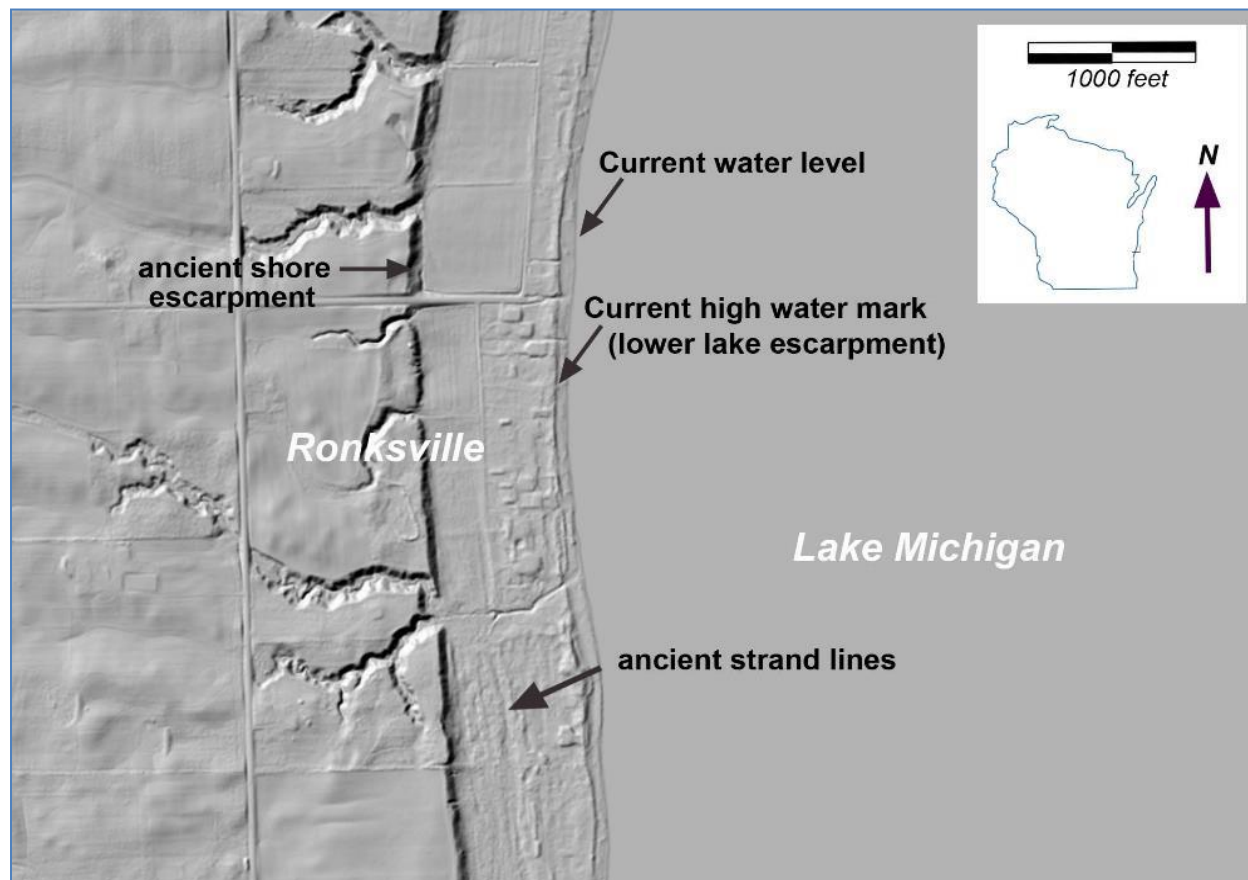


Figure 8: LiDAR image of Ronksville area, showing relict shoreline bluff west of current shoreline, the current lake escarpment, and indications of reworked sediments between the relict shore and the current shore.

Lake Michigan and the Shoreline Environment

Modern Lake Michigan's history began with the dissolution of the Lake Michigan lobe of the Wisconsinian ice sheet approximately 14,000 years ago. After a period of high water (640 feet ASL) at the southern end of the Lake Michigan basin when melt water was dammed by adjoining moraines and the retreating ice, lake levels fell dramatically when a series of outlets were exposed at the north end of the lake basin. Water levels subsequently reached a long-term low of perhaps 470 feet ASL that persisted for several thousand years (10,000 to 6,300 years ago) (Thompson 2019).

A combination of factors, including the effects of isostatic rebound and the return of a cooler and wetter climate, led to a resurgence in lake levels in southern Lake Michigan by 6,300 years ago, peaking 5,500 years ago. Water levels again overtopped the modern shoreline and reached a high of approximately 600 feet ASL, creating a relict twenty-foot shoreline bluff apparent today just over a quarter of a mile west of the current shore (Thompson 2019) (Figure 8). Afterwards, the lake slowly retreated to its modern levels.

Over the last century, Lake Michigan has cycled between rising and falling water levels at much smaller (5-10 foot) scales (USACOE 2019), a pattern presumably typical of the decades prior to the initiation of consistent recordkeeping in 1918. Historic low monthly mean water levels were recorded in 1964 when the lake dropped to the vicinity of 577 feet ASL (SEWRPC 1997). By July 5, 2019, the lake had risen to nearly 582 feet ASL, within a few inches of the record high set in October 1986 (Southeastern Wisconsin Coastal Resilience 2019). Within the survey area, these changes will have brought alternating periods of eastward lateral expansion of dry beach and surf zones by up to 100 feet or more during periods of low water, and westward retreat of the low beach-line escarpment during periods of high water.

Overlain on these broad cycles are the effects of wind and weather. Storm-driven waves erode and remove sediments and artifactual materials within the surf zone and along the eroding high water escarpment, while wave action during periods of calmer weather shifts sediments and objects back towards the shore to replenish the beaches. As sediment and artifacts are eroded, tumbled, washed lakeward, then pushed back shoreward, they are transported—on average—in a southerly direction along the coastline (SEWRPC 1997:17; Wu 2019) though individual storms may move material in any direction.

Objects within the survey area thus have been reworked by both long and short-term cyclical lateral movements of beach, surf, foreshore, and offshore zones, in addition to the seasonal effects of ice pack and ice push. Though the survey area has not been as severely impacted as other sections of the Lake Michigan shoreline, it has been affected. Archaeological materials within the shoreline environment—even those of recent vintage—have been transported and tumbled by energetic physical processes. In addition, artifacts have been affected by the chemical and biological processes associated with alternating periods of submergence and desiccation.

The Shoreline at Ronksville Pier

The 1873 plat map of Belgium Township depicts a shoreline roughly on par with that of 2019 in the vicinity of Ronk's Pier but extending further eastward both north and south of the pier location, creating a small embayment (Figure 9) (OCHS 1994). A U.S. navigational chart completed between 1866 (land) and 1877 (water) depicts the then-contemporary shoreline at the approximate location of today's high water mark (USCOE 1866/1877). Subsequent terrestrial plat maps dating to the late 1800s and early 1900s (OCHS 1994) also depict shorelines roughly on par with those present today. Aerial photos dating from 1937, on the other hand, reveal that lake levels were lower and the beach was approximately 100 feet wider than today (USDA 1937). The lower lake escarpment at that time was stable and well-vegetated.

In 1995, the Southeastern Wisconsin Regional Planning Commission (SEWRPC) completed studies of the beach in Section 7 of Belgium Township, extending south from Jay Road through Ronksville to Silver Beach Road. At that time lake levels were lower,

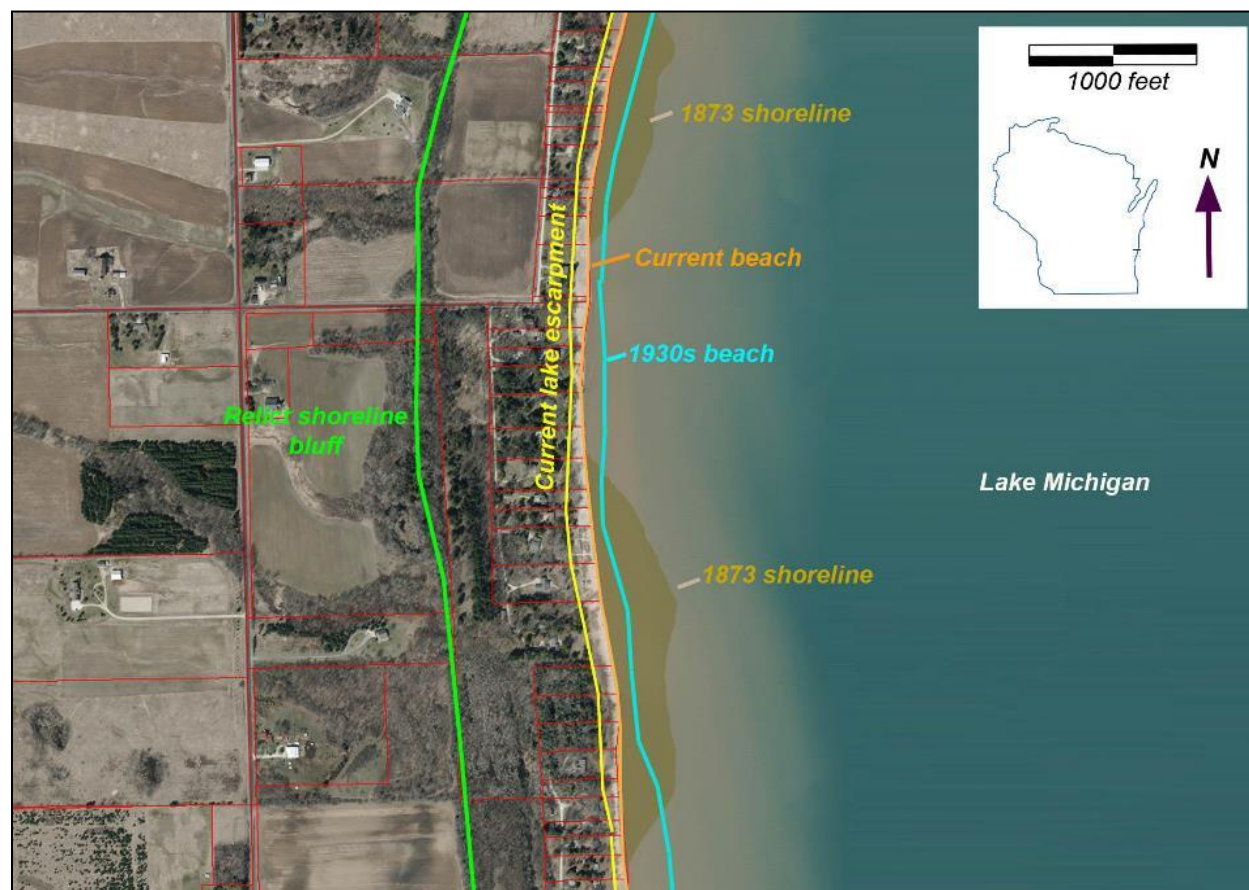


Figure 9: Changes in the shoreline in the vicinity of Ronksville since 1873.

the beach was between 30 and 100 feet wide and the low shoreline bluff was vegetated, stable, and—according to SEWRPC—protected by riprap and other erosion control measures on most lots. SEWRPC’s study suggests that the shoreline along the stretch of beach south of Jay Road was relatively stable between the 1960s and 1990s, though the shoreline to the south of the Ronksville pier had retreated up to 90 feet (SEWRPC 2019:302-306)—an observation consistent with the more easterly shoreline apparent on the 1873 plat map. By the time of our 2019 survey only a few remnants of shoreline protection structures were apparent within the study area, the beach was notably narrower, and the low shoreline escarpment was no longer vegetated fully.

Historical Background

Human Occupation of the Lake Michigan Shoreline

American Indian populations have resided along the shores of Lake Michigan since the glaciers receded, for a period of 13,000 or more years. The shoreline falls within the ancestral territories of both the Ho-Chunk and Menominee Nations, and was home to other Nations such as the Potawatomi during the tumultuous decades following European

Contact. Traces of American Indian settlements representing this full and deep sweep of history are abundant along the length of the Lake Michigan coastline, though distributed at different positions inland or offshore according to the then-contemporary shoreline elevations.

Though no prior surveys were conducted within or immediately near the area investigated in 2019, a number of pre-Contact archaeological sites are known from surveys and informant reports within a three-mile radius (Table 1). Most are located either on the current lake terrace bordering the current beach escarpment, or on the edge of the upper lake terrace created 5,500 years ago. As might be expected, none of the lower-elevation sites have been dated conclusively to the period prior to 5,500 years ago, since earlier sites would have either been submerged, buried, or altered by rising lake levels prior to that date. As lake levels retreated back to the modern shoreline, the lower lake terrace and shoreline environment became suitable for habitation. The known pre-Contact sites within the modern shoreline zone primarily are small scatters of stone knapping debris of unknown age, representing small camps or special use sites. A Middle Woodland (ca. 2000-1500 years ago) camp and a village site with both Early and Late Woodland components (ca 2500/1300-800 years ago) are located in the center of a cluster of sites just under three miles north of the project area. A cemetery is associated with the Early Woodland component of the latter site. The same site (SB-0006) was also the location of a post-Contact American Indian village and cemetery of unknown tribal affiliation (WHPD 2020).

Coastal southeastern Wisconsin lies within the ancestral territory of both the Ho-Chunk and Menominee Nations, and was home to Potawatomi populations fleeing Iroquois expansion after AD 1650. By the early 1800s, Ho-Chunk populations had relocated westward to central and western Wisconsin. The U. S. Government took Menominee and Potawatomi lands in much of eastern Wisconsin south of Green Bay through land cession treaties in 1835, and Euro-American settlement of the region began in earnest.

At that time, much of Ozaukee County and the mid-Lake Michigan coast of Wisconsin was forested. Vegetation in the vicinity of Ronk's Pier consisted of a mix of soft and hard woods: oak, beech, sugar maple, elm, birch, alder, and ash, with some tamarack swamp in lower areas (GLO 1835). Soldiers returning eastward from the Black Hawk war of 1832 carried home news of the vast fertile lands that supported these forests. As the news that the territory had been opened for settlement spread, the floodgates opened and waves of European settlers began arriving almost daily. Most settlers heading for southeastern Wisconsin arrived via Milwaukee, before, as early settler William Opitz noted, traveling north through "a wilderness without any roads to the 'cheap lands' of \$1.25 an acre" (Western Historical Company 1881:477). Some settlers traveled up the coast via ship, moving their families and belongings to shore by boat or raft (Anonymous 1965:1-2).

Site #	Site Name	Description	Landform
OZ-0001		Pre-Contact village or campsite	Current lake terrace
OZ-0002		Pre-Contact village or campsite, possible cemetery	Current lake terrace
OZ-0192		Shipwreck	Submerged
OZ-0328	Lake Shore Stone Company	Abandoned early 20th century lime works, quarry, and company town.	Current lake terrace
SB-0006	New Amsterdam	Large multi-component village and cemetery with Early Woodland, Late Woodland, and post-Contact components.	Current lake terrace
SB-0105	T. Hawe	Pre-Contact village or campsite	Inland
SB-0106	J. Hawe	Pre-Contact village or campsite	Upper lake terrace
SB-0116	New Amsterdam Shell Midden	Large shell midden, 25 feet in diameter and ten feet high.	Current lake terrace
SB-0118		Pre-Contact village or campsite	Current lake terrace
SB-0194	De Bruine	Pre-Contact scatter of stone knapping debris	Inland
SB-0300	Atlanta	Shipwreck dating to 1906	Offshore
SB-0380	Amsterdam	post-Civil War Dutch settlement and pier of Amsterdam (ghost port)	Current lake terrace
SB-0448	Amsterdam Dunes 1	Middle Woodland camp or village	Upper lake terrace
SB-0449	Amsterdam Dunes 2	Pre-Contact scatter of stone knapping debris	Upper lake terrace
SB-0450	Amsterdam Dunes 3	Woodland campsite	Upper lake terrace
SB-0451	Amsterdam Dunes 4	Pre-Contact scatter of stone knapping debris	Upper lake terrace
SB-0452	Amsterdam Dunes 5	Pre-Contact scatter of stone knapping debris	Upper lake terrace

Table 1: Archaeological Sites reported within four miles of the survey area (WHPD 2020).

Development of Wisconsin's Mid-Lake Michigan Maritime Landscape

For settlers, life in the “cheap lands” was hard. Transportation relied on lake boats, river scows, the ancient trail network established by Native peoples, and later on a primitive corduroy road built to link Milwaukee to Green Bay. In the late 1840s and 1850s, numerous immigrants from Germany, Luxembourg, the Netherlands, and the Eastern seaboard arrived, bound for prosperity. They established small communities where rivers provided milling power and at locations along the coast where small ships could land or at least send boats ashore, and began to carve farms out of the timberlands. Ozaukee and Washington Counties were surveyed and formed as political units in the mid-1850s (Anonymous 1965; Western Historical Company 1881). Simultaneously, Milwaukee and Chicago’s non-Native populations swelled, displacing their original inhabitants.

Prior to the first waves of Euro-American settlement, the Lake Michigan shoreline of Wisconsin was home to Potawatomi, Menominee, Ho-Chunk, and Ojibwe villages and French or British trading posts, from which lake-going parties came and went via canoe or small sailing vessel. Lake Michigan’s waters were hazardous to travel, with one early historic account recounting the mass drowning of hundreds of Ho-Chunk when they were caught mid-lake by a gale (Thwaites 1902:421). After the region was claimed by the U. S. Government, the lake trade expanded. The early Lake Michigan fleet was composed of small sailing vessels that ferried in settlers and the diverse cargoes needed to support them. The central and southern Lake Michigan lakeshore offered little protection to the fleet, and few landmarks for navigation (Jensen and Hartmeyer 2014).

In 1836, Congress authorized a project that would identify and develop a series of Federally-funded harbor facilities along Wisconsin’s Lake Michigan shoreline. Surveyor J. M. Berrien identified Milwaukee, Sheboygan, Manitowoc, Racine, and Kewaunee as suitable harbor locations. Each offered the makings of a natural port, with relatively unobstructed river mouths emptying into slightly deeper lake bottoms (Jensen and Hartmeyer 2014). Port Washington was not among the locations chosen initially by Berrien, but by 1849 the Federal government had begun to invest in harbor improvements there as well (Jensen and Hartmeyer 2014:56).

Berrien’s designs included the construction of twin crib and piling piers at each harbor, flanking the river mouths—a tried-and-true design utilized at other ports along the Great Lakes (Jensen and Hartmeyer 2014:46). Lighthouses substituted for natural navigational landmarks. Initial harbor improvements began in 1839 or 1840, and continued throughout the following decades, supplemented by piers, buoys, and other improvements funded by private capital. By the end of the 1850s, each of Berrien’s designated harbors boasted sturdy Federal piers built to his designs. The piers constrained the river’s outflows, maximizing the force of currents entering the lake and allowing them to scour deeper channels further out into the lake bottom. Despite this, a continuous program of dredging was needed to keep port facilities clear, since the Federal piers had a tendency to trap sediment moving laterally down the shoreline and raise sandbars (Jensen and Hartmeyer 2014).

The presence of the early Federal harbors influenced patterns of settlement and development of the region's overland transportation routes, most particularly railroad routes. Secure and protected harbor facilities allowed bulk importation of coal to fuel railroad and other engines as the region industrialized in the 1860s. Immigrants were funneled into the harbor towns via maritime travel routes, thence spreading overland and by smaller ship from their ports of arrival. Overland transportation routes converged on the larger harbors, linking them to inland manufacturing, commercial, and political centers and to each other, and bypassing smaller coastal communities. At the same time, the developing terrestrial network provided new opportunities for inland community development at crossroads and railroad stops. The region's circulation networks developed to service the Federal harbors, driving patterns of development in each harbor's catchment zones and influencing where and how successful smaller port facilities could be.

As this network developed, settlers continued to arrive. In short order, the Euro-American frontier overflowed from the lake country onto the treeless and fertile prairies and open oak savannahs of southern Wisconsin, where fields could quickly be plowed and planted. But while these lands did not require the backbreaking work of clearing trees that awaited lake country settlers, they also did not furnish the basic material necessary for building communities—lumber (Berton 1996:99).

Lake Michigan's Lumber Trade

The beginning of the nineteenth century found the western Lake Michigan basin a forested land populated by American Indian communities and a handful of European fur traders and missionaries. At the century's close the area had been deforested and broken by the plow and its original inhabitants had been expelled. By then, Lake Michigan also boasted one of the busiest shipping ports in the world (Karamanski 2000:69). This change was made possible, in part, by Lake Michigan itself. The lake, with an abundance of natural harbors and landings, facilitated rapid transfer of both goods and people to and from the growing European settlements in the Eastern United States.

In particular, Lake Michigan was ideally located for the development of a lumber trade. Spanning over 300 miles north to south, Lake Michigan was a water highway surrounded by everything required to birth one of the world's most productive lumber industries. The lake's northern shore was surrounded by some of the largest stands of white pine in North America. Its southern shore possessed one of the busiest shipping ports in the world (Chicago), with an appetite for lumber equal to its vessel traffic. This combination birthed one of the most productive and profitable industries in America (Berton 1996:98).

The few large timber stands that existed in the prairie and savannah lands of the Midwest were exhausted by 1840. Fortunately for the prairie settlers, however, one of the greatest stands of timber in America lay just to the north in Wisconsin, Minnesota, and Michigan's Upper Peninsula. Settlers in these areas found forests so vast they seemed inexhaustible. In 1852, a Wisconsin congressman spoke of "interminable forests of pine sufficient to supply all the wants of citizens....for all time to come." Lumber was a bulky

commodity and awkward to move, but a key geographical feature connected the northern timber lands with the southern demand—Lake Michigan—and lake schooners quickly answered the call (Berton 1996:98; Fries 1951:5). Smaller sailing vessels, with a shallow draft, could load in unimproved lake ports, and lumber's durable nature allowed it to be carried in leaking vessels whose wet holds would have ruined more fragile cargoes

The Lake Michigan lumber industry began on a small scale to supply local needs, but quickly grew into one of the nation's most productive lumber operations. By 1840, the value of Wisconsin's lumber industry exceeded the fur trade and lead mining and became Wisconsin's leading commercial enterprise, providing fresh employment opportunities for those displaced from the declining fur and lead industries (Fries 1951:16; Kreisa 1992:8-1; Lusignan 1986:5-2). Forest clearance began, as might be expected, in southern Wisconsin, feeding the birth pangs of new Midwestern cities.

As Wisconsin's southern forests were cleared, timber extraction moved northward to the Green Bay, Wolf, Black, St. Croix, and Chippewa River districts (Kreisa 1992:8-2). The Green Bay and lakeshore district witnessed rapid growth beginning in the late 1840s. In 1846, the only two mills of considerable size in northeastern Wisconsin were at Green Bay and the mouth of the Menominee River, with an additional four or five smaller mills scattered throughout the district. By 1854, however, the district's lumber output had reached 137 million board feet annually; by 1865, annual shipments totaled 200 million board feet in addition to shingles and other wood products. By 1871, annual production had reached 300 million board feet (Fries 1951:18; Lusignan 1986:5-3). Many cities on Lake Michigan's northern shore were created and sustained almost solely by the Lake Michigan lumber trade (Karamanski 2000:65).

Wisconsin's lumber industry witnessed its most expansive growth following the Civil War. According to the Wisconsin Geological and Natural History Survey (1901), between 1840 and 1873 the Wisconsin lumber industry harvested a total of 20 billion board feet of pine, and tripled its production to 66 billion board feet between 1873 and 1898 (Grey 1998:43). Improvements in saw technology played an important role in increasing mill output as slower reciprocating saws were replaced by steam-powered circular saws capable of cutting four to six boards at a time (Cooper 1987:51).

The lumber harvest was a seasonally cyclic process. The felling of trees and milling of lumber products most often took place during winter months. Snow cover and frozen ground allowed easier transportation of large logs through the forests via horses and sleds. Once received and processed at the mill, lumber products were piled along the Lake Michigan shoreline to await the opening of the shipping season when the lake ice receded. Lumberjacks emerged from the forests with the spring thaw to load ships with lumber from the trees they had felled the previous winter (Lusignan 1986:5-6). As soon as Lake Michigan was cleared of ice, many lumber towns had several vessels at anchor, waiting their turn to take on cargo (Fries 1951:70).

Timber products were valued for a number of reasons, but two in particular drove the pace of timber extraction. One, oddly enough, was the lake trade itself. Early steamships utilized cordwood as fuel, and entrepreneurs sprang forth to supply the needs of

passenger and cargo vessels. A large steamer might consume ten acres of forest on a single voyage from the eastern Great Lakes to Chicago (Zaun 1965:61). The other, and more important, long-term driver was a growing demand for lumber for building and infrastructure, whether cut lumber or posts for fences or telegraph poles.

The frontier cities of Milwaukee and Chicago had an enormous appetite for building materials and were an important factor in the lumber industry's rapid growth (Kreisa 1992:8-1). In 1860 alone, Milwaukee received 30 billion board feet of lumber, and increased its consumption to 150 billion board feet by 1897 (Kreisa 1992:8-3). Chicago eclipsed Milwaukee's consumption, however, and white pine became the mainstay of Chicago trade and the most important product carried by ship to that city (Karamanski 2000:65). Early lumber shipments to Chicago satiated the city's construction needs, but Chicago's location allowed it to prosper into a large scale lumber wholesaling district that supplied growing communities throughout the Midwest.

Chicago was well connected with the western prairie lands to the west via the Illinois and Michigan Canal that opened in 1848, as well as a railroad system that opened a year later, giving Chicago an unrivaled ability to economically move lumber to the west and south. The successful grain market of the 1850s and 1860s lured farmers to settle the western prairie lands and created a strong demand for lumber for houses, barns, and fences. Railcars arrived at Chicago filled with prairie wheat and corn, and returned to the prairies loaded with pine lumber (Cooper 1987:51; Fries 1951:81; Karamanski 2000:65-66). By 1856, Chicago had become the world's largest lumber market with no less than 12 miles of the Chicago riverfront devoted to lumber docks. By 1860, Chicago was the world's busiest port (Berton 1996:102; Karamanski 2000:65-66).

