FORGING CITY AND LAKE:
MARQUETTE’S WATERFRONT BEYOND THE ORE DOCK LEGACY

BY

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THESIS

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ABSTRACT

Since the decommission of Marquette, Michigan’s massive waterfront ore dock in 1971, the city’s post-industrial lakeshore has been left to decay and has become the locus of a marginal landscape. This scenario is true for many harbor towns with ore docks on Lake Superior. There have been recent efforts to redesign Marquette’s waterfront and development plans are now being implemented, but they are not adequately forward-thinking and do not secure the site as public property. This thesis explores planning options for Marquette’s waterfront while establishing criteria for a design that will ultimately make the city function better and secure its place as an operational site for the future. Through the process of analysis of land and the flow of natural resources, Marquette is examined in order to reconnect the lost history of the industrial age and to improve on post-industrial landscape adaptive reuse objectives. The plan employed the waterfront with accessibility, space for social functions, and renewed site ecology, reestablishing a functional ecosystem. This was achieved in part by implementing flexible programming, while seaming the connection of the water to the city. The criteria established could be applied to the redesign of other Lake Superior city waterfronts that are in similar states.
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CHAPTER 1: RESEARCH OVERVIEW

The remnants of the Great Lakes’ industrial past are decaying, waiting to be re-imagined. Many American cities in the Midwest were built on the waters of the Great Lakes and served as gateways to facilitate the shipment of materials. Economists distinguish three eras of the industrial configuration in North America: concentrated, decentralized and distributed development. Each of these configurations established a different kind of spatial organization, and each shaped urban form in its own way (Waldheim 2006:1). The shift in modes of production over the past several decades has left spatial modes once used for manufacturing and distribution obsolete and abandoned. This has impacted port cities in the Great Lakes region as decaying industrial infrastructure and unused land were left behind in the wake of this change.

Often interpreted as marginal land and ignored by the cities’ populations and planners. The post-industrial land acts as a divider between these inhabited spaces and the waterfronts. The marginal land and abandoned infrastructure —potentially some of the most desirable real estate in these cities—often go unnoticed, forgotten by planners and the community, and provide no inherent value.

Claude Levi-Strauss identified the convergence of the natural and cultural forces involved in the urban landscape, “cities have often been likened to symphonies and poems, and the comparison seems to me a perfectly natural one: they are in fact objects of the same kind. The city may even be rated higher since it stands at the point where nature and artifice meet. . . . It is both natural object and a thing to be cultivated; individual and group; something lived and something dreamed; it is the human invention, par excellence” (Levi-Strauss 1967:127).

The urbanization, landscape, infrastructure, and ecology of the Great Lakes region are of concern in the discipline of Landscape Architecture because of the opportunities that exist in post-industrial marginalized landscape and challenges of environmental degradation the region encompasses. Landscape architects are in a unique position to shape the course of the Great Lakes Region because of their ability to act as mediators between singular, specialized, or technocratic disciplines such as civil engineering or urban planning.

This thesis focuses on Marquette, Michigan’s waterfront, known as the Lower Harbor. Marquette’s origins and growth stem from its proximity to an abundance of iron ore and its strategic position as a port for shipping to the steelmaking cities in the lower Great Lakes. Since the decommission of Marquette’s massive waterfront ore dock in 1971, the city’s industrial lakeshore
has been left to decay and has become the locus of a marginal landscape. The project develops criteria through research that could be applied to other port towns along the southern Lake Superior coast in order to reconnect their abandoned post-industrial lakefronts to the cities that grew up around them. Duluth, Minnesota; Two Harbors, Minnesota; Superior, Wisconsin; Ashland, Wisconsin; and Marquette, Michigan are all examples of towns with disconnected waterfronts, at varying degrees, because of post-industrial neglect and the abandoned ore docks that tower over their harbors.

Looking at extensive deindustrialization and the ongoing transformation of urbanism in the rust belt including along the Lake Superior Coast, this thesis will explore the complex relationship between urbanization, landscape, and the material economies of the Marquette region in order to develop criteria to redesign this harbor town waterfront and to make it vital to the community again.

These criteria were used to generate a set of site-specific design proposals that seam the perceived edge between the city and the waterfront. In order to do this, the project approaches the waterfront site not as an edge, but as part of a continuum between land and lake. Marquette’s residents often consider the abandoned ore dock blight, but as a reminder of the region’s industrial history, it is a central part of the town’s legacy. It is important to preserve the dramatic experience and character of the site in order to situate its importance historically as well as create a sense of integrity for the city. I will examine Marquette’s waterfront in order to reconnect the forgotten history of the industrial age and improve on post-industrial landscape adaptive reuse objectives. The design will employ the marginal land to connect a community to its waterfront and the deserted monumental structures left in the wake of post-industrialization.
CHAPTER 2: DESCRIPTION OF CONTEXT

An abandoned ore dock, Ore Dock No. 6, dominates Marquette’s harbor, revealing quite plainly the city’s industrial past. Railroads ran from the hinterland to the lakefront, using trains to connect iron ore mines directly to lake freighters. Ore Dock No. 6 was once connected to an elevated train that ran directly through the city. This transportation infrastructure, no longer used, was dismantled in 1999 after being out of use for 28 years. Lacking a plan for the future use of this space, city administration allowed the dock, its immediate area, and the land where the elevated train once stood to become marginalized. Like other post-industrial waterfronts throughout the Midwest, the landscape became fragmented, without a concrete, sustainable plan for its future use.

