



# Shoreline Spiders as Sentinels of Mercury Contamination of the Trinity River

Andrew Todd, Macyn Willingham, Tori Martinez, and Matthew Chumchal  
Texas Christian University



## Introduction

- Vast, man-made sources of coal-fired power plants and artisanal gold mines have large outputs of emissions containing inorganic mercury (IHg)
- Mercury alone is not toxic; however the conversion to Methylmercury (MeHg) that takes place in aquatic systems raises awareness.
- MeHg varies in different aquatic systems.
- This study examines the bioaccumulation of MeHg in the individual bodies of water using shoreline spiders as sentinel species.

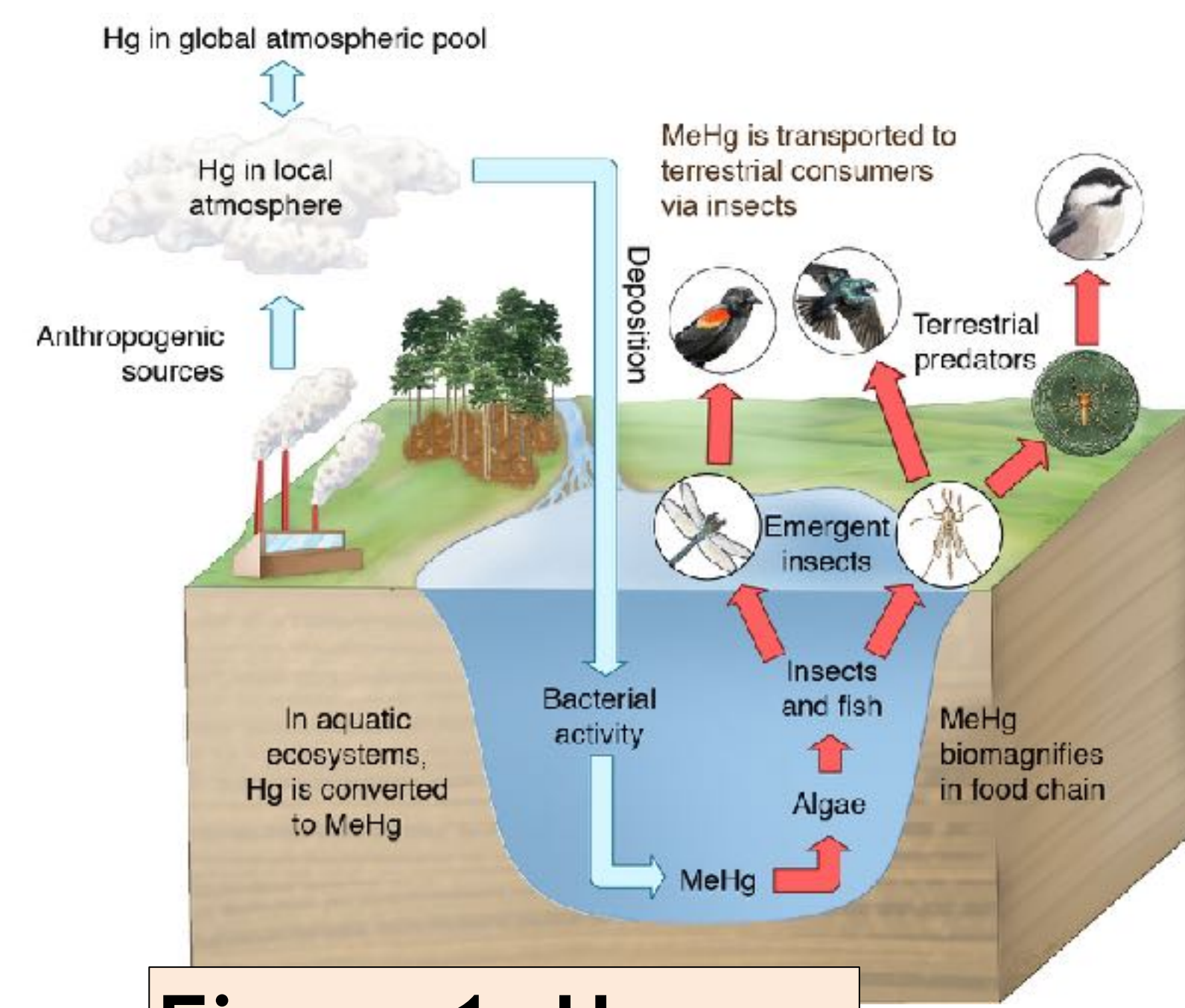


Figure 1. Hg Cycle

## Objectives

1. The objective of this study is to determine if shoreline spiders act as a proxy and relay information concerning the contamination and pollution of mercury in localized bodies of water, the Clear and West Fork of the Trinity River.

