



MYSTICETUS

PROJECT MANAGER

GUIDE





AUDIENCE

This document is intended for the Project Managers (PM) or senior researcher responsible for final data Quality Assurance (QA) prior to final analysis. By this, the document targets what is often referred to as **the project reviewer/manager, typically onshore, who ensures that data coming out of the field is correct** before it moves further along the data “pipeline”.

In many companies this is indeed the one who “manages the project”. In other teams it may be one of their assistants, a hired contractor, lead observer onboard with expanded duties, etc. Whoever this person is, “PM” or not: if you are the first human reviewing data after it has been reviewed and signed off by onboard observers at the point of collection and who typically follows our companion “PSO and Lead PSO QA/QC Guide”. This document is for you.

The point of this document is to establish procedures and practices to obtain the highest quality data possible as close to the point of collection as practicable. It outlines the knowledge and tools for successfully accomplishing this task. This includes new tools emerging in Mysticetus OnCloud services starting in 2021.

Last updated June 2023.

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OVERVIEW

Quality Data Pipeline



During QAQC, we review the Mysticetus file and identify errors. QAQC is done 3-6 times, the final 2 times are optional, depending on project.

End-of-shift by PSO in the field (check for blanks, quick review of all new rows)

End-of-day by the Lead PSO (same as PSO, but also first formal QA)

Daily by the Project Manager (this document)

Daily by the data analyst assigned to the project (*some projects or teams may not have this step)

After the survey while creating charts, tables, and maps for the final report (*some projects or teams may not have this step)



BACKGROUND INFO

FEEDBACK TO THE LEAD PSO

Feedback goes opposite the data flow, back towards the field



As the first person to see the data as it comes out of the field, it is up to the PM to perform QA checks on the data as detailed below. In theory, the PSO and the Lead PSO have already checked their data (they refer to the **PSO & Lead PSO QA/QC Guide**) – but we're all human, new PSOs sometimes need additional training and practice, or once in a while something just get crazy out there. Stuff Happens™

In the case where the PM finds errors or ways to improve, it is incumbent on them to provide feedback to the Lead PSO. The goal is to find and fix errors as close to the source (e.g., vessel) as possible – when that doesn't happen, this is a "Training Moment" for the person upstream.

We engage in **Continuous Process Improvement** (CPI): we fix things, document the fix, teach, and train the person upstream, and try again. We've implemented many tools to help this process; Watch dogs onboard for the PSOs to reference, Watch dogs onshore for real time vessel communications status (health) for Project managers to reference, and a data dashboard OnCloud for project managers to keep tabs on.





GPS TRACKING

Accurate GPS tracking is critical for data collection.

There are two PSO GPS devices on each ship. The GlobalSat BU-353-S4 USB GPS (aka “mushroom” or “hockey puck”) is plugged into the laptop. This GPS device automatically records GPS coordinates and stores the information in Mysticetus.



The second connection is a backup, handheld Garmin eTrex. Lead PSOs are responsible for uploading the track from this daily and clearing the track this GPS. There are PM steps (below) that describe how to check this has occurred.





DATA COLLECTION TIME PERIODS

Data is collected daily in 24-hour periods for 24/7 operations, or over the course of a single day for daylight-only operations. PSOs are responsible to ensure the Mysticetus data collection application is closed at the end of a 24-hour period (or earlier if data collection is, for example, daylight only). The exception to this is if an observation day is shorter due to anchoring, docking or leaving dock.

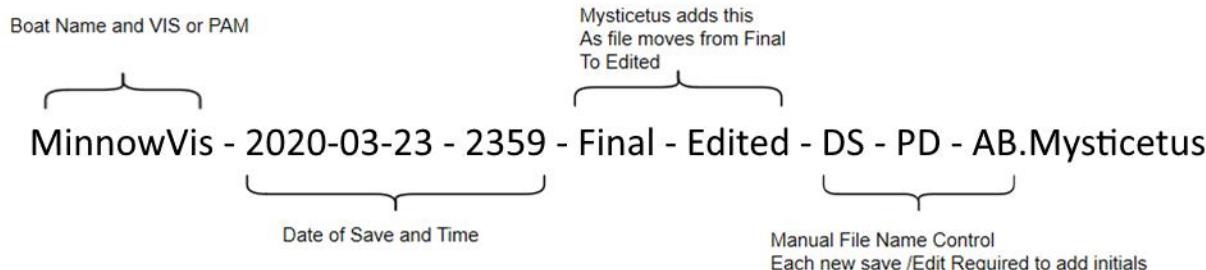
Data collection happens in UTC (computers are configured to run in UTC). Data collection stop and restart is at midnight UTC.

Mysticetus saves several intermediary files throughout the day, typically at 2-hour intervals to the cloud and 3-minute intervals to in-field storage (e.g. SD cards in computers). Mysticetus then saves a Final file at the end of the data collection period. These files are automatically uploaded to the Mysticetus cloud. These files are a valuable source of information about what happened and when – useful to check if PSOs and Lead PSOs performed the appropriate QA tasks in the field.

FILE NAMES

Each survey has a standard file naming syntax generated by Mysticetus. The filename includes the station id (typically vessel name plus Vis or PAM) and the date and time from the final time stamp in the file.

As the file progresses through the QAQC process, each team member appends their initials to the filename. By the end of the process, the filename will appear as:





PROJECT MANAGER TASKS

OVERVIEW

Project managers are a critical step in setting up the project unique variables in the master PSO template to be pushed to the local project per below. The final QAQC process of gathering data for your projects. With the QAQC process you are the first step for the onshore data quality, and it is typical that these QA steps are required by your prime.

Reliable data requires quality data collection at the source and checks every step of the way. Progress in these steps is tracked and displayed to energy developer via a graphical dashboard.

*Quality Reporting Requires Solid
Data*



MANAGING YOUR TEMPLATE

The following tasks are required to be performed by Project Managers, both at initial project setup and as things change over the course of time. PMs need to perform these tasks because they are best positioned to know the relevant situations and data (i.e. Mysticetus has no insight into these things).

TEMPLATE HIERARCHY

Templates are organized in a hierarchy, where the top level (Energy Developer) defines all the required data collection fields, and the next level defines PSO-provider specific items as well as vessel-specific items such as which PSOs are assigned to which boat, project variables, etc.

Researchers are recommended to consider a structured naming convention with their project names as well. By structured consider who you are, location, type of data collection or purpose, year at a minimum.

The hierarchy typically is structured like this. Note: one Western Atlantic offshore developer model deviates from this design by only having a parent-> Local project:

Energy developer -> EnergyDeveloper.PSOProvider -> Local Project

The **Energy developer**, aka root template, defines all core collection requirements they require to satisfy regulatory and their unique needs. This template is managed by Mysticetus personnel based on energy developer requirements. We often refer to this as the Grandparent template.

The **EnergyDeveloper.PSOProvider** or PSOProvider template refers to the root (Energy Developer) template, plus defines all active vessels, personnel assigned to boats (along with PSO eye heights), exclusion zones around vessels, etc. The project PM edits all unique project information in this template. Once unique information is edited into this template the project manager saves the template and **deploys** it to relevant project(s) per the below example on defining crew members and their eye heights. This one is often called the parent template. Not all environments will have a parent template, there is one case today.

The **Local Project** template is the template unique to a given project and is never edited directly. It is deployed from the PSO Provider template.



The local project naming convention is:

EnergyDeveloper.LeaseArea.VesselProvider.PSOprovider.Vessel.Type.Mo.Year

Type is typically shorthand for things such as GT for GeoTechnical, GP for GeoPhysical, BE for BEntic, or CONST for construction and is defined by Mysticetus for you.

NOTE: It is critical for PSO project management to set up local project parameters in the PSOProvider template then to save and deploy the changes to that Local Project. See the next section for details.

For any operation the following project parameters must be set:

- 1) Observation Platform Heights
- 2) Crew Members and their eye heights
- 3) Security Alerts list (recommended for any operation)

For Western Atlantic based projects, the Project Manager must setup all of the above three sets of project parameters plus:

- 4) Dead animal sighting alerts
- 5) Entangled animal sighting alerts
- 6) North Atlantic Right Whale sighting alerts

These project parameters are described below in detail.

SYSTEM OPTIONS

Once the PSOProvider project has been selected, most settings managed by PMs are found in the System Options. Click **Ball -> Configure -> System Options** as shown in the next figure:



Mysticetus – Project Manager Data Quality Assurance Procedures

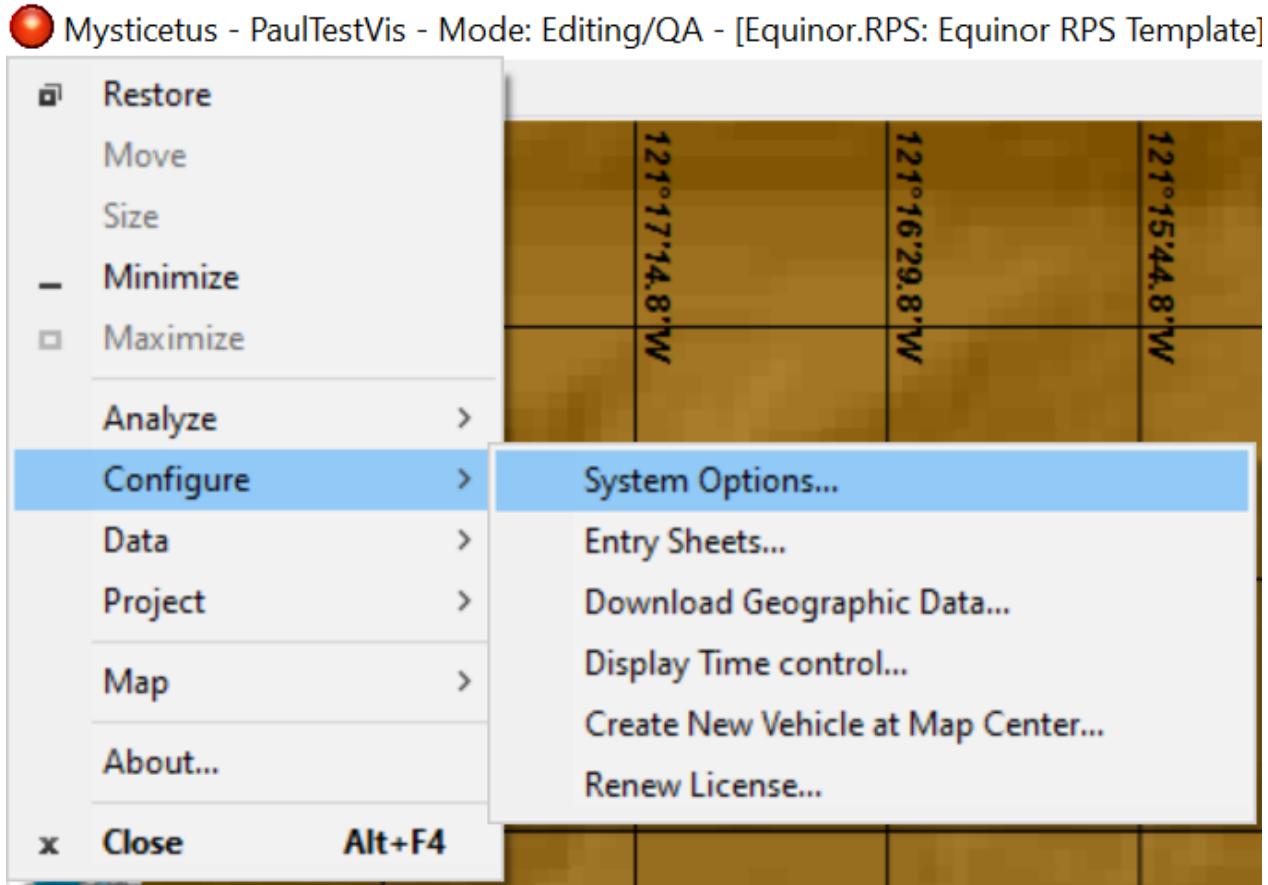


Figure 1 Configuring your template starts here.

The screenshot shows the 'Options' dialog box with the 'System' tab selected. The 'Lists' section is expanded, showing a table of named lists:

Field Modifiers	<No Modifiers>
MMSI	Ram XV (366878290)
Named Lists	DeadSightingAlertList (Ram IV), Entangler...
Obs Platforms	IR - Mounted - Seiche (Stril Explorer): 0 m, Bri...
Observers	Daniela Durazo (Ram XV: 1.5), Alex Vest (Ra...
Variables	(Ram XV: [Project Name, Equinor Empire Wind...]

The 'Macros' section shows 'All Macros'. The 'Magnetic Variation' section shows 'System Magnetic Variation' and '15° F'.

Figure 2 All named lists for all vessels are held here; PSO details, ship's deck heights, optical devices, etc..



NAMED LISTS - CRITICAL ALERTS CONTACT LISTS

Named Lists hold the definition of contact lists for critical event notifications. They consist of a mix of email aliases and user/phone numbers for text messages. These critical event lists are an important component of starting the process of satisfying early alerting requirements for critical events as defined by the typical operator permit.

The screenshot shows a software interface titled "Named Lists". Under the heading "Members:", there is a list of eight items, each preceded by a number from 0 to 7. The items are: 0 DeadSightingAlertList (Deep Helder), 1 EntanglementAlertList (Deep Helder), 2 NARWSightingAlertList (Deep Helder), 3 SecurityAlertList (Deep Helder), 4 DeadSightingAlertList (RV Dolphin), 5 EntanglementAlertList (RV Dolphin), 6 NARWSightingAlertList (RV Dolphin), and 7 SecurityAlertList (RV Dolphin). To the right of the list are two small square buttons with arrows pointing up and down, likely for reordering the list. At the bottom left are "Add" and "Remove" buttons. Navigation arrows (< and >) are also present at the bottom.

Index	Alert List Name
0	DeadSightingAlertList (Deep Helder)
1	EntanglementAlertList (Deep Helder)
2	NARWSightingAlertList (Deep Helder)
3	SecurityAlertList (Deep Helder)
4	DeadSightingAlertList (RV Dolphin)
5	EntanglementAlertList (RV Dolphin)
6	NARWSightingAlertList (RV Dolphin)
7	SecurityAlertList (RV Dolphin)

Figure 3 Alerts named lists for multiple ships working for a common customer.



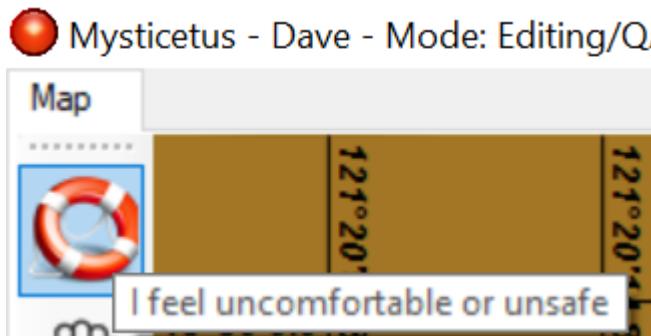
Mysticetus – Project Manager Data Quality Assurance Procedures

Typically, in the Western Atlantic the following alert lists must be created by the project manager. Each list name shown below has its own unique properties around compliance and due to this are broken out as separate lists.

- Dead animal sighting alerts, DeadSightingAlertList (VesselName)
- Entangled animal sighting alerts, EntanglementAlertList (VesselName)
- North Atlantic Right Whale sighting alerts, NARWSightingAlertList (VesselName)
- Security Alerts list, SecurityAlertList (VesselName)

As can be seen, each vessel has its own unique set of lists. The first three lists should contain the names of people to be notified when these events happen, and typically include wind developer, vessel operator, and PSO provider personnel. Ask Mysticetus for help with the wind developer personnel who should be listed here if you don't already have a list to copy from.

The last list, Security Alerts list, is for HSE events that allow your PSO team to silently alert onshore personnel of onboard HSE violations. Its design is to allow a team member to discretely alert the OnShore managers of a threatening situation. It is triggered when the PSO (or other crew) pushes the Life Preserver button:



Below you can see examples on how to enter email aliases and unique phone numbers for US based phones. The entries do not have to be ordered in any particular way. Do not allow for line spaces between entries.

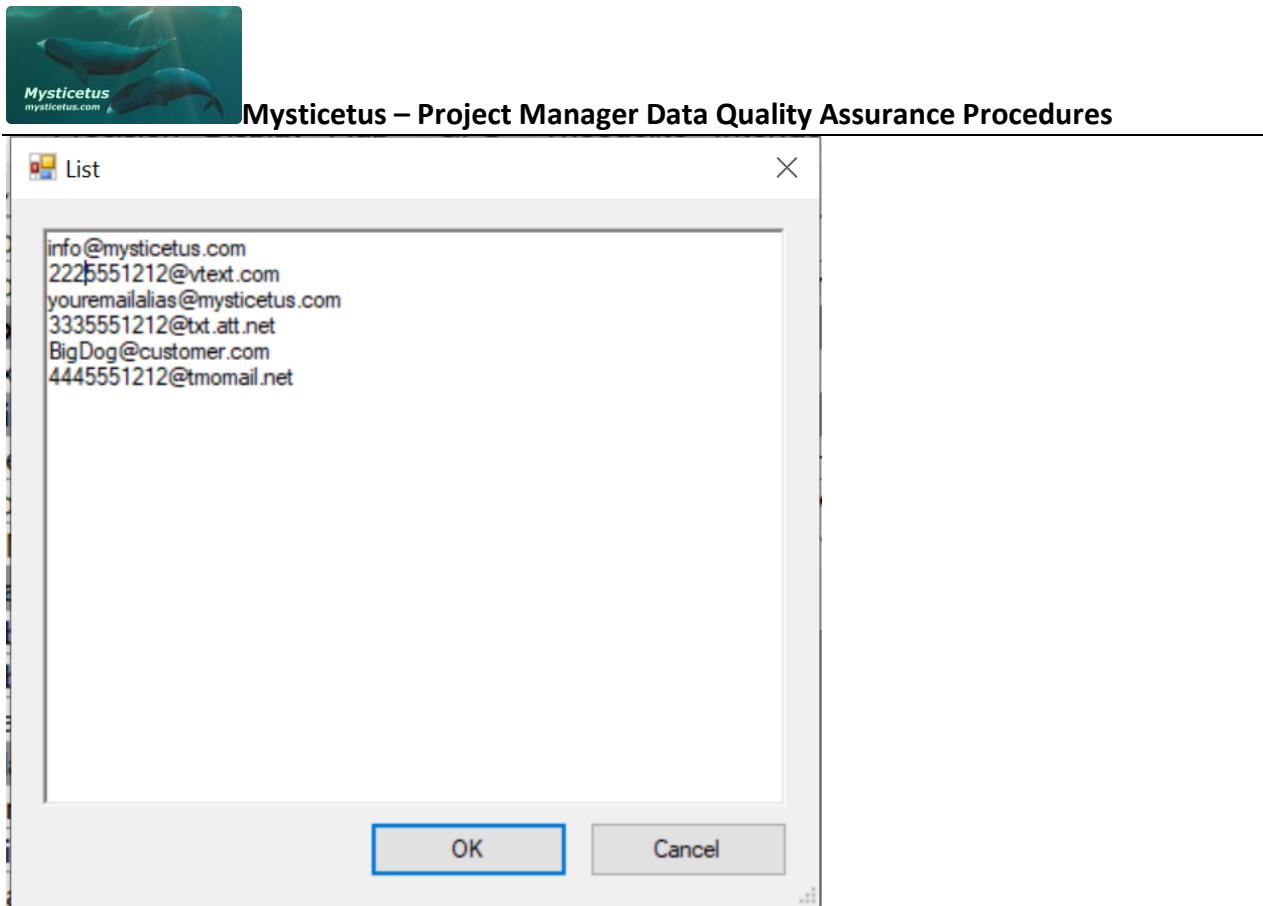


Figure 4 Alert list showing email and SMS addresses.

OBS(ERVATION) PLATFORMS

Correct observation platform heights are critical to accurate animal localizations. These heights are most accurately obtained by actual measurement (drop a weighted tape measure). If that is not possible, ship's diagrams are frequently available and provide a good estimate of deck height above water.

Observation Platform height will be added to PSO Eye Height for the relative viewing location onboard when determining distance to an animal based on reticle binoculars. This setting 'trickles' down from your parent template. Note that PSO's tend to do their effort records with their unaided eye and their visual sightings with reticular binoculars.

Each location a PSO could observe from gets its own Observation Platform. Name should be the location and method (e.g. Bridge-Fujinon7x50). Enter the height (e.g. 4.2 m or 13.775 ft), most reticle binoculars have a reticle to degree conversion factor of 0.2779, and select the appropriate boat.

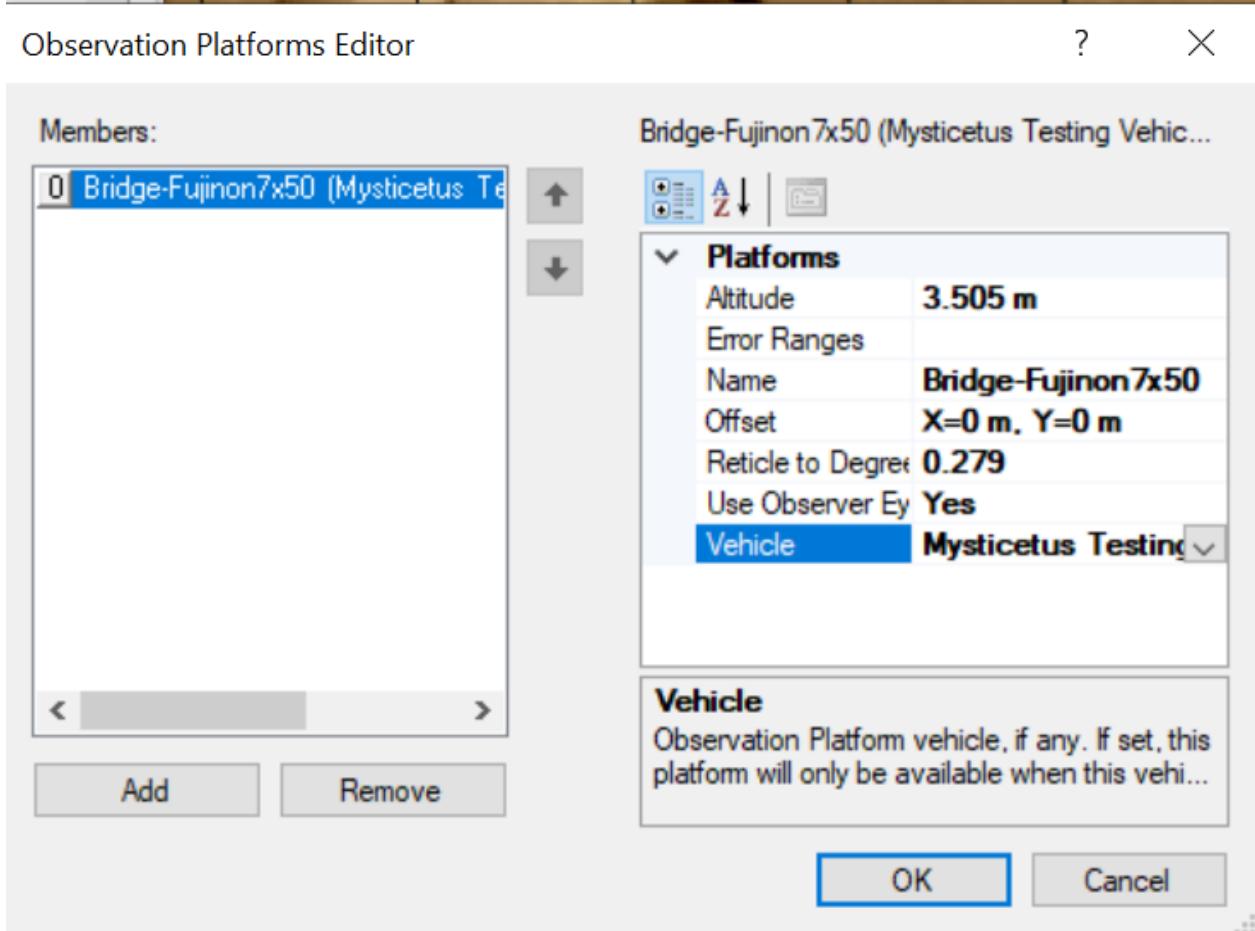


Figure 5 Adding optical devices, don't forget the Reticle to degrees conversion.

OBSERVERS - DEFINING CREW MEMBERS AND THEIR EYE HEIGHTS



Mysticetus – Project Manager Data Quality Assurance Procedures

Each PSO needs to be defined in the Observers settings. Add the PSO and assign them to the correct boat:

```
graph TD; TV[Mysticetus Testing Vehicle] --> DS[Dave Steckler (1.7 m)]; TV --> PD[Paul Donlan (1.8 m)]; PD -.-> TV
```

Figure 6 Defining PSOs and their eye height(s).

Click the Edit button to change vessel or eye height.

Properties

Observer	Eye Height	Name	Vehicle
	1.8 m	Paul Donlan	Mysticetus Testing Vehicle

Figure 7 Assigning a PSO to a ship.



VARIABLES

The project variables must be set via the project variable editor. These variable names are defined in your ‘Project’ tab for data collection. The variable names must match the variable names in your entry sheet. Highlighting a field in you entry sheet will show you the exact name of that variable. Not getting this correct is the most common source of errors.

The screenshot shows a Windows-style dialog box titled "Variables Editor". It contains a table with two columns: "Variable" and "Value". The "Variable" column lists various project parameters, and the "Value" column shows their corresponding entries. Some values are redacted with black bars. At the bottom right of the dialog are "OK" and "Cancel" buttons.

Variable	Value
BOEM Lease	OCS-0487/0486
IHA	2022-00041
IR Equipment	Handheld IR, NVTS
Nighttime Ops	Yes
Number of PSOs	4
PAM Equipment	Not Required
Project Manager	[REDACTED]
Project Name	[REDACTED]
Project Type	Geophysical
Remote Source	Deep Helder
Survey Plan	SFW01
Vessel Draft Meters	4.5 m
*	

SETTING VARIABLE DEFAULT VALUES –

Environmental mitigation typically calls for a lot of data to be collected by the PSO's whose principal job is to keep their eyes on the water. In defining data variables we know there are tradeoffs between "I want the PSOs to think about this field" vs "holy moly we need to simplify" as PSOs have a lot of stuff to enter. Use of ellipses calls for an input field as a required input and will then cause a watch dog to "bark" when the entry is missing.

For variables that must be populated by the PSO's then set the Default Value to an ellipsis.



Mysticetus – Project Manager Data Quality Assurance Procedures

For variables that are “optional” put “N/A” as the Default Value for optional fields in the template to reduce PSO workload. In this example no watch dogs will respond.

To summarize.

- 1) Setting a default value to ellipses tells Mysticetus the field(s) entry is required.
- 2) Setting a default value as N/A will result in the PSO needing to remember to fill in the field when applicable.

Note: This does not work with Date/Time fields.

Name	Type	Description
Low Count	Count	Lowest estimate of animals in this group
High Count	Count	Highest estimate of animals in this group
Best Count	Count	PSO's best estimate of the number of individuals for this record/row of data.
Pace	FixedList	Relative speed animal(s) is traveling. Select from Vigorous (creating large splashes or a wake; Moderate (cre...
Detection Cue	FixedList	“Clue” that tipped PSO off to presence of animal(s). Select best option from dropdown menu.
Initial Behavior	FixedList	Observed behavior of animal(s). Behavior 1 is for the first observed behavior. If a second behavior is observe...
Second Behavior	FixedList	A subsequent observed behavior if more than one behavior was observed during a detection. Select None if ...
Reaction	FixedList	A perceived change in behavior as a result of vessel or operations. Select None if no perceived reaction.
Mitigation Request	FixedList	If PSO or PAM Operator requested mitigation for this detection, enter the requested measure in this field. Sel...
Mitigation Response	FixedList	If PSO or PAM Operator requested mitigation, enter the mitigation that was implemented. Select Denied if m...
Time of Mitigation	DateTime	If detection resulted in a mitigation, edit to reflect the exact time of implementation. Enter NA if not applica...
Time of Entry into EZ	DateTime	If animal(s) entered its EZ, edit to reflect the time when first detected within EZ. Enter NA if not applicable.
Time of Exit from EZ	DateTime	If animal(s) confirmed departing its EZ, edit to reflect the time when confirmed outside EZ. Enter NA if not a...
Seconds in Active EZ	Count	If animal(s) observed within its ACTIVE Exclusion Zone (EZ, i.e., while regulated sources <200 kHz operationa...
Seconds in Inactive EZ	Count	If animal(s) observed within its INActive Exclusion Zone (EZ, i.e., while regulated sources <200 kHz are NOT o...
CPA to PSO	Distance	Closest Point of Approach to PSO in meters. Enter this CPA value in the row of data corresponding to the ob...

Figure 8 N/A is a default behavior. The danger is it can get overlooked when it shouldn't.

When the Default Value for fields are currently set to ellipses (...)

Auto-Time Others
Column Style
Default Value
Export Format
Fixed List

Default Value
The default value for this cell.

{ Export: False, Field: *, Single Point: True, Boolean Format: YBlank, Cloud Field: No (MitigationResponse)}

Figure 9 Default here tells Mysticetus a value is required.



Mysticetus – Project Manager Data Quality Assurance Procedures

Mysticetus highlights in red as a "hint" that these need to be filled in:

Second Behavior	Reaction	Mitigation Request	Mitigation Response	Time of Mitigation
...	

Figure 10 Missing Fields that must be populated.

SETTING TRACK LINE DEFINITIONS –

Track lines are a way to customize knowledge of what you ship is doing within its project. Track lines are shown on the map display in Mysticetus. Red track lines indicate to you the ship is in an undefined state or is off effort. The track line should never be red during active operations.



Figure 11 Red track lines must be fixed!

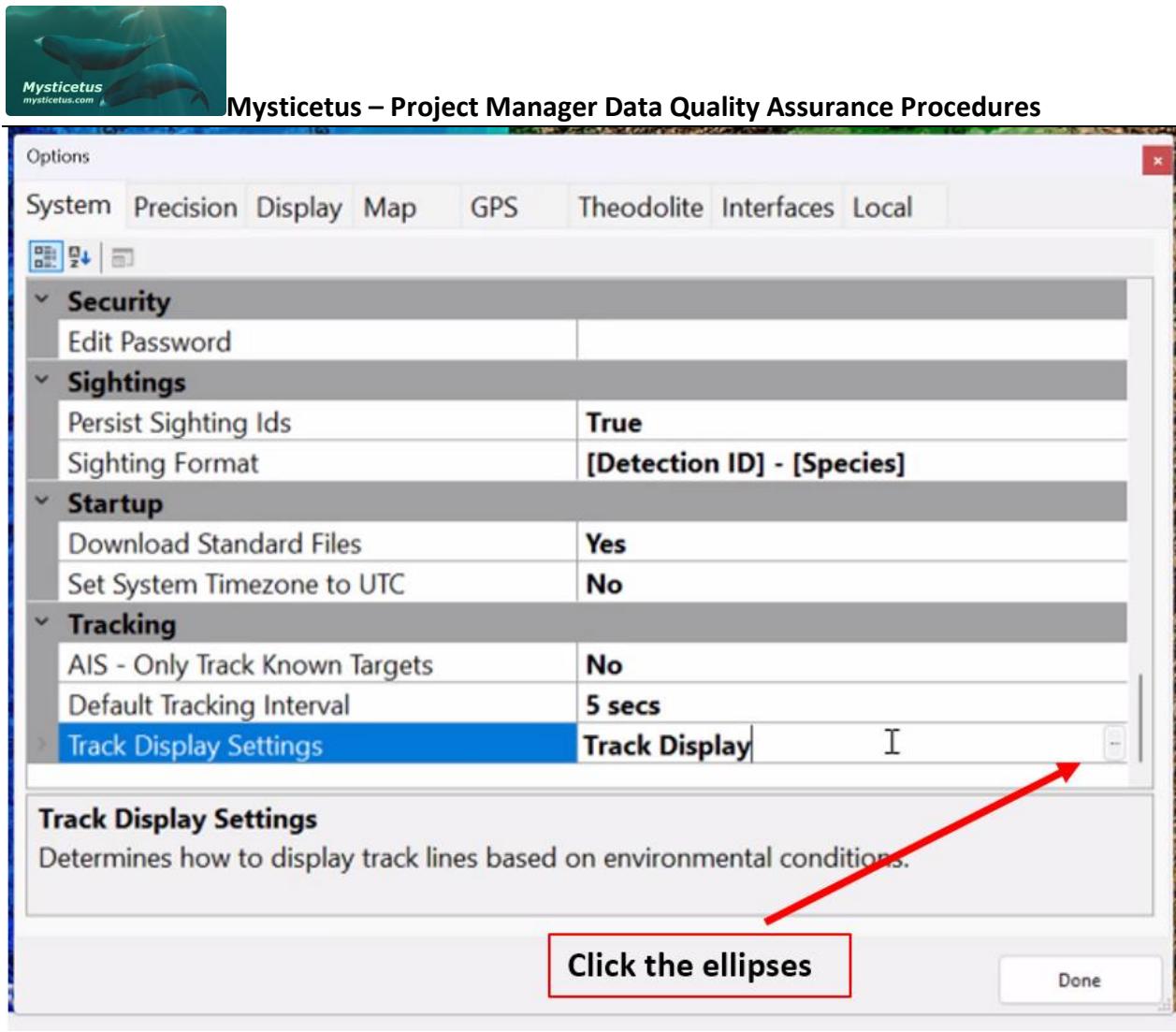


Figure 12 Setting track lines is found in Options System tab.



Mysticetus – Project Manager Data Quality Assurance Procedures

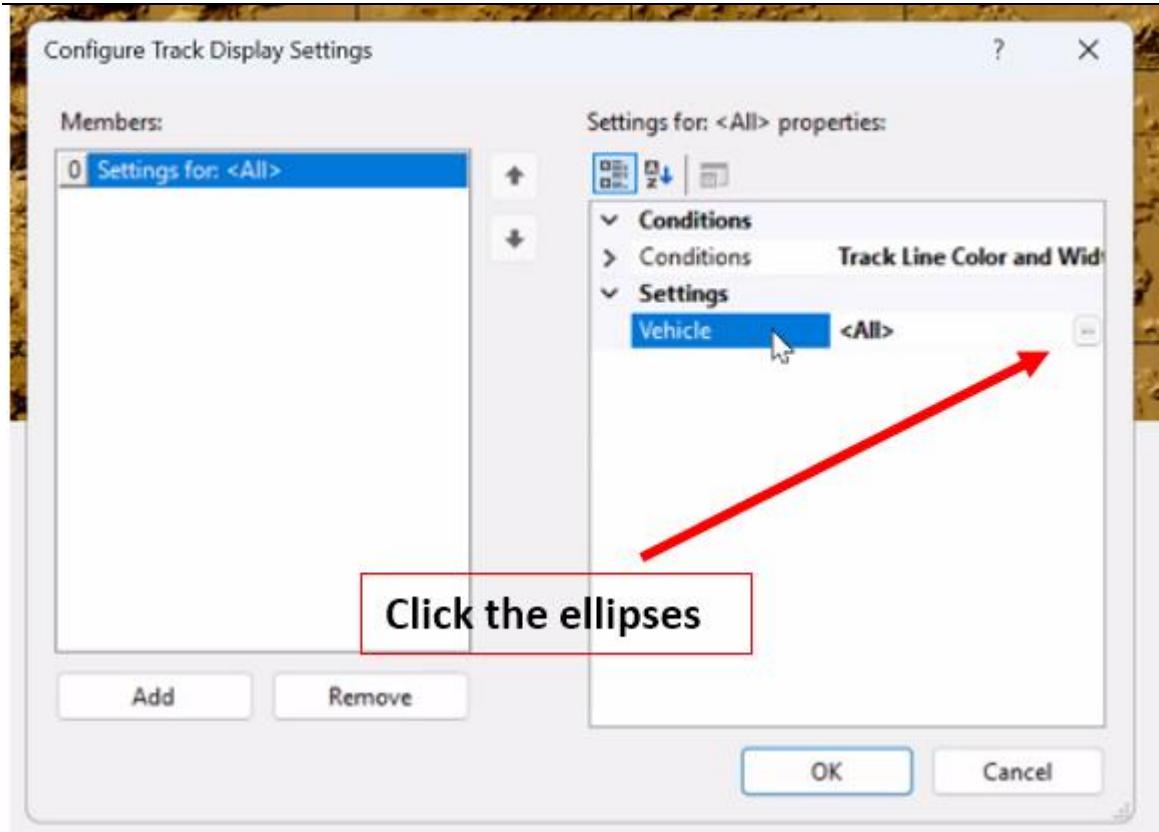


Figure 13 How to change vehicle to <All>

All comes from here after clicking ellipses to the right of Vehicle.

Using <All> sets track line definition for all ships for the parents. Now you can define all ships here then click 'Go'.



Figure 14 Highlight <All> then click 'Go'

Your next step is to verify and/or define all defined effort states in your template. There can be a lot or a few depending on how the template was set up by the template owner. This is done by clicking on the Conditions ellipses, below.



Mysticetus – Project Manager Data Quality Assurance Procedures

Options

System Precision Display Map GPS Theodolite Interfaces Local

Security Edit Password

Sightings Persist Sighting Ids Sighting Format

Startup Download Standard Files Set System Timezone to UTC

Tracking AIS - Only Track Known Targets Default Tracking Interval 1 s Track Display Settings

Track Display Settings
Determines how to display track lines based on environmental conditions.

True

Configure Track Display Settings

Members: 0 Settings for: <All>

Add Remove

Settings for: <All> properties:

Conditions Track Line Color and Vehicle

Click the ellipses

OK Cancel

Step 1 Click Add

Configure Track Display Settings

Members: 0 Settings

Configure Track Display Conditions

Members: 0 Visual Effort!Effort Type 1: NVD
1 Visual Effort!Effort Type 1: IR
2 Visual Effort!Effort Type 1: UE
3 Visual Effort!Effort Type 1: IR - Handl
4 Visual Effort!Effort Type 1: IR - Moun

Click Add

Add Remove

Visual Effort!Effort Type 1: NVD properties:

Settings

Sheet Name	Visual Effort
Track Control	
Color	MediumSpringGreen
Condition	NVD
Control Field	Effort Type 1
Width	2

Color
Color to set track segment when under the specified environmental conditions.

OK Cancel



The screenshot shows the 'Properties' panel for a track control setting. The 'Track Control' section is expanded, showing the following configuration:

Setting	Value
Color	<input type="checkbox"/> Transparent
Condition	
Control Field	
Width	0

A tooltip for the 'Color' setting is displayed below the panel, stating: "Color to set track segment when under the specified environmental conditions."

Step 2 Set condition and Control Field.

Condition is the effort field such as UE or NVD or IR Camera, which is defined in your Visual effort variables. In this case we are setting UE. The Condition is very literal to how your template is setup. View your named list and use copy and paste commands.



Mysticetus – Project Manager Data Quality Assurance Procedures

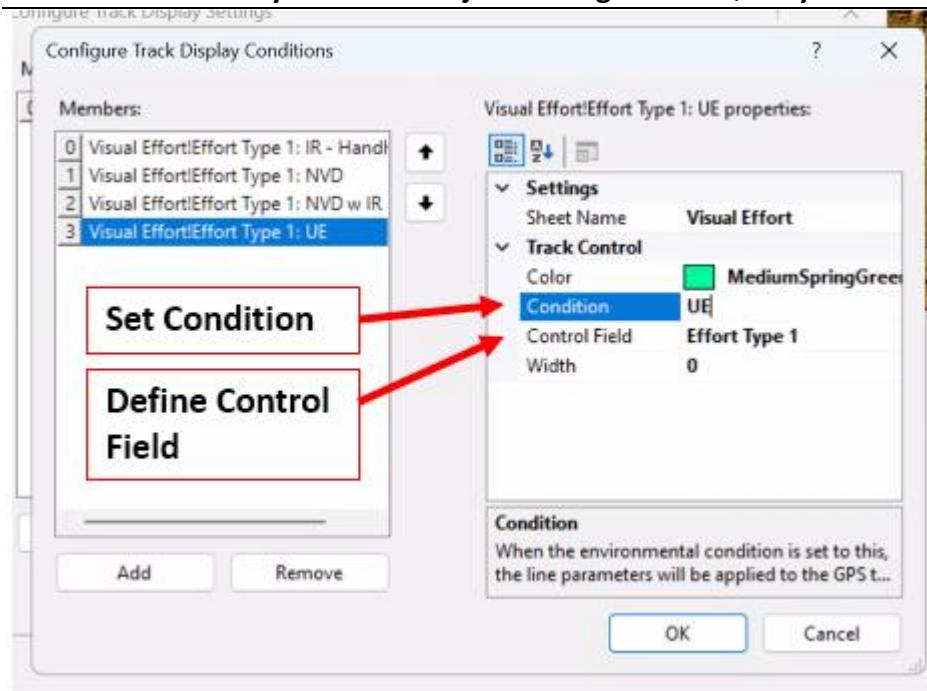


Figure 15 Think of this as the test against the control field.

“Effort Type 1” is the control field you’ve defined in your visual effort Entry Sheet. This test is literal. So if Effort Type 1 is changed to Effort Types 1 (change to plural ‘s’) then you’ll need to update the control field in the configure track display conditions. We recommend using Windows’ copy and paste for pasting in these names from the effort state as seen in the template effort type field.

Step 3 change color by clicking ellipses to right of color which will show the color picker UI.



Mysticetus – Project Manager Data Quality Assurance Procedures

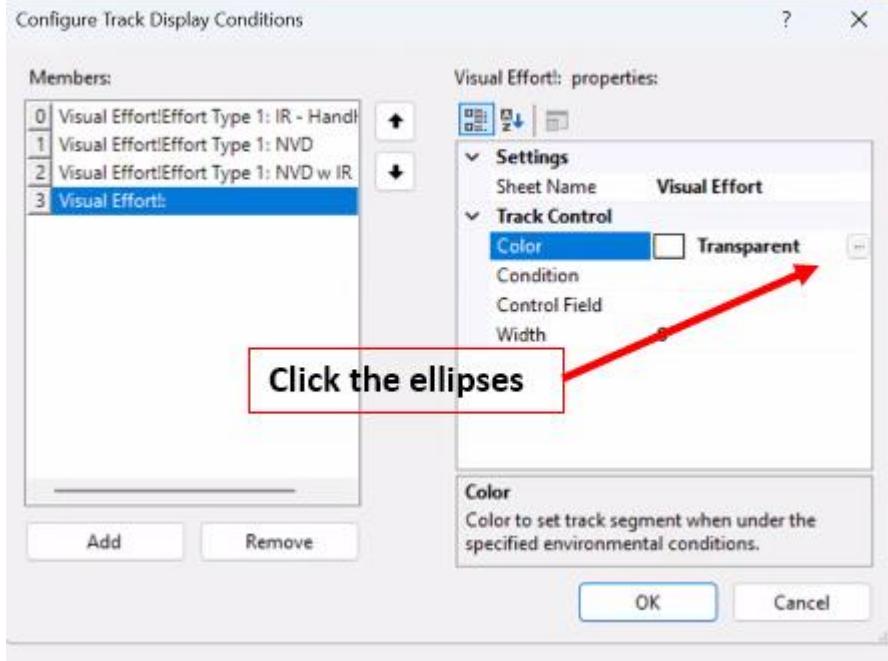


Figure 16 Click here to get to the color picker.

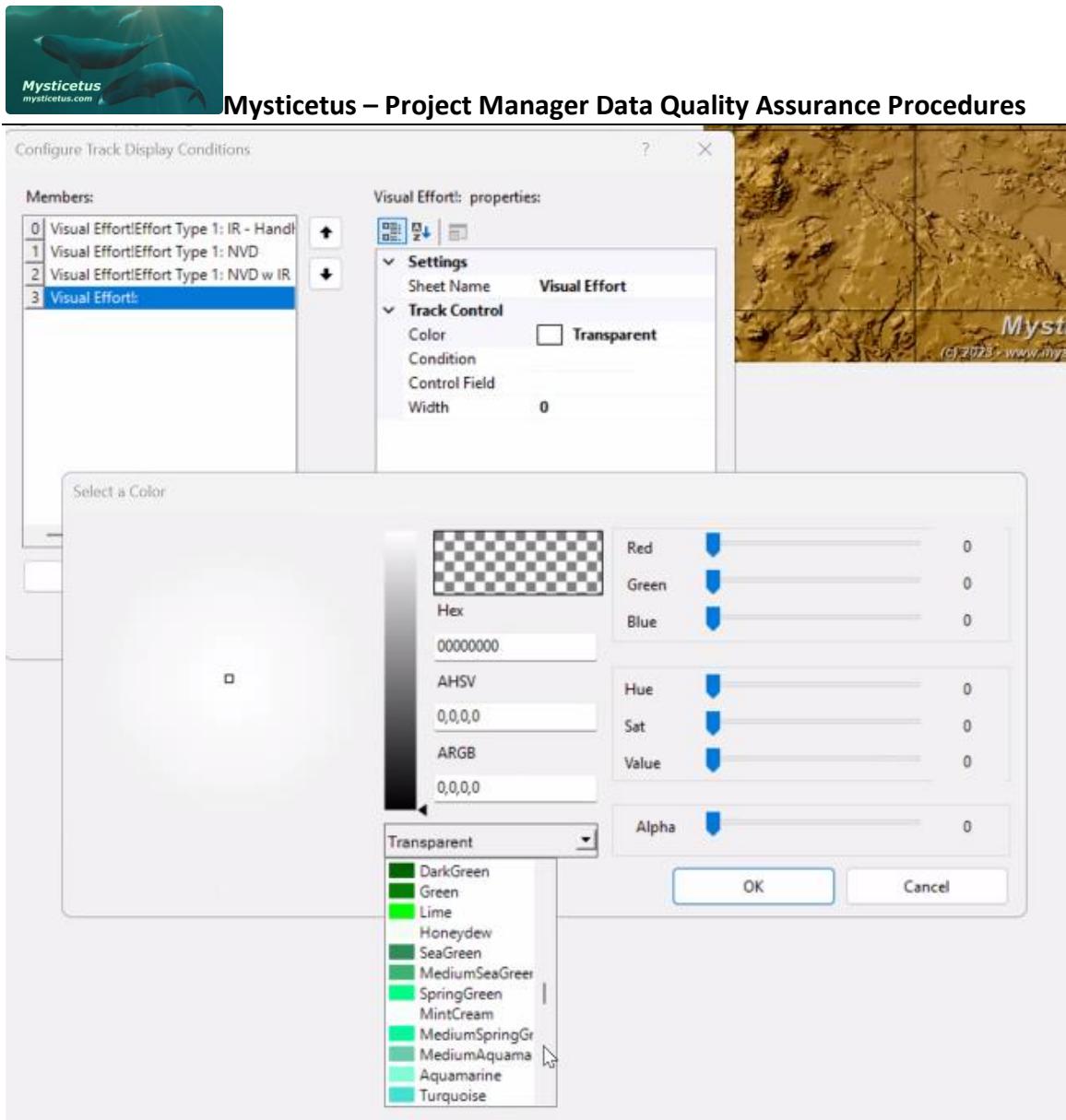


Figure 17 Selecting track line color.

We use medium spring green. Select your color and click okay. Use the same color for all effort states unless there is specific need to have differentiation between states for visual auditing by your PSOs. The use of different colors is more commonly done in the research community.

NOTE: Don't use Red for a track line color.

Step 5 Set (line) width to 2.

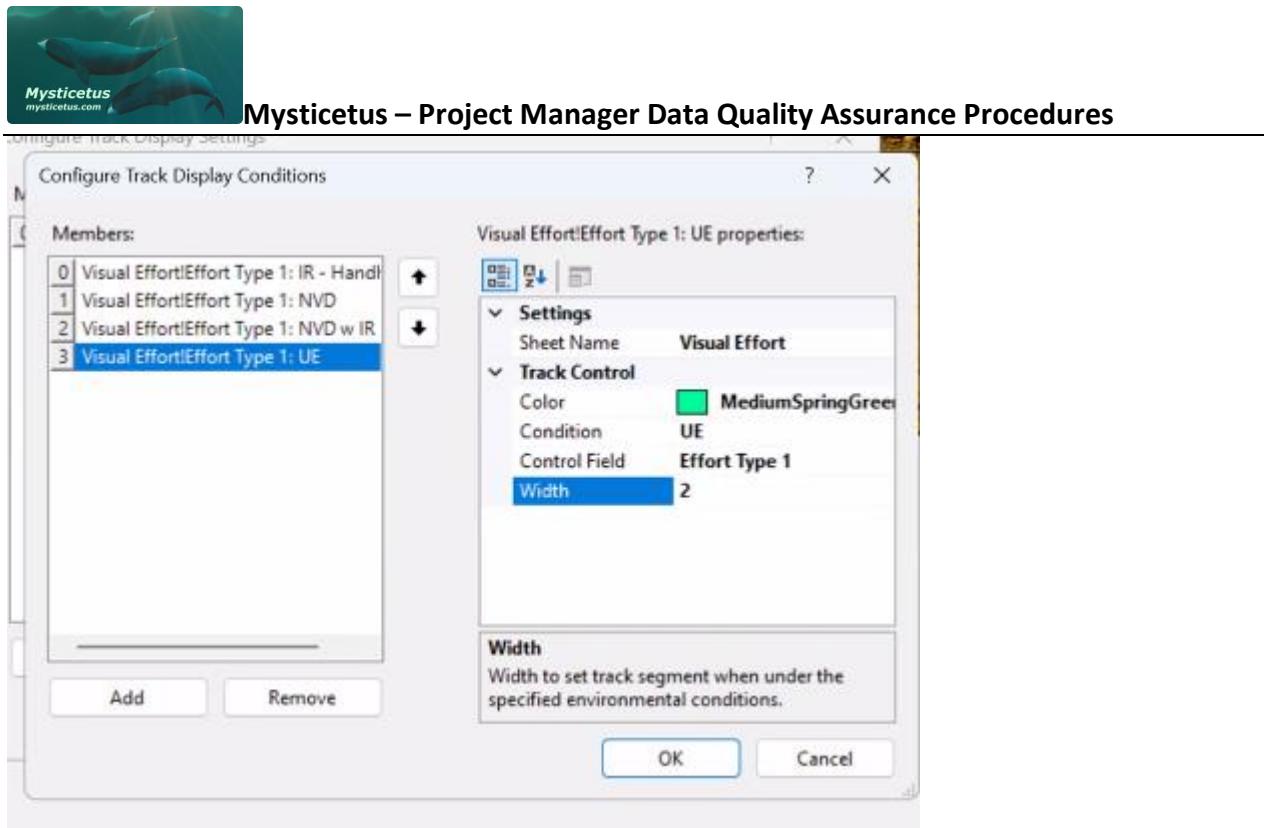


Figure 18 Set width of track lines.

Now you need to do this for all effort type named list defined in the master template called the grandparent for three-tiered template schemes and parent for two tiered. Be very consistent with track colors.

Note: We have moved away from the use of two-tiered Template schemes except for one legacy implementation.

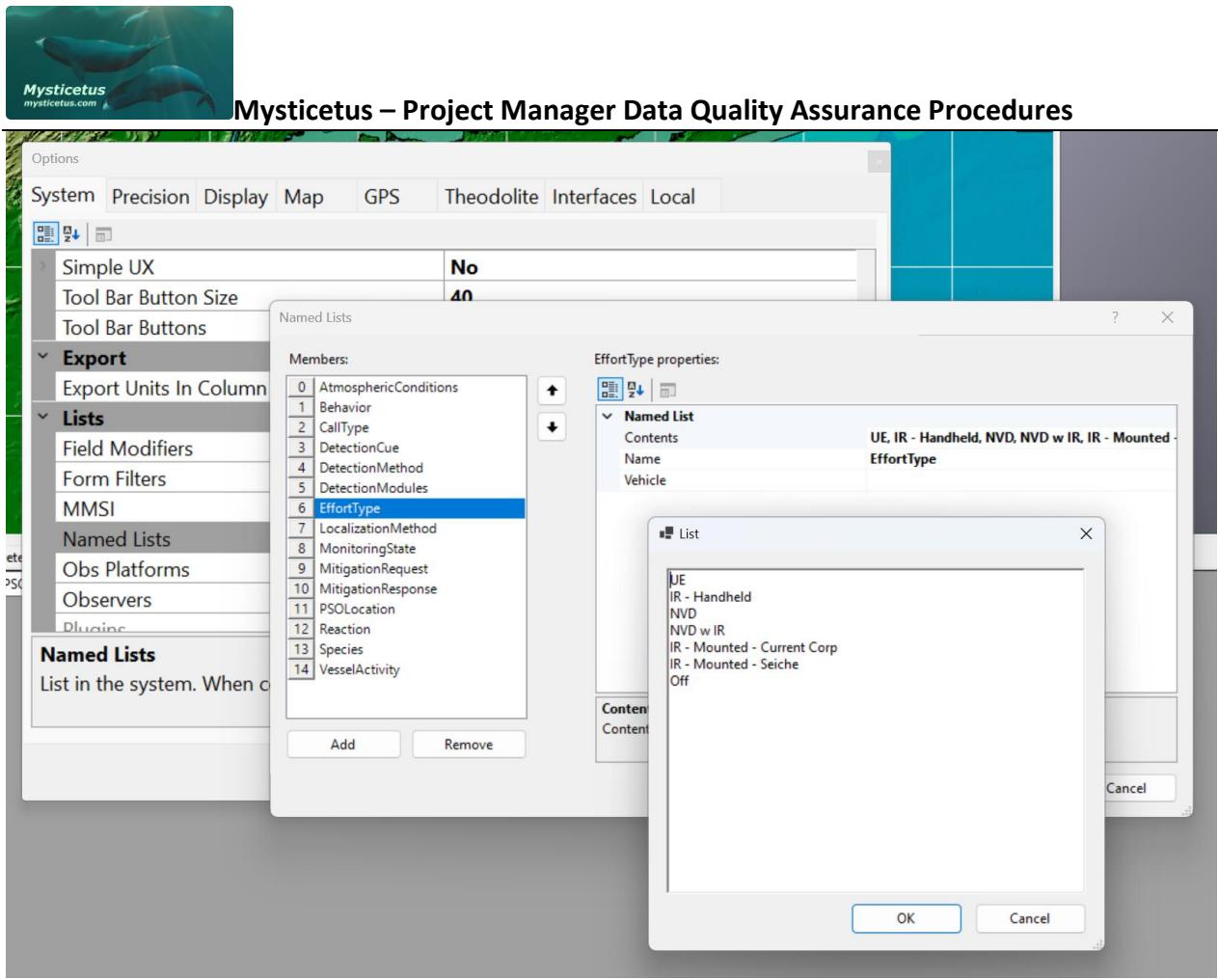


Figure 19 Named List of effort states.