Figure 1. Map of the Great Lake Region, Indicating Where Marquette is Located

In the many Lake Superior ports of Minnesota, Wisconsin, and Michigan, ore docks were once common. In the 1840s, iron ore deposits were discovered in the Upper Peninsula of Michigan and by the 1890s; Michigan was the largest supplier of iron ore in the U.S. The ore was hauled on railroads from the mines to the ore docks to Marquette among other cities, where ore freighters would intercept it and transport it throughout the Midwest and beyond. The iron ore was use to make steel, a fundamental material for the industrialization of the United States.

The development of Marquette was a result of the discovery of iron in nearby Teal Lake in
The first ore dock on Lake Superior was built in Marquette in 1859 and by 1862 the village had a strong economy with over 1,600 residents. By 1871 it was incorporated as a city. For twenty years, Marquette was the only port that shipped iron ore in the Lake Superior district. Linked by rail to numerous mines, Marquette was the leading shipping center of the Upper Peninsula during this era.

While Marquette was booming as an industrial iron ore shipping port, the harbor was a constant center of activity. Ships transported all types of commercial goods to Marquette to be distributed across the Upper Peninsula. The ships also carried passengers who visited the area for business, pleasure, and health rehabilitation.

The demand for iron ore grew, and by 1931 in order to remain competitive, the D.S.S. & A. Railway built the monumental Ore Dock No. 6. It was constructed of steel and concrete—86 feet high and 969 feet long. The dock remained in operation until it was abandoned in the late 1960s when the demand for iron ore waned, forcing its closure.

The infrastructure of the train lines and the ore dock once gave life to Marquette. Officially decommissioned in 1971, the dock is now stuck in time with no purpose except as a stark symbol of the city’s legacy. Elevated railroad tracks ran through the city and connected to the ore dock. When these tracks were dismantled in 1999, the dock was severed at the water’s edge—further disconnecting the waterfront from the city. Almost forty years later, the city of Marquette has yet to come to terms with how to deal with its waterfront.

This project examines the history of Marquette’s ore dock and its importance as a reminder of the town’s past—but more importantly the dock’s potential as a symbol of Marquette’s future. With the migration of shipping routes because of changes in industrial production, this formerly central part of the town’s economy has become part of a marginal landscape. This thesis proposes a design that utilizes the potential in the waterfront property, the site’s central location in town, and the abandoned structure, creating a destination with a large integrated waterfront system marking its industrial history.
CHAPTER 3: THEORETICAL CONTEXT

The process of deindustrialization has stressed urban centers as well as rural areas. Post-industrial sectors of cities present challenges to landscape architects to find ways to recover and re-image these landscapes. “Any innovative response to these developments will most likely come from a creative appreciation of how today’s space and time are phenomena radically different from the historical antecedents” (Corner 1999:14). As these shifts in cities occur, post-industrial spaces need to be creatively re-imagined as new sources of vitality, rather than ignored (as in the case of Marquette’s ore dock) or neglected (as in the case of other Great Lakes cities).

Landscape As Infrastructure

Reconfiguring infrastructure and reutilizing land are important elements in reshaping the landscape of our postindustrial cities. At a great historical and practical loss to these cities, tracts of land are left abandoned and existing structures are often destroyed or simply ignored. Pierre Bélanger reveals, “the failure to return land to productive reuse and reinvest in public works signals that conventional approaches to redevelopment and remediation have reached a tipping point. The financial magnitude and logistical complexity of the challenge facing the North American economy can no longer be resolved by singular, specialized or technocratic disciplines such as civil engineering or urban planning that once dominated 20th- century reform.” (Belanger 2009:80). The kinds of redevelopment plans that are commonly employed today are not addressing the issues of putting land back into use for the public, and therefore these landscapes do not stand a chance of recovery.

Although static in and of themselves, infrastructures serve as a means for the organization and management of complex systems of flow, movement, and exchange. Not only do they provide a network of pathways, they also work through systems of locks, gates, and valves—a series of checks that control and regulate flow (Allen 1999:55).

The Marquette waterfront will have the ability to adapt over time. This will be achieved in part by implementing flexible programming, while seaming the connection of the ore dock to the city. Not only does this landscape need to connect the physical surfaces of the waterfront to the city but it must also do so in the services it provides. Alex Wall reveals, “if the goal of designing the urban surface is to increase its capacity to support and diversify activities in time—even activities that cannot be determined in advance—then a primary designing strategy is to extend its continuity
while diversifying its range of services” (Wall 1999:233).

Because much of the industrial infrastructure was originally built at the shipping points at the water’s edge, and cities grew around this, communities have inherently been disconnected from their waterfronts throughout the twentieth century. In the first part of the century, industry restricted public enjoyment of much of the waterfront space in cities by the creation of spaces that were of a size beyond the human scale, often dangerous, and uninviting. The dismantling and abandonment of the industrial infrastructure in the later part of the century presented city planners and landscape architects with the potential for real change and connection of city and waterfront; however, this has not yet been realized. As evidenced by current city plans for Marquette’s waterfront, lakefront space often remains marginal and underutilized.

