

## C-OPS Processing Directions

This processing architecture was originally intended and developed for UCSB's Plumes and Blooms project. The Plumes and Blooms project is a monthly, long-standing time series in the Santa Barbara Channel. The C-OPS radiometer is cast at each station where a tsv file is created by the Biospherical Inst. program with a specific station number pb### and date stamp. This file is initially converted from a .tsv file which is read by excel, to an ASCII(LCD) file format conforming with NASA SeaBASS database file format. Conversion from tsv to ASCII requires the use of UCSB's perl and matlab scripts.

### Creating base LCD files

- Base LCD files are generated by using a perl script that converts the .csv or .tsv files to and general ASCII file format.

Command line syntax is:

```
perl cops2lcd.pl pb###_STN1_141218_2255_data_001.tsv  
ASCII file calibrations.txt must be present in the conversion  
directory.
```

The perl script assumes the pb###... file format is what is provided, as it parses the input string for date information

Further matlab processing scripts assume file format generated by the perl script. If individual file format is desired, some modifications to the matlab scripts are needed.

### Picking the top and bottom of a downcast

Once matlab is started with graphical output in the chosen processing directory, the calling script process\_COPS.m is called. Calling syntax for this script is >>process\_COPS('twoletterprefix').

### Automatic quality control scripts

Adjusting QC parameters for varying water conditions such as turbidity requires modifying two files:

```
Copsrqclist.txt  
COPSbscalc_window.txt
```

These files adjust regression depth intervals for bscalc and noise limits for radqc.

## SeaBASS file creation

In order to adhere to NASA's SeaBASS archive format, a perl script is again utilized to convert the lcd file to a .sb file.

Command line syntax:

```
cops2sb.pl pb### kcmbsbanKrqcmCOPSP130411A.lcd.1
```

## Processing Scripts

### \* cops2lcd.pl

Conversion script to change files generated by Biospherical Instruments software to an ASCII format which is modifiable.

### \*process\_COPS('PB')

Global calling script which initiates all other function calls until quality control is through.

### \*auto\_bt

Picks the downcast of a profile by checking variation in depth within a particular sample measurement size. CPSbt\_E.m is the manual version

### \*domath(filename,'s','LuZDepth',0,0.4,'depth\_ed')

A multi-use function that performs addition, subtraction, and ratio calculation on two numbers specified in columns. This call is subtracting is calculating depth\_ed by subtracting from LuZDepth .4m.

### \*COPStradQC(filename,radpath)

Noise qualification for radiometric limits. Lower limit noise levels for each band are referenced to throw out bad data.

### \*CPSdoKQ(infile,'m','EdZ412',10,0.005,0.02)

### (infile,type,channel\_name,depth\_int,trend,variation)

Qualifies incident light over a specific depth window, if any row has a high variation outside of a stipulated region, a flag is generated. This call compares the M1stdiff/mean and sigm/mean of data in window +/- 5m to 0.02 %and 0.05 respectively for

channel EdZ412.

(infile,type,channel\_name,depth\_int,trend,variation)

\*CPSangQ(infile,'EdZPitch','EdZRoll','EdZ443','LuZ443')

Verifies angles of the profiler package do not exceed stipulated amount, otherwise a flag is generated for that data row.

\*COPSbscacloop or COPSbscalloopII(infile>windowfile)

Performs Ed0- regressions and appends statistics to the lcd file

Performs regression to find statistics on light measurements in the upper few meters of the water column. 0- values are appended to the statistics line at the end of the file

\*COPSmathloop(infile)

Script that calls domath, to perform an RRS calculation Lu/Ed

\*MCR\_COPSkloop(infi,'/Copsrqclist.txt')

Calculates Kd's throughout the entire profile.

\*cops2sb.pl

Converts final file generated by matlab scripts to .sb file format for NASA submission.

## Step by Step

1. Run processing on a unix based machine
2. Matlab must be installed and processing mfiles must be linked in the path. Later versions of matlab have graphics handling issues
3. Copsrqclist.txt, calibrations.txt, COPSbscalc\_window, must be in the directory you wish to process the files in. Instrument specific
4. Open a terminal window to enter unix command
  - a. perl cops2lcd.pl pb###\_STN1\_(date)\_(time)\_data\_00(run number).tsv
5. Start matlab and add processing script to path if not done already
6. Call script "process\_COPS('PB')", where PB could be any prefix
7. Observe the processing. User input will be required at one step to confirm correct processing text files as mentioned above are present.
8. cops2sb.pl pb### kcmbanKrqcmCOPSP130411A.lcd.1

