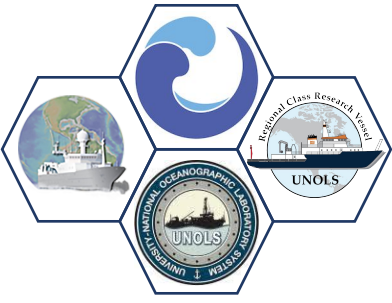




# An update on: Developing CTD Best Practices

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RVTEC 2023  
October



# Group Members & Working Group Leads



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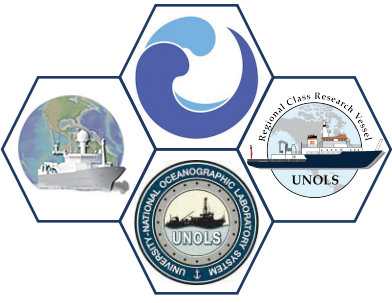
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# General Best Practice for CTD

- CTD Cast naming convention
  - should be unique, preferably with *CRUISE ID* included - where possible
    - *RR2301\_001*
    - *AE2319\_CTD\_001*
- CTD data structure
  - raw - for (hex, xmlcon, btl, hdr)
  - proc - for processed data ie (cnv, asc)
  - doc - for current sensor calibration files for all sensors that are on the ship
- Log file of events - (R2R Eventlog)
  - deploy; max depth; recover; abort
  - sensor cleaning esp when using bleach or Triton/Tergitol used for cleaning
  - Oxygen sensor (#####) swapped out for (#####)



# Recommended Minimum Instrumentation on CTD

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## Primary Sensors

- dual temperature (SBE 3)
- dual conductivity (SBE 4)
- oxygen (SBE 43) with backup on board

## Auxiliary

- C-Star Transmissometer
- Fluorometer
- Valeport Altimeter

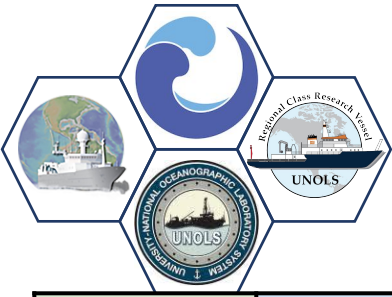
## Other?



# Basic Recommended Cleaning

There are several options described by Seabird application notes, and are summarized below.

- 1) Flush the T/C sensors using the Seabird provided syringe. Agitate warm (wrist warm) distilled water through the cell in a washing action, forcefully pull the plunger in and out to flush the sensors (this can be accomplished with Tygon tubing and a syringe kit – see Application Note 34) for 2 minutes.
- 2) Cleaning chemicals
  - a. Bleach - For bio-fouling it is extremely effective in controlling growth.
  - b. Tergitol - For removal of surface and air-borne oils ingested into the plumbing.
  - c. White Vinegar - For minor mineral deposits ( 5 – 8% acetic acid).



# Cleaning Compatibility Chart

Sensors	Bleach	Tergitol/ Triton X	Vinegar	Lens Paper	High grade isopropyl Alcohol	DI H2O agitated cleaning	CLEAN Compressed air	Rinse w hose	Soapy water	HCL
Temp	Y	Y	Y			Y		Y	Y	
Cond	Y	Y	Y			Y	Y	Y	Y	Not recommended
Oxygen		N				Y		Y	N	
O2 Optode		N				Y		Y	N	
Fluorometer		Y		Y		Y		Y	Y	
SUNA				Y	Y	Y		Y		
PAR		Y				Y		Y	Y	
SBE Pumps		Y				Y		Y	Y	N



# Mechanical Termination

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What does your vessel use:

- Mechanical poured
- Guy grip
- Feige fitting

Pull Test

- Guy grip 3,000 lb - change out every 100 casts?
- Poured termination - pull to and for how long?
- Feige fitting (needs a pull test for setting the termination) - don't quite test to same strength





# Electrical Termination

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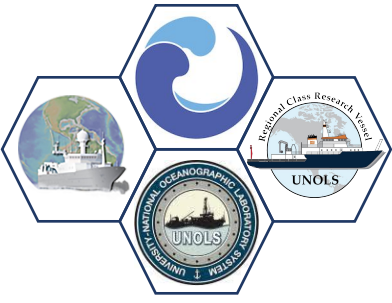
How does your ship to the Electrical Connection?

- Tie all conductors together
- Each conductor independent
- Scotch casts
- Mecca vs wet pluggable

How often do you?

- Megger cable
- ohm out cable





# Science Provided Sensors

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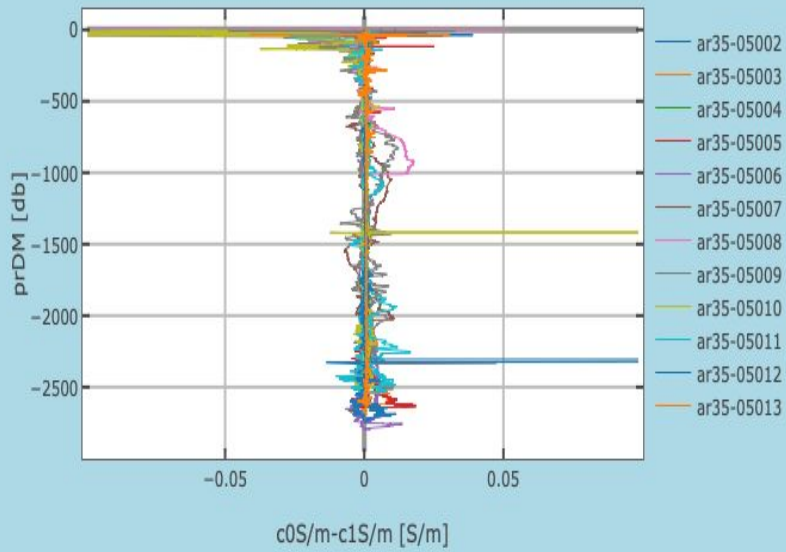
Science provided sensors - RCRV - designed a frame to accommodate instruments and LADCP