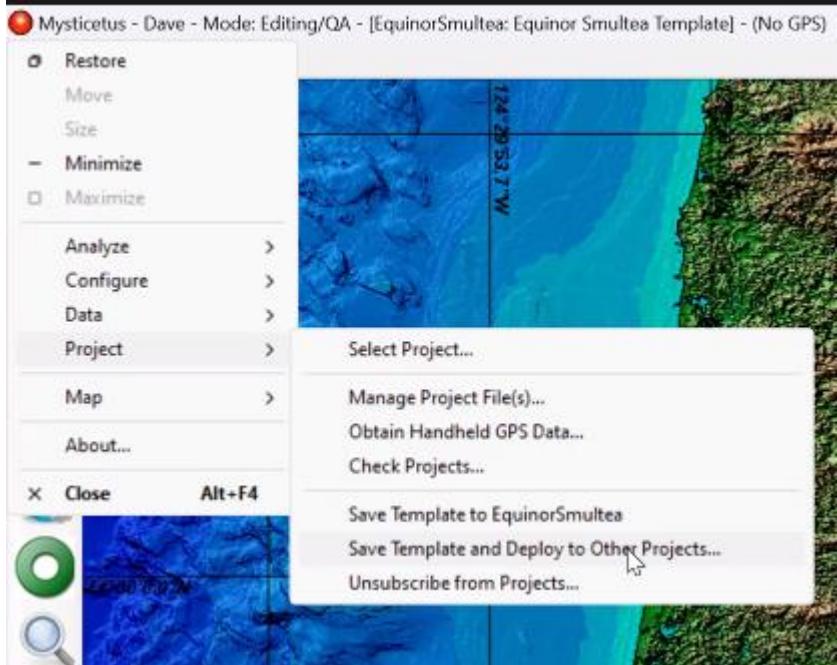
Then save and deploy your template to all active projects.



Figure 20 Correct appearance of track lines.



Mysticetus – Project Manager Data Quality Assurance Procedures



If you have older saves with red tracklines you want to update

Then load the final save or the edited file, whichever is latest. This should be done before final signed off, but another signed off file can be created.



Mysticetus – Project Manager Data Quality Assurance Procedures

The screenshot shows the Mysticetus Project Manager interface. The main window has a green header bar with the title "Mysticetus – Project Manager Data Quality Assurance Procedures". Below the header is a toolbar with tabs: Options, System, Precision, Display, Map, GPS, Theodolite, Interfaces, and Local. A status bar at the bottom indicates "You are screen sharing".

The left sidebar contains a tree view of project settings:

- Parent Project
- Safety
- Save
- Security
- Sightings
- Startup
- Tracking
 - AIS - Only Track Known Targets
 - Default Tracking Interval
 - Track Display Settings

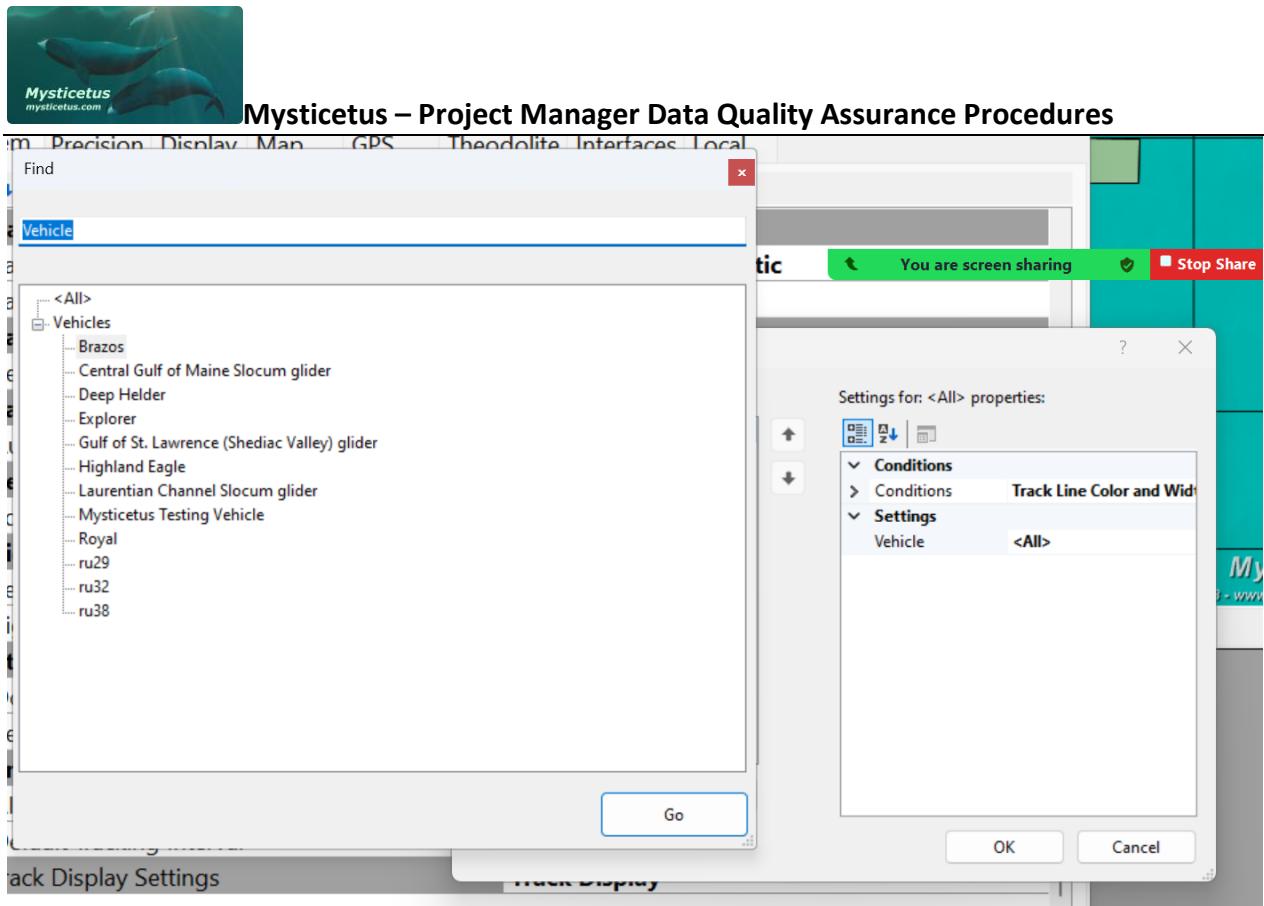
The "Track Display Settings" node is expanded, showing a description: "Determines how to display track lines based on environmental conditions." At the bottom right of this section is a "Done" button.

A modal dialog box titled "Configure Track Display Settings" is displayed over the main window. It has two panes:

- Members:** A list box containing "Settings for: Brazos".
- Settings for: Brazos properties:** A tree view showing:
 - Conditions
 - Conditions
 - Settings
 - Vehicle: Brazos

At the bottom of the dialog are "OK" and "Cancel" buttons.

And change vehicle to <All> by clicking on the all shown when you look at variables



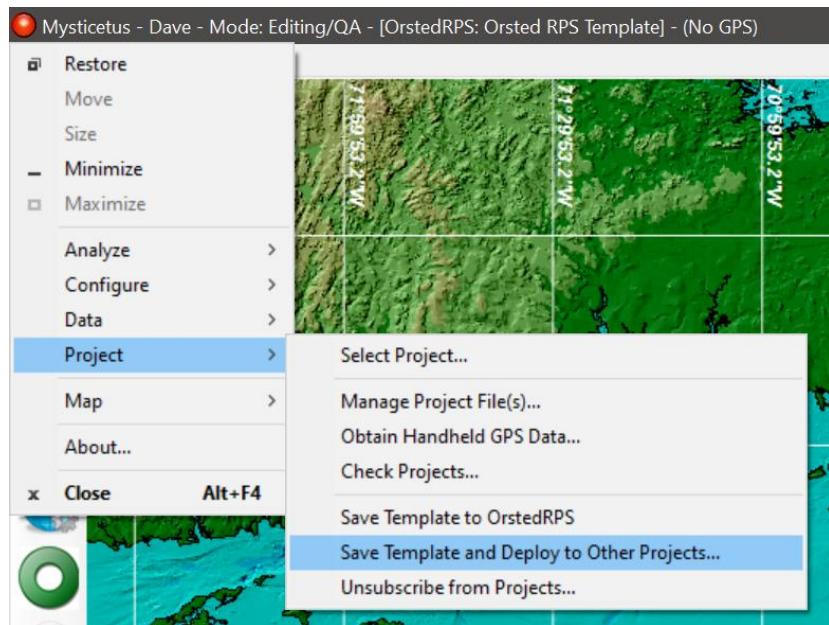
Then click go-> okay ->done. If you still see track lines that are red you've missed one.

SAVING AND DEPLOYING TO A VESSEL PROJECT

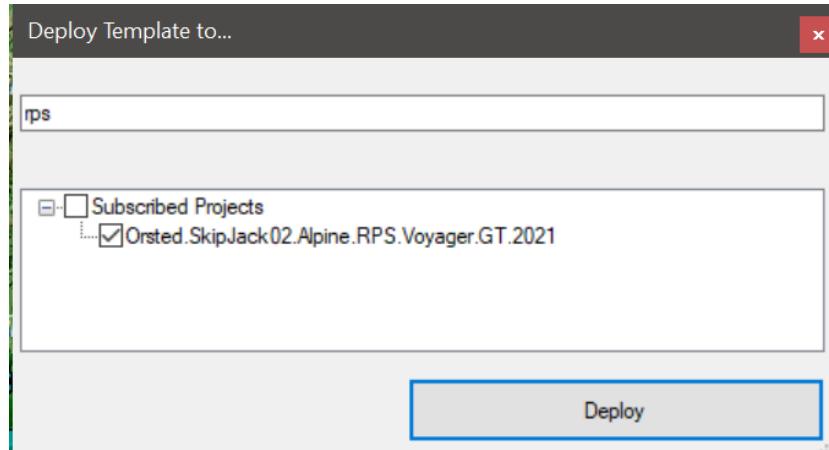


Mysticetus – Project Manager Data Quality Assurance Procedures

Choose: Project -> Save Template and Deploy to Other Projects:



Select the appropriate project and press Deploy.



Exit the Mysticetus Editor application when finished (do not save on exit, the previous step did it for you).



Mysticetus – Project Manager Data Quality Assurance Procedures

The next time the Voyager PSO crew restarts their Mysticetus app onboard, it will pick up these changes assuming a healthy internet connection. The PSOs onboard will be signaled that an update is pending via the relevant watchdog.

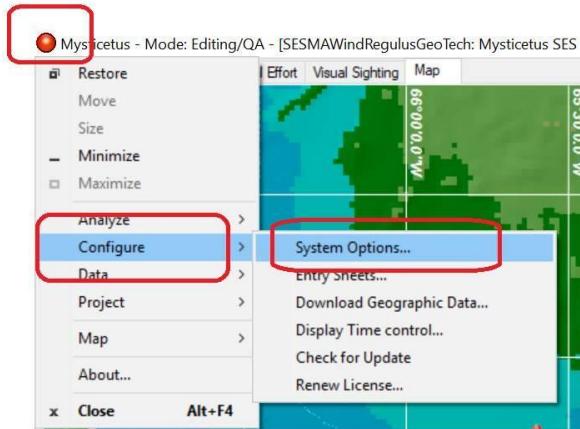
PROCESS YOUR FIRST FILE

These steps are to aid you when you are just starting a new project or a new role as a data reviewer. **This is completed once** on your PC.

SET YOUR STATION ID

The Station Id attaches your identity to your work. Template changes, directories, and analysis reports associated with you will display this ID. This is completed once when initially configuring Mysticetus for a data analyst or project manager. You need to do this once on each PC you use.

1. Open Mysticetus Editor and click on the **red ball** at the top left off the screen to open the Mysticetus menu.
2. Select Red Ball > Configure > System Options.
3. Select **Local** tab
4. Scroll to **Station ID** field
5. Enter your full name in the **Station Id** field. Spaces will be removed automatically.
6. Select Done.



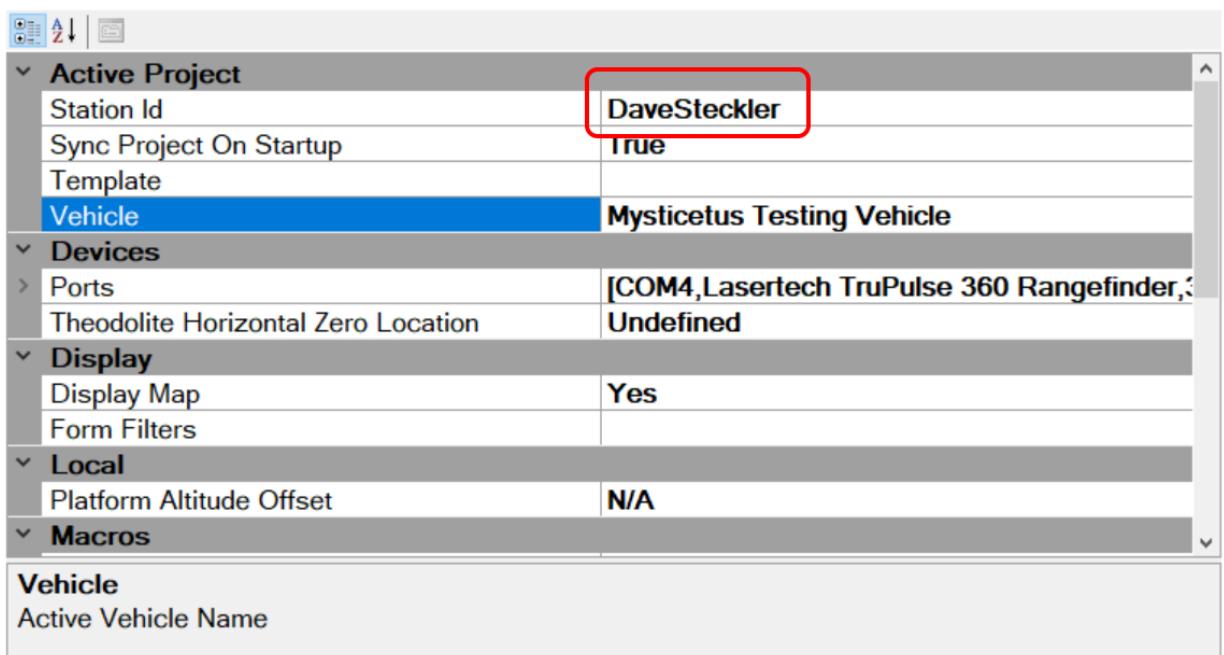


Mysticetus – Project Manager Data Quality Assurance Procedures

Options ×

System Precision Display Map GPS Theodolite Interfaces Local

These options control how Mysticetus starts and runs.
Changes will take effect the next time Mysticetus is restarted



DaveSteckler

True

Mysticetus Testing Vehicle

[COM4, Lasertech TruPulse 360 Rangefinder,]

Undefined

Yes

N/A

Done

While you are setting your station ID check your other local settings per the below section:

OTHER LOCAL SETTINGS

Set “check for update” to “True”

Set “Detect GPS” to “False”

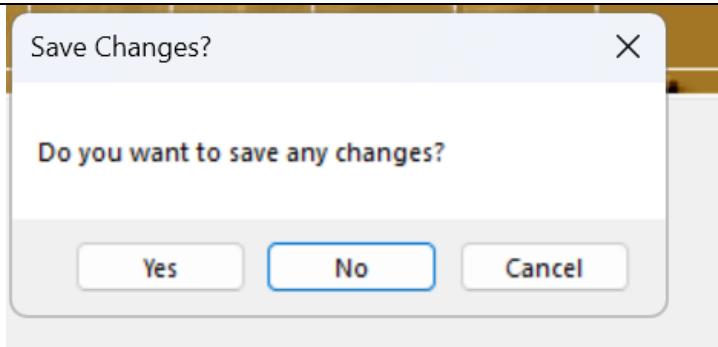
Set “Wait for GPS” to “False”

Set “Sync Project on Startup” to “True”

Set “Track GPS After Shutdown - Duration” to “none”

Set “Track GPS After Shutdown – Interval” to “none”

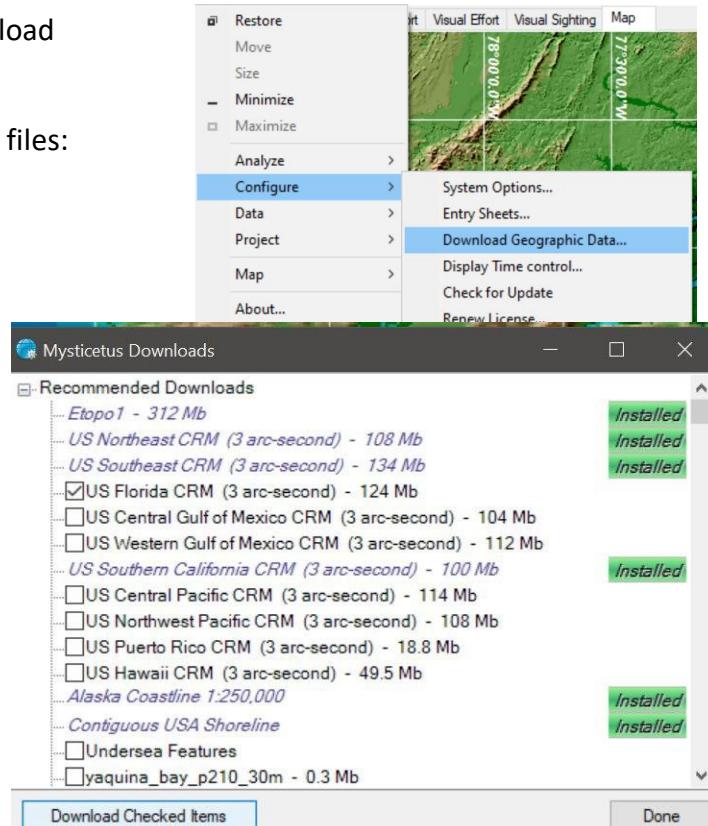
When you exit Mysticetus in Editor mode you’ll be prompted to “save any changes” select no



DOWNLOAD MAPS

Before you can start looking at Mysticetus map data you will need to add maps to your copy of Mysticetus. Be advised that if you have trouble downloading and seeing map data in Mysticetus you may need to consult with your IT department to allow for writing map data to the public/documents directory.

