

Standard Operating Procedure (SOP) #17

Preparing YSI Files for Importing into the Database

Version 5.02 (June 10, 2024)

Change History

New Version #	Revision Date	Author	Changes Made	Reason for Change	Previous Version #
2.0	7/18/2018	Kelly Kozar	Updated instructions for processing YSI files in the KorEXO software	The KorEXO software has changed and the instructions in this SOP no longer apply	1.0
2.01	3/7/2019	Kim Weisenborn	Updated instructions for processing YSI files in Ecowatch Lite software, and instructions for file locations and naming conventions	Some instructions were unclear	2.0
3.0	11/12/2020	Kim Weisenborn	Updated KorEXO procedures and screenshots for clarity and to fall in line with the latest software version. Removed file locations and naming conventions section and referred to the WQ YSI Processing Steps SOP instead.	Previous steps and screenshots were out of date. File locations and naming convention guidance already exists in SOP_WQ_data_processing_steps.docx and is identical. Best practice to only update in one location.	2.01
4.0	2/5/2021	Kim Weisenborn, Glauco Puig-Santana, Amanda McCutcheon, Anne Farahi	Added section about preserving .bin files from the sonde into the I:\ drive. Refined instructions for processing FW & BB vs. MR YSI files. Added references to other reference material (SOPs and user manuals); other pertinent updates.	Important information for preserving .bin files. Previous info was no clear on processing different file types (FW, BB, MR).	3.0
5.0	2/26/2021	Kim Weisenborn	Removed content about YSI 6600 data sonde and YSI file processing in Ecowatch; updated to NRR formatting; renumbered SOP from #17 to #15	We no longer use the YSI 6600 data sonde; formatting needed to be applied; some SOPs were removed or renumbered within the protocol	4.0
5.01	3/15/2022	Kim Weisenborn	Updated content to refer to new PACN I&M SharePoint. Updated figures to reflect change.	PACN data is no longer stored on a networked server (I:\ drive) and is now stored on the PACN I&M SharePoint site.	5.0
5.02	6/10/2024	Kim Weisenborn	Renumbered SOP from #15 to #17. Updated SOP references. Added	A new SOP has been added to the protocol therefore some SOP	5.01

New Version #	Revision Date	Author	Changes Made	Reason for Change	Previous Version #
			steps to upload raw and clean files to SharePoint.	reference #s have changed.	

Only changes in this specific SOP will be logged here. Version numbers increase incrementally by hundredths (e.g., version 1.01, version 1.02) for minor changes. Major revisions should be designated with the next whole number (e.g., version 2.0, 3.0, 4.0). Record the previous version number, date of revision, author of the revision, changes made, and reason for the change along with the new version number.

Purpose

This SOP gives detailed instructions on how to download data from the YSI EXO2 Multi-parameter Data Sonde, process the files using the KorEXO® software, and upload the files to the [Water Quality project workspace](#) on the PACN I&M SharePoint site¹. This SOP also discusses how to create a SharePoint shortcut on the user's computer in order to import the processed YSI files into the Water Quality Monitoring Database, however thorough procedures for the actual importing are found in the [Water Quality Monitoring Database Users Guide](#).

***Note:** If at any time you find that the EXO handheld or sonde will not connect with the KorEXO software, please check that you have the latest version of the software². This is a frequent issue as our computers will not automatically install software updates nor will we receive any notification of an update. If you discover a new software update and that software version is not already in the [KOR-EXO software folder](#) in SharePoint, please let the PACN Data Manager and the PACN Aquatic Lead know. Submit a helpdesk ticket to have the software updated on your computer.*

User Manuals

- [EXO User Manual](#)
- [EXO Handheld Operation Guide](#)

Both User Manual PDF documents are located the [Water Quality Monitoring Database Documentation](#) in SharePoint.

¹ PACN I&M SharePoint site, <https://doimspp.sharepoint.com/sites/nps-PWR-PACNIM> (last accessed 10 June 2024).

² YSI Software Downloads, <https://www.ysi.com/customer-support/software-firmware-downloads/software> (last accessed 10 June 2024).

KorEXO Settings and Parameters

In the KorEXO software, update the settings shown in the steps below before opening the YSI data files for the first time.

1. Click on **File** in the left-hand corner of the KorEXO main screen (Figure SOP 17.1).

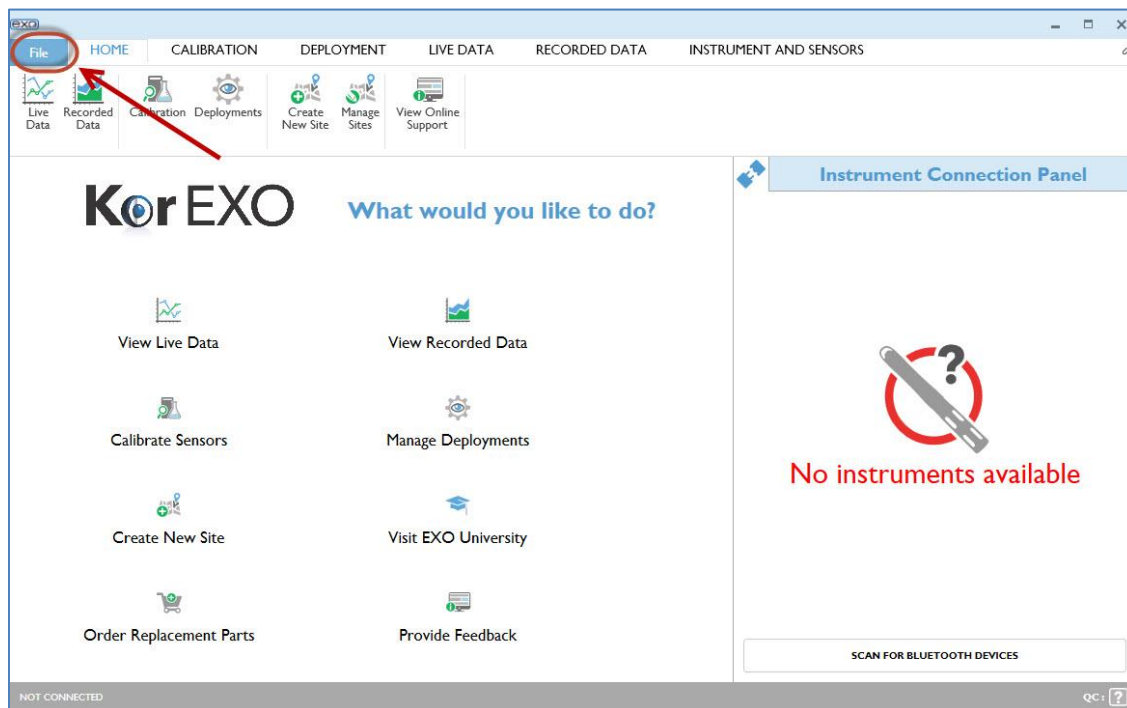


Figure SOP 17.1. Opening the File menu in KorEXO.

2. Click on **Settings** on the left-hand side to open the Settings window (Figure SOP 17.2).

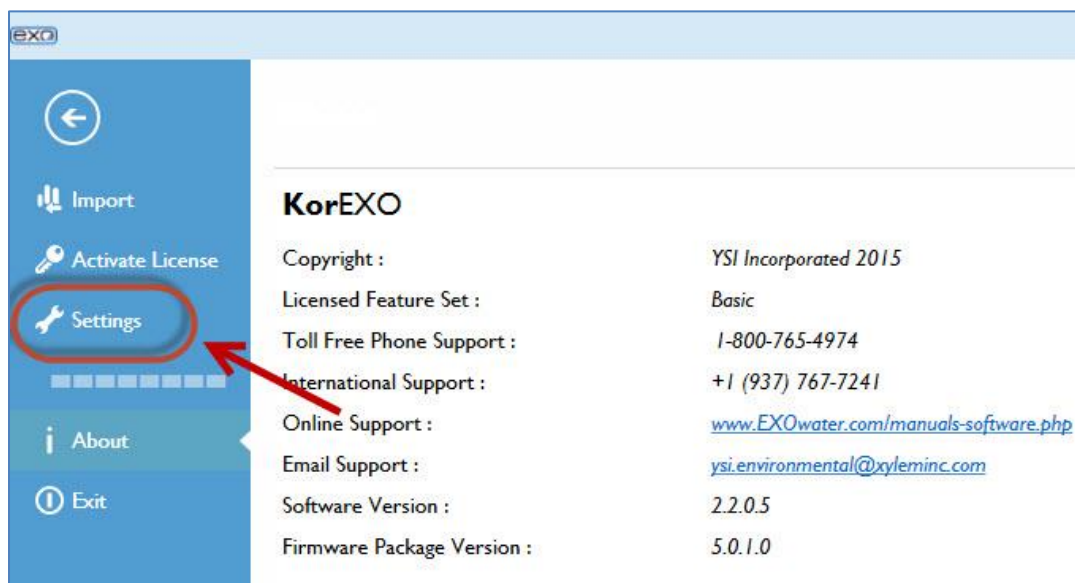


Figure SOP 17.2. Opening KorEXO settings menu.

3. In the General Settings tab and under the File Export section, make sure you select "**Use ',' as delimiter**" for the CSV Delimiting Character field and set the CSV Export Type as "**With Header**". Leave the default settings for the other fields as seen in Figure SOP 17.3.

