JANUARY UPDATE

PFAS in Saltwater Fish Study

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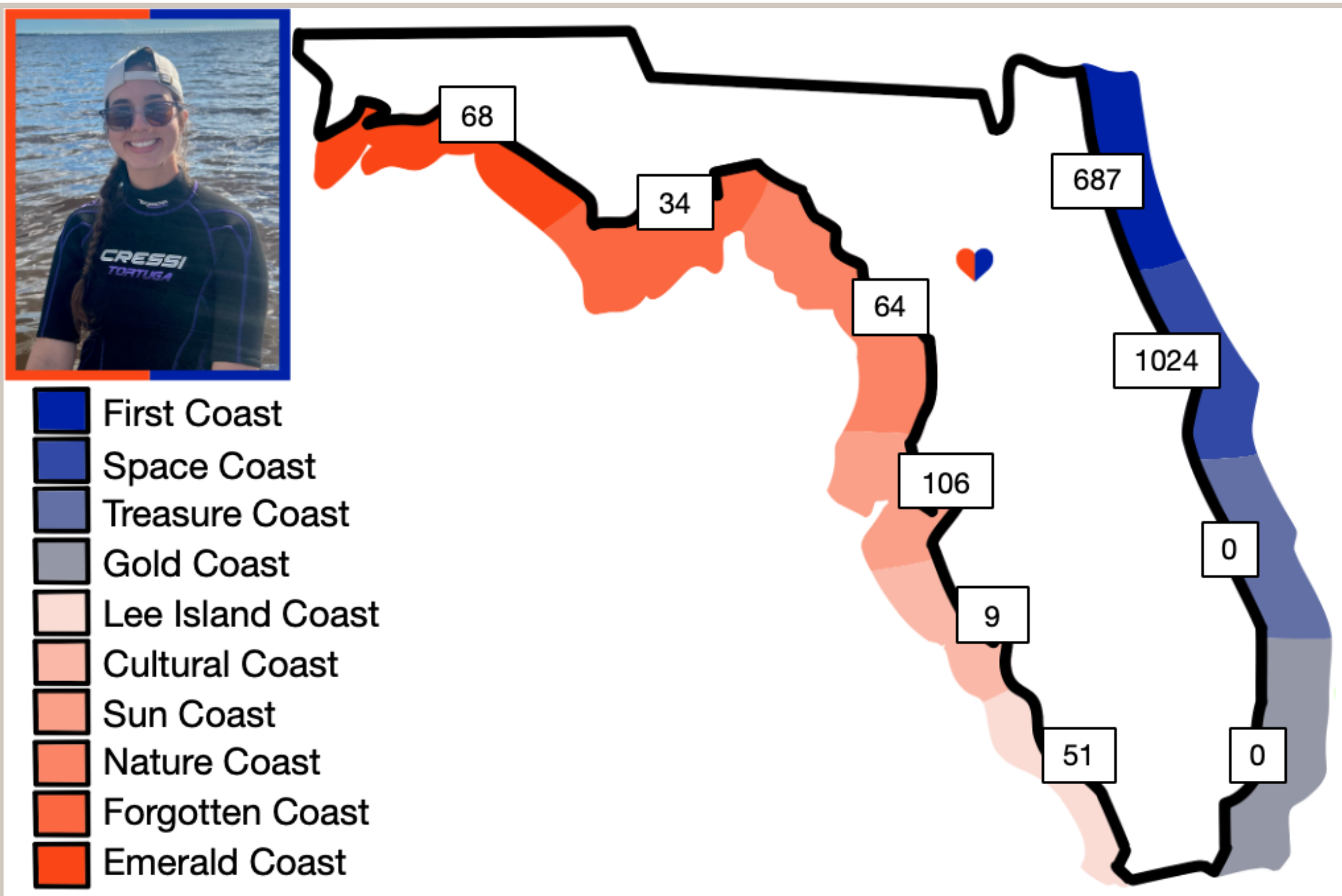

Figure 1. We have organized samples by coastal regions. The figure shows how many samples we have from each coast of Florida as of January 2025. The photo in the figure is Isabella, the grad student.

Hello everyone, please allow me to introduce myself. My name is Isabella Cioffi and I am the PhD graduate student leading this fish project. I am aiming for this to be a monthly newsletter to update interested parties on our progress, as well as provide insight into the laboratory workflow.

