Procedure for processing data from DO sonde in Excel

1. Open excel document of raw data from the sonde. If it is still in a .cnv format, open with Excel and save as an Excel document titled “group\_date.xlsx”. (eg “stb\_081218.xlsx”)
2. Go to Data 🡪 Text to Columns 🡪 Delimited 🡪 Tab 🡪 Do not import 🡪 Finish
   1. This eliminates the first column, which is empty.
3. Open DO MACROS.xlsm and click “enable macros” if prompted. Make sure that DO MACROS.xlsm. Open the cast info and field log as well.
4. In the raw data file, go to View 🡪 View Macros 🡪 'DO MACROS.xlsm'!DataPrep.DataPrep then click “Run”.
   1. This macro will save the result as a new file with the title “group\_date\_edited.xlsx”.
5. Graph “Scan” vs “Depth” and count how many casts there are in the data and make sure it is the same as what you have recorded in the field log.
6. In the cast info file, highlight the data (It should all be in one column) and go to Data🡪Text to Columns. Choose “Delimited”, hit next, select comma and space, then Finish. This should create multiple columns, with one of them containing only the scan numbers that each cast starts on.
   1. Copy and paste this column into the data file to the right of the data.
7. In the data file, enter the number 1 in box C2, then enter this formula into box C3: C3=if(isna(vlookup([ScanNumber],[StartScanNumberColumnFromCastInfo],1,false)),[cellAbove],[cellAbove]+1).
   1. In the formula bar, replace the bracketed info with the described box/column.
   2. Copy the formula throughout the column.
   3. This makes it so that the cast number will increase each time the first scan of a new cast is reached.
   4. Go through the sheet and make sure there is the correct number of casts listed.
   5. Copy the cast numbers column and paste values in the same place. If the column is left in formula format, the cast numbers will be distorted once the data is trimmed.
8. It may be helpful to make Ascend/Descend columns to more clearly mark up- and downcasts.
   1. Ascend column: q2=if(h2=max(h2:h52),"X","")
   2. Descend column: r3=if(h2=min(h2:h52),"X","")
   3. Copy each formula throughout its column.
9. At the beginning of each cast is the equilibrium minute, then the depth decreases slightly and begins to increase rapidly (the downcast).
   1. Delete data up to the point where the depth begins to increase rapidly.
10. Scroll down until the depth reaches a maximum and begins to decrease. This is the bottom of the cast.
    1. Hold shift and select the row just after the maximum depth value. Find the last row in the cast, then hold shift and click on it to select the data in between. This is the data recorded during the upcast and should be deleted.
11. Delete the Ascend, Descend, and starting scan number columns from the data sheet since they are extra, then go to View 🡪 View Macros 🡪 'DO MACROS.xlsm'!BobbleFix.BobbleFix and click “Run”.
    1. This will remove the effect of the boat bobbing in waves and deletes data for which the depth is shallower than previous depth, so only downcasts are kept. This macro will save your data as “group\_date\_edited\_BF.xlsx”.
    2. If the ascend, descend, and scan number columns are not first deleted, then running BobbleFix will first just delete these columns but not the bobble data, so the macro will need to be run a second time to actually trim the data.
    3. Check the number of rows in the sheet that contain data to confirm that the macro has actually removed data.
12. Go through each cast, looking at the top and bottom of the cast and deleting data that does not have depth increasing at the same rate as the rest of the data.
    1. For example, at the top of the cast, there may be a few seconds where the sonde was at the same depth, so the redundant data can be deleted. At the bottom of the cast, the sonde may have hit the bottom, so depth values will only increase slightly with time as the sonde sinks into the mud or falls over. This data is especially important to delete because you are measuring the DO in the sediment, not of the water column. To visualize this, it may be helpful to graph depth vs. Scan for each cast separately to see where the depth begins to level off.
13. When you are satisfied that your data has been cleaned up, go to View 🡪 View Macros 🡪 'DO MACROS.xlsm'!InterpMacro and click “Run”.
    1. Now your data will be interpolated to depth intervals of 0.5m.
    2. The result will be saved as “group\_date\_edited\_BF\_interp.xlsx”.
14. Enter the data needed in the remaining columns from your notes in the field log file.
15. Calculate adjusted chlorophyll in column N.
    1. For data from the Brown group, the adjusted chlorophyll column is the same as the corrected chlorophyll.
    2. For the DEM group, multiply the corrected chlorophyll by 1.345153 to get the adjusted chlorophyll.
    3. For the STB group, multiply the corrected chlorophyll by 0.77226 to get the adjusted chlorophyll.
16. Calculate the lab-calibrated chlorophyll in column O by multiplying all adjusted chlorophyll values by 2.058275.
17. Copy the data sheet and paste values to preserve data.
18. Create a combined file that contains the data from all three groups. The order of the data should be STB, Brown, then DEM.
    1. Delete the “Scan”, “Cast Number”, “Turbidity”, and “Corrected Chlorophyll” columns.
    2. Format the columns so Depth, Temperature, and DO( %) sat have one decimal place and Salinity, Density, DO (mg/l), and both Chlorophylls should have two decimal places.
    3. Add a column titled “Dip-in?” and put “Y” for the stations that were a dip-in.