Settings

ISE DO ORP PAR pH Sonde Temperature Turbidity Wiper
General Settings Algae Barometer Conductivity Chlorophyll Depth fDOM GPS

AUTOMATION SETTINGS

Automatically Update Software and Firmware
Off ☐

Automatically Download Data from Instrument to PC
On ☒

Automatically Connect to Instrument
Off ☐

Automatically Update Instrument Time to PC Time
On ☒

FILE EXPORT

CSV Delimiting Character: Use ',' as delimiter

CSV Export Type: With Header

STARTUP OPTIONS

Require User Login
Off ☐

LANGUAGE SETTINGS

Select Language: English (United States)

Override Regional Settings
☒ Use Selected Language Regional Settings
☐ Use Local OS Regional Settings

Figure SOP 17.3. Settings menu in KorEXO.

4. Choose from the parameters across the top of the Settings window to set defaults for each parameter. Click on each successive parameter and make sure to only select the necessary options (Figure SOP 17.4 to 17.12). **All other parameters should be marked as disabled**, so make sure to click on each of the parameter buttons and disable any parameters not listed below. Click **Save** when done.

Barometer (psi)

Settings

General Settings **Barometer** BGA

BAROMETER

☒ BAROMETER ENABLED

☐ mmHg

☐ mbars

☐ inHg

☒ psi

☐ kPa

☐ Atm

Figure SOP 17.4. Barometer parameter settings.

Algae (a.k.a. BGA) – Phycocyanin ($\mu\text{g/L}$) and Phycoerythrin ($\mu\text{g/L}$)

Settings

ISE DO **ORP** PAR

General Settings **Algae** Baromet

PHYCOCYANIN

RFU
Off ☐

☒ $\mu\text{g/L}$
On

cells/mL
Off ☐

PHYCOERYTHRIN

RFU
Off ☐

☒ $\mu\text{g/L}$
On

cells/mL
Off ☐

Anchialine pools, brackish, or freshwater sites

Anchialine pools, brackish, or marine sites

Figure SOP 17.5. Algae parameter settings.

Conductivity – Specific Conductivity (mS/cm) and Salinity (ppt)

Settings

ISE DO ORP PAR pH **Conductivity** So

General Settings Algae Barometer

CONDUCTIVITY

SPECIFIC CONDUCTIVITY

+ SPECIFIC CONDUCTIVITY ENABLED

☐ $\mu\text{S}/\text{cm}$

☒ mS/cm

RESISTIVITY

TDS

SALINITY

+ SALINITY ENABLED

☐ psu

☒ ppt

Figure SOP 17.6. Conductivity parameter settings.

Chlorophyll ($\mu\text{g}/\text{L}$)

Settings

ISE DO ORP PAR pH Sonde **Chlorophyll** Temperat

General Settings Algae Barometer Conductivity

CHLOROPHYLL

RFU

Off ☐

☒ $\mu\text{g}/\text{L}$

cells/mL

Off ☐

Figure SOP 17.7. Chlorophyll parameter settings.

Depth – Depth (m) and Gage Pressure (psi g)

Settings

ISE DO ORP PAR pH Sonde Temperature
General Settings Algae Barometer Conductivity Chlorophyll **Depth**

DEPTH

☒ DEPTH ENABLED

☒ m

☐ ft

VERTICAL POSITION

ABSOLUTE PRESSURE

GAGE PRESSURE

☒ Gage Pressure Enabled

☒ psi g

☐ bar g

Figure SOP 17.8. Depth parameter settings.

Dissolved Oxygen (DO) - %Sat and MG/L

Settings

General Settings Algae

ISE **DO** ORP

^ % SAT

% Sat

On ☒

^ MG/L

mg/L

On ☒

^ % LOCAL

^ % LOCALB

Figure SOP 17.9. Dissolved oxygen parameter settings.

pH

Settings

General Settings Algae Barometer Co

ISE DO ORP PAR **pH**

^ PH

pH

On ☒

mV

Off ☐

Figure SOP 17.10. pH parameter settings.

Temperature (C°)



Figure SOP 17.11. Temperature parameter settings.

Turbidity (FNU)



Figure SOP 17.12. Turbidity parameter settings.

Downloading YSI Data from the Handheld or Sonde

If you collected **attended data** using the smaller EXO2 sonde with the handheld, then data are stored on the handheld (typically for freshwater and brackish locations). If you collected **unattended data** using the larger EXO2 sonde with no handheld, data will be stored on the EXO2 sonde (typically for marine locations). Proceed with the appropriate section below.

Downloading Data from the EXO Handheld

1. Open the KorEXO software.
2. Plug the micro USB connector cable* into the micro USB port located at the top of the handheld. Next, plug the USB connector on the other end of the cable into a USB port on your computer.

***Note:** the micro USB port/connector cable is the same cable that is used to charge the handheld.

3. Turn on the handheld and click **Connect** (Figure SOP 17.13).



Figure SOP 17.13. Connecting the handheld to the user's PC.

4. YSI data should start downloading automatically from the handheld to KorEXO; if it does not, click **Start Download from Device** to download the YSI data (Figure SOP 17.14). YSI data will be downloaded as BIN (.bin) files to *C:\Users\[User Name]\Documents\YSI\EXO Exports\Archive*.



Figure SOP 17.14. Downloading the YSI data from the handheld to the user's PC.

Downloading Data from the Larger EXO2 Sonde (marine):

1. Data collected directly on the larger EXO2 sonde will automatically download when you stop the unattended deployment using the KorEXO software. If you did this, skip to Step 6. If you stopped the deployment using the Handheld or you do not find the BIN (.bin) files in the folder as described in Step 6, the data have not yet been downloaded. Proceed with Step 2 here.
2. Open the KorEXO software.

3. Turn on the Bluetooth signal on the sonde using the magnet wand. Blue lights will begin flashing on the instrument. Ensure that your computer's Bluetooth receiver is on. Alternatively, plug the micro USB connector cable into the micro USB port located at the top of the USB adapter ([EXO Signal Output Adaptor - USB | ysi.com](http://www.ysi.com)) and plug the adapter into the appropriate port on the top of the EXO sonde. Next, plug the USB cable into a USB port on your computer.
4. If using the Bluetooth method, click “**SCAN FOR BLUETOOTH DEVICES**”. The computer will search and find the sonde (Figure SOP 17.15). You may have to click the scan button more than once especially if this is the first time you have connected this sonde to the computer. If using the USB adapter, skip to Step 5.

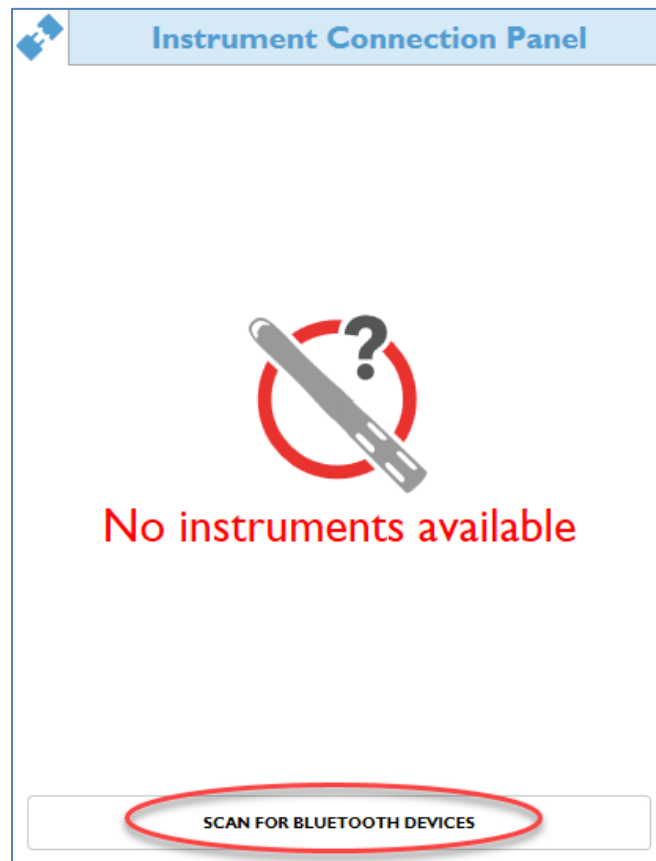


Figure SOP 17.15. Scanning for the sonde using Bluetooth.

5. For both means of connection (Bluetooth and USB adapter), click connect (Figure SOP 17.16).

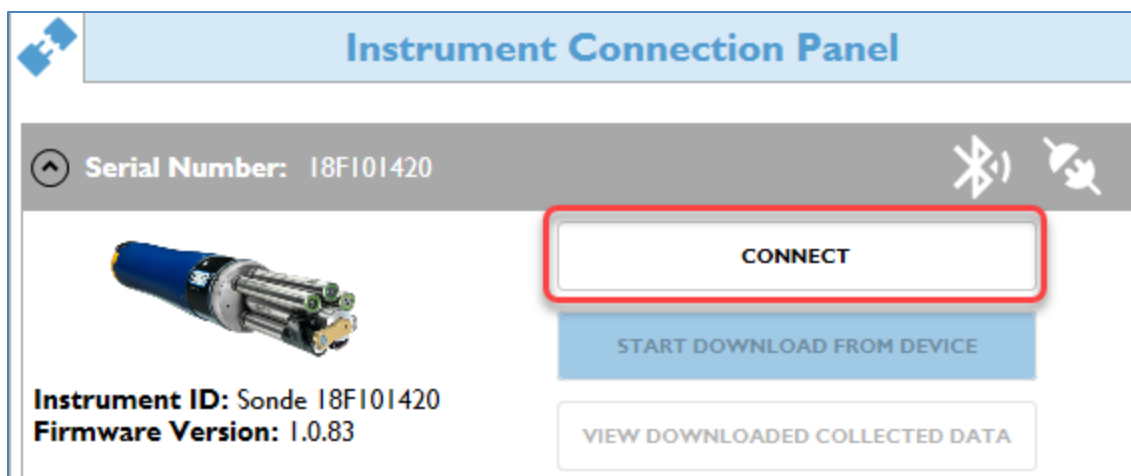


Figure SOP 17.16. Connecting the sonde to the user's PC.