Lumber transport on Lake Michigan began with the earliest lumbering activities during the mid-1830s when the first lumber schooner arrived in Chicago with a cargo of "white wood" from St. Joseph, Michigan in 1833 (Karamanski 2000:65). Following this first shipment, the number of vessels engaged in the Great Lakes lumber trade increased slowly to 50 vessels in 1840, and then quickly grew to over 500 vessels, carrying 8,000 cargoes annually, by 1885 (Kreisa 1992:8-3). Lake schooners varied in size and could carry between 250,000-1,500,000 board feet of lumber depending on the vessel (Lusignan 1986:5-11). Most Lake Michigan lumber schooners operated out of Milwaukee or Chicago, but at least one or two ships hailed from nearly every shoreside town (Karamanski 2000:75). With a heavy dependence on the wind, the Lake Michigan lumber trade was often unpredictable, and unfavorable conditions could leave the southern city markets wanting for lumber (Fries 1951:70).

The industry saw a shift region-wide to the schooner barge beginning in the late 1860s. The lumber merchants of Buffalo in 1861 began dismantling sailing ships and towing their converted hulls behind steam tugs (Cooper 1987:49; Mansfield 1899:518,520). Barges of this type carried roughly over three hundred thousand board feet of lumber and a quantity of smaller products like lath (Fries 1951:70). Despite the development of schooner barges, lumber schooners remained operating independently of tows until 1930 (Karamanski 2000:222). By 1884-1885, there were about 500 steamers and schooners

on the Great Lakes lumber trade, hauling approximately 8,000 cargoes a year. Quite a few ended their lives as shipwrecks in Wisconsin waters (Kreisa 1992:8-3). The decline of the lumber industry was to a large degree the passing of the age of sail on the Great Lakes (Cooper 1987:52). By 1872, 12,000 vessels had docked at Chicago—9,000 loaded with lumber. In that year, 740 lumber schooners hailed from Chicago (Karamanski 2000:69).

The lumber industry was, however, purely extractive—only capable of producing for a brief period before its resources dried up. In 1869, 2.75 billion board feet of pine was produced annually by the lake states, increasing to seven billion board feet by 1889, the lumber industry's peak. Soon after, most of Wisconsin and Michigan's accessible pine lands were logged out, and by 1897, most of the forest surrounding the lakes had been destroyed by what became known as the Big Cut (Cooper 1987:51; Mansfield 1899:514; Rector 1953:57-60). Technological advances had made it possible to strip a 36-mile timber berth clear of pine within ten years, helping to destroy the seemingly "inexhaustible" stands of pine in a little more than 50 years (Berton 1996:98-103).

The lumber industry employed a great number of people in the region, mostly immigrants from Ireland, Scandinavia, Germany, and Quebec, and the industry's success was in part due to skilled labor supplied by these immigrants (Fries 1951:13). Many other woodsmen came to Wisconsin from the lumber industries of the Eastern United States, from lumbering communities of Maine, New York, New Hampshire and Pennsylvania. Enticing advertisements and newspaper articles extolled the "rare chance" opportunities available in Wisconsin (Fries 1951:14). When settlers arrived, however, they found that one of their greatest hardships was procurement of supplies. Many transported in goods via keelboats or by teams over extremely difficult routes. Prices for transportation of goods were so high that many lumbermen entered into the freighting business themselves, purchasing ships and opening up mercantile stores of their own (Fries 1951:15).

Other Lakeshore Industries

In the lake counties of eastern Wisconsin, the shoreline environment provided two other goods that satisfied demand for building materials—clay and stone. Lacustrine clays found in close proximity to sand deposits enticed brick makers to set up shop. Major brickyards operated at Port Washington, Milwaukee, and Racine, but smaller brickyards were set up at other locations both along the coast and at points inland (Western Historical Company 1881:168-169, 411, 513, 573). Limestone found at lake bluff outcrops north of Port Washington was quarried and shipped southward, cut into dimensioned stone or burned down into lime (Western Historical Company 1881:473).

The lake itself provided another seemingly abundant resource, in the form of fish. Salted or pickled, packed into barrels, and shipped out of Milwaukee and Chicago to inland diners, preserved fish found a place in Midwestern cuisine. At first, the growing lake fish industry provided a counterbalance to the declining timber industry in southeastern Wisconsin. Large net arrays were set up offshore in the form of "pound nets" fastened to wooden stakes and left up during the Spring and Autumn fish spawning runs. Steamships

or tugs towing massive gill nets worked deeper waters. The lake fishing fleet reached its peak of 82 vessels in the 1880s. Long before then, however, fish stocks had begun to decline. While shoreline harvests in the 1850s were massive and easily taken, by the early 1870s only smaller fish were caught and harvests were less fruitful. In the early 1920s, fish stocks crashed long-term, entire harvest areas were abandoned, fleets were dismantled, and the era of large-scale commercial fishing on Lake Michigan came to an end (Jensen 2007; Struwe 2016).

The Ghost Ports of Western Lake Michigan

In the 1840s, Euro-American settlers arriving in the lake country of eastern Wisconsin found themselves in a sparsely-inhabited country that presented both opportunities and challenges. To the south were fledgling cities hungry for building materials and foodstuffs. To their east lay Lake Michigan, a ready means of transport that provided access not only to the newborn markets of Chicago and Milwaukee, but to the established cities of the eastern seaboard. Fertile soil, clay, and building stone lay beneath their feet and fish were plentiful offshore. The land, however, had few roads and was covered by dense timber.

Thus began a great competition along Wisconsin's eastern coastline. The winning strategy was simple: move the products of the land onto the lake and clear farmland in the process, exchange those products for capital and manufactured goods, sell those goods and the cleared lands to farmers, convince the farmers to both import and export goods through your port, and use the remaining capital to invest in infrastructure to attract more commerce and more capital. In order to begin, port facilities were needed.

The Role of Landscape

From the beginning, natural features provided an uneven playing field. Along the Door County coast in northeastern Wisconsin, shorelines were rocky, soils were poor, and roads horrible to non-existent. The rugged coast and its rocky shoals posed challenges to pier construction and sent many ships to their doom. Nonetheless, a series of huge "mega-piers" were built out into the lake by lumber dealers and mill owners at places where water power was available at or near the lakeshore. In the absence of wide-scale agricultural development and roads, the piers and their workforce of loggers, shippers, and mill operators served as nuclei around which later settlement condensed (Boyd, Leitz, and Weimer 2020).

Absentee landowners bought up vast tracts of land, with the intention of extracting timber and then selling the cut over lands to any optimistic (or naïve) settlers up to the task of farming the poor land. With few nearby markets or manufacturing facilities, initial production focused on the manufacture of minimally-finished items such as tanners bark, whole logs, fence posts, and telegraph poles. The isolation of the northern lumber ports made them ideal places to set up chandleries and small shipyards, allowing ships to resupply and repair without traveling long distances. Initially, development included the piers and mill facilities themselves, plus warehouses, boarding houses, and residences. Before long, entrepreneurs erected dance halls and taverns, hotels and gristmills (where

possible), and—as populations grew—schools, post offices, and telegraph offices (Boyd, Leitz, and Weimer 2020).

In contrast, the stretch of Lake Michigan coastline extending along the shores of Sheboygan and Ozaukee counties was kinder. It was described, in the 1890s, as “bold” and suitable to “be approached at any place within one-third to half a mile” (Scott 1892:184). Lake bottoms primarily were sandy rather than rocky and winters less harsh. Chicago and Milwaukee and their torrent of arriving immigrants were closer. Federal funding was extended to select communities along the shoreline, taking some of the burden of infrastructure creation off of private enterprise. Road systems—though poor at first—expanded rapidly; the railroad brought additional means of overland transport in short order. There was no lack of settlers wishing to purchase cut-over land, buy goods, and ship grain.

Southern pier communities, as a result, grew along different lines. In the south, piers were erected not only to ship lumber and other products but to supply settlers and the commercial enterprises drawn to them with manufactured goods. Settlements were as likely to condense around inland crossroads and river confluences as near the piers themselves. With mill facilities already available at older or Federally-assisted communities, not all southern pier owners bothered to have sawmills erected nearby. Since the supply and customer chains for the southern pier communities were more dispersed, linkages to overland transportation networks were crucial. Where pier communities could utilize river transport, they did so, and it is no surprise that the Federal harbors were established where rivers provided not only ready access to the interior, its population, and its resources, but also water power and sheltered locations to anchor.

Piers

Along both northern and southern coasts, the distance between the shore and deep water was a big obstacle. Goods could be moved by paying to lighter out across that distance—hoisting goods from small skiffs and barges into the holds of schooners anchored a safe distance offshore (Karamanski 2000:67). Long piers, however, were a more efficient and successful method of moving bulk cargo and larger items (Figure 10). Piers constructed all along the coast needed to fulfill similar functions and were thus built in similar ways. Some, such as the Ronksville pier and the larger piers in Door County, had L-shaped or expanded terminals, with extensions oriented towards the north. Rails and tram lines ran along wide decks (Boyd, Leitz, and Weimer 2020:15).

Nineteenth century Lake Michigan piers were constructed in two basic fashions. Piers constructed in more protected waters could be of lighter build, with decking placed



Figure 10: One of the twin piers at Centerville (also called Hika, and now within the municipal boundaries of Cleveland, Wisconsin), ca 1895-1910 (adapted from Village of Cleveland 2020). Note evidence of repair/rebuilding in the form of older pilings.

solely upon pilings driven into the lake bottom. For those built along exposed coastal areas that offered very little protection from strong winds and large waves, piers were typically a series of wooden cribs that were decked over. It was not out of the ordinary for larger piers of the period to be constructed using some combination of the two—as the Federal piers were—allowing them to be extended several hundred to well over a thousand feet offshore into deeper water.

The most robust piers were those created using cribs. The crib framework was constructed with a technique similar to log cabin walls. Roughhewn logs were stacked, with the corner construction of the cribs varying significantly according to the woodworking abilities of their creators. The crib sides were pinned through with alternating iron rods to strengthen the structure. Cribbing was assembled on shore during winter months and, once completed, pulled out onto the ice and placed into position by teams of horses. As spring began to warm the air, the structures heated up causing the ice to melt around them, and the cribs would drop through the ice into place on the lake bottom.

Cribs were constructed to heights sufficient to permit several feet to protrude above the surface of the water. If the depth of water was misjudged, an extension to the crib

platform would need to be added before adding the top deck. Once submerged, the cribs were filled with large-grade quarried stone moved from shore or brought to the site by ship. This stone filler held the crib in place and prevented it from shifting under large waves. Heavy planking was used to construct deck platforms to top and inter-join multiple cribs, as well as create walkways from the shore. In many instances marine rail was installed to facilitate movement of products along the length of a pier. Machinery such as capstans or winches was used in conjunction with marine railway to pull product out onto the pier for loading and move incoming cargo ashore for land transport and sale.

Piers along both stretches of shoreline shared another commonality—they were expensive to both build and maintain. Ships crashed against them in storms. Waves and ice pack demolished large sections of pier with little notice, or periodically swept their decking, support structures, and stockpiled materials into the lake. Fire was a constant hazard, since piers sat among wooden support structures—mills, warehouses, etc.—in the midst of stockpiles of flammable materials. Busy piers required repair at least annually to be maintained in good working order, and piers that were not maintained in good order soon were no longer busy at all (Boyd, Leitz, and Weimer 2020).

The Ghost Ports of Manitowoc, Sheboygan, and Milwaukee Counties

Sailors drifting along the western shores of Lake Michigan during the height of the lumbering trade in the 1850s and 1860s passed a regular array of pier structures reaching out into the boisterous lake waters (Figure 11). Apart from Ronksville, which will be discussed in detail later in this volume, eleven other ghost ports or ghost piers are known to have stood at intervals along the eastern shore of Manitowoc, Sheboygan, and Ozaukee counties, between Two Rivers and Milwaukee (other ghost piers were located north of Two Rivers, but will not be covered here). Federally-supported piers and port facilities existed at Two Rivers, Manitowoc, Sheboygan, and Port Washington. The earliest piers and support facilities at these latter communities were removed and replaced by more modern structures but were originally of similar construction and purpose as their less fortunate brethren.

Northeim

The Northeim piers (also known as the Nordheim piers, Mann's landing, Mann's pier, the Otto & Bode pier, and the Mathaus pier) were twin pile piers located approximately six miles south of Manitowoc, Wisconsin (Falge 1912:327; Nash 1878:327; Scott 1892:184; USCOE 1866/1877) (Figure 12). The piers were first constructed in the early 1860s "for the shipping of cordwood, lumber, and farm produce" (Falge 1912:327). The 1866/1877 coastal chart depicts structures belonging to the community about 1000 feet inland, clustered around a crossroads west of the northern pier (modern CTH 'U' and Northeim Lane). A feeder road connects the southern pier to the overland transportation network (USCOE 1866/1877). Today, the terrestrial component of Northeim remains as a very small unincorporated community, severed from its maritime roots. The pier and its support structures have long since vanished.

Yorkville

The 1866/1877 U.S. Corps of Engineers chart of Lake Michigan depicts another set of twin piers at a place called “Yorkville” (USCOE 1866/1877) (Figure 12). Contemporary terrestrial plat maps (Nash 1878) identify this location as the Rossburg pier, and indicate that the adjoining land was owned by “Rossburg and Co.” Scott (1892:184) describes these piers (along with each of the others along this stretch of shoreline) as pile piers. The terrestrial portion of the community of Yorkville was located at a crossroads just over 2000 feet inland from the pier, in the vicinity of the intersection of modern North Avenue and its intersections with Centerville Road and I-43. No trace of Yorkville or its pier exists today. Neither the Yorkville nor Rossburg names appear in the Falge history of Manitowoc County (Falge 1912).

Centerville/Hika

Centerville (also known as Hika), located halfway between Manitowoc and Sheboygan, Wisconsin, is the only former pier community along this stretch of shoreline to survive in any substantial form. Its pier complex has long since vanished, replaced by a small boat launch in modern Hika Park. After the collapse of its maritime economy, Centerville was incorporated into the expanding municipal boundaries of the inland community of Cleveland. The 1866/1877 Coastal Chart and plat maps depict a small but substantial settlement with a formal street grid at a point where the lakeshore road (modern Lakeshore Drive) turns inland towards Cleveland (Nash 1878; USCOE 1866/1877) (Figure 12). A small number of support structures are located near the base of the northern pier.

Community development began in the 1840s with initial settlement of the site. In the 1850s and early 1860s, the two Centerville piers (Bode’s pier and the Farmer’s pier) were erected, and a planing mill began operation (Falge 1913). The town’s main source of income and employment, however, was a large and ornate brewery established by German immigrant Simon Kraus and constructed from locally-produced brick. Centerville’s future seemed to be bright. Just as plans were being finalized to begin the program of harbor improvements that would have upgraded Centerville’s status as a lake port, however, the Kraus brewery burned to the ground (Ertel 1976). With that financial blow, and the railroad serving the needs of the outlying farming community, Centerville’s economic fortunes turned away from the lake.

Though little information exists concerning the operation of the pier complex, it can be inferred from existing clues that Centerville once shipped a variety of products to urban markets, certainly including wood products and beer, and likely also grain, other agricultural products, and perhaps brick. In turn, manufactured goods delivered to the pier would have been sold in Centerville itself and transported further inland to Cleveland and surrounding farmsteads.

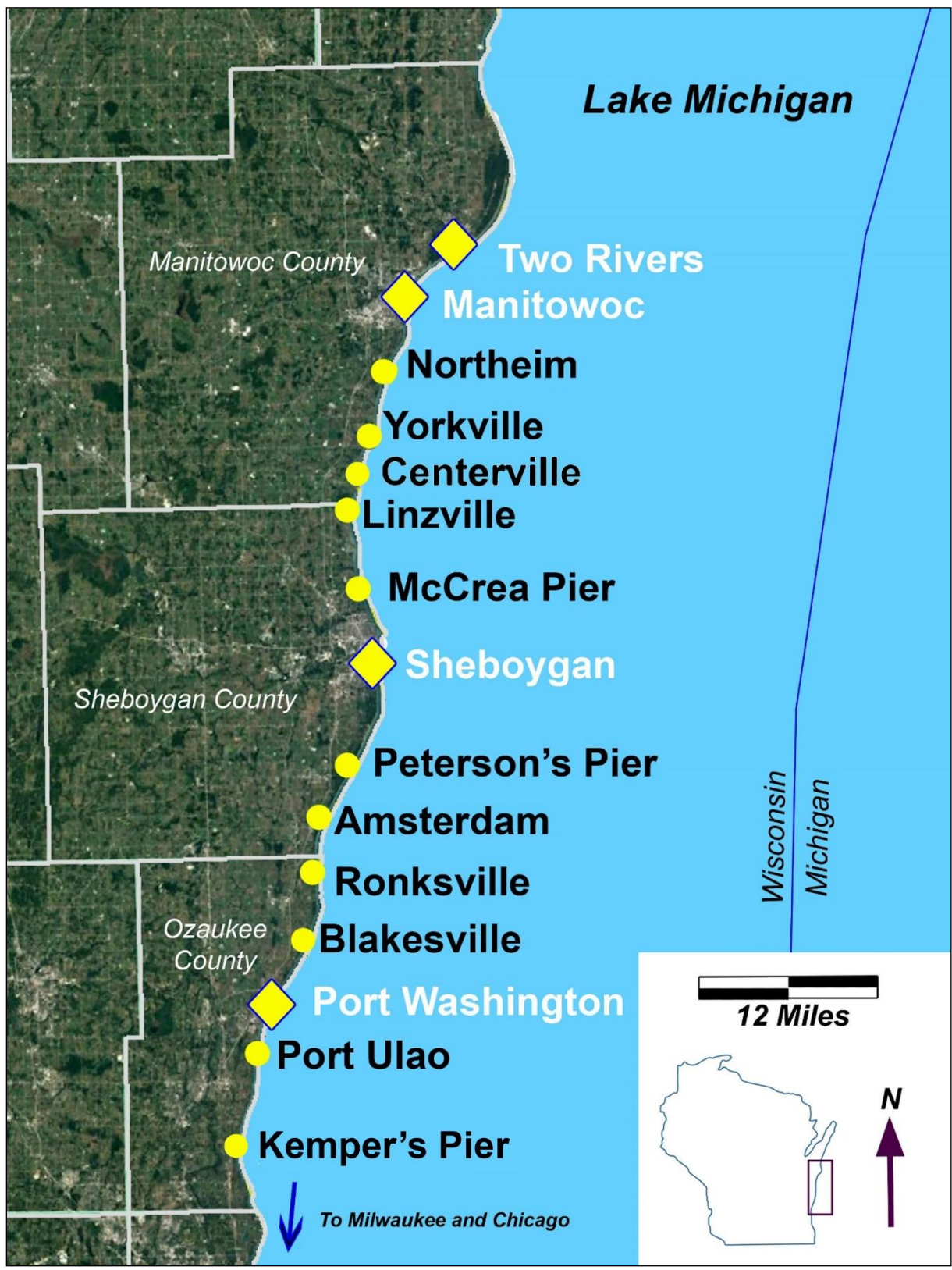


Figure 11: Ghost ports (black text) of Ozaukee, Sheboygan, and Manitowoc Counties.

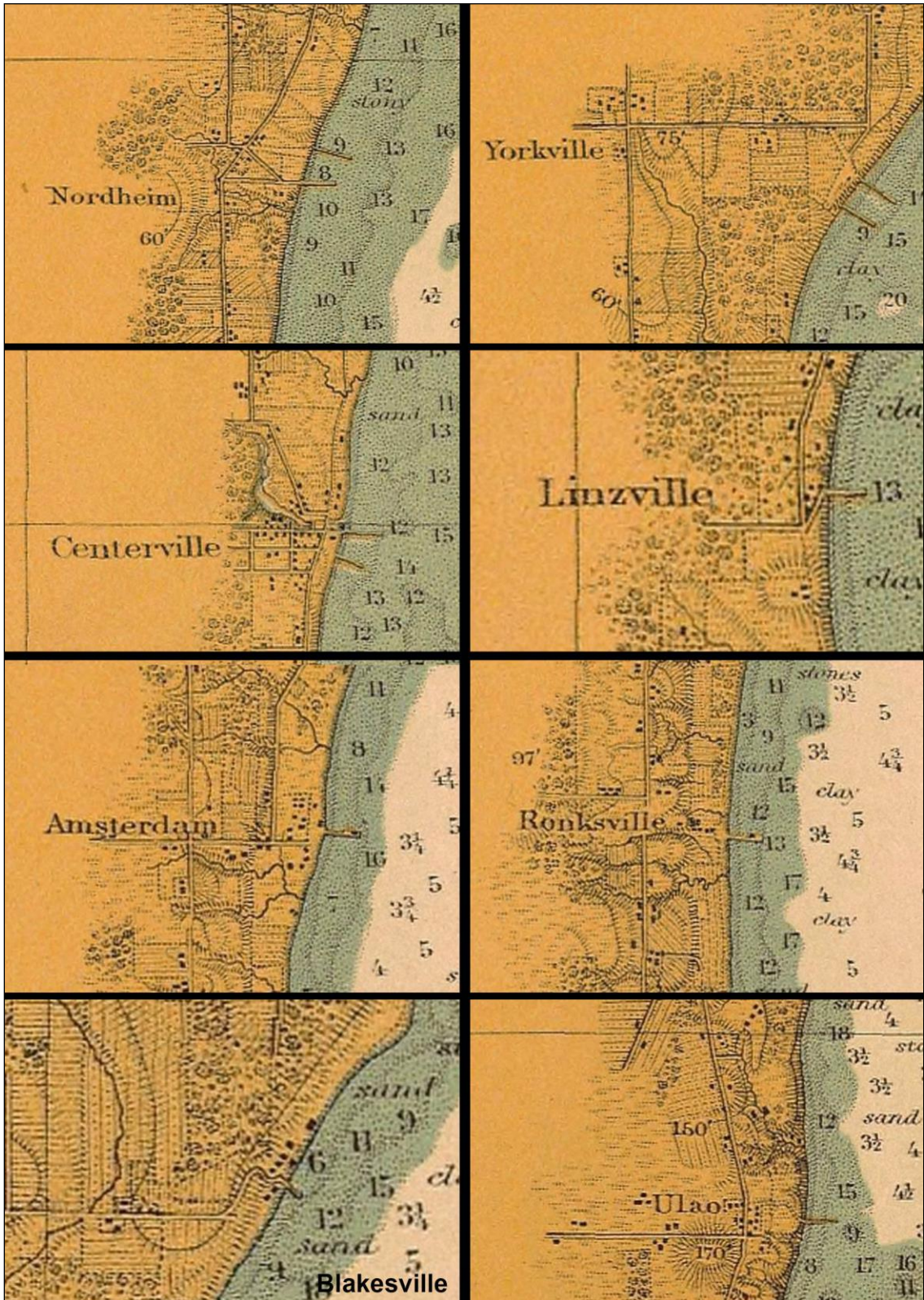


Figure 12: Details from the 1866/1877 Lake Michigan Coastal chart showing pier complexes (USCOE 1866/1877).

Linzville

The Linzville pier (a.k.a. Lunz or Linz pier) was located approximately eight miles north of Sheboygan, Wisconsin (Randall and Palmer 1862; Randall 1875; Scott 1892:184; USCOE 1866/1877), at what is today the intersection of Orchard and Lakeshore Roads. It was built prior to 1862. Scott's Coast Pilot guide mentions only a single pile pier, "extending into deep water" (Scott 1892:184). The USCOE map (1866/1877) depicts a number of structures where a road leading from the pier intersected Lakeshore Road. This pier community is not mentioned in the History of Sheboygan County (Ziller 1912). No trace of Linzville remains today.

McCrea/Pigeon River Pier

A pier is shown approximately four miles north of Sheboygan on the 1862 plat map of Sheboygan County, just under one mile north of the mouth of the Pigeon River (Randall and Palmer 1862). This pier is not depicted on the U.S. Corps of Engineers chart of the Sheboygan area (USCOE 1866/1877), nor is it mentioned in Scott's Coast Pilot guide (1892), suggesting that it fell out of use prior to 1866. A.L. McCrea ran a lumbering and brick business, and the pier, as might be expected, was used to transfer bricks, lumber, and cordwood to ships for transport to Chicago and Milwaukee (Pape 1993). A road is shown on the 1862 map linking a single structure on the property overland with Sheboygan itself. Given the pier's proximity to the port facilities at Sheboygan, the Pigeon River pier was likely abandoned as soon as local resources were exhausted or when transportation of goods to Sheboygan became more cost-effective. It extended into the lake from property owned by McCrea, near the modern terminus of Blackstock/Waveland Road. All surface indications of the pier and its support structure have been destroyed.

Peterson's/Wilson's Pier

The 1862 and 1875 plat maps of Sheboygan County both depict a pier/dock in the southern portion of the Town of Wilson in Sheboygan County, approximately six miles south of Sheboygan, at what is now the terminus of Old Park Road/CTH "KK" (Randall and Palmer 1862; Randall 1875). The location is now within Kohler-Andrae State Park. Oddly, the pier is absent from the 1866/1877 coastal chart (USCOE 1866/1877), and it is not mentioned in Scott's Coast Pilot guide (1892), despite a documented history of use that spans the creation of both documents.

Conflicting accounts of the pier's construction exist. In one telling of the story, the pier was constructed in the late 1840s by fisherman David Wilson, for whom the Township is named, and Wilson did own the lakeside property where the pier was located. He used the pier as a port for his fishing fleet, and as a means to ship out salted sturgeon and whitefish by the barrel (Dippel 2018). Other accounts attribute the pier's construction to a lumber dealer named Abram Peterson, sometime prior to 1860 (*Sheboygan Press* 1932; Cowan 1985:41, 50). Peterson is reputed to have run a wood merchant business from it and used it to ship railroad ties. It may be that both individuals funded and used the pier,

or that they were involved to various extents with successive rebuildings of it. The version that attributes the pier to Peterson contains a clue that may explain why the pier does not appear on the coastal charts...the telling states that ties were loaded onto scows at the pier, and then lightered out to larger ships. If the pier extended only into shallow water, it may not have been perceived as worthy of much note.

