

Cruise Plan
R/V Thomas Thompson
15 January to 5 March 2010
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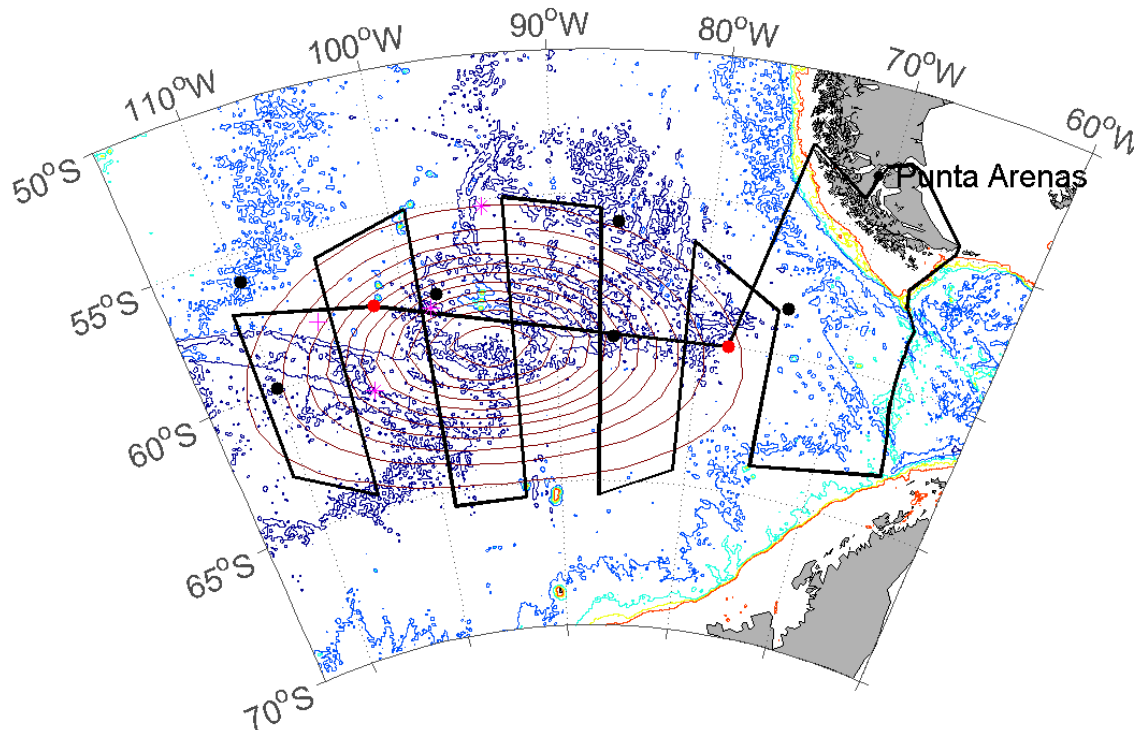
The goals of the cruise are to:

- 1.) Sample a tracer that was released at 1500 m depth, 58 S, 105 W, in February 2009. This will be done with a CTD/Rosette/LADCP system, with 22 x 4-liter Niskin bottles. The samples will be taken into glass bottles and analyzed on board the ship within a few hours of a cast. Samples will also be taken for oxygen and salinity calibration.
- 2.) Survey turbulent energy dissipation rates and velocity shear with free-falling profilers over the full depth of the ocean. These casts will be done together with the CTD casts when weather allows. We have two profilers for redundancy, only one of which will be used at each station. The profilers have their own launch and recovery rigs which will fit under the A-frame on the stern. At each station where we are doing both a turbulence profiler and a CTD cast, we will deploy the profiler first (which is free falling), then do the CTD cast to approximately 2000 meters in most cases, and then recover the profiler. The average time between the start of CTD/profiler stations will be about 10 hours. Sometimes they will be more or less frequent than that.
- 3.) Deploy two sound source moorings in approximately 4500 meter depth.
- 4.) Deploy 105 RAFOS. These floats will be deployed in sets of 6 in rapid succession at CTD stations along 105 W. The floats are released from tubes that can be put over the side by hand.
- 5.) Deploy 4 Shearwater floats at various locations. These are 24 feet long and weigh 180 lbs and so must be deployed with a crane. An attempt will be made to recover the first of these floats, which will be given a mission of about 10 days. The others stay in. The one that is recovered will be redeployed if all goes well.
- 6.) Deploy 6 EM-APEX floats at various locations. These can be deployed by hand.
- 7.) Deploy approximately 36 XCTDs near selected CTD stations.

A chart of the prospective cruise track is attached. CTD and profiler operations will start as soon as we get beyond the continental shelf and into water deeper than 2000 meters, or if we fail to get clearance from Chile on time, as soon as we are out of Chilean waters. The track takes us to the position of the first mooring deployment early in the cruise. We then will do CTD/profiler stations across the region believed to be occupied by the tracer as we make our way to the second mooring deployment location. Then we will start a radiator sampling pattern west of the mooring. The details of this pattern will depend on what we find along the way. Turning points of the pattern will be decided on the basis of how much tracer we are finding along a given line. When we get to the line at 105 W we

will deploy all of the RAFOS floats and several of the other floats. If time allows, the last section will be across Drake Passage, with stations chosen relative to the topography, in order to measure the turbulence in this region.

We propose to depart from Punta Arenas through the west end of Magellan Strait and return via the east end. However, suggestions on how to do this more efficiently are welcome. Also, if we encounter problems that keep us from going as far east as planned, we may opt to return via the west end.



Prospective Cruise Track. We start heading west out of Punta Arenas. The red dots show the two mooring locations. The black dots show moorings that are already deployed. The ellipses show an estimate of where the tracer might be. Bottom depth contours are shown every 1000 meters, from 1000 to 5000 meters. The (faint) magenta asterisks show where 3 floats released with the tracer in February 2009 at the magenta '+' came to the surface in late November 2009.