

2015 Torch Lake Sandbar Study

Health and Safety Considerations

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Introduction

A shallow water sandbar stretches along the southern shore of Torch Lake. It is particularly shallow at its westernmost portion, making it a tempting spot for wading and playing games in the water. The bottomland is private property¹ that belongs to the riparian owners along Crystal Beach Road in Clearwater Township, Kalkaska County. The dividing line between Kalkaska and Antrim Counties is shown differently on various maps; it is, however, clear that some portion of the bottomland of the sandbar is in Milton Township, Antrim County. Thus, jurisdictional responsibility for the control of behavior on the sandbar is somewhat ambiguously divided among four municipal entities.

Riparian owners of the bottomlands have, at times, welcomed the temporary occupancy of the area by local families enjoying the sandbar and, at times resented and complained of trespass by uninvited people, largely non-residents of the area, who have flocked in stimulated by the promise of unregulated “fun” by social media postings.

As crowds have grown and behaviors have deteriorated, the community has become ever more concerned about safety in the face of overcrowding, trespass, indecent exposure, intoxicated behavior, litter, and risk of health hazards generated by the use of the waters as a waste disposal site. The sheriff departments of Kalkaska and Antrim Counties have resorted to cross-deputization of all police officers to alleviate the jurisdictional issues when patrolling the sandbar.

In an effort to gauge the magnitude of the potential health hazard produced by the crowds of partygoers, a water quality study was undertaken over the 2015 Fourth of July holiday week-end jointly by the Three Lakes Association and the Torch Lake Protection Alliance.

Study Design

The water quality parameters chosen for study included *Escherichia Coli* (*E. coli*) as an indicator of fecal pollution and ammonia as an indicator of urine pollution. Samples collected had, of necessity, to be stored beyond standard holding times because the study was conducted during a holiday when the laboratory would not be open to receive and process samples in a timely fashion. The impact of exceeding holding times is that the results obtained may underestimate the amount of pollution present at the time of collection.

Twelve points anticipated to be representative of the human occupancy over the holiday week-end were mapped and identified with GPS coordinates (latitude and longitude). These points included near-shore areas in the vicinity of the Lake Street public access, locations along the westerly edge of the sandbar, and the shallowest area where the greatest concentration of people were expected to congregate. These points are shown in Figure 1.

Water samples were collected at each of the twelve points at approximately 9 AM and 4 PM on July 3, July 4, and July 5. Samples were promptly placed on ice and refrigerated until delivery to the laboratory on the morning of July 6.

Results

Results for all locations are shown in the Table.

E. coli: Sample values on July 3 and in the morning of July 4 were generally quite low. Only eleven of a total of seventy two values collected over the three days of sampling exceeded 50 cfu/100 ml. Five of these were found in the afternoon on July 4, five in the morning of July 5, and one in the afternoon of July 5. Of these values, only two (55 cfu/100 ml at point 7 and 84 cfu/100 ml at point 11) were found outside of the area of the highest human congestion. For the most part, values in the afternoon samplings were generally higher than in the mornings, consistent with the higher human congestion in the afternoons. The single highest E. coli value, measuring 1300 cfu/100 ml, was found at point 3 on the afternoon of July 5. We have no observation to explain this reading; however, the site is where deliberate or unintentional release of fecal matter as boats were leaving could have occurred.

Ammonia: For reasons of budgetary limitation, ammonia levels were measured at only three of the twelve sites, selected to try as best we could to sample the whole area under study. Only one of the eighteen samples collected had a value above the laboratory's minimum detection level of 0.05 mg/L. That one measurable ammonia level was found at point 3 on the afternoon of July 4, the time the greatest amount of urine could have been expected to be in the water and at the site most likely to contain urine due to the congregation there of large numbers of beer drinkers.

Discussion

Michigan's Water Quality Standards (WQS) (promulgated pursuant to Part 31 of the Natural Resources and Environment Protection Act, 1994 PA 451, as amended) R 323.1062 state that :

"All surface waters of the state protected for total body contact recreation shall not contain more than 130 *Escherichia coli* (*E. coli*) per 100 milliliters, as a 30-day geometric mean. Compliance shall be based on the geometric mean of all individual samples taken during 5 or more sampling events representatively spread over a 30-day period. Each sampling event shall consist of 3 or more samples taken at representative locations within a defined sampling area. At no time shall the surface waters of the state protected for total body contact recreation contain more than a maximum of 300 *E. coli* per 100 milliliters. Compliance shall be based on the geometric mean of 3 or more samples taken during the same sampling event at representative locations within a defined sampling area."

