

Physical Oceanographic Mooring Time Series Protocol

Instrumentation Procedures: Bottom-mounted Thermistors

Moorea Coral Reef LTER

By K.Seydel, 12 January 2010

Bottom mounted thermistor protocol

There are bottom mounted thermistors at all LTER lagoon sites, 10 and 20m at all fore reef sites and 30 and 40m at LTER 0,4 and 5. The coordinates are available on the GPS units.

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. Once the 39 is programmed, save a capture file of the information. 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. 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.

Tools needed for deployment:

1 small game bag

Flat head screw driver

Wire cutters

Extra 3 1/16 to 4" stainless steel hose clamps

For the lagoon thermistors:

Park the boat at the anchoring GPS location. For sites 3-6 the thermistor plate is between the finish of the #2 fish transect and the start of the #3 transect. For site 1 the thermistor is approximately 10m inshore of the anchoring location. For site 2 the thermistor is inshore of the finish of the #2 fish transect, approximately 15m from the anchoring location.

Take the tools and hose clamps in the game bag with the thermistor to deploy and find the thermistor plate. Remove the existing thermistor recording the time it comes off the plate. Occasionally the hose clamp is so corroded that it needs to be cut off with the wire cutters. Assess if a new hose clamp is needed or if the old one can be reused and attach the new thermistor to the plate, recording the time.

For the fore reef thermistors:

Leave the boat at the mooring, put the two thermistors, tools and spare hose clamps in the game bag and swim first to the 20m thermistor site. These are close to the physical oceanographic t-string at 1,4 and 5. At site 6 it is approximately 2m north of the boat mooring, at site 2 it is offshore and east of the boat mooring and at site 3 it is offshore and north of the boat mooring. Change out the thermistor as described above. Then move to the 10m thermistor. These are all between the end of the #2 fish transect and the start of the #3 fish transect. Again, change out the thermistor as described above. Once back at station place the thermistors in a pond to cross calibrate.

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.