CalCOFI CTD FAQ

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General practices & notes on CalCOFI's Seabird 911/911+ CTD-Rosette

- Data are logged at 24hz so all data may be rederived with different coefficients if necessary
  - Raw cast data files are distributed independently of the processed data so reprocessing or other methods of processing may be applied by end users
  - Processed 1m binavg ascii data are also distributed - refer to our data pages or CTD data pages for files
- CalCOFI has always used Seabird 911 or 911+ CTD systems. The primary sensor array includes T, C, O2 with pump; the secondary array *was* T, C and pump only until 2009 when we started running a second O2. During a 911+ system upgrade in July 2009 (0907), we acquired an additional O2 sensor so we had enough SBE43s to start running dual sets and have adequate spares.
- CTD data are processed according to Seabird's recommendations for 911+ casts to 500m. After *Data Conversion*, the *Window Filter* module is applied to help smooth the rough ISUS nitrate sensor -see the SBE Data Processing Manual and/or the CTD Data Processing Methods web page for additional info.
- Loop edit is not usually applied to our data. In order to maintain the sensor data collected when the CTD stops for a bottle closure, loopedit is not applied since it eliminates data collected when the CTD is not moving.
- The CTD "fish" is mounted horizontally in its cage with the T intake and pump output at roughly equal height to minimize any pressure differential. The transmissometer is mounted on its side adjacent to the "fish" with an unobscured waterflow through the optical path. The fluorometer and ISUS optics are mounted optics down, at the same height as the fish with unobscured views downward. The Remote PAR is mounted on the upper rosette ring, high on the frame to prevent reflections or shading of the sensor. The altimeter is mounted vertically low on the frame with an unobstructed view down. Refer to CTD-rosette photos for additional info.
- The ISUS nitrate sensor is powered by an external 12v battery pack. The lead-acid battery is charged between casts on the rosette and vented prior to deployment.
- On 3500m casts, the ISUS nitrate sensor and battery, the remote PAR, and the SBE18 pH sensor are removed.
- The CTD is powered on ~15mins before station; ISUS battery plugged in ~20mins before station, during bottle prep.
- The CTD-rosette is deployed, sent to 10m for 2mins. If pump status is "on" and sensor pairs agree, the CTD-rosette returns to surface, data archiving (In Seasave: *Real-Time Data/Start Archiving*) is started, and after ~45-60secs, the CTD-rosette is lowered at 30m/mins to 100m then 60m/min, weather-permitting, to 515m. 515m terminal depth is a historical terminal depth from earlier bottle casts protocol when the terminal target depth was 500+m. In order to insure the deepest bottle was below 500m, an extra 15m was added to the cast card. This allowed for some wire angle and still be below 500m. It's practice is to preserve the continuity of the time-series.
- We try to keep the CTD sensor configuration the same for each cruise: V0/1=transmissometer/fluorometer; V2/3: altimeter/rPAR; v4/5: O21/O22; V6/7: ISUS/pH. But occasionally we test new sensors such as the RINKO O2 optode on CalCOFI 1210NH & 1611SR, which we ran as the secondary oxygen sensor. Note that altimeter and secondary SBE43 O2 sensors are removed to accommodate the RINKO which requires two voltage channels.
- Transmissometer M & B coefficients are recalculated prior to the first cast by deck testing the in-air transmission dark & light, freshly RBS-rinsed lenses. Voltage values are key-entered into a tabulation/calculation spreadsheet and M & B calculated (since 2002).
- After each cast, the dual plumbed sensor arrays are flushed with DI water for ~10secs. The carousel trigger array is freshwater rinsed. ISUS battery charging cable is attached to the ISUS battery on the rosette and charged between casts.