6. YSI data should start downloading automatically from the sonde to KorEXO; if it does not, click **Start Download from Device** to download the YSI data (Figure SOP 17.17). YSI data will be downloaded as BIN (.bin) files to *C:\Users\[User Name]\Documents\YSI\EXO Exports\Archive*.

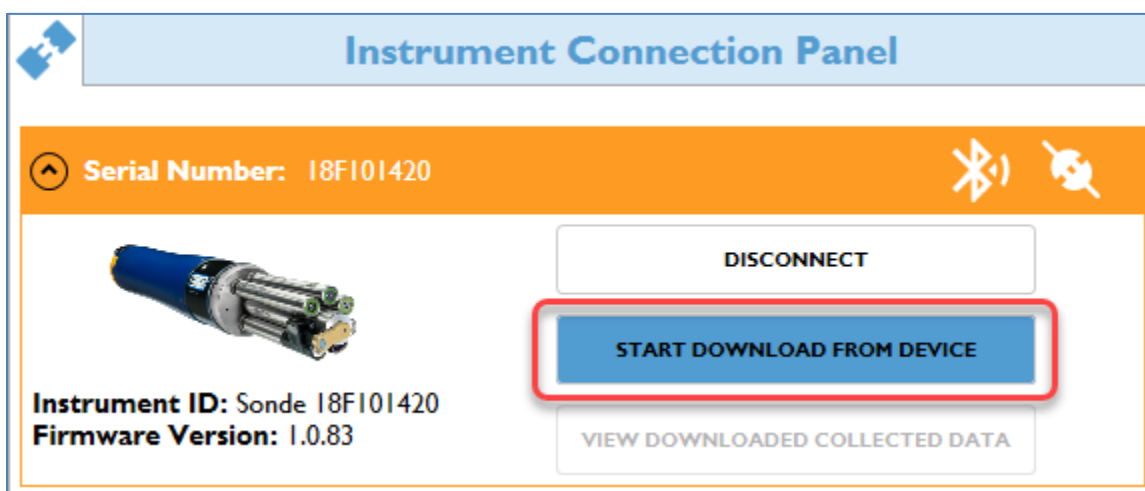


Figure SOP 17.17. Downloading the YSI data from the sonde to the user's PC.

Importing/Exporting Data to/from KorEXO

Import Binary File

** The following steps in this section are only necessary if you are working with data that you did NOT download directly from a handheld. If you downloaded the data onto your computer directly from the handheld as described above, skip to the [View Data](#) section below. **

To open BIN (.bin) files that were uploaded from a YSI EXO2 sonde they will need to be imported into KorEXO.

1. Navigate to *C:\Users\[User Name]\Documents\YSI\EXO Exports\Archive* and save the binary file(s) that you would like to open.
2. Open the KorEXO software.
3. Click on **File** in the left-hand corner of the KorEXO main screen (Figure SOP 17.18).

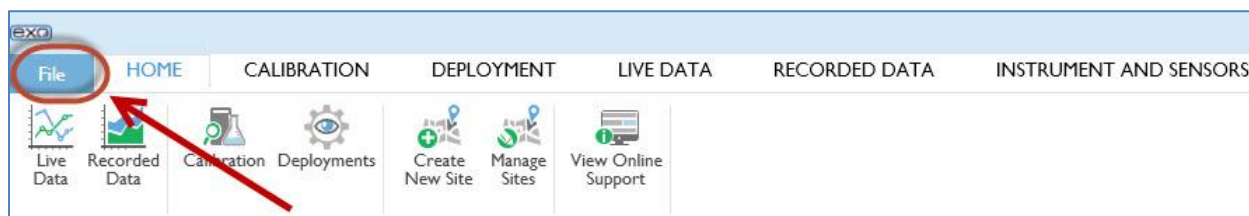


Figure SOP 17.18. Opening the File menu in KorEXO.

4. Click on **Import** on the left-hand side (Figure SOP 17.19).

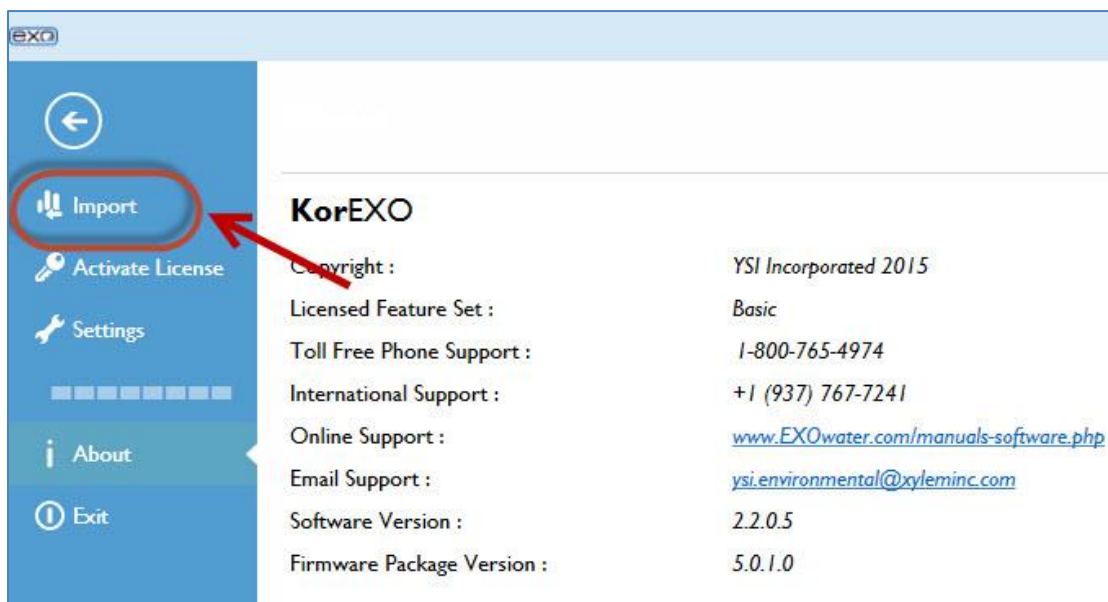


Figure SOP 17.19. Opening the Import menu in KorEXO.

5. Click on “**IMPORT EXO BINARY FILE**” to import the binary or BIN (.bin) files (Figure SOP 17.20).



Figure SOP 17.20. Importing the EXO binary files.

6. Navigate to *C:\Users\[User Name]\Documents\YSI\EXO Exports\Archive* and select the binary files that you would like to import—you can select one or all of the binary files that you want to import at once (e.g., Ctrl + click, or Ctrl + A for all files). Click **Open** to import the files (Figure SOP 17.21). Make sure to see the message, “All files uploaded successfully” after import.

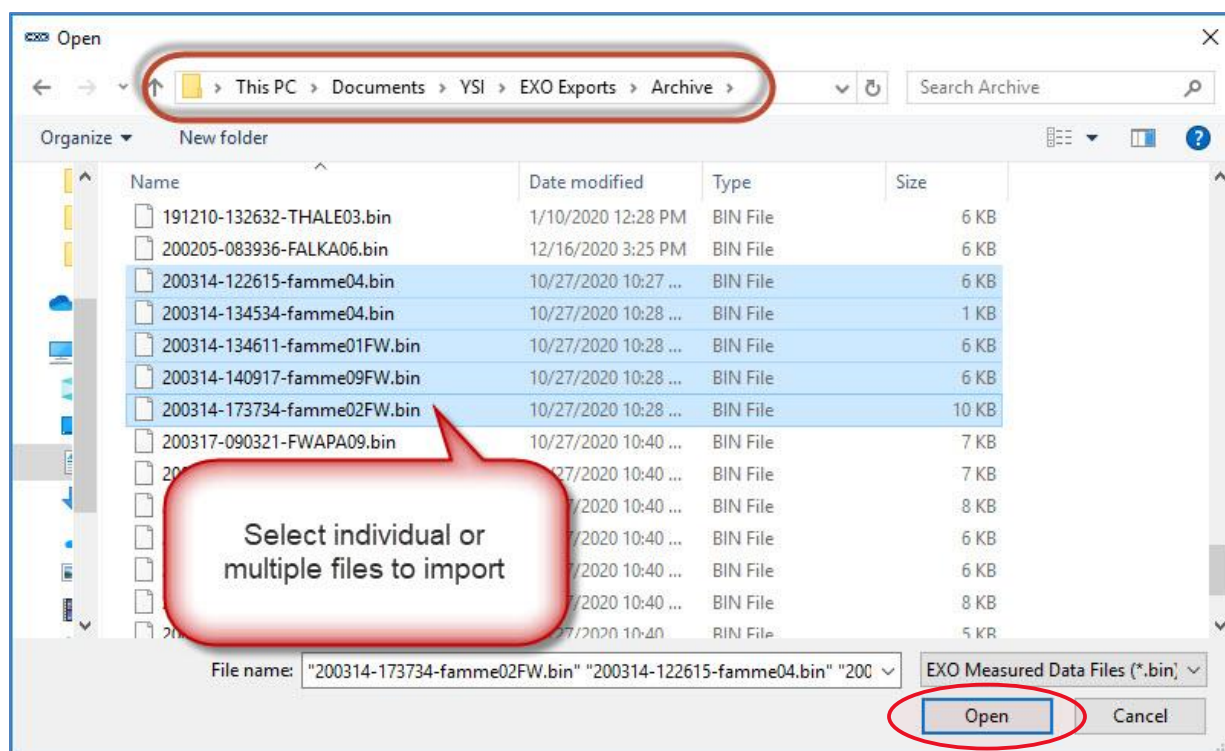


Figure SOP 17.21. Selecting the binary files for import.

