

Southeast Coast Network

National Park Service
Inventory and Monitoring Division



Standard Operating Procedure 2.2.11

Park-wide Assessment Data Entry, Processing, and QA/QC—Version 1.0

Please cite this as:

Starkey, E. N., and D. McCay. 2022. Park-wide assessment data entry, processing, and QA/QC — Version 1.0. Southeast Coast Network Standard Operating Procedure NPS/SECN/SOP—2.2.11. Southeast Coast Network, Athens, Georgia.

Summary

This standard operating procedure (SOP) describes the step-by-step procedures for entering, processing and QA/QC of data resulting from park-wide assessments of water-quality. Data entry covered by this SOP includes station information, hydrographic profile, water sample collection, sediment sample collection, water sample laboratory results, and sediment sample laboratory results. This SOP is for users who already have access to the SECN Estuarine Water-Quality Monitoring Database.

Revision Log

Revision Date	Author	Changes Made	Reason for Change	New Version #

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Park-wide Assessment Activities and Workflow Summary

An overview of park-wide assessment activities and workflow are presented in Figure 1. SOPs are presented left to right in the general order of operations for each activity. This SOP (2.2.11) pertains to lab and field data entry and certification during the Post-Sampling activity.

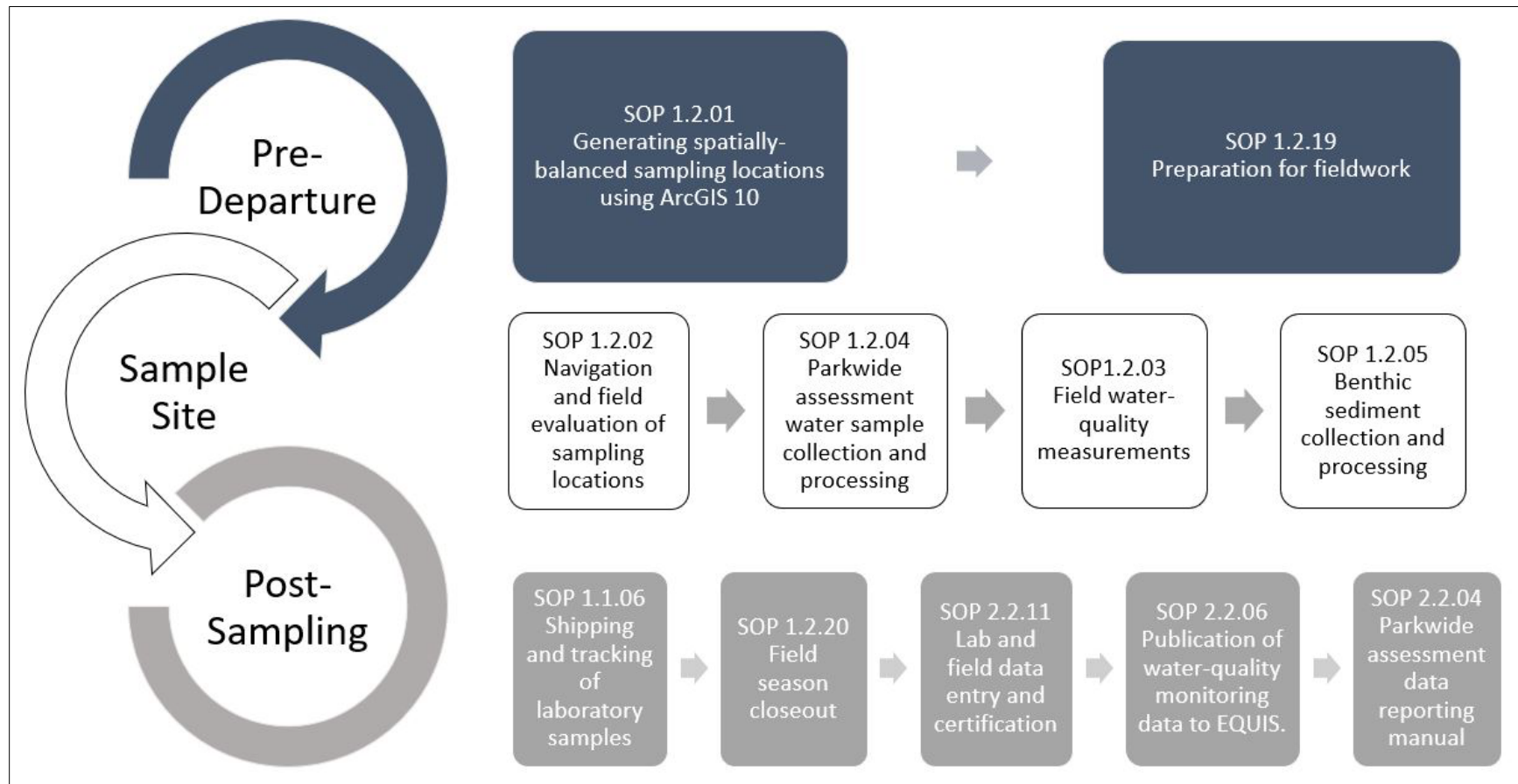


Figure 1. Park-wide assessment activities and workflow. SOPs are presented left to right in the general order of operations for each activity.

Required Software, Access, and Materials

- