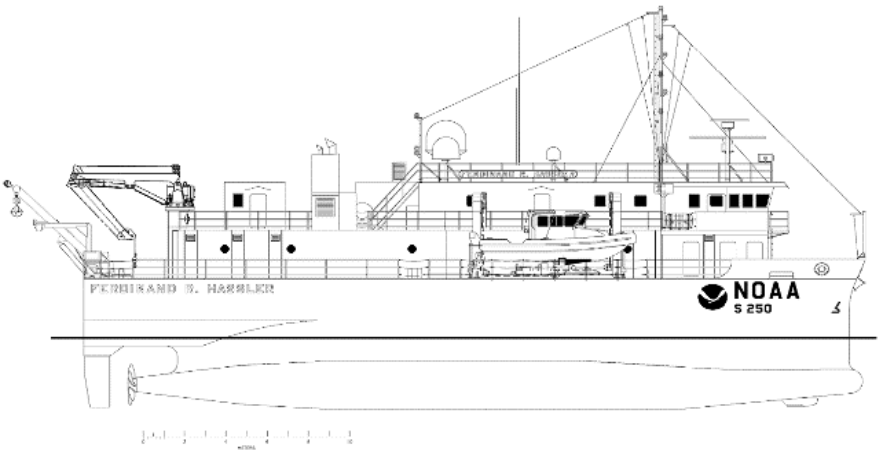
Data Management and Charlene Processing

Standard
Operating
Procedure



REVISION HISTORY			
REV	**Description of Change**	**Editor**	**Effective Date**
1	Initial release	PS Amanda Finn	03/25/2022
2	Added line report and updating acquisition log sections	LTJG Carly Robbins	6/29/2022
3	Reviewed	LT Debroisse	7/11/2023
4	Updated	LT Debroisse	7/8/2024

Contents

Overview

This SOP covers night processing using the automated tool "Charlene." Many steps are automated; for a manual run-through of all steps, refer to the Manual CARIS 11 Processing SOP. Charlene is an interface that utilizes batch processing back ends of both CARIS and Applanix to automate night processing.

The SOP starts with a quick reference guide for Charlene setup for the field season. If you are experienced with Charlene and just want to look at the setup for FH, you can use this instead of having to read

the whole SOP. The next section is a quick guide for the Charlene data management structure used on FH. If you want further explanation on how to use Charlene, you can read the rest of the SOP.

Familiarization with Ship Network

On the *Ferdinand R. Hassler (S-250)*, acquired bathymetry data is stored in five (5) locations:

1. SIS Computer/.all files:
    a. **RawData (D:)\sisdata\raw\HXXXXX**

- This is where all your raw MBES .all files are logged to on the SIS computer. You will COPY them from this location to the Data_Transfer folder via a transfer drive

2. Positioning (POS) Files (on Ship Acquisition computer):
    a. **DATAPART 1 (E:)\GNSS_data**
        i. Create a project folder *(OPR-X###-FH-22)*, sheet folder *(HXXXXX)*, and day number folder *(2022-DDD)*
        ii. Final folder destination for logging POS:
            1. **P:\20YY\OPR-XXXX-FH-YY_Name\HXXXXX\Raw\Positioning\Hassler_2040_Dual\YEAR-DN**

3. Data Transfer folder location:
    a. **Q:\2022\DATA_TRANSFER**

- This is your "launch transfer drive," where you will store all of your positioning, raw multibeam, sound speed, and acquisition log files for each day of acquisition. The next section will instruct you on how to make a folder structure for your next day of data acquisition. You will also be directing Charlene to the MBES files located in here.

4. RAW (Q:)

P:\20YY\OPR-XXXX-FH-YY_NAME\HXXXXX\Raw\MB\Hassler_2040_Dual\20YY-DDD

This is where Charlene will transfer the raw data files to during processing. Charlene will create this project folder structure the first time you run data through the program. (Do NOT create manually!)

5. Proc (S:)
    a. **R:\20YY**

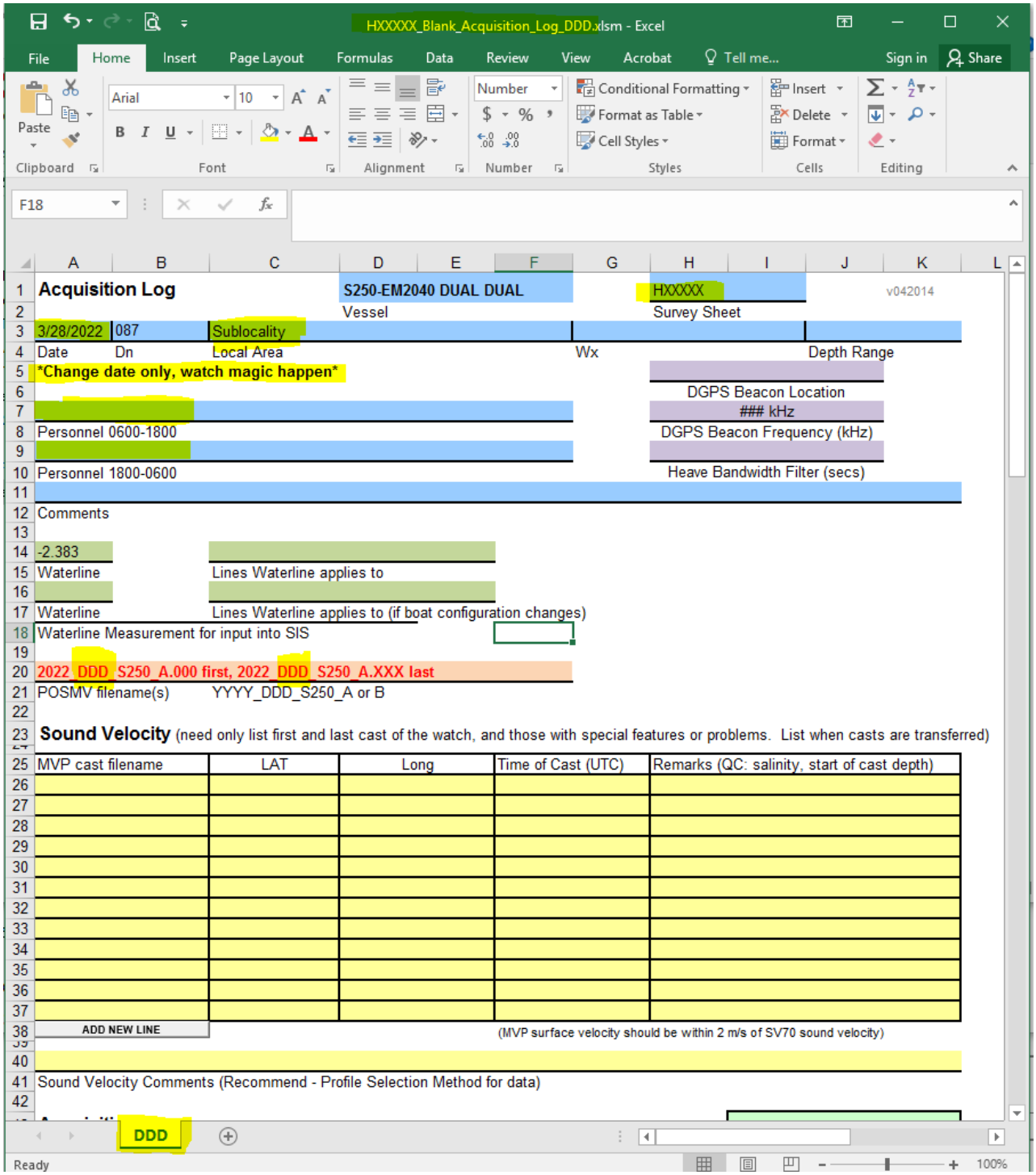
This is where Charlene will deposit all of the processed data, including your .hips file and Master SVP file. Charlene will also create this project folder structure the first time you run data through the program. Utilize the premade structure in the RAW drive. Ensure folders like those listed below are there.

- **Acquisition_Logs\Hassler_2040_Dual\20YY-DDD**
- **MBES\Hassler_2040_Dual\2022-DDD**
- **Positioning\Hassler_2040_Dual\20YY-DDD**
- **SVP\Hassler_2040_Dual**

When you transfer data at UTC midnight, simply copy and paste the files into the appropriate day number subfolder.

Daily Acquisition Log

- A blank acquisition log exists on the ship acquisition computer's desktop:
  - *HXXXXX_Blank_Acquisition_Log_DDD*
- Save this to the "Acquisition Log" folder in the data directory you created
  - Rename it and fill out the survey-specific information at the top of the document



Data Transfer Process (End of acquisition/UTC Midnight)

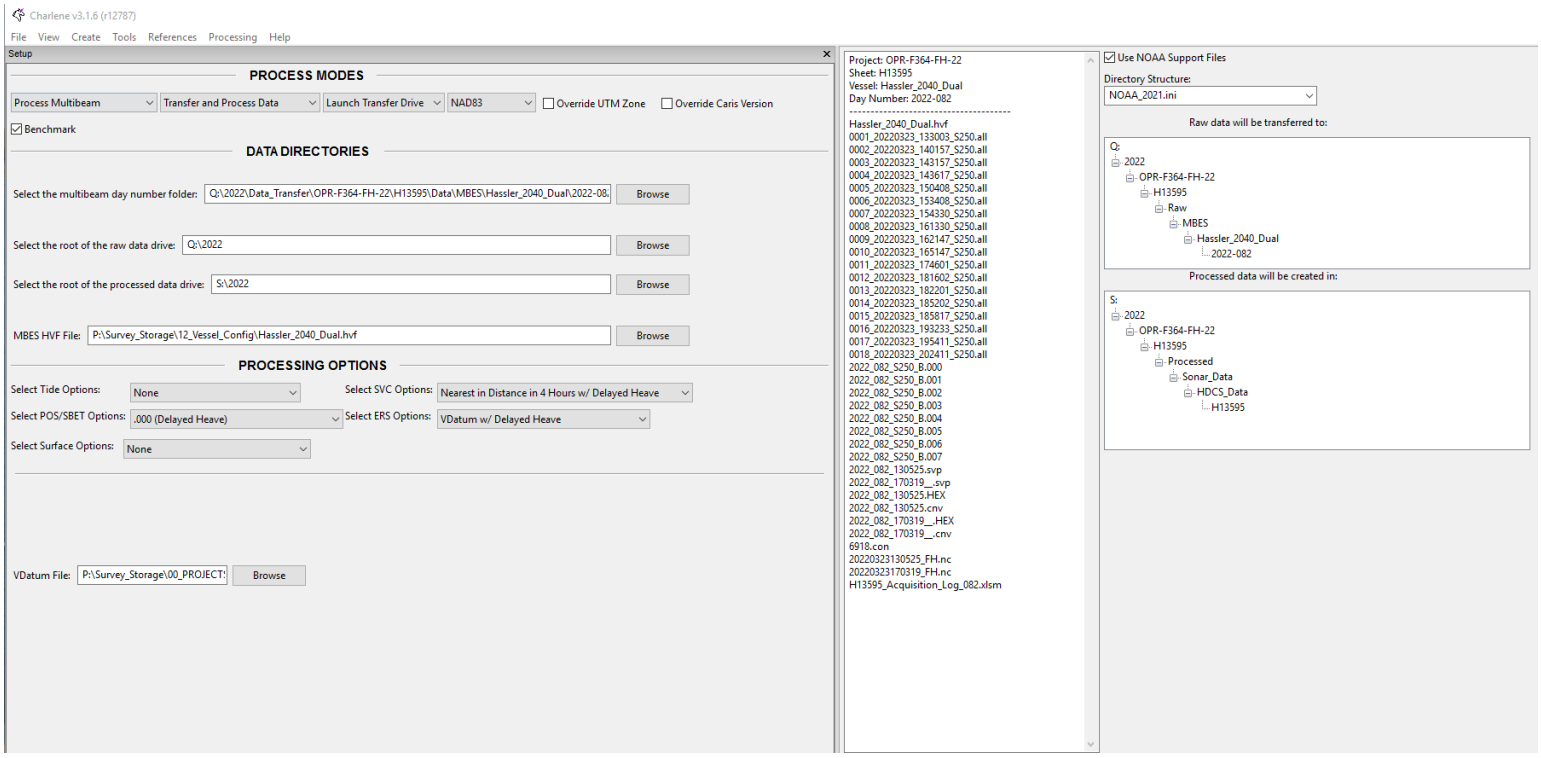
Prior to jumping into Charlene, it is good practice to look over the data in the drives to ensure that the files in the Data Transfer folder are properly named and located. The following are some issues you should look for which have tripped night processors up in the past:

- Make sure you have data in all of your needed folders—Acquisition Log, MBES, positioning, and SVP!
    - ***Acquisition Log***: save directly into Data Transfer folder from acquisition computer
        - *Q:\2022\Data_Transfer\OPR-X###-FH-22\HXXXXX\Data**Acquisition_Logs**\Hassler_2040_Dual\YYYY-DDD*
    - ***MBES***: copy from SIS computer's local Raw drive
        - *RawData D:\sisdata\raw\HXXXXX\S250\YYYY\MM\DD*

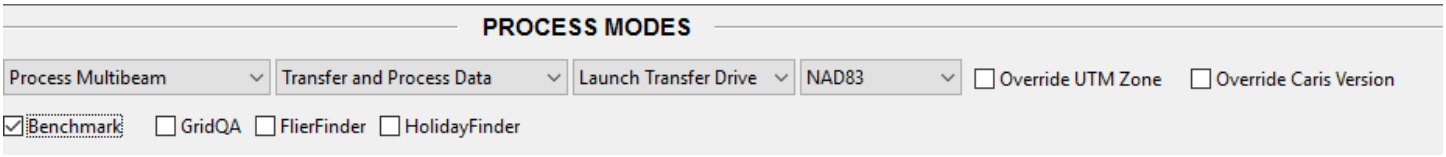
          Copy to
        - *Q:\2022\Data_Transfer\OPR-X###-FH-22\HXXXXX\Data**MBES**\Hassler_2040_Dual\YYYY-DDD*
    - ***Positioning***: For ship acquisition, retrieve from local Acquisition computer:
        - *DATAPART1 (E:\GNSS_data\OPR-X###-FH-22\YYYY-DDD)*

          Copy to
        - *Q:\2022\Data_Transfer\OPR-X###-FH-YY\HXXXXX\Data**Positioning**\Hassler_2040_Dual\YYYY-DDD*
    - Raw, SVP, and NCEI files should all have been mapped to their respective locations in the Data Transfer folder through Sound Speed Manager***
        - *Q:\2022\Data_Transfer\OPR-X###-FH-\HXXXXX\Data**SVP**\Hassler_2040_Dual**Raw**\YYYY-DDD*
        - *Q:\2022\Data_Transfer\OPR-X###-FH-22\HXXXXX\Data**SVP**\Hassler_2040_Dual**SVP**\YYYY-DDD*
        - *Q:\2022\Data_Transfer\OPR-X###-FH-22\HXXXXX\Data**SVP**\Hassler_2040_Dual**NODC**\YYYY-DDD*
- ***If the day number folders had the wrong year, this will carry through via Charlene and all data for that vessel and day will be referenced to the wrong year.
- Make sure the POSPac positioning files are named correctly. They should be YYYY_DDD_S250.000
    - If there is an additional ".000", remove the FIRST .000 from the file name. Do this to a set of COPIED files before changing the original files to avoid deleting the .000 file extension

Charlene Processing



A. PROCESS MODES

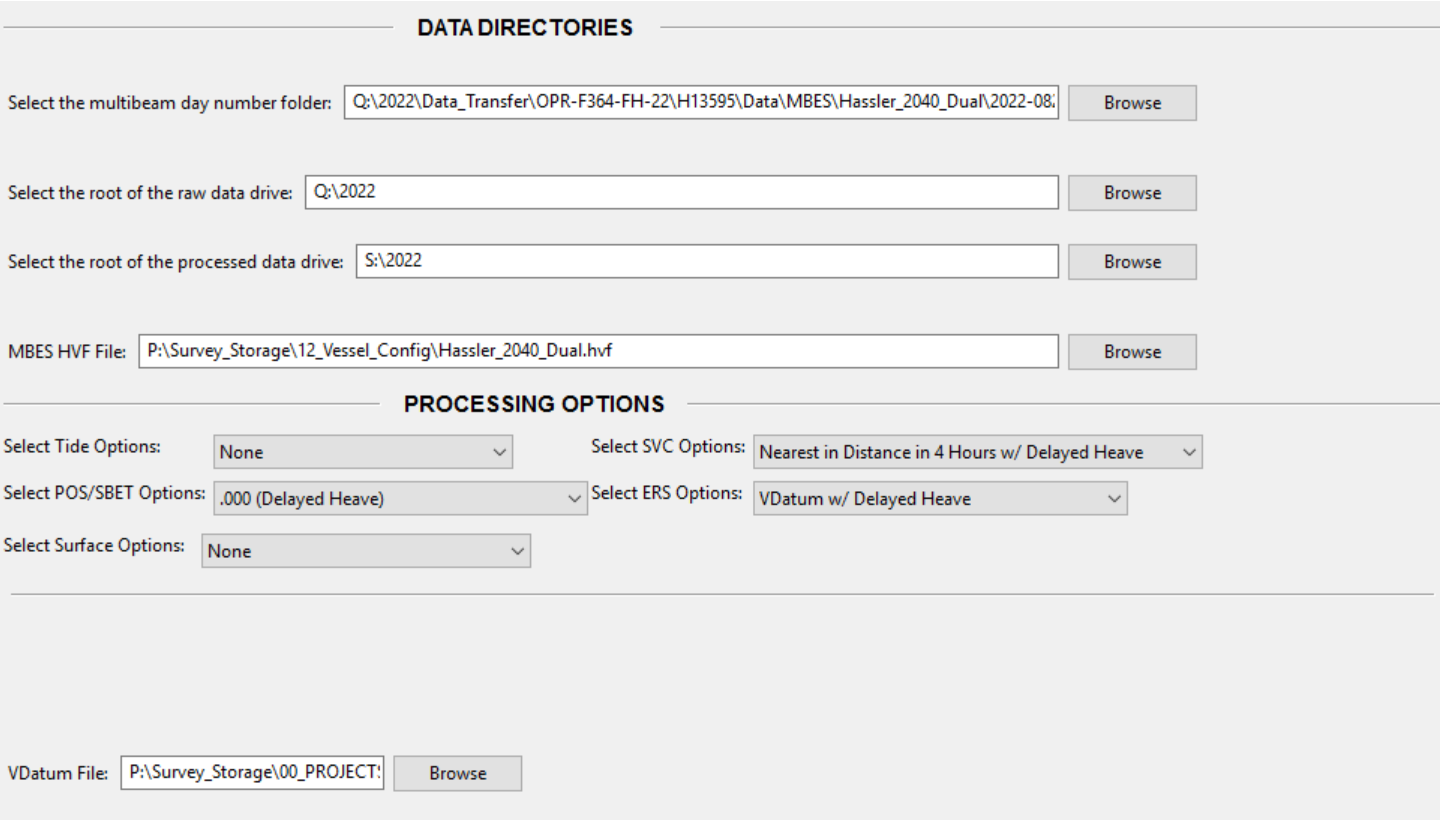


1. Process Multibeam
2. Transfer and Process Data
    a. This transfers data from the Data Transfer folder to the Raw and Proc drives
    b. Raw .all or HSX (2702) files will be converted into the HDCS Caris format
3. Launch Transfer Drive
    a. Use this mode to utilize the folder structure you created through Charlene earlier
4. NAD83
    a. Charlene retrieves UTM Zone from your SV files
5. UTM Zone = unchecked
6. Override Caris Version = unchecked
    a. Charlene will default the most recent version of Caris to process the data

b. Only check this box to use an older version of Caris

7. Benchmark = checked
    a. Tracks your hardware's statistics when processing and delivers it to a database

B. SELECTING DATA DIRECTORIES



As mentioned in the previous section, *Hassler* utilizes a "Data Transfer" folder that holds all the daily acquisition files. These files are transferred from the acquisition machine to the Data Transfer folder after UTC midnight.

Q:\2022\Data_Transfer\OPR-X###-FH-22\HXXXXX\MBES\Hassler_2040_Dual\YYYY-DDD.

****This folder structure is created using Charlene's "Create Launch Transfer Drive" function. DO NOT create these manually!!****

Select the root of the ***raw data drive*** on the network:

- **Raw Q:\YYYY**.

Select the root of the ***processed data drive*** on the network:

- **Proc S:\YYYY**.

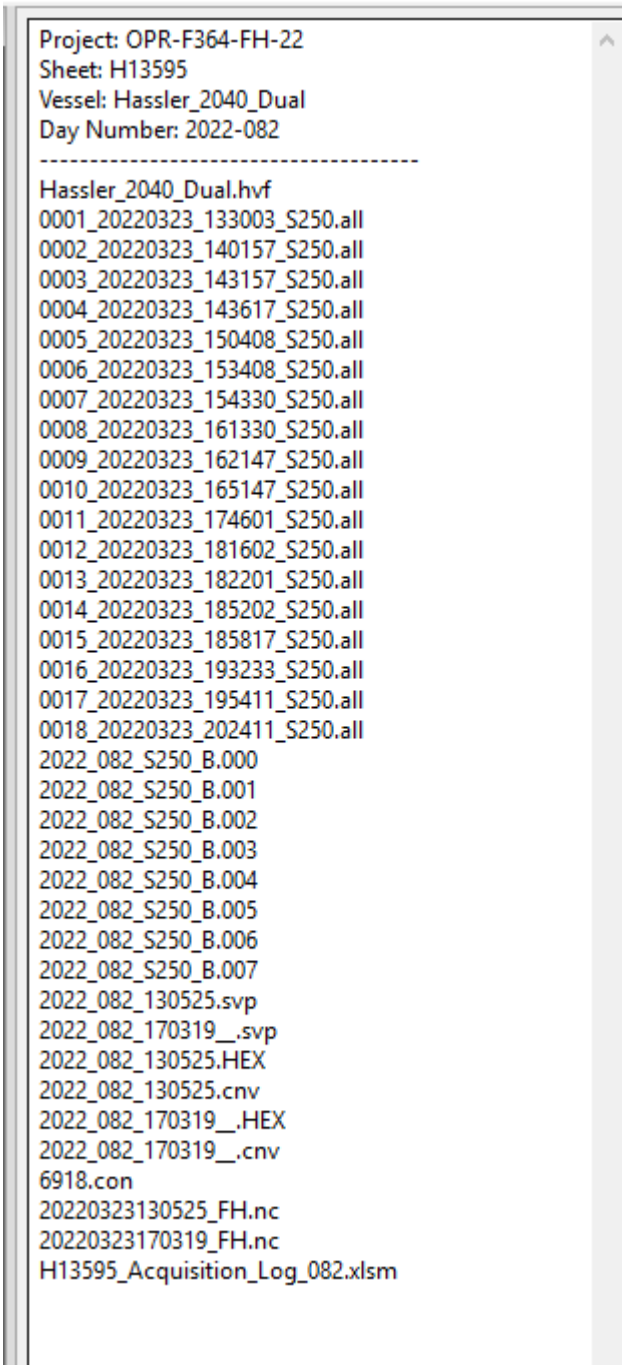
Select your appropriate *HVF file* from here:

