# Slocum Deployment (shoreside) (Coastal)

1. Was software image applied to glider during checkout?
   1. SBD, MBD, TBD set accordingly
   2. Core mission MA files should be set correctly for test mission
   3. Confirm log folder is clear (of at least SBD’s)
2. status.mi
   1. Mission completed normally and confirm GPS hit achieved
3. Vehicle Sanity Check
   1. Battery level
   2. Vacuum level (> 7 in Hg)
   3. Confirm ‘boot app’ with ‘boot’ command
4. Stage 1 deployment (glider in water)
   1. With or without float
      1. Typically float is used when glider is shipped and deployed in a new area
      2. Floats are not used locally
      3. Water depth can be determiner in float usage as well, if deep ocean you may want the increased security of a float
   2. zero\_ocean\_pressure
   3. run odctd.mi
      1. confirm abort is for overdepth
      2. confirm boat witnessed submergence and reemergence
      3. note abort time and mark (this will become deployment start time)
      4. note GPS location and insert into GE
   4. Boat side (if possible)
      1. Transfer DBD and MLG’s
   5. sync\_time
5. Stage 2 deployment (Test Mission)
   1. Test Mission Parameters
      1. Runs for < 20 min
      2. Sends data across the clothesline
      3. Lightly samples all data on science bay, only CTD is included in the SBD & MBD
      4. Mission completes to gliderDOS
      5. Backup timer of 30 minutes
   2. Confirm goto\_l10.ma makes sense given GPS mission above
   3. Run Test Mission
   4. Transfer SBD, MBD, and TBD
   5. Data analysis (depending on tool used, glider Plot or matlab scripts)
      1. Flight Dynamics
         1. Note average roll of vehicle, across up’s and downs
         2. Note dive and climb pitch angles
            1. Should at least be positive on climbs and negative on dives
            2. Not to exceed 30 degrees, if so take note, usually a glider should step up to right pitch angle, not overshoot
            3. Pitch not responsive?
            4. Pitch vs battpos plot?
         3. Note if vehicle tracks a heading to within +- 40 degrees
            1. Note if heading is tracked consistently port or starboard to intended
            2. If heading tracks about 0 error, fin should also cross over 0 point, confirm this
         4. Altimeter
            1. Confirm that we are seeing bottom (if possible, bottom < 80 m away)
            2. Any false hits or bottoms?
            3. Strong return on bottom > 2,3 m\_water\_depth’s updated on the dive
      2. Ballast considerations
         1. Dive and climb time should be equal given equal magnitude pitch on dive and climbs.
         2. Function to estimate glider density?
      3. Pressure / Depth Checks
         1. CTD and glider pressure should agree (TBD data + MBD data)
         2. Confirm glider not impacting bottom
         3. Confirm if glider is breaching or near surface, note approximate climb depth.
         4. Note if glider appears ‘out of the water’ or negative depth
      4. Science Checks
         1. Temperature, salinity, density sanity check
         2. Other data exists?
            1. Optode phases
            2. All necessary optical channels
         3. Timestamp check
   6. Note surfacing GPS and mark in GE, waypoint location still OK?
6. Stage 3 Deployment (Final Mission)
   1. Make necessary MA adjustments
      1. goto still pertinent?
      2. adjust no\_comms to 1 hour missions with backup set to 1 hour past eventual surfacing interval (ie: 4 hours for 3 hours)
      3. yo10.ma
         1. adjust dive\_to depth if glider was seeing bottom satisfactorily
         2. adjust climb\_to depth if glider was breaching
      4. if glider is not obtaining proper pitch angles quickly, make adjustment of doubling u\_pitch\_max\_delta\_battpos (usually .02 to .04)
      5. Correct any SBD, MBD, TBD file errors
   2. Run final mission

# Slocum Daily Monitoring

1. Check notes page for deployment updates
2. Google Earth check on location
   1. Check overlays
   2. Shipping lanes, danger areas
   3. Note progress or lack of, proper waypoints?
   4. If necessary (ie: going to slow or mission planning) calculate a speed
      1. Speed based on distance made good is the best metric, measure a glider’s speed to waypoint or target, not necessarily speed in the water to give true measure of glider’s speed. This is usually best done visually.
3. Check deployment page for data visuals
   1. Confirm the plots are updating and recent
   2. Confirm data exists and is not blotchy, missing, or perhaps working incorrectly
   3. Check surface log reports for device warning printout (ctrl^w)
      1. Note any warnings or errors to get mental image of glider
      2. Increasing number of warnings could indicative and help troubleshoot quickly a problem that crops up
      3. Often some devices have many oddities however
4. Diagnostic plots – these are plots to be generated near real time, on a segment or multi-segment / deployment basis
   1. Depth Plot – a straightforward plot showing the depth time series of the glider. Overlayed CTD data pressure record showing a comparision of the pressure sensors. Also plotted should be m\_water\_depth and other altitude sensors to monitor performance. This plot should be able to show approximately how close to surface you get and how close to bottom. Strange anamolies should be able to be visualized here.
   2. Heading, pitch, roll plot
      1. Show pitch easily, perhaps just magnitude of dives and climbs. Should be able to see how quickly we are obtaining pitch and if we hold it throughout the half yo. Should not go from 26 to 30 to 26 deg and so on
      2. Roll is simple plot but better suited for deployment wide time series. Perhaps a plot showing average pitch of every dive and every climb averaged. A 2nd plot, perhaps incorporated into i) above, should show just a segment’s roll. The main purpose is to diagnose and identify a wing loss
      3. Heading plot is very important. Heading error is the best diagnostic and perhaps we should define heading error as: error = m\_heading – c\_heading (interpolated)
         1. It is helpful to have depth overlayed to see at which points in flight is it not flying well (typically at inflections or near surface)
      4. Heading statistical plot is perhaps more importrant than iii) above. This plot will show the standard deviation and perhaps average error of the glider’s heading. This is a better deployment-wide plot to gauge if performance changes or decreases over time
   3. Battery plot
      1. Time series of battery voltage over deployment
         1. Check for drops or try to trace alkaline curve for predictive purposes
         2. Make sure still enough battery to get where you need to go (if necessary)
            1. Predict number of days left
            2. Combine with your speed from above
   4. Power / Energy plot
      1. Limited usefulness, text could do as much as this, as in ’45 days remaining on battery, or about 800 km’
      2. Energy usage perhaps more like roll, in that you just want to monitor the rate to make sure glider is not operating outside normal limits.