

To: All SPURS investigators

Re: SPURS cruise planning for fall 2012 KNORR cruise

Below I repeat the general cruise outline and then provide a more detailed time-line with some figures. Thanks to all who provided details. Your continued feedback is welcome. -- Ray

The basic constraints for the Knorr cruise:

Dates: Depart WH Sept. 6 – Arrive Ponta Delgada, Azores, Oct. 9, 33 days at sea

Distances: It is 1915 nm from Woods Hole to 25° N 38° W, about 8 days of steaming.

It is 993nm from 25° N 38° W to Ponta Delgada, about 4 days of steaming.

This gives our working time on site of about 21 days.

My thinking is that we can spend roughly one week deploying assets, including moorings, floats and gliders, about one week doing a small “control volume” with repeat surveys around the moorings, and about one week doing a feature survey, targeting a front or eddy identified by the satellites and models. Of course, we must always figure on some time lost to weather or chasing down the errant glider, but this is a general outline.

The moorings will require bathymetric surveys of the sites before finalizing line lengths; Tom requests that we do the surveys for all three sites first so as to give time for the mooring groups to set up. Surveying will not take long, and can be done at night; the three moorings should take no longer than three days to deploy, so long as the weather is reasonable. Obviously, some gliders, floats and drifters could be deployed during this time as well.

Steve is planning deployment of his 25 profiling floats in a 5 x 5 grid with 30 km spacing. If we steam this with a “radiator” pattern this would take about 2 days. I imagine this would be the best time to deploy the gliders, though perhaps they can self-position and get to their survey lines on their own, so could be deployed as soon as we are in the area.

The control volume around the moorings will be done with an Under Way CTD while steaming, ships ADCP, then microstructure and CTD/LADCP casts at the corners. The idea is to hit the corner stations on a 7 hour cycle, so we get four in an inertial period (~28 hrs). The corners could be the moorings or some wider square. A turbulence glider would be doing the legs, and it may be an excellent pattern for a wave glider as well. If we do this for 6 days we cover 5 inertial periods.

This would allow us about a week to chase down and survey an interesting feature (front or eddy) suggested by the satellites and models. Surveys could be stars (eddy) or butterflies (front) and the UW-CTD, CTD/LADCP and microstructure profiles will be appropriate assets.

Draft SPURS Cruise Timeline for KNORR, Sept. 6- Oct. 9, 2012

- Sept. 6: Depart WH (~10am? high tide = 11:48 am) Steam for 25°N, 38°W
- Sept. 8: 1 test station (CTD/LADCP ~ 1hour)
- Sept. 9: 1 test station (microprofiler)
- Sept. 10: 1 test station (glider, etc)
- Sept. 11-13: Continue steaming with test stations as needed
- Sept. 14: Deploy NW Seaglider near site. Arrive at 24° 45'N, 38° 02'W, Begin survey bottom at 3 mooring sites (Figure 1)
- Sept. 15: deploy WHOI mooring
- Sept. 16: deploy North PMEL mooring
- Sept. 17: deploy East PMEL mooring
- Sept. 18: steam and deploy Seagliders (Figure 2), ARGO floats, (5x5 grid for the 25 floats, 30 km spacing, ~2 days to do radiator pattern, Figure 3), Wave Gliders, 15 Surface Drifters
- Sept. 19: steam and deploy floats, surface and mixed layer drifters
- Sept. 20: weather day or retrieve wayward glider or deploy mixed layer drifters
- Sept. 21: Deploy T-Glider and begin control volume survey with U/W CTD, and micro-structure and CTD stations at the mooring locations, ~7 hrs between stations, 4 knot steam with U/W CTD, inertial period ~28 hrs. (Figure 4).
- Sept. 22: Control volume survey with U/W CTD, and micro-structure and CTD stations
- Sept. 23: Control volume survey with U/W CTD, and micro-structure and CTD stations
- Sept. 24: Control volume survey with U/W CTD, and micro-structure and CTD stations
- Sept. 25: Control volume survey with U/W CTD, and micro-structure and CTD stations
- Sept. 26: Control volume survey with U/W CTD, and micro-structure and CTD stations
- Sept. 27: End box survey after 6 days (5 inertial periods), retrieve T-Glider, identify salinity frontal feature with input from satellites and models
- Sept. 28: Steam to feature site, deploy surface drifter cluster, begin feature survey