- **P:\Survey_Storage\12_FOO_Only\Vessel_Config\S250\HVF**

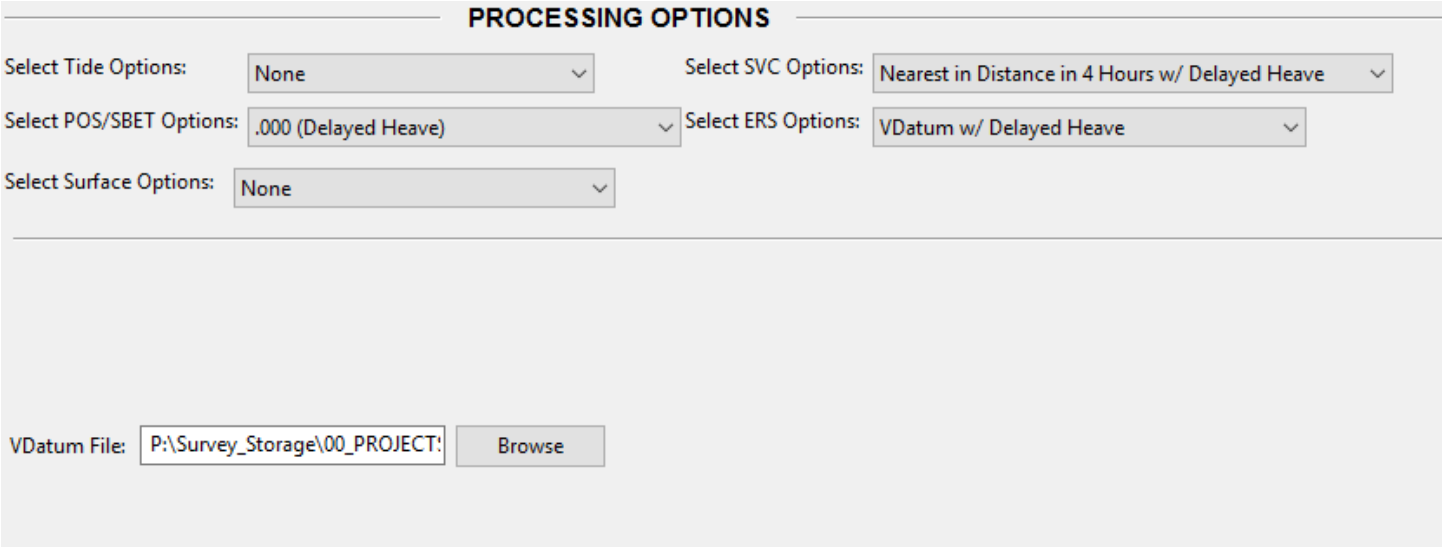
Navigate to the specific day number of multibeam data in the Data Transfer folder:

Q:\2022\Data_Transfer\OPR-X###-FH-22\HXXXXX\MBES\Hassler_2040_Dual\YYYY-DDD

Check the middle window to ensure that all expected filed are present and that they match the day number. If they don't, double check that you have the correct DN folder selected.



C. PROCESSING OPTIONS



The next section you will be indicating your tide and SVC options.

Select Tide Options: **None**

Select SVC Options: **Nearest in Distance in 4 Hours w/ Delayed Heave**

Select POS/SBET Options: **.000 (Delayed Heave)**

Select ERS Options: **VDATUM w/Delayed Heave**

Select Surface Options: **None.** You can choose to have a surface created for daily QC, if you so desire.

VDATUM File: Map to VDatum .csar file provided by HSD Ops

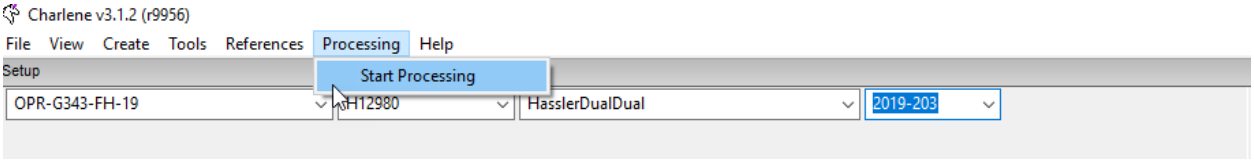
- **P:\Survey_Storage\00_PROJECTS\2022\OPR-X###-FH-22\Project_Files\Vertical Control\VDatumSEP**
- ***Be sure you are retrieving the MLLW (Mean Lower Low Water) .csar file, and not a MHW (Mean High Water) file!***

PAUSE

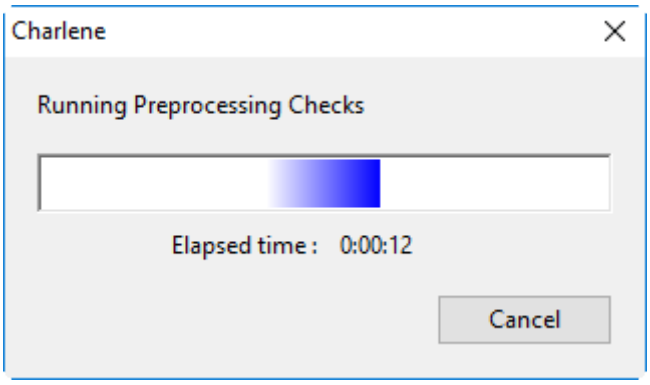
MAKE SURE ANY INSTANCES OF YOUR SURVEY'S HIPS FILE/HDCS DATA ARE CLOSED BEFORE CONTINUING

D. PROCESSING

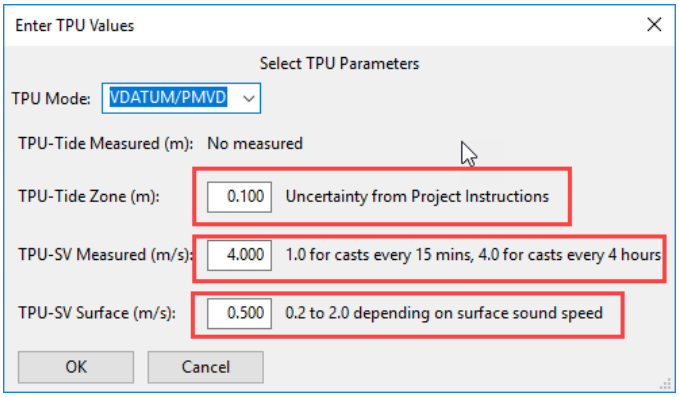
Click **Processing** and select **Start Processing**