1. Open Mysticetus Editor.
2. Select Red Ball -> Configure -> Download Geographic Data
3. Click to download the following map files:
 - US Florida CRM
 - US Southeast CRM
 - US Northeast CRM
 - Contiguous USA
4. Click “Download Checked Items”
5. Let the downloads complete
6. Click “Done”
7. This is performed once for each computer running Mysticetus





SUBSCRIBE TO A PROJECT

Before you can open Mysticetus files for your vessel, you must subscribe to the vessel project.

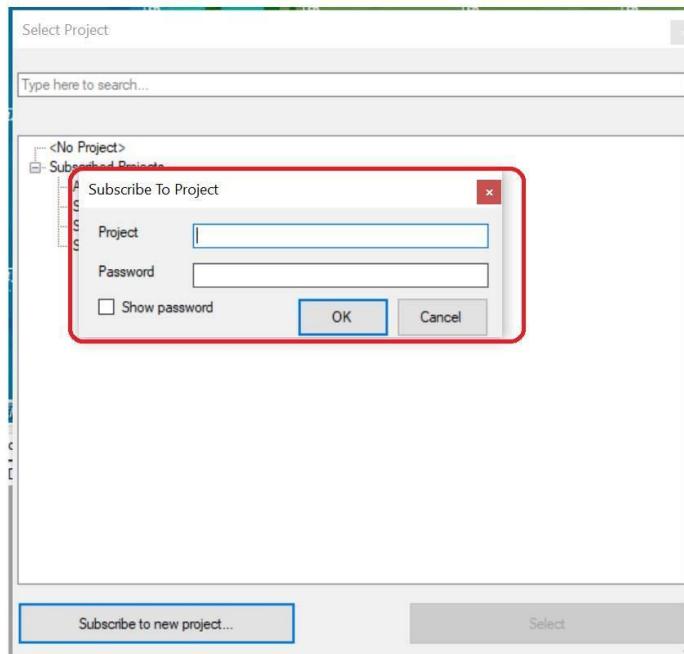
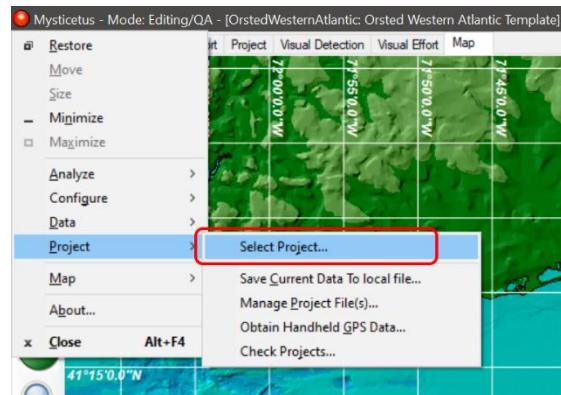
8. Open Mysticetus Editor.

Select Red Ball -> Project > Select Project.

Select the **Subscribe to new project** button (at the bottom)

Enter the **Project name** and **Password** as supplied by Mysticetus.

Select OK. Mysticetus will restart with your new project active.





PROJECT MANAGER DAILY QA/QC OVERVIEW

Before the PM gets their crack at the data, both the PSO (at the end of their shift) and the Lead PSO (at the end of the day) perform QA steps as outlined in *Mysticetus PSO and Lead PSO QAQC Checklist*. At the end of each day, the lead PSO reviews the final data file. This operation is performed in the Mysticetus Editor onboard the vessel.

There are several items a Lead PSO is responsible for as part of the daily QAQC - a detailed description is found in the *PSO and Lead PSO QAQC CheckList*.

This document addresses the PM's review of the day's data, including:

1. Look for blank cells (in general there should be no blank cells)
2. Ensure that every mitigation request has a subsequent mitigation response
3. Check for unusual species
4. Check for odd GPS tracks
5. Check for unlikely/non-sensical weather combinations, etc.

Clarify any questions with the Lead PSO as soon as possible. You also must confirm that the GPX files are uploaded and the Lead PSO performed the daily reporting.

Any errors found by PMs are a “Training Opportunity” for Lead PSOs. Data coming off the boats should be nearly perfect by the time it reaches the PM. When that doesn’t happen, engage the Lead PSO to figure out what happened and fix it for the future. People further down the data pipeline will be doing the same with you.

DAILY GPX FILES

There are two GPS devices on each vessel. One is connected to the data collection Mysticetus laptop. The second GPS is a hand-help Garmin eTrex. The Lead PSO is responsible for ensuring that the detailed track file from the Garmin eTrex is uploaded to the Mysticetus cloud. (this is a single button push in the Mysticetus Editor on the boat).

The Garmin eTrex is a backup GPS device in the case of a failure with the primary GPS, disconnection, etc. The data collected from the Garmin eTrex is used to ‘repair’ and ‘stitch’ together missing track information by the data analyst team and provide a back-up for any potential gaps in the GPS data collected by the GPS device connected directly to the laptop.

CONFIRM AND REVIEW DAILY GPX FILE

Confirm the Lead PSO uploaded the GPX files from the hand-held Garmin Device.



Mysticetus – Project Manager Data Quality Assurance Procedures

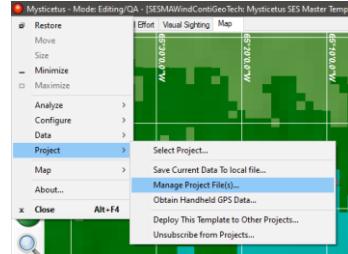
Confirm Lead PSO uploaded the Garmin GPX files and ran an analysis report for the date you are preparing your Daily QAQC.

To reach the listing of data files follow these steps:

Select Red Ball

Select Project -> Manage Project Files

Note: This allows you to view and download all saved project files.

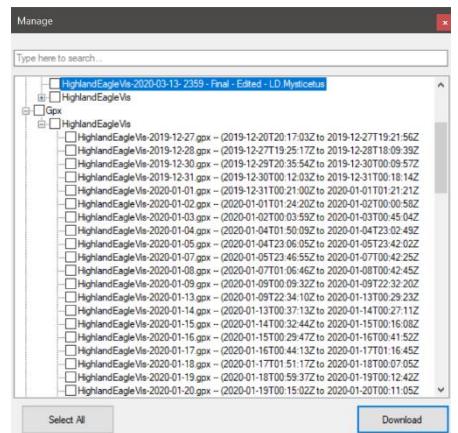


To confirm the GPX files were uploaded to the CLOUD data storage. Select the + under GPX then the + for your Vessel and confirm the GPX files are there for the day.

Mysticetus also displays the date and time range the Garmin collected data

There are two main errors to check for:

1. Failure to clear the GPS track after uploading the data the previous day. In this case the track will span multiple days.
2. Failure to upload the file at all. In this case it will simply be missing.



ONCLOUD DATA FLOW DASHBOARD

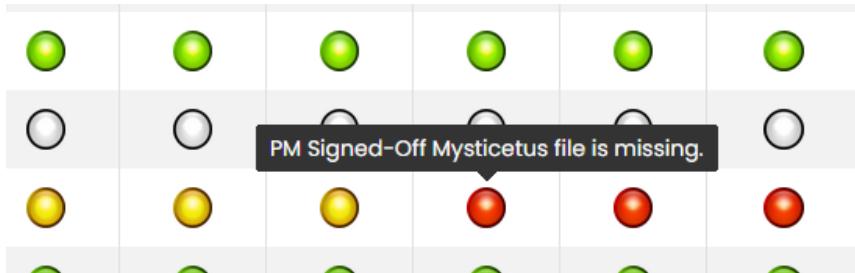
Mysticetus OnCloud maintains a dashboard that tracks compliance with the QA/QC steps required to marshal customer data into OnCloud. The project managers will have access to this dashboard to monitor for completion of major tasks.



Mysticetus – Project Manager Data Quality Assurance Procedures

Vehicle		May 10	May 09	May 08	May 07	May 06	May 05	May 04
+ Crew Test Vehicle (Equinor – Test – [TEST] Beacon Wind)		Grey	Grey	Grey	Green	Grey	Green	Green
- [REDACTED]		Grey	Yellow	Yellow	Yellow	Red	Red	Red
↳ Data Entry Complete		Grey	Green	Green	Green	Green	Green	Green
↳ End of Day QA Analysis		Grey	Green	Green	Green	Green	Green	Green
↳ Daily Report Generated		Grey	Green	Green	Green	Green	Green	Green
↳ PM Exposure Confirmation (IHA)		Grey	White	White	White	White	White	White
↳ PM Sign Off		Grey	Yellow	Yellow	Yellow	Red	Red	Red
↳ GPS Coverage		Grey	Green	Green	Green	Green	Green	Green
↳ GPX Upload		Grey	Green	Green	Green	Green	Green	Green

Typical dashboard appearance of a live project and a Mysticetus test project. The colored balls give a status at a glance. Green is good, yellow is pending, red needs follow up by the project manager.



Hovering mouse cursor over the concerned watchdog gives status.

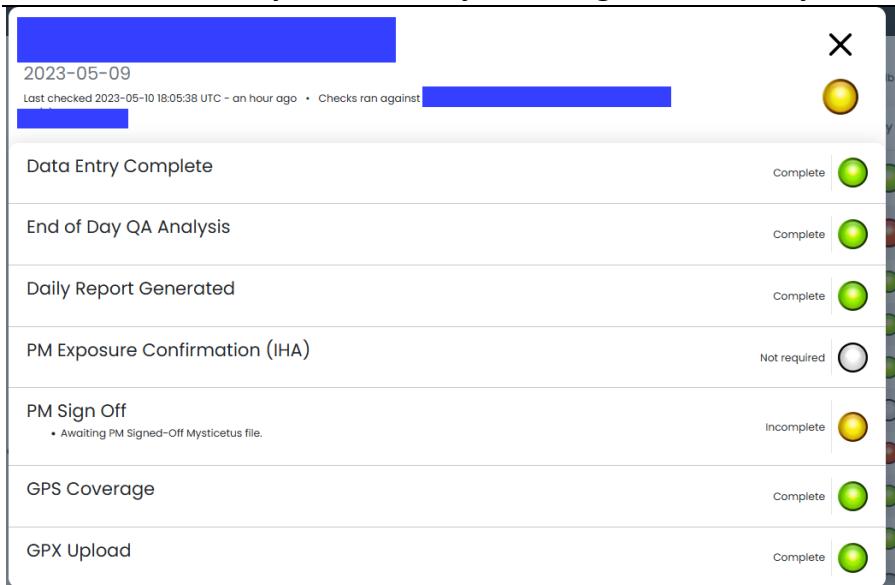
Legend

- Watchdog Ok - Watchdog(s) Concerned - Data Pending - No Data Collected - Not Required

A legend is provided to define the meaning of the respective colored balls aka “Gumballs”.



Mysticetus – Project Manager Data Quality Assurance Procedures



Clicking on a gumball gives an expanded view of the day's status and the last filename that was processed by Mysticetus OnCloud.

Defining the particular checks in OnCloud –

Data Entry Complete – This verifies a final, end of day save has been created by the PSO team.

End of Day QA Analysis - This verifies the lead PSO has run the Mysticetus Analysis tools to look for obvious mistakes in the data and that the lead PSO has reviewed the final save of the day then saved it off an ‘edited’ file.

Daily report Generated – This verifies that the lead PSO or project manager has run the daily report in Mysticetus OnCloud.

PM Exposure Confirmation – Verifies that the OnCloud IHA take tracker also referred to as the IHA suspected take tracker table is up to date for the given day.

PM Sign Off – Refers to the project manager reviewing the edited file for final corrections and has saved it as a ‘signed off’ file. This is the data the Offshore wind developer will hand off to the appropriate regulatory agencies as required by permit.

GPS coverage – looks for obvious holes in the GPS track. Gaps larger than about two minutes will require fix up by the project manager.

GPX upload – Verifies the daily upload of the back up GPS data, with a GPX file extension, has been uploaded by the lead PSO. The GPX file is used by the project manager to fix any gaps in the collected data. This is a critical backup to data value.



GIS ANALYSIS TOOLS

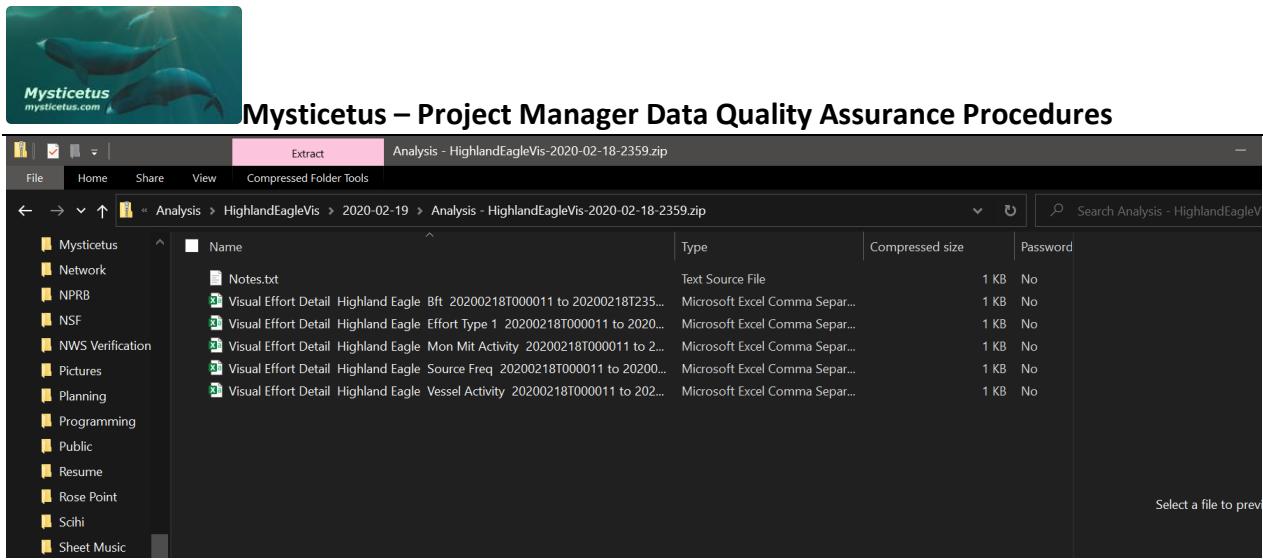
Mysticetus has a variety of standard analysis built in that display effort and sighting data and perform instant analysis over these data. These analyses are useful for spotting errors. Lead PSOs are instructed to run GIS analysis tools as part of their daily QAQC efforts.

As the project manager this is the starting path on your daily QAQC efforts. You should verify the Lead PSO has indeed run these tools. This is accomplished in the **Project -> Manage Project Files** window (like GPX upload).

Navigate to the **Analysis** folder and verify there is one for the day from the Lead PSO:

The screenshot shows a software interface titled "Manage". At the top is a search bar with placeholder text "Type here to search...". Below it is a file tree view. The tree starts with a root node, followed by a series of dates from 2020-02-12 to 2020-03-10. Under each date node, there is a single file entry: "Analysis - HighlandEagleVis-[date]-[timestamp].zip". The file for the date 2020-02-18 is highlighted with a blue selection box. At the bottom of the interface are two buttons: "Select All" and "Download".

Check the box, download this file – Mysticetus will automatically open it in File Explorer for you. The contents will look something like the following.



There will be a number of CSVs containing analysis, as well as a Notes file. Check the Notes file for any communication from the Lead PSO.

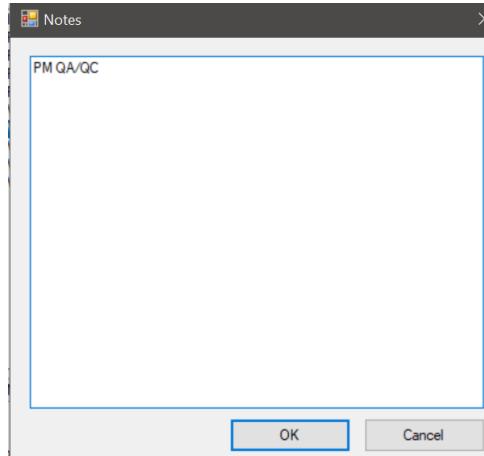
Then quickly scan through each of the CSVs in Excel (just double click) – the data in there should “make sense”. Effort totals should be appropriate, sightings should match expectations.

