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Quick, Timely Reads
On the Waterfront

The Iron Boats: Best Job I Never Took

By David Frew
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Dr. David Frew, a prolific writer, author, and speaker grew up on Erie's lower west side as a proud "Bay Rat," joining neighborhood kids playing and marauding along the west bayfront. He has written for years about his beloved Presque Isle and his adventures on the Great Lakes. In this series, the JES Scholar-in-Residence takes note of life in and around the water.

The iron ore poured as the years passed the door,
And the iron boats came to pick up their loads.
Then the work was cut down and the door was closed.
They complained in the east that they're 'payin' too high,
And say the ore 'aint' worth digging no more.'
– Bob Dylan, "North Country Blues"

Lake freighters were endemic to life on the bayfront in Erie, Pennsylvania. The "big ships" regularly came and went during summer seasons, and when winter approached several arrived for the off-season to undergo maintenance (lay-ups). The winter fleet collected near the Cascade Docks (Bay Rat haunts), where Perry Shipping performed regular lay-up work. Erie did not have a dry dock during those early years, but Perry was able to complete every other aspect of required maintenance. The Cascade Docks' winter fleet was anchored just north of the docks with individual ships chained together in a wide row while Perry regularly moved one of them at a time to the east side of the westernmost Cascade Dock to make it easier for workers to move back and forth.

We were fascinated by the ships and watched them with awe as they departed for what we imagined to be glamorous destination ports. Even though they were actually bound for semi-familiar places like Detroit, Buffalo, Cleveland, and Chicago, we romanticized their trips. We were also drawn to the sailors. They seemed like heroes to us, and several lived in the neighborhood. They were gone each summer but home by Christmas (most years) and happy to enjoy free time all winter. And money. Great Lakes sailors that we knew had cars, spending money, and long off-seasons of leisure in which to prowl the neighborhood clubs and bars.

For much of my childhood there seemed to be two consistent employment choices for new high school graduates: (1) the factories that stretched along West 12th Street and where many of our fathers walked to work each day with lunch buckets, or (2) the ships. Hot sweaty factories that reeked of chemicals and machine oil … or the "glamorous" ships that visited far-off ports. Given neighborhood contacts and the economic growth of the 1950s, either was possible. Trudging mindlessly toward West 12th Street each morning, sometimes through sleet and snow, or standing on the deck of a glamorous ship watching waves, shoreline vistas and sunsets (we did not pay much attention to the dangers of shipwrecks or cold-water drownings because Bay Rats were immortal). Easy choice!

Three friends shipped off and two of them continued for long enough to retire. Lake freighter retirees who I knew were able to work double and triple shifts (at time-and-one-half or double- time pay), save their money, and retire comfortably. There wasn't much to spend money on at sea. One of them began to invest in real estate after a few years and ended up owning dozens of rental flats, condos, and apartment buildings, stretching from Erie to Florida. The other packed his onboard cabin with books about the stock market and investing then dedicated off-duty time to learning how to read annual reports as well as balance sheets. Both became multimillionaires after 20 years on the water and retired before they were 40 years old. Fortunately (or unfortunately), I was unable to imagine how those careers were going to play out at age 17 and after a few visits to 12th Street factories I decided to try college.

The majority of ships that they sailed, like the largest proportion of ships on the Great Lakes at the time, were bulk carriers. Raw materials, including sand, gravel, coal, and limestone, were loaded directly into the holds of the ships and moved from points of origin to locations where they were needed. Of all the bulk products shipped on the Great Lakes, however, the most common was iron ore. Thus, the common descriptor, ore carriers. Iron ore was discovered in the Lake Superior region during the mid-1800s, almost instantaneously making the twin-city port of Superior-Duluth the busiest destination on the lakes. Ore was mined in many nearby locations on the Upper Peninsula of Michigan and in Minnesota and hauled to the port via railroad cars. The essential ingredient in steel making (along with coal and limestone), Mesabi Range iron ore was soon responsible for the geometric growth of America's steel industry. The steel-making plants, themselves, were

largely located near the coal ranges of Ohio and Pennsylvania so the transportation challenge revolved about shipping mined iron ore (and later taconite) from Duluth, Minnesota to Lake Erie.