Reliance on fishing, rather than timber, allowed the community to survive and prosper after many other piers along the coast had fallen. The settlement boasted arrays of offshore pound nets, fish shanties, residences, a school, a general store, and—in some accounts—even a hotel (Cowan 1985:41-42, 50). When overconsumption condemned the lake fishing industry to the same fate as the lakeshore lumber industry, residents left for better prospects and the community dissolved. No structures remain.

Amsterdam

The once-vibrant community of Amsterdam, located not far north of the Sheboygan County line only three miles north of the project area, was settled by Dutch and other immigrants in the 1840s and 1850s. It was served by a pile pier that extended “into deep water” (Scott 1892:184). This pier was, for a time, one of three owned by Barnum Blake of Port Washington. The 1912 History of Sheboygan County reveals that the residents “employed the greater part of their time in the summer fishing, and in the winter in hunting and trapping, there being an abundance of game...for some time quite a business was carried on in lumber, cord wood, and fish, but as the timber disappeared and the fish became scarcer, Amsterdam began to dwindle away until it now has scarcely any existence” (Ziller 1912:246).

Blakesville

Blakesville was another Blake family holding, built by Barnum Blake and operated (and later owned) by son Edward R. Blake. Blakesville was situated between Ronksville and Port Washington in the vicinity of the terminus of modern Lake Road. It is said to have been a briefly thriving community, with a small (300 foot) pier, general store, and 100 residents (Hammond Times 1939). The 1873 plat map of Ozaukee County, Wisconsin, shows the land under the ownership of an “R. Blake,” with no indication of a supporting community (OCHS 1994). An unlabeled pier on the 1866/1877 coastal chart (USCOE 1866/1877) seems to be that of Blakesville (Figure 12). The pier is depicted as smaller than others along the coast and is flanked by a linear string of buildings stretching along the lakeshore rather than along a feeder road. In 1881, the pier caught fire while spring repairs were underway, destroying the pier and sending the complex’s pile driver to the lake bottom. Afterwards, Edward Blake indicated that he did not intend to rebuild (*Ahnapee Record*, March 3, 1881).

Port Ulao

Port Ulao was founded in 1847 at the base of the lake bluffs by James T. Gifford. The community was envisioned as a refueling station for steamships, supplied by the

seemingly endless lakeshore forests. On the 1866/1877 U.S. Corps of Engineers chart, Port Ulao is depicted as a small community of about a dozen buildings north of the current intersection of Ulao and Lakeshore Roads, a short distance inland from a single pier (USCOE 1866/1877) (Figure 12). Histories describe a blufftop sawmill and warehouse linked to a 1000-foot pier at the base of the steep lake bluffs by a wooden chute. As steamships transitioned away from wood as a fuel source in the 1860s and the lakeshore forests vanished, Port Ulao's fortunes declined. Today, the name "Ulao" endures as that of an unincorporated community, though few contemporary structures remain (Zaun 1965).

Kemper's Pier

The precise location of Kemper's pier is unclear, as it does not appear on historic plat maps or maritime charts. Written accounts, such as they are, place it somewhere along the shore in the Town of Mequon, about 12 miles south of Port Washington, about 16 miles north of Milwaukee, between Milwaukee and Port Ulao. What is known of the pier community derives from the retelling of three rather unusual incidents. In 1855 a fight broke out between rival wood cutting parties near the pier, with one party having driven wagons inland from the pier complex (*Manitowoc Herald* 1855). The same year a body was found in Milwaukee and identified conclusively as one John Dwire—an identification brought into some doubt when Mr. Dwire arrived from Kemper's pier, where he had been living—to testify at the inquest into his death that he was in fact still alive (Seddon 2014). In 1876, while Mrs. Kemper harvested cabbages near the pier complex (the pier, a brickyard, and the Kemper residence are mentioned), two acres of the property suddenly subsided sixty feet, taking fences and trees with it, while a 17-foot-high "island" appeared just offshore. The article detailing this last event—presumably a large-scale block slump of the lake bluffs—ends with a notation that Mr. Kemper would have to remove his house (*Watertown News* 1876). The pier was presumably abandoned at that time.

Ronksville

The Ronk Brothers

Nicholas Ronk was born January 3, 1816 in Ellange, Canton de Remich, Grevenmacher, Luxembourg (erroneously listed in the 1860 U. S. Federal Census as Holland). His brother Paul was born into the same community on September 2, 1820. The brothers and Nicholas' first wife Maria entered the United States together through New York on July 5, 1849 (naturalization records erroneously report Paul entering a year later). Though the 1850 census lists the brothers as residents of Port Washington, Nicholas in fact had purchased 80 acres on the north side of what would become Jay Road in the Southwest Quarter Section 1 of the Town of Belgium, less than a mile northwest of the pier location (Figure 14). Maria died that year and was buried at the cemetery in Lake Church. The next year, Paul purchased half (40 acres) of Nicholas' property for himself. In 1855, Paul took up duties as the Town Clerk for the Town of Belgium, and both brothers became naturalized citizens.

Savvy entrepreneurs, the Ronk brothers decided to take advantage of the fact that the local church had become a gathering place for local residents and travelers—and thus potential customers. In 1856, Paul accordingly purchased land in Section 13, across the road from the church. Later maps and documents indicate that a store, tavern, and hotel occupied the property, but whether they were constructed by Paul or purchased by Paul is unclear. In the same year the brothers purchased adjoining lots along the lakeshore in fractional Section 7. The seller of the lakeside lots was Barnum Blake, the owner of the Amsterdam and Blakesville piers, a third pier in Port Washington, and several commercial and industrial enterprises. Barnum earlier had purchased huge tracts of land along the lakeshore, shipping their timber from his piers before selling the cut-over lands to farmers. Among Barnum's holdings were several grain elevators in Port Washington, which the buyers of his lands promptly filled (Anonymous 1965:47-48).



Figure 13: Nicholas and Mary Ronk. Photo submitted by David Hirn.

In 1858, dissatisfied with the time and distance involved to bring in goods to their businesses from the nearest ports, the brothers founded the Luxemburger Pier Company. Construction of the company's pier began shortly afterwards on the windswept stretch of shoreline where the brothers had purchased adjoining parcels, and the seed for "Ronksville" was planted. Around this time, both brothers—as had others along the lakeshore—realized the value of lumber as a commodity and began forays into the trade as lumber merchants. The pier also served this part of their business investment.

On December 27, 1858 Nicholas and Paul Ronk and their wives deeded a portion of their shoreline land to the Luxemburger [sic] Pier Company for an unrestricted public road to the lakeshore "to be used by every body for a road forever" (Figure 15). The deed described both the course of the road and a 330-foot section of shoreline flanking it and extending 264 feet inland that formed the terrestrial portion of the pier complex. Notably, the Ronk brothers reserved to themselves the right to cut timber on the shoreline parcel. The particulars of the deed established an east-west running feeder road from the western side of Fractional Section 7 to the lakeshore through Lot 1 (the east half of the fractional northern $\frac{1}{4}$ of Fractional Section 7). In addition, two adjacent 264-foot (E/W) by 165-foot (N/S) lots adjoining Lake Michigan were transferred from the Ronk holdings to the new company, one on either side of the road. These parcels presumably both contained the terrestrial end of the pier and provided space where the Luxemburger Pier Company could erect support structures and store goods. The relationship between the Ronk brothers and the Luxemburger Pier Company was one of ownership, as tax records list them as joint owners of the pier itself (Figure 16).

The 1860 U.S. Census lists Nicholas and Paul as dealers in cut wood, both living in the Town of Belgium, Ozaukee County, Wisconsin. By then, Nicholas lived with his second wife Mary and four children, and Paul with his wife Anna and five children as well as an older female relative. Each brother had real estate totaling \$3000, and personal estates valued at \$300 (U.S. Census Bureau 1860), for combined assets worth over \$206,052 in today's currency.

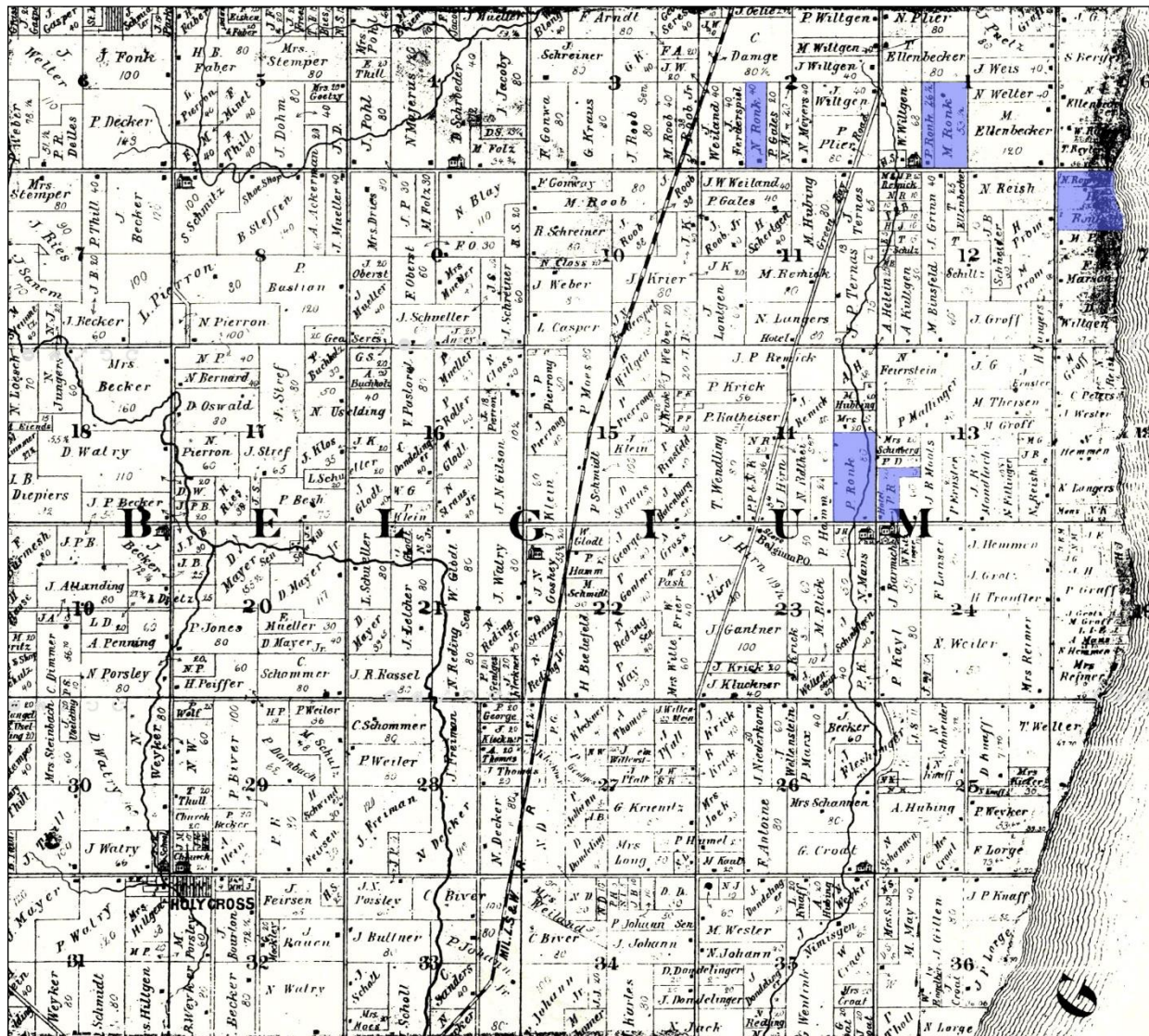


Figure 14: Ronk holdings at their maximum extent, in 1873 (OCHS 1994).

Paul and Nicholas Ronk and their wives, to the Luxemburger Pier Com. Deed.
 This Indenture made the 27th day of December A. D. 1858: between Paul
 Ronk and his wife Anna; and Nicholas Ronk and his wife Mary, all of the
 town of Belairum, Ozaukee County and State of Wisconsin, parties of the
 first part and the Luxemburger Pier Company of the said town, County
 and State, party of the second part. Witnesseth: That the said par-
 ties of the first part; do hereby give free and voluntary to the said Luxem-
 burger Pier Company, a public Road, Commencing a. being in the middle
 of Lot No. One, Section No. Seven (7,) in Township No: twelve (12,) Range No:
 twenty three, (23,) East, beginning West of said Range No: 23 and running
 through the middle of said Section No: 7. to Lake Michigan Shore, to be
 used by every body for a Road forever. And also two acres of land on the
 West side on Lake Michigan Shore, East of aforesaid premises, one acre
 South of aforesaid Road, having Section Rods from North to South and Ten
 Rods from East to West, and also one acre on the Northern Side of aforesaid
 Road, having Section rods from South to North, and ten rods from East to
 West, which two acres of land can be sold with the Pier by the said Luxem-
 burger Pier Company, but never in Lots can said two acres be sold, and the
 said parties of the first part behold the right, to cut all woods and timber
 on said land, and that the said Company has to pay the tax on aforesaid
 granted land. In Witness, whereof the said parties of the first part have here,
 unto set their hands and Seals, the day and year aforesaid.

Peter Dells }
 Jacob Dells }

Paul Ronk
 Anna Ronk,
 Nicholas Ronk,
 Maria Ronk.

State of Wisconsin }
 Ozaukee County } S.

Be it Remembered, that on the 27th
 day of December A. D. 1858. before me came, the aforesaid Paul
 Ronk and his wife Anna and Nicholas Ronk and his wife Mary, to
 me known to be the persons, who executed the within Instrument and
 acknowledged, that it is their free Act and Deed, for the uses and pur-
 poses therein mentioned. Matthias Kovac, Justice of the peace.

Figure 15: Deed for the "forever road" gifted to the town. Document provided by Jonathan Ronk.

TAX ROLL for the Town of Belgium

NAME OF OWNER.	DESCRIPTION.	Section.	Town.	Range.	Acres	Hand- redths.	VALUATION
Nicholas Ronk	N. 27 ac. of Lot No. 1 and part of Pier	7	12	23	27		400
Paul Ronk	S. 27 ac. of Lot No. 1 and part of Pier	"	"	"	27		400
Nicholas Ronk	N. 25 5/8 ac. of Lot No. 2	"	"	"	25	50	350
Matthias Proun	S. 30 ac. of Lot No. 2	"	"	"	30		440
Francis Marston	Lot No. 3	"	"	"	55	60	800
Tom Wilton	Lot No. 4	"	"	"	55	60	800

Tax Roll for the Town of Belgium County of Ozaukee, for the year 1872

NAME OF OWNER.	DESCRIPTION.	Section.	Town.	Range.	No of Acres.	Parts.	VALUATION
Nicholas Ronk	N. 27 ac. of Lot No. 1 and part of Pier	7	12	23	27		600
Paul Ronk	S. 27 ac. of Lot No. 1 and part of Pier	"	"	"	27		600
Nicholas Ronk	N. 25 5/8 ac. of Lot No. 2	"	"	"	25	50	350
Matthias Proun	S. 30 ac. of Lot No. 2	"	"	"	30		440
Francis Marston	Lot No. 3	"	"	"	55	60	800
Tom Wilton	Lot No. 4	"	"	"	55	60	800

Figure 16: 1870 (top) and 1872 (bottom) Tax Rolls for the Town of Belgium indicates the pier within Lot 1 jointly owned by the Ronk brothers. Documents provided by Jonathan Ronk.

Ronksville and its pier are depicted on the 1866/1877 coastal chart (Figure 17) but remain invisible on terrestrial plat maps. The 1866/1877 coastal chart depicts Ronksville as it was in 1866, when the terrestrial portion of the map was made. Several structures are shown on the property, including one structure on the uplands west of the pier, another at the base of the ancient lake escarpment, and a line of structures leading along the “forever road” to the pier. The earliest terrestrial plat available, drafted in 1873 (Figure 18), merely shows the boundaries of the Ronk properties and their likely residences on the higher bluff marking the ancient high water mark (OCHS 1994).

The prominence of the Ronksville community on maritime charts and its absence on terrestrial maps is a testament to the maritime focus of the small settlement. In 1865, when Ronksville seems to have been at its height, Nicholas Ronk went so far as to purchase his own ship—a 15-year old, 81-foot two-masted schooner called *Northerner*. Nicholas Ronk and neighboring landowner Nicolaus Kanton (misspelled as Nicholas Canten on the ship’s enrollment document) became equal 1/3 owners in the small lumber schooner (Figure 19). Their partnership, however, lasted only a little better than a season. By December 7, 1866, Nicholas Ronk bought out his partner and became sole owner of the *Northerner* (Bureau of Navigation 1866) (Figure 20).

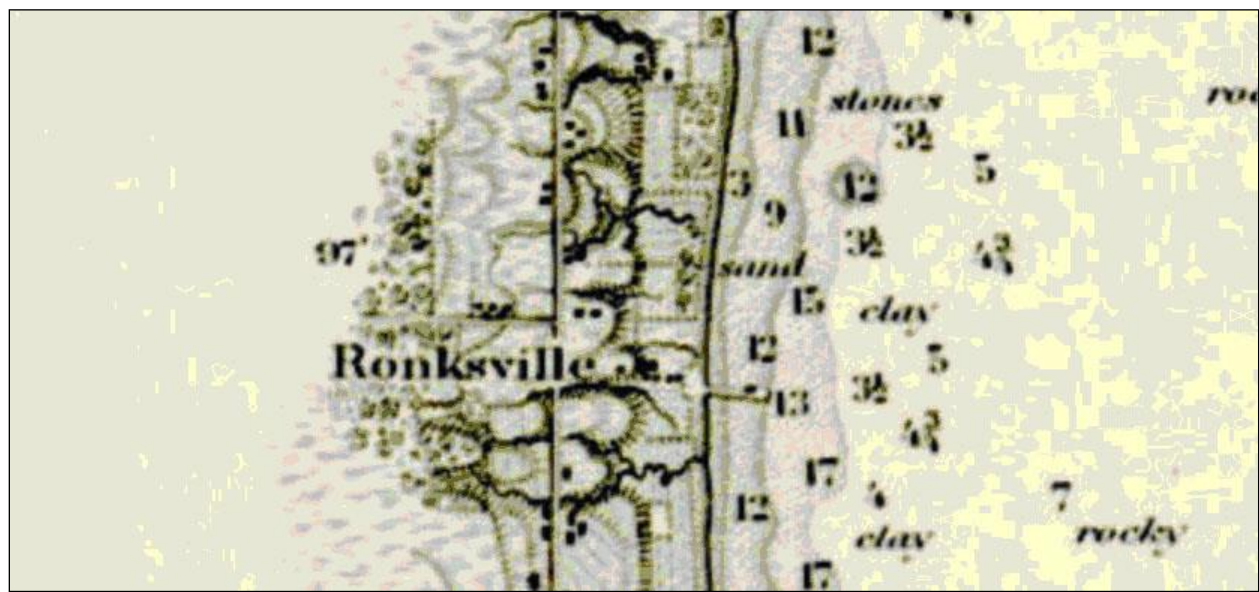


Figure 17: Detail from 1866/1877 navigational chart with Ronksville, its pier, and support buildings shown. A structure is depicted at the end of the pier, with others on land in a line leading back along the “forever” road.

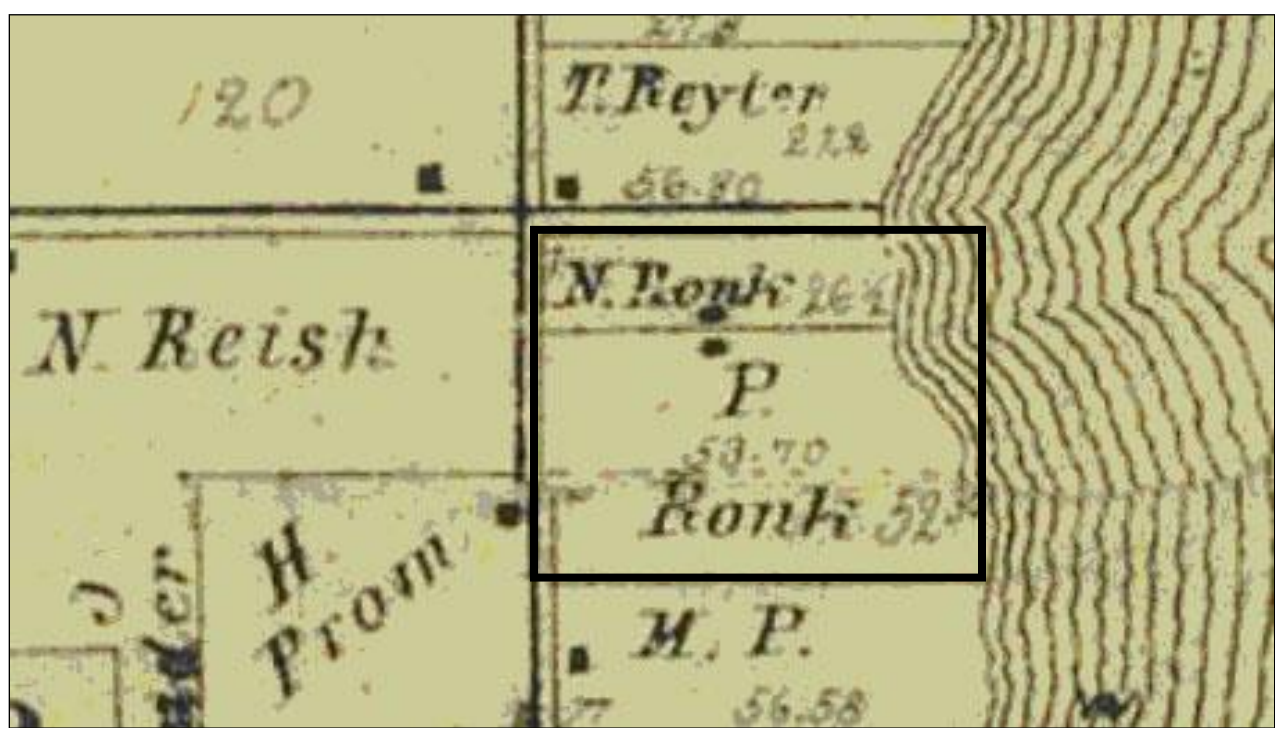


Figure 18: Detail of 1873 Town of Belgium plat map with the Nicholas and Paul Ronk lakefront properties highlighted (OCHS 1994). The line between the properties is the location of the “forever road.”

ENROLLMENT.



Northern, Northeastern and Northwestern Frontiers of the United States.

In Conformity to an Act of the Congress of the United States of America, entitled "An Act for Enrolling and Licensing Ships or Vessels, &c.," passed the 18th February, 1793, and "An Act to regulate the Foreign and Coasting Trade on the Northern, Northeastern and Northwestern Frontiers of the United States, and for other purposes," passed the 17th June, 1804, and the Acts of the 7th July, 1838, 29th July, 1850, and 6th May, 1864.

Nicholas POND of Rensselaer Wisconsin having taken or subscribed the Oath required by the said Acts, and having sworn that he is owner of one half and Nicholas Caution of Rensselaer is owner of the other one half: that they are Citizens of the United States, sole owners of the Ship or Vessel called the Northerner of Milwaukee wherof F. W. Edmonds is at present Master, and as he hath sworn is a Citizen of the United States, and that the said ship or vessel was built at Ellis Island in the year 1859, as appears by the Certificate of her Enrollment at the Port of Chicago, dated March 29th 1860 numbered 69 now surrendered, said vessel having changed owners & districts.

And said former Enrollment having certified that the said ship or vessel has One deck and two masts and that her length is Eighty one feet her breadth Eighteen feet her depth Seven feet her height Ten feet that she measures Seventy Seven tons and 53 hundredths.

	Tons	$\frac{1}{100}$
Capacity under tonnage deck,	74	05
Capacity of enclosures on deck,	3	28
Total tonnage,	77	33

that she is a Schooner has a square stern and Oval ~~cutwater~~ head.


And the said Nicholas Pond having agreed to the description and admeasurement above specified, and sufficient security having been given in conformity with the terms of the said Acts, the said Schooner has been duly enrolled at the Port of Milwaukee.

[Signature]

Given under my Hand and Seal, at the Port of Milwaukee, this 21st day of September, in the year one thousand eight hundred and sixty five.

[Signature]

Figure 19: 1865 vessel enrollment for the schooner Northerner. (U.S. Bureau of Navigation 1865).

Permanent ENROLLMENT.  No. 37

In Conformity to an Act of the Congress of the United States of America, entitled "An Act for Enrolling and Licensing Ships or Vessels, &c.," passed the 18th February, 1793, and "An Act to regulate the Foreign and Coasting Trade on the Northern, Northeastern and Northwestern Frontiers of the United States, and for other purposes," passed the 17th June, 1804, and the Acts of the 7th July, 1838, 30th July, 1850, and 6th May, 1864,

Nicholas Ronk of Rockville Wis. having taken or subscribed the Oath required by the said Acts, and having sworn that he is a

Citizen of the United States, sole owner of the Ship or Vessel called the Northerner of Milwaukee whereof Fred Edwards is at present Master, and as he hath sworn is a Citizen of the United States; and that the said ship or vessel was built at Mills Island in the year 1857, as appears by the Certificate of her enrollment at this Port dated September 16, 1865 numbered 119 now surrendered by reason of Change of owners


And her former enrollment having certified that the said ship or vessel has one deck and two masts and that her length is Eighty-one feet her breadth Eighteen feet her depth Seven feet her height ten feet that she measures Seventy seven tons and 30 hundredths.

	Tons	1/100
Capacity under tonnage deck,	74	65
Capacity of enclosures on deck,	3	28
Total tonnage	77	33

that she is a Schooner has a Square stern, and oval cut water head.

And the said Nicholas Ronk having agreed to the descriptions and admeasurement above specified, and sufficient security having been given in conformity with the terms of the said Acts, the said Schooner has been duly enrolled at the Port of Milwaukee.

