



THE WORLD IS NO LONGER “LINEAR”

One seemingly boring statistic about Lake Superior is very important. It takes about 200 years for an average drop of water to pass through the lake. This could also be a drop of any pollutant. At least half of the pollution entering the lake in the last 200 years is still there in a linear world. However, the distribution of pollutants entering the lake in the last 200 years is skewed significantly to the last 100 years and even more to the last 50 years. Most of the human generated pollution that has entered the lake is still there. It lies on the bottom as taconite tailings, is suspended as sediment and is dissolved as chemicals for some examples.

The multitude of pollution sources and the quantities are accelerating. More people, more power, more mining, more industry are realities both locally and globally. As is the blind hostility toward environmental regulation even in the face of accurate scientific data identifying the problems. A human trait labeled “normalcy bias” has shown that humans generally fail to react to reality in the face of pending disasters, especially if they have not happened before. Climate, politics, war and economics are all rampant with examples. It’s the old “frog in the pot of water” syndrome. Irreversible damage results.

In most cases the negative effects reach a certain “tipping point” after which bad things happen very quickly. Lake Erie has been declared dead at least once and is working on another collapse. Water pollution in Lake Superior and its watershed is a pending example. We may not be at a tipping point for significant harm from pollution in Lake Superior yet but it is approaching. We no longer live in a “linear world”.
LeRoger Lind

Wisconsin waters threatened by tar sands crude oil expansion

Whether you see Lake Superior and other Wisconsin waters as poetry or commodity, proposals for a massive expansion of tar sands crude oil shipments on and around the Great Lakes do not make sense. Among the waters vulnerable to Canadian pipeline company Enbridge's ill-advised plans are Lakes Superior and Michigan as well as the Bois Brule, Namekagon, Chippewa, Wisconsin, Fox and Rock rivers.

Connect the dots on Enbridge's efforts to quietly network thousands of miles of pipelines — a system that would lock in both Wisconsin and our region as a major transportation corridor to ship tar sands crude oil overseas to the world market for decades to come — and a reasonable citizen would be outraged.

Profit and jobs would go to Canada. Crude oil would go overseas. Toxic risk would stay here, sprinkled throughout our region in the crude oil spills, air quality and public health impacts that would certainly come.

Enbridge's piecemeal method, linking and converting already existing pipelines with new connectors, has largely escaped the intense public scrutiny and uproar the Keystone XL pipeline proposal has met — so far.

Tar sands crude oil spills are notoriously difficult to clean up well — and there are serious questions whether the tar sands

corrosive qualities make pipeline ruptures inevitable. Tar sands' raw product is bitumen, similar to asphalt. To move it through a pipeline requires diluting, with benzene (a known carcinogen) for example, high temperatures and increased pumping pressure.

The tar sands project itself is a vast swath of northern Alberta, Canada; once pristine, now a notably polluted industrial landscape. This particularly dirty crude oil is already criticized for its role in magnifying climate issues and



extreme weather. Now, the tar sands emerge as a serious threat to Earth's finest collection of freshwater: Lake Superior and the upper Great Lakes.

Worth noting: Tar sands developers want to triple production.

Enbridge's record merits alarm. Just 150 miles east of Milwaukee, our nation's largest inland crude oil spill began on July 25, 2010, devastating the Kalamazoo River near Marshall, Mich. Cleanup is still incomplete; costs are passing the billion-dollar mark.

For 17 hours, through three shift changes and multiple alarms going off, Enbridge employees in their Calgary, Alberta, control room did not shut down the pipeline. That only happened when a Michigan utility worker called. Meanwhile, 840,000 gallons of crude oil spilled.

Key information was only shared a week later: The spill was tar sands, not conventional crude oil.

Enbridge's pipeline 67, the linchpin of the whole plan, runs from Alberta to Superior. Its proposal doubles its capacity to 880,000 barrels per day.