Public accessibility to downtown waterfronts will help to secure cities as important and prosperous places for the future. “Landscape is seen as a means to resist the homogenization of the environment while also heightening local attributes and a collective sense of place” (Corner 1999:13). By reclaiming the marginal landscape, the connection from the city to the waterfront can be made to create a sense of place as well as a space for public use and enjoyment.

Landscape As A Means Of Interconnection

Continued environmental degradation and resulting costs to public health and welfare have heightened the interest city dwellers have in nature. The focus of landscape architecture has moved towards the integration of natural systems into the design of cities rather than simply the “greening up” of desolate landscapes. “It is time to expand what has been a romantic attachment to the ornaments of nature into a commitment to reshape the city in harmony with the workings of nature” (Spirn 1984).

Long-term sustainability in large parks is a challenge because of the expanded potential for biodiversity, together with complexity of their ecology and programs. (Lister 35). Lister sees design, planning, management, and maintenance all as parts of this challenge. “Sustainability demands the capacity of resilience – to recover from disturbance, to accommodate change, and to function in a state of health – and therefore, for adaptation” (Lister 36).

Creating open space and corridors can make a city more vibrant, healthy, and productive. A comprehensive strategy for ecologically sound planning necessarily involves an urban design strategy to improve air quality, conserve energy, and improve overall comfort throughout the city.
(Spiri 1984:77). However, the recreational needs of people living in cities and creative design goals often conflict with these ecological priorities; therefore our responses must be adaptive, complex, layered, and flexible. As cities revitalized their post-industrial areas through the creation of parks, designers must consider how ecological and therefore adaptive design might influence the art and science of creating these spaces (Lister 2007:38).

Socioeconomic factors are likewise important considerations in planning for the challenges created by a large park. The space will need to accommodate social, cultural, technological, and political desires that are constantly shifting. At the same time, importance must be placed on allowing the site to retain its original identity (Czerniak 2007:216). This is why the site will need to be planned to accommodate present needs, as well as allow for the possibility of future changes in community priorities. As cities revitalize their post-industrial areas through the creation of parks, designers must consider how ecological and therefore adaptive design might influence the art and science of creating these spaces (Lister 2007:38).

In contemporary urban areas, escalating land costs along with decreasing availability of suitable sites make new parks a costly and a less likely endeavor. The shrinking of public resources is also revealed in the demand that parks be revenue-generating. This is why parks need to be planned with long-term viability and economic sustainability in mind (Lister 36). Designers must tap into fixtures in the community with access to capital and reasons for investment. Northern Michigan University is located in Marquette, within a few miles of the waterfront site opening the possibility that the university could develop an ecological research component and facility at the waterfront. Marquette also has a robust hockey culture. There is economic incentive to develop an ice rink at the site, generating revenue that would help sustain the site economically.

It must also be considered that urban life has changed in the last hundred years, and the need for public space is different now. This proposal allows for the Marquette waterfront plan to be economically viable and potentially revenue-producing by creating a destination that brings people into the city, flexible programming that includes a community market, and repurposing the ore dock for use as a source of power generation.

A waterfront park has the potential to impact the vitality of Marquette through the wide range of services a park offers. According to Czerniak, parks play a role as social catalysts, ecological agents, and imaginative enterprises. Parks are places to be imaginative, to project futures, and extend sets of possibility (Czerniak 2007:244). Parks have the ability to shape the
culture of a city by creating platforms on which a city can play out its roles. This was instrumental in determining how to create environments in which program can be implemented, but flexible enough to where it can change over time.

With cities in decline and nature enveloping the vacancies left behind in the wake of deindustrialization, we have the opportunity to reimagine the urban landscape. With the amount of marginal and under-utilized space in our cities due to the transition in modes of industry, “a park’s configuration is more imposed than chosen” (Czerniak 2007:220). Tracts of land are often fragmented socially and programmatically, as is the case with Marquette’s waterfront. The reuse and re-interpretation of Marquette’s waterfront can connect the city to Lake Superior while giving the city a sense of place grounded in its industrial history. This project unites fragmented land, creating an integrated open space system.

**Landscape As A Neighborhood Mosaic**

Connected spaces are ideal for fostering ecological and social functions. The spatial configuration of land-use types needs to be considered in ecological planning to avoid undesirable effects on humans and nature. Anna Hersperger proposes the neighborhood mosaic, a local assemblage of landscape elements linked together by strong interaction, as a promising unit for studying, planning, and managing spatial configurations (Hersperger 2005). Interactions among landscape elements can be ecological flows, such as water, energy, wind, and pollution (material) or the movement of animals and plants as well as people (Hersperger 2006). Three aspects of the neighborhood mosaic concept are patch adjacency, patch-and-matrix pattern, and patch neighborhood (Hersperger 2006). The term patch, a fundamental term in landscape ecology, is a relatively homogeneous area that is different from the areas that surround it (Forman 1995). Patch adjacency refers to an area of landscape and its immediate adjoining elements (Hersperger 2006). The patch-and-matrix pattern concept deals with the interactions among the patches. Patch neighborhood refers to strong the interactions among neighborhood elements such as species movement or human engagement. (Hersperger 2006). The spatial concept of the neighborhood mosaic is a useful tool as a design concept because of its potential to cultivate the integration of ecological knowledge into city planning (Hersperger 2006). By understanding the patches in Marquette I was able to assemble ecological and statistical data from the area, and found methods to engage the waterfront site by incorporating it into the neighborhood mosaic.
This thesis examines the process through which Marquette’s ore docks and Lower Harbor situated the surrounding city. It also reveals the relatively recent severed connections between Marquette and its lakefront resulting from the decommissioning of the shipping centers and the abandonment of the ore docks. Reconnecting the cities with their lakefronts through landscape, infrastructure, and ecology will reinvigorate the areas and set the groundwork for development focused on localism and sustainability.