Sept. 29: Feature survey (star or butterfly) pattern with U/W CTD, and micro-structure and CTD stations

Sept. 30: Feature survey with U/W CTD, and micro-structure and CTD stations

Oct. 1: Feature survey with U/W CTD, and micro-structure and CTD stations

Oct. 2: Feature survey with U/W CTD, and micro-structure and CTD stations

Oct. 3: Feature survey with U/W CTD, and micro-structure and CTD stations

Oct. 4: Feature survey with U/W CTD, and micro-structure and CTD stations

Oct. 5: Check moorings, CTD stations at moorings, retrieve some gliders, begin steam for Azores

Oct. 6: Steam toward 25 N 35.5 W to deploy 7 surface drifters east of SPURS site

Oct. 7: Steam

Oct. 8: Steam

Oct. 9: Arrive Ponta Delgada, Azores

SPURs 2012 Buoy Sites ~20km spacing

6/1/12

DATA SET: Smith and Sandwell topo/bathy v8.2

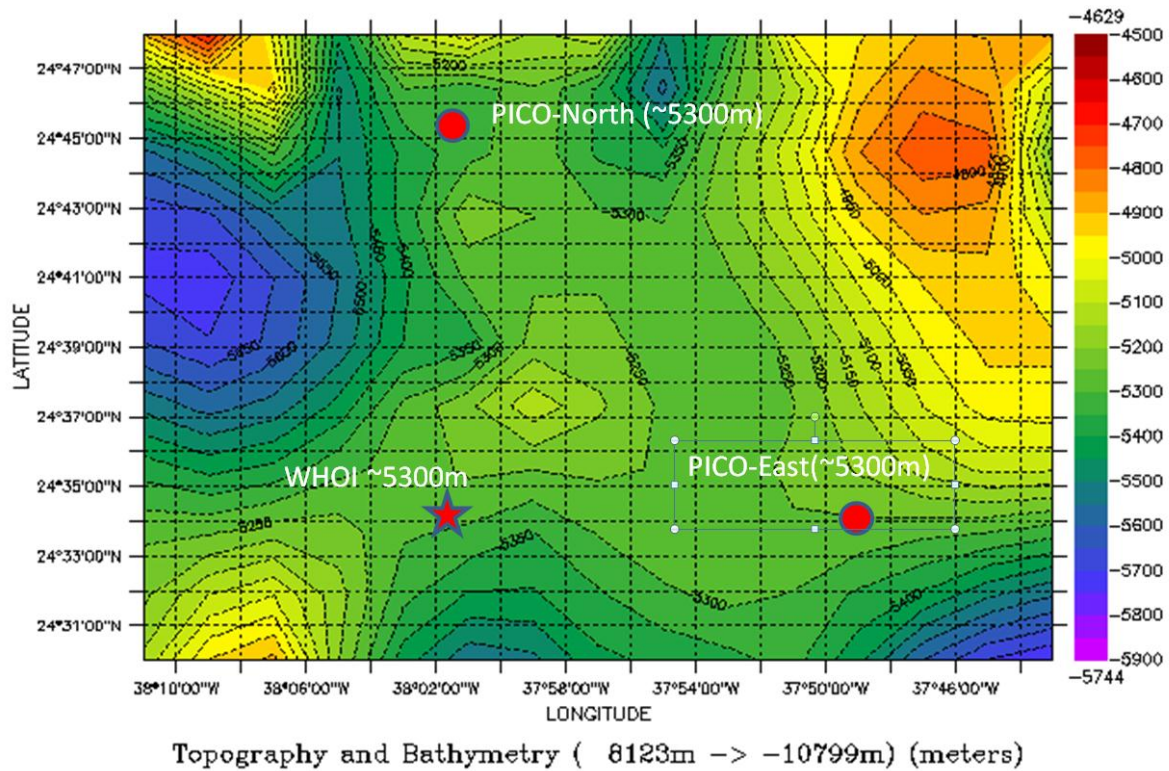


Figure 1. Mooring sites with bathymetry: WHOI mooring at 24°34'N, 38°02'W
PICO-East at 24°34'N, 37°49'W, PICO-North at 24°45'N, 38°02'W