This window will appear…



…followed by the TPU Window - Enter TPU Values



When the pop up asking for antenna type comes, select GA 830

TPU-Tide Measured: **0.0**

TPU- Tide Zone: **X.X**

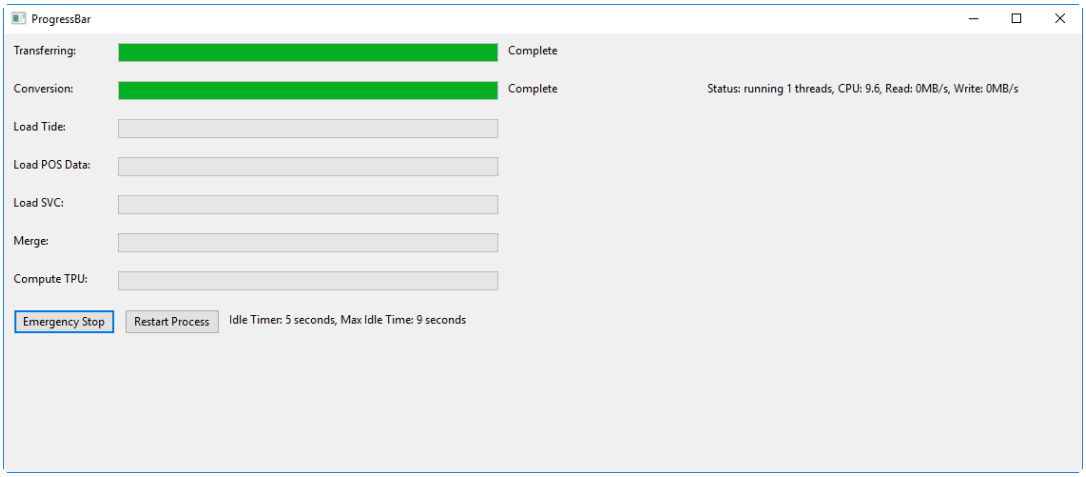
- Value can be found in Project instructions or VDATUM .txt file.

TPU-SV Measured:

- MVP = 1.0 m/s (taken every 2 hours or less)
- CTD = 4.0 m/s (taken every 4 hours)

TPU-SV Surface: **0.5**

If Charlene does not encounter any errors, the ProgressBar window will pop up next:



Keep an eye on the **Output** window in the main Charlene screen, as it will show (in sporadic bursts) the output messages from CARIS. This is a great way to check in and verify that things are going as planned.

When Charlene is complete, a new instance of CARIS will open.

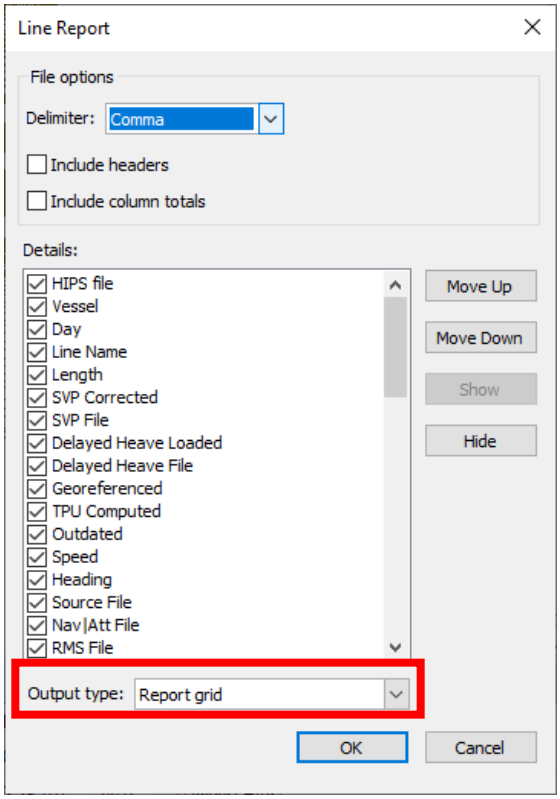
It is good practice to ensure the following file have been transferred correctly:

- Multibeam data:
  - *Q:\YYYY\OPR-X###-FH-22\HXXXXX\Raw\MBES\ Hassler_2040_Dual \2022-DDD*
- POSMV files (*.000)
  - *Q:\YYYY\OPR-X###-FH-22\HXXXXX\Raw\Positioning\ Hassler_2040_Dual \YYYY-DDD*
- Acquisition Logs
  - *S:\YYYY\OPR-X###-FH-22\HXXXXX\Processed\Reports\Survey\ Acquisition_Processing_Logs\Acquisition_Logs\Hassler_2040_Dual\YYYY-DDD*
- Raw Sound Velocity files (.cnv/HEX and .nc)
  - *Q:\YYYY\OPR-X###-FH-22\HXXXXX\Raw\SVP\ Hassler_2040_Dual \Raw\YYYY-DDD*
  - *Q:\YYYY\OPR-X###-FH-22\HXXXXX\Raw\SVP\ Hassler_2040_Dual \NODC\YYYY-DDD*
- Processed Sound Velocity files (.svp)
  - *S:\YYYY\OPR-X###-FH-22\HXXXXX\Processed\\Hassler_2040_Dual\SVP\YYYY-DDD*

E. RUNNING LINE REPORTS

A line report in Caris generates information about your track lines such as (X, Y, Z). If this is your first time running a line report on the computer you are using, you will need to configure which variables the line report will generate. To do so, you will first run a script that will organize the variables for you. This will make it so your Line Report contains all the necessary fields to be compatible with the acquisition log, and will also bring much joy. You will then run the line report.

1. Navigate to P:\Survey_Storage\02_Software\CARIS\Line Report and double click BringMeJoy, then click Run
2. In CARIS, select your newly processed lines and select Tools > Report > Line.
3. In the Line Report window, ensure that the variables are organized in the Details window as per the screenshot below. If they are not organized as per the screenshot, you must go back and re-run BringMeJoy.



4. Once CARIS outputs the line report, click the first line in the output window, grab the slider on the right and drag it all the way to the bottom (EVEN IF IT DOESN'T MOVE). Wait, it will jump to the bottom in time. When it does HOLD SHIFT AND CLICK the bottom line. Then right click and select copy (Ctrl-C does not work!) and paste them into the acquisition log. It should match the screen shot shown below. If this is done correctly, the fields above the query should be populated with the information from the query. If this doesn't happen, undo and try again, or get help from the lead night processor.

Report

HIPS file	Vessel	Day	Line Name	Length	SVP Corrected	SVP File	Delayed
H13629_MB	Hassler_2040...	2022-154	0014_202206...	3054.76	Yes	S:\2022\OPR...	
H13629_MB	Hassler_2040...	2022-154	0018_202206...	9709.89	Yes	S:\2022\\OP...	
H13629_MB	Hassler_2040...	2022-154	0016_202206...	9004.64	Yes	S:\2022\\OP...	
H13629_MB	Hassler_2040...	2022-154	0017_202206...	3098.79	Yes	S:\2022\\OP...	