The birth of the modern Great Lakes shipping industry and its ships was almost entirely connected to the transportation of iron ore from Lake Superior to Lake Erie. And the incredible series of innovations that has always characterized American engineering and technology drove efficiencies that have ultimately allowed the United States to become the world leader in steel. In the beginning, ship loading was unimaginably slow and labor-intensive. Raw ore was shoveled into barrels and lifted into small multi-purpose, wooden steamships. The unloading process was similarly crude with gangs of dock workers lifting barrels of iron ore out of the ships and re-shoveling it into waiting railroad cars. In addition to delays caused by labor intensive loading and unloading the shipping, itself, was interrupted by the 27-foot difference in elevation between Lake Superior and Lake Michigan. The St. Mary's River that connected the two lakes had a vigorous current that made ship transit impossible. So, to move iron ore from Lake Superior south to Lake Huron, steamships had to be unloaded at the northern end of the river so that barrels of ore could be hauled downstream by mules and wagons. Once collected on the Lake Huron (south) end of the river, barrels of ore were reloaded for the trip to Lake Erie.

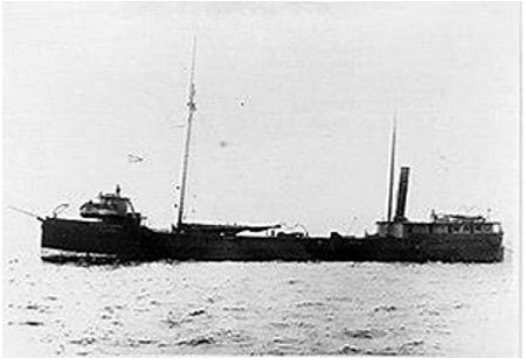
Map of the Great Lakes shows the St. Mary's River at the east end of Lake Superior.

Since the existing fleet of Great Lakes topsail schooners seemed very well-suited to the job of moving cargoes of iron ore from the southern end of the St. Mary's River down Lake Huron and through the rivers that led to Lake Erie, they were the ships of choice. The first iron ore delivery system emerged. Small wooden steamers were loaded with barrels of hand-shoveled ore at Duluth. From there, ships steamed east

to the top of the St. Mary's River and were unloaded. Barrels of ore were then hauled to the other end of the river where contents were poured directly into the holds of schooners. After a schooner had traversed Lake Huron and found its way to an unloading dock somewhere between Detroit and Buffalo, the iron ore was unloaded manually. In the early days it generally took a crew of 12 men four days to shovel the ore from the hull of a schooner onto a dock.

A classic style bulk ship berths at Duluth, waiting to be loaded.

The geometric growth of the steel industry during the mid- to late-1800s put pressure on the delivery system. And the first major efficiency came when the St. Mary's River was made into a navigable waterway in 1855. A single lock was added to the middle of the river that could accommodate a typical wooden steamer. Even with the new lock, however, several shippers continued to transfer their iron ore to wooden schooners at the southern end of the river. The old steamers simply did not have enough capacity to keep up with demand. But everything was about to change!



The wooden steamer, R. J. Hackett, launched in 1869, was the first ship designed for Great Lakes iron ore deliveries.

From that moment forward, unimaginable improvements in delivery efficiency evolved in three areas: (1) the locks in the St. Mary's River, (2) ship design and (3) loading/unloading efficiencies. For almost 150 years after the first lock was built on the river, the state of Michigan and then the federal governments (Canada and the United States) collaborated to make the locks bigger and better. As the locks increased in size, more than one ship could be raised or lowered at the same time. Increasing lock sizes encouraged ships to get bigger. The MacArthur locks that opened in 1943 allowed the previous generation of "big ships" like the Edmund Fitzgerald (of Gordon Lightfoot fame) to transit the waterway. The current edition of the Poe Locks opened in 1969 and is still in operation. This new 1,200-foot lock opened the way to modern 1,000-foot ore carriers. The size of the evolving St. Mary's River locks became the length-standard to which iron ore carrying ships were designed. Ships were systematically lengthened and expanded as locks were made bigger. Another Poe Lock expansion is scheduled for 2030.

Hewlett machines unload a ship at Cleveland.