- a. ph sensors
- b. SUNA2 Nitrate Sensor
- c. ECO FLNTU
- d. Turbidity sensor
- e. using the USBL to know where there package is in the water column
- f. upward/downward LADCP -
  - i. signature 100 - downward
  - ii. RDI LADCP
- g. eDNA auto sampler

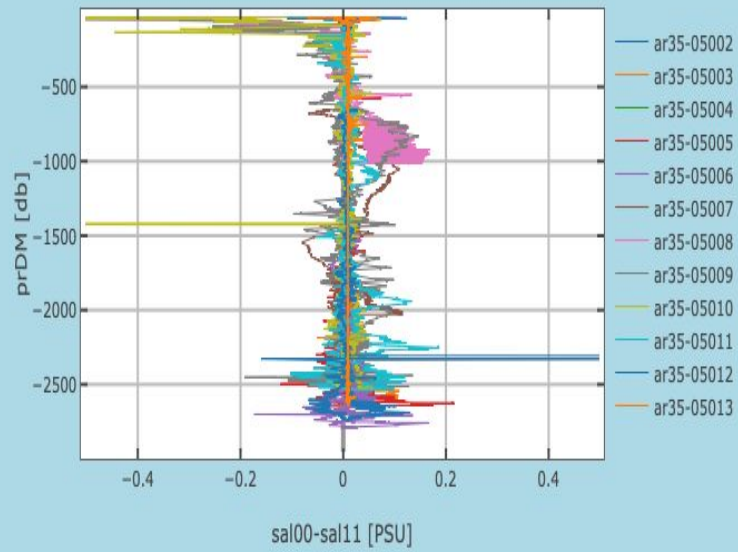


# r2r\_ctd\_plot

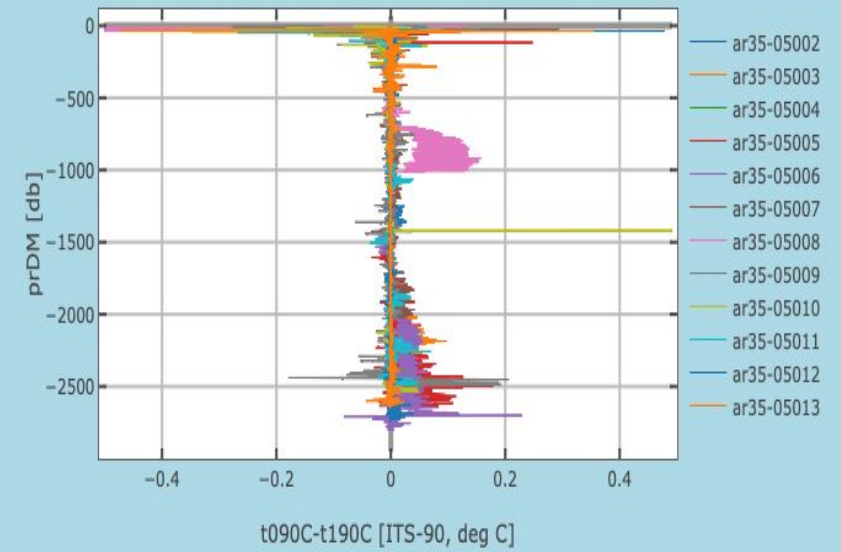
prDM vs. (c1S/m - c0S/m)



prDM vs. (sal11 - sal00)



prDM vs. (t190C - t090C)

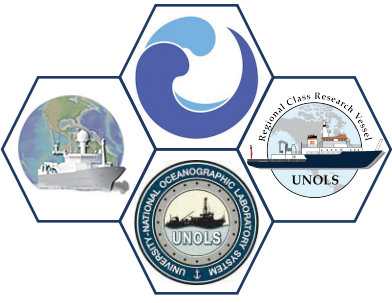




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Questions?

Thank you!



Post Deployment

1. Agitate and flush warm water through cell, repeat 3x
2. Push through DI water, leave syringe in place until next cast.

30 minutes

1. Agitate and flush warm water through cell, repeat 3x
2. Push through DI water, leave syringe in place until next cast.
3. Rinse entire package package
4. Process CTD stations and plot up; if possible plot a couple of stations on top of each other.

>60 minutes

1. Agitate and flush warm water through cell, repeat 3x
2. Push through DI water, leave syringe in place until next cast.
3. Rinse entire package
4. Pull pylon clips up and flush with fresh water
5. Process CTD data station and plot up; if possible plot multiple casts showing difference in temperature and conductivity

Post Cruise

1. Inspect and clean all bulkhead connectors, cables, and O-rings
2. Main housing maintenance
3. Inspect pressure port
4. Conductivity cell cleaning based on fouling
5. Validate frequency output for zero conductivity
6. Validate temperature sensors
7. Ancillary sensor and pump maintenance
8. Refer to proper storage recommendations