



Mercury Concentrations in Turtles from the Clear Fork and Brazos River

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Introduction

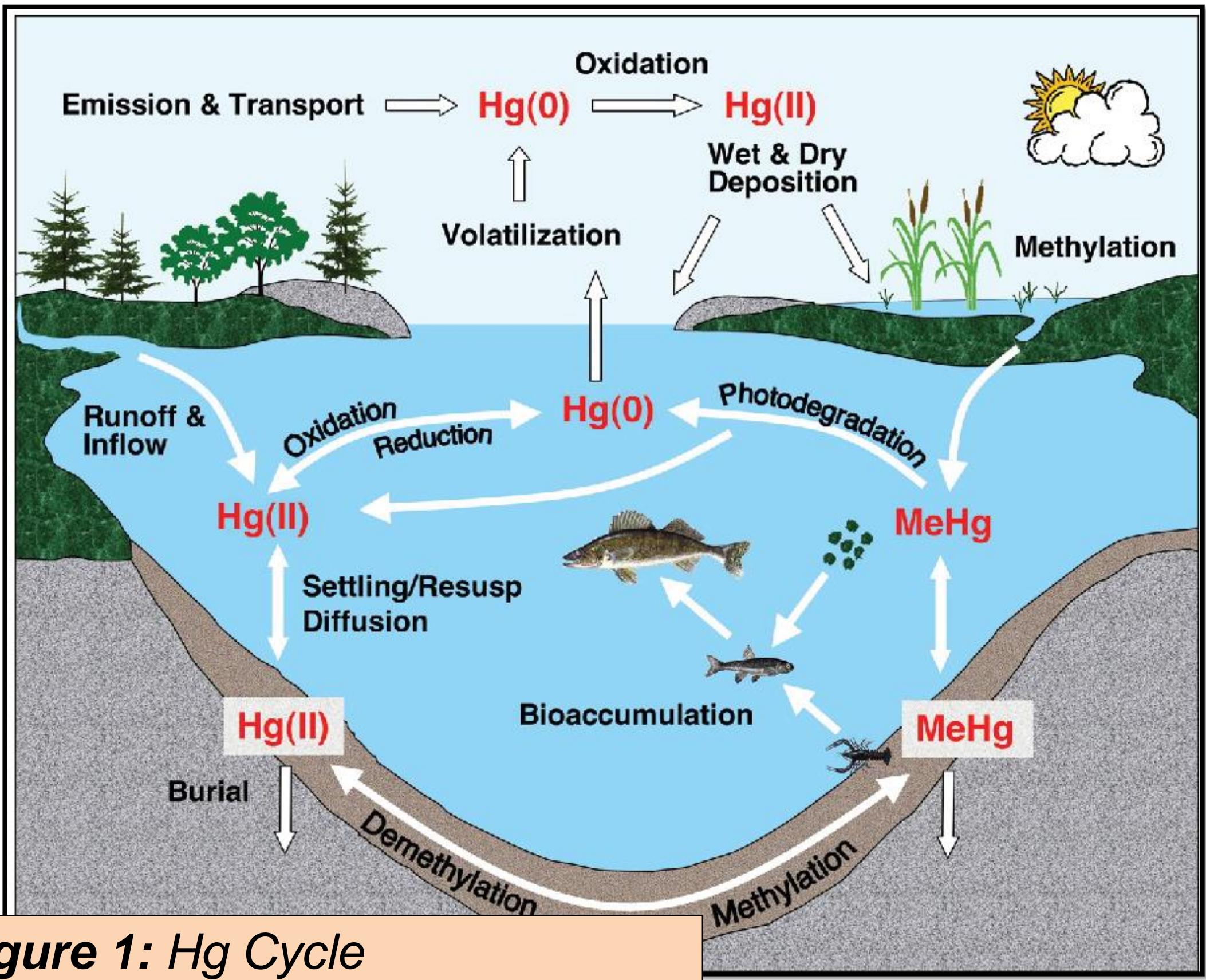


Figure 1: Hg Cycle

- Mercury (Hg) is a neurotoxin that biomagnifies through aquatic food chains. Coal-fired power plants and artisanal gold mining release Hg into the environment. Aquatic bacteria then convert inorganic forms of Hg into highly toxic methyl Hg. Turtles acquire Hg through their diet (Selin 2009, Fig 1).
- Forty-three and 36 red-eared sliders were collected in the Clear Fork of the Trinity River in 2018 and the Brazos in 2021, respectively (Figs. 2, 3).
- Toenails were sampled from each turtle for Hg analysis.