The exploration of urbanization, landscape, and the material economies of the Marquette region have implications for understanding how landscape can influence social and cultural changes associated with the transformation of a Lake Superior harbor that ignores its waterfront. As society tries to redefine the role of landscape as a cultural and economic driver, this project also has implications for understanding the problems associated with the Lake Superior post-industrial marginal waterfront.
CHAPTER 4: COMPARATIVE STUDIES AND CRITERIA

Three other formerly underutilized waterfront spaces serve as useful comparable case studies: 1. the Brooklyn Bridge Park in New York, through which Michael Van Valkenburgh Associates (MVVA) transformed a bleak post-industrial landscape into a vibrant waterfront park; 2. the Fox Riverfront in Green Bay, Wisconsin, designed by Stoss Landscape Urbanism, an urban park project which integrates the former railroad corridor and the steel bulkhead wall on Green Bay’s river font with the city to form a useful public open space; and 3. Leslie St. Split in Toronto, a dumpsite as well as open public space. Through these projects, we can examine site potential in purpose and execution. Though dissimilar in many ways, each has valuable lessons that can be utilized in the development of criteria for design.

1. Brooklyn Bridge Park, New York, NY

With MVVA as the project’s lead designer and planner, the industrial landscape of Brooklyn Bridge Park is now being transformed into an eighty-acre park that deals with a similar situation to Marquette’s ore dock: enormous scale of surrounding elements, the water’s edge, and an area bound by the streets of a city. As was the case in Marquette, the Brooklyn waterfront saw significant growth in the first half of the nineteenth century and became a booming hub of shipping and manufacturing. It was later abandoned and became a bleak expanse of concrete, abandoned buildings, and piers. MVVA focused on the intersection between the land and the water, the active edge where the water’s rise and fall interacts with the land, and significant differences in texture. Sustainability was a key focus of this project where MVVA reused structures and the materials that naturally exist on the site.

By focusing similarly on these elements of sustainability including the reuse of materials at the Marquette’s waterfront site, my intent is to achieve a landscape with staying power, built with the same integrity and industrious vision as the ore dock that dominates the site.

2. Fox Riverfront, Green Bay, Wisconsin.

The Fox Riverfront design forms a corridor along the edge of the river in downtown Green Bay, Wisconsin. The site extends from the city’s level ground to a steel bulkhead wall at the river’s edge. The bulkhead wall is composed of six different segments built at different times all using different structural systems. The site is narrow and complex; however the designers found ways
to incorporate a variety of flexible spaces for public interaction through the creation of an intricate series of architectural piers and walkways.

Chris Reed, the lead designer and founding principal of Stoss, believes that landscape architects relinquished their social relevance as scientists when they allowed engineers to ascend and take the lead in the implementation of comprehensive infrastructures (Reed 2006:270). Landscape architects need new modes of practice—no longer simply covering up problems or dressing up sites (Reed 270). Reed achieved the redesign of the Fox Riverfront by taking on engineering roles that landscape architects have abandoned in the recent past, creating a comprehensive infrastructure as well as a social design plan. The Fox Riverfront incorporates physical and environmental complexities to form an infrastructural landscape that stimulates social and cultural activity. It is important that landscape architects play a role in the reimagining of the postindustrial landscape in order to achieve a comprehensive plan for the landscape—including aesthetic elements as well as engineering projects (Reed 2006).

3. The Leslie Street Split, Toronto, Ontario

The Leslie Street Split is a headland dumpsite made up of waste materials, mostly concrete and rubble. Existing as a dumpsite from urban operations, it was taken over by an ecology of birds and mammals. Because it has been continually used as a dumpsite, it was avoided by housing, retail, and other developments, leaving that land for industrial purposes free for an unmanaged ecology to develop. The industrial activity on the site protected the land from being used in other ways, giving rise to a sanctuary of sorts for the people of Toronto within walking distance from the city. "As a polyfunctional infrastructure, the site operates as an active dumping ground during regular business hours, and an ecological recreation area during off-hours...while at the same time operating as a coastal protection barrier for nearby island communities" (Belanger 2009:82-83). Continuing to use the site for industrial purposes maintains the site and protects it from further development, allowing it to remain an ecological recreation area.