There should be no <Blank> or <No Data> Flags

There should be no Missing Track flags.

RUN THE GIS ANALYSIS TOOLS

You should run the GIS Analysis tools yourself (people downstream will be similarly checking that you did so). When prompted, indicate you are performing PM QA/QC:



Check that your results make sense, no <Blank> or Missing Track flags.

PROJECT MANAGER'S USE OF THE GIS ANALYSIS TOOL

If there are several updates and changes during the QAQC process to the data file – or if there are additional checks you want to make – you can run the GIS Analysis Tool as a final step of your review to ensure all issues are resolved.



Mysticetus – Project Manager Data Quality Assurance Procedures

The template provides standard reports for the various types of detections and effort.

NOTE: If the primary GPS fails or starts late during data collection, you will see a message in the reports stating *Warning: No GPS Track found for vehicle 'SS Minnow' at effort times: 2018-08-12 00:00:00.1 EDT, 2018-08-12 00:36:09.6 EDT.*

If the time loss is significant, more than 5 minutes in a 24-hour period, this requires a fix by the data analyst team from the secondary GPS information (the Garmin eTrex GPX data files). **Notify your data analyst contact to correct this issue.**

Also, if the GPS track is missing for only the first effort entry, this means the PSOs started Mysticetus without waiting for a GPS signal – this is a teachable moment: talk with the lead PSO to make sure this doesn't happen (there is a big red flashing light in the center of their screen until the GPS has a fix, they should not be ignoring that).

ISSUES TO LOOK FOR IN DAILY ANALYSIS REPORTS

The most common clue to a problem is a cell containing <blank> or <unknown>. These entries indicate a blank field in the Mysticetus file. There should be no blanks – this is an education opportunity for your PSOs.

Effort reports display distance and hours of effort. The total hours in an effort report should not exceed 24 hours.

If the report displays more than 24 hours, first confirm there is an OFF Effort row at the end of the day. If the OFF Effort row does exist and the effort report exceeds 24 hours – contact your data analyst to review the Vehicle Tracks and GPS data. The data file may have extra or duplicate tracks. If it slightly (a few minutes) exceeds 24 hours, this may be a slightly delayed restart of Mysticetus for the next day – **this is ok.**

Review the results from the LEAD PSO. Does the information in the analysis reports “Make Sense”? This is where your expertise and project requirements come in. These files are a summary of the day’s efforts. Looking for...

1. Missing & Incomplete data
2. Bft (Beaufort) ranges or time in certain values that do not make sense
3. Animal sightings that do not make sense for the region
4. Missing GPX track detail (at the top of the report)

A	B	C	D	E
1	Bft	Overall_Totals		
2	GPS Track coverage of effort: Complete			
3	2019-06-04 01:26:32.6 to 2019-06-04 03:55:52.5 UTC			
4				
5	Overall Le	36020.37		
6	3	8075.58		
7	4	27944.8		
8				
9	Overall Tir	8595598:33:27		
10		3 8595596:31:20		
11		4 2:02:08		
12				
13				

This is the TIME analysis test
This likely is a file missing an OFF-Effort Row. time should be 24 hours or less (depending on the effort for the day)



Mysticetus – Project Manager Data Quality Assurance Procedures

5. Overall time for visual effort that is greater than 24 hours. (this indicates either a missing OFF Effort row or PSOs did not shut down Mysticetus).
6. Overall time effort of less than 24 hours. Verify this makes sense. Did the Vessel dock and wasn't out for a 24-hour period or did the PSO crew shut down Mysticetus for the day prematurely?

Summary: The PM should **NOT** be finding errors. This is not a productive use of your time. 99.9% of errors should be caught and fixed on the boat. When a PM finds an error, this is an “educational opportunity” to teach the PSOs and their lead how to do it better.

It is expected that new projects and new PSOs will need a lot of coaching and instruction – the QA process is great for driving this discussion. After a week or so, PSOs should be generating nearly flawless data.

MANAGING YOUR ANALYSIS TOOLS

You own your set of analysis tools. You can remove them, modify their settings, or create all sorts of new ones yourself. Don't forget to deploy to the individual boats so they are included in the data gathered. You should probably consult with other interested members of your team before changing analysis settings and hence the analysis tools available to all of your vessels operating under the DeveloperVesselOperator project (as per below).

=====
More Details
=====

1. When running analysis, **you don't have to check all the boxes, all the time**. Uncheck the ones you don't want to run at that moment.

Analysis

<input type="checkbox"/> PAM Effort at Night
<input checked="" type="checkbox"/> PAM Effort Detail
<input type="checkbox"/> PAM Effort Outside Lease Area
<input checked="" type="checkbox"/> Sightings Summary
<input type="checkbox"/> Visual Effort - Garden State, Skipjack
<input checked="" type="checkbox"/> Visual Effort at Night

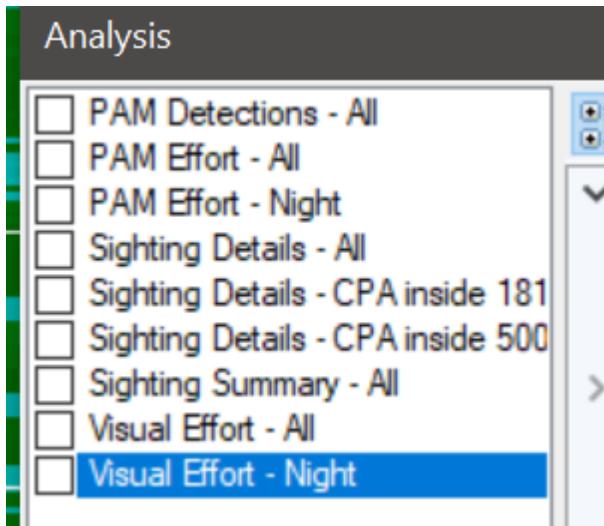
The above example will only run "PAM Effort Detail", "Sightings Summary", and "Visual Effort at Night", using their settings at that moment in time.



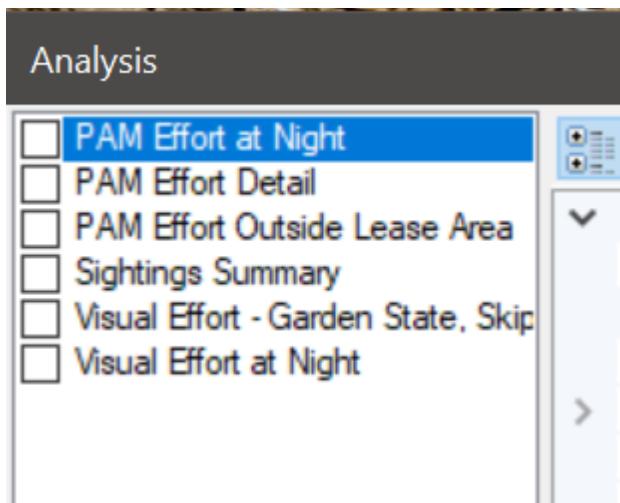
Mysticetus – Project Manager Data Quality Assurance Procedures

2. The set of available analysis tools is a compilation of:

(a) the "parent" Developer project, eg Ørsted, Equinor, Avangrid, etc, which has the following pre-configured analysis available to all PSO providers, should they choose to use them:



(b) the ("child") **DeveloperVesselOperator** project, which has analysis tools and settings a PSO operator supporting that vessel operator cares about at this moment, which might be:



3. In your **DeveloperVesselOperator** project, you can **delete whatever you want** (and deploy to the particular boat project).



Mysticetus – Project Manager Data Quality Assurance Procedures

Analysis

- PAM Effort at Night
- PAM Effort Detail
- PAM Effort Outside Lease Area
- Sightings Summary
- Visual Effort - Garden State, Skipjack
- Visual Effort at Night

New...

Remove

Report Start:

2000-01-01 00:00:00 PST

Re

31

4. You can **create new ones** in the **DeveloperVesselOperator** project that have whatever settings you want (and deploy to the boat project):



Mysticetus – Project Manager Data Quality Assurance Procedures

Analysis

- PAM Effort at Night
- PAM Effort Detail
- PAM Effort Outside Lease Area
- Sightings Summary
- Visual Effort - Garden State, Ski
- Visual Effort at Night

New... Remove

Analysis

Analysis Description	Analys
Analysis Name	PAM E
Edit	

Analysis Name

Report Start: 2000-01-01 00:00:00.0 PST

Report End: 3000-01-01 00:00:00.0 PST

Analyze...

5. You can modify any OrstedGardline settings (and deploy):

Analysis	
Analysis Description	Look at me annoying my fellow Gardline peeps by changing stuff in here without talking to them
Analysis Name	PAM Effort at Night
End Time	3000-01-01 23:59:59.9 PST
Polygons	We doan need no steenkin polygons
Start Time	2000-01-01 00:00:00.0 PST
Total by Day	No
Use Polygons	No
Effort	
Effort Bucket Fields(s)	PAM Effort
Effort Sheet	Yo Wazzup
Effort Vehicle	Ocean Observer
Restrictions	
Close-To Range	N/A
Close-To Vehicle	
Effort Restrictions	Breaking Things Woo!Dill = Pickles
Ignore States	Off
Ignore States Cell	PAM Effort
Stop State	I have so mangled these settings. mwahahaha
Stop State Cell	Vessel Activity

=====

One can delete or change whatever in the Analysis tools. Or if you find issues (like it just hangs forever), please let us know to take a look. Or if something seems out of whack in the Developer parent project, we can fix that too.



Mysticetus – Project Manager Data Quality Assurance Procedures

These tools are there for you the PSO provider. You can do what you want with them (settings, create, delete, etc.) in the **DeveloperVesselOperator** project, and you don't have to wait around for us to get to it.

Pro-Tip: please read any errors that pop up. Generally, there's a typo or old setting that no longer applies - (i.e. wrong field or sheet name). The error message will tell you precisely what it is looking for and can't find.

GIS ANALYSIS WITHIN POLYGONS

We recently added an update to how 'Use Polygons' works. The problem is there are approximately 14 million (give or take, well too many anyway) polygons in a given template, and running the effort analysis over all of them can take an unacceptable number of hours or days.

So now you can specify which polygons you want to run against:

The screenshot shows a software interface with a sidebar on the left containing icons for file operations (New, Open, Save, Print, Find, Sort, Help) and a search bar. The main area displays a configuration form with the following sections and settings:

- Analysis**
 - Analysis Description: Visual Effort - All
 - Analysis Name: Visual Effort - All
 - End Time: 3000-01-01 23:59:59.9 UTC
 - Polygons** (highlighted with a red box)
 - Start Time: 2000-01-01 00:00:00.0 UTC
 - Total by Day: No
 - Use Polygons: Yes- Effort**
 - Effort Bucket Fields(s): PSO 1,PSO 2,Effort Type 1,Effort Type 2
 - Effort Sheet: Visual Effort
 - Effort Vehicle: Ocean Researcher
- Restrictions**
 - Effort Bucket Fields(s)**
Name of field(s) (comma separated) that specifies effort type buckets.



Mysticetus – Project Manager Data Quality Assurance Procedures

For example (separate polygon names with a comma)

The screenshot shows the 'Analysis' configuration screen. On the left, a list of analysis types is shown with 'Visual Effort - All' checked. On the right, detailed settings for the selected analysis are displayed:

- Analysis**:
 - Analysis Description: Visual Effort - All
 - Analysis Name: Visual Effort - All
 - End Time: 3000-01-01 23:59:59.9 PST
 - Polygons: LeaseArea0500Only, LeaseArea0487Only
 - Start Time**: 2000-01-01 00:00:00.0 PST (highlighted with a red box)
 - Total by Day: No
 - Use Polygons: Yes
- Effort**:
 - Effort Bucket Fields(s): PSO 1,PSO 2,Effort Type 1,Effort Type 2,Vessel Activity,M
 - Effort Sheet: Visual Effort
 - Effort Vehicle: Ocean Researcher
- Restrictions**:
 - Start Time**: The analysis will only include values between Start Time and End Time.

At the bottom, 'Report Start:' and 'Report End:' fields are set to 2000-01-01 00:00:00.0 PST and 3000-01-01 00:00:00.0 PST respectively.

This can still take a decent amount of time depending upon your computer (like two hours), with the gazillions (or so) of track marks in that aggregate. Mysticetus does in-or-out polygon detection on each track mark...that takes time even on fast computers. But it doesn't take all year.

If you want to further reduce the time, reduce the number of Bucket Fields - Mysticetus iterates through all track marks (each 24-hour day is ~16,000 track marks) times each bucket field times each polygon.

EFFORT ANALYSIS USING ONCLOUD

Mysticetus OnCloud has automated many time-consuming tasks required for reporting. Notably here is effort analysis where data aggregation over days or months is required. OnCloud has automated the aggregation of data over any range of time for performing effort analysis. As a project manager you should have access to OnCloud today if your project is part of the Western Atlantic Wind development work underway.



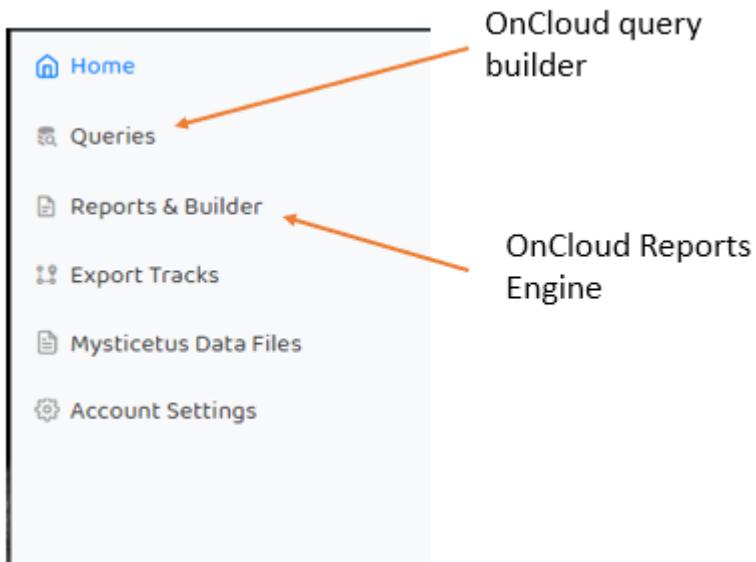
Mysticetus – Project Manager Data Quality Assurance Procedures

OnCloud is used to aggregate all “Final” saves made by the Lead PSO and the latest “Signed off” save made by the project manager. Oncloud does not see any other files outside of those two designations. This includes files edited and saved under the “other” directory.

OnCloud can be found navigating to: <Https://oncloud.mysticetus.com>

Upon initial login the project manager is presented with two options here.

First is the OnCloud query builder which allows for increasingly complex queries against a scope of data you define.



Second is the OnCloud reports engine. This pathway allows the lead PSO to generate their daily reports. Also available to the program manager is the ability to generate other report types.



Mysticetus – Project Manager Data Quality Assurance Procedures

Report Types to Generate*

Select a report type...

Detection Summary

Selecting this report type will prevent you from generating any other report types in this report.

Effort Analysis Detail

Selecting this report type will prevent you from generating any other report types in this report.

Lead PSO Daily Report

PM Signed-Off Daily Report

Here there are multiple report options as seen in the above figure. These reports are generated in a fashion analogous to the Mysticetus application. The big difference is the easy ability to generate for any range of data over the life of the project saving the project analyst hours if not days of effort to simply aggregate the daily data for analysis by any other means. The computational horsepower of a cloud based service too serves to dramatically reduce analysis time by many more hours to days. To capture the entire life of the project one can set the start date to an earlier year until current date. OnCloud will only analyze across existing data.

- 1) Detection summary for a given vessel/project pair. This report will summarize and tabulate all recorded detections for the specified time period.
- 2) Effort Analysis Detail – replicates the effort analysis model in Mysticetus. Bucketed fields are the data types desired for the effort analysis. Ignore stop states field is the field type to analysis for conditions where the data should be ignored for a particular analysis. Mysticetus defaults to the typical condition where the vessel is inactive during a stop at the dock.



Mysticetus – Project Manager Data Quality Assurance Procedures

Effort Analysis Detail

Data version type*

Signed Off

Data Types*

Visual Effort

Bucketed fields*

Ignore states field

Effort Type 1 | x

Ignore states

Off | x

Stop states field

Vessel Activity | x

Stop states

Anchored | x Docked | x

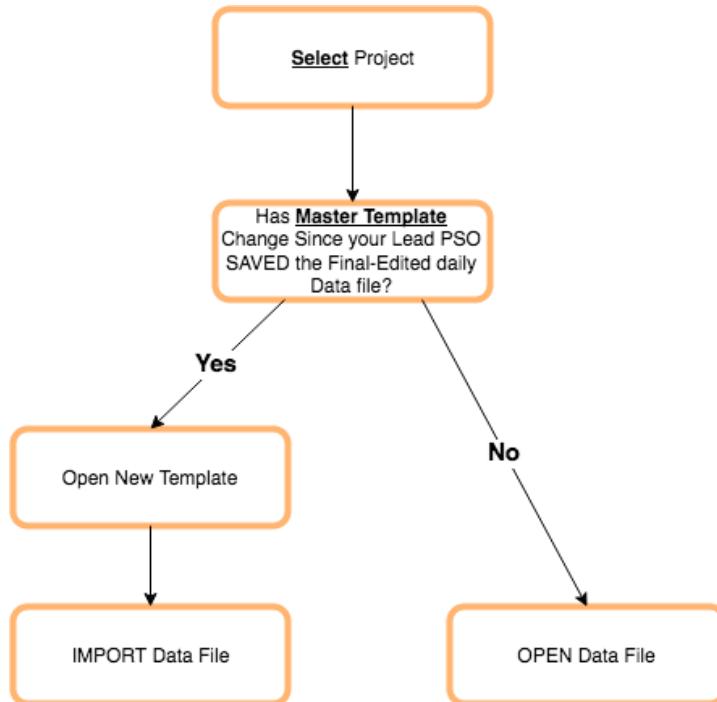
Bucketed fields*

- Air Temp
- Atmospheric Conditions
- Beaufort Sea State
- Borehole Drilling
- Chirps
- Cloud Cover
- Coring
- Vessel Activity | x



REVIEWING MYSTICETUS DATA FILES - OTHER

If the Mysticetus template has changed since the file you wish to QAQC was created, you must import the Mysticetus file into the most current Mysticetus template. If the Master template has not change then proceed to Opening a Data File



SELECT A PROJECT

These steps assume you have already subscribed to the project. If not see directions above.

