



BETTER FORECAST THE CLIMATE: MARION DUFRESNE LEAVES TO INVESTIGATE IN THE SOUTHERN OCEAN

Mission ACCLIMATE 2 : Around thirty scientists of 11 different countries are gone on research vessel Marion Dufresne to better understand the climate history of the Southern Ocean, the largest CO₂ reservoir on the planet.

Mission Code Name: ACCLIMATE 2

Mission duration: February 9th to March 1st 2020

Exploration area: heading for the Roaring Forties and Furious Fifties off the coast of South Africa. Unruly sea conditions with waves of 4-5 meters up to 10-12 meters (likely to disrupt operations).

Technical means: research vessel Marion Dufresne of the French Oceanographic Fleet operated by Ifremer, equipped with the giant coring device Calypso, the same one that broke the world record for coring length in 2019.

Crew on board: around thirty scientists of 11 different countries. The mission is led by Ifremer's Marine Geosciences laboratory and the Climate and Environmental Sciences

Laboratory (CNRS-CEA-University of Versailles Saint-Quentin-en-Yvelines). Scientists from the universities of Perpignan, Bordeaux, Barcelona, Rio de Janeiro, the Bjerkness Centre for Climate Research and the NORCE Research Centre (Norway), and Cardiff University (United Kingdom) will also be of the party.

Scientific challenges: to better understand the climate history of the Southern Ocean, the largest CO₂ reservoir on the planet. This ocean, very difficult of access, is among the least studied.

Analysis of marine sediments already collected during the ACCLIMATE 1 campaign in 2016 shows rapid variations in ocean circulation and climate. Still poorly understood, this phenomenon is also observed in polar ice cores. Scientists agree that the great alternation of glacial/interglacial periods occurring every 100 000 years is linked to the Earth's insolation cycles. Now they want to better understand what causes the more rapid millennial-scale variations in climate. Achieving this level of understanding would improve climate models and help better anticipate climate responses to massive greenhouse gas emissions.

Exploration methods: sampling of at least 8 cores 40 to 70 meters long (perhaps more!) of marine sediment at depths of 1,000 to 4,600 meters. From these sediments, scientists will study grain size, chemical composition and microfossils. The information they will obtain from this indicators will tell them about the origin of the water masses that travelled through the area, the speed of the bottom currents at different times and the evolution of the temperature of surface and bottom waters.

Two sediment cores will also be taken along the South African coast. By comparing these records with terrestrial equivalents (from stalactites and stalagmites), Norwegian and British scientists want to reconstruct the evolution of South Africa's climate in the Quaternary (from 2.5 million years ago to the present) and determine its impact on human evolution.

Live: The ACCLIMATE 2 cruise can be followed live on the acclimate2.cearc.fr web page. A blog will also enable schools, colleges and high schools on land to follow the mission day after day and to talk with the crew.

ADDITIONAL INFORMATION

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