The open area at the Marquette waterfront site was created by the industry that once occupied it. In this way, it was secured much like the Leslie Street Split—because of industrial activity. One way to hold the Marquette waterfront site for future industry and for public use is to implement the site with a polyfunctional infrastructure similar to that of Leslie Street. Because Marquette’s site functioned as an industrial port, it was able to thrive as an important landscape in
another way. By incorporating industrial functions within the site, together with the public use and recreation element, it will ultimately function better and will be secured as an operational site for the future.

Although very different in terms of scale, the three comparables have similarities they all share. They are waterfront sites that once or still have an industrial function and now act as a destination for recreation and social functions, and the three sites all have distinct character that stems from their industrial pasts that renders them unique. These characteristics directly relate to Marquette waterfront. Understanding how these landscapes were designed and dealt with influenced this project significantly. These include practices of sustainability, reusing materials from Brooklyn Bridge Park, creating a variety of flexible spaces for public interaction at Fox riverfront, and the polyfunctional infrastructure of Leslie Street Split.

Criteria Developed During Thesis Process To Design Marquette’s Lower Harbor

During the thesis process Marquette was explored on many levels in order to ground the design in the context of the site. There are numerous factors that created and influenced the waterfront site over time. By exploring these dimensions of the site—figuring out the important drivers of its existence and recent state, I was better able to implement a design that responds to its history in ways that can secure it as an operational site for the future. These criteria can be followed when looking at any Lake Superior post-industrial harbor town. In Chapter 6, there are image examples that further explore the criteria:

1. The natural history of the site including geology, climate, and native ecologies.
2. The cultural context of the site and the historical sequence of its development: specifically the dynamic of infrastructural flows between land and water.
3. The significant site artifacts and existing materials available for reuse.
4. The extent of the site, marked by changes over time.
5. The greater community as defined by culture, economy, and ecology, and the inter-relationships between them.
6. The systems that link the site as an exchange point with other sites, including infrastructure, economy, natural resources.
CHAPTER 5: RESEARCH DESIGN

The investigation of this thesis follows the established criteria in order to design Marquette’s waterfront as a regionally specific and important asset to the community again. The waterfront of Marquette, Michigan was used to demonstrate how these criteria can be applied to other post-industrial Lake Superior waterfront sites. The strategy positions the site between land and water in a broader context as part of a continuum between land and lake. Marquette’s waterfront is the last parcel of land before the lake on the continuum between the two.

The project first focused on accumulating information and photographs of the area the site and region. An inventory was taken of hydrological, topographical, cultural, social, and spatial information. Mapping was used extensively as a tool for site analysis to reveal latent conditions of the land to reveal the potential and virtue of the open space. By analyzing the site using the established theoretical framework while examining its history, ecology, and potential social functions a comprehensive body of knowledge was created in order to establish a conceptual framework.

Drawing on the concepts of using infrastructure to create a polyfunctional landscape, making connections to the broader community, and the neighborhood mosaic, the plan will employ the waterfront with, accessibility, space for social functions, and renewed site ecology, reestablishing a functional ecosystem.
CHAPTER 6: THESIS PROCESS

Site Inventory

This image shows the site in its surrounding context revealing its orientation to the city and to the harbor to the north, Presque Isle Harbor. The site, outlined in green, encompasses the lakeshore of Marquette’s Lower Harbor, including the standing abandoned ore dock as well as the wooden piles from docks that have been torn down that remain drilled into the earth under the surface of the lake. The photographs were taken on a site visit in May of 2010.

Figure 2. Marquette’s Downtown Waterfront
There have been recent efforts to redesign Marquette’s waterfront and development plans are now being implemented. The images are stills from a videotaped public presentation the developers gave to show their plan, including what they claim are great public spaces. There are three parcels that the city decided to sell and the development phases are in progress for two of them. This project assumes that at least up to phase six will be built, which includes condominiums and a hotel. This project is a reaction to this kind of typical development, which ignores the specifics of the place and its context including ecology and the connections to the community. Additionally, the plans do not secure the site for future public access.
Figure 5. Inventory of Cultural Artifacts and Site Conditions

The photographs were taken of the site in May of 2010. Nature is erupting in and around the relics of an industrial past, adding a dynamic element to the site. These cultural artifacts reveal the mechanisms of exchange and their potential for reuse. The value of the site begins at its cultural history. From the outset, it was these artifacts, including the massive ore dock, were key site features, but further research revealed that there is much more that makes Marquette a unique place.
Michigan’s upper peninsula has some of the oldest rocks in the world—nearly 3 billion years old. These rocks include the iron formations found in the Marquette Range that supplied the resources that created the city of Marquette.

Basement rocks are the oldest rocks in a given area; a complex of metamorphic and igneous rocks that underlie the sedimentary deposits. The Upper Peninsula is cratonic upland of very ancient rocks from as long ago as Archean times, nearly 3 billion years ago. These rocks include the iron formations in the Upper Great Lakes region.

Penokean orogeny was a mountain-building episode that occurred in the early Proterozoic about 1.85 to 1.84 billion years ago. Before this episode the area was a passive continental margin occupied by a shallow sea, which created large sedimentary deposits including the banded iron formations of the iron ranges. The remains of the Penokean can be seen today in the iron ranges of Minnesota and Ontario, the Northern Highlands of Wisconsin and the Upper Peninsula of Michigan. The beginning of the Penokean orogeny is recorded by the Lake Superior banded-iron formations, including those in the Marquette, Gogebic, Mesabi, and Gunflint Iron Ranges (Davis 2010).