The most revolutionary technical changes, however, were associated with the processes of loading and unloading. Loading techniques at Duluth were first to become sophisticated. It was a simple matter to haul railroad cars filled with iron ore up and onto elevated hoppers at the docks where they were emptied into bins. From there, gravity systems were used to drop the ore directly into the holds of waiting ships. The unloading process was far more difficult to mechanize. The first major improvements were associated with dockside unloading machines, enormous mechanical dinosaurs that contained specialized steam shovels that could be dipped into a ship's hold. The first-generation machines were "Brown Hoists" and they were revolutionary. But the most amazing of the unloaders were developed at the nearby port of Conneaut, Ohio. With the financial backing of Andrew Carnegie, who had a vested interest in the iron ore operations at his dock, Conneaut inventor George Hewlett created an enormous dockside machine that could unload a ship in just a few hours. Hewlett machines spread rapidly to almost every major port on the Great Lakes (a few were used on the Atlantic Coast) and represented the state of the art until the mid-1960s when self-unloading ships appeared. Using interior elevator/conveyor systems of lifting clams inside the hull,

a modern self-unloading ship could extend a deck boom and drop a pile of iron ore (or any other bulk material) on any dock, eliminating the need for individual receiving piers to have their own equipment.

Iron ore ships eventually evolved to meet the specific needs of their cargo. Between 1869 and 1969, a span of only 100 years, the iron ore delivery business fundamentally drove the design of Great Lakes ships. The change began when a shipbuilder combined two original types of delivery ships, the wooden steamer and the topsail schooner. The resulting design emerged in the R. J. Hackett, a steam-driven propeller ship designed in the now classic, wheelhouse forward and engineering in the rear, Great Lakes style. Longer than a standard schooner but sharing the same hull design, the ship allowed ore to be loaded directly into its hull. When traditional sailors objected, complaining that steam engines could not be trusted as a power source, a traditional sailing rig with a long boom was added to the deck. The resultant ship could steam efficiently when there was no wind, or a course was directly upwind. But when the ship was traveling with the wind, the sail could be used to add to the hull speed. The new design eventually eliminated the process of offloading and portaging of iron ore on the St. Mary's River as it added to the size of the average payload.

The 729-foot Edmund Fitzgerald was typical of the post-1943 MacArthur Lock ship designs that my friends sailed on. She was a classic ore boat design with her wheelhouse forward and engine aft, as well as a self-unloader.

The final change in ship design followed the 1969 expansion of the Poe Locks, which encouraged the fabrication of the 1,000-foot ships that currently carry the bulk of the nation's iron ore. That change had a significant impact on Erie's maritime economy. In anticipation of the demand for huge new ships, Litton Industries, an Atlantic Coast shipbuilding company, moved to Erie's east bayfront and began the construction of the Stewart J Cort, the Great Lakes first 1,000-foot ship. Fabrication plans required a dry dock at the downtown shipbuilding facility. While the Cort, itself, proved to be a financial disaster, it paved the way toward the new Great Lakes shipping economy in which a small number of mega-ships eventually

replaced almost 100 of the old-style vessels that had provided jobs for my friends. One crew of 32 sailors on a 1,000-foot ship was able to replace 15 or 12 crews from smaller ships, creating an employment disaster and ending many of the opportunities for secure, lifetime employment that so many of my friends had enjoyed.

The Stewart J Cort

The Cort was the first of the Great Lakes 1,000-footers that now dominate the iron ore delivery system. While the Cort project proved financially disastrous for the company, Litton attempted another major ship construction, the Presque Isle, an innovative 1,000-foot, integrated tug and barge. The idea was to allow smaller crews (a cost saving) to move a huge barge filled with bulk material after which the tug portion could disengage and depart with another barge. The idea did not "take" but the Presque Isle is still working the lakes and spends winters in Erie tied up to the channel as lay-up work is completed.

The Presque Isle

While most of the opportunities for employment as a Great Lakes sailor disappeared with the new 1,000-foot ships, there is a new and prosperous job opportunity in the maritime industry. DonJon Shipbuilding currently employs a huge staff of full- and part-time employees and these days the "golden skill" is welding. An ambitious high school graduate (or career shifter) can attend one of the local technical colleges, become certified as a welder, and probably find one of many lucrative jobs. DonJon is almost always hiring.

Litton Industries is long gone but the dry dock tit built is now the central feature of DonJon's shipbuilding, repair, and winter lay-up business.

I still have second thoughts about a career path not taken. But having a sailboat that I have used to travel extensively (during good weather) has helped soften the doubts that sometimes float into my brain. Meanwhile, I can be a ship-spotter who lives vicariously through the "big boats" that I regularly watch on Presque Isle Bay (as well as online). And I am still thinking about becoming a welder.