Given under my Hand and Seal, at the Port of Milwaukee, this seventh day of December in the year one thousand eight hundred and sixty six


Collector of Customs

Northern, Northeastern and Northwestern Frontiers of the United States.

Figure 20: 1866 vessel enrollment for the schooner Northerner listing Nicholas Ronk as sole owner (U.S. Bureau of Navigation).

Nicholas Ronk spent the winter shopping for a new business partner, and a new captain for his ship. On May 22, 1867 a new enrollment was entered at the port of Milwaukee for change of owners (Figure 21). Andreas Ryerson of Milwaukee was listed as owning 1/3 and Nicholas Ronk of Ronksville as owner of the remaining 2/3 of the vessel. Captain Markers Gunnerson was placed in command (Bureau of Navigation 1867). Ryerson was a professional mariner. He sailed the schooner *Guido* in 1867, the same year he became part owner of the *Northerner* and was said to have also spent time at the *Northerner's* helm (Gjerset). By late May of 1868, Ryerson became Master solely of the *Northerner* and remained at her wheel until the vessel's loss on November 28, 1868 (Bureau of Navigation 1867, 1868) (Figure 22).

Meanwhile, Paul Ronk had expanded his commercial holdings at Lake Church, picking up another large property at Lake Church in Section 11, where another store and saloon were located. By the end of the decade, Paul Ronk effectively owned the commercial district of Lake Church. In 1869, however, the year after the loss of the *Northerner*, Paul began to sell his Wisconsin holdings. First to go were his original lands in Section 1, a 38 acre parcel in Section 2 purchased sometime in the previous years, and 35 acres of his lakeshore lot. All were purchased by his brother.

After the loss of the *Northerner*, Ronksville continued to facilitate the transport of goods to and from Lake Michigan for the villages of Lake Church and Belgium, and still served as a landmark for sailors on the lake. However, the lumber trade was waning, and trouble loomed ahead. Both Ronk brothers listed their professions as “farmer” in the 1870 Federal Census, rather than lumber dealers. The 1870 census indicates that Nicholas had a personal estate value of \$2000 and real estate totaling \$3000, and Paul's personal estate was valued at \$500 with a real estate valued at \$4000. Together, their holdings—when adjusted for inflation—were worth \$187,897 in today's currency, a drop in valuation since 1860, though total holdings had risen.

In 1874, Paul sold his properties in Section 13 of Lake Church to his son and his remaining lakeshore property at the pier to his brother. He was installed as postmaster in the Town of Belgium the next year. A few years later, in 1879, he divested himself of the last of his Wisconsin lands by selling the remaining portion of his Lake Church properties to his son. Between his appointment as postmaster and the final sale, he emigrated west to settle in South Creek, Dixon County, near Ponca, Nebraska. He died there on December 29, 1880, at the age of 60. In the 1880 Federal Census Nicholas Ronk continued to list his occupation as farmer. He passed away on Valentine's Day of 1884 at the age of 68. He was interred at St. Mary's Cemetery in Lake Church.

Nicholas Ronk, Jr., son of Nicholas, died in October 1891. Evidently the 1892 plat map was already drafted because it shows the younger Nicholas as the sole owner of the Ronk properties (OCHS 1994). His wife Mary Hubing Ronk continued to own the property until she sold it to her youngest son, Peter N. Ronk (the youngest son of Nicholas Ronk, Jr. and Mary Hubing Ronk) on November 27, 1914. Peter owned the properties until he sold the land to Alvin G. Weldboom of Lima, Wisconsin on December 21, 1916, bringing the Ronk family's tenure in the Town of Belgium to an end.

PERMANENT ENROLLMENT.



No. 127

In Conformity to an act of the Congress of the United States of America, entitled "An Act for Enrolling and Licensing Ships or Vessels, &c.," passed the 18th February, 1793, and "An Act to regulate the Foreign and Coasting Trade on the Northern, North-eastern and Northwestern Frontiers of the United States, and for other purposes," passed the 17th June, 1864, and the Acts of the 17th July, 1838, 29th July, 1850, and 6th Nov. 1864.

Andrus Peterson of Milwaukee Wis. having taken or subscribed the Oath required by the said Acts, and having sworn that he owns one third (1/3) and that Nicholas Bond of Pontville owns two thirds (2/3) the lot or Citizens of the United States, sole owners of the Ship or Vessel called the Northerner of Milwaukee whereof Markus Gunnerson is at present Master, and as he hath sworn is a Citizen of the United States, and that the said Ship or Vessel was built at Kells Island in the year 1859, as appears by the Certificate of her Enrollments at this Port dated December 7th 1866 number 37 now surrendered by reason of change of name

And her former Enrollment having certified that the said Ship or Vessel has One deck and two masts and that her length is Eighty one feet, her breadth Eighteen feet, her depth Seven feet, that she measures Seventy Seven tons and 55 hundredths,

	Tons.	$\frac{1}{100}$
Capacity under tonnage deck,	74	00
Capacity of enclosures on deck,	3	28
Total Tonnage,	77	28

that she is a Schooner has a Square stern, and Oral Cat Water head.

And the said Andrus Peterson having agreed to the description and admeasurement above specified, and sufficient security having been given in conformity with the terms of the said Acts, the said Schooner has been duly Enrolled at the Port of Milwaukee.



Given under my Hand and Seal, at the Port of Milwaukee, this 22 day of May in the year one thousand eight hundred and sixty Seven
O. Latham Giles
Collector of Customs.

Northern, Northeastern and Northwestern Frontiers of the United States.

Figure 21: 1867 vessel enrollment for the schooner Northerner (U.S. Bureau of Navigation).

PERMANENT ENROLLMENT.

1868

In Conformity to an act of the Congress of the United States of America, entitled "An Act for Enrolling and Licensing Ships or Vessels, &c." passed the 18th February, 1793, and "An Act to regulate the Foreign and Coasting Trade on the Northern, North-eastern and Northwestern Frontiers of the United States, and for other purposes," passed the 17th June, 1864, and the Acts of the 17th July, 1836, 29th July, 1850, and 6th May, 1864.

Andreas Ryerson of Milwaukee Wisconsin having taken or subscribed the Oath required by the said Acts, and having sworn that he owns one share (1/3) and that Nicholas Bank of Bensenville Wisconsin owns two shares (2/3) that they

are Citizens of the United States, sole owners of the Ship or Vessel called the Northerner of Milwaukee whereof Andreas Ryerson is at present Master, and as he hath sworn is a Citizen of the United States, and that the said Ship or Vessel was built at Mills Island in the year 1859, as appears by the Certificate of Temporary Registry at the port of Chicago dated May 23. 1868 numbered 8 now surrendered. The said vessel having arrived within her home district

And her temporary Register having certified that the said Ship or Vessel has one deck and two masts and that her length is Eighty one feet, her breadth Eighteen feet, her depth Seven feet, that she measures Seventy Seven tons and 33 hundredths,

Capacity under tonnage deck.	-	-	-	-	-	-	-	-	-	-	74	25
Capacity of enclosures on deck.	-	-	-	-	-	-	-	-	-	-	3	28
Total Tonnage,											77	33

that she is a Schooner has a square stern, and oval cut water head. And the said Andreas Ryerson having agreed to the description and admeasurement above specified, and sufficient security having been given in conformity with the terms of the said Acts, the said Schooner has been duly Enrolled at the Port of Milwaukee.

Given under my Hand and Seal, at the Port of Milwaukee, this 1st day of June in the year one thousand eight hundred and sixty eight. Signed by Latham Stokes, Collector of Customs.

Northern, Northwestern, and North-eastern Frontiers of the United States.

Figure 22: Northerner's final vessel enrollment in 1868 (U.S. Bureau of Navigation).



Figure 23: Nicolas Ronk headstone at St. Mary Cemetery in Lake Church. Photo submitted by David Hirn.

The Ronksville Pier Complex

Based on the record left behind by deeds and tax rolls, the Ronksville pier would have been built sometime between 1858 and 1860. Ronksville, in the form of a pier and support complex, appears on the 1866/1877 chart of Lake Michigan (USCOE v1866/1877). The 1873 terrestrial plat map includes neither pier nor place name but does reveal the presence of side-by-side structures, one on each side of the brother's property line and potentially representing the Nicholas and Paul Ronk family homes (see Figure 18) (OCHS 1994). These structures are located on the upper lake terrace, overlooking Lake Michigan and well east of what is now Sauk Trail Road. The "forever road" does not appear in recognizable fashion on any of the maps but is visible on the 1937 aerial photograph of the Ronksville area (Figure 24). A discoloration marks the probable location of the upper building on the Nicholas Ronk property, by then no longer extant.

The 1866/1877 navigational chart provides the fullest picture of Ronksville (see Figure 17). As noted, the chart shows a single structure on the summit of the ancient shoreline bluff. A line of smaller additional structures extended eastward along the former boundary between the Nicholas and Paul Ronk properties to a pier, marking the course of the "forever road" to the lakeshore. A single, larger structure is shown just north of this line at the foot of the lake.

When the 1873 plat map and 1866/1877 maritime chart are geo-referenced to modern features, two potential locations for the pier emerge (Figure 25). The first, based on the 1873 plat map, situates the pier at the end of the "forever road" on the line between the former Nicholas and Paul Ronk properties, within the beachfront of 6868 Jay Road Beach South. The navigational chart, on the other hand, depicts the pier slightly to the south at 6842 Jay Road Beach South, with associated structures sited along the line between 6842 and 6852 Jay Road Beach South and on the line between 6852 and 6868 Jay Road Beach South. The sole building shown on the upper lake terrace on the 1866/1877 maritime chart falls at the location where the potential Paul Ronk residence is shown on the 1873 plat map (OCHS 1994).

This southerly location, however, seems improbable. The pier was more likely to have been built in line with the "forever road" at the junction of the Ronk brother's properties. When the pier and associated structures shown on the 1866/1877 maritime chart are shifted northwards to the property line, the structure on the higher lake terrace on the 1866/1877 chart relocates to the position of the structure on the Nicholas Ronk parcel.

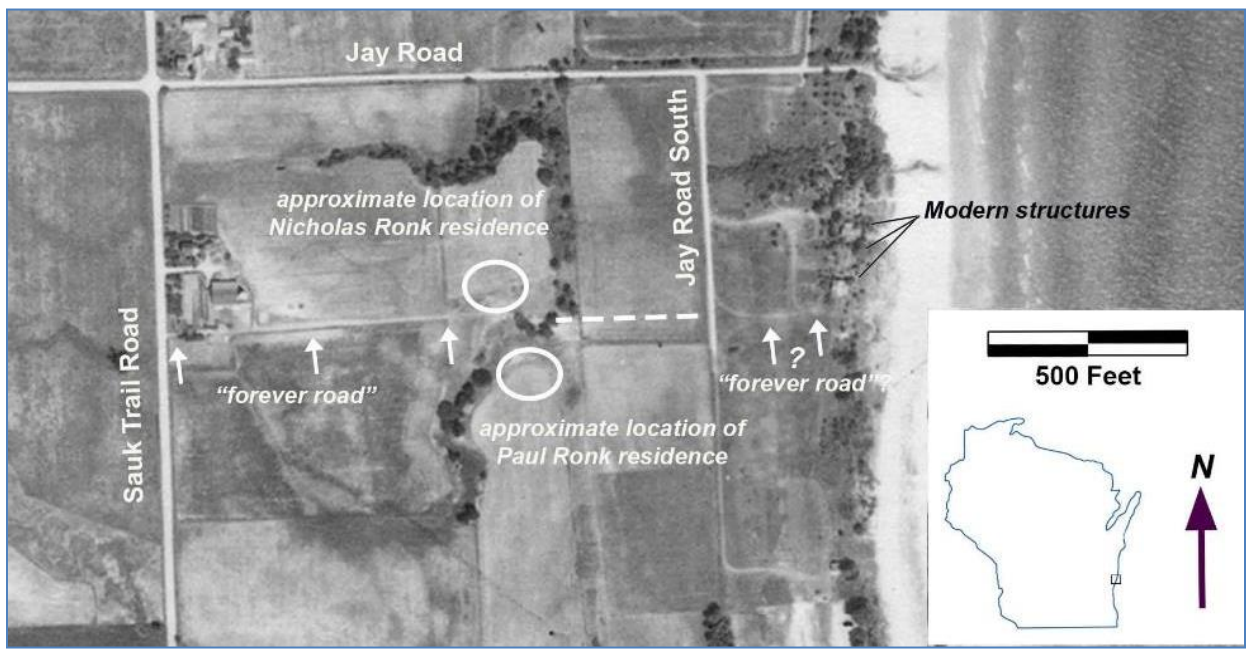


Figure 24: 1937 aerial photograph of the Ronksville area, showing the line of the “forever road” linking Ronksville to Sauk Trail Road. The “forever road” is clearly visible between Sauk Trail Road and the Ronk residences, and another section nearer the lake may be visible, though repurposed as a driveway to newer homes along the lakeshore.



Figure 25: Georeferenced features as depicted on 1873 plat map (yellow) and 1877 maritime chart (green) superimposed on modern aerial photo. Modern property lines are shown in red. The 1873 shoreline is depicted as well, as darker brown shading offshore.

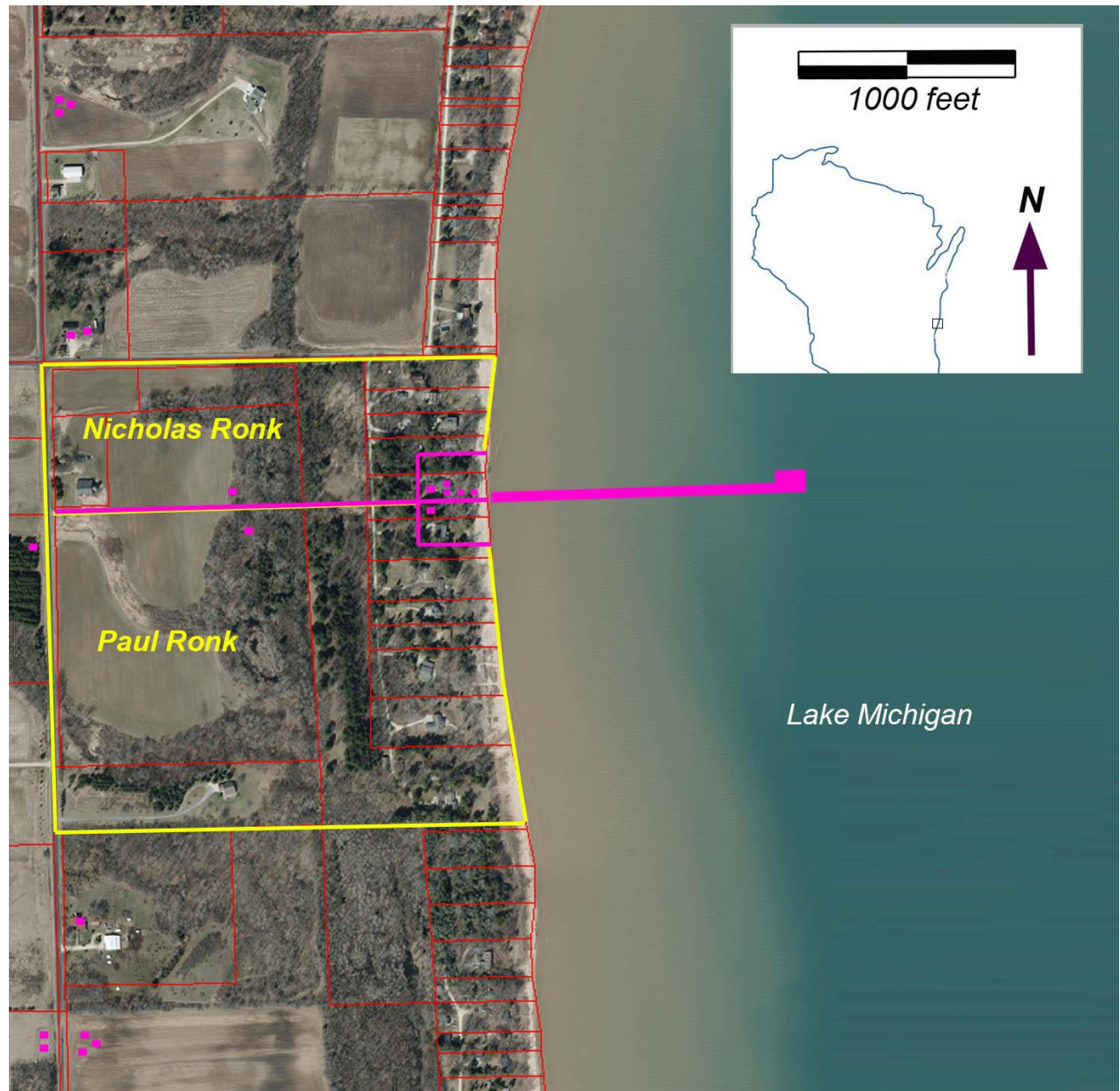


Figure 26: Hypothesized layout of Ronksville pier support complex and environs, based on a georeferenced hybrid of the 1873 plat map, deeds, and 1866/1877 chart. Ca. 1866/1877 structures shown in pink.

The remaining structures relocate to the former Nicholas Ronk property, in a line across the current lake terrace to the shore. When the georeferenced positions of the structures are compared to the dimensions of the shoreline lots owned by the pier company, however, they extend well west of the pier company’s property. This phenomenon also hints that the 1866/1877 chart was not precise. A hypothesized layout for the pier and its support features, taking into account the shift northward and containment within the pier company property is presented in Figure 26.

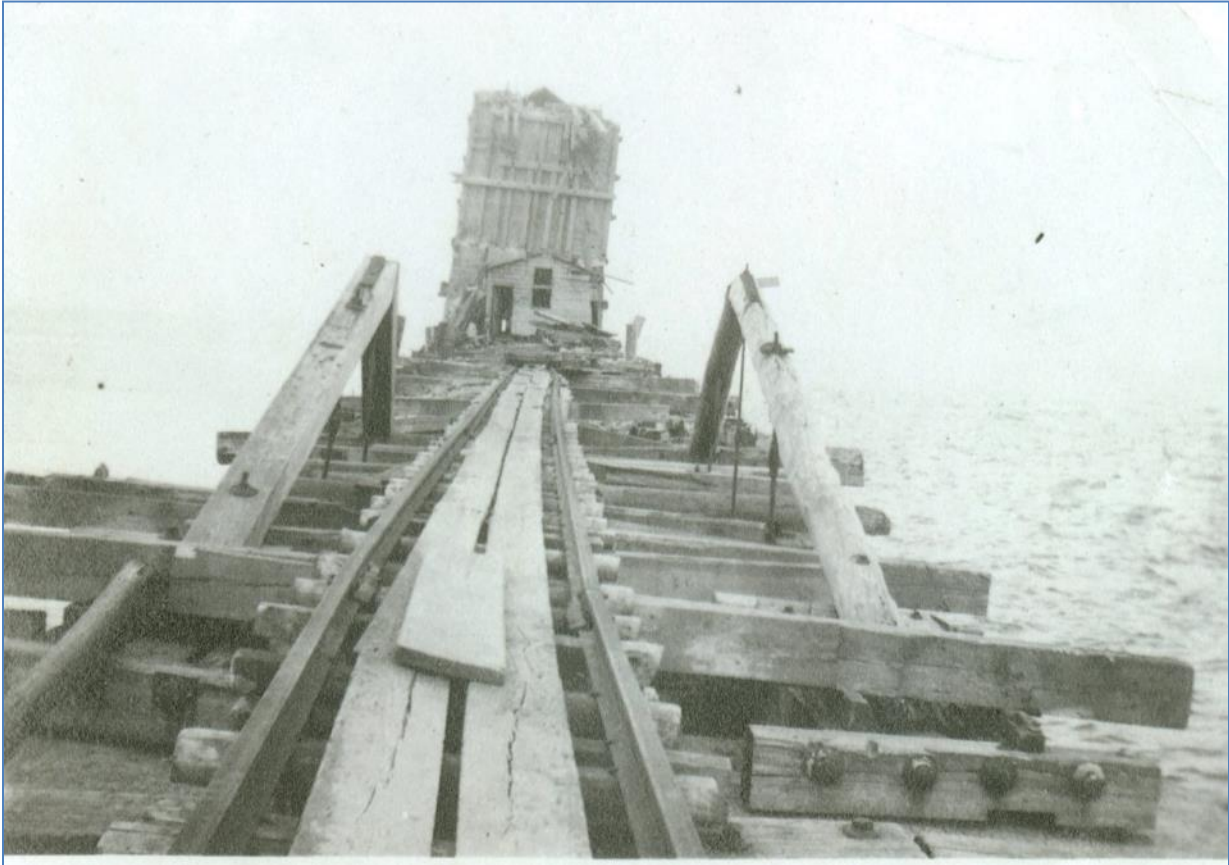


Figure 27: Ronksville pier, with rail system, truss, and buildings at the lake terminus of the pier readily visible. What may be cordwood or lumber is stacked near the frame building. Date of photo unknown. Photo submitted by David Hirn.

The 1866/1877 maritime chart depicts the pier as long (approximately 700-800 feet), extending into deeper water, with an L-shaped terminus and a structure at its far end. These features are corroborated by Scott's Coastal Pilot Guide, which describes the pier as extending into deep water (Scott 1892:184), and by a historic photo of the pier that clearly shows it to be of substantial construction and size, with a large building at its end (Figure 27). A second photo, which includes the Ronk brothers and some employees, shows a truss superstructure at the end of the pier rather than the building depicted in the first photo (Figure 28).

The Ronk brothers would have used their pier to transfer goods to Milwaukee and Chicago, and to import city goods to Paul Ronk's businesses in Lake Church. Family lore obtained from Jonathan Ronk suggests that the Ronks might also have owned a blacksmith shop in the nearby village of Belgium. Census records specifically identify the Ronk brothers as dealers in cut wood. Newspaper accounts of the Northerner's activity and the cargo still in her sunken hold testify to the shipping of cordwood to the Milwaukee market. Given that the brothers reserved the right to cut timber along the shoreline on Luxemburger Pier Company holdings, it is clear that they were involved in



Figure 28: Ronksville pier, with Ronk brothers (foreground) and workers (background). Truss system is present rather than the building that appears in Figure 27. Railcar and rail system readily apparent. Date of photo unknown. Photo submitted by Jonathan Ronk.

the lumber industry in some fashion. However, the *Northerner* did not pick up her final cargo at Ronksville.

A 1939 newspaper article about Wisconsin ghost towns specifically identifies Ronksville, along with nearby Amsterdam, as supported by the “shook” industry—bundled sets of staves or other pieces ready to be assembled into barrels, boxes, or other items. If true, this assertion raises significant questions concerning which facilities might have been present in Ronksville apart from the pier. Shook, as a shaped wood product, required planing and milling, and there are no records suggesting that the Ronk brothers owned or operated a mill. Furthermore, involvement with shook invokes the name of the enterprising Barnum Blake yet again.

Blake owned the piers on either side of Ronksville, at Amsterdam and Blakesville, as well as his own pier, a general store, an entire commercial block, and grain elevators in Port Washington (Anonymous 1965:46). His son—later operator of the Blakesville pier—continued in the lumber trade as well, and inherited or constructed warehouses, lumber

yards, and stores in Port Washington (Western Historical Company 1881). Most importantly, one of Barnum Blake's first ventures upon arriving in Port Washington was to establish a shook factory (Anonymous 1965:46). It was Blake who had sold the Ronk brothers the land upon which they built the pier.

A 1965 history of the early years of Ozaukee County, in one of the extremely rare mentions of the Ronksville pier, simply notes that it was "one of the more well-known in the area" and then states that "...Much trading was conducted at Blake's pier in the southeastern corner of Belgium, creating some rivalry" (Anonymous 1965:85). A number of possibilities emerge, when the situation is examined. It may be that the 1939 article confused Ronksville with Blakesville, given their proximity and interconnections. Ronksville might have produced only rough pieces destined for the shook industry, with planing and shaping completed elsewhere after shipping. Perhaps one of the buildings at the pier complex was a small cooperage or mill. It may also be that the Ronks and Blakes were not as much rivals as the 1965 history made them out to be, partnering in the lumber and shook trades, and that Ronksville supplied Blake's mill in Port Washington.

It is certain that whatever timber items the Ronks dealt in, the pier complex was a nexus for more than wood products. As noted, Paul Ronk's commercial enterprises needed supplying, and difficulty obtaining goods in a timely fashion sparked construction of the pier in the first place. Some idea of which products may have been moving through Ronksville, and by extension the neighboring piers at Amsterdam and Blakesville, may be gained by investigating items moving into and out of Port Washington's harbor in 1879.

Imports—obtained no doubt from Lake Michigan pier communities—are dominated by timber products: 5.2 million board feet of lumber, one million lath, six million shingles, and 378 cords of tanning bark. Port Washington also took in large amounts of grain, agricultural machinery, plaster, fuel, and general merchandise. Exports were dominated by agricultural products, most processed in some fashion: beer, butter, cheese, cattle, eggs, flour, hay, malt, oats, pork, wheat, and wool (Western Historical Company 1881). Most of these items were likely shipped to Milwaukee, Chicago, Detroit and points east. Similar products also might have shipped directly from the lumber piers (e.g., beer from the Kraus Brewery at Centerville). The 1965 history of Ozaukee County generally notes that the southern Lake Michigan piers exchanged cheese, wild turkey, and "other commodities" for "necessary supplies" (Anonymous 1965:85)

The pier would have required a support complex, in order to function as a shipping entrepôt. While no specific description of the Ronksville complex exists, its existence is confirmed by the 1866/1877 coastal chart (USCOE 1866/1877) and supported by accounts of other Lake Michigan pier communities (Boyd, Leitz, and Weimer 2020). At minimum, the complex would have needed storage buildings and lumber yards, as well as a boarding house or residences for pier workers. Storage facilities might have been located on the lake terrace, beach, or on the pier itself. Well-supported pier complexes documented elsewhere boasted their own mills, blacksmith shops, ice houses, and cooperages. The very best enticed workers, sailors, and travelers with taverns, dance halls, hotels, and other amenities. Just which facilities Ronksville possessed is currently

unknown, though it seems likely that the Ronksville complex ranked among the smaller-scale shipping facilities.

