

How Does Mercury Affect Bald Eagles on the Eastern Seacoast?



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Introduction

We studied about how bald eagles are affected by Mercury. Mercury is a silvery white poisonous chemical element which is useful for measuring devices such as thermometers, but is toxic to humans and animals. Our question was, "How does Mercury affect bald eagles on the Eastern Seacoast?" Our hypothesis was we think that Mercury is entering the blood and feathers of bald eagles. In the Fish and Wildlife Service article we found that Mercury is released from coal-fired power plants in the Midwest and is being carried Eastward by prevailing winds. It is settling into bodies of water and enters the food chain by aquatic macroinvertebrates. Predators to the macroinvertebrates bioaccumulate mercury in their body tissue. Since bald eagles are at the top of the food chain, the mercury is beginning to affect their reproductive success by making the eggs thin and weak. We decided to choose bald eagles because it intrigued us, and we wanted to learn more about them and how they are impacted.

Materials and Methods

Our Lab Biology class went to Saint Gaudens National Historic Site to collect dragonfly larvae to figure out the mercury levels in the dragonflies. Also we had to collect a water sample before going into the water and finding dragonfly larvae. We went to the bottom of the Blow-Me Down Brook by Route 12 to collect all the samples we needed. We had to wear waders and use D-nets so we wouldn't contaminate our samples. Our hands weren't allowed to touch the samples so we had to use a method called "Clean Hands Dirty Hands." The "dirty hands" person had to put on gloves and not touch anything else but the sample and the inner bag. The "clean hands" person was the one who was holding the outer bag that was not allowed to touch the sample or the inner bag. After we collected our samples we sent the data to Dartmouth College to be analyzed for their level of mercury.



Here is a crawfish that we found in the Blow-Me Down River.

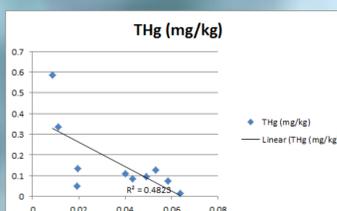
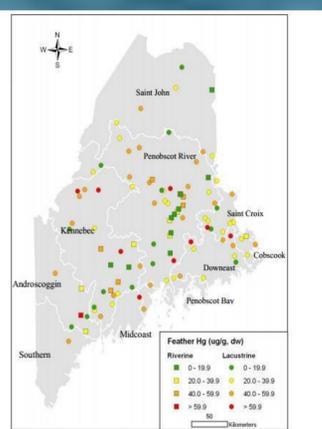
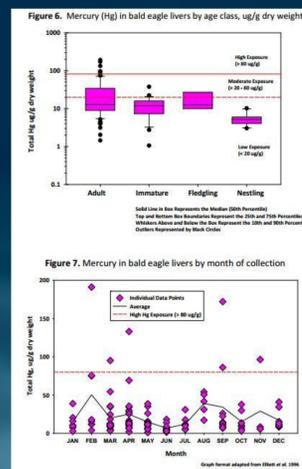


Alyx is using a D-net in the water to help get the macroinvertebrates.

Data

We gathered data sets to help answer our question and here are a few of them:

	Total Lead (Pb)	Total Mercury (Hg)
Geometric Mean	0.69	13.49
Geometric Standard Deviation	10.2	2.6
Range	< 0.01 - 167.00	1.06 - 191.00
Arithmetic Mean	12.77	71.98
Arithmetic Standard Deviation	32.23	29.26



In this graph we are comparing the weight and how much mercury is in the dragonfly larvae. We figured out that the bigger the larvae the less mercury they contain. So in that case its the same with bald eagles.

Conclusions and Discussion

- ★ Our data didn't fully answer our question, but it gave us an understanding of what cases have already occurred. Our hypothesis is supported because we found data that showed us that mercury is indeed in the feathers of the bald eagle including their livers.
- ★ The future classes that take this course should study a subject that not many people have covered over the past years. For example brown bears, black bears, and raccoons. What we would have done differently is we would have studied how mercury affects bears.

Investigate Further

- ★ Are levels of mercury affecting large portions of the bald eagle population in places other than the Eastern Seacoast?
- ★ How much has the Bald Eagle population already been affected by Mercury?
- ★ Is Mercury affecting Bald Eagles in different ways than how they're being affected in the Eastern Seacoast?

Literature Cited

- DeSorbo, Christopher R., and Charles S. Todd. "Assessment of Mercury in Maine's Interior Bald Eagle Population." N.p., n.d. Web.
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