

Physical Oceanographic Mooring Time Series Protocol

Instrumentation Procedures: Cook's Bay T-string

Moorea Coral Reef LTER

By K.Seydel, 12 January 2010

Cook's Bay T-string instrument deployment/retrieval protocol

The Cook's Bay thermistor string (t-string) is serviced once per year, during the December trip to Moorea. It is located at -17.47725, -149.8249833, is in 28m of water and contains 4 SeaBird 39 thermistors and 1 SeaBird 39-P thermistor. The 39-P is deployed just below the buoy at 7m. The others are 11.5m, 15.5m, 20m, 24.5m.

SeaBird 39s:

Before the deployment day the thermistors are programmed with a 120second interval, internal memory is cleared, clock set to current GMT and the start time set to 8am of the day of deployment. The program should look as follows:

```
SBE 39 v 2.0a SERIAL NO. 1923 15 Jul 2005 02:14:26
battery voltage = 9.3
not logging: waiting to start at 16 Jul 2005 18:00:00
sample interval = 120 seconds
samplenum = 0, free = 466028
serial sync mode disabled
real-time output disabled
SBE 39 configuration = temperature and pressure
Binary upload includes time
Temperature = 25.43 deg C
```

Make sure the battery voltage is close to or above 9V(if not replace the battery with a new 9V lithium battery), the temperature reading seems correct for where you are, the time reads correct and the samplenum is set to 0. Save a capture file of the final output. Serial numbers of all units are recorded in the deployment log under "currently being deployed".

Once programmed, add a desiccant pack to the 39, check and lubricate the o-rings and seal the unit. Do not crank down hard with a wrench. The serial number of the unit is then written on the cage and the body of the thermistor taped to prevent fouling. The tape should not cover the water flow slots of the thermistor cage. Once taped the thermistors are placed in a pond. The 39's should remain in the pond until at least 8:30am on the day of deployment – allowing 30min of cross calibration between the units.

Deployment/ retrieval:

Once the 39's are cross calibrated they can be removed from the pond – record the time they are removed.

Needed items for deployment/retrieval:

Med size game bag – 1 or 2
2 large bladed flat head screwdrivers
At least 4 spare 1 9/16” to 2 1/2” diameter stainless steel hose clamps
Anchor with at least 100’ of line

Take the thermistors in the game bag and boat to the GPS location. While one person holds the boat as close to the point as possible the other diver snorkels around the area looking for the buoy. They often need to dive under the water to 15’ to see the buoy since the visibility is often bad in this area. Once found the snorkeler keeps their eye on the buoy while the boat is anchored as near to them as possible. The divers then descend the buoy line to the bottom of the t-string. The chains and shackles are checked at the bottom and then the dive team starts up the mooring. Each thermistor is attached to the line with 2 hose clamps. Both hose clamps are released and the deployed 39 is placed in the game bag and a fresh one is taken. The new 39 is aligned on the mooring line with the thermistor probe facing down and attached with the two hose clamps. Make sure the location of the replacement is exactly the same. Record the time that the 39 was removed from the mooring line and also the time the new 39 was placed on the line. Work your way up the line replacing the thermistors and checking and cleaning the condition of the mooring line. Make sure to replace 39’s with 39’s and save the 39-P for the shallowest position right below the buoy. When finished with the replacement of the last 39-P clean the buoy as you do your safety stop. When the thermistors are returned to the station place them in a pond for at least 30min to again cross calibrate before cleaning.

Cleaning:

Remove thermistor from pond and note the time the unit is removed. To clean the thermistors, peel off the tape that is covering the body of the unit. Most of the fouling should come off with the tape. Unscrew the cage that protects the thermistor probe and leave it to soak in a vinegar solution. Make sure that special care is taken when cleaning around the probe. Using a soft tooth brush and vinegar, gently brush away the algae and CCA that are left on the thermistor. Zip-ties are acceptable to use to pick things out of the hole in which the probe sits. After the cage has had sufficient time to soak in vinegar, scrub the remaining fouling off and give everything a fresh water rinse.

Download:

When the 39 is clean dry it and open the unit using a large wrench on the flat flanges by the threads of the cage. Be careful when doing this because the wrench can slip off the flanges and break the thermistor probe. Once open put the desiccant pack in the bag marked “to be dried” and attach the thermistor to the computer. Open www.time.gov and get the correct GMT time. Open seaterm and connect to the 39 and do a status check on the 39 – simultaneously checking the time on time.gov so that you can see how many seconds the internal clock of the 39 has drifted since deployment. Record this number. Then “stop” the 39 from logging and initiate an upload of the data stored on the thermistor. In the “comment” section of the upload record the site and depth that the thermistor was collected as well as the outplant and retrieval dates. For file naming see

the file called “file name structure.txt” Once the 39 has finished downloading use a flash drive to back up the data file on another computer.