The purchase of the *Northerner* would have enhanced the ability of the Ronksville complex to ship goods and given the Ronk brothers more flexibility in commercial ventures. The loss of the vessel in 1868 likely was a blow. The *Northerner's* last voyage, however, reveals a story in which Ronksville is lacking. The *Northerner* had docked not at Ronksville to take on cargo, but further north at Amsterdam. While being loaded with cordwood, she struck bottom, and got underway with an undiscovered leak. Her Captain sailed past Ronksville (whether before or after noticing the leak is unclear), put in at Port Washington, offloaded her deck cargo, and then had her towed towards her registered port at Milwaukee. She never made it, capsizing off Port Ulaio instead (*Milwaukee Sentinel* 1868). Ronksville's facilities, though important to her owners, were not sufficient to provide her a registered port nor facilities for repair.

Records of the U.S. Life Saving Service indicate that a vessel stranded at the Ronksville pier in 1874, confirming that vessels continued to visit for some years afterwards (U. S. Treasury 1876: 949). The appearance of the pier in Scott's Coast Pilot guide hints that the pier remained in use—or at the very least standing—for at least a couple of years after Nicholas Ronk's death. By then, the land surrounding the pier was owned by Nicholas Ronk's daughter-in-law Mary and the lumbering industry had largely died out in southeastern Wisconsin. The Blake facilities not located at Port Washington had shuttered as well. Amsterdam continued its involvement in the fishing industry after its mill shut down but found its remaining income stream insufficient and its residents and workers dispersed (Buchen 1945; *Hammond Times* 1939:59). The pier at Blakesville burned and was never rebuilt (*Ahnapee Record*, March 3, 1881).

In the end, the fate of Ronksville was likely the same as that of the other ghost ports: income from the operation of the pier facility was inadequate to maintain it in good working order. As ice, wind, and waves worked to dismantle the pier, the continual cost of keeping it in service became untenable. Railroads were able to move goods quickly and efficiently year-round and overland transport emerged as the most attractive option for commercial trade. The forests and fish were gone, the railroad had come, and adjacent communities offered better harbors, infrastructure, and manufacturing capabilities. With few products to offer, and with communities able to import goods cheaper and more reliably overland, Ronksville faded away.

Aerial photos taken in 1937 show no signs of the pier, nor of any structures relating to Ronksville (USDA 1937). A patch of lighter colored soil at the location of the building on the upper terrace on the Nicholas Ronk property indicates it was removed not long prior. Instead, the first of the current lakeside homes were in place, marking a new chapter in the history of this stretch of Lake Michigan shoreline.

Ronksville Pier Survey

Site Identification and Investigation

At the request of the Ronk family descendants, Wisconsin Historical Society archaeologists with Wisconsin's State Archaeology and Maritime Preservation program, in coordination with Dan Joyce of the Kenosha Public Museum and Crossmon Consulting, conducted archival research and survey on land and in the lake in an attempt to relocate any traces of the Ronksville pier. David Hirn and Jonathan Ronk kindly supplied the results of research they had undertaken regarding their family history and the Ronk holdings, and their data were used to outline a survey block extending into the lake from a strip of shoreline south of Jay Road.

In addition to searching for surviving traces of the Ronksville pier, survey was undertaken in order to test the utility of several non-invasive techniques in shoreline environments. Underwater side-scan sonar survey was conducted on July 24, 2019 by Crossmon Consulting, resulting in the identification of several sonar targets. The following day, staff traveled overland to the survey area and met with Dan Joyce, David Hirn, Jonathan Ronk, and other Ronk descendants and family members. Ground penetrating radar (GPR), metal-detector survey, walkover survey, additional sonar survey, and visual examination of sonar targets were completed with their assistance on July 25, 2019. In addition, Society staff spoke to residents of some of the lakeshore lots, revealing that worked timber appeared periodically on the beach following bouts of rough weather.

Shoreline survey culminated in the discovery of worked timbers consistent with 19th century pier construction, north of the original survey block and probable pier location, at the high water mark. This fragment was fully uncovered, measured, photographed, and a 3-D model created using Agisoft Metashape software. Other fragments were reported to have been moved from the adjoining beach to private property south of Jay Road but were not directly observed. Following terrestrial survey, maritime archaeologist Tamara Thomsen dove on the most intriguing sonar targets, disclosing the presence of a line of apparent cribbing ballast extending roughly eastward into Lake Michigan.

Shoreline Survey-Surface Survey and Metal Detector Sweep

Following on-site identification of the likely pier area by David Hirn, walkover survey was conducted along the public beach fronting the modern lakeshore lots, from roughly 6816 Jay Road Beach South northward to a point not far north of the terminus of Jay Road (Figure 29). The walkover area incorporated the likely line of the "forever" road and pier, extending on either side of the former boundary between the Nicholas and Paul Ronk properties. Survey was bounded on the west by the high-water mark and the line between public and private properties and on the east by the active surf line. High water limited the walkable area to a narrow strip less than 10 feet wide in most locations.

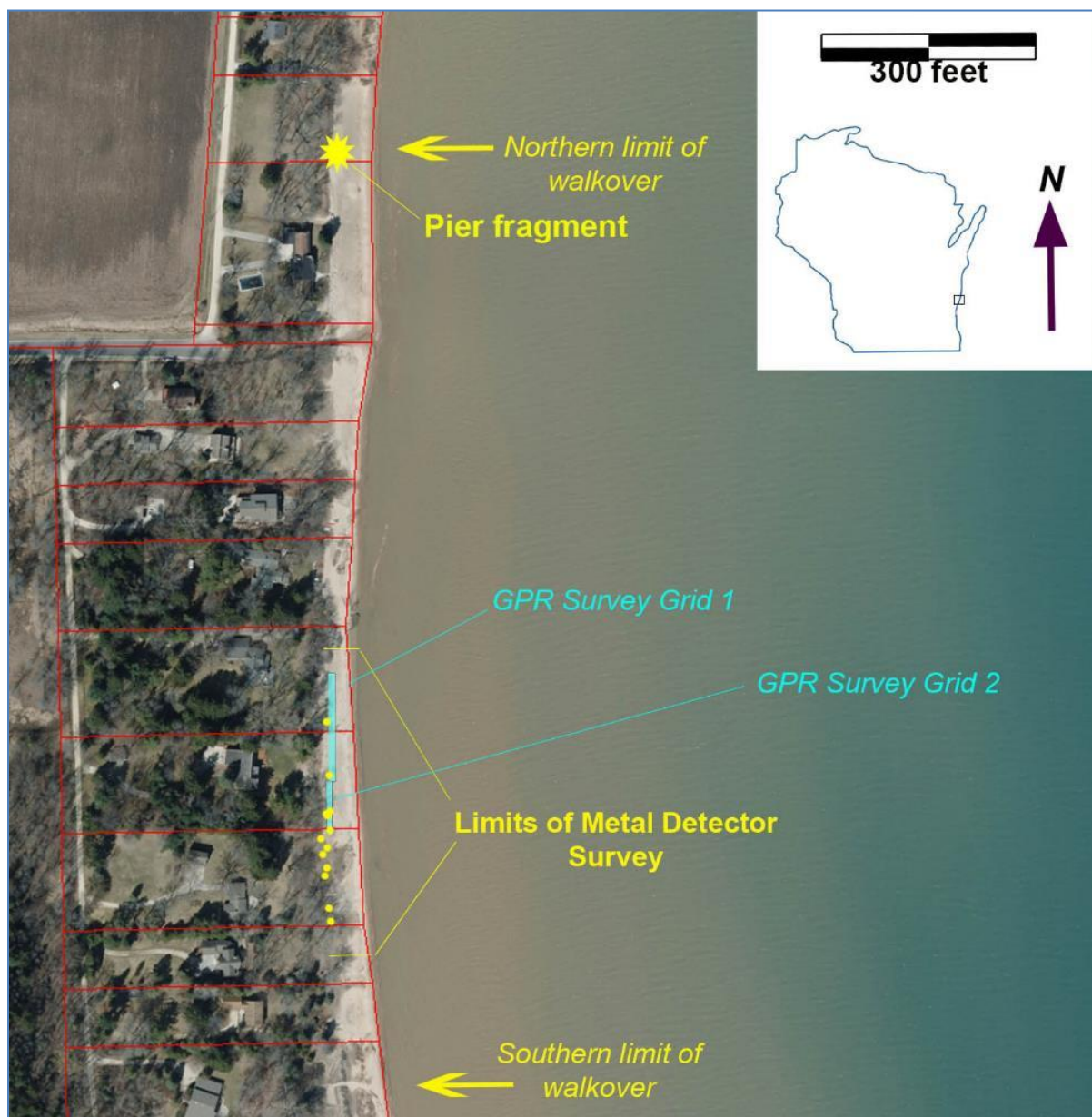


Figure 29: Walkover, metal detector, and GPR survey limits. Metal detector hits are marked with yellow dots. Location of pier fragment at north end of walkover area identified by yellow sunburst symbol. Beach in this aerial photo is considerably wider than it was at the time of the 2019 survey.

Surface survey identified signs of disturbance east of 6868 and 6878 Jay Beach South Road, in the form of rip-rap, a fallen cut-stone retaining wall, and a section of chain link fencing lying in the beach sand. These features are interpreted as the remnants of failing erosion control measures.

Otherwise, surface survey resulted in the identification of a diffuse artifact scatter, characterized by heavy alteration from transport and tumbling. There was a notable lack



Figure 30: Cluster of metal detector hits along beach marked by blue plastic pin flags, photo taken looking south. Note small rock ledge along lake escarpment far lower right.

of recent trash on the beach, suggesting that the beach is either policed for litter or that the adjoining residents have been careful to keep the beach clean. The most abundant artifacts observed were fragments of modern beach glass, some relatively unworn and others tumbled into pebbles. A small fragment of partially rust-encrusted blue and white enamelware was observed as well. The only items potentially dating to the period of historic Ronkville were one piece of very heavily tumbled porcelain and a moderately tumbled horse molar. Given their position in the active storm surge zone of the beach, none of the items can be considered to be *in situ*, and their origins are unknown.

A metal detector sweep using a hand-held unit was conducted simultaneously with the surface survey from the mid-point of the beach adjoining 6868 Jay Beach South Road to a point on the beach at the south line of 6842 Jay Beach South Road. Metal detector survey was not conducted along the beach adjacent to 6878 Jay Beach South Road due to the presence of the aforementioned chain link fencing, nor in the northern portion of the beach adjoining 6868 Jay Beach South Road due to the fallen retaining wall. The positions of all hits were marked with plastic pin flags and recorded using sub-meter accurate GPS (Figures 29, 30). Only a single small hit was recorded adjacent to 6868 Jay Beach South Road. Multiple hits and clusters of hits were noted within a swath of beach east of 6842 and 6852 Jay Beach South Road, at and south of the point where the survey grid crosses the former property boundary and where the 1877 navigational chart places the base of the Ronkville pier. Some of the hits were undoubtedly related



Figure 31: GPR unit and cart sitting at the boundary between GPR Survey Grid 1 and GPR Survey Grid 2, looking northeast.

to the presence of modern metallic debris. It may be notable that lawn chairs and a fire circle were seen at the top of the high water mark on the adjoining private property, within feet of one of the clusters of detector hits. A fragment of melted aluminum was observed on the beach surface at that location. However, other hits along this stretch of shoreline were quite strong and indicative of the presence of larger buried metal items.

*Shoreline Survey-GPR (*see Appendix A)*

Dan Joyce of the Kenosha Public Museum conducted Ground Penetrating Radar (GPR) survey within two sample grids within the survey block (Figure 29, Figure 31). The survey grids were established with fiber tapes and plastic pin flags and transects were set 0.5 meters apart. Data acquisition was completed using a Model 5103 Geophysical Survey Systems, Inc (GSSI) TerraSearch SIR (Subsurface Interface Radar) 3000 single channel unit, manufactured by GSSI. This unit is capable of penetrating to a depth of 3-4 meters bgs and detecting objects of 25 cm or more. The unit and antenna were mounted on a GSSI Model 623 survey cart with survey wheel. Data were processed using GSSI RADAN version 7.0 software and GIMP and images were assembled into a radargram using multiple color palettes, entered into 3-D mode, and examined again for anomalies.

Survey grid 1 measured 3 meters by 56 meters and was placed at what was believed to be the most likely location of the base of the pier, between 6852-6868 Jay Beach Road South. The north end was located at the north end of the stair of 6868 Jay Beach Road South, while the south end was at the south end of the stairs at 6852 Jay Beach Road South. Survey width was limited by high water. GPR investigation of this grid identified strata consistent with reworking of shoreline deposits, with three vertical anomalies identified as probable natural features.

Survey grid 2, of similar dimensions, was positioned immediately south of Survey grid 1 and offset from it by 1.5 meters to the west. This second grid extended along the shore on the south side of 6852 Jay Beach Road South. It encompassed an area where some metal detector hits were obtained. Additional vertical anomalies were noted, but again were interpreted by Dr. Joyce as probable natural features. These anomalies tended to appear in sections of the GPR grids that were periodically wave-washed and could result from saturated soil. Other anomalies in Survey Grid 2 are more enigmatic. Some pinpoint anomalies with significant pre-processing parabola seemed to identify objects within the sand, potentially correlating with metal detector hits. While no obvious pier remnants or historic disturbances were identified, the presence of pier fragments or other items cannot be ruled out.

Further details concerning this portion of the survey may be found in Appendix A of this report, written by Dr. Joyce.

Jay Road North Pier or Cribbing Fragment

As preparations were being made for survey in the weeks ahead of the site visit, landowners reported seeing worked timbers exposed along the beach after storms. While no such timbers were identified within the primary survey area, our attention was called to a new report of a particularly intriguing timber not far north of the terminus of Jay Road, just north of the Nicholas Ronk property line. WHS staff and Dr. Joyce accompanied David Hirn, Jonathan Ronk, and other family members and descendants to that stretch of shoreline, where exposed timbers were observed on the public beach at the base of the low escarpment marking the high water mark. Enough sand was removed from the find location to expose the timbers and allow measurements and photographs to be taken (Figure 32).

The fragment consists of two timbers that are fastened through with iron drift pins (Figure 33). One timber is 0.9 feet square and 13.5 feet long (Figure 34). The second is 0.9 feet thick but the width varies as it is significantly weathered over its exposed edge. The timbers are offset on each end where they were likely scarphed together with additional timbers to extend the overall length of a structure. The drift pins are 0.1 feet square. Four sets of two pins are spaced 2.5 feet apart and used to fasten the timbers together. Each pin set is set in from the exposed face by 0.2 feet.



Figure 32: Pier fragment at the time of its discovery, north of the Jay Road terminus. Left to right, Dr. Dan Joyce of the Kenosha Public Museum, WHS Maritime Archaeologist Tamara Thomsen, and Ronk descendant Mr. David Hirn.

After the fragment was measured, a series of photographs were taken and later rendered into a 3-D model using Agisoft Metashape software. The position of the fragment was recorded using sub-meter GPS. Storms wracked the beach the weekend following the completion of the survey, and shortly afterwards David Hirn reported that the timber was either gone or was at least no longer visible. WHS later received word that the fragment had, in fact, been recovered by the landowner at 175 Jay Road (formerly the northeast corner of the Nicholas Ronk property), who had retrieved similar objects off of the beach in the past. This landowner had communicated to staff on the day of the survey that other timbers had turned up along the beach, and other residents reported seeing worked timber (some potentially shipwreck-derived) on the beach at or near 6814 Jay Road Beach South, near the southern limits of the Ronk holdings. If these timbers all represent fragments of the Ronksville pier, they have been scattered a considerable distance both up and down-shore from the pier location.

Side-Scan and Diving Results

Prior to initiation of survey, the 1866/1877 nautical chart and property deeds were used to define the most appropriate offshore survey area (Figure 4, Figure 35). The boundaries of the survey area were set at a point just offshore, extending out approximately 1,600 feet

into Lake Michigan. The northern survey boundary was coincident with the north line of the first private lot north of Jay Road, a short distance north of the former extent of the Ronk properties (and just south of the cribbing fragment previously described). The southern boundary was coincident with the south line of 6814 Jay Road Beach South, which marks the south line of Government Lot 1. The maritime survey grid thus encompasses the off-shore sections of all of the Nicholas Ronk property and most of the off-shore section of the Paul Ronk property, and certainly encloses the area of the pier. The lake bottom in this region is recorded on the 1866/1877 nautical chart as sand and clay.



Figure 33: Detail of drift pins on exposed pier fragment.

Crossmon Consulting, LLC, conducted a bottom survey of the area. Using a transom-mounted Lowrance Generation 3, 455 kHz Sonar, a total of twenty-four overlapping side-scan sonar passes were completed within the off-shore survey boundary. Sixty feet of bottom was surveyed on either side of the boat per pass. The bottom topography of the area is predominately flat sand bottom. Bottom anomalies were marked. As a target of interest was passed over, the screen would show a bright sonar return, which is an indication of a hard target of rock or steel. Marks were placed where the coloration change began and where it ended along each pass to define areas of interest.

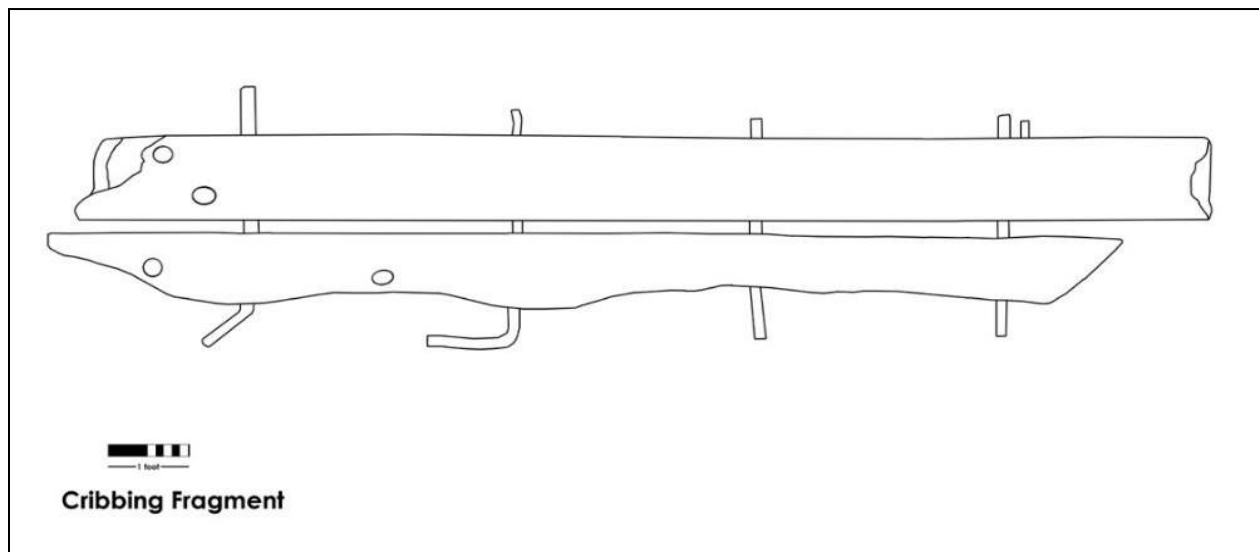


Figure 34: Plan view of pier fragment located north of the Jay Road terminus.

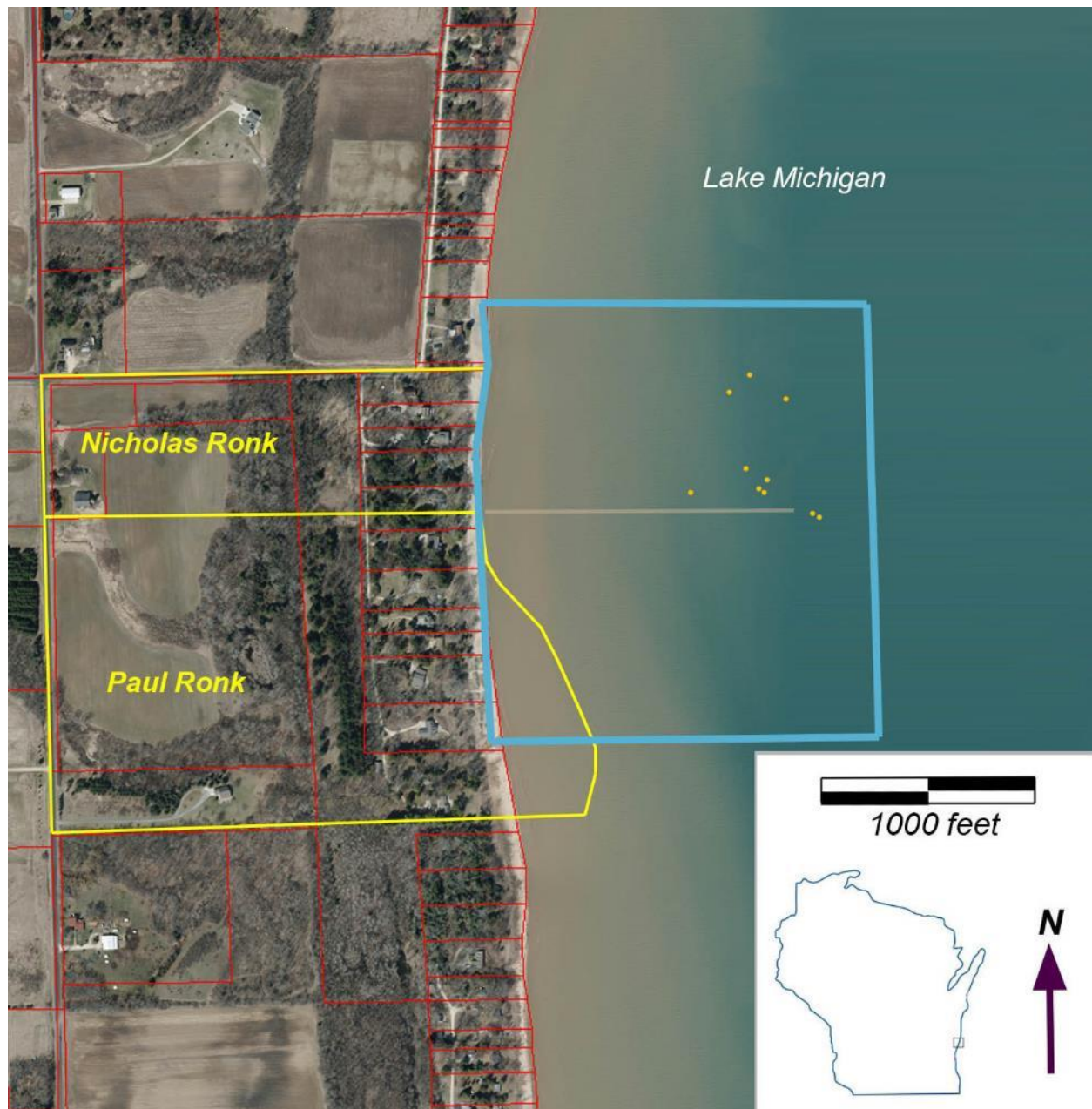


Figure 35: Offshore survey results, showing limits of survey area (blue box) and sonar anomalies (yellow dots). Hypothesized pier line based on deeds/property boundaries depicted as tan line. Southernmost anomalies are all in deeper water and roughly fall along the hypothesized pier line.

After the sonar survey was complete, locational data from the targets was transferred to a Hummingbird side-scan sonar and bottom finder on the Society's research vessel. A diver visually examined each data point. Although some of the targets proved to be glacial erratics or other natural items, a swath of angular stone extends from the shoreline east into the lake and makes a loose L-shape. Wood fragments were found within the stone swath, but nothing indicated definitively that they represented surviving pier cribbing. If cribbing structures were removed or damaged by storm or by ice, the rocks inside the

cribs would have fallen out and could have conceivably formed this feature on the otherwise flat sand bottom.

Scott's Coast Pilot Guide (1892:184) characterizes the Ronksville pier as a pile pier. The two available photographs of the completed pier (Figures 27 and 28) do not show the pier's understructures—only the decking, deck structures, and marine rail. Period photographs of one of the Centerville piers (see Figure 10) seem to depict a pile pier, but horizontal features just above the waterline in the distance (and in deeper water) may represent the tops of cribs. The only specific account of construction at Blakesville mentions the loss of a pile driver, used to drive pier posts into the lake bottom (*Ahnapee Record*, March 3, 1881). Investigations of pier sites in Door County, where pier builders had to contend with more rock, has identified pier stubs on the beach at Clay Banks and some sort of foundation structure just offshore at Foscoro, but no clear evidence of cribbing, which would again have been of more use further offshore (Boyd, Leitz, and Weimer 2020).

Photographs displayed in the Lake Church Tavern, once owned by Paul Ronk, record pier cribbing under construction (Figure 36). These photos have long been believed to depict work on the Ronksville pier. If so, the photos confirm that cribbing was utilized in the construction of the Ronksville pier, which would explain the offshore discoveries made in 2019. The rock located on the bottom offshore of Jay Beach Road South is angular (i.e., not glacial in origin) and consistent with large grade fill stone used in pier cribs. Although none of the outer crib structures remain, given the century and a half between the survey and the last use of the pier, even deeply submerged structures would likely have suffered considerable damage from storms and winter ice. It was, in fact, typical for lake piers to sustain damage and be repaired many times over their lifespans.

The available photos of the Ronksville pier suggest that it had a similar history of rebuilding and repair. One photo shows an extensive truss system at the pier terminus. Another shows a multi-story and somewhat haphazardly built structure and a smaller frame building in the same location. Given the constant blows of weather-related damage—and the changing needs of the Luxemburger Pier Company and its workers—the Ronksville pier would have been built and rebuilt as needed, so long as funds were available and the owners of the Luxemburger Pier Company were willing to invest in it.

