



PHYSICAL OCEANOGRAPHY RESEARCH DIVISION 0230  
SCRIPPS INSTITUTION OF OCEANOGRAPHY  
9500 GILMAN DRIVE  
LA JOLLA, CALIFORNIA 92093-0230

Tel: (858) 534-6368  
Fax: (858) 534-9820

14 October 2005

Ms. Liz Tirpak  
Oceans Research Clearance Coordinator  
Department of State, OES/OA Room 5805  
2201 C Street NW  
Washington, DC 20520

## PRELIMINARY CRUISE REPORT

**STATE DEPT. CRUISE NO.:** 2005-011  
**CRUISE DATES:** 21 August to 14 October 2005  
**CLEARANCE COUNTRIES:** Chile  
**FOREIGN PARTICIPANTS:** Eduardo Navarro Vallejos, Gadiel Eugenio Alarcon Coronado  
**PROJECT TITLE:** Antarctic Intermediate Water Formation in the Southeast Pacific  
**CHIEF SCIENTIST:** Dr. Teresa Chereskin, Scripps Institution of Oceanography, 9500 Gilman Drive, La Jolla, CA 92093-0230 USA, tel. 858-534-6368, fax 858-534-7452, email [tchereskin@ucsd.edu](mailto:tchereskin@ucsd.edu)

**DESCRIPTION OF SCIENTIFIC PROGRAM:** Antarctic Intermediate Water (AAIW) is a low salinity water mass that fills most of the southern hemisphere and the tropical oceans at about 800 to 1000 m depth. As the densest of the circumpolar Subantarctic Mode Waters (SAMW), AAIW is formed as a thick, outcropping mixed layer in the southeastern Pacific just north of the Subantarctic Front (SAF). SAMW and AAIW formation have a major impact on the oceanic sink for anthropogenic CO<sub>2</sub>, whose largest uncertainty is at intermediate depths. Our plan is to characterize the AAIW formation processes, with a winter and follow-on summer hydrographic survey of the AAIW outcropping region and the fronts that bound it.

### DATA DESCRIPTION:

#### **21 August to 6 October 2005, Punta Arenas to Puerto Montt, Chile:**

Shipboard measurements consisted of profiles of conductivity-temperature-depth (CTD) and ocean currents from a lowered acoustic Doppler current profiler (LADCP) made at fixed station locations, including up to 24 discrete water samples measured for salinity, oxygen, nutrients, CFCs, and CO<sub>2</sub>. Continuous underway measurements were made of upper ocean currents (ADCP), surface meteorology, and surface N<sub>2</sub>O, CO<sub>2</sub>, O<sub>2</sub>, temperature, and salinity. Temperature and salinity profiles were measured between stations using expendable XCTDs. We also deployed 13 subsurface floats and 20 surface drifters; these deployments were all made outside of the Chilean EEZ. A digital copy of the data was provided to the Chilean observer, Eduardo Navarro Vallejos.

**9 October to 14 October 2005, Puerto Montt to Arica, Chile:**

Underway measurements continued on the transit from Puerto Montt to Arica at the request of our Chilean collaborators, Drs. Laura Farias and Oswaldo Ulloa, from the University of Concepcion. A digital copy of the data was provided to the Chilean observer, Gadiel Eugenio Alarcon Coronado.

**DATE OF EXPECTED DELIVERY TO THE DEPT. OF STATE:** 30 April 2006

encl.: ship track maps

cc: Liz Caporelli, Rose Dufour, Lynne Talley

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Dr. Teresa Chereskin