Massena, NY Grasse River Superfund Site; Effects of Alcoa's Pollution on Water Quality and River-Side Residents

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Abstract

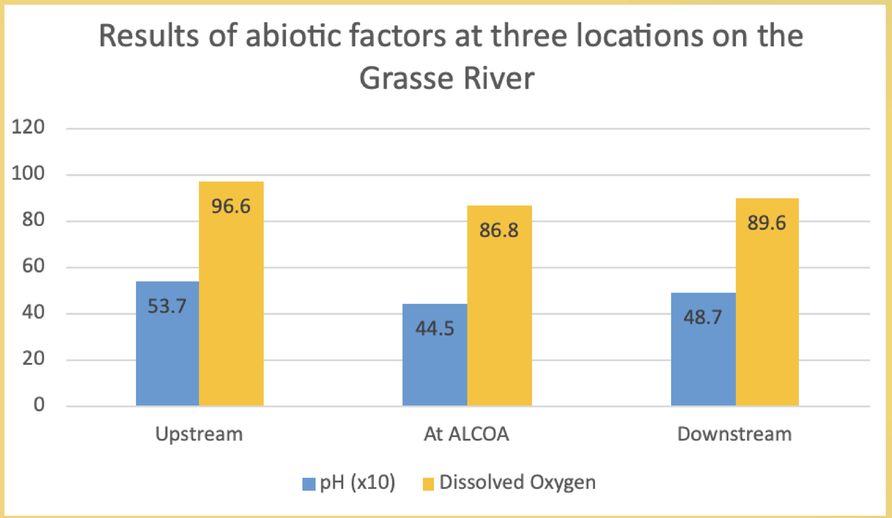
Our study compares the industrial and economic implications of Alcoa with the importance of the Grasse River to raise awareness of this environmental injustice. A clear dialogue exists about the value of these environmental resources and how they impact surrounding residential and ecological communities. Superfund sites are areas where a large amount of environmental degradation occurs due to pollutants entering the ecosystem, usually at fault of a large corporation. The locations chosen for these Superfund sites often directly correlates to the race of effected communities. The United States has 1,344 Superfund sites; a prominent one is in Massena, NY. This study is important to record the lasting effects Superfund sites have on the Massena community.

Figure 1. pH and DO at three different sites along the Grasse River

Research question and hypothesis:

- What have been the effects of Grasse River being polluted by ALCOA; what has been the effects on the water conditions, marine ecosystems, wildlife and corresponding riverside residents?
- H1:We expect river side residents upstream to utilize the rivers aesthetic and physical factors while residents near ALCOA and downstream will be negatively affected and not be able to activate direct use factors of the river.

Picture 1: Trumble and DiFonzo testing water on the at ALCOA location on the Grasse River



Methods

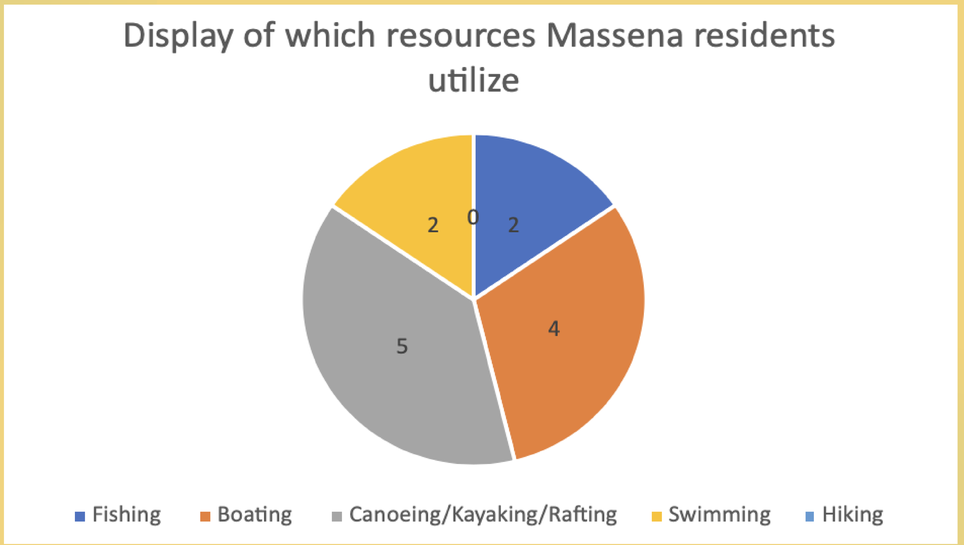
In our assessment of the aquatic life on the three locations of the river we used hester dendys – a pile of small square platforms stacked on a thin pole that is stuck into the riverbed and tied to a tree - to sample the macro invertebrate diversity and richness levels.

We visually assessed quality of fish, tadpoles, and frogs at each site. We tested the Ph levels and dissolved oxygen levels at each of the three sites using a water quality assessment device. We compared this data to the survey results for a comprehensive understanding of the Grasse Rivers water quality.

Data Results

- Net Upstream: tad poles and minnows
- Net at midstream: dead blue/purple crayfish
- Net downstream: Two species of macroinvertebrates
  - Graph 1: Ph levels of water were highest at the upstream location and lowest midstream
  - Graph 1: DO levels were highest upstream and lowest midstream:

Figure 2. Survey question asked "Do you utilize the Grasse River for any recreational activities?" Results are as follows:



1st photo: dis-colored Crayfish on the edge of the Grasse River.

2nd photo: evidence of pollution on the river, high mineral content in the water.

Picture 4: "Warning," "No one should eat fish from these waters due to PCBs." Sign from the DEC discouraging use of Grasse River

References

- "Hazardous Waste Cleanup: ALCOA Incorporated in Massena, New York." *EPA*, Environmental Protection Agency, 29 Apr. 2020, www.epa.gov/hwcorrectiveactionsites/hazardous-waste-cleanup-alcoa-incorporated-massena-new-york.
- http://www.thegrasseriver.com/docs/2020%20Construction%20Monitoring%20Data.pdf
- https://www.epa.gov/sites/production/files/2017-03/documents/grasse-river-cip.pdf
- "DEC Announces Agreement with Arconic to Protect Grasse River Habitat in Massena." *DEC Announces Agreement with Arconic to Protect Grasse River Habitat in Massena - NYS Dept. of Environmental Conservation*, www.dec.ny.gov/press/120857.html

Discussion:

- Residents living upstream of the ALCOA Superfund site responses supported they have not been affected by the pollution
- Residents living downstream are more effected and have heard of the Superfund site.
- More upstream surveyors said they still boat/kayak than downstream
- Ph and dissolved oxygen levels differed from upstream to midstream and downstream (see chart)
- Biodiversity and richness of the stream is higher upstream, decreasing at and past ALOCA's Superfund site.
- The survey indicated that although most recipients were aware of the Superfund cite and utilized it for recreational use, they were not aware of Brennan Marine's clean-up project.
- Level of utilization of river was dependent on where the recipients lived, also by the water level of river.

Background:

The Aluminum Company of America, later renamed ALCOA, has been polluting culturally significant rivers in the North Country since the 1950s. Alcoa deposited polychlorinated biphenyls (PCBs), which are chemical compounds often used in industrial manufacturing, into the Grasse River through mineral sediment. Settlement of PCBs atop the bedrock of the river impacts the entire ecosystem. ALCOA first involvement with the EPA came in 1989, when the EPA required Alcoa to invest resources to find the extent of sediment pollution, and to work with the EPA to design an affordable and sustainable clean-up project. We assert that ALCOA's pollution still effects the Grasse River and larger Massena community.