At Superior, the pipeline splits. One pipeline bisects Wisconsin on its way to Delavan before continuing south. Some of its crude oil would go to Chicago-area refineries; most is destined for ports and refineries on the Gulf of Mexico.

Another pipeline runs eastward from Superior, before crossing under the Straits of Mackinac to connect to Detroit-area refineries — and others on the Atlantic Ocean.

Furthermore, Calumet Specialties, a Superior refiner, wants to ship 13 million barrels per year of crude oil across Lake Superior and through the Great Lakes on barges.

"Both plans are unacceptable" (pipeline 67 expansion and oil barges on Great Lakes), a Detroit Free Press editorial proclaimed on May 9.

British Columbia, provincial neighbors of the tar sands, used similarly blunt language in a May 31 rejection of an Enbridge pipeline proposal, saying, "Trust me is not good enough in this case."

Wisconsinites should say no as well. Insist that federal and state permits for the Enbridge line 67 expansion, the oil barges and other hazardous crude oil proposals be denied.

Milwaukee author Eric Hansen is an award-winning conservation essayist and public radio commentator (www.eric-hansen.com).
<http://m.jsonline.com/more/editorials/wisconsin-waters-threatened-by-tar-sands-crude-oil-expansion-b9944286z1-214318651.html>

Micro-Plastics in the Great Lakes

When I hear a reference to plastic pollution in water, I immediately think of the oceans. Specifically, the Great Pacific Garbage Patch, which is a huge, swirling mass of mostly plastic garbage, caught in the North Pacific gyre (large system of rotating currents). Size estimates of the Garbage Patch vary, some say it's twice the size of Texas, some say it's as big as the USA itself.

Discarded plastic will find its way, via wind or rain, into the waterways. In the Los Angeles area alone, 20 tons of plastic fragments, like grocery bags, straws and soda bottles, are carried into the Pacific Ocean every day. Articles written about the Garbage Patch invariably mention one thing; plastic does not biodegrade like other forms of refuse. It just "photo-degrades" into smaller and smaller pieces, Pieces of plastic.

These smaller, even microscopic, floating pieces of plastic are eaten by marine life, which mistake them for food. The particles may leach toxic additives and other pollutants stuck to their surface into the animals that swallow them,

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such as bisphenol A (BPA) and phthalates. These particles also absorb other toxic chemicals, such as PCBs and DDT. To quote an article from <http://www.biologicaldiversity.org>

“As plastic debris floats in the seawater, it absorbs dangerous pollutants like PCBs, DDT and PAH. These chemicals are highly toxic and have a wide range of chronic effects, including endocrine disruption and cancer-causing mutations. The concentration of PCBs in plastics floating in the ocean has been documented as 100,000 to 1 million times that of surrounding waters. When animals eat these plastic pieces, the toxins are absorbed into their body and passed up the food chain”

Key words: “Passed up the food chain”. And who sits on top of the food chain? That’s right, you and I.

Another side effect of our love of plastic is its immediate physical effect on marine life. Images flood the Internet of seabirds with digestive tracts so full of indigestible plastic that they died of starvation, seals with plastic rings wedged around their necks, dead whales entangled in hundreds of feet of discarded plastic fishing nets.

These problems seem to be thousands of miles away, but guess what? Similar problems are occurring in the Great Lakes right in our own backyard. A recent Lake Erie study showed that 85 percent of the plastic particles are smaller than 2/10 of an inch, and range in concentrations up to 1.7 million particles per square mile. (<http://motherboard.vice.com/blog/theres-a-great-plastic-garbage-patch-in-the-great-lakes-too>)



“Single-use” plastics are everywhere. We use them every day in grocery bags, water and soda bottles, straws, and food containers. Plastics are convenient and make our lives easier, but at what price?

One plastic bottle floating on the water, one plastic bag blowing down the street. For all the ones you see how many are already under water?