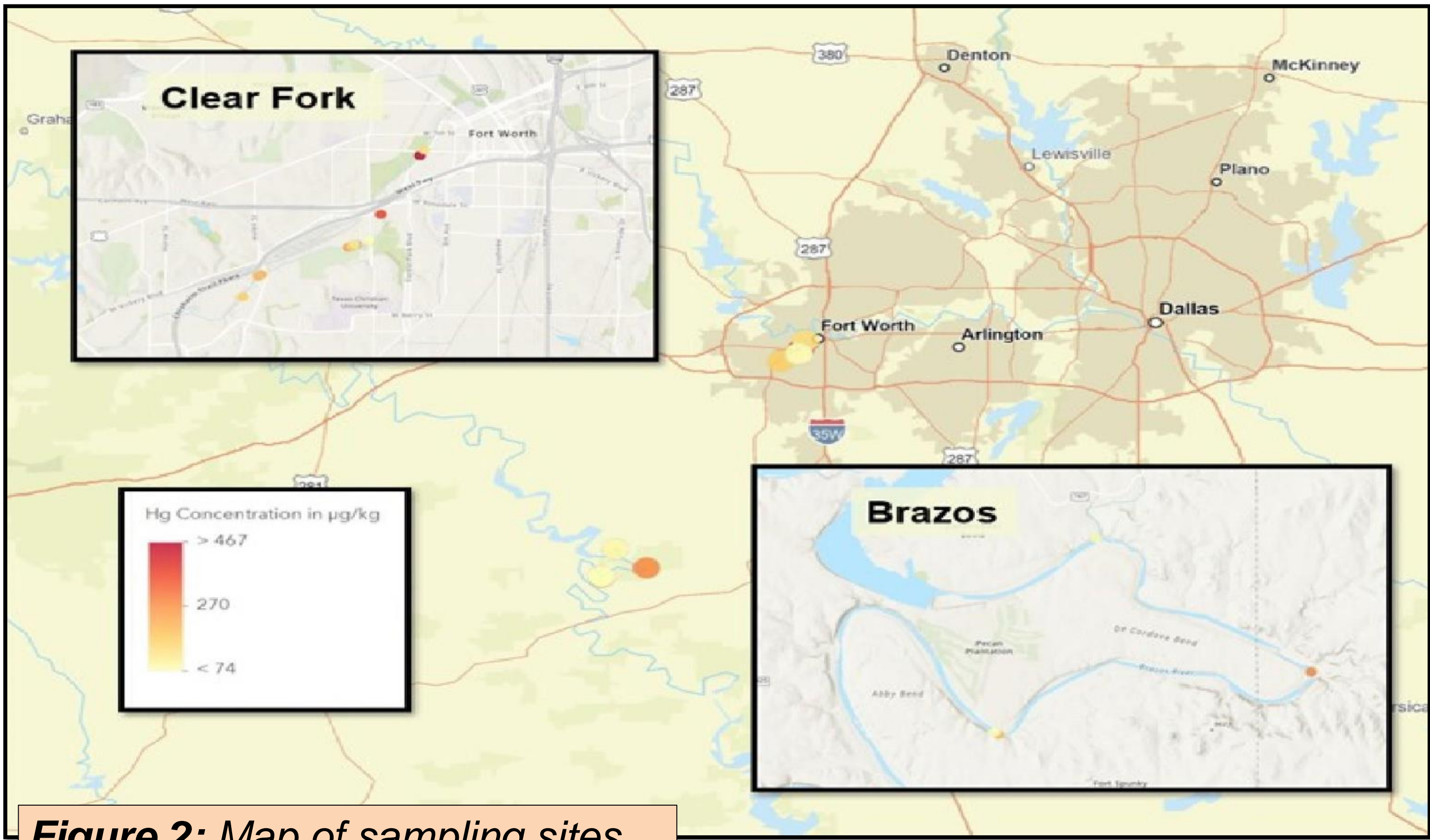


Figure 2: Map of sampling sites

Objectives

- Determine Hg concentrations in turtles using toenails
- Compare Hg concentrations between the two populations
- Provide High School students with the opportunity to work on a research project.



Figure 3: Turtle Trap in the Clear Fork of the Trinity River

Methods

- Toenail samples were dried for 24 hours prior to analysis.
- Samples were analyzed using a direct Hg analyzer (Figs. 4, 5) that uses combustion and a gold amalgamation trap prior to measuring the amount of total Hg.