1. Open Mysticetus Editor.

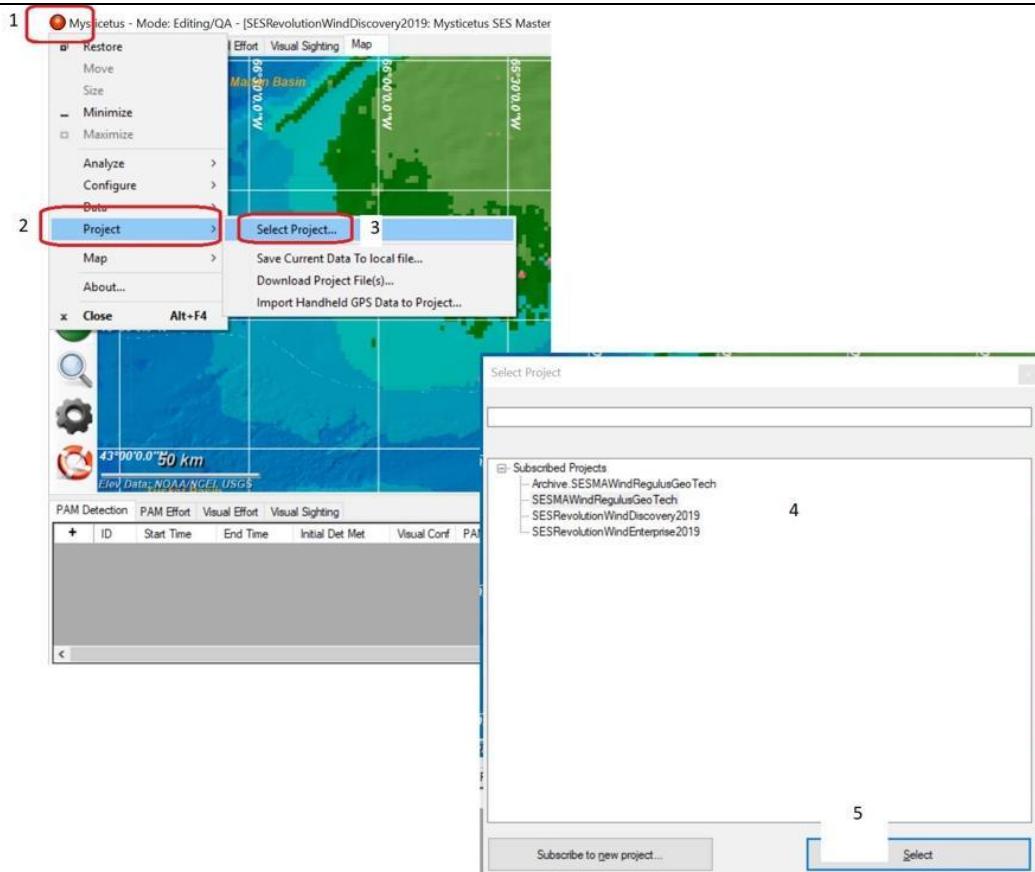
Select Red Ball > Project > Select Project. The Open dialog box appears.

Select your project from under the Subscribed Projects heading within the dialog box and then the **Select Project** button.

Hint: If you do not see your project, it is possible the **Subscribed Projects** heading is collapsed. Click the plus(+) sign adjacent to **Subscribed Projects** to expand the heading and see all projects to which you have subscribed.



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Hint: If you are managing one project or you do not need to switch between projects – you can skip this step. This is required to switch between projects.



OPEN TEMPLATE & IMPORT DATA FILE

If the Mysticetus template has changed since a file was created or this is your first-time running analysis, you must import the Mysticetus file into the most current Mysticetus template (because it has the most current definitions and GIS tools – the old file, from the old template does not contain these things).

1. Use Data > Import > From other Mysticetus file(s) to locate your file in the Edits directory.
2. Select your Mysticetus file and **Open**.

OPEN DATA FILE

1. Go to the Mysticetus main menu to retrieve the final data file:

Red Ball -> **Data** -> **Open Mysticetus File**



Navigate to “EDITS” and select the Mysticetus file marked “FINAL-edited-{Lead PSO’s Initials}”. This is a manual procedure to indicate the stage the data files are in. Note: There could be times this isn’t accurate – if in doubt, check with your Lead PSO for the final data file for the day and correct the naming convention during your data file save.

For example: DiscoveryVIS-2019-06-17-2359-Final-Edited-ND.Mysticetus

Click “Open”



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The screenshot shows a list of final save files in a 'Edits' window. The 'Edits' section header is highlighted with a red box. A specific file, 'DiscoveryVis-2019-06-17-2359 - Final - Edited - ND.Mysticetus', is also highlighted with a red box. A red arrow points to the 'Open' button at the bottom right of the window.

Perform the QA/QC effort

TO COMBINE MULTIPLE FINAL SAVE DATA FILES

When PAM data collection is underway in conjunction with Visual sighting work – two different final save data files are created and need to be merged for each date by the project manager. Another scenario this addresses is when a given collection day has several Final Saves. These need to be merged as part of the QA/QC process, typically by the lead PSO or project manager, then saved as an edited file as discussed further below.

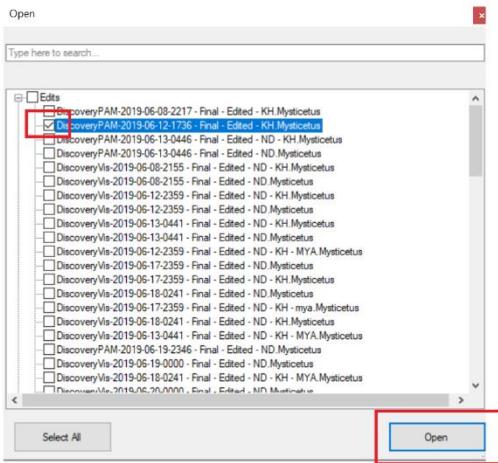
1. Open the daily VIS data files

The screenshot shows the Mysticetus software interface with a map. A context menu is open, with the 'Data' option highlighted with a red box. A sub-menu 'Import' is open, showing various options for importing data from other files. One option, 'From other Mysticetus file(s)...', is also highlighted with a red box.



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The **Open** dialog box appears.



Select the PAM file to combine with the VIS file. Click **Open**. On the next screen Select **IMPORT**

Several data fields are referenced from the Visual Effort tab. When you integrate PAM with visual Effort data files, you'll need to "recalculate the column".

- Mouse over the column
- Right click your mouse
- Select Recalculate formulas for Column.
- Repeat this for all columns that are auto filled and are missing data.

DMA Status	Vessel Activity	Source Freq	GPS Pos	Water Depth	Speed	Course
			Recalculate Formulas for Column	NaN	0 kts	0°
			Delete Rows Containing	NaN	0 kts	0°
			Delete Rows NOT Containing		0 kts	0°
			43°40'34.0"N 65°26'42.5"W		0 kts	0°
			43°40'34.0"N 65°26'42.5"W		0 kts	0°
			43°40'34.0"N 65°26'42.5"W		0 kts	0°
			43°40'34.0"N 65°26'42.5"W		0 kts	0°

Some of the data values are referenced from the Visual Effort tab. When you combined the two data files; need to "recalculate" the formula for the column. Mouse over the column header -> Right Click your mouse and select recalculate formulas for column

Once the merge is completed the QA/QC procedure can be followed.

QA/QC PROCEDURES AND PM SIGN OFF



INTRODUCTION

Data flow from daily, ongoing collection to final project manager (PM) sign off is designed to address the quality assurance and quality control procedures (QA/QC) that are increasingly common in the energy industry today. These processes are designed to address regulatory requirements and have become critical to addressing the terms of development permits common today.

Data flow, in summary, essentially works along these lines:

Active data collection -> Final end of day save -> lead pso QA/QC -> PM QA/QC -> PM Sign Off

Once the above is completed the PM then must record any take events discussed below. Take and suspected take tracking is evolving as the industry moves towards construction and change to these procedures can be expected over time.

PM QA/QC PROCEDURES

Data Procedures and checks are project specific. As the project manager, ***you are looking for information or data errors that do not make sense.*** Your expertise in the area and the project requirements is a critical step.

HIGH LEVEL ANALYSIS CHECK POINTS

1. Review GIS Analysis tools for issues

Review data fields per the data dictionary and QAQC checks

- a) Review all the fields, looking for blank cells, ensure all data fields are complete. If not, put an explanation in the notes (example: equipment down, didn't write down, etc.)

Below are a few common items to check

- b) Read notes, fix typos.
- c) Review the sighting records and attach any photos from the day to the proper sighting.
- d) Make sure the "Night" box is checked for all nighttime hours.
- e) Make sure DP thrusters are checked for any time that the thrusters are on or the correct equipment is noted as operating.
- f) Look for inconsistent times.
- g) Ensure that for every Mitigation request there is a Mitigation response.



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- h) Ensure sighting reports have the appropriate and correct data.
- i) Check that bearings and headings are entered correctly.
- j) Check that reticles and distances are appropriate.
- k) If times look off, note that Mysticetus uses whatever time the laptop is set to run. For example, if times in Mysticetus need to be in UTC, set the laptop's time to UTC.

Review, looking for anomalies. Check for blanks; go back to the Mysticetus user interface and fill in any blank cells there.

Look at the map to check for odd vessel track lines.

Remember: For any changes created by the PM or data analyst – a note must be added in the notes field with your initials stating the change.

SIGNING OFF DAILY DATA

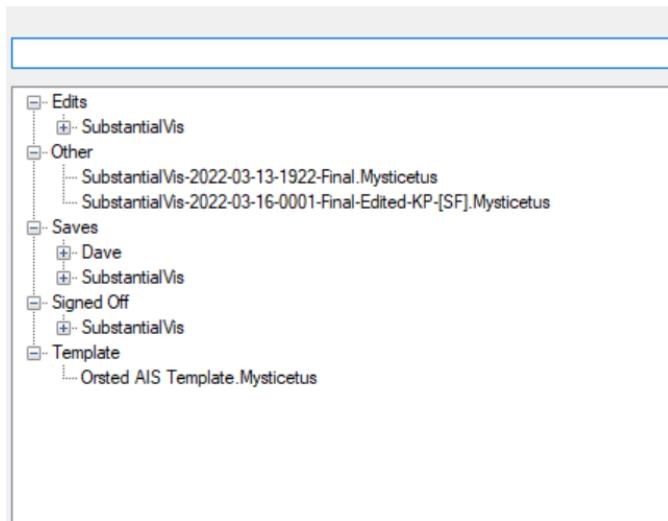
For 2021 and beyond the project manager must sign off the daily data within 72 hours of that day. The process for doing this is to open the edited file for that day. The edited file is essentially the final QA/QC file created by the Lead PSO as part of their end of day work. This is not the final save, but the resulting, edited file from the final save.

There are multiple files in the capturing and validating data for a given collection day. **Saves**, **Edits**, and **Signed Off** are of interest here and discussed below.

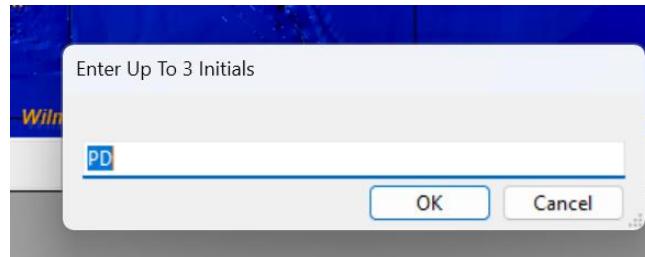


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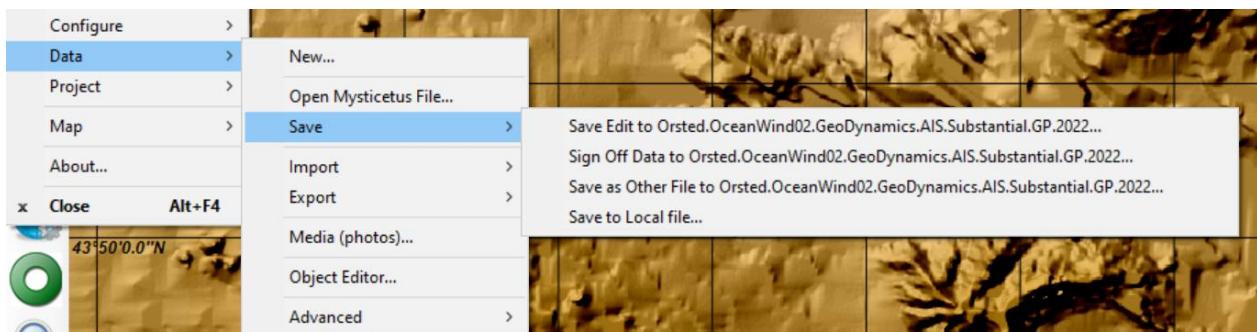
Open



Saves – this is where incremental saves and the final saves are stored. The Lead PSO will edit/validate the final save then they will ‘Save Edit to...’. Then enter your initials when prompted.



Mysticetus will complete the file naming convention and include the initials in the save file naming convention.



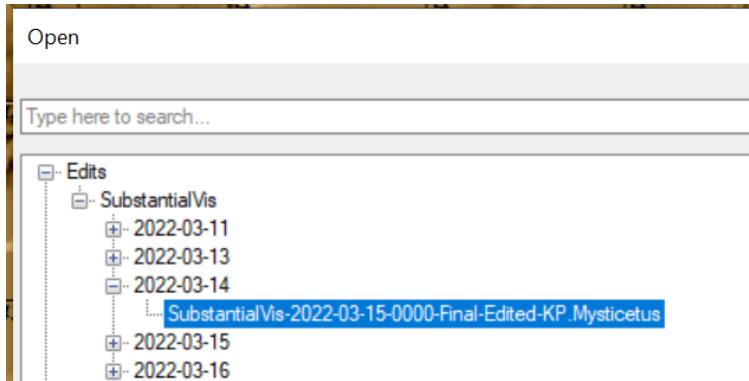
Edits – this is where the PSO’s QA/QC’d file is stored. The file names under Edits will indicate “Final-Edited” in its name here.

To sign off data the PM will **open the Final-Edited file**. Some things to check for:

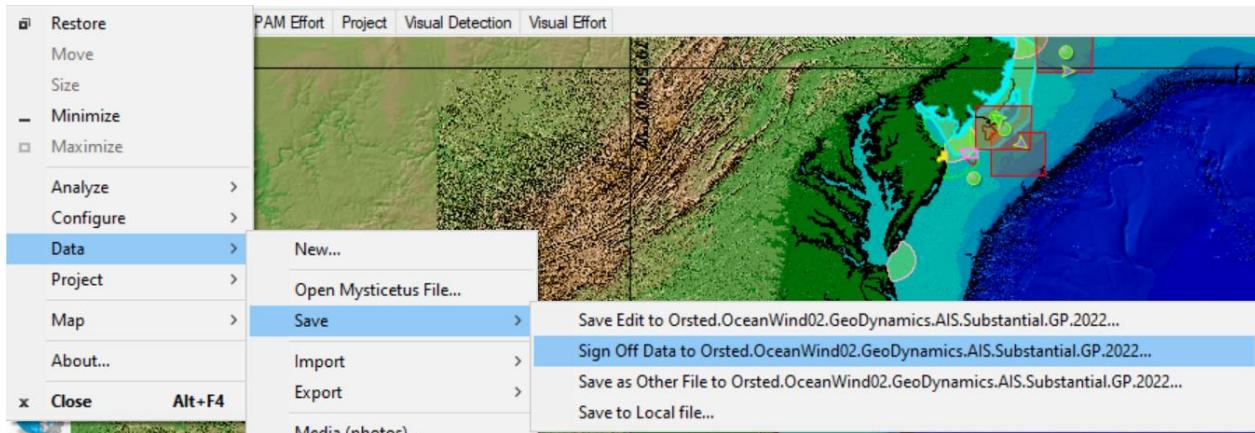


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- If the Final-Edited file is missing for the day of concern, reach out to your Lead PSO to finish this task or do it yourself. It really should be done by the lead PSO! **Note:** The absence of an expected file may be due to internet transmission delays off the boat.
- If there are multiple Final-Edited files, then open the latest save. To determine this, it will have multiple sets of initials. Open the file with the highest sets of initials – typically there is only one file.



Signed Off – this is where all signed off files are located. The PM, after reviewing the final, edited file by fixing any data entry errors, providing other edits such as determining critical events are correctly accounted for, and including useful images (your lead PSO should of done this) will save that file as the signed off file. You will save the “Signed Off Data to ...”. Below example is for an Ørsted project.



Other – this is where the project manager can work on files and store them off for later retrieval.



INPUTTING TAKES VIA ONCLOUD

New for 2021 is the IHA Take tracker in Mysticetus OnCloud services. OnCloud is now also being used for daily report generation by lead Observers, effort query analysis for report generation, and the general data query engine. It is incumbent on the PSO Provider's Project Manager or their delegate to enter takes via this tool. This data is viewable by the permit holder, typically the project developer (developer). The developer only has view access to this data as recorded by the PSO providers. Developer viewing of cumulative takes for any given IHA permit are cumulative across all active vessels in the permit area as well as take summaries per vessel. The PSO provider can only see takes relevant to the vessels they're contracted to.