The emerging pollutant we are most interested in is a class of chemicals known as per- and polyfluoroalkyl substances (PFAS). To summarize the chemistry aspect, these molecules are synthesized and have fluorine atoms in their structure. Please see Figure 2 for more chemistry information. The molecular bonds with the fluorine atoms are so strong that these molecules are considered “forever chemicals.” These substances are used in flame retardant foam, pesticides, nonstick coatings, stain resistant textiles, and other industrial applications[1]. As the name suggests, these forever chemicals outlive their original application, and through long range transport, end up in the environment all over the world. Unchecked PFAS in the environment is detrimental to human health in many ways. PFAS has been linked to cancers, reproductive issues, and birth defects[1]. We are exposed to PFAS through ingestion, inhalation, and absorption in our environment[2].

“PFAS has been linked to cancers, reproductive issues, and birth defects.”

-Gaber, N., et al. 2023

Like most environmental pollutants, we have seen PFAS accumulate in various animals in the environment[3]. This observation has inspired many studies on apex predators, like sharks and marine mammals[4,5]. There have been small scale studies across the U.S. which study PFAS in fish[6,7,8]. Even fewer studies focus on PFAS concentrations in fish from a human consumption standpoint[9]. This is the gap of knowledge that we aim to fill, starting in our state. Florida’s proximity to the Gulf and Atlantic fisheries makes it a great location to get various samples of fish at different levels of the water column.

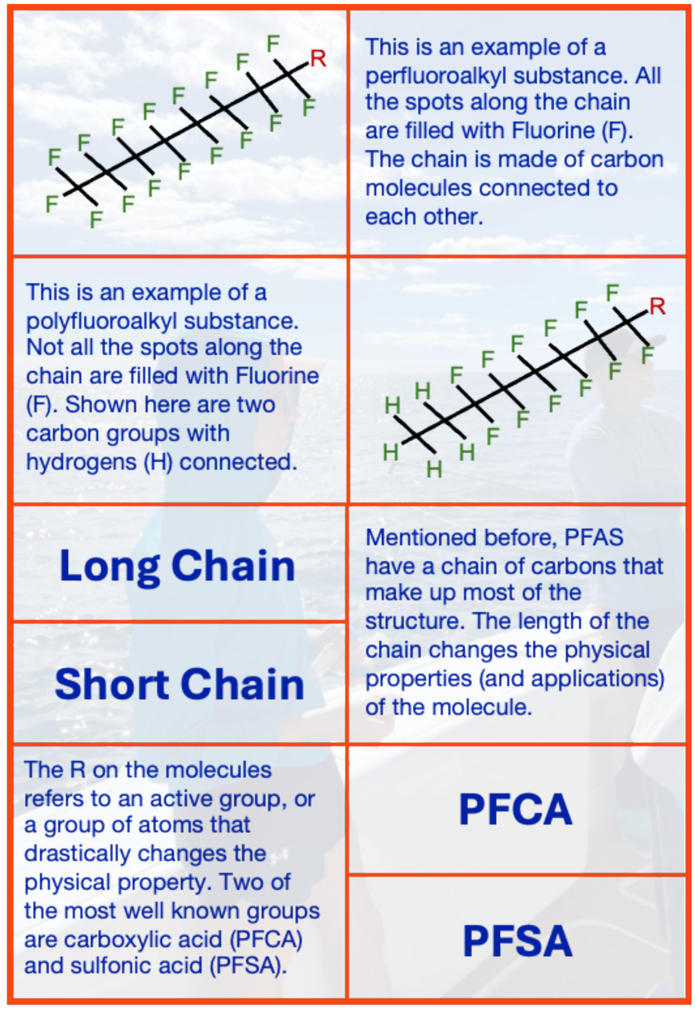

Figure 2. Illustrative explanation of PFAS molecules.

Did you know? There are 14,000+ different molecules that fall under the PFAS umbrella[10].

Fall 2024, we sent out a number of sampling kits to fish charters, avid fishermen, and fish markets. We would like to thank everyone for the outpour of support and hard work collecting samples for us. We will be accepting fish samples until April 1st. Please reach out if you need more supplies or shipping support.

Currently, we have 2300+ samples stored in multiple freezers. A list of species and current quantity is available on the Bowden Laboratory website. Some of the species you will see are not fish we commonly consume. However, these “bait” fish are typically eaten by the fish that we do consume. Any concentration of PFAS in these “bait” fish will be informative due to bioaccumulation.

The next newsletter will focus on how we organize the samples and what statistical tests we will use. Thank you for reading, I have included references if you would like to read up on the wide world of PFAS. If you have any questions or would like further information about things discussed in the newsletter, do not hesitate to reach out. You can either click here to email or please direct your inquiries to cioffi.is@ufl.edu with the subject line, PFAS Saltwater Fish Project.

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