Output | Selection | Report

F. UPDATE ACQUISITION LOG

1. Copy the line report.
2. Open the acquisition log.
3. Scroll to the bottom of the document, and under the HIPS file header, paste the line report. You may need to delete the first row of the pasted report.

	A	B	C	D	E	F	G
166							
167							
168	ADD NEW LINE						
169							
170							
171							
172	Processing comments						
173							
174							
175	**PROCESSING QUERY**						
176	• Make sure the CARIS query fields match the fields below EXACTLY.						
177	• Paste line query from CARIS. Total Mileage, Caris Lines, Launch Lines, and Count Check will ca						
178							
179	**Total Nautical Miles**		**Number of Lines in CARIS**		**Number of lines transferred**		
180	89.99102		25				
181							
182	**HIPS file**	**Vessel**	**Day**	**Line Name**	**Length**	**Speed**	**Heading**
183	H13629_M	Hassler_2040_Dual	2022-155	0033_2022(	9711.11	5.39	324.
184	H13629_M	Hassler_2040_Dual	2022-155	0021_2022(	9448.97	5.25	325.
185	H13629_M	Hassler_2040_Dual	2022-155	0027_2022(	9410.47	5.23	325.
186	H13629_M	Hassler_2040_Dual	2022-155	0034_2022(	9379.71	5.21	324.
187	H13629_M	Hassler_2040_Dual	2022-155	0040_2022(	9353.12	5.20	324.
188	H13629_M	Hassler_2040_Dual	2022-155	0041_2022(	9257.5	5.14	323.
189	H13629_M	Hassler_2040_Dual	2022-155	0022_2022(	9167.2	5.09	324.
190	H13629_M	Hassler_2040_Dual	2022-155	0028_2022(	9162.15	5.09	324.
191	H13629_M	Hassler_2040_Dual	2022-155	0038_2022(	9101.83	5.06	144.
192	H13629_M	Hassler_2040_Dual	2022-155	0037_2022(	8958.55	4.98	14:
193	H13629_M	Hassler_2040_Dual	2022-155	0043_2022(	8927.04	4.96	145.
194	H13629_M	Hassler_2040_Dual	2022-155	0044_2022(	8783.67	4.88	144.

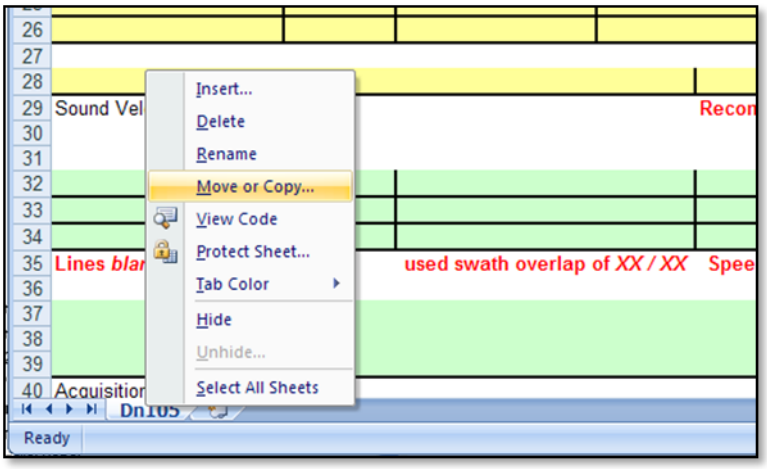
G. CONCATENATE ACQUISITION LOGS

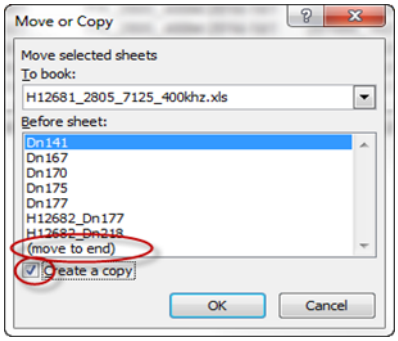
1. Open the Master Concatenated file (HXXXXX_S250_EM2040_YYYY) for the vessel located here:

R:\2024\OPR-XXXX-FH-YY_NAME\HXXXXX\Acquisition_Processing_Logs\Acquisition_Logs\Hassler_2040_Dual

If it is the first day of acquisition simply make a copy of the acquisition log and rename it to be the master.

B. Once the daily and master files are open, go to the daily log, right mouse click on the daily tab and select "Move or Copy."

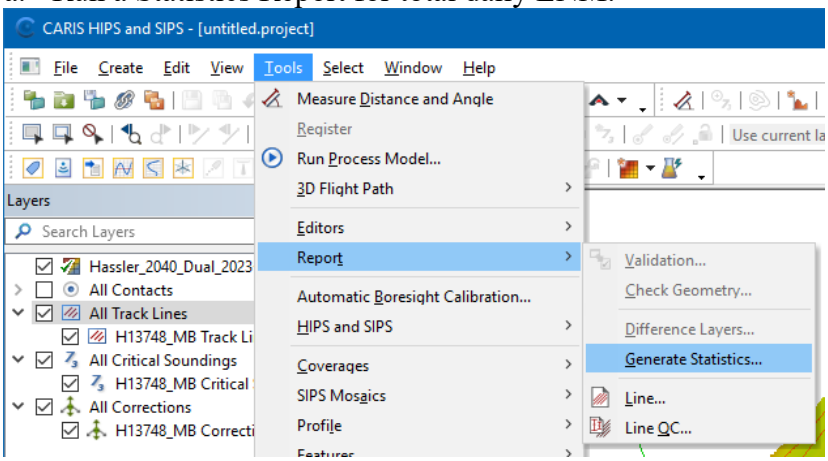


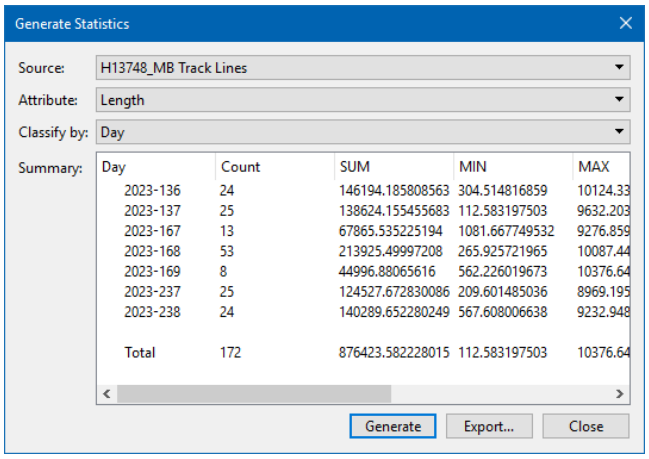


Make sure to have the concatenated file in "To Book", the option to "move to end" of document selected, and check the box for "Create a copy" as seen in the image above.

