

SOP 5: CTD Data Download and Transfer to Network version 2

Summary

During a cruise, ideally at the end of each day, the contents of the CTD are downloaded to a laptop computer and given basic quality assurance tests. If significant problems are found during the quality assurance review, some stations may need to be reoccupied the following day in order to avoid loss of data. If problems are due to equipment fault, then the backup CTD has to be brought into service in order to finish the cruise.

After the data are transferred to the computer and a backup USB drive, the CTD memory is then erased to make room for additional data.

At the end of each cruise, the laptop files are copied to the park's network file server. These files are the basis for many other deliverables.

This process is the responsibility of the Project Leader.

Detailed steps

1. Before a cruise:
 1. Ensure the laptop has working copies of SeaTerm software.
 1. If not found on the laptop, seek Data Manager's assistance.
 2. In order to function, SeaTerm requires a serial port with DB-9 connector be present on the laptop.
 2. If this is the first cruise of the year:
 1. Create a "c:\oceanography\YYYY\HEX_raw\" folder on the laptop to hold the season's cruise data, where YYYY is the four-digit cruise year.
 2. Create a "c:\oceanography\YYYY\PLOT\temp\" folder on the laptop to support field-generated hex plots.
 3. Create a "c:\oceanography\YYYY\CON\" folder on the laptop to hold the latest CON files that are required to create field hex plots.
 4. Copy the latest CON calibration files for both the primary and backup CTDs from \\files.glba.nps.gov\Science\Data\Oceanography\Data\YYYY\CON_calibration\ to c:\oceanography\YYYY\CON\.
 3. Ensure the serial data transmission cable is packed for the field.
 4. Determine the starting dump number for the cruise by incrementing the last dump number used by the OC survey program.
 1. It may be found on the most recently completed survey field log sheet from the prior cruise.
 2. **Only one sequential dump number is maintained for the monitoring program, regardless of how many CTDs are employed at various times.**
2. For each cruise day:
 1. Collect cast data using the method described in SOP 4.

2. Retrieve daily data from CTD.
 1. Connect laptop serial port to CTD using proprietary data transmission cable.
 2. Invoke SeaTerm software.
 3. Be sure SeaTerm is set to download one specified cast at a time.
 4. Press “connect” software icon.
 1. If it doesn’t connect, take remedial action such as tightening cables and replacing batteries.
 2. If it does connect, the number of casts and the record numbers for each cast will be displayed.
 1. Complete a CTD Download Checklist (see Appendix B) from the displayed information; for date, use the local date transferred rather than the GMT collection date.
 2. If no processing is done on the CTD for 90 seconds, the connection is dropped to conserve battery power.
 5. Invoke a data transfer using the “upload” button.
 6. Specify the next cast to save, as tracked on the checklist.
 7. You will be prompted for “header” information.
 1. Enter the values from the correct row of the field log sheet.
 2. Some entries play a critical role in subsequent processing and must match an exact format—do not add extraneous spaces or punctuation.
 3. Be mindful of the 90-second disconnect timeout.
 8. Specify the destination file on the laptop as
c:\oceanography\YYYY\HEX_raw\YYMM_C_DDDD_CC.HEX, where YY is year of cast, MM is month of cast, C is local CTD number (see Appendix F), DDDD is dump number, and CC is cast number. Zero fill any name component to ensure the filename is exactly 18 characters.
 9. Watch screen progress to be sure the correct sample numbers are reflected for that cast and that no transmission errors are indicated. If the wrong records appear listed, delete the file using Windows Explorer and redo the download.
 10. Mark the completed download on the paper checklist.
 11. Repeat for each cast until the list is completely checked off.
3. Visually check basic quality of each HEX file.
 1. Locate each downloaded file with Windows Explorer and open it in NOTEPAD.
 2. The cast number should match the log sheet entry **and** the filename—this is **very important!**
 3. The header text should match the corresponding field log sheet values.
 4. Beyond the header, every line should be exactly the same length, with no gaps. Scan down to the end of the file for short or long lines. For one CTD/sensor configuration currently employed in the GLBA sampling, the line length is 24 characters, but the exact number of characters in the data line varies by the number and type of sensors on the CTD at the time it is used. What matters is they are all the same length.
4. If any file does not meet the quality assurance requirements, then delete it with Windows Explorer and recreate it with SeaTerm.
 1. A file cannot be deleted if it is still open in NOTEPAD. Close the file if necessary.

2. The new file must go through this quality assurance as well.
3. If a second attempt at downloading the cast also results in data lines that are not uniform in length:
 1. If logistics permit, perform a new cast for the problem station.
 2. Otherwise, use the NOTEPAD session to delete the invalid lines.
 1. Save the file and close NOTEPAD.
 2. Add a comment to the field log sheet specifying the number of invalid rows deleted due to length errors.
 3. If, from a particular point in time, files begin exhibiting consistently short or long lines, this suggests the CTD is faulty and must be serviced immediately.
 1. Loose or wet cable connections are a possible cause and field repairs may be possible.
 2. If field repairs do not resolve the issue, the backup CTD must be brought into service to complete the cruise.
5. Verify header data.
 1. In Notepad, check all header information against that cast's data line in the original Field Log sheet; correct as necessary.
 2. Comments can be manually added by inserting a line beginning with two asterisks (**) after the "Cast Target Depth" line.
6. Back up the current cruise's HEX files in the laptop folder to a USB drive.
 1. Plug in drive and wait for it to be recognized.
 2. Use Windows Explorer to copy all files from c:\oceanography\YYYY\.
 3. Use the "Safely remove hardware" function in the system tray to ensure the copy is complete.
 4. Physically remove the drive and store in a location separate from the laptop.
7. Erase data from CTD.
 1. Verify that all casts have been downloaded to the laptop and backed up on the USB drive. If there is adequate memory (using CTD #5), this step can be delayed until data have been successfully transferred from the laptop to the network (see below).
 2. Using SeaTerm, enter the command "IL" and confirm the operation by entering "IL" a second time when prompted.
 1. This permanently erases all observations from the CTD memory.
 2. Do not use the "Init Log" button on the SeaTerm screen: it does not function properly with every CTD.
8. Disconnect.
 1. Exit the SeaTerm program.
 2. Disconnect the cable from CTD and laptop.
 3. Securely replace the dummy plug on the CTD connection to the data transmission cable.
3. At end of each cruise:
 1. Copy the HEX files from laptop to the network server folder at \\files.glba.nps.gov\Science\Data\Oceanography\Data\YYYY\HEX_raw\ where YYYY is the survey year.

1. Subsequent data processing will fail unless this specific folder holds all files for the cruise year.
 2. File names are critical for automated processing: they must exactly match the specified format.
2. Store the field log sheets in an annual paper file kept by the Project Leader.
 1. They will be required before the next cruise to determine the next starting dump number.
 2. They will be required postseason to generate OC_H field log images.
 3. They will be required postseason to generate OC_M data quality assessments.