Do what you can to avoid single-use plastics. Use reusable bags, and skip the plastic beverage bottles. Support manufacturers who use biodegradable packaging. The health of oceans, the Great Lakes, and the people, who use them, depend on it.

by Eric Lind

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Minnesota Lakes Are Contaminated with Cocaine and Antidepressants

Lake Superior and other bodies of water around Minnesota have been found to contain a disturbing amount of chemicals, including prescription drugs and even cocaine. A recent study by the Minnesota Pollution Control Agency has found that local lakes and rivers are chock full of DEET, BPA, prescription and even illegal drugs. The 10-year study examined surface waters from the Minnesota area, finding contaminants even along untouched shorelines.

The investigation, which was led by researcher Mark Ferrey, tested waters that were near wastewater treatment plants and developed areas, as well as water near untouched shores. Water from 50 Minnesota lakes were collected and analyzed by a lab in Vancouver.

Of the 50 lakes tested, researchers found 47 to contain at least one of a list of 125 contaminant chemicals, with insect repellent DEET being the most common at 76 percent. BPA, the chemical found in plastics, was found in 43 percent of the tested lake. But most surprising finding was that cocaine and the antidepressant amitriptyline were found in one-third of the lakes tested. The researchers don’t think that cocaine is being dumped into Minnesota’s waterways, but instead note that the substance can attach to particles 2.5 microns in size, being easily carried through the air.

The levels of these chemicals are not yet alarming, but researchers worry that hormone-disrupting chemicals, at any level, could affect not only the drinking water, but the ecosystem and wildlife of the water system.

By Lori Zimmer, 05/21/13 Inhabitat.com

Summer Reading: [BOOM, BUST, BOOM](#)

With a 2012 copyright, Bill Carter's "Boom, Bust, Boom, A Story about Copper, the Metal that Runs the World," is a timely read before PolyMet's slated Supplemental Draft Environmental Impact Statement (SDEIS). Carter's book is a composite personal story combined with monumental research. Although based within the setting of Bisbee, Arizona, the story can easily be transposed to northern Minnesota. And Carter's story doesn't stay in Arizona--it takes us to Mexico, Alaska, China, and beyond.

The pages of "Boom, Bust, Boom" cover geology, history, and economics while Carter and his wife debate leaving their chosen town of Bisbee due to concerns about the reopening of the mine. During the course of the decision making, Carter interviews workers and mining company executives. He ponders how mining officials can use indigenous peoples as collateral damage while defacing huge expanses of pristine environments. He sheds light on the 1872 Mining Law that allows companies to make billions of dollars for executives and shareholders at the expense of the American public. He notes that all copper mines pollute and the legacy of mining pollution continues in watersheds throughout our country, and world. He explains how mining companies can easily control politics by winning over one or two key political or city leaders and letting them control those underneath, by donating money toward community projects, and by carefully crafting language to present the mining process in positive ways.

Carter also wonders "at what point the damage caused by extracting minerals will alter how we justify the many conveniences of our modern way." (P. 59) I feel a weakness in Carter's narrative is that he doesn't develop this kind of ethical question in any way. He also mentions that the mining industry itself drives demand for mining more metals in order to produce mining facilities and equipment. Again, he doesn't delve into this aspect of mining processes. And while he states that the needs of China and India will continue to drive the demand for more metals, he doesn't question how countries with such huge populations plan to put everyone in their own vehicle, modeling after the transportation policies advanced by our country since the days of Henry Ford.

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So a weakness in his narrative, I believe, is the assumption that demand will continue to drive the mining of copper. This assumption does not take into account new technologies that could bypass much of this need, including energy sources that would get us off the grid, a change in transportation policies, and a change in public attitudes that would take us away from social reliance on cell phones and computers to social reliance on our own communities and food supply. Nor are we addressing the military's use of metals and the impact that climate change may have upon economic expansion.

But those are topics for another book. Bill Carter and his wife decide to move with their two young daughters to a town without mining. Our job as residents of northeast Minnesota is to become informed so that we can articulate both the science and the morality of saying no to copper-nickel mining in Superior National Forest and the Lake Superior watershed.

Elanne Palcich