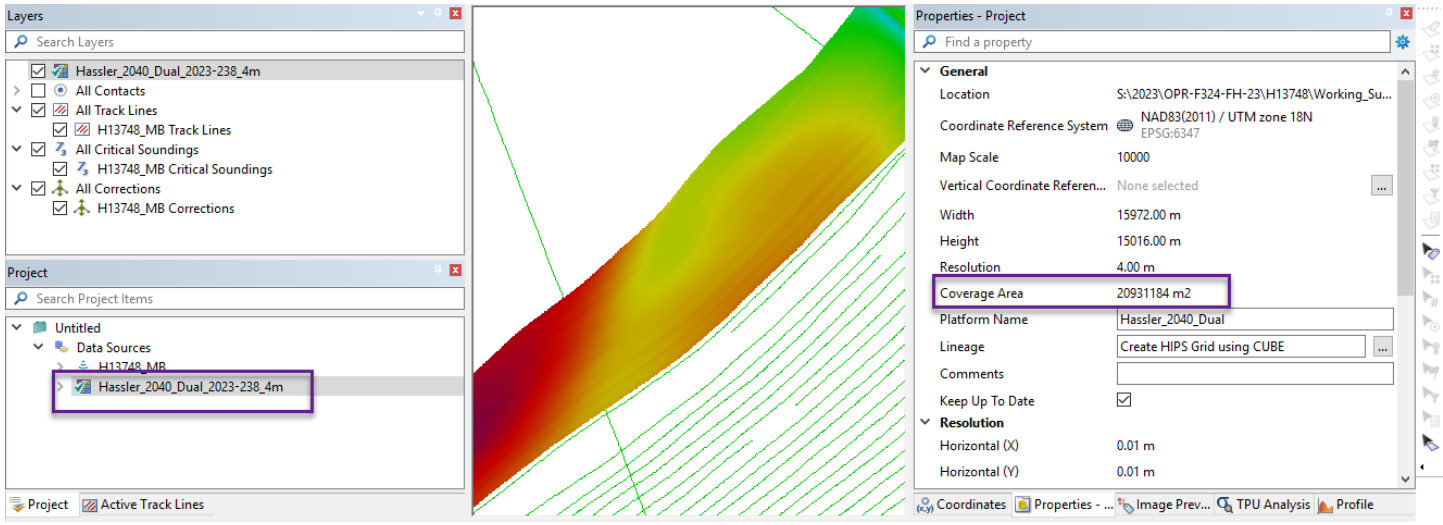
H. Daily Notes

1. Update the processing section of the day tab in the Project Acquisition Log. Be sure to note what was processed by Charlene and any deviations or trouble lines.
2. Add the daily statistics to the Daily tab in the Acquisition Project Log.
    a. Run a Statistics Report for total daily LNM.

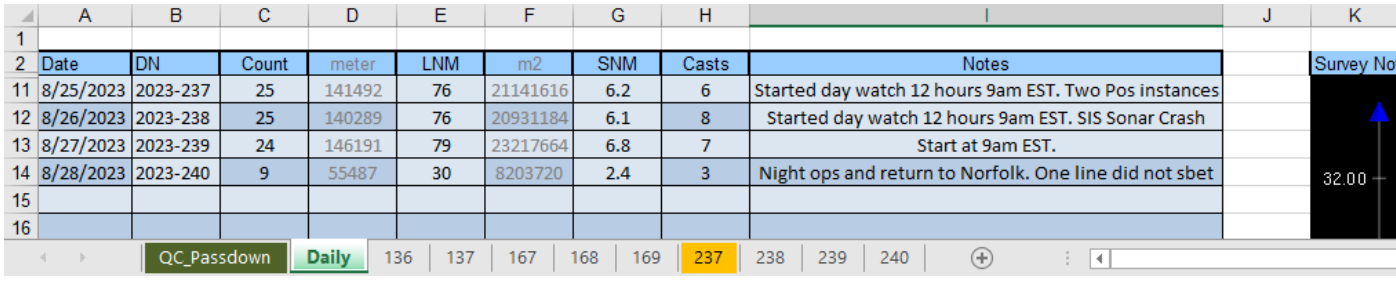




b. Load or build a daily csar surface to attain SNM. Charlene can be set to automatically build a surface during processing.
S:\YYYY\OPR-X###-FH-YY\H12345\Working_Surfaces_Mosaics\Bathymetry\2023-###



c. Update the Daily Tab in the Acquisition Project Log.



	A	B	C	D	E	F	G	H	I	J	K
1											
2	Date	DN	Count	meter	LNM	m2	SNM	Casts	Notes		Survey No
11	8/25/2023	2023-237	25	141492	76	21141616	6.2	6	Started day watch 12 hours 9am EST. Two Pos instances		
12	8/26/2023	2023-238	25	140289	76	20931184	6.1	8	Started day watch 12 hours 9am EST. SIS Sonar Crash		
13	8/27/2023	2023-239	24	146191	79	23217664	6.8	7	Start at 9am EST.		
14	8/28/2023	2023-240	9	55487	30	8203720	2.4	3	Night ops and return to Norfolk. One line did not sbet		
15											
16											

3. Quick QC
   a. Review the project area for fliers and holidays. If automated in Charlene the files will be available for review at:

S:\YYYY\OPR-X###-FH-YY\H12345\Working_Surfaces_Mosaics\Bathymetry\2023-###\H12345_MB_QC

b. Clean any fliers and update the grid.
c. Inspect area cleaned, and the identified holiday areas against the coverage require and create area features to the project holiday file designated by the FOO.