The remnant piece that was discovered on the beach is not consistent with logs used for submerged crib structures, nor with pilings, nor with onshore support buildings. This fragment, based on its morphology and method of construction, was likely from the deck structure of the pier. While similar fragments are said to have been collected on private property on the former Nicholas Ronk holdings, the fragment recorded in 2019 remains the only piece to date that can be assigned with any confidence to some version of the Ronksville pier.



Figure 36: Pier cribs and workers, possibly recording construction of an iteration of the Ronksville pier. Photo provided by the Lake Church Tavern.

Ronksville in Context: Lake Pier Communities and Directions for Future Research

Pier Communities and Cultural Landscapes

Ronksville represents a poorly-known cultural resource type in Wisconsin, and one that has not been approached in a holistic manner. Most archaeological studies of pier sites approach them as maritime resources within maritime cultural landscapes—features peripheral to submerged resources found within the lake and site types investigated preferentially through underwater survey. However, Wisconsin SHPO staff have in recent years begun to recognize a fuller spectrum of terrestrial resource types associated with “maritime” landscapes, such as ore docks, quarries, lighthouses, warehouses, industrial structures, and rail shipping features (Penkiunas 2018). The Wisconsin Historical Society’s State Archaeology and Maritime Preservation Program has focused in particular on the integration of land and lake through exploration of pier and dock sites associated with stone quarries in the Apostle Islands of Lake Superior (Thomsen and Zant 2014). SAAMP’s Apostle Island surveys added the results of new off-shore survey to prior documentation of on-shore resources, allowing the quarry sites to be considered in their entirety for the first time. This integrated approach was pursued, at least in part, at Ronksville, though much additional work is needed to better understand areas further inland from the modern shoreline.

Both current and future investigations of Ronk's pier are best served by placing the pier complex in its own cultural landscape, emphasizing its functional and social role in the patterns of Wisconsin's late 19th century history. But is a maritime landscape the best fit for Ronk's Pier? The National Park Service provides guidelines for the delineation and evaluation of such cultural landscapes (NPS 1999), and while their framework does not conform easily to the landscape revealed by this study, it does at least provide a starting point for discussion and exploration. NPS guidelines divide rural cultural landscapes into a number of landscape types. Deeper investigation of those landscapes is facilitated by consideration and documentation of four processes (land use/activities, patterns of spatial organization, response to the natural environment, and cultural traditions) and seven physical components (circulation networks, boundary demarcations, vegetation related to land use, buildings/structures/objects, clusters of features, archaeological sites, and small-scale elements).

In practice, Ronksville, and its associated landscape do not fit neatly into the NPS typology. Ronksville's landscape, shared by other ghost ports along this stretch of the lakeshore, evolved over time and encompassed multiple NPS landscape types simultaneously (maritime, agriculture, industry, and transportation). Ronksville and its fellow pier complexes instead represent a "coastal" landscape that emerged synergistically with Euro-American settlement of the region and enfolded other landscape types. Nevertheless, the following discussion is roughly framed around the landscape types, processes, and components described above.

Landscape Type

Though maritime cultural landscapes specifically include terrestrial components such as piers, terrestrial features that are truly part of maritime landscapes consist of submerged resources that were formerly terrestrial in nature (e.g., stone hunting blinds and village sites predating the rise to current lake levels) or are currently exposed to the air but primarily maritime-facing (e.g., shell middens, fishing communities, lighthouses). The stone quarries investigated by SAAMP fall within this category. Though terrestrial resources, they existed within a system that functioned to move shoreline stone directly into maritime transportation and trade. They were places where maritime commerce touched the coast lightly.

While the piers of mid- to southern Lake Michigan functioned within the realm of maritime commerce and trade, they also looked inland and served inland concerns. A more holistic approach recognizes that ghost ports like Ronksville existed within a series of nested, overlapping, intricately connected, and co-dependent circulation systems that transported raw materials, manufactured goods, labor, wealth, and innovation throughout the Upper Midwest and Great Lakes. Piers initially were built to solve a specific physical transportation problem—how to move items from shore to lake and vice versa, given the realities of contemporary ship construction and shoreline configurations, and thus served as crucial parts of a transportation network with a strong maritime component. However, pier communities were also mechanisms within the settlement and capitalist systems, facilitating Euro-American territorial expansion and the transformation of available

agricultural and natural commodities into cash for owners and workers in an industrializing society.

Rather than dissecting pier sites and their associated landscapes into the four closest NPS analogues (maritime, transportation, agriculture, industrial), it is best to envision pier complexes as lynchpins within a single “coastal” cultural landscape. Coastal cultural landscapes, in contrast to Maritime landscapes, are those created by human activities requiring both land and lake. They are affected as much by terrestrial resources and needs as maritime ones. Particular resources within the terrestrial “half” of such landscapes are capable of functioning without the other ‘half’ of the system, by re-orienting towards different transportation networks, commodities, or human populations. Resources within the “maritime” half, however, are dependent upon the terrestrial “half” to function well. When the two decouple, the landscape ceases to exist.

Wisconsin’s “coastal” landscape, in existence within the temporal window between initial Euro-American settlement and dominance of the railroad along Wisconsin’s Great Lakes coastlines, was one characterized by movement, commerce, opportunity, and change in constant opposition to destructive natural forces. It arose from a “lake effect,” whereby the lake provided particular efficiencies and opportunities to human populations within Wisconsin’s Lake counties, accelerating regional economic and social development at a faster pace than would otherwise have been likely. At the same time, the lake, with its storms and ice, continually endangered the existence of the same landscape it fostered.

Processes—Evolution of Wisconsin’s Ghost Ports

The life cycles of the ghost ports were influenced by factors particular to their natural and social settings, and controlled by the evolution of the cultural landscapes in which they functioned. These factors, which NPS divides into land use/activities, patterns of spatial organization, response to the natural environment, and cultural traditions, are difficult to disentangle, as all worked synergistically to direct the course of each port’s evolution. Human response to the natural environment was likely the most prominent process, constraining how land could be used and in which manner, and in turn affecting how cultural landscapes were spatially organized. Additionally, the coastal landscapes that developed around the ports did not spring to life in unoccupied environments. Their development was affected—sometimes drastically—by the pre-existing *human* environment in which they emerged.

The ghost ports of the Lake Michigan shoreline of Wisconsin followed historical trajectories peculiar to their geographic setting and the natural resources available to them. Along the northwestern Lake Michigan shoreline north of Two Rivers, Wisconsin, communities coalesced around piers and mills where rough timber products (and later milled products) were moved onto lake-going ships. Their cultural landscape primarily was maritime/industrial. The hinterlands of the northern pier communities had few to no roads and the railroad did not arrive in the area until after most timber was gone. Furthermore, poor soils, heavy timber, harsher climates, and longer distances from ports where settlers disembarked, prevented a strong and diversified agricultural landscape

with its associated farmsteads and farming communities from forming until quite late in the region's history (Boyd, Leitz, and Weimer 2020).

Settlement and commerce accordingly clustered around the pier complexes, forming true lakeshore towns with stores, chandleries, mills, cooperages, blacksmith shops, other commercial businesses, hotels, schools, taverns, telegraph offices, and dance halls. The northern pier communities functioned within the maritime landscape by providing ports of call and even repair facilities for passing ships, and within the industrial landscape by hosting mills and other manufacturing facilities. Timber, however, was their life stream, and once the timber was extracted the northern pier communities' days were numbered. Though some pier towns managed to subsist for a time on other extracted products—mainly hay grown on the cutover lands and fish—income streams were neither large enough nor steady enough to sufficiently fund pier upkeep. The loss of the piers decoupled the northern pier towns from the maritime landscape and sounded their death knells (Boyd, Leitz, and Weimer 2020).

In the south, where soils were fertile, natural resources like limestone, clay, and fish were abundant in addition to timber, and settlers were both nearby and eager to put down stakes, pier communities developed along different lines (Figure 37). The earliest settlers, establishing mills and farms inland, formed nuclei for pre-pier communities. Federal investment at select locations with a congruence of desirable natural resources created harbor facilities that could not be duplicated through private investment alone (though Port Washington managed to attract Federal investment through strenuous early efforts). Roads were established throughout the region at an early date, at first following Native trail networks and later expanding to connect newborn urban centers and Federal harbors to each other and to the earliest inland settlements and farms. The southern pier communities thus emerged within kinder and gentler natural landscapes, but also within the confinements of pre-existing human landscapes.

Initially constructed to fulfill the particular needs of Euro-American commerce and settlement—whether those needs were a way to get settlers to their new land holdings, more efficiently import needed manpower and supplies, or capitalize on the presence of salable commodities—pier communities and their surrounding coastal landscapes evolved over time as circumstances demanded. Though described as lumber piers, and certainly funded by income available during the lumber boom, the lake piers between Milwaukee and Two Rivers served a more diversified and deeper hinterland from the beginning. Early in the area's development, poor roads spurred entrepreneurs such as Barnum Blake and the Ronk brothers to establish piers in areas too far from the Federal ports to be efficiently served by them. A variety of goods were brought in by ship to supply newly-established farms and agricultural communities, in exchange for a variety of locally-produced products. So long as timber was plentiful, timber was the main

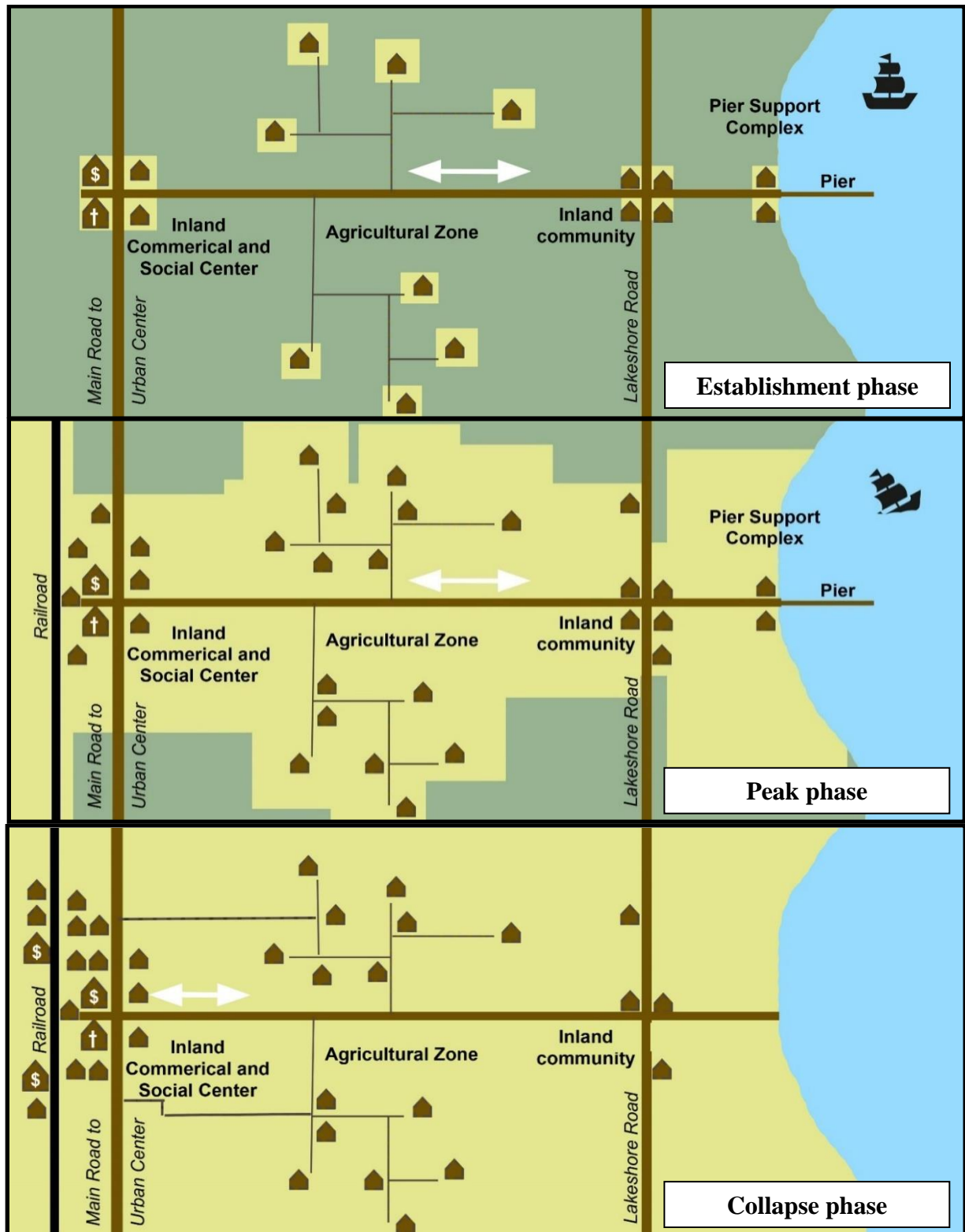


Figure 37: Idealized evolutionary trajectory of southwestern Lake Michigan coastal landscapes, from establishment to coastal landscape collapse.

export. Historic records however, confirm that many other products moved through pier communities.

Most ports—Norheim, Centerville, McCrea’s pier, the Peterson/Wilson pier, Amsterdam, Ronksville, Blakesville, and Port Ulao specifically—are known to have exported cord wood and at least roughly shaped timber products (Anonymous 1965; Cowan 1985; Dippel 2018; Ertel 1976; Falge 1912:327; *Hammond Times* 1939; Pape 1993; Zaun 1965; Ziller 1912:246). In addition, Centerville exported grain and beer (Erel 1976; Falge 1912) and Barnum Blake traded in grain, which may have been shipped out from farms he had cleared, and sold via his piers at Amsterdam and Blakesville (Anonymous 1965). Brickyards are mentioned in connection with McCrea’s pier (Pape 1993) and Kemper’s pier (*Manitowoc Herald* 1855; *Watertown News* 1876). Fish was exported in bulk from the Peterson/Wilson pier (Cowan 1985; Dippel 2018) and Amsterdam (Buchen 1945; Ziller 1912:246). It seems unlikely that the Ronksville complex, alone among its brethren, failed to capitalize on the income that could be made from shipping non-timber products.

The early development of inland transportation and agricultural systems drew the centers of gravity of settlement away from the lakeshore. Whereas the hinterlands of the northern ports consisted of hayfields on cut-over ground, ephemeral logging camps, and the lumber, mosquito, and fishing fleets, the supply and customer base for southern pier complexes included full-fledged transportation networks, agricultural communities with commercial and social institutions, a more active maritime landscape, and nearby industrial and urban centers. There was no need for the development of compact port towns. Instead, pier facilities such as Ronksville served as transfer points—stripped-down nodes where maritime networks linked into terrestrial systems in a way that benefitted both the local population and investors/owners.

On the human side of the equation, the establishment of earlier inland settlements and the Federal harbors provided the basic framework guiding subsequent port development. Smaller ports like Ronksville sprang up at regular intervals where the needs of inland communities and extraction zones outweighed the chance of competition with the better-equipped Federal harbors. Without recourse to the scant protection offered by river mouths, with no Federal investment, and with access to second-tier overland transportation (and no direct links to railroads), the operators of smaller pier facilities found niches of opportunity where and when they could. Ronksville was founded to serve Lake Church and environs, Blakesville to move items to and from Port Washington, and McCrea’s pier was a likely satellite of Sheboygan.

Small support complexes were established near the piers themselves, including warehouses, storage yards, and other facilities. These complexes, in turn, drew workers and support personnel from small villages established inland at the nearest major crossroad, while importing and exporting goods to and from older communities further inland and Federal harbors up and down the coastline. Feeder roads linked the piers to their hinterlands, funneling timber to the lake and settlers inland. As timber was removed,

farms were established and full-fledged agricultural and commercial systems emerged. Fisheries were set up off shore. The extraction zones for each southern pier complex were thus expansive, well populated, and diverse.

On the maritime side, ports of all sizes were linked to each other by Lake Michigan's "mosquito fleet"—small vessels that moved from port to port, pier to pier, transporting goods from their points of origin to where they were wanted and needed. Some of the vessels in the fleet, such as the *Northerner* or the *E.R. Blake* (owned by Barnum Blake and named for his son) were owned by pier operators, comprising the most obvious lake-going components of the pier's specific circulation networks.

Landscape Components – Defining Pier Communities

The dispersed nature of the cultural landscapes of the southern ghost ports raises the question of just how such southern port communities should be defined. Though the names of many ghost ports (*Ronksville*, *Blakesville*, *Yorkville*, *Linzville*, *Nordheim*) suggest the presence of villages similar to those in northwestern Wisconsin at the Federal harbors, historic maps fail to confirm the existence of compact village-type communities (apart from Centerville, which boasted a formal street grid and diversified commercial base early on). If Ronksville was not a discrete village with a typical array of residential, commercial, and manufacturing structures, what was it?

A case could be made that "Ronksville," as a dispersed community, incorporated the entire northeastern quadrant of the Town of Belgium—including all of the Ronk holdings, the interior social, commercial, and residential centers at Lake Church and Belgium supplied by the pier, and the agricultural production areas that shipped produce to it. Each component of the overlapping circulation networks contributed to the pier's operation and supported individuals who benefited from it, sent goods to it, received goods from it, and who may have invested income in its upkeep. The "community," from this point of view, was composed of all local residents who utilized the pier or benefitted from its operation. The pier was the literal bridge that extended the economic "lake effect" onto land, facilitating rapid development in the region.

The cultural landscape of Ronksville thus includes many surviving components. The circulation network of which the Ronksville pier complex was a part included the "forever road" and other roads linking the pier to Lake Church, other Ronk properties, and surrounding farmstead. Boundary demarcations may be observed wherever fence lines and other property markers preserve farm and field boundaries established in the northeastern portions of the Town of Belgium between 1858 and 1884. Vegetation and cropping practices in the region have changed drastically since the time of Ronksville, but relict stands of timber exist in some rugged patches of ground, and gardens and fruit trees may preserve some heirloom crops.

Standing buildings that formed components with the Ronksville coastal landscape include, of course, the Lake Church tavern, church, and other structures owned by or frequented by the Ronk brothers. Farmstead buildings from this era survive in multiple

locations. Lake Church itself may be identified as a “cluster” according to the NPS guidelines. Archaeological sites include Ronk’s pier itself, any surviving traces of the support complex or Ronk cabins, the wreck of the *Northerner*, and period cemeteries (including the graves of the Ronk family). Small scale elements may consist of items lost off of lake-going vessels and timbers removed from the beach by local residents.

Becoming Ghosts

Survival of the fittest ensured that not all piers endured. Some pier complexes struggled with disadvantages from the beginning. Kemper’s pier, notably, proved to be situated in an extremely unsuitable place, the ground literally giving way beneath its onshore holdings (*Watertown News* 1876). Scott’s Coastal Pilot guide warned navigators of “many shoals and rocky spots...particularly in the vicinity of Yorkville and Centerville” (Scott 1892:185). Other communities (e.g., Sheboygan, Port Washington, etc.) that were able to capture Federal investment drew in greater volumes of shipping attracted to well-funded ports with abundant storage and manufacturing facilities. Centerville was on the verge of taking that path to survival via private funding when the fire at the Kraus Brewery doomed attempts to improve its harborage (Ertel 1976).

The first obstacle faced by those pier communities not doomed by fire or natural disaster was the collapse of the local lumbering trade. As noted, some pier operators took advantage of their situations within the coastal landscape by making do with income derived from the fishing trade (which collapsed in its own turn) and terrestrial-based industries. By then, however, the railroad had arrived, competing for goods and customers. Running northwards from Milwaukee to Green Bay, the railroad line bypassed most coast-side communities, veering lake-ward only where substantial shipping and Federal harbor facilities made connections worthwhile. When railroad shipping became more efficient and profitable than lake shipping, income streams sufficient to keep the piers in good working order faltered. As the piers deteriorated, the maritime and terrestrial portions of the coastal landscape decoupled and terrestrial resources reoriented to inland circulation networks.

Tax records suggest that the Ronk brothers were casualties of this trend. Even as their pier was being built, the railroad was extended northwards from Milwaukee towards Green Bay. The course of the railroad took it west of Lake Church, on the west side of Belgium, Wisconsin. The residents and businesses in Lake Church, Belgium, and environs thus had competing choices for shipping and transport, in opposite directions from each other. Since Paul Ronk owned most businesses in Lake Church, Ronksville had the advantage, at least for a time. Though the Ronksville pier complex continued to operate through at least the mid-1870s, and potentially into the 1890s, the Ronk’s timber business had faltered enough by 1870 that they no longer considered themselves lumber merchants (their claim to be employed as “farmers” that year, however, glosses over their continued ownership of the Luxemburger Pier Company and Paul Ronk’s original store and hotel in Lake Church).



Figure 38: Photograph by Harry Dankoler, ca. 1905, showing damage from storm and ice to a Lake Michigan pier in Door County, Wisconsin. WHS Image ID 69430.

The nearby presence of piers run by Barnum Blake and his son, with better pier-side facilities and connections to manufacturing facilities in Port Washington, likely also cast a shadow over the Ronksville pier complex. Paul Ronk's concerns in Lake Church, namely his stores, tavern, and hotel, were nearer the railroad line than the pier, "forever road" notwithstanding. Farm products could just as easily be shipped by road and rail as by ship—and year-round rather than seasonally. Perhaps in response, Paul Ronk began to sell off his properties and businesses, leaving Wisconsin not long after. The center of gravity of commerce in the town of Belgium shifted to the railroad line, much to the benefit of the *village* of Belgium and to the detriment of Ronksville and Lake Church. In the end,

Ronk's Pier might have been utilized for fishing or small-scale shipping for a time, before slowly collapsing into the lake and more than a century of obscurity.

Port Ulao now is known only as "Ulao," the "Port" having been dropped from the place-name many years ago. Norheim, such as remains, faces terrestrial transportation routes rather than the lake. Centerville was absorbed politically into Cleveland, an inland railroad town. Though a boat dock remains where the Centerville/Hika piers once stood, the community cannot really be considered a port of any kind. Linzville, Yorktown, Kemper's pier, McCrea's pier, Amsterdam, Blakesville, and the Peterson/Wilson piers—like Ronksville—have left little to no traces behind.

Future Research

At Ronksville specifically, efforts should be made to relocate any surviving traces of support buildings, including the buildings shown on the 1873 plat map on the upper lake escarpment and any structures or work areas nearer the pier. Of particular interest is the layout of the support complex along the "forever road" and any evidence that investigations might provide with regard to their function. Though the upper escarpment was under cultivation by 1937, foundation remnants, cellars, and other structural remnants may survive. The likely location of the Ronksville support structures falls on a single privately-owned lot, and may be a productive site for future investigation.

More in-depth research utilizing local historic records, including local newspaper archives, should help fill in gaps in what is known about the pier operations, and perhaps clarify the relationship of the pier complex to adjoining property owners, businessmen, and area farmers. Additional historic research might also shed light on the name of the ship that stranded at Ronk's pier in the 1870s, as well as identify its cargo, and provide clues to the later years of the pier after the sinking of the *Northerner*.

Survey of the shoreline area resulted in several revelations. The offshore survey, using side-scan sonar and limited diving, was most fruitful. The most important finds were made at greater depths, less susceptible to disturbances from current and storm transport. This observation may reveal that the potential for preserved remains of shorter piers such as the Peterson/Wilson pier or Blakesville is poor, but that potential does remain for the survival of portions of the deep water piers. The fact that the remaining traces of the Ronksville pier did not resemble those at other piers previously investigated by SAAMP (e.g., Thomsen and Zant 2014), is intriguing in itself. The offshore sections of the Ronksville pier did not survive in the form of preserved wooden structures, but as a line of angular stone crib fill. This feature may be a diagnostic indicator of other "lost" early piers.

The metal detecting survey identified a cluster of "hits" that would have seemed to have supported the southerly location for the pier, as shown on the 1866/1877 maritime chart, had it not been for the discovery of the crib fill offshore in a position matching the course of the "forever road." Interviews with local residents, and the discovery of pier fragments north of Jay Road, reveals that large pier structures along the Lake Michigan shoreline disperse widely when they break up, extending for thousands of feet along the shoreline.

The “hits” in the metal detector survey, and some of the anomalies identified during GPR survey, may well be displaced pier fragments. Alternately, the metal detector hits may correspond to areas where items with metal components were discarded or stored along the beachfront. Future work along the beach should include ground-truthing, similar to the exhumation of the Jay Road pier fragment, combined with reburial after traditional documentation and photogrammetry. Better investigation of the effects of rising lake levels, beach erosion, and sediment transport on the site is also recommended.

The results of the GPR survey, in particular, were somewhat disappointing. However, use of the technology further inland where structures relating to the Ronksville pier complex may have stood seems a desirable action. Such investigations should include magnetometry and resistivity as well.

Finally, the availability of the Ronk descendants and local informants on the day of the terrestrial survey, and their willingness to share research and family memories with us, contributed greatly to the success of the venture. Archaeology works best when it connects living communities to the past, and this survey was no exception.

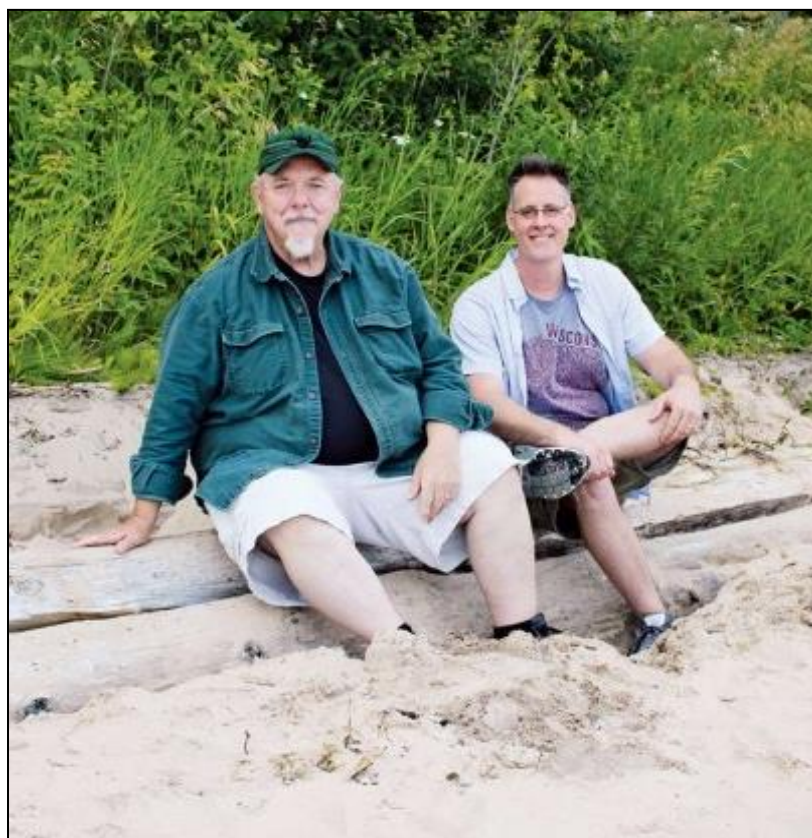


Figure 39: David Hirn (left) and Jonathan Ronk (right) on the fragment of their ancestor's pier.