- Once files have been imported, click the back-arrow button to return to the KorEXO main screen (Figure SOP 17.22).

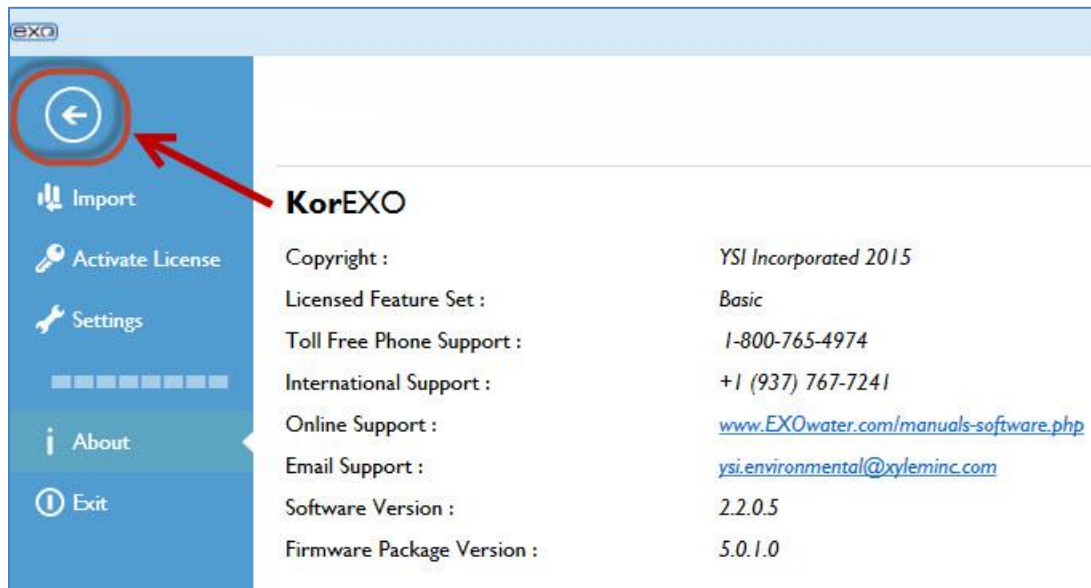


Figure SOP 17.22. Returning to the KorEXO main screen.

View Data

Next view the data from the BIN (.bin) file.

- Click on **View Recorded Data** or **Recorded Data** at the top of the KorEXO main screen (Figure SOP 17.23).

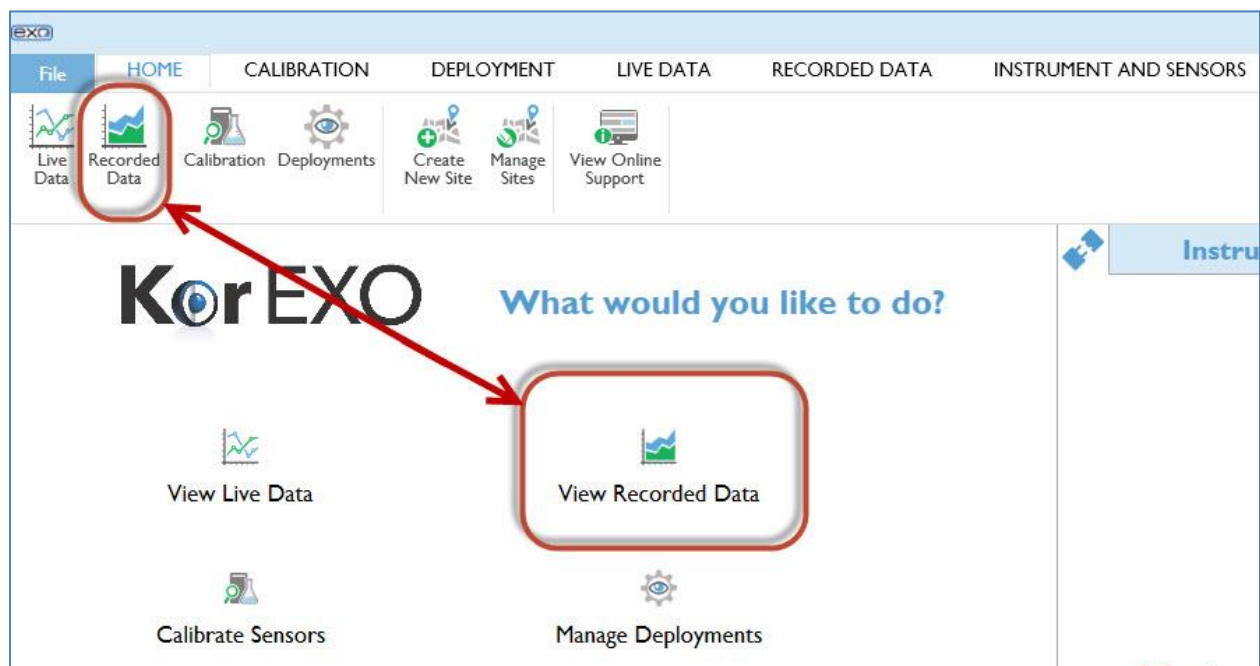


Figure SOP 17.23. Viewing the recorded binary data that was previously imported.

- Click **Search** to view recorded data (Figure SOP 17.24). Doing so will open the Select Data to View window.

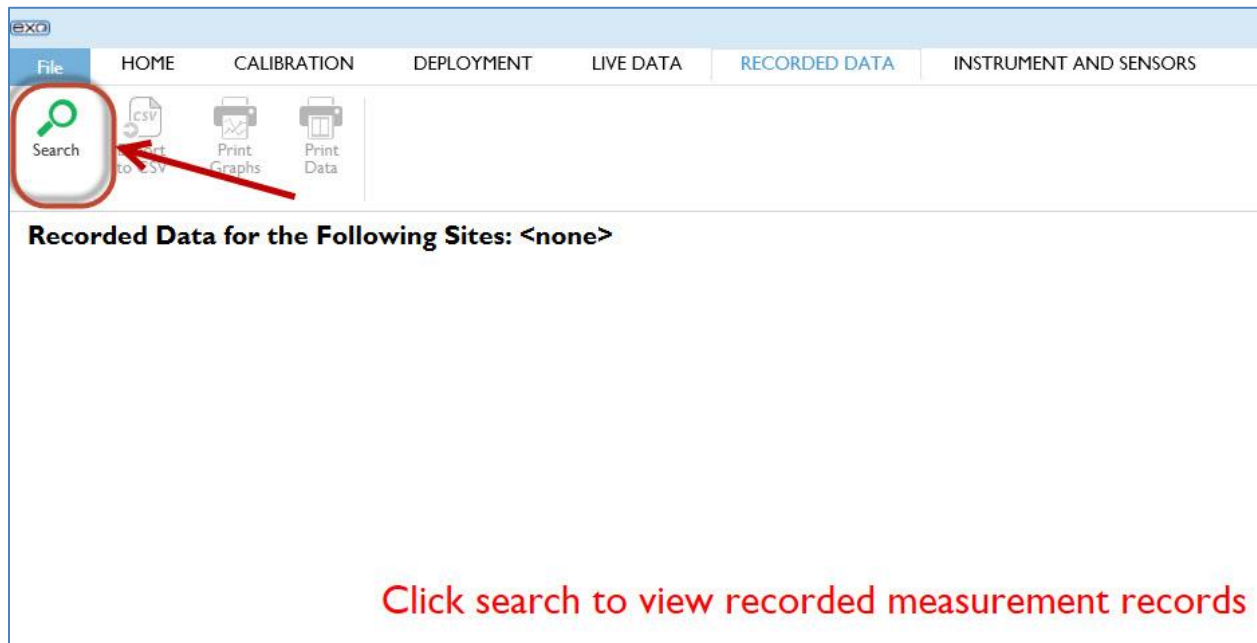


Figure SOP 17.24. Searching for the previously imported binary records.

- Since you just downloaded the BIN (.bin) files you'd like to view, click the **Recently Downloaded** check box under the Recent Downloads section on the left-hand side (Figure SOP 17.25). Alternatively, you can choose to use other filters to view your files. Recently downloaded binary files will display under the Results section.

