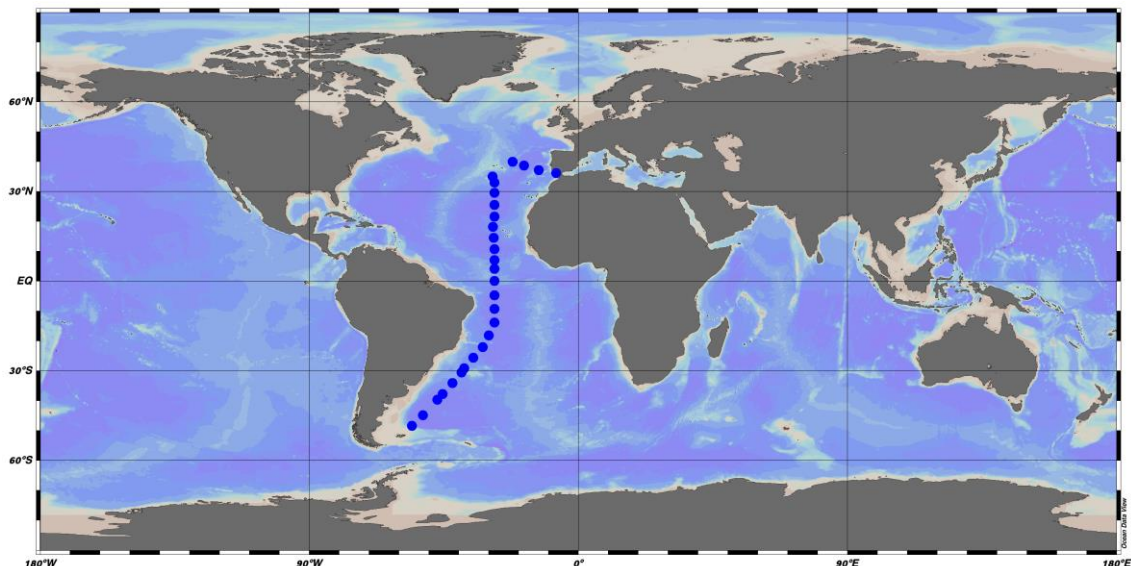


CRUISE REPORT: A17

Created: Jan 2009, Updated Feb 2024



Cruise Summary Information

Section Designation	A17	
Expedition Designation (ExpoCode)	29HE20010305	
Chief Scientist	Aida F. Rios / IIM-CSIC	
Dates	5 March - 17 April 2001	
Ship	R/V <i>Hespérides</i>	
Ports of Call		
	-7.3873	
Geographic Boundaries	-48.3502	40.002
	-55.6807	
Stations	29	
Floats and Drifters Deployed	0	
Moorings Deployed and Recovered	0	

Contact Information

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Report assembled by Savannah Lewis, UCSD/SIO

Links to Selected Topics

Shaded sections are not relevant to this cruise or were not available when this report was compiled.

Cruise Summary Information	Hydrographic Measurements	
<u>Description of Scientific Program</u>	CTD Data:	
<u>Geographic Boundaries</u>	Acquisition	
<u>Cruise Track (Figure):</u> PI CCHDO	Processing	
Description of Stations	Calibration	
Description of Parameters Sampled	Temperature	Pressure
Bottle Depth Distribution (figure)	Conductivity	Oxygen
Deployments	Bottle Data	
Moorings Deployed or Recovered	Salinity	
	<u>Oxygen</u>	
Programs and Principal Investigators	<u>Nutrients</u>	
Scientific Personnel	<u>Total CO₂</u>	
	CFCs and SF ₆	
Problems and Goals Not Achieved	<u>Total Alkalinity</u>	
	<u>pH</u>	
Underway Data Information	Lowered Acoustic Doppler Current Profiler	
Navigation Bathymetry		
Acoustic Doppler Current Profiler		
Thermosalinograph		
XBT and/or XCTD		
pCO ₂	Acknowledgements	
Atmospheric Chemistry Data		
Meteorological Observations		

CRUISE FICARAM II

PI: Aida F. Ríos and Fiz F. Pérez

R/V Hespérides

Cruise: He073

Dates: 5 March to 17 April 2001

Chief scientist: Aida F. Rios (IIM-CSIC)

Nutrients analysis responsible: Carmen G. Castro (IIM-CSIC)

During the cruise FICARAM II, 29 stations were performed (Figure 1). Alkalinity and pH were measured on board. The variables of carbon system, pH and alkalinity, in surface waters together with the $f\text{CO}_2$ measured, were used to study the internal consistency of the measurements.

pH was measured spectrophotometrically following Clayton and Byrne (1993).