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1. Folk singer, Bob Dylan, was born in Duluth, Minnesota but moved to a small mining town on the Mesabi Range, where he was raised. Influenced by Woody Guthrie, much of his early writing (including "North Country Blues") revolved about the injustices of labor.

Bob Dylan

2. The twin ports of Superior and Duluth provide a worthwhile vacation destination. The constant marine traffic, museums, and surprisingly mild weather make a visit more than worthwhile. Try the fresh whitefish and be sure to visit the last remaining whaleback ship, the Meteor.

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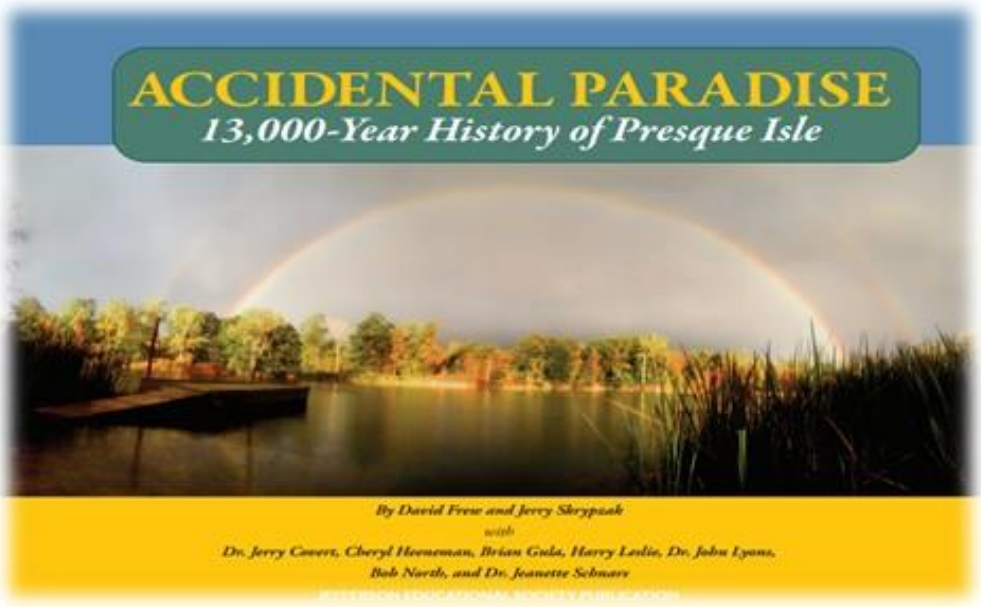
Accidental Paradise

by Dr. David Frew and Jerry Skrypzak



The beautiful book on Presque Isle published by authors David Frew and Jerry Skrypzak – "**Accidental Paradise: 13,000-Year History of Presque Isle**" – is on sale at the Tom Ridge Environmental Center's gift shop and through a special website, **AccidentalParadise.com**.

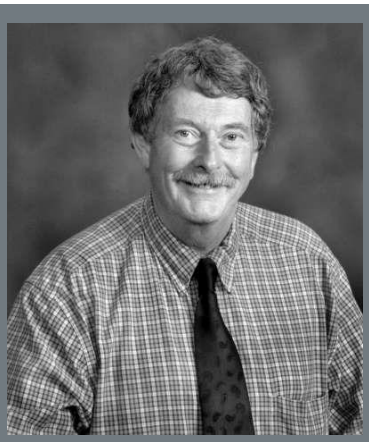
The book, priced at **$35 plus tax and shipping**, can be ordered now through the website sponsored by the TREC Foundation, **AccidentalParadise.com**.

Presque Isle Gallery and Gifts on the main floor of TREC, located at **301 Peninsula Drive, Suite #2, Erie, PA 16505** will also handle sales ***daily from 10 a.m. to 4 p.m.***

For more information, send an email to **aperino@TRECF.org**.

To watch "Accidental Paradise: Stories Behind The Stories" click **here**.

ABOUT THE AUTHOR



Historian and author David Frew, Ph.D., is a Scholar-in-Residence at the JES. An emeritus professor at Gannon University, he held a variety of administrative positions during a 33-year career. He is also emeritus director of the Erie County Historical Society/Hagen History Center and is president of his own management consulting business. Frew has written or co-written 35 books and more than 100 articles, cases, and papers.

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