## Methods

- Methodology included the preservation of spiders in 95% ethanol followed by measurement of leg length and consequential categorization.
- Mercury analysis is conducted by the DMA80.
- After making a direct mercury analysis, a correlation was examined between mercury concentration and spider size.

Figure 2. RWBL Nestling Period

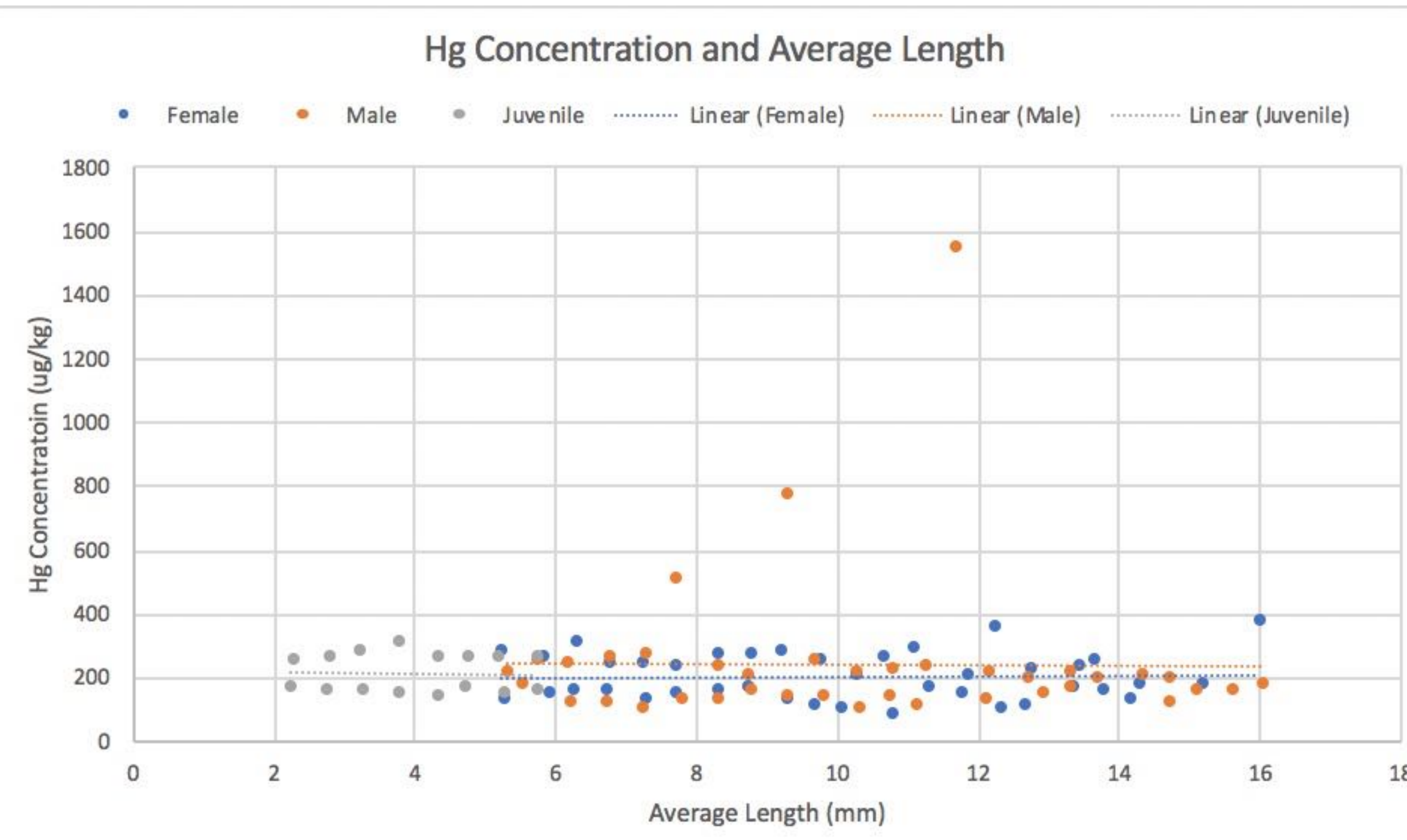