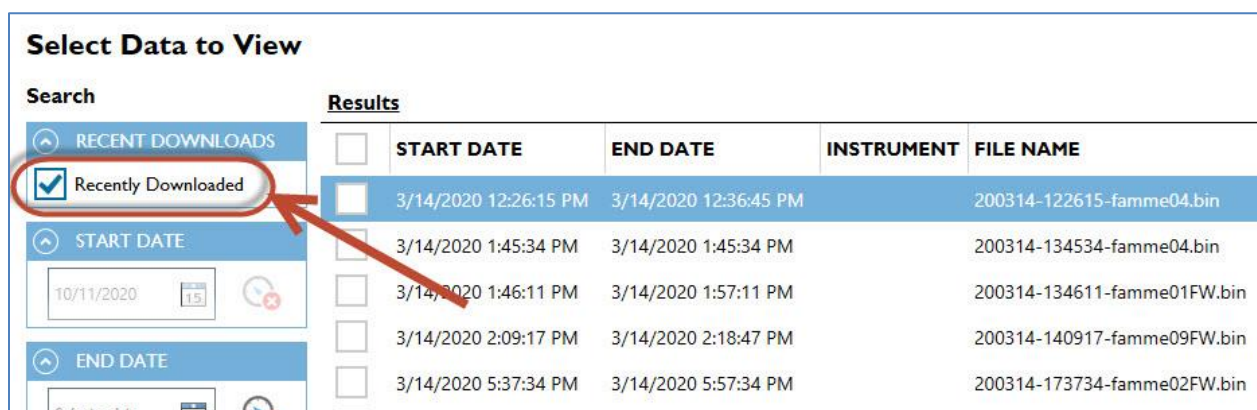


Figure SOP 17.25. Filtering search results on recently downloaded records.

- Since the data needs to be exported for each station separately (with exception to marine YSI data, which is collected as one continuous file for all stations visited on a given day), click on one file at a time to view. After selecting a file under the Results section, click **View Selected**

Recorded Data at the bottom right hand corner of the window (Figure SOP 17.26), or hit *Enter* on your keyboard.

START DATE	END DATE	INSTRUMENT	FILE NAME	DATA
3/14/2020 12:26:15 PM	3/14/2020 12:36:45 PM		200314-122615-famme04.bin	22
3/14/2020 1:45:34 PM	3/14/2020 1:45:34 PM		200314-134534-famme04.bin	1
3/14/2020 1:46:11 PM	3/14/2020 1:57:11 PM		200314-134611-famme01FW.bin	23
3/14/2020 2:09:17 PM	3/14/2020 2:18:47 PM		200314-140917-famme09FW.bin	20
3/14/2020 5:37:34 PM	3/14/2020 5:57:34 PM		200314-173734-famme02FW.bin	41
3/17/2020 9:03:22 AM	3/17/2020 9:16:22 AM		200317-090321-FWAPA09.bin	27
3/17/2020 9:47:13 AM	3/17/2020 10:00:53 AM		200317-094723-FWAPA01.bin	28
3/17/2020 10:30:49 AM	3/17/2020 10:45:19 AM		200317-103049-TWAPA02.bin	30
3/17/2020 11:21:28 AM	3/17/2020 11:30:58 AM		200317-112128-TWAPA01.bin	20
3/17/2020 12:01:19 PM	3/17/2020 12:12:49 PM		200317-120119-FWAPA03.bin	24
3/17/2020 1:46:33 PM	3/17/2020 1:51:33 PM		200317-134633-FWAPA10.bin	31
3/19/2020 9:36:16 AM	3/19/2020 9:44:16 AM		200319-093615-FWAPA05.bin	18
2/12/2020 3:19:00 PM	2/14/2020 1:02:30 PM	Sonde 16F1040:	WAPA 2020Q1 Agat 20180516_16F1C	5488
2/18/2020 6:25:00 AM	2/18/2020 10:10:30 AM	Sonde 16F1040:	WAPA 2020Q1 Asan 20180516_16F1C	452
2/18/2020 10:11:00 AM	2/18/2020 11:06:30 AM	Sonde 16F1040:	WAPA 2020Q1 Asan 20180516_16F1C	112

Figure SOP 17.26. Selecting the binary records to view.

- The data from the chosen file will be displayed with the parameters that were chosen in [Settings](#) – **double-check to make sure that the parameters and units displayed are correct (if not repeat steps in [Settings](#) and [Parameters](#))** (Figure SOP 17.27). Parameters displayed will be slightly different for freshwater vs. marine, but the initial set-up of parameters in [Settings](#) will automatically display the parameters if initially established correctly.

Recorded Data for the Following Sites: 'famme01FW'

Time	DATE	SITE NAME	CHLOROPHYLL (µG/L) 17H102247	DO (% SAT) 17H102137	DO (MG/L) 17H102137	SAL (PPT) 19J101526	SP COND (MS/CM) 19J101526	PHYCOCYANIN (µG/L) 17H102247	TURBIDITY (FNU) 16F102143	PH 18F103125	TEMP (°C) 19J101526	BAROMETER 17J101018
1:57:11 PM	3/14/2020	famme01FW	3.51	-0.2	-0.02	1.33	2.601	-0.05	9.04	7.39	30.035	14.643
1:56:41 PM	3/14/2020	famme01FW	3.36	-0.2	-0.02	1.32	2.586	-0.02	8.97	7.40	29.993	14.645
1:56:11 PM	3/14/2020	famme01FW	3.40	-0.2	-0.02	1.31	2.569	-0.03	9.11	7.41	29.997	14.643
1:55:41 PM	3/14/2020	famme01FW	3.48	-0.2	-0.01	1.31	2.563	-0.05	9.09	7.41	29.979	14.643
1:55:11 PM	3/14/2020	famme01FW	3.53	-0.2	-0.01	1.31	2.554	0.00	9.06	7.41	29.959	14.645
1:54:41 PM	3/14/2020	famme01FW	3.54	-0.1	-0.01	1.32	2.576	-0.03	9.11	7.41	29.924	14.645
1:54:11 PM	3/14/2020	famme01FW	3.44	-0.1	-0.01	1.31	2.569	-0.10	9.16	7.41	29.906	14.645
1:53:41 PM	3/14/2020	famme01FW	3.61	-0.1	-0.01	1.31	2.563	0.04	8.94	7.41	29.883	14.645
1:53:11 PM	3/14/2020	famme01FW	3.42	0.0	0.00	1.31	2.564	-0.09	8.96	7.41	29.859	14.645
1:52:41 PM	3/14/2020	famme01FW	3.48	0.0	0.00	1.31	2.553	-0.01	9.23	7.41	29.838	14.645
1:52:11 PM	3/14/2020	famme01FW	3.55	0.1	0.00	1.31	2.564	-0.01	9.18	7.41	29.830	14.643
1:51:41 PM	3/14/2020	famme01FW	3.36	0.1	0.01	1.31	2.568	-0.10	9.37	7.41	29.794	14.645
1:51:11 PM	3/14/2020	famme01FW	3.65	0.2	0.01	1.32	2.574	-0.05	9.26	7.42	29.820	14.645

Figure SOP 17.27. Doublecheck that parameters and units are correct in the displayed record.

- The next step involves exporting the data from KorEXO into a CSV (.csv) file, described in the [Export Data](#) section below.

Export Data

The last step in KorEXO is to export YSI data to a CSV (.csv) file.

- While [viewing the data](#), export the data by clicking on **Export to CSV** in the top left-hand corner of the Recorded Data tab (Figure SOP 17.28). A dialog box will open.



Figure SOP 17.28. Exporting the binary data as a CSV file.

- Export the data to *C:\Users\[User Name]\Documents\YSI\EXO Exports\Archive* .
 - Save the **RAW** file using the naming conventions:
 - For freshwater and brackish YSI data files:
`[YYYYMMDD]_[Station_ID]_[type]_YSI_raw.csv`³ (e.g.,
 20200314_FAMME01_fw_YSI_raw.csv)

³ See Appendix [SOP 14.a. Abbreviation Key for File Naming Conventions in SOP #14 Workspace Setup and Project Records Management](#) for a file naming abbreviation guide.

ii. For marine YSI data files:

[YYYYMMDD]_[Park]_mr_YSI_raw.csv⁴ (e.g., 20201210_NPSA_mr_YSI_raw.csv) — marine YSI data is collected as one continuous file for all stations collected on a single day, therefore you will save as one raw file for each day for now.

Note: Occasionally, a single days' data collection will download as multiple files. This results from the sonde being bumped throughout the day and suffering very brief data gaps, this is not a problem. If this is the case be sure to select all of the files for the day when you view the recorded data and export it as one .csv. This will result in multiple header lines throughout the document, which should be deleted.

3. Click **Save**.

4. If the data exported successfully, a pop-up box will open. Click **OK** (Figure SOP 17.29).

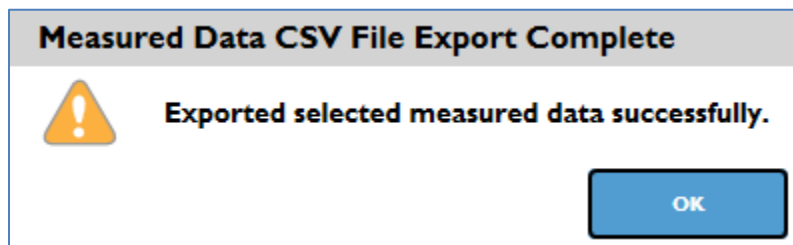


Figure SOP 17.29. Confirmation message that data was exported successfully.

5. The CSV file will open automatically.

a. For freshwater and brackish YSI data files:

i. The top 8 rows need to be deleted in order for the file to be imported into the Water Quality Monitoring Database correctly. After doing so, the new first row of the CSV (.csv) file should be the parameters.

ii. Highlight the top 8 rows (and right-click > **Delete** (Figure SOP 17.30)).

