



Rolling Deck to Repository (R2R) Mojolicious Plotting Routine (CTD)



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Background:

Rolling Deck to Repository (R2R) supports acquisition, documentation, preservation, and enhanced usability of underway environmental sensor data from scientific cruises by the U.S. Academic Research Fleet (ARF). R2R, in collaboration with several institutions, has been creating Best Practices for many shipboard instruments. The goal of the Best Practices is to ensure the 'Reusability' of data under FAIR data guidelines.

The CTD acquisition system on UNOLS vessels has long been used to collect data of the water column. Many scientists use the CTD as a 'fail-safe' way to collect data when other scientific operations are put on hold due to weather or equipment malfunction. Good CTD data takes more than putting the carousel into the water. It needs dedicated time for thorough cleaning and documentation of drift over time. It is valuable to review CTD data collected during the cruise so modifications or cleaning can occur before another cast is collected.

A great diagnostic tool to use during acquisition of data are difference plots between any two lines of plumbed sensors (ie. conductivity, temperature, or oxygen). These plots are integral in showing a dirty sensor or something getting stuck in the CTD causing an error in the data.

Step 1. Install cpan and Mojolicious

Via Terminal ~% sudo cpan
In the cpan shell > install Mojolicious
Download other dependencies in terminal with sudo cpan App::cpanminus Array::Utils Class::Struct

Step 2. Download the GitHub Repository

GitHub Link: https://github.com/rvdata/R2R_ctd_plot/tree/main
Get the processed CTD data and note the directory path

Step 3. Run the CTD Plot script

Run the plots via the terminal: nohup -> ./ctdplot.pl -d ctd_dir -l http://cipo-cport: &
On windows terminal: Start-Process "perl" -ArgumentList "ctdplot.pl", "-d", "ctd_dir", "daemon", "-l", "http://127.0.0.1:cipo-cport"
Go to the page on browser: http://cipo-cport-

Stations to Plot		Instruments to Plot																									
Select One or More Stations Search... <table border="1"> <thead> <tr> <th>Available Stations</th> <th>Selected Stations</th> </tr> </thead> <tbody> <tr> <td>shiptcd01_1db.cnv</td> <td>shiptcd02_1db.cnv</td> </tr> <tr> <td>shiptcd01_24Hz.cnv</td> <td>shiptcd03_1db.cnv</td> </tr> <tr> <td>shiptcd02_1db.cnv</td> <td>shiptcd04_1db.cnv</td> </tr> <tr> <td>shiptcd02_24Hz.cnv</td> <td>shiptcd05_1db.cnv</td> </tr> <tr> <td>shiptcd03_1db.cnv</td> <td></td> </tr> </tbody> </table>		Available Stations	Selected Stations	shiptcd01_1db.cnv	shiptcd02_1db.cnv	shiptcd01_24Hz.cnv	shiptcd03_1db.cnv	shiptcd02_1db.cnv	shiptcd04_1db.cnv	shiptcd02_24Hz.cnv	shiptcd05_1db.cnv	shiptcd03_1db.cnv		Select One or Two (for diff) X-Axis Instruments Search... <table border="1"> <thead> <tr> <th>Variables</th> <th>Selected Variable</th> </tr> </thead> <tbody> <tr> <td>CStarTr0</td> <td>c0S/m</td> </tr> <tr> <td>altM</td> <td>c1S/m</td> </tr> <tr> <td>c0S/m</td> <td></td> </tr> <tr> <td>c1S/m</td> <td></td> </tr> <tr> <td>Amcct00</td> <td></td> </tr> </tbody> </table>		Variables	Selected Variable	CStarTr0	c0S/m	altM	c1S/m	c0S/m		c1S/m		Amcct00	
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Figure 1. List of CTD .cnv files and associated parameters that you would like to plot.
Can plot an indefinite number of .cnv files at once.

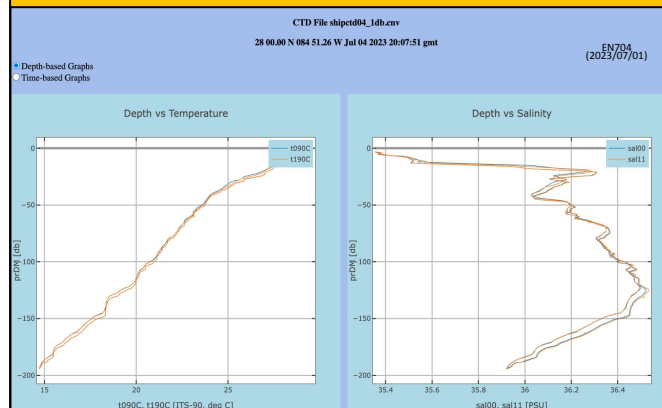


Figure 2. Example plots in 'single cast view' with parameter vs depth.

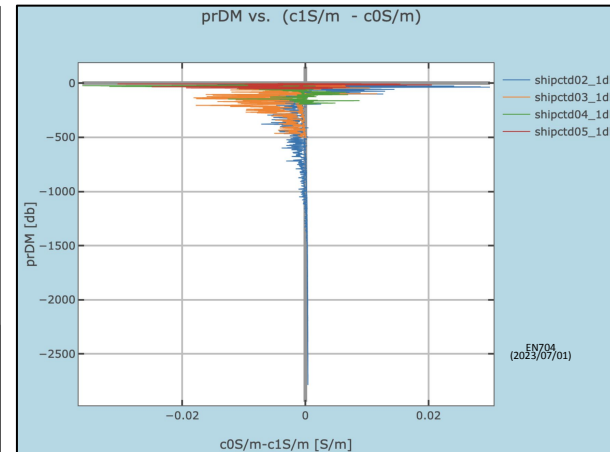


Figure 3. Example of a 'multiple cast view' from EN704 with two plumbed conductivity sensors in a conductivity vs depth plot.

Processing Notes:

Please note this CTD plotting routine needs a processed CTD file (.cnv). Which can be generated by Seabird's SBEDDataProcessing software. For information on operation, refer to the SBEDDataProcessing manual (pages 19/20).

Step 1. SBE Data Processing Software on Windows

On the Run Tab select Data Conversion. On the Data Conversion window in File setup:
Select the .gss file as a Program Setup File and the .XMLCON file as the Instrument configuration file and the .hex file as the input file

Step 2. Data Setup Tab on Data Conversion Window

Select Output Variables: Add any additional variables required. Remove the Time, System [seconds] variable.
Recommend Variables: Depth, Lat, Lon, Conductivity 1&2, Salinity 1&2, Temperature 1&2, Oxygen, Pressure
Start Process - Generates the .cnv file

