

Lake Michigan and Chicago River Sand and Silt

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1 Regional Background

Lake Michigan formed around 13,000 years ago when the Wisconsin Glacier retreated, leaving behind the glacial Lake Kankakee and a big hole for that water to flow into. The glaciation and subsequent Kankakee Torrent left the area around modern day Chicago a big flat swampy mess. The Lake Michigan drainage basin (ultimately part of the St. Lawrence River Basin) doesn't extend very far south or west; all that land drains into the Mississippi River basin and eventually the Gulf of Mexico. David Foster Wallace put it excellently in his essay, *Tennis, Trigonometry, Tornadoes*¹ :

The terrain's strengths are its weaknesses. Because the land seems so even, designers of clubs and parks rarely bother to roll it flat before laying the asphalt for tennis courts. The result is usually a slight list that only a player who spends a lot of time on the courts will notice. Since tennis courts are for sun-and-eye reasons always laid lengthwise north-south, and since the land in Central Illinois rises very gently as one moves east toward Indiana, the court's forehand half, for a rightie facing north, always seems physically uphill from the backhand.

Chicago was settled by a series of Native American nations, and was first discovered by Europeans around 1679. The first European settled in Chicago around 1780. By the 1830s, following a series of wars and treaties, the Native Americans were removed and the Town of Chicago was established. Due to the size of the Lake Michigan basin, Chicago quickly became a major center of trade; goods coming in from the Atlantic, Canada, or north-eastern states had to pass through the Chicago Portage to reach the Mississippi River basin and ultimately the west or southern states.

In 1871, a three-day fire destroyed Chicago's city center (it was not, as was reported, started by Irish immigrant Catherine O'Leary's cow). The citizens simply pushed the debris out into the lake and started again. This had the effect of adding a few square miles' worth of landfill to Chicago. The building I live in now stands on ground that was under water before the Chicago fire.

¹<http://harpers.org/wp-content/uploads/HarpersMagazine-1991-12-0000710.pdf>

The Chicago River was originally two small tributaries, the North Branch and the South Branch, which combine in the city's center and drained into Lake Michigan. This presented Chicagoans of the late 19th century with a problem: their waste (human and industrial) was dumped into the river, but their water supply came from the lake. The solution was obvious: reverse the flow of the Chicago River. In 1871, the Illinois and Michigan canal (a 96 mile canal connecting the Chicago and Illinois rivers) was deepened to the point where the Chicago River reversed for a season, and in 1901, the Chicago Sanitary and Ship Canal (connecting the Chicago and Des Plaines rivers) was completed, reversing the flow of the Chicago River completely. The State of Michigan successfully sued the City of Chicago for draining Lake Michigan, so a lock had to be built in Chicago Harbor. The city of St. Louis, Missouri sued Chicago for dumping their sewage into the Mississippi River (eventually, by way of the Des Plaines and Illinois rivers), but lost.

The South Fork of the South Branch of the Chicago River was, in the early 1900s, an open sewer for the meat packing plants in Chicago's south side. The decomposing carcasses let off so much gas that residents nick-named it Bubbly Creek. Efforts to restore Bubbly Creek are ongoing.