AutoSave Off 20200314_FAMME

File Home Insert Page Layout Formulas Data Review View Developer Help Acrobat

Paste

Cut

Copy

Format Painter

Clipboard

Calibri

11

B *I* U

Font

Alignment

General

\$ % ' &

Number

A1 KorEXO MEASUREMENT DATA FILE EXPORT

	A	B	C	D	E	F	G	H	
1	KorEXO MEASUREMENT DATA FILE EXPORT								
2									
3	FILE CREATED:	11/11/2020 0:30							
4									
5				MEAN VALU	3.44	6	0.47	1.26	
6				STANDARD I	0.35	20.1	1.57	0.27	
7									
8	SENSOR SER 17H102247 17H102137 17H102137 19J101526 19J101526								
9	Date (MM/DD/YYYY)	Time (HH:mm:ss)	Time (Fract. Sec)	Site Name	Chlorophyll	ODO % sat	ODO mg/L	Sal ppt	SpCo
10	3/14/2020	13:46:11		0 famme01FV	2.06	98.6	7.74		0
11	3/14/2020	13:46:41		0 famme01FV	3.99	13.5	1.02		1.3
12	3/14/2020	13:47:11		0 famme01FV	3.89	9.3	0.71		1.34
13	3/14/2020	13:47:41		0 famme01FV	3.32	7.3	0.55		1.35
14	3/14/2020	13:48:11		0 famme01FV	3.34	5.1	0.38		1.33
15	3/14/2020	13:48:41		0 famme01FV	3.43	3	0.23		1.31
16	3/14/2020	13:49:11		0 famme01FV	3.14	1.3	0.1		1.32
17	3/14/2020	13:49:41		0 famme01FV	3.37	0.6	0.04		1.31
18	3/14/2020	13:50:11		0 famme01FV	3.73	0.4	0.03		1.32

Delete the top 8 rows.
The first row in the CSV
file should be the
parameter

Figure SOP 17.30. Cleaning up the CSV data file.

- iii. After deleting the top 8 rows, the CSV (.csv) YSI file will now look like Figure SOP 17.31, with the parameters being the new first row:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Date (MM/DD/YYYY)	Time (HH:mm:ss)	Time (Fract. Sec)	Site Name	Chlorophyll ug/L	ODO % sat	ODO mg/L	Sal ppt	SpCond mS/cm	TAL PC ug/L	Turbidity FNU	pH	Temp °C	Barometer psi
2	3/14/2020	13:46:11	0	famme01FW	2.06	98.6	7.74	0	0.002	3.87	7.44	27.875	14.645	
3	3/14/2020	13:46:41	0	famme01FW	3.99	13.5	1.02	1.3	2.539	0.16	10.32	7.58	29.205	14.643
4	3/14/2020	13:47:11	0	famme01FW	3.89	9.3	0.71	1.34	2.62	-0.07	8.96	7.48	29.451	14.642
5	3/14/2020	13:47:41	0	famme01FW	3.32	7.3	0.55	1.35	2.639	-0.01	8.68	7.45	29.786	14.643
6	3/14/2020	13:48:11	0	famme01FW	3.34	5.1	0.38	1.33	2.597	-0.04	9.02	7.44	29.713	14.643
7	3/14/2020	13:48:41	0	famme01FW	3.43	3	0.23	1.31	2.568	-0.05	9.29	7.44	29.693	14.643
8	3/14/2020	13:49:11	0	famme01FW	3.14	1.3	0.1	1.32	2.574	-0.05	8.98	7.43	29.711	14.643
9	3/14/2020	13:49:41	0	famme01FW	3.37	0.6	0.04	1.31	2.56	-0.01	8.94	7.43	29.736	14.643
10	3/14/2020	13:50:11	0	famme01FW	3.73	0.4	0.03	1.32	2.571	-0.03	9.16	7.43	29.713	14.645
11	3/14/2020	13:50:41	0	famme01FW	3.54	0.3	0.02	1.32	2.575	-0.05	9.13	7.42	29.792	14.646
12	3/14/2020	13:51:11	0	famme01FW	3.65	0.2	0.01	1.32	2.574	-0.05	9.26	7.42	29.82	14.645
13	3/14/2020	13:51:41	0	famme01FW	3.36	0.1	0.01	1.31	2.568	-0.1	9.37	7.41	29.794	14.645
14	3/14/2020	13:52:11	0	famme01FW	3.55	0.1	0	1.31	2.564	-0.01	9.18	7.41	29.83	14.643
15	3/14/2020	13:52:41	0	famme01FW	3.48	0	0	1.31	2.553	-0.01	9.23	7.41	29.838	14.645
16	3/14/2020	13:53:11	0	famme01FW	3.42	0	0	1.31	2.564	-0.09	8.96	7.41	29.859	14.645
17	3/14/2020	13:53:41	0	famme01FW	3.61	-0.1	-0.01	1.31	2.563	0.04	8.94	7.41	29.883	14.645
18	3/14/2020	13:54:11	0	famme01FW	3.44	-0.1	-0.01	1.31	2.569	-0.1	9.16	7.41	29.906	14.645
19	3/14/2020	13:54:41	0	famme01FW	3.54	-0.1	-0.01	1.32	2.576	-0.03	9.11	7.41	29.924	14.645
20	3/14/2020	13:55:11	0	famme01FW	3.53	-0.2	-0.01	1.31	2.554	0	9.06	7.41	29.959	14.645
21	3/14/2020	13:55:41	0	famme01FW	3.48	-0.2	-0.01	1.31	2.563	-0.05	9.09	7.41	29.979	14.643
22	3/14/2020	13:56:11	0	famme01FW	3.4	-0.2	-0.02	1.31	2.569	-0.03	9.11	7.41	29.997	14.643
23	3/14/2020	13:56:41	0	famme01FW	3.36	-0.2	-0.02	1.32	2.586	-0.02	8.97	7.4	29.993	14.645
24	3/14/2020	13:57:11	0	famme01FW	3.51	-0.2	-0.02	1.33	2.601	-0.05	9.04	7.39	30.035	14.643

Figure SOP 17.31. Example of what the clean CSV should look like after clipping/trimming unnecessary rows in the CSV file.

- iv. Next, clip/trim data and save the **CLEAN** file as a CSV (.csv) file
 1. Review the first few lines of data to determine when all the parameters have stabilized. Usually, pH and turbidity take a little longer than the others to stabilize so you may need to remove the first few measurements.

Further review the data to look for any unusual spikes in the dataset. Often spikes could be associated with a fish swimming by or algae blocking a probe. Consult the datasheet to see if there was any mention of known spikes or adjustments to the sonde that need to be considered. Remove any such spikes or anomalies. If you are unsure whether to remove a specific anomaly, please ask a more experienced team member. Please leave a note on the datasheet and in the database if you remove anything other than stabilizing parameters.

Also, review the last few lines of data to make sure readings are still within range. Sometimes the sonde is removed before stopping the data collection, or in the case of marine, it is moving to a different depth.

2. Go to **File > Save As** to *C:\Users\[User Name]\Documents\YSI\EXO Exports\Archive* and save as a **CSV (Comma delimited (*.csv))** with the naming convention:
[YYYYMMDD]_[Station_ID]_[type]_YSI_clean⁴ (e.g., 20200314_FAMME01_fw_YSI_clean).
3. You will get the Microsoft Excel warning message in the dialog box below. Click “**Yes**” to keep using that format (Figure SOP 17.32).

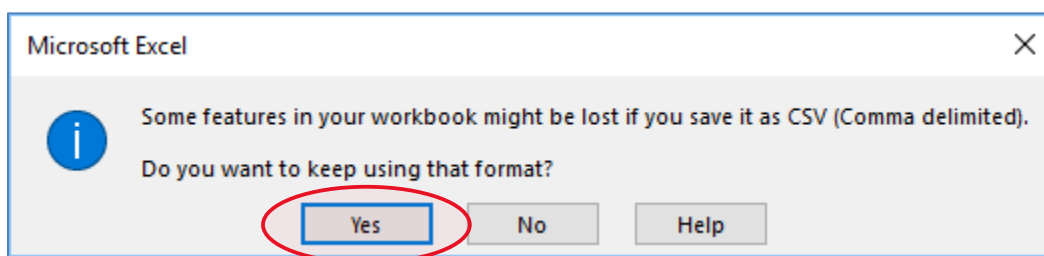


Figure SOP 17.32. Confirming to keep the current format in Excel.

⁴ See Appendix [SOP 14.a. Abbreviation Key for File Naming Conventions in SOP #14 Workspace Setup and Project Records Management](#).

- v. Back in KorEXO, click **Search** to view recorded measurement records again. Choose the next file to view results and export data. Repeat the same steps as above until data has been exported for all files.

b. For marine YSI data files:

Marine YSI files require ‘clipping’ of individual site data from the full day/multiple days of readings in the CSV (.csv) file. You will make separate files for bottom and surface measurements at each individual site.