Issued On: June 11, 2021 | Expires On: June 10,
As of 2021-07-19 8:20 PM UTC

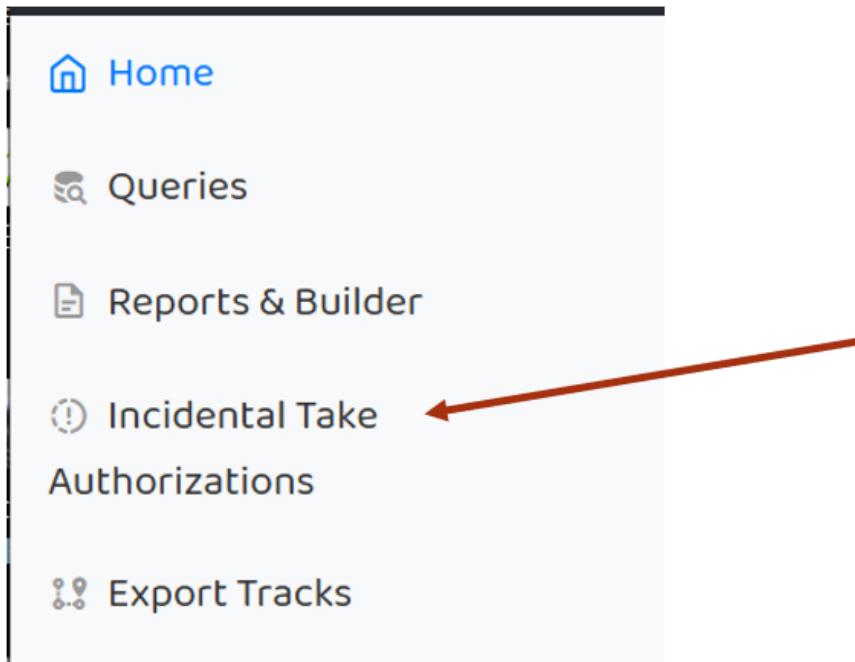
Species	Total Take Allowance	Aggregated Total Exposures
<		
North Atlantic Right Whale	14	0
Fin Whale	9	0
Sei Whale	1	0
Minke Whale	3	0
Humpback Whale	4	0
Sperm Whale	3	0
Atlantic white-sided dolphin	15	0
Atlantic spotted dolphin	9	0
Common Bottlenose Dolphin Offshore Stock	437	0
Common Bottlenose Dolphin Migratory Stock	1192	0
Short-finned pilot whale	10	0
Long-finned pilot whale	10	0
Risso's dolphin	30	0
Common dolphin	112	0
Gray seal	9	0
Harbor seal	9	0

An alerting mechanism exists to notify the developer when take counts are reaching permitted limits. The Incidental take tracker is found at <https://oncloud.mysticetus.com/permits/>. Contact



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Mysticetus staff for access if you do not have a login and feel you should or are having trouble logging in.



Clicking the above option will take you to the permits page allowing you to view any of the active permits your organization is working in. Click the “View” option to the right of the particular permit that you wish to view and add/edit takes. Only permits your marine observer service providers are supporting will be displayed for that provider.

Not all operations are governed by IHA permits and take reporting will not be required.

For more on IHA permits see both:

<https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>

<https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable>

The PM has the option to mark existing detections as takes or to add detections to a particular day as a take. The table allows for adding animals not included in the original permit. These entries will be appended to the end of the table and shown to be not included under permit terms.



Mark Takes for Garden State IHA

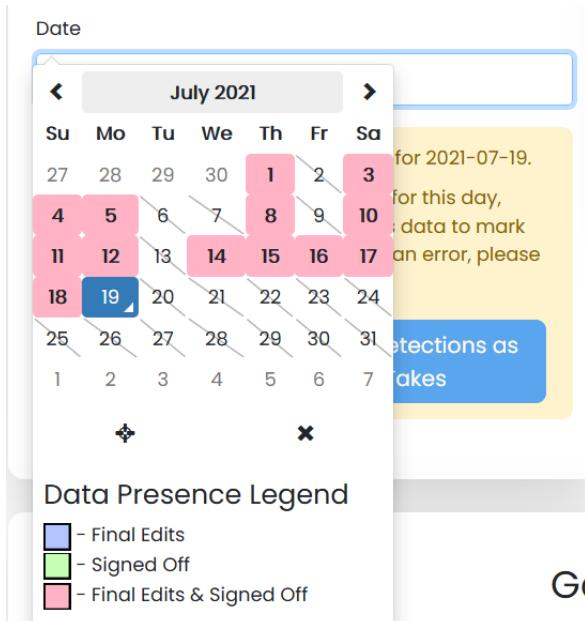
Vehicle

Select a vehicle ▾

Date

Please select a vehicle and date above to begin marking or entering takes.

First pick your vehicle under review from the drop down. Then you will pick the date for editing detections as takes. OnCloud will show you which days there are data for review as per the Data Presence Legend in the below image. Dates in which there is a diagonal slash through it indicates no available data.





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Upon selecting a day for marking takes the PM has two options to either “manually enter takes” which is effectively recording a new detection event or “mark recorded detections as takes”.

Date

2021-07-18

Ocean Researcher has no take(s) for 2021-07-18.

[Manually Enter Takes](#) [Mark Detections as Takes](#)

The above dialog indicates to you two things:

- 1) There are sighting detections.
- 2) That currently no sightings have been marked as takes.

Date

2021-07-07

Ocean Researcher has no take(s) for 2021-07-07.

This vehicle has no data recorded for this day, please select a new day which has data to mark or enter takes. If you believe this is an error, please contact info@mysticetus.com.

[Manually Enter Takes](#) [Mark Detections as Takes](#)

This dialog, above, indicates there is no recorded data on that day and thus no takes can be marked from detections or created manually. In short, pick another day or contact Mysticetus per the email alias shown. It is extremely important on any email reporting issues that very verbose information is provided: Vessel, IHA permit area, project filename in use that day, and what is expected.

MARKING DETECTIONS AS TAKES

Marking recorded detections as takes is the expected common way to indicate such events.

Clicking on “Mark Detections as Takes” takes you to the below example. The PM can then select which detections were take events as defined to you. In the below example you might select the detection ID V213 then click the Mark as Takes button to confirm your choice.



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Detections for 2021-07-16

Use the checkboxes below to mark which detections count as takes for the Ocean Researcher.

	Detection ID	Date & Time (UTC)	Species	Count	CPA Distance (m)	Exposure	Type	Mitigation Request	Mitigation Response	Miti
<input checked="" type="checkbox"/>	V213	2021-07-16 11:50	Unidentified Sea Turtle	1	13	true	Visual Detection	Shutdown	Shutdown	2021
<input type="checkbox"/>	V214	2021-07-16 12:16	Leatherback Sea Turtle	1	180		Visual Detection	Detection Delay	Detection Delay	2021
<input type="checkbox"/>	V215	2021-07-16 12:51	Leatherback Sea Turtle	1	140		Visual Detection	Detection Delay	Detection Delay	2021
<input type="checkbox"/>	V216	2021-07-16 12:57	Leatherback Sea Turtle	1	300		Visual Detection	Detection Delay	Detection Delay	2021
<input type="checkbox"/>	V217	2021-07-16 13:35	Unidentified Sea Turtle	1	15		Visual Detection	Detection Delay	Detection Delay	2021
<input type="checkbox"/>	V218	2021-07-16 14:06	Unidentified Sea Turtle	1	200		Visual Detection	Detection Delay	Detection Delay	2021
<input type="checkbox"/>	V219	2021-07-16 18:46	Unidentified Sea Turtle	2	336.423		Visual Detection	Other (see notes)	Other (see notes)	2021
<input type="checkbox"/>	V220	2021-07-16 19:19	Leatherback Sea Turtle	1	461.402		Visual Detection	None	None	

Showing 1 to 8 of 8 records.

First Prev **1** Next Last

[Close](#)

[Mark as Takes](#)

Then confirm your decision per the below:

Are you sure?

Selecting "Confirm" will mark no detections as takes for 2021-07-16.

[Confirm](#)

Any takes marked this way can be removed as well should further analysis require it.

COMMON ERRORS

For a complete listing of data fields; QAQC checks and definitions please see the project Data Dictionary.

The following section is for common and reoccurring errors in the data files.

Ensure that you document all changes you make to the file by adding your initials and an explanation in the Notes field.



EFFORT TABS

BLANK CELLS

Are there blank cells? As of July 1 2019 – all data fields must have a data value. If your Lead PSO or yourself find there isn't a value that meets the situation, address with the overall Project management and Mysticetus teams.

If you have a blank cell that should auto-fill from another tab, mouse over the column heading and select **Recalculate formulas for column**. This command prompts Mysticetus to get that data and add it here.

OFF EFFORT ROW

PSOs add an *off effort* row when effort stops, such as when the vessel is docked, at anchor, or at the end of the day for 24-hr operations. This row signals Mysticetus to stop tracking time and distance. An *off effort* row is a data row that has **Visual Effort** or **Effort Type 1** (depending on the template) set to **Off**.

PAM Detection	PAM Effort	Visual Effort	Visual Sighting		Time	Night	PSO 1	PSO 2	Effort Type 1	Effort Type 2	Vessel Activity	Source Freq	PCPT	DP Thrusters	Sparker	SBP	USB	
2015-06-21 19:51:09.3 UTC					2015-06-21 19:51:09.3 UTC	☐	Melissa Riley	Neil Duffy	UE	UE	Equipment test	Below 200 kHz	CPPT	Off	Off	Off	Off	
2015-06-21 19:55:02.9 UTC					2015-06-21 19:55:02.9 UTC	☐	Neil Duffy	Ashley Schrader	UE	UE	Equipment test	Below 200 kHz	CPPT	Off	Off	Off	Off	
2015-06-21 20:59:14.7 UTC					2015-06-21 20:59:14.7 UTC	☐	Tracy Petroske	Ashley Schrader	UE	UE	Equipment test	Below 200 kHz	CPPT	Off	Off	Off	Off	
2015-06-21 21:45:54.5 UTC					2015-06-21 21:45:54.5 UTC	☐	Tracy Petroske	Ashley Schrader	UE	UE	Equipment test	Below 200 kHz	CPPT	Off	Off	Off	Off	
2015-06-21 21:46:31.1 UTC					2015-06-21 21:46:31.1 UTC	☐	Tracy Petroske	Neil Duffy	UE	UE	Retrieving equipment	Below 200 kHz	CPPT	Off	Off	Off	Off	
2015-06-21 21:46:45.4 UTC					2015-06-21 21:46:45.4 UTC	☐	Tracy Petroske	Neil Duffy	UE	UE	Calibration Test	Below 200 kHz	CPPT	Off	Off	Off	Off	
2015-06-21 22:29:46.5 UTC					2015-06-21 22:29:46.5 UTC	☐	Tracy Petroske	Neil Duffy	UE	UE	Deploying equipment	Below 200 kHz	CPPT	Off	Off	Off	Off	
2015-06-21 22:57:02.4 UTC					2015-06-21 22:57:02.4 UTC	☐	Tracy Petroske	Neil Duffy	UE	UE	Transit	Below 200 kHz	CPPT	Off	Off	Off	Off	
2015-06-21 22:57:36.0 UTC					2015-06-21 22:57:36.0 UTC	☐	Tracy Petroske	Ashley Schrader	UE	UE	Transit	Below 200 kHz	CPPT	Off	Off	Off	Off	
87	2019-06-21 23:59:12.0 UTC	☐	Tracy Petroske	Ashley Schrader	Off							Equipment Test	Below 200 kHz	CPPT	Off	Off	Off	Off

For 24-hour surveys, *Mysticetus* requires a file boundary to happen at a regular time. An *off effort* row performs this function. This record is created when the Lead PSO or other PSO commits their final save of the collection day, midnight UTC.

The most common QAQC correction has been to add a missing *off effort* row. Ensure there are no blank fields in the *off effort* row. This problem has been minimized recently. To fix a missing off effort row perform the below.

- #### 1. Select the Visual Effort tab

Press Shift+Alt+Plus to add a new row and copy down all fields.

Set the time stamp correctly

Change the Visual (or PAM) Effort Type 1 to Off.

In the **Note** field, enter something like: "DS: Added off effort row"



NIGHT

Ensure **Night** is checked between the hours of nautical twilight after sunset and nautical twilight before sunrise. Nautical twilight changes each day and differs by location. If the time stamps and the **Night** checkbox look *off*, use a sunrise/sunset calendar to check the times for that day and location. <https://sunrisesunset.com/predefined.asp> is a good resource.

VESSEL ACTIVITY AND REGULATED SOURCES FIELDS

Ensure **Vessel Activity**, **Mitigation Source Status** (or **Sound Source Status**), and checkboxes for specific equipment make sense as a group. Additionally, there may be a field for **Source Frequency**. Notes for each effort row may indicate which equipment is active.

These fields are important as a group for the final report because we sort and restrict data based on these settings to provide charts, tables, and maps to show effort and sightings while various types of equipment are running.



SIGHTING TABS

Common errors include:

1. Are sighting id numbers sequential? Do they contain simply Vnum (e.g. "V32") instead of "My Awesome Visual Sighting 32" or "V32.1"? (PSOs sometimes think they are being creative, and instead are breaking downstream analysis)

Are there extra characters in the sighting id? For example, change VIS91 to V91.

Are there any blank fields? (GIS Analysis is a huge help here – you don't have to scan every field to find things).

A **Mitigation Request** field should have a corresponding **Mitigation Response** field.

Tip: To see both "halves" of a row at the same time, select the sighting tab in both the top and bottom pane of the Mysticetus screen. In the bottom pane, scroll to the far end of the row, to display the "last half" of the record.

MAPS

- Are the track lines the correct color?

On Effort = Green

Off Effort = Red

- Are there gaps in the line? (surveys started before July 2019 may have short gaps during lead PSO editing)
- Are there marine animals on land?

Tip: If your map appears empty, select the time stamp on any tab. Right-click to select **Position Vehicle at This Time**. Then select the **Toggle Follow Vehicle** control. The map will display your vessel's position at that time.

MISSING MEDIA

If there is a name in the **Image Credit** field mouse over the **Images** cell icon and ensure the media is attached. If not, this message appears:



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Images	Image Credit	Sgt Desc Notes
	Herman Melville	Adult. grey with dark spots
No Media. Click the down arrow to add some.		

1. Locate the missing media by opening Mysticetus saves from earlier in the shift. Use the time stamp of the sighting as a guide.
2. Click in the **Images** cell. The **Media** dialog box appears.
3. Select the image(s) and use the **Save** button to save them to your local computer.
4. Re-open the edited Mysticetus file.
5. Click in the **Images** cell. The **Media** dialog box appears.

Use the **Add** button to add the graphics from your local directory to the sighting record.

Like all missing data, this is a teachable moment for your lead PSO. They should be doing this on the boat.

MISSING TRACKS

If you see **Warning: No GPS Track ...** in an GIS

Analysis Tools -> Effort Report or the report

indicates a section of tracks is missing, there is a gap in the track details.

A	B	C	D	E	F	G	H	I
Rft	Overall_Totals							
		Warning: No GPS Track found for vehicle '(all)' at effort times: 2019-06-27 04:00:40.7 UTC 2019-06-27 04:00:40.7 to 2019-06-28 04:00:15.6 UTC						
	Overall Le	12739.1						
	1	2000.64						
	2	7093.23						
	3	1773.77						
	4	1871.45						
	Overall Tir	23:59:35						
	1	3:02:46						
	2	12:07:00						
	3	4:28:52						
	4	4:20:57						
	5							

The data analyst team needs to quantify and summarize effort for the Final Report. If there is a gap in the GPS track for that day, it needs to be addressed. A gap in the track is common at the beginning of the day during a 24 hour a day survey when the PSO restarts Mysticetus. This gap is



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usually negligible. If the gap is significant (more than 15 minutes), you need to repair that gap. Mysticetus attempts to prevent these gaps, we've found these attempts can be defeated.

This requires the data analyst to import the daily GPX files from the Garmin Handheld.

A	B	C	D	E
1	Bft	Overall_Totals		
2	GPS Track coverage of effort: Complete			
3	2019-06-21 00:00:29.6 to 2019-06-21 23:59:12.0 UTC			
4				
5	Overall Le	164994.1		
5	2	38853.27		
7	3	35621.22		
3	4	49163.82		
9	5	41355.81		
0				
1	Overall Tir	23:58:42		
2	2	5:26:03		
3	3	6:07:55		
4	4	7:56:21		
5	5	4:28:24		
6				

PROJECT MANAGER CHECK LIST

Once the Lead PSO completes the daily QAQC review. Project managers perform an analysis of the data quality prior to having the data analyst team review and aggregate the daily data for submittal against permit requirements.

Description

1	Start the Mysticetus Editor program	
2	Select your project	
3	Confirm Garmin GPX files are in Cloud Storage	
4	Review daily email communication from Lead PSO	
5	Confirm Lead PSO ran the GIS analysis files	
6	If project has PAM – ensure PAM files are combined (merged) into one file with the Visual sighting file	
7	Review the Lead PSO's GIS analysis files. Check NOTES data file for communication. Ensure nothing is of concern in the reports.	
8	Open the daily data file from Mysticetus. This is the one labeled [Project Name][File Date and time]-[Final]-[Lead PSO Initials]	
9	Run the GIS Analysis Reports	
10	Review data for issues and quality problems. Check for abnormal data and no missing data.	



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11	Confirm Off Effort Rows occur when Docked; at anchor or at the end of the day for 24-hr operations.	
12	<p>Review Map.</p> <p>Track lines correct color?</p> <p>On effort = Green</p> <p>Off Effort = Red</p> <p>Are there gaps in the Line (review the GIS Analysis tools for GPS Gaps)</p> <p>Are marine animals on land?</p>	
13	Review sightings – is all information complete	
14	If have PAM operations – review PAM tabs for completeness.	
15	Save a new copy of the data file with your initials	
16	If you made significant changes run the GIS analysis reports to ensure all issues are resolved.	
17	Notify Data Analyst of issues you are unable to resolve (for example track lines)	
18	Follow up with Project managers/Mysticetus of issues that require review (for example new values in the drop-down fields)	
19	Follow up with Lead PSO on training issues/common issues found	
20	Mark takes as they occur in the Mysticetus OnCloud IHA take tracker	
21	Perform the daily sign off of the ‘edited’ data file	