Total Alkalinity (TA) was measured using potentiometric titrations with hydrochloric acid to a final pH of 4.40 (Pérez and Fraga, 1987). The electrodes were standardised using a buffer of pH 4.42 made in CO_2 free seawater (Pérez et al., 2002).

Dissolved oxygen was determined by Winkler potentiometric titration. The estimated analytical error was $\pm 1 \mu\text{mol}\cdot\text{kg}^{-1}$. Oxygen saturation was calculated following Benson and Krause equation (UNESCO, 1986).

Nutrient samples were frozen before the analysis. Nutrient concentrations were determined by segmented flow analysis with Alpkem system, following Hansen and Grasshoff (1983) with some improvements (Mouriño and Fraga, 1985; Álvarez-Salgado *et al.*, 1992). The analytical error was $\pm 0.05 \mu\text{mol}\cdot\text{kg}^{-1}$ for nitrate, $\pm 0.05 \mu\text{mol}\cdot\text{kg}^{-1}$ for silicic acid and $\pm 0.01 \mu\text{mol}\cdot\text{kg}^{-1}$ for phosphate.

CT was calculated from $\text{pH}_{\text{T}25}$ and total alkalinity with the Mehrbach et al (1973) constants refitted by Dickson and Millero (1987).

To check the accuracy of the pH and TA measurements, samples of CO_2 reference material (CRM, batch 41 and 51 distributed by A.G. Dickson from the Scripps Institution of Oceanography) were analysed during the cruises. The uncertainties of pH and alkalinity were ± 0.002 and $\pm 1.4 \mu\text{mol kg}^{-1}$, respectively. The corresponding theoretical $\text{pH}_{\text{T}25}$ value (7.918) for this batch was calculated using the dissociation constants from Lueker et al. (2000), which was in agreement with the theoretical value (± 0.0002).

To check the internal consistence of the carbon measurements the CO_2 fugacity ($f\text{CO}_2$) values measured at every station sampled during FICARAM II cruise were compared with those calculated from $\text{pH}_{\text{T}25}$ and total alkalinity with the Lueker et al. (2000) dissociation constants. The agreement between both $f\text{CO}_2$ was high ($r^2 = 0.94$), confirming the good internal consistency of our measurements. The average and

standard deviation of the differences between both calculated and measured CO₂ was -
2.8 ± 8 μatm.

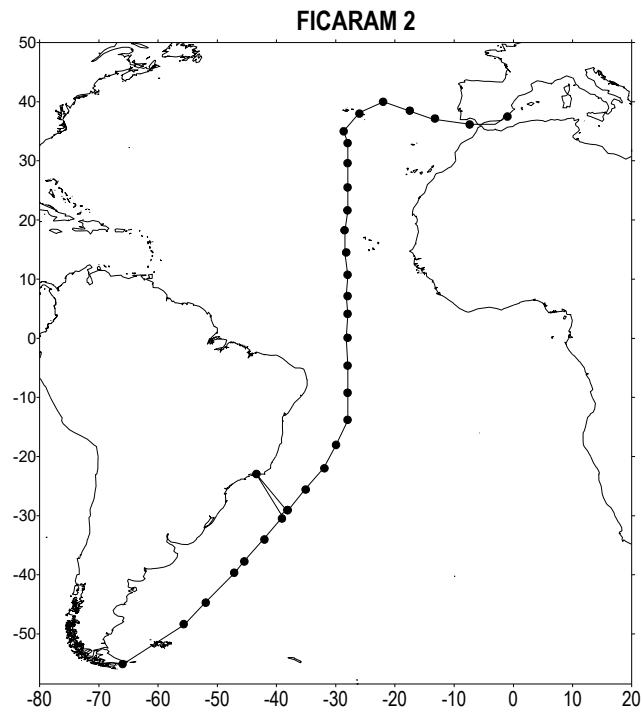


FIGURE 1- Section of the cruise FICARAM II

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