

11TH U.S. SYMPOSIUM ON HARMFUL ALGAE

EVALUATING SPATIOTEMPORAL AND TROPHIC FACTORS TO TRACE CIGUATOXIN IN MID FOOD WEB REEF FISH: A STABLE ISOTOPE APPROACH

Ciguatera poisoning is caused by ciguatoxin (CTX) contaminated fish (via *Gambierdiscus* spp.) and has global distribution in warm reef environments. Areas with persistent ciguatera poisoning often have spatial patterns of localized CTX contamination on algal dominated hard bottom reefs that are buffered from short time scale environmental disturbances (e.g., intense wave action, temperature swings). These areas provide habitat for the benthic dinoflagellate *Gambierdiscus* spp. and demersal organisms resulting in the spatiotemporal patterns of reef fish CTX contamination. The purpose of this research was to investigate CTX distributions in reef food webs based on the hypothesis that omnivorous fish show differences in CTX contamination based on their food resources. Nine species of omnivorous damselfish ($n = 140$) and a mesopredator grouper species (*Cephalopholis cruentata*; $n = 76$) were collected across four reefs in St. Thomas, US Virgin Islands, to be analyzed for total CTX toxicity using a sodium channel specific neuroblastoma assay and CTX congener profiles via LC-MS/MS. New data on C, N, and S bulk isotope signatures from fish and basal resources (macroalgae, epiphytes, invertebrates) across spatiotemporal scales will be presented and linked to CTX contamination using isotope biplots with cluster analysis, traditional statistics, and linear modeling. Insights into the development of isotope mixing models for determining basal contributions to CTX and non-toxic fish will be presented. Understanding spatiotemporal and trophic factors that may drive toxicity is important for future work modeling the distribution of CTX in food webs and evaluating the risk of ciguatera poisoning from reef fish.

CLAYTON BENNETT, PHD STUDENT | 1. SCHOOL OF MARINE AND ENVIRONMENTAL SCIENCES, UNIVERSITY OF SOUTH ALABAMA; 2. DAUPHIN ISLAND SEA LAB

Clayton Bennett is a doctoral student in the School of Marine and Environmental Sciences at the University of South Alabama and Dauphin Island Sea Lab (DISL). He has experience at-sea monitoring fisheries through the Alabama Department of Conservation and Natural Resources and Gulf of Mexico Fisheries Observer Program. Bennett is an active member in the AAUS dive program at the DISL and has led his own research trips diving in the Gulf of Mexico and St. Thomas, US Virgin Islands. Bennett's dissertation research is focused on understanding factors related to bioaccumulation, distribution, and elimination of algal toxins in Caribbean fish and developing predictions on the risk associated with seafood species.

After receiving his degree, Bennett plans to continue working with fisheries and stake holders on seafood safety and sustainability issues and hopes to gain more experiences working with international communities.

<https://www.linkedin.com/in/clayton-bennett-7a750365/>

CBENNETT@DISL.ORG