

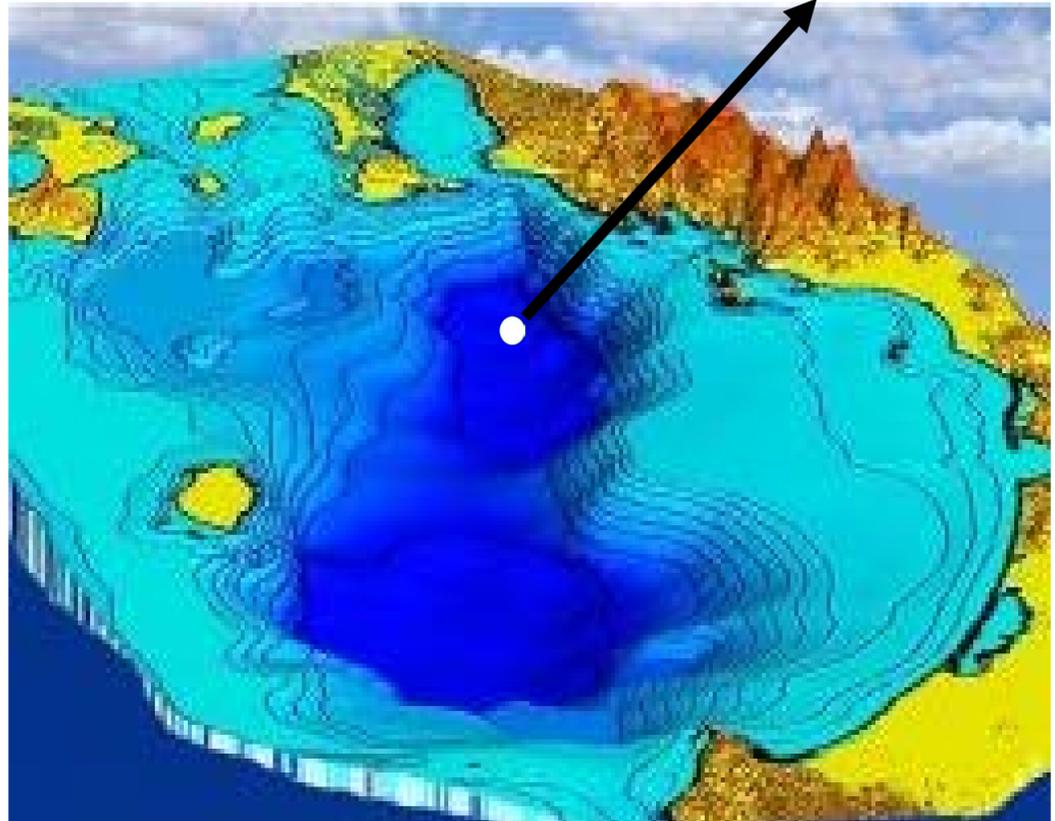
Fish Community Dynamics of the Cariaco Basin from the Little Ice Age to the Present

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CARIACO Station

Introduction

The Cariaco Basin is the largest oceanic anoxic basin in the world and consists of two depressions at ~1400-meters depth. The basin lies off of the coast of Venezuela, off of the continental shelf, and relies on coastal upwelling stimulated by the Intertropical convergence zone (ITCZ), which is where the trade winds converge. Strong, seasonal coastal upwelling in the dry season allows primary production to increase which can establish a larger fish biomass. Around 200-meters water movements are restricted, and the basin becomes anoxic due to a lack of ventilation. Therefore, organisms, except anaerobic bacteria, are unable to live below this depth. The lack of bioperturbation allows preservation of organic matter at the bottom, creating a well-preserved record of events that occurred in the basin in the past.



CARIACO Ocean Time-Series Program

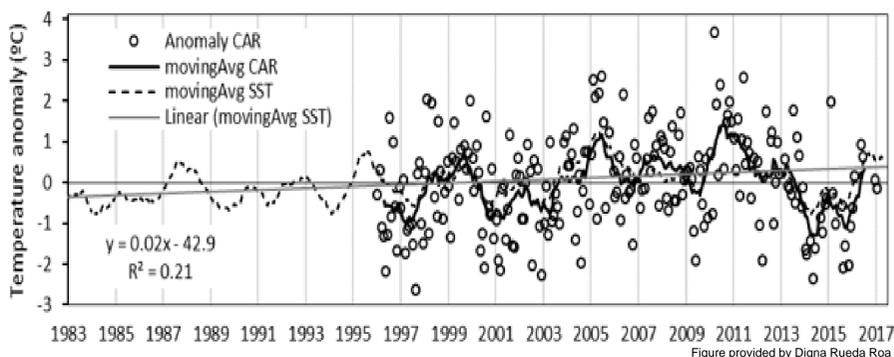


Figure provided by Digna Rueda Roa

Hypothesis

Changes in fish communities and their abundance throughout time may be an indication of climate change. Therefore, the analysis of fish remains in sediment cores may reveal community differentiations that have occurred over a long time period. Environmental variations may trigger changes in communities, and analysis of the coupling of environmental changes with fish remains records may give an indication of the causes of these community transformations.

Objective

- Evaluate changes in the fish population (specifically sardine species) through the analysis of fish remains of sediment cores collected at the CARIACO time series station.
- Quantify changes in the relative abundance of sardine and other fish populations coupled with changes in sea surface temperature and diatom flux.
- Evaluate the importance of other fish species that may have commercial relevance for the Venezuelan fisheries industry.

Methods

Box core samples from the Cariaco Basin are going to be used for this study. They were collected in 2008 at 952 meters (10° 45.98 N, 64° 46.20 W). These core samples corresponds to the time interval of 500 years. Fish remains are going to be examined to determine what type of fish species are found and abundance changes in time.

Procedure

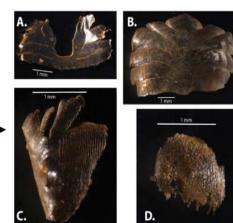
- Frozen sample → Freeze dry a portion

- Sieve sample →

- Separate fish remains

- Identify →

- Analyze data and compare to sea surface temperature and the flux of biogenic silica.



Skrivanek, 2015.