Figure 4: Toenail samples in the direct Hg analyzer

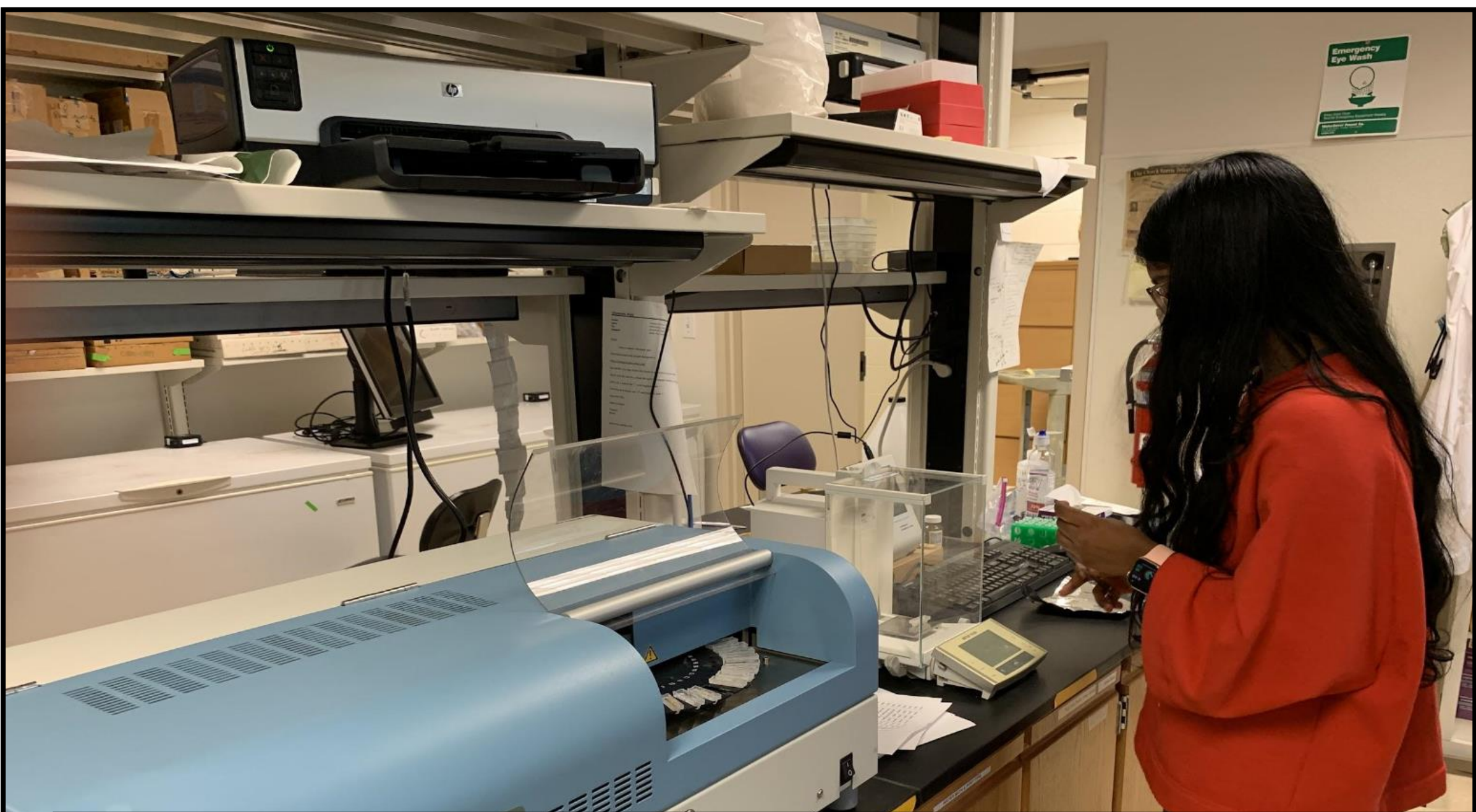


Figure 5: Inputting data from samples into analytics program

Results and Discussion

- Turtles in the Brazos had a higher average Hg concentration than those in the Clearfork (Fig 6, Table 1). The concentrations were 658.302µg/kg and 400.146µg/kg, respectively.
- Fecal samples and observations indicate turtles in the Clear Fork are feeding primarily on algae, whereas invertebrate prey availability was much higher in the Brazos and may compose a larger portion of their diet.
- Mercury is known to biomagnify, therefore red-eared sliders in the Brazos may bioaccumulate more Hg while feeding on a higher trophic level than turtles in the Clear Fork.