Hundreds of millions of years after the Penokean orogeny, about 1.1 billion years ago,
Midcontinent Rift, occurred in the same area creating the basin that would eventually become Lake Superior. It is 1,243 miles long and formed when the continent’s core began to split apart. The rift failed and is the deepest closed rift ever discovered—no deeper rift ever failed to become an ocean, instead becoming Lake Superior.

Figure 7. Geology and Lake Sediment of the Lake Superior Region

This diagram shows the Lake Superior region’s geology, while at the same time revealing Lake Superior’s lake bottom sediment. The city of Marquette resides on Jacobsville Sandstone and the lake bottom in the area is sand. The drawing obscures the line between land and lake to reveal that it is a continuous landform.
The land and lake are connected through watersheds—another example of their continuity. The hydrology of the Marquette area is heavily influenced by its adjacency to Lake Superior. Half of Marquette County’s watersheds drain into Lake Superior and the other half into Lake Michigan. The lake borders the entire eastern edge of the city and serves as the final outlet of numerous watersheds. The site, Marquette’s lower harbor, is drained primarily by city storm outlets. The city of Marquette is located primarily within the two of Dead River watersheds and the Whetstone/Orianna Creek watershed. Marquette’s waterfront site is drained by the Matton Park drainage and storm outlets.
**Criterion 2: The cultural context of the site and the historical sequence of its development: specifically the dynamic of infrastructural flows between land and water.**

Coal and iron ore flowed through. By 1971 this flow stopped when the last standing ore dock in the Lower Harbor, ore dock No. 6 was decommissioned. This was an important marker in the history of the site because it was no longer an economic driver for the city. However, its presence provides a contemporary opportunity to generate new flows.

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*Figure 9. Iron Ore and Coal Flows Through the Lower Harbor*
By the 1930s, when Ore Dock No. 6 was built, Great Lakes iron ore production was a formidable economic driver for the region. The diagram shows the routes the ore took from Lake Superior to lower lake steel-making cities in 1937. The weights of the lines are proportional to the amount of iron ore that was in movement. The diagram suggests that on a regional scale, a network of lake towns could cooperate towards common economic interests.
The railroads carried the iron ore out of the mines to the shores of Marquette, where it was loaded onto ships and carried to the lower lakes in a continuous flow, with the site acting as the exchange point. The grid represents the Land Survey System, where each large square represents 36 square miles. The proximely of the ore deposits to the natural harbor reveal strategic importance of the site.

Heavy vessel traffic to and from Marquette, along with Lake Superior's gales and fogs, made shipwrecks a common occurrence, especially early in the lake's navigation history. Mapping the shipwrecks of Lake Superior reveals the most important shipping routes. The concentration of shipwrecks reveal Lake Superior's busiest route—the route between Marquette and Sault St. Marie where the Soo Locks link Lake Superior to the lower lakes.
These maps show the site as it was in 1916. At this time, the working industrial site was heavily dominated by rail yards. Multiple ore docks were in use for transferring materials from inland Upper Peninsula Michigan to the lower lake ports and back. It was a working site, vital to the city's existence.

This diagram shows the continuum of land and lake, as it emphasizes the continuation of the contours of the lakefront to the depths of Lake Superior. The elevation of the city is significantly higher than the waterfront site.
This diagram combines many ways of conceptualizing, organizing, measuring, and comprehending territory, both land and water. It positions the site as part of a continuum by showing coordinate systems and constructions that are used to identify where we are, including the land survey system (PLSS), Transverse Mercator grid ticks, zip codes, watersheds, latitude and longitude, city limits, townships, and congressional districts. Over water these designations disappear, and instead we rely solely on coordinates (latitude and longitude). Miles per hour changes to knots, and miles change to minutes in the water. Our sense of way finding and place distinction changes dramatically as we move from land to lake. This is because we put more emphasis on way-finding over land. The area that defines the city limits of Marquette encompass includes 8 square miles of water, but this landscape is under utilized. By classifying and identifying the site in this way it reveals more of the site’s dimensions.
In order to get a sense of the site and its relationship to the water, it was necessary to understand where the docks in the harbor once stood and where the pilings of past docks still exist. Further examination showed what piling fields could be employed for public reuse versus those that are privately. By diagramming the existing docks and remaining piles, the site took shape. The pilings on the south side of the site, outlined in red, are owned by Wisconsin Central Railroad and are available for reuse with a bottomland lease and a use agreement from the Michigan Department of Environmental Quality. The lease is would be an agreement to use and occupy unpatented Great Lakes bottomlands for public purposes. The two piling fields on the north side of the site, outlined in white, are associated with privately owned docks, located on State of Michigan bottomlands, and are currently not available for reuse.