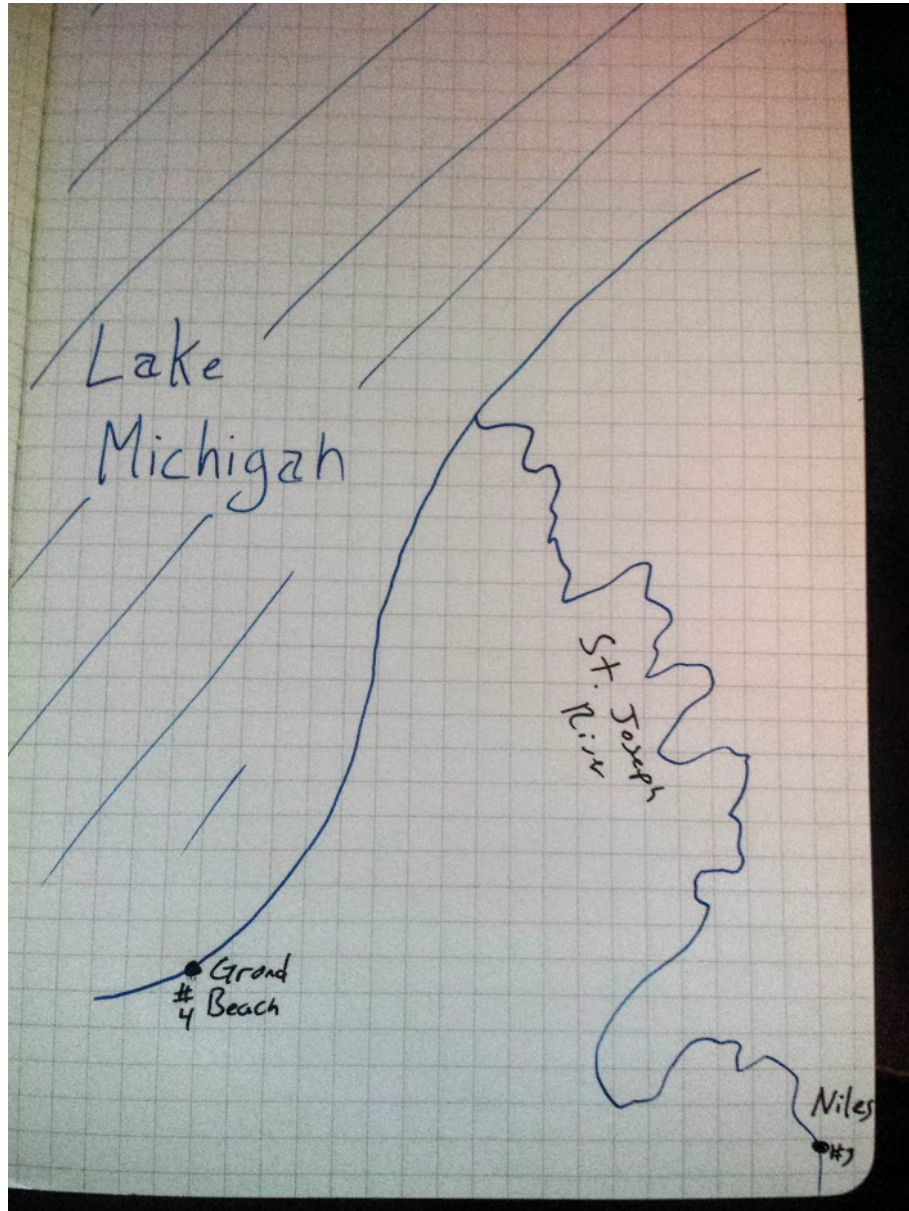
The rest of the Chicago River system is pretty filthy as well, but restoration efforts are having a greater impact. Rumor has it that it's now safe to eat as many as six fish per year from the Chicago River!