- i. Open the original marine YSI raw CSV (.csv) file and a new Excel spreadsheet by selecting **File > New > Blank workbook**.
- ii. Copy the parameters of the top row of the original marine YSI raw CSV (.csv) file, and paste into the first row of the new, blank workbook.
- iii. Return to the original marine YSI raw CSV (.csv) file. Observe the **Date** and **Time** columns in the file and compare these values to the site sampling times on the sampling event datasheets*, located in the Water Quality Monitoring project workspace “[1 Field datasheets](#)” raw data folder in SharePoint. *It will be helpful to organize the datasheets in chronological order so that the dates and times are organized from earliest to latest, like in the marine YSI file.
 - 1. Begin with the first site in the time series, then refer to the original marine YSI raw CSV (.csv) file and isolate the data that corresponds with these sampling times for the site.
 - 2. Observe **Depth** values to indicate if the sonde reading is a “bottom” reading or a “surface” reading compared to the values on the datasheet and to ensure the sonde was fully submerged to the sampling depth (there may be a few readings taken while the sonde was still being lowered and secured or raised from one depth to another).
 - 3. Observe **Salinity** values and make sure that they are in the range of approximately 30 to 37 ppt to indicate if the sonde was in the water.
- iv. Copy the rows of data in the original marine YSI raw that fall within the **Date, Time, Depth, and Salinity** ranges for the site.
- v. Return to the new workbook and paste the copied data underneath the parameters.
- vi. Review the data to ensure all the parameters were stabilized and that the data is free of any spikes or anomalies (See Step iv. under freshwater and brackish above.)

- vii. Go to **File > Save As** to *C:\Users\[User Name]\Documents\YSI\EXO Exports\Archive* and save as a CSV (Comma delimited (*.csv) with the naming convention:
[YYYYMMDD]_[Station_ID]_[depth]_mr_YSI_clean⁵ (e.g., 20201210_FNPSA06_btm_mr_YSI_clean, 20201210_FNPSA06_sur_mr_YSI_clean).
- viii. You will get the Microsoft Excel warning message in the dialog box below. Click “**Yes**” to keep using that format (Figure SOP 17.33).

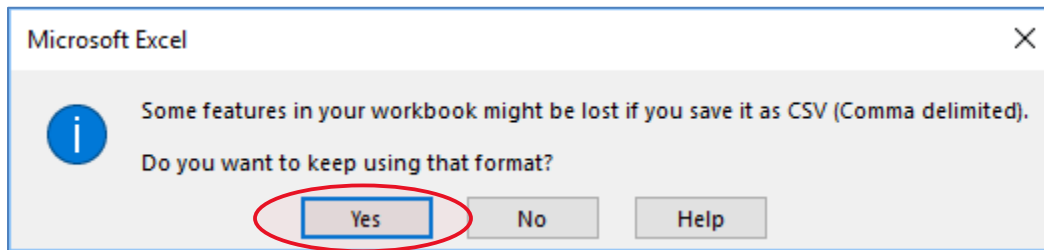


Figure SOP 17.33. Confirming to keep the current format in Excel.

- ix. Repeat the above steps until all marine data for each site and depth has been trimmed and saved as a clean YSI data file onto your local C:\ drive.
- x. **If modifications have been made to the original marine YSI raw CSV (.csv) file, do not save upon closing—this file should remain in its raw form with all of the original data for all of the sites.**

Uploading YSI Files to SharePoint

After all BIN (.bin) files have been downloaded from the sonde, “raw” CSV (.csv) files have been exported from KorEXO, and “clean” CSV (.csv) files have been trimmed, all files are to be uploaded to SharePoint.

Raw BIN and CSV Files

1. Navigate to the Water Quality Monitoring project workspace “[3 YSI](#)” data folder in SharePoint, then the Year and Park folders.
2. Create a “raw” sampling event folder if one has not been created yet using the naming convention,
[YYYYMMDD]_[Park]_[Island]_[type]_YSI_raw⁶ (e.g., 20240616_AMME_fw_YSI_raw), that corresponds with the processed YSI files.

⁵ See Appendix [SOP 14.a. Abbreviation Key for File Naming Conventions in SOP #14 Workspace Setup and Project Records Management](#).

3. Drag or Upload the BIN (.bin) and raw CSV (.csv) files from C:\Users\[User Name]\Documents\YSI\EXO Exports\Archive to the raw sampling event folder in SharePoint (Figure SOP 17.34).

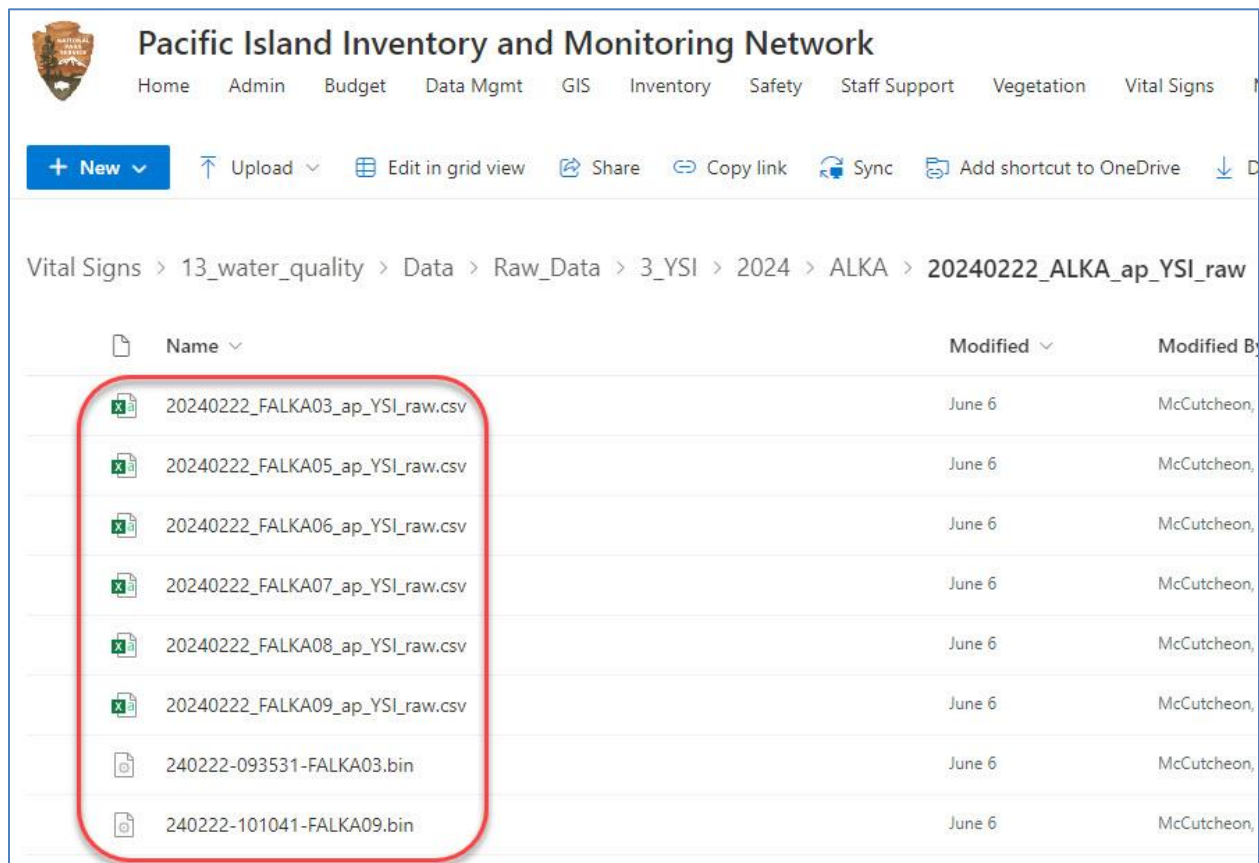


Figure SOP 17.34. Example of uploading BIN (.bin) and raw CSV (.csv) files to the a raw sampling event folder in SharePoint.

Clean CSV Files

1. Navigate to the Water Quality Monitoring project workspace “[3_YSI](#)” data folder in SharePoint, then the Year and Park folders.
2. Create a “clean” sampling event folder if one has not been created yet using the naming convention,
[YYYYMMDD]_[Park]_[Island]_[type]_YSI_clean⁶ (e.g.,
 20200314_AMME_fw_YSI_clean; 20201210_NPSA_Tut_mr_clean), that corresponds with the processed YSI files.

⁶ See Appendix [SOP 14.a. Abbreviation Key for File Naming Conventions in SOP #14 Workspace Setup and Project Records Management](#).

3. *Drag or Upload* the clean CSV (.csv) files from *C:\Users\[User Name]\Documents\YSI\EXO Exports\Archive* in File Explorer into the corresponding clean sampling event folder in SharePoint (Figure SOP 17.35).