Figure 4. RWBL Nestling Blood MeHg Concentration

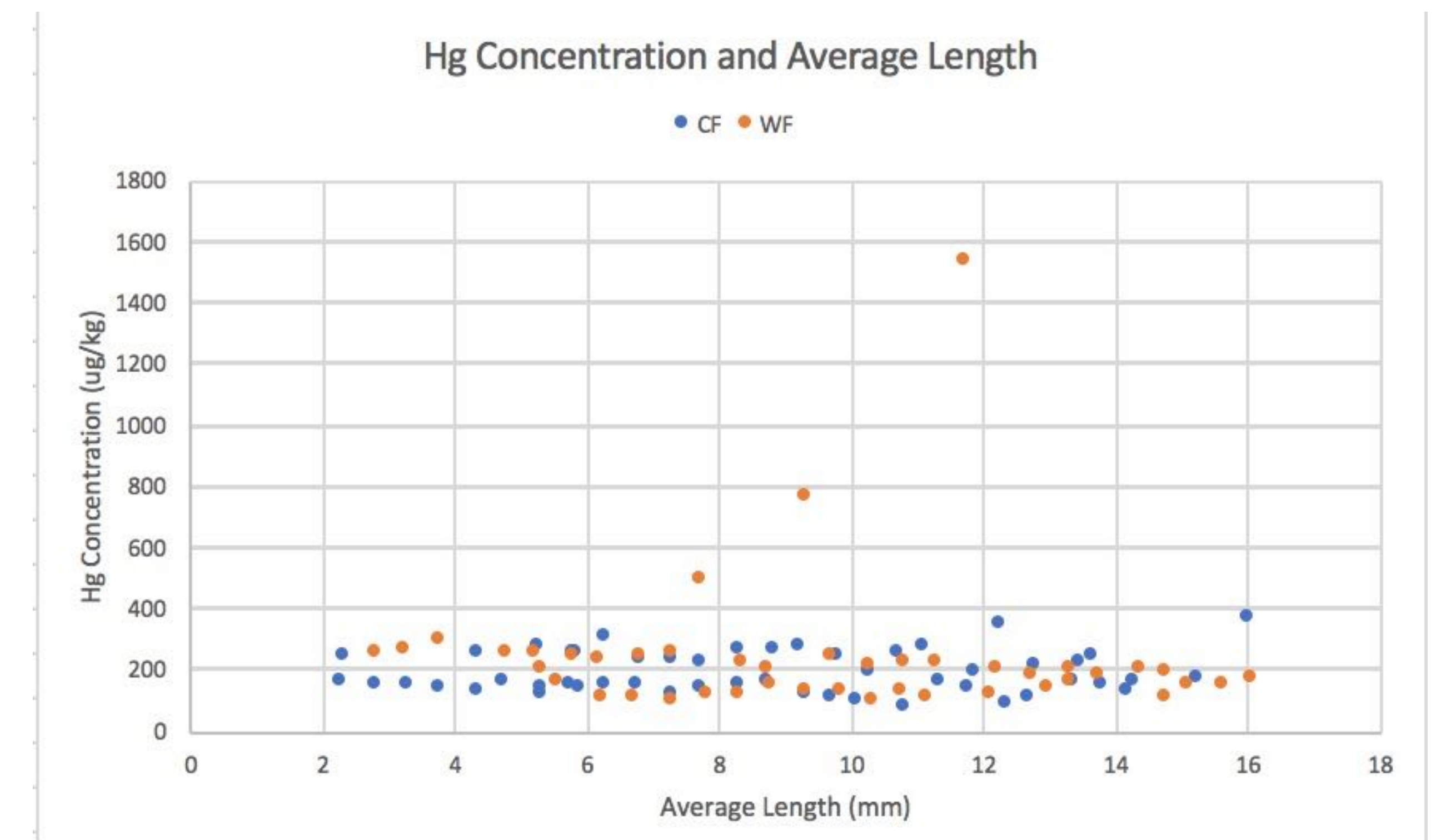


Figure 5. MeHg & Nitrogen Stable Isotope Ratios

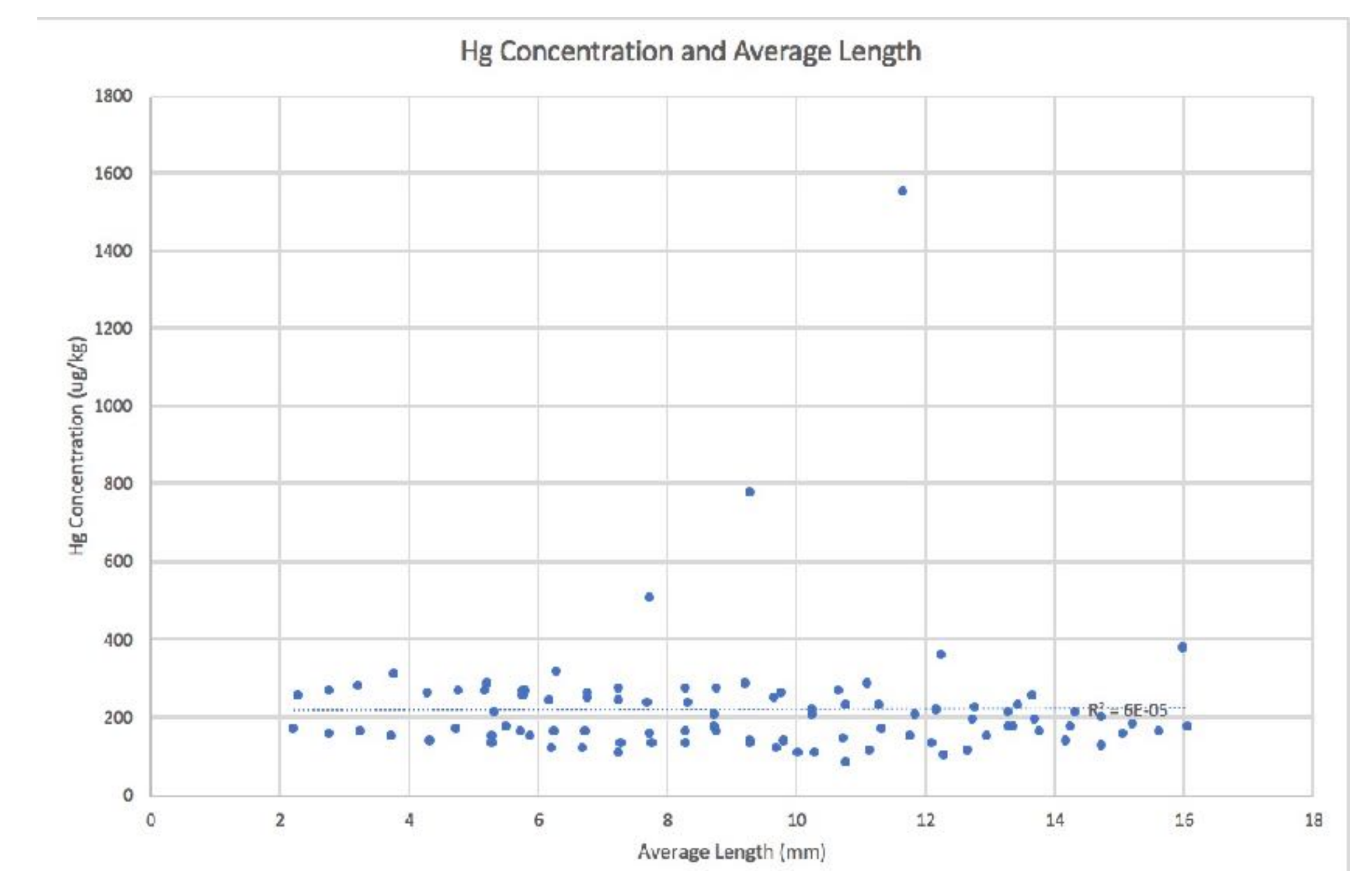


Figure 6. Odonate Emergence and Availability

## Results and Discussion

- The study observed a positive correlation between leg length and MeHg concentration.
- This study served as an additional piece of evidence that the Clear Fork has greater mercury concentrations than that of the West Fork, and future studies using fish reaffirmed this hypothesis.
- This study successfully displayed that shoreline spiders may serve to unveil information concerning mercury concentrations in nearby bodies of water.

## References and Acknowledgements