References Cited

Ahnapee Record

1881 *Ahnapee Record*, 3 March.

Anonymous

1965 Early History of Ozaukee County, Wisconsin. Electronic document accessed 9/21/2020 digicoll.library.wisc.edu.

Berton, Pierre

1996 *The Great Lakes*. Stoddart Publishing Co., Ltd. Toronto, Canada.

Boyd, Richard, Russel Leitz, and Douglas Weimer

2020 *Ghost Port Settlements and Shipwrecks in Door County's Clay Banks Township: A Wisconsin Maritime Study*. Wisconsin Underwater Archaeological Association, Waupaca, Wisconsin. Copy on file State Historic Preservation Office, Wisconsin Historical Society.

Buchen, Sen. G. W.

1945 Fish Shanties at Amsterdam. *The Sheboygan Press*, February 9, 1945

Bureau of Navigation

1865 *Northerner* Permanent Certificate of Enrollment No. 119, Port of Milwaukee, Great Lakes Marine Historical Society Collection, Milwaukee Public Library. Milwaukee, Wisconsin.

1866 *Northerner* Permanent Certificate of Enrollment No. 37, Port of Milwaukee, Great Lakes Marine Historical Society Collection, Milwaukee Public Library. Milwaukee, Wisconsin.

1867 *Northerner* Permanent Certificate of Enrollment No. 127, Port of Milwaukee, Record Group 41, U.S. National Archives. Washington D.C.

1868 *Northerner* Permanent Certificate of Enrollment No. 188, Port of Milwaukee, Great Lakes Marine Historical Society Collection, Milwaukee Public Library. Milwaukee, Wisconsin.

Cooper, David J.

1987 1986-1987 Archaeological Survey of the Schooner *Fleetwing* Site 47 DR168, Garrett Bay Wisconsin. Master's Thesis, Department of History, East Carolina University, Greenville, NC. Copy on file State Office of Historic Preservation, Wisconsin Historical Society, Madison, WI.

Cowan, Jon

1985 *The Lakeshore at Terry Andrae State Park: An Historical Interpretation*, Master's Thesis, University of Wisconsin-La Crosse, La Crosse, Wisconsin.

Dippel, Beth

2018 *Black River Boasts Deep History in Sheboygan County*. *Sheboygan Press*, June 15, 2018.

Ertel, Barbara

1976 *Glimpses of our Heritage: Town of Centerville and Village of Cleveland*. Manuscript available electronically at <https://digicoll.library.wisc.edu>.

Falge, Louis

1912 *History of Manitowoc County, Wisconsin*. Goodspeed Historical Association, Chicago, Illinois.

Fries, Robert F.

1951 *Empire in Pine: The Story of Lumbering in Wisconsin 1830-1900*. State Historical Society of Wisconsin, Madison, WI.

General Land Office

1835 Plat Map and Notes for Town 12 North, Range 23 East, Board of Commissioners of Public Lands, Washington, D.C.

Grey, Jefferson J.

1998 *Fueling the Fire: An Underwater Archaeological Investigation of the Claflin Point Wreck in Little Sturgeon, Wisconsin*. Master's Thesis, Department of History, East Carolina University, Greenville, NC.

Hammond Times

1939 (May 8), *Ghost Ports*, Hammond, Indiana.

Jensen, John, and Philip Hartmeyer

2014 *A Cultural Landscape Approach (CLA) Overview and Sourcebook for Wisconsin's Mid-Lake Michigan Maritime Heritage Trail Region*. NOAA Office of National Marine Sanctuaries, Washington, D. C.

Jensen, Trygvie

2007 *Wooden Boats and Iron Men: History of Commerical Fishing in Northern Lake Michigan and Door County*, Paise Publishing Company, De Pere, Wisconsin.

Karamanski, Theodore J.

2000 *Schooner Passage: Sailing Ships and the Lake Michigan Frontier*. Wayne State Press, Detroit, MI.

Kreisa, Paul P.

1992 Schooner-Barge *Noquebay*. National Park Service, National Register of Historic Places Registration Form. Unpublished manuscript on file, State Office of Historic Preservation, Wisconsin Historical Society, Madison, WI.

Lusignan, Paul

1986 Logging and Lumber Milling. In *Cultural Resource Management in Wisconsin*, Vol. 2, Barbara Wyatt, editor, pp. 1-21. State Office of Historic Preservation, Wisconsin Historical Society, Madison, WI.

Mansfield, J.B.

1899 *History of the Great Lakes*. Vol. 1, J.H. Beers and Co, Chicago, IL.

Manitowoc Herald

1855 *Manitowoc Herald*, 9 June.

Meverden, Keith N., Tamara L. Thomsen and Matthew J. Carter

2012 *The Golden Age of Sail on the Great Lakes: Underwater Archaeological Investigations of Wisconsin's Sailing Fleet 2010-2011*. State Archaeology and Maritime Preservation Technical Report Series #12-002. State Office of Historic Preservation, Wisconsin Historical Society. Madison, Wisconsin.

Milwaukee Sentinel

1868 Milwaukee Sentinel, 30 Nov.

Nash, G. V.

1878 *An Illustrated Historical Atlas of Manitowoc County, Wisconsin*. G. V. Nash, Manitowoc, Wisconsin.

National Park Service

1999 Guidelines for Evaluating and Documenting Rural Historic Landscapes. National Park Service Bulletin 30, Washington, D. C.

Ozaukee County Historical Society

1994 *Ozaukee County Wisconsin Historic Plat Map Reproductions*. Ozaukee County Historical Society, Cedarburg, Wisconsin.

Pape, Alan

1993 National Register of Historic Places Nomination Form for the Blackstock, Thomas M. and Bridget House, Manuscript available State Historic Preservation Office, Wisconsin Historical Society, Madison, Wisconsin.

Penkinuas, Daina

2018 SHPO Perspectives on Maritime Cultural Landscapes. Proceedings of the Maritime Cultural Landscape Symposium, Volume 2. ed. Barbara Wyatt and Debora Dietrich-Smith, pp. 18-20, National Park Service, Washington, D. C.

Randall, G. A.

1875 *An Illustrated Historical Atlas of Sheboygan County, Wisconsin*. G. A. Randall and Company, Oshkosh, Wisconsin.

Randall, G. A. and C. Palmer

1862 Map of Sheboygan County, Wisconsin. G. A. Randall and C. Palmer, Milwaukee, Wisconsin.

Rector, William Gerald

1953a *Transportation in the Lake States Lumber Industry 1840-1918*. The Arthur H. Clark Company, Glendale, CA.

1953b *Log Transportation on the Great Lakes*. A.H. Clark, Glendale.

Schanen, Bill

2019 Searching for Signs of Ronksville, *Ozaukee Press* Thursday, July 25, 2019, Port Washington, Wisconsin.

Scott, George

1892, *Scott's New Coast Pilot for the Lakes: Containing a Complete List of all the Lights and Light-houses, Fog Signals, and Buoys on Both the American and Canadian Shores*, Free Press Printing Company.

Seddon, Peter

2014 *Law's Strangest Cases: Extraordinary but True Tales*, publisher unknown.

Sheboygan Press

1932 *Sheboygan Press*, August 20.

Southeastern Wisconsin Coastal Resilience

2019 <https://sewicoastalresilience.org/lake-michigan-water-levels-at-record-highs-in-july-2019/> Accessed August 12, 2019.

Southeastern Wisconsin Regional Planning Commission

1997 Lake Michigan Shoreline Recession and Bluff Stability in Southeastern Wisconsin: 1995, SEWRPC Technical Report 36, Waukesha, WI.

Struwe, Taylor Everson

2016 Lake Michigan: A Calamitous History of Commercial Fishing, 1870-1925, M. A. Thesis on file UW-Eau Claire, electronic document accessed September 23, 2020, https://minds.wisconsin.edu/bitstream/handle/1793/75404/Struwe-Taylor_2016%20August.pdf

Thompson, Todd

2019 *After the Thaw—The Development of Lake Michigan*. Indiana Geological and Water Survey, Indiana University, electronic document accessed August 12, 2019.

Thomsen, Tamara and Caitlin Zant

2014 *To Feed, Fuel, and Build the Heartland: Underwater Archaeological Investigations from the 2014 Field Season*. Wisconsin Historical Society State Archaeology and Maritime Preservation Program Technical Report 15-002, Madison, Wisconsin.

Thwaites, Reuben Gold

1902 *The French Regime in Wisconsin I: 1634-1727. Collections of the State Historical Society of Wisconsin* Vol. XVI, Madison, Wisconsin.

U.S. Army Corp of Engineers

1877 Lake Michigan Coast Chart No. 2, Vicinity of Sheboygan.

2019 <http://lre-wm.usace.army.mil/ForecastData/GLBasinConditions/LTA-GLWL-Graph.pdf>, Accessed August 12, 2019.

U.S. Census Bureau

1860 Town of Belgium, Ozaukee County, Wisconsin. U.S. Department of the Interior, Government Printing Office. Washington, D.C.

U. S. Department of Agriculture

1937 Aerial photo taken August 9, 1937, accessed online at <https://maps.sco.wisc.edu/WHAIFinder>

U. S. Treasury Department

1876 Report of the U. S. Life-Saving Service, U. S. Treasury Department, Washington, D. C.

United States Geological Survey

1974 Cedar Grove 7.5' Topographic Map, United States Geological Survey, Washington D.C.

Village of Cleveland, Wisconsin

2020 History, electronic document accessed at <http://www.clevelandwi.gov/history/history-hika-bay-pier-cleveland-wisconsin>)
September 2020.

Volk, Albert

1915 Plat Book of Washington and Ozaukee Counties, Wisconsin, Northwestern Publishing Company, Des Moines, Iowa.

Western Historical Company

1881 *History of Washington and Ozaukee Counties, Wisconsin*. Western Historical Company, Chicago, Illinois.

Wisconsin Historic Preservation Database

2020 Archaeological Site Inventory Records, State Office of Historic Preservation, Wisconsin Historical Society, Madison, WI. electronic database accessed September 2020.

Watertown News

1876 *Watertown News*, 29 November.

Wisconsin Geological and Natural History Survey

1901 Biennial Report of the Wisconsin Geological and Natural History Survey, Covering the period from October 1, 1898 to September 30, 1900. Democrat Printing Company, State Printer, Madison, Wisconsin.

Wu, Chin

2019 Bluff Erosion along Lake Michigan in Ozaukee County. University of Wisconsin-Madison, electronic document, accessed August 12, 2019.

Zaun, Ralph

1965 *Early History of Ozaukee County, Wisconsin*, ed. Dorothy Kelm, Mr. James McCray, Mrs. Arnold Barr, electronic document, accessed August 28, 2020.
<http://digicoll.library.wisc.edu/cgi-bin/WI/WI-idx?id=WI.OzEarlyHist>

Zillier, Carl

1912 *History of Sheboygan County, Wisconsin, Past and Present*. S. J. Clarke Publishing Company, Chicago, Illinois.

Appendix A: Dan Joyce GPR Report

Ronk Pier 47-OZ-361

Ground Penetrating Radar Investigations Lake Church, Ozaukee County, Wisconsin



Daniel J. Joyce
Executive Director and Archaeologist
Kenosha Public Museums
5500 1st Avenue
Kenosha, Wisconsin 53140

Kenosha Public Museums, Report of Investigations, Number 29

ABSTRACT

Tamara Thomson, Maritime Archaeologist at the Wisconsin Historical Society invited the author to be part of a team from the Historic Preservation office. The goal was to locate, if possible, remnants of Ronk Pier built in 1859 in what was then known as Ronkville, Ozaukee County. The effort involved maritime archaeology, terrestrial archaeology, history and remote sensing in the form of ground penetrating radar. The result of two ground penetrating radar surveys at the suspected location of the pier are presented.

ACKNOWLEDGMENTS

I would like to thank Tamara Thomson, Maritime Archaeologist and Amy Rosebrough, Archaeologist of the Wisconsin Historical Society. After years of knowing both of them, it was a pleasure and fun to work on a project together. I also learned quite a lot about maritime archaeology in the process. Maybe you can teach an old dog new tricks. Thanks also to David Hirn and Johnathan Ronk, descendants of Nicholas and Paul Ronk, founders of the Luxemborg Pier Company in 1859. It was wonderful to see the interest in the project by them as well as many other family members and neighbors.

I would like to thank Mayor John Antaramian for his interest in archaeology and his support in many, varied endeavors by myself and the museums. The Kenosha Public Museums and its Board of Trustees have always supported research by staff and continue to do so. Thanks to my colleague, Robert Sasso of the University of Wisconsin - Parkside for allowing me to use the ground penetrating radar in a number of local venues in conjunction with his University of Wisconsin - Parkside field school which for many years has been a cooperative effort between UW-P and the Kenosha Public Museum.

Thanks are due to John Broihahn, State Archaeologist State Historic Preservation Office. Support from their office has always been superb, carrying on the tradition of Bob Birmingham, the former state archaeologist to whom I also owe a debt for several previous projects.

Finally, thanks to my wife and fellow archaeologist Ruth Blazina-Joyce and our children Sara and Tessa for their patience with my time consuming preoccupations.

INTRODUCTION

Ronk Pier was a substantial structure. Today, only underwater stones from cribs and a few wooden remnants washed ashore remain. Tamara Thomson of the Wisconsin Historical Society invited the author to take part in the search for Ronk Pier. While Thomson would be responsible for the underwater archaeological aspects of the project, Amy Rosebrough would be in charge of the terrestrial aspects of the work. The long history of the Ronk family and its impact on the area was chronicled by Ronk descendants, David Hirn and Jonothan Ronk. With their able assistance and interest the work was undertaken on July 25, 2019 with the author being responsible for the remote sensing aspects of the project.

While it was suspected that the shore had eroded significantly since the pier was abandoned and any likely anchors to the shore long gone, the survey was made. There is always a possibility that there were still remnants of the pier under the sand whether in their original positions or later broken fragments washed ashore.

The investigations took less than a half a day and the author was then able to assist Ms. Thomson in looking for remnants of the pier underwater. That effort was successful and time spent on the project was well spent.

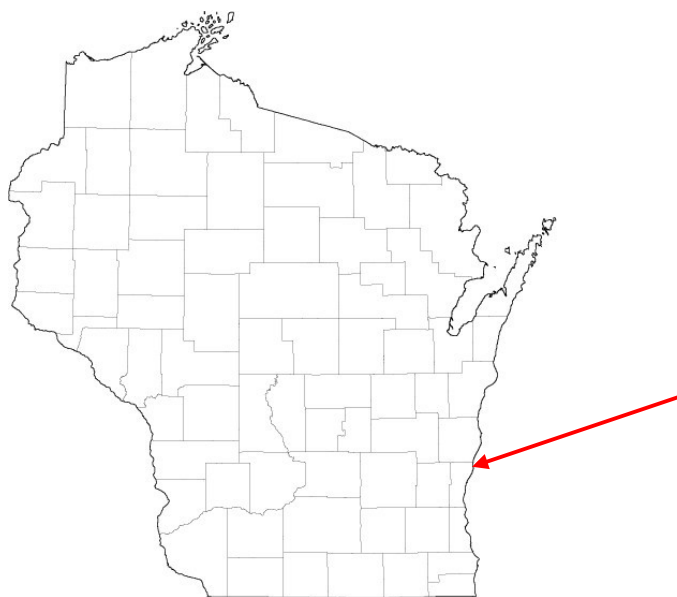


Figure 1. Location of Ronk Pier site in Ozaukee County, Wisconsin



Figure 2. Site location in northeastern Ozaukee County. The red arrow is the suspected location of Ronk Pier per David Hirn, just south of the original dividing line between the two brothers parcels. Lake Michigan is on the right.

BRIEF HISTORICAL BACKGROUND



Figure 3. Nicholas and Paul Ronk (white shirts) on Ronk's Pier circa 1860's. Luxembourg Cultural Heritage Center collection.

Luxembourg brothers, Nicholas and Paul Ronk immigrated to the United State in 1849 settling in the area of Belgium, Ozaukee County, Wisconsin. In Luxembourg, they were builders and were soon plying their trade with an entrepreneurial twist in Wisconsin. Near the Catholic Church, they cleverly built a general store and tavern later known as the Lake Church Inn. Very soon the area was known as Ronksville as the brothers impact increased. In 1856 Paul bought acreage on the Lake Michigan shore. Little else was in this area at the time. Trails were there but there was little to connect them to the outside world. Roads were a novelty and the lake was the main source of travel.

Soon the brothers ended up with two plots next to each other on the shore of Lake Michigan. Nicolas had the smaller lot to the north and Paul had his 13 acres adjoining on the south. Realizing that the lake was an economic asset, they formed the Luxembourg Pier Company in February 1859. Soon a large wooden pier situated between the brother lots jutted out into the lake. It was a connection to the outside world and a dock to transport goods and merchandise

into the area. In 1863, Nicholas purchased the *Northerner*, an 81 foot long schooner. Unfortunately, the *Northerner* sank in 1868 at the pier near Cedar Grove.



Figure 4. Ronk's Pier is shown in this map image outlined in black. It is located just north of where the investigation was made, but most likely be further south, where Nicholas and Paul's land abutted.

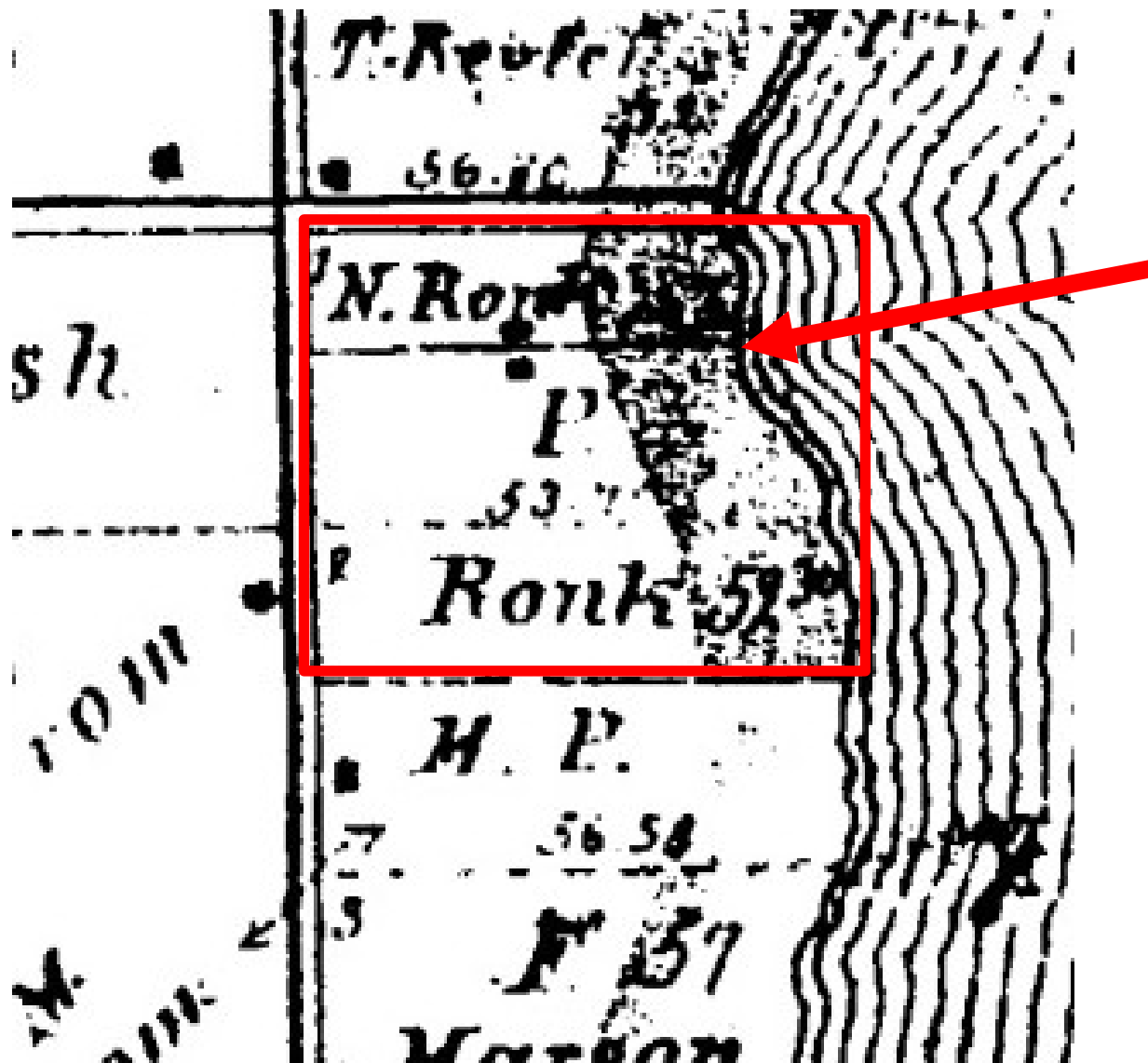


Figure 5. The location of Nicholas and Paul Ronk's lots on the 1873-74 Ozaukee County Plat map.

GROUND PENETRATING RADAR OVERVIEW

Ground-penetrating radar (GPR) is a nondestructive geophysical method that uses radar pulses to image the subsurface. It uses electromagnetic radiation in the microwave band, and detects the reflected signals from subsurface anomalies. GPR can be used in rock, soil, ice, fresh water, pavements and structures. It is capable of detecting objects, changes in material, and voids (Conyers, 1997).

Ground penetrating radar is a useful remote sensing technique to initially identify or refine targets in the course of archaeological work. It has the highest resolution of any remote sensing technique. The main advantage is that while a ground penetrating radar survey is being completed on site, the 2-D results are seen in real time. Post-processing software coupled with a survey cart and distance meter, lessens survey time considerably. Another advantage is that prospecting survey capabilities have improved in recent years. The addition and refinement of 2-D survey transects into 3-D blocks has improved interpretation immensely. The ability to rapidly process these data in the field has led to more efficient excavation strategies. Improvements in computer speed as well as software capabilities have coupled to lessen the time used in post-processing and analysis (Kvamme, K.L. 2003). High-frequency radio waves are transmitted into the ground. When the wave encounters an object or a boundary with different dielectric constants, the receiving antenna records variations in the reflected return signal.

The major disadvantage of ground penetrating radar is that the dielectric constant of the soil(s) has varying effects on signal attenuation. While dry sand is the ideal for use with radar, wet, saturated clay is the least favorable – absorbing or attenuating much of the signal and lessening penetration/depth. Advances in radar and antennae design have improved this situation somewhat recently (Kvamme, K.L. 2003). Fortunately the sand in which the shipwreck is encased is perfect for ground penetrating radar use.

Another disadvantage of ground penetrating radar is that the depth of the survey is not often known. This is especially true where two differing strata have two very different dielectric constants. While the machine can be set for one dielectric constant to give a somewhat accurate depth reading in a homogeneous strata, it cannot give a reading that reflects real depths where the strata is varied. One method of ground truthing the data is to bury a metal object at a known depth in an excavation wall and then calculating real depth onto the resulting radargram from the appearance of the metal on the transect radargram profile.

Despite limitations, geophysical survey techniques are a cost and time effective non-invasive method to gain information about the shipwreck and can serve as a base for future work in identifying suspected shipwrecks. This is due to the fact that ground penetrating radar, electrical resistivity, gradiometry, and other remote sensing techniques have been shown to be effective non-invasive survey techniques that have the potential to locate sub-surface archaeological features that otherwise would have required excavation.

Kaufmann and Kean (2002) demonstrated that geophysical survey techniques (D.C. resistivity, E.M. conductivity, and ground penetrating radar) could be used to locate

subsurface disturbances (wooden palisade walls) at Aztalan State Park in Jefferson County, Wisconsin. The findings from this preliminary survey were supported by historical maps and previous excavations at the park.

Hargrave et al. (2002) illustrated the potential of an electrical resistivity survey, and other geophysical survey techniques, when trying to manage and investigate a large historic site that is several hundreds of meters in size, such as the Army City site at Fort Riley, Kansas. Army City was a civilian owned, World War I era, planned community designed to meet the recreational needs of soldiers, the site was later abandoned and became a hay field.

In the 1990's, the site was considered for eligibility for the National Register of Historical Places (NRHP). Electrical resistivity surveys were used to locate buried building foundations for excavation in order to determine if the site met NRHP criteria. Ground-truthing excavations were used to verify results from the geophysical surveys. Due to the use of geophysical survey techniques, coupled with verification by actual excavation of the areas highlighted by the geophysical survey, Army City met the eligibility for NRHP.

Finally, Parrington (1979) demonstrated the use of geophysical survey techniques in a large, historical area that had suffered from modern disturbances in his survey of Valley Forge National Historical Park in Pennsylvania. With the geophysical surveys, he was still able to locate Revolutionary War era refuse pits and troop lodgings.

METHODOLOGY

The survey grids were laid out using fiber tapes and plastic pin flags to minimize radar signal disturbance. The survey wheel was calibrated for accurate distance measurement and the gain was adjusted before data collection. Transects were .5 meters apart.