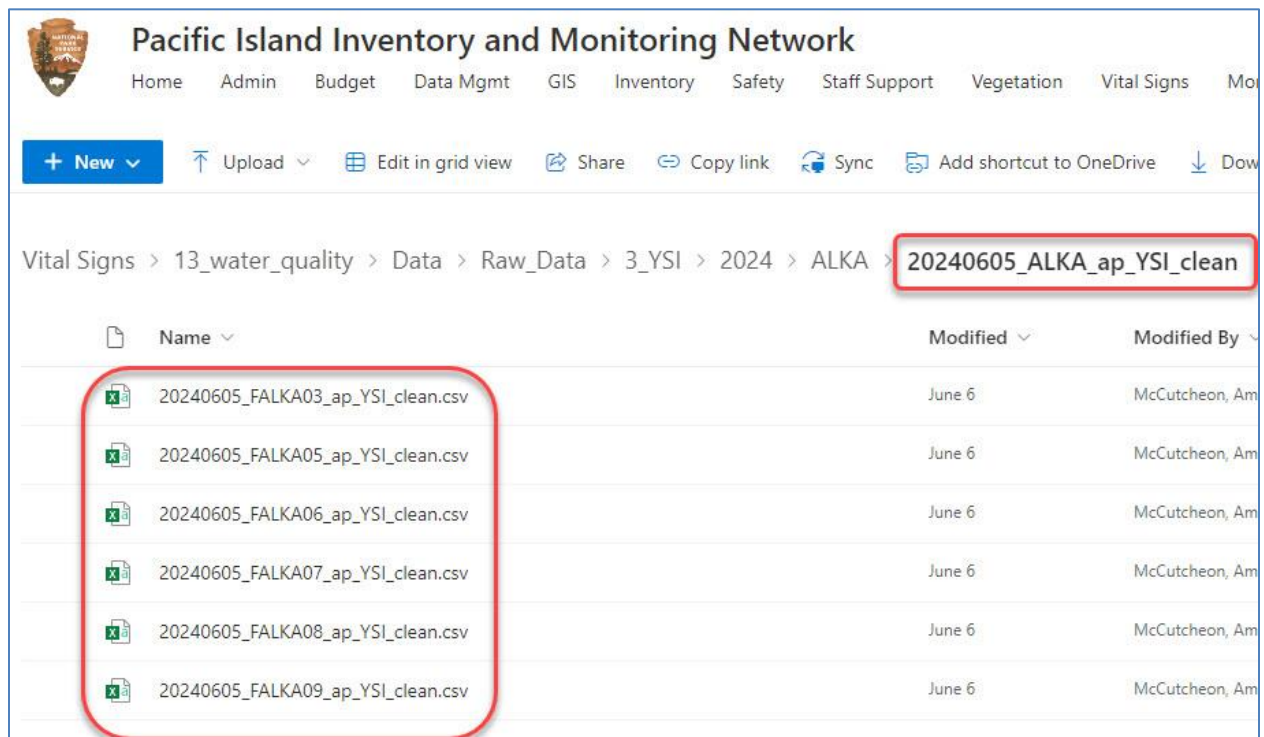


Figure SOP 17.35. Example of uploading clean CSV (.csv) files to the a clean sampling event folder in SharePoint.

4. Next, back out of the clean folder to the root Park folder. Select the clean folder by clicking the ellipse symbol (...) next to the filename and then select “**Copy to**” (Figure SOP 17.36).

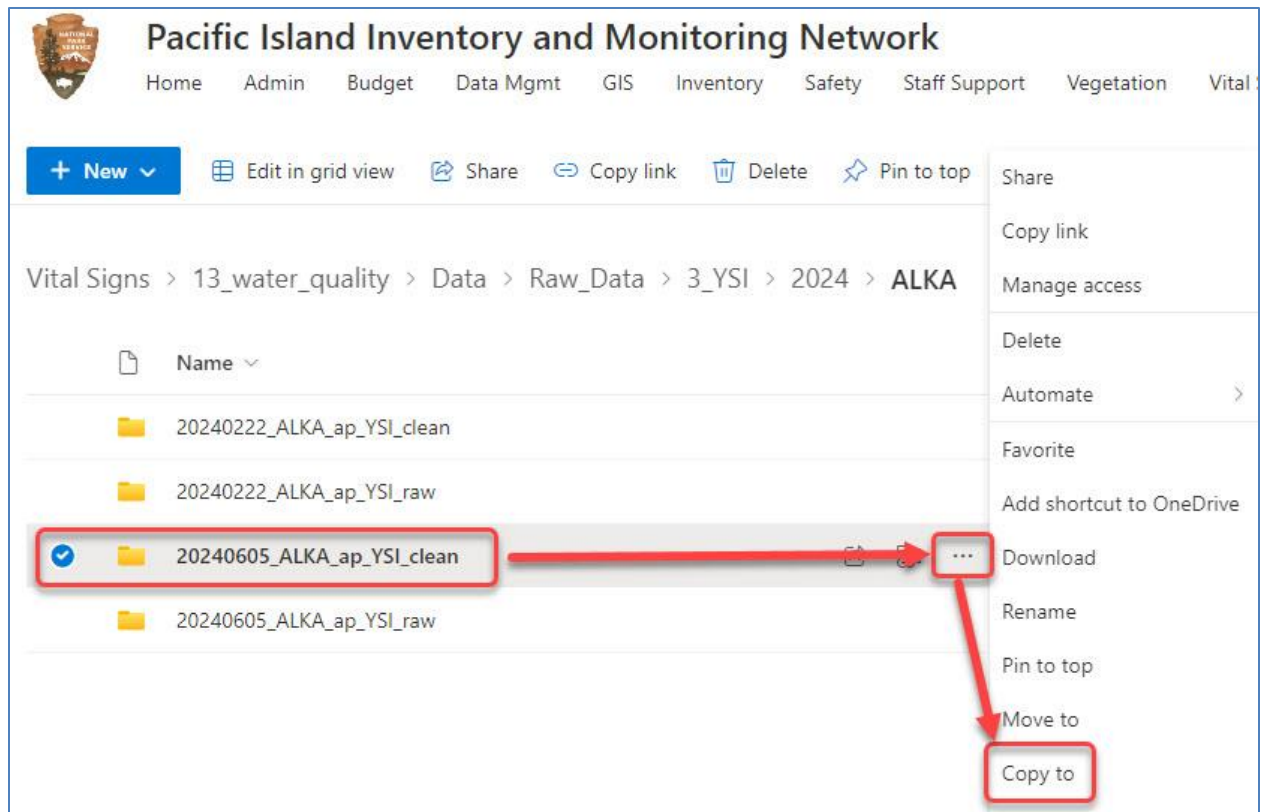


Figure SOP 17.36. Example of copying a clean sampling event folder in SharePoint.

5. Navigate to the “[VS WQ YSI files](#)” folder and click “**Copy here**” (Figure SOP 17.37).

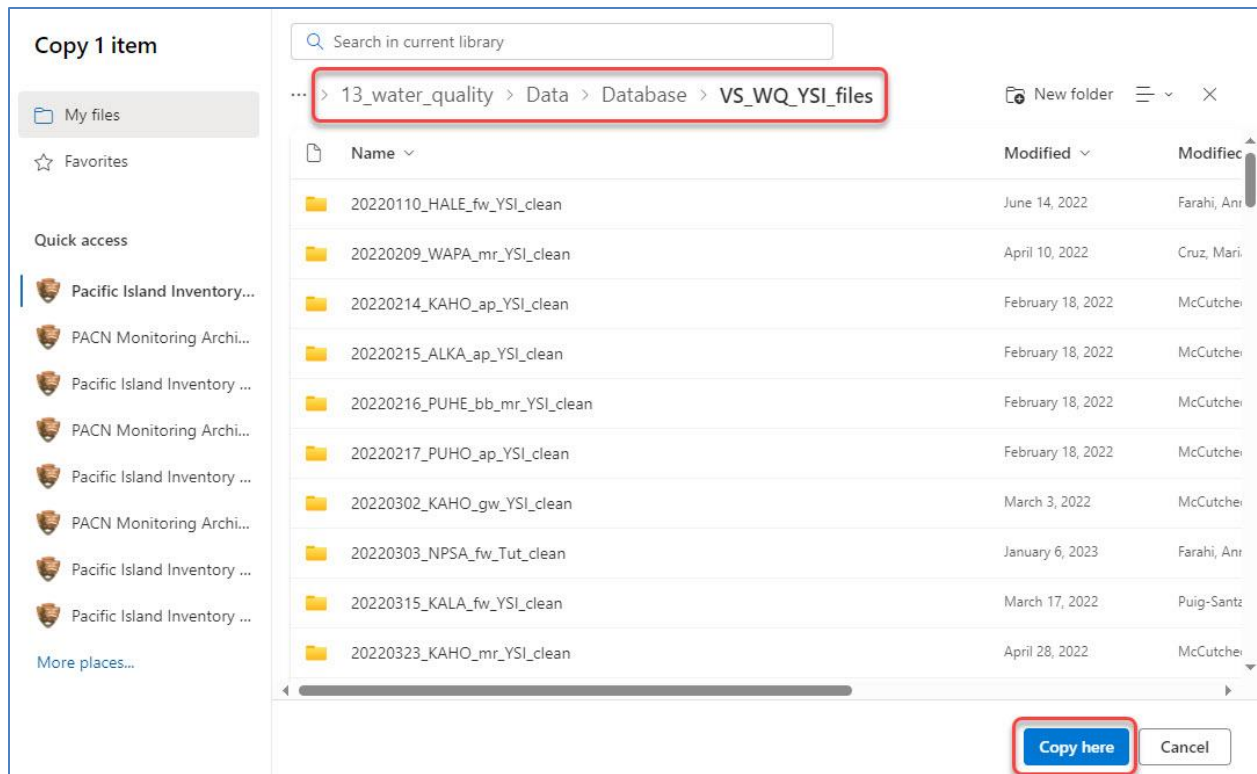


Figure SOP 17.37. Example of moving a copied clean sampling event folder to another folder location in SharePoint.

The files in the “VS_WQ_YSI_files” folder are what will be imported into the Water Quality Monitoring Database (see [Importing YSI Files into the I&M Water Quality Monitoring Database](#) section below for more details).

Importing YSI Files into the Water Quality Monitoring Database

Before YSI files can be linked to the database, a shortcut to the “[VS_WQ_YSI_files](#)” folder in SharePoint will need to be added to the user’s OneDrive. See [SOP #14 Workspace Setup and Project Records Management](#), section **Creating Shortcut to Database Files** for instructions.

Additionally, for thorough instructions on how to import the clean YSI files into the Water Quality Monitoring Database, see the **YSI Sonde Data section** in the [Water Quality Monitoring Database Users Guide](#), located in the [Water Quality Monitoring Database Documentation](#) folder in SharePoint.