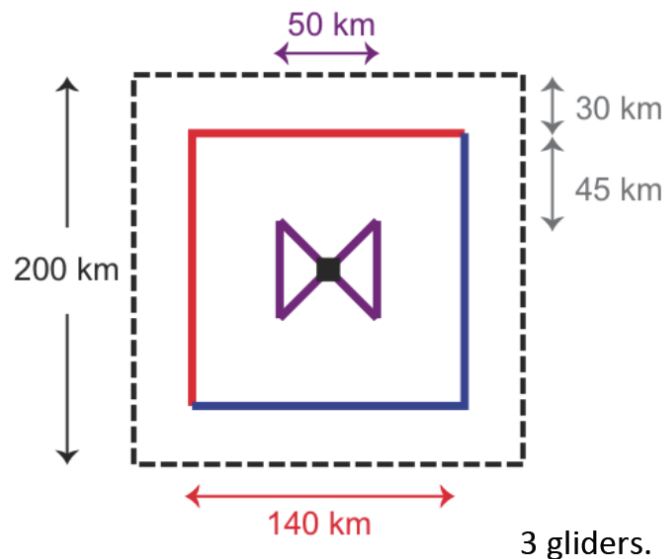


Figure 2. Seaglider survey plan. 2 gliders would occupy a 140km x 140 km box centered on the WHOI mooring (red/blue), a third would perform a 50 km scale butterfly pattern around the mooring (purple).

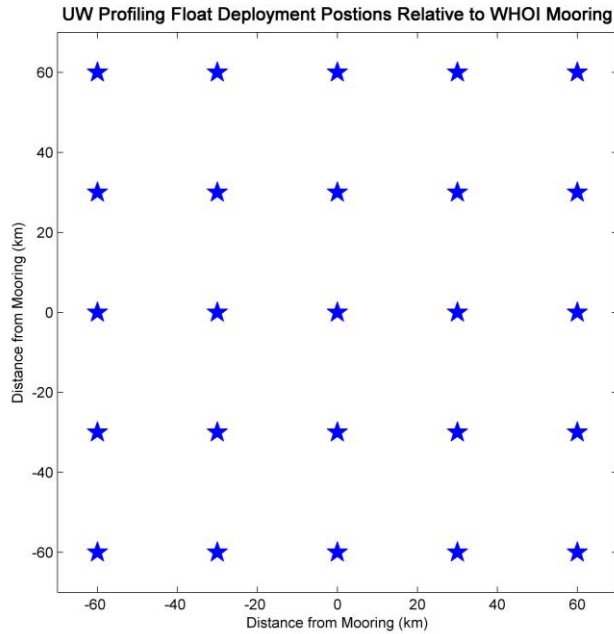


Figure 3. Float deployment positions around central mooring. These are within the 140 x 140 km box defined by the Seagliders (plot border).

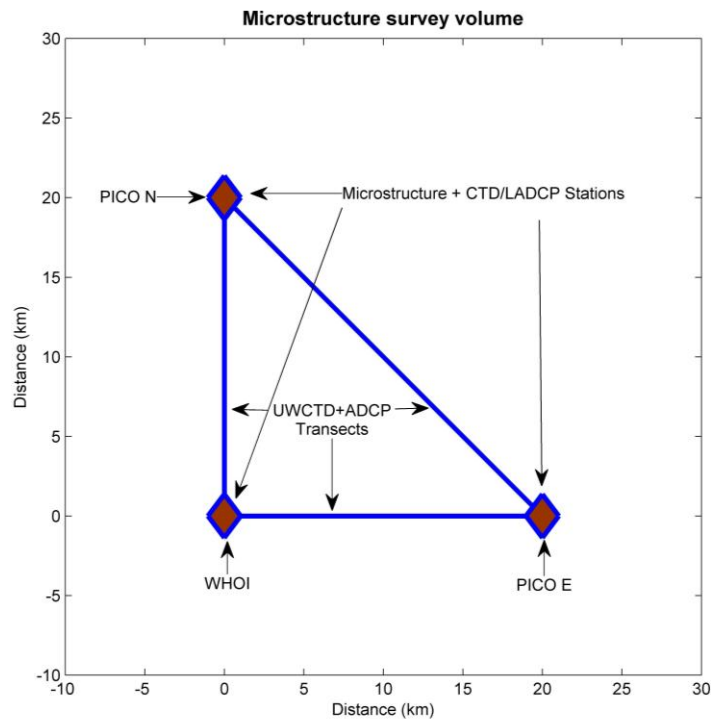


Figure 4. UnderWay CTD survey volume around moorings with microstructure and CTD/LADCP profiles at moorings.