The GPR used in the survey was a Geophysical Survey Systems, Inc (GSSI) TerraSearch SIR (Subsurface Interface Radar) 3000. It is a single channel data acquisition unit manufactured by GSSI, Model 5103. A 400 MHz GSSI antenna was used and attached to the Digital Control Unit (DC-3000). This antenna is both the transmitter and receiver of the radar signal and is ideal for most archaeological applications, penetrating 3 – 4 meters below the surface. The antennae is well shielded and generates a tight electromagnetic cone beneath the unit. Objects of 25 cm or more can be detected by a 400 MHz antenna. The antenna and DC-3000 are mounted on a GSSI Model 623 survey cart which incorporates a survey wheel for high-precision automatic distance measurements.

The GSSI DC-3000 was adjusted for data acquisition as follows:

- 512 samples per scan
- 16 bit samples
- Scans/Sec 100
- Scans/unit 50
- Units 2

- Diel =8
- Soil type 1 (sand)
- Approximate depth of up to 4 meters

The data were processed using GSSI's RADAN version 7.0 software and GIMP. The radargrams were processed to remove background noise, set time zero, deconvolution and migration. The gain was set higher to improve anomaly amplification examined using differing color palettes. These processing steps improve the resulting accuracy in determining size, shape, depth of anomalies, subsurface features and reduce noise in the data. Individual transects were assembled into one radargram and examined using multiple color palettes. The assembled transect/radargram data was then entered into 3-D mode and again examined in several color palettes and gain amplification for anomalies.



Figure 6. Close-up of lots 5 and 6 which is where the dividing line between Nicolas and Paul's land was located. The red arrow marks a spot, just south of the dividing line where Ronk Pier should have met the land.

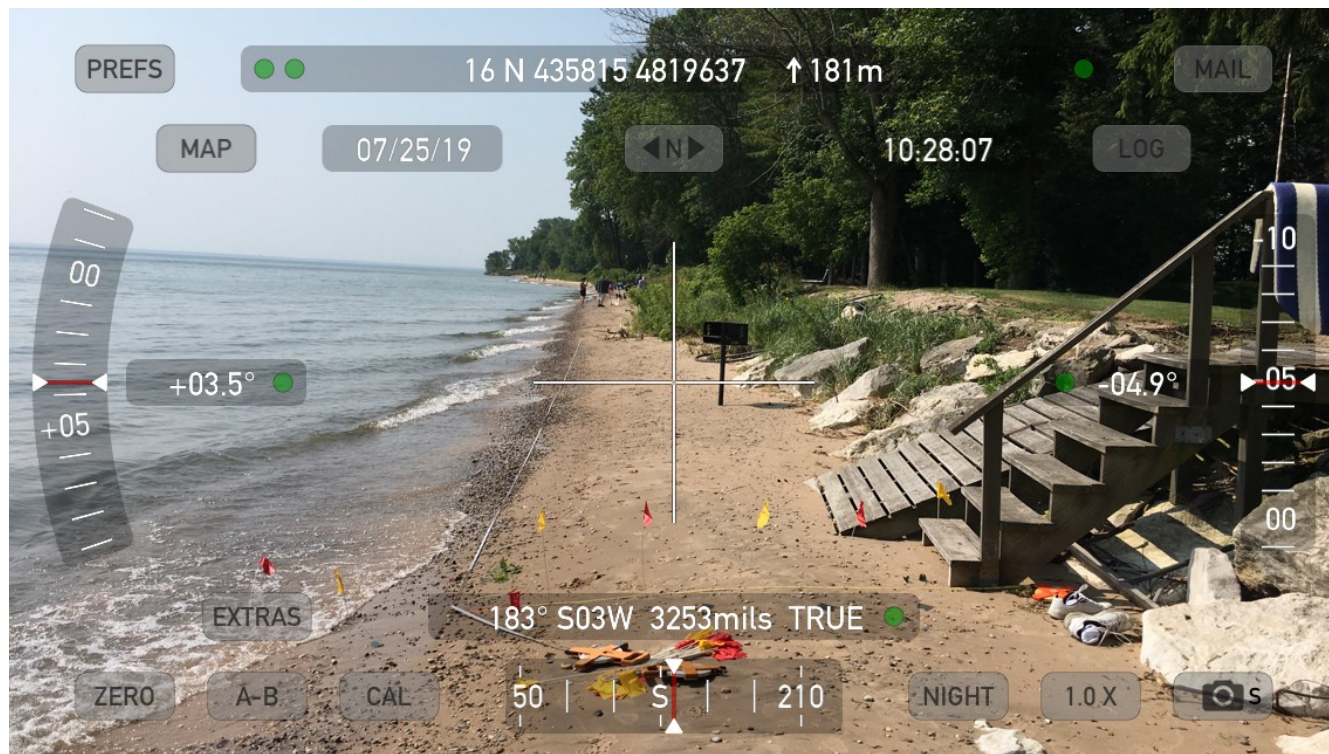


Figure 7. Survey 1 looking from the north line (upright red and yellow flags) looking south.

Survey 1

Survey 1 was set to cross the alleged location of the pier between modern lots 5 and 6. The transects were set .5m apart and were taken in a unidirectional manner. The point of beginning was in the southeast corner of the grid, nearest the lake. The north end was located at the north end of the stair of Lot 5 (figure 7.) The south end of the grid was at the south end of the stairs of lot 6. The grid was 3 meters by 56 meters (figure 12). The survey was very limited by high water with much of the “normal” beach being underwater. The grid was 3 meters wide by 56 meters long. In figure 7 we are looking to the south from the north end of the grid. The easternmost/first transect may be slightly compromised due to waves washing over it.

The results of transects 1 (0 meter line), transect 4 (1.5 meter line) and transect 7 (3 meter line) are seen in figures 8, 9 and 10 respectively. All three transect radargrams show deposition and erosion typical of shoreline environments. Figure 8 shows three vertical “intrusions” that I cannot explain. They look more natural than man made but it is not clear if that is correct (arrows). This could be related to the fact that these transects, closest to the lake, were washed with water. In figure 9 and 10 there are distinct anomalies and disturbed

areas. The anomaly on the left of both figures 9 and 10 appear to be the same and could relate to buried portions of the pier. In the 3-D mode, nothing distinct is seen in survey 1.

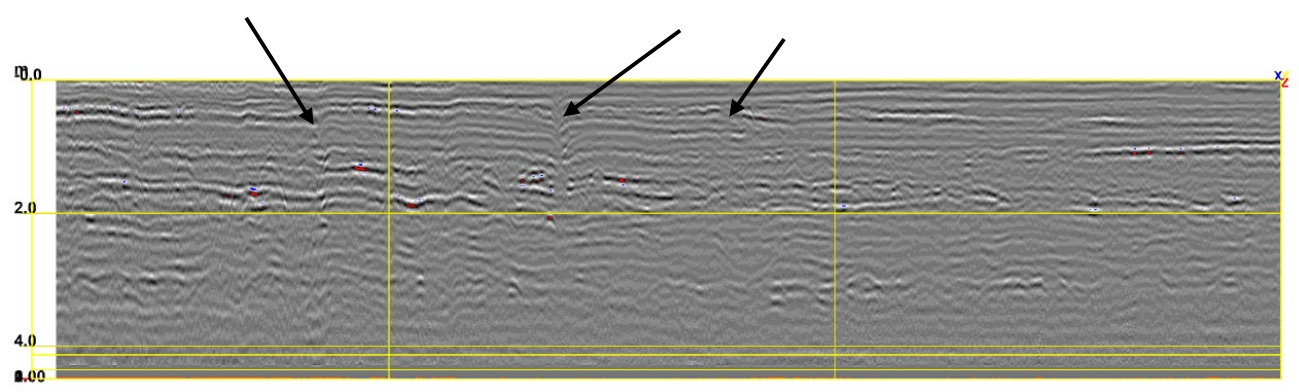


Figure 8. Survey 1, transect 1 (0 meter line), vertical axis exaggerated 200%. North is to the right. Vertical “intrusions” (arrows), that appear natural and not man-made.

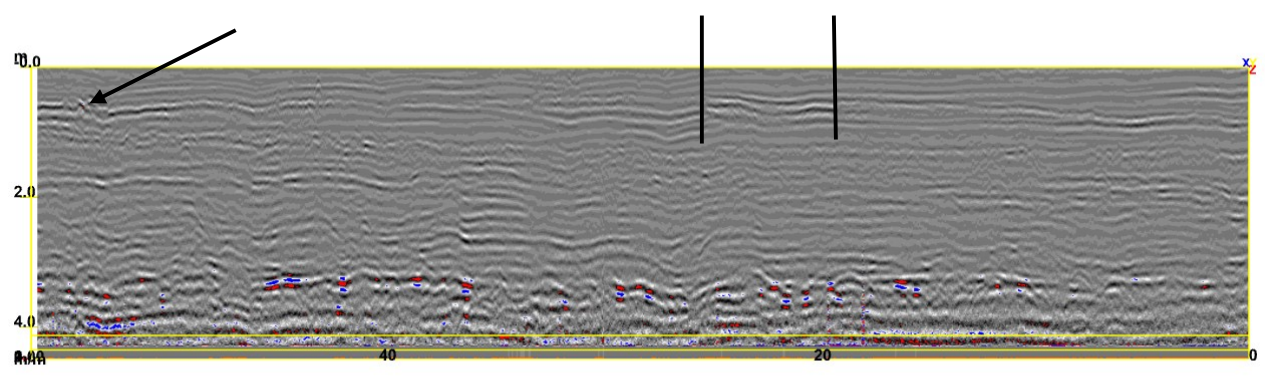


Figure 9. Survey 1, transect 4 (1.5 m line), vertical axis exaggerated 200%, north is to the right. The black arrow shows a small anomaly and there is a discontinuity between the black lines.

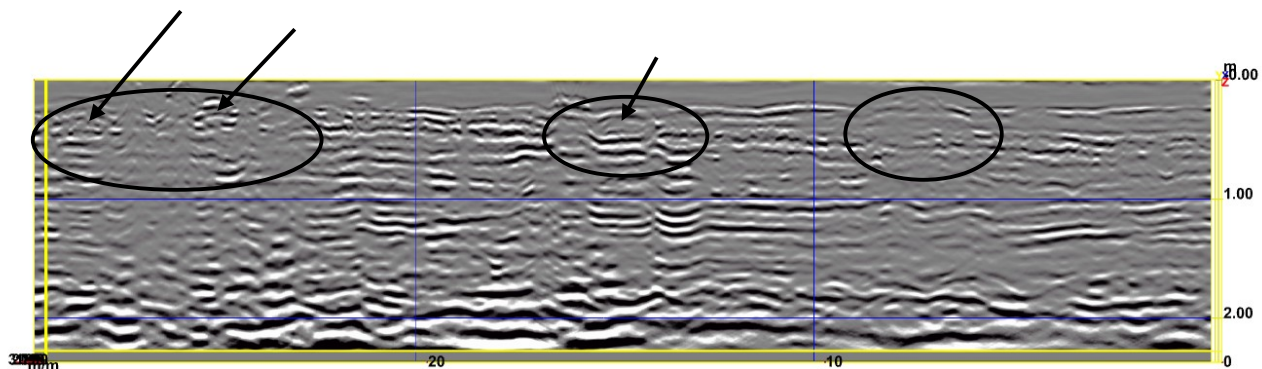


Figure 10. Survey 1, transect 7 (3 m line), vertical axis exaggerated 200%, north is to the right. Ovals show anomalies and areas of disturbance. Arrows point to distinct anomalies of unknown origin.



Figure 11. Looking from the north line of survey 1 to the north. The people are standing where a portion of the pier cribbing was discovered.

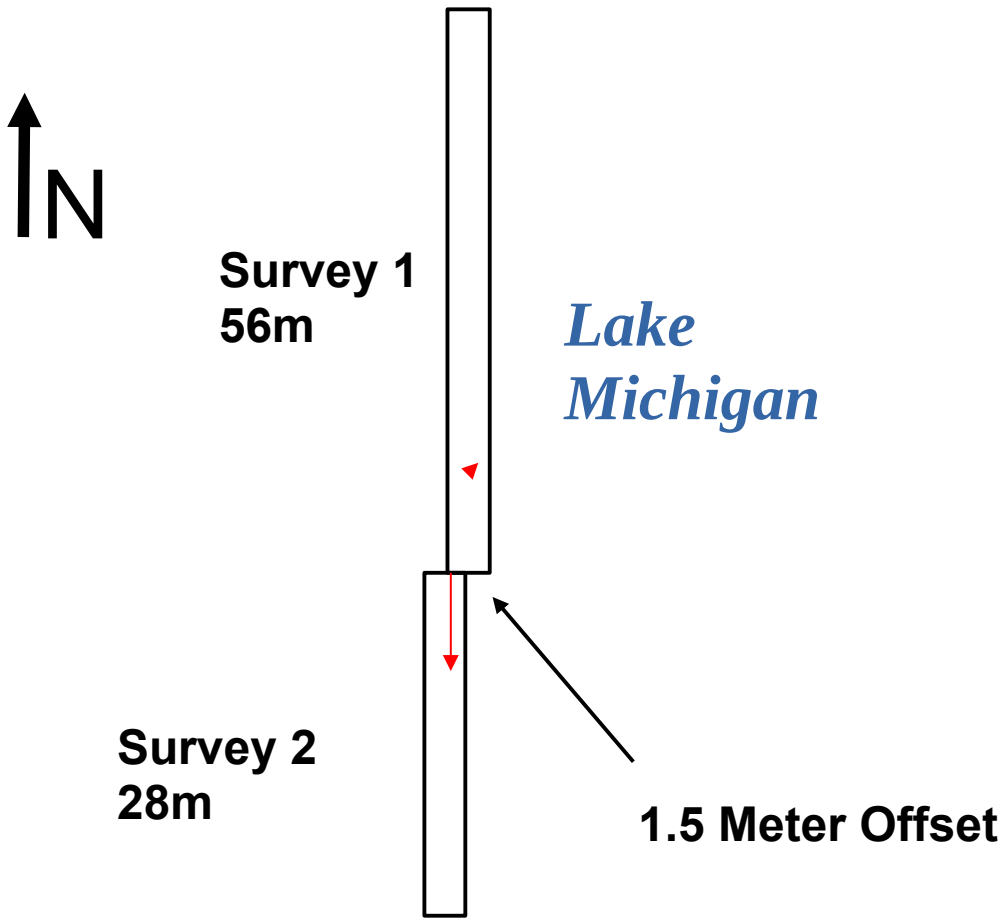


Figure 12. Survey 1 and survey 2 in relation to one another. Red arrows indicate the direction of survey lines and the point of beginning corners. Survey 2 was offset 1.5 meters west of survey 1 due to irregularities in the shoreline to the south.

SURVEY 2

Survey 2 was conducted at the request of Amy Rosebrough after detecting numerous metal loci to the south of survey 1, along the beach. Transects were taken from a north to south direction, were .5 meters apart and unidirectional. The point of beginning was in the northeast corner of the grid, nearest the lake. The grid was 3 meters by 28 meters (figure 12).

The survey was very limited by high water with much of the “normal” beach being underwater. Survey grid 2 joined Survey 1 but was offset 1.5 meters to the west due to irregularities in the shoreline to the south. Again, the easternmost and first transect may have been slightly compromised due to waves washing over it.

The results of transects 1 (0 meter line), transect 4 (1.5 meter line) and transect 7 (3 meter line) are seen in figures 14, 15 and 16 respectively. Again, all three transects radargrams show deposition and erosion typical of shoreline environments.

Figure 14 is transect 1 at the 0 meter line and is closest to the lake at its present level. The three red arrows show vertical intrusions into the soil that do not appear to be cultural and likely related to natural near shore processes. This is the same phenomenon that appears in transect 1 (0 meter line) in survey 1, both nearest the shoreline.

Figure 15 is transect 4 at the 1.5 meter line in the middle of the grid. The oval highlights an anomaly that is also seen in figure 16. This may be a pier fragment. There are many pinpoint targets that show individual targets/objects as well. Black arrows are a discontinuity in the strata that is sealed above by a later deposits.

Figure 16 is transect 7 at the 3 meter line and is the westernmost transect. The area between the red lines shows a discontinuity in the strata that goes all the way to the surface and is relatively modern. This is not related to the pier. The oval highlights an anomaly that is also seen in figure 15 and has the potential of being a pier fragment, but is not a certainty. This transect was slightly longer than the others and the anomalies line up in both figures 15 and 16. There are pinpoint targets that show individual targets/objects as well. These may relate to individual objects in the sand and possibly correlate with positive metal detector hits.

Discontinuities can be seen in all three radargrams in figures 14, 15, and 16. In all the, we can see some curious anomalies with some potential but nothing definitive. My initial quick look at the processed data did not see much. A closer look in various color palettes and different gain settings began to reveal potential, but again nothing definitive. It is curious that in the 3-D mode, nothing definitively caused by cultural processes could be seen in survey 2.

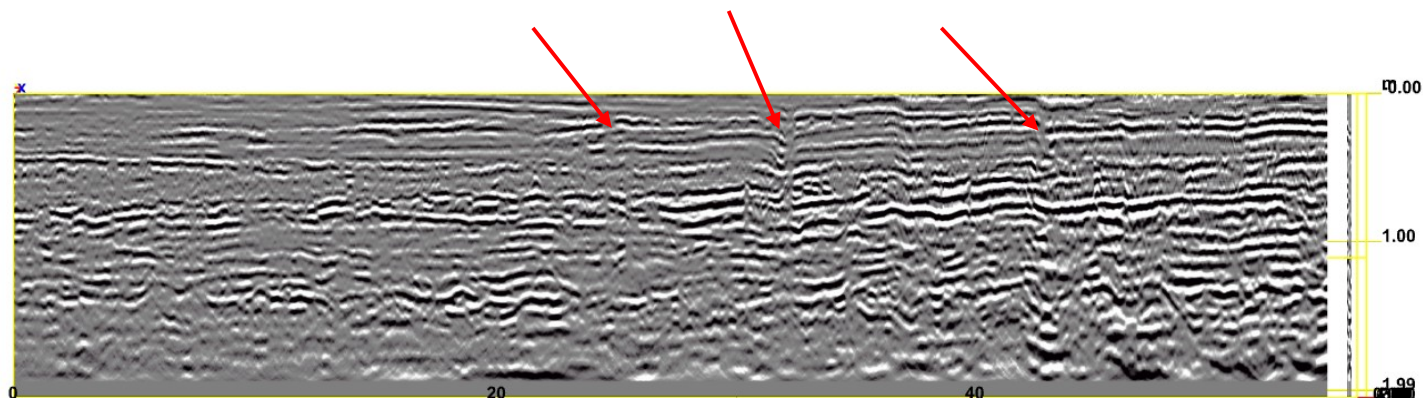


Figure 14. Survey 2, transect 1 (0m), closest transect to the lake. North is to the left. Vertical axis exaggerated 200%. This is the transect that is closest to the lake at present. The three red arrows show a vertical intrusion into the soil that do not appear to be cultural and likely related to natural near shore processes.

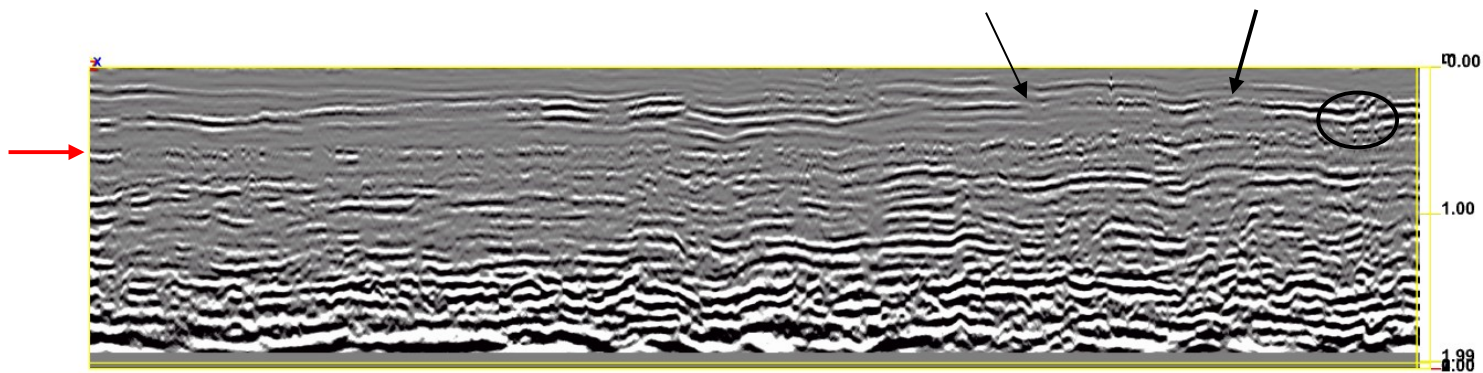


Figure 15. Survey 2, transect 4 (1.5m), north is to the left. Vertical axis exaggerated 200%, north is to the right. This transect is up the middle of the three meter wide grid. The oval highlights an anomaly that is also seen in figure 10. There are pinpoints that show individual targets/objects as well. The red arrow shows a curious discontinuous strata. Black arrows are a discontinuity in the strata that is sealed above by a later deposit.

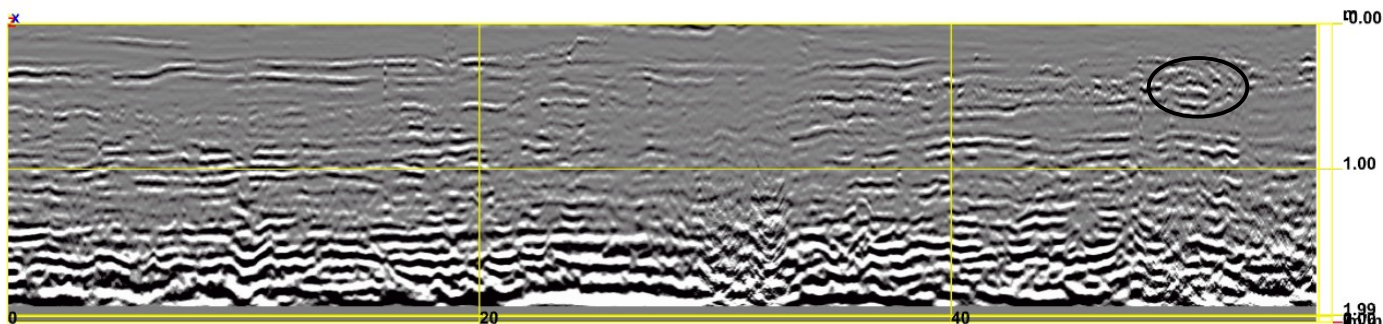


Figure 16. Survey 2, transect 7 (3m), the furthest inshore transect. North is to the left. Vertical axis exaggerated 200%. This transect is furthest west. The area between the red lines shows a discontinuity in the strata that goes all the way to the surface and appears relatively modern. The oval highlights an anomaly that is also seen in figure 15, possibly relating to pier fragments. There are pinpoints that show individual targets/objects as well. This transect is slightly longer – the anomaly lines up in both.

CONCLUSIONS

Two survey grids were set along the beach. Survey 1 was located to overlap the reported location of where the pier and shore met (David Hirn, personal communication). After the surveys were complete and the maritime investigation conducted, it is thought that the place where the pier met the land may be at the northernmost of our GPR surveys or even further north. This area was inaccessible GPR due to a fallen retaining wall and chain link fencing exposed in the beach.

Survey 1 was the northernmost survey with survey 2 immediately to the south (figure 12). In both surveys we see mixed cycles of erosion and deposition that I interpret as typical of active shoreline environments. Transect 1 in both surveys show vertical anomalies that seem to be natural (figures 8 and 14). These transects closest to the lake were washed with water. The vertical “intrusions” may be due to saturated soils. Sections of saturated soil can wreak havoc on GRP signals. We do not see these interesting features in the other transects further inshore. In figure 9 and 10 there are distinct anomalies and disturbed areas. The anomaly on the left of both figures 9 and 10 appear to be the same and could relate to a portion of the buried pier. Curiously, in 3-D mode nothing is distinctly cultural in survey 1 plan view.

In survey 2, as discussed above there are again vertical “intrusions” in the soil (figure 14).

In figure 15 the oval highlights an anomaly that also appears in figure 16 and is likely the same object and may or may not be a pier fragment. There are many pinpoints that show individual targets/objects as well. These could relate to positive hits on the metal detector.

Figure 16 is transect 7 is the westernmost transect. A more modern disturbance can be seen between the two red vertical lines that is not related to the pier. The oval contains an anomaly that is also seen in figure 15 and again, has the potential of being a pier fragment, but this is not certain. This transect was taken slightly longer than the others (figures 14 and 15) and the anomalies line up. Throughout the upper levels are pinpoint anomalies that indicate individual targets/objects as well. Before post-processing, most of these had significant parabolas attached. These may relate to individual objects in the sand and possibly correlate with positive metal detector hits. Stratum discontinuities can be seen in all three radargrams in figures 14, 15, and 16. In all the, we can see some curious anomalies with some potential pier pieces but nothing that I would say is definitive.

My initial quick look at the processed data did not see much. A closer, more thorough look in various color palettes and different gain settings revealed anomalies with some potential but no certainty. Again nothing definitive. I am a bit puzzled that in the 3-D mode plan view, nothing definitively caused by cultural processes could be seen in both survey 1 and survey 2. Even the anomaly seen in both figures 15 and 16 were not visible in any definitive manner. My suggestion for further studies is excavate the metal detector positive hits and see if there are associated pier elements. A second approach would be to excavate the suspected pier fragments in the radargram but it could all be natural in the end. At least with the metal we know that those items are cultural.

REFERENCES CITED

1991 Bevan, B.W. , The Search For Graves, *Geophysics*, 56 (9): 1310-1319.

2003 Brown, L., Chiment, J., Perks, W., Haenlein, J., Neville, J. Ground Penetrating Radar in Support of Mastodon Studies In New York. Paper presented at the 38th Annual Meeting of the Geological Society of America.

2003 Kvamme, K.L., Geophysical Surveys as Landscape Archaeology, *American Antiquity*, 68(3):435-457.