**Criterion 3: The significant site artifacts and existing materials available for reuse.**

Figure 16. Ore Dock No. 6 and Pilings for Reuse
The shape of Marquette’s lower harbor shoreline has changed significantly over the course of its 150-year history. The linear distance of lakefront shifted as docks were built and torn down and land was filled. The initial study measured the linear distances of the shoreline (including the docks in the harbor) over time and compared the findings to other lakefront sites around the world with similar linear distances. In this way insight was gained into the type of programming that would be appropriate for the site in Marquette. The populations of the cities that the precedent projects were taken from were significantly different from Marquette’s, making it difficult to interpret the appropriate programming from this study. Although the inquiry into precedent projects with similar shoreline distances did give a sense of scale to the Marquette project. Four time periods were taken into account for the study: pre settlement, the first years of dock building, the 1930s when the remaining dock was built, and now. By 1855 there were already docks on the shore. In 1938 the site peaked in the sense that the largest number of docks were in use and the site was thriving—iron ore was flowing on trains from the mines to the site and onto ships. By 1990 only Ore Dock No. 6 remained.
Figure 18. Marquette’s Origins and Economic Growth Were Derived from Iron Ore

**Criterion 5: The greater community as defined by culture, economy, and ecology, and the inter-relationships between them.**

Early in the history of mining, developers concluded that local smelting of iron could not compete with the advantages of coke smelting on the lower lakes. It proved more economical to carry the ore over the lakes. Innovation in the early years of Marquette’s history gave a characteristic of development that continued in succeeding decades. The hand-loading of ships gave way to the mechanized pocket ore dock.

Because of mineral riches, and with the help of innovation and entrepreneurship, Marquette grew as a city. It became, as George Francis Thomas wrote in in 1885 in his Sportsman’s Guide to the Upper Lakes, “by all odds the best built and wealthiest city on Lake Superior: a city peerless in her native loveliness, with a veritable Bay of Naples at her feet” (Bogue 2007:239). He wrote of broad, paved, lighted streets, substantial blocks with businesses, and impressive residences on the ridge above the harbor (Bogue 2007:239).

The origins and economic growth of Marquette stemmed from mineral riches, mostly iron ore. By including the Public Land Survey System grid, this map shows exactly where those riches were to be found; approximately eight miles from Marquette’s lakefront. In essence Marquette grew because there was economic opportunity to be excavated just inland.
Figure 19. Regional Features

These maps show how resources were gathered in order to program the space. Exploring the current condition of Marquette helped to understand what important drivers should influence the site.

The natural systems should be extended; bringing the woodlands could into the site. The streams that empty into Lake Superior at the site should be daylighted and rainwater could be drained onsite rather than in storm drains. There is an enormous opportunity to make positive
changes in terms of mitigating pollution and encouraging natural systems. Draining this water on site will significantly reduce pollution runoff into the lower harbor.

Two significant business corridors lead directly to the waterfront site, presenting an opportunity to extend those systems as well, bolstering the local economy.

Understanding where people have access to food helped to understand how local food system should influence the site.

Figure 20. Waterfront Market

Criterion 6: The systems that link the site as an exchange point with other sites, including infrastructure, economy, natural resources.

Any one of the maps from Figure 19 could be projected further to show how it can influence the site as it relates to the land/lake continuum. For example, a food distribution system can be created for the site by exploring Marquette’s food access. There is an existing farmers’ and artists’ market downtown Marquette on Saturdays. The existing market could be moved to the lakefront, eventually expanded, and made year-round and permanent.
Figure 21. Farms That Participate in Marquette’s Artists’ and Farmers’ Market

Most of the farms that participate in the farmers market are located about the same distance from Marquette as the iron ore mines to the east—on more suitable land for farming. The railroad, indicated with a red dotted line, runs through the mining area and to Presque Isle harbor. Many of the farms are located closer to U.S. 41 that leads directly to the Lower Harbor. The farm products could be a new type of flow to the waterfront providing an economic framework for inter-community cooperation.
Many lake towns have farmers markets near Marquette. This is an opportunity for farmers to make strong regional connections by selling to other markets while diversifying products at all markets. Marquette would act as a hub for this flow. The site would act as a polyfunctional infrastructure. By incorporating infrastructural systems, like a farmers’ market exchange hub, and allowing the site to operate as an ecological recreation area, it would ultimately function better and secure it as an operational site for the future.
Site Design

The site was divided into 3 areas, each concerned with the land/lake continuum in their own way. One area primarily deals with recreation, tapping into local sports and culture. Another extends commerce from the downtown to the lake, moving the farmers market to the lakeshore, and adding a floating music venue that would release from the shore during an event but would be a fixed open area otherwise. It would bring premier artists, encourage an annual film or music festival, and act as a regional destination, enhancing tourism. The third area preserves the lakeshore for ecological enhancement, bringing in the university for a research element. This helps to secure the land as public space for the future. This diagram indicates unique programming for each of the three areas of the site but also shows that each part also integrates elements of the others.

Lower Harbor Recreation–Local Sports and Culture
Lakefront Commerce–Downtown Economic Extension
Preserve–Local Ecological Enhancement
Area Connections–Connect the three areas of the site as one, and connect the site to the city, including parks.
The master plan employs the strategies of using infrastructure to create a polyfunctional landscape, creating connections to the broader community, and the neighborhood mosaic, while following the established criteria, to addresses the marginalized conditions at the post-industrial waterfront. This was accomplished by regarding the site as part of a continuum between the city and the lake. The redesign utilizes the potential in the waterfront site. This includes the reuse of cultural artifacts the site’s central location in town, and the abandoned structure, which creates a destination—with a large integrated waterfront system. The waterfront in energized
with accessibility, space for social functions, and renewed site ecology, reestablishing a functional ecosystem. A network of corridors integrates the site into the city fabric.

