

## Plan Overview

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*A Data Management Plan created using DMPTool*

**DMP ID:** <https://doi.org/10.48321/D1SC99>

**Title:** Abrupt changes in the deep western tropical Atlantic Ocean during the last two glacial periods

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### Project abstract:

The Atlantic meridional overturning circulation (AMOC) was recently listed as a tipping element of the climate system. However, large uncertainties are associated to the possibility of a future AMOC shutdown/marked slowdown and to its consequences. Marine sediment cores from the Atlantic Ocean recorded repeated shutdown/marked slowdown events of the AMOC during the last glacial period, holding a wealth of much-needed information not available in the instrumental record. Yet, the paucity of records hampers the detailed characterization of the consequences of such AMOC shutdown/marked slowdown events to the deep ocean. Here we will determine the detailed response of the deep western tropical Atlantic Ocean to the shutdown/marked slowdown events of the last two glacial periods. Therefore, we will apply the following proxies to a carefully selected depth transect of marine sediment cores from the continental margin of NE South America: (i) stable carbon isotopic composition of epibenthic foraminifera (a proxy for remineralization of organic matter and the source of bottom waters); (ii) neodymium isotopic composition of authigenic phases (a proxy for the source of bottom waters); and (iii) the radiocarbon age difference between coexisting benthic and planktonic foraminifera (a proxy for bottom water age). By doing this, we will provide an in-depth understanding of the responses of the deep western tropical Atlantic Ocean to abrupt changes in AMOC strength of the two last glacial periods, helping to constrain possible future scenarios for the Atlantic Ocean.

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## **Abrupt changes in the deep western tropical Atlantic Ocean during the last two glacial periods**

The data being produced within this project consists in geochemical data obtained via a variety of analytical procedures. The starting material for the extraction of meaningful data consist in loose sediment materials originating within a marine environment along the Brazilian coast. These materials are collected with specified equipment capable of performing a coring of the sediment into about 6 m long tubes. The sediment core is then sampled at specific depths coinciding with specific historic time intervals. Sediment samples are then prepared for analysis. Planktic and benthic foraminifera species are identified and collected for then being subjected to a series of geochemical analyses in order to primarily identify the Carbon and Oxygen stable isotopic ratio within the foraminifera carbonate.

All the produced data will be first stored locally within the laboratory computer that operates the scientific equipment. Once the data is being produced, interpreted and published, it will obligatorily uploaded to the Pangea database that can be found at [www.pangea.de](http://www.pangea.de). The system is extremely robust and safe, accounts are secured by an individual password. This software allows secure long-term storage and export to simple formats (CSV, XLSX) or statistical software. Pangea.de takes care of logging input and changing data for auditing purposes. There are data quality rules that can be preconfigured to ensure data reliability

The metadata that accompany the isotopic data register the day and time of the analysis. Moreover, a series of parameters that are useful to identify whether the analysis is of good quality is also being recorded for quality assurance.

Given the nature of the research, there are no ethical questions concerned.

Question not answered.

The data produced by the analytical equipment are going to be stored locally onto the computer that operates the scientific equipment. Every week a complete backup of the computers is being performed in order to create data redundancy and security. The backup is being performed on a dedicated separate hard drive. periodic consistency check and data integrity are also being performed at regular intervals

The computers and hard drives where the data is being stored are of restricted access and offline.

Question not answered.

Question not answered.

Question not answered.

Being the data produced of special value due to the infrastructure required for their collection (Marine research expeditions on dedicated research vessel, specialized heavy-duty equipment and specialized analytical equipment), the data is only available for sharing once the data is being published on a scientific journal.

Question not answered.

Question not answered.

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