2 Maps

2.1 Chicago area



2.2 Southeast Michigan



3 Samples

3.1 Ohio St. Beach

N 41.89385 W 87.61319

Monday, 14 September 2015

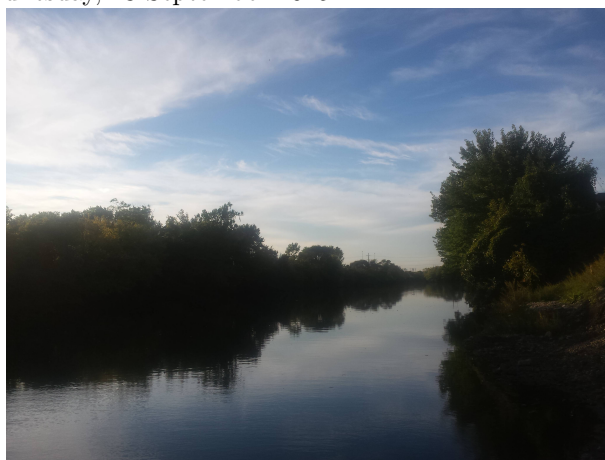


I took the first sample from the Ohio St. Beach. It's a dinky little beach, no more than 100 meters long, just north of Chicago's Navy Pier, that's kind-of nestled into a little crook between the City and the water filtration plant. I took a walk around lunch time and scooped some sand into a vial at the water's edge. According to the Chicago Parks District website, on the day the sample was taken the bacteria level was predicted to be 6.8 CFU per 100 ml.

3.2 Bubbly Creek

N 41.83182 W 87.65761

Wednesday, 23 September 2015



I took the second sample from Bubbly Creek, the South Fork of the South Branch of the Chicago River. The river is typically hard to access, but I found a little ramp down behind the Bridgeport Arts Center. The ramp is made from gravel that's been poured into place, so I used a length of iron pipe and a piece

of rope to build a dredge I could throw out into the middle of the river and drag back. It took me a few tries to get any silt at all, I think because the ground is so rocky. Bubbly Creek lived up to its name – I noticed a few pockets of bubbles while I was down there. There was also a certain odor. I wouldn't drink this sample if I were you.

3.3 St. Joseph River

St. Joseph River

Niles, Michigan

N 41.82808 W 86.25774

Sunday, 18 October 2015



I took the third sample from the St. Joseph River in Niles, Michigan. I actually don't know anything about the St. Joseph or Niles. I drove about a hundred miles out there because a guy from the Internet was giving away a free air compressor (only slightly broken), and I run a community workshop² that survives on free tools. The guy, Peter, was cool. He moved to Niles about nine months ago, following a rough divorce. I think he runs an antique shop. He was bragging that movies at the local theater are only \$2 and some change (my wife and I pay \$12 per person at our local theater). Pictured above is the Main St. bridge, which is being rebuilt.

It looks like Niles is one of the many farming communities in southern Michigan and northern Indiana that are drained by the St. Joe into Lake Michigan. I was looking at a list of those towns on Wikipedia, and I noticed Benton Harbor, which is where some of my wife and I's favorite wineries are. Southwest Michigan is a lovely area; if you ever get a chance, it's worth a visit.

²South Side Hackerspace: Chicago. <http://sshchicago.org>

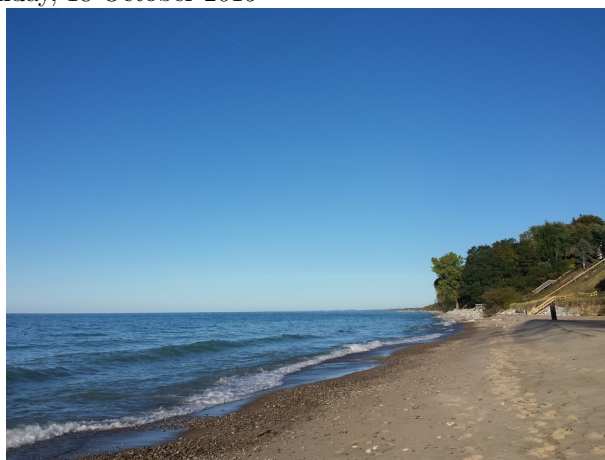
3.4 Grand Beach

Lake Michigan

Grand Beach, Michigan

N 41.77527 W 86.79538

Sunday, 18 October 2015



The final sample came from the shore of Lake Michigan, from a community called Grand Beach, Michigan. It took me a while to find a place where I could access the beach; a lot of people have houses that go right up to the water's edge. A guy I know³ says that sand has the highest silicon content of any sand in the world. I can't speak for the veracity of that statement.

³Steve. He used to be a mattress salesman.