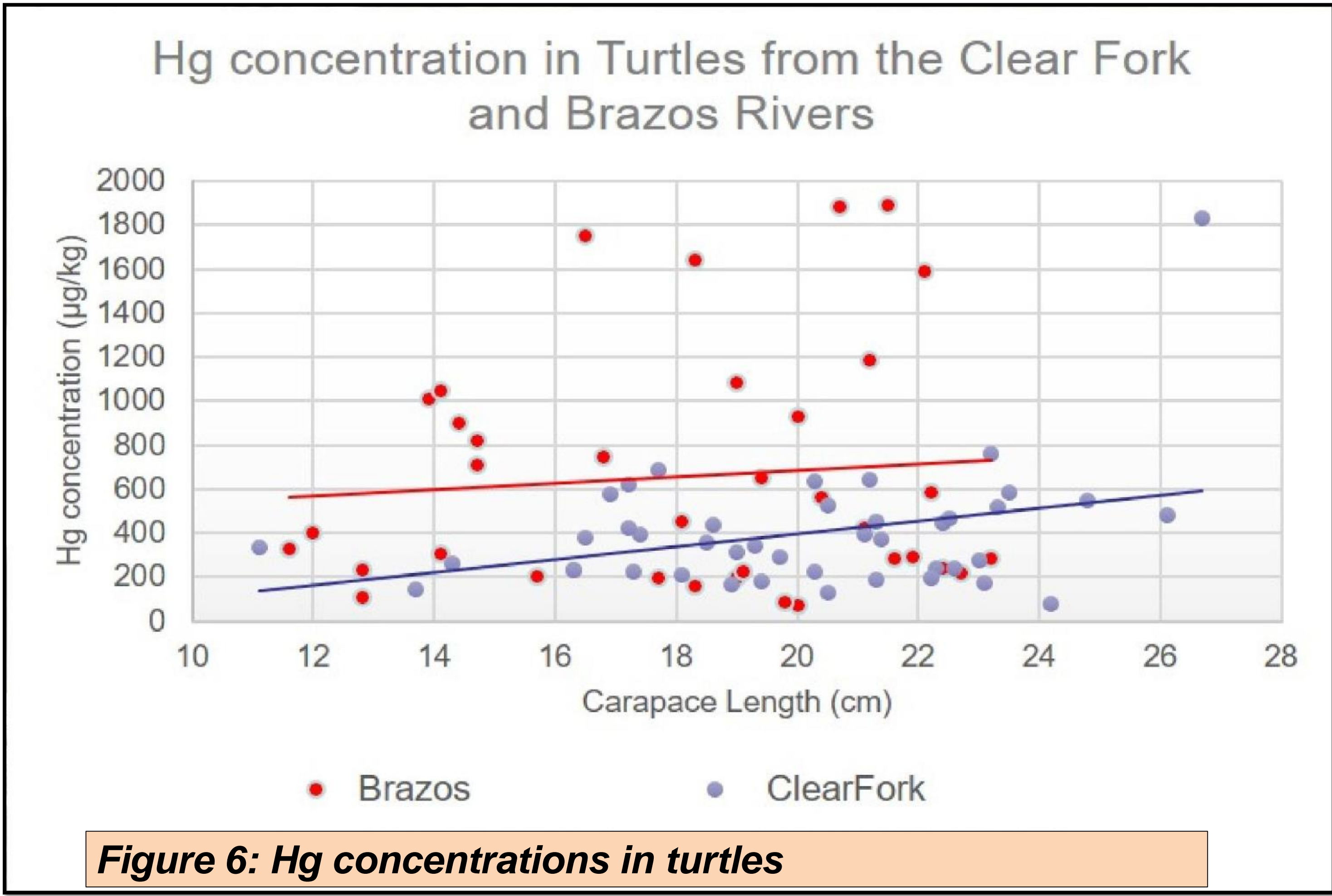


Figure 6: Hg concentrations in turtles

Table 1: Hg concentrations in turtles

	Male	Female	Combined
Brazos	656.2 µg/kg	1193.4 µg/kg	658.3 µg/kg
Clearfork	324.8 µg/kg	465.6 µg/kg	400.1 µg/kg

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