Historically, Lower Harbor Park was part of Lake Superior, but over time the lake was filled in between the coal dock and the shoreline. By cutting out a section of the fill and restoring it to the lake, the edge becomes more complicated, opening up possibilities for the program to become more flexible. Allowing the lake to come in toward the city in an ideal place tucked in at the back end of the harbor, where it is naturally protected from the wind and the elements creates a functional and aesthetically pleasing public space. The area accommodates active and passive recreation that includes bike trails, cross-country ski trails, and an ice rink that supports the area’s robust hockey culture as well as active recreation.

The area of the site where Ore Dock No. 6 stands supports an exchange of material flows; much like the ore docks’ original purpose. The plan envisions a cultural center that supports the local economy and promotes sustainability that could include a public market. The area can be accessed by land or water, with Ore Dock No. 6 acting as a point of exchange for people and good. The existing pilings just south of the ore dock are used to create docks that envelop the launching area for a floating music venue. This gesture explores the underutilization of the water in for public use. This regional attraction will generate tourism creating revenue for the city.

Day-lighting streams and draining storm water on site will reduce lakefront pollution as well as accommodate passive recreation. The woodlands that surround Marquette follow the streams through the city to the site create habitat connections to the waterfront. Connecting the woodlands by developing a natural area with native vegetation at the site will make for a more viable and resilient landscape.
Figure 25. Waterfront Research

Figure 26. Waterfront Recreation
The program applied to the site is flexible. The low level of specificity allows for interpretation as Marquette’s needs become apparent and change over time. There are systemic layers over layers of program. The program proposed suggests a place which acts in the manner of a community-gathering site at the pedestrian scale. The example of a farmers market is implemented in order to visually convey the possibilities.
Figure 28. Community and Ecological Connections to the Waterfront Site

The plan connects the city of Marquette to its waterfront in ways. The woodland and riparian corridors lead directly to the site. Extending the commerce area of downtown Marquette to the waterfront and tying the university into the preserve area of the site will create strong connections to the community. The site’s circulation system will accommodate automobile, pedestrian, boating, and bicycling. A regional network of bike and pedestrian paths will connect to the waterfront site.
Figure 29. Marquette’s Existing Marginalized Waterfront Landscape

Figure 30. Marquette’s Waterfront Activated for Public Use
CHAPTER 7: CONCLUSION

Changes in industrial production forced the ore dock in Marquette’s lower harbor to close. Forty years later, the city is still disconnected from its downtown waterfront and has disinherited its industrial identity. Abandoned and left to decay, the post-industrial waterfront landscape has become marginalized. Marquette has been myopic in its re-development priorities. The city has sold a portion of its waterfront to developers who are building a hotel, a shopping complex, and condominiums. The plan ignores the specificity of place and its context including ecology and connections to the community. Marquette should position itself for its future by creating a resilient waterfront landscape that secures the waterfront for public use.

Through the process of analysis of the land and the flow of natural resources, this thesis explored the regional area of Marquette and its waterfront, establishing criteria for a design that will ultimately make the city function better and secure its place as an operational site for the future. The criteria can be a guide for other designers, applying the principles to other northern lake towns that are in similar post-industrial states, disconnected from their waterfronts.

The project approached the waterfront site not as an edge, but as part of a continuum between the land and the lake in order to understand Marquette conceptually. This was achieved by analyzing geological features, natural processes, and the flow of materials from Marquette to lower lake cities, revealing the continuity between land and the lake.

The master plan employs the strategies of using infrastructure to create a polyfunctional landscape, developing connections to the broader community, while following the established criteria to addresses the marginalized conditions of the site. The design utilizes the potential of the waterfront site, including the reuse of cultural artifacts, the site’s central location in town, and the abandoned structure, all of which create a destination with a large integrated waterfront system. The city, the downtown waterfront, and the lake–three discontinuous zones in Marquette–are re-imagined as a continuous landscape.


FIGURES

Figure 1.
No Citation

Figure 2.

Figure 3.

Figure 5.
No Citation

Figure 6.
Figure 7.

Figure 8.

Figure 9.
Marquette Geographic Information Systems (GIS) Data

Figure 10.

Figure 11.
b. Crowell & Murray. The iron ores of Lake Superior, containing some facts of interest relating to mining and shipping of the ore and location of principal mines, with original maps of the ranges., Cleveland: Penton Pub. Co., 1911.

Figure 12.
Ackerman, Paul W. “Lake Superior Dive Chart Shipwrecks Located and Identified” [map]. Chicago, IL: Midwest Explorers League, 1981.

Figure 13.
Figure 14.

Figure 15.

Figure 16.

Figure 17.
Figure 18.
Crowell & Murray. The iron ores of Lake Superior; containing some facts of interest relating to mining and shipping of the ore and location of principal mines, with original maps of the ranges. Cleveland: Penton Pub. Co., 1911.

Figure 19.

Figure 20.
No Citation

Figure 21.

Figure 22.

Figures 23-30.
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