



F A C T S H E E T

Lake Lucille

Impairment from Zinc and Lead in Lake Bed Sediments November 2018

Lake Lucille (also spelled Lucile) is located in southcentral Alaska in the Matanuska-Susitna Borough and is within Wasilla city limits. The lake is a popular recreational and residential area.

Lake Lucille is under an existing recovery plan to correct a low dissolved oxygen impairment.

Zinc and Lead Sediment Impairment

From 2011–2013, the Alaska Department of Environmental Conservation (DEC) sampled Lake Lucille's water and lake bed sediments during times when it was raining and during times when conditions were dry. The study focus was on metals (copper, lead, zinc) and polycyclic aromatic hydrocarbon (PAH) pollution being added to the lake through the two stormwater discharge outfalls located on the northeast and northwest lake shores (see Figure 1).

Metals and PAH concentrations above water quality standards have the potential to negatively affect aquatic organisms (fish and invertebrates) that come into contact with and take in these pollutants.

- Lake water sampling showed that the water column is meeting state water quality standards for metals and PAH.
- Lake bed sediment samples were collected near the stormwater discharge outfalls and further out into the lake including a natural background site.
- The results showed zinc and lead concentrations in the lake bed sediments greater than the state-allowed limits for protecting aquatic life in:
 - 1.1 acres near the northwest stormwater discharge outfall
 - 4.5 acres near the northeast stormwater discharge outfall
- Copper and PAH concentrations were also elevated in the lake bed sediments and are of concern. These pollutants are not being included in the impairment determination, but should be considered when implementing activities to improve water quality.
- The source of the copper, lead, zinc, and petroleum hydrocarbon pollution in the lake bed sediments is from stormwater runoff entering the lake through the two stormwater discharge outfalls.

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DEC's Water Quality
Reports:
<http://dec.alaska.gov/water/wqsar/reports.html>

Alaska Water Quality
Standards, Chapter 70:
<https://dec.alaska.gov/comish/regulations/index.htm>

- These pollutants can come from gas-powered vehicles, gasoline additives, wearing of tires and brakes, and corrosion of building materials and culverts. They accumulate on road and parking lot surfaces and get washed into the stormwater system that discharges to the lake.

Conclusions

- Based on the sampling results and analysis, DEC is proposing to include a total of 5.6 acres of Lake Lucille on the state's list of impaired waterbodies for lead and zinc in lake bed sediments.
- The source of the pollution is stormwater being discharged to the lake through two stormwater discharge outfalls. The pollutants attach to particles in the stormwater and sink to the bottom of the lake, building up over time. Fish and invertebrates come into contact with and can take in the lead and zinc. Based on national guidelines, the levels of lead and zinc measured are likely causing negative health effects to aquatic life.

What's Next?

- DEC is continuing to work with the City of Wasilla, Alaska Department of Transportation and Public Facilities, and the Matanuska-Susitna Borough on ways to address stormwater pollution in the more urbanized areas of the borough.
- DEC is committed to analyzing options to reduce stormwater pollution and improve water quality in Lake Lucille. DEC plans to re-sample the lake after implementation of pollution reduction activities.

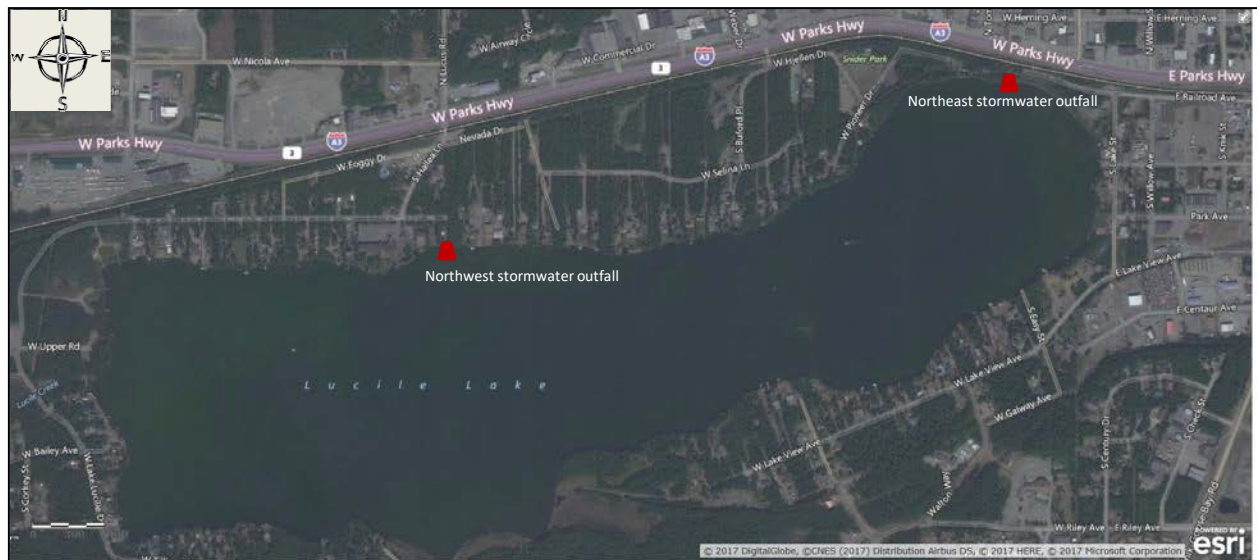


Figure 1. Lake Lucille in Wasilla, AK showing the two stormwater outfall locations.