Given how the water quality standards of the state are defined, the E. coli results from this study would not have triggered a beach closure advisory despite the fact that individual unhealthy and potentially unsafe levels were found. Indeed, the authorities might well have dismissed all of the results because of the unavoidably long sample holding times. It is important to recognize, however, that any inaccuracy in the measured levels of E. coli due to the long holding times would have caused them to be lower than what was actually present at the time of sampling. From the data we were able to obtain it is not knowable if beach closure advisories would have been called for if timely data could have been generated.

Ammonia levels in water are rapidly converted to nitrate and nitrite by bacterial activity and, as such, are hard to capture in the absence of huge levels of pollution. Ammonia levels greater than 0.03 mg/L (less than the laboratory's minimum detection level of 0.05 mg/L) are potentially toxic to fish, damaging their gills and reducing their ability to obtain oxygen. The one measurable level we found, 0.07 mg/L, was sufficient to be damaging to any fish in the immediate area.

In addition to E. coli and ammonia, many other biological and chemical threats to human and animal health may have been present. A sampling from among the possibilities are viruses, such as hepatitis, norovirus (what has been making people sick on contaminated cruise ships), and many others. Additional contaminants that were not measured in this study include protozoa such as giardia. Given the uncounted number of boats congregated on the sandbar, the possibility also existed of contamination by oil, gasoline and other machine-related fluids.

The lake water on the sandbar, usually clean and clear, was disturbed at the afternoon sampling times to the point of being opaque, making it hazardous to walk among the unseeable anchors and submerged trash. Floating debris of discarded food, cans, bottles, wrappers, toy parts, and more made wading through the mess unsavory at the least and in all probability a health risk. Trash that actually made it to the shore overwhelmed the collection receptacles and littered the area as shown in Figure 2.

Health Safety Conclusions

Based on the results of our study, the congested and elevated human occupancy during holiday weekends on the sandbar at the south end of Torch Lake appears to be a risk to the health safety and welfare of the party-goers as well as to the local area residents. Tremendous disturbance to the environment occurs when large numbers of boats and people overrun the sandbar area. A more rigorous study could and should be done by our local health department utilizing their new equipment for more rapid results.

Many activities that can take place without bothering anyone become unacceptable nuisances when carried out in great quantity. This would appear to be the essential problem at the sandbar: a few people having fun swimming or tossing a Frisbee is one thing. A blaring music stand surrounded by vast numbers of inebriated young people unfamiliar with this area engaging in whatever activities that strike them as fun is another thing altogether.

Recommendations

The riparian owners whose bottomlands make up the sandbar may wish to tolerate its use by local families temporarily recreating there; that is their right and privilege. They should not, however, be deprived of their ownership rights to use the area as they choose. They should not have to tolerate trespass by uninvited hordes of disorderly, messy, noisy, and rude people coming here and damaging the environment.

Specific actions that could be taken to rein in the sandbar problems and contribute to the health, safety, and welfare of the populace exist. Local ordinances that limit the permitted activities on public land, such as the Clearwater Township Ordinance 20 of 2007², could be enforced as they stand and could be strengthened as needed to deal with behaviors that are undesirable. Riparian rights of the private property owners could be supported by law enforcement when help is requested by the property owners. Determining and enforcing maximum safe occupancy levels on the sandbar area, similar to what is done for other venues, could be done. It would be helpful to make use of the very social media that are attracting the crowds to the sandbar to spread the word on rules and regulations, requirements for permits, penalties for violating the ordinances, and socially acceptable behaviors for visitors to our area.

Figure 1: Sandbar Sampling Points



Figure 2: Trash Overflow



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References

1. Hall vs Wantz 336 Mich 112 (1953)
2. Clearwater Township Ordinance No. 20 of 2007, accessed at www.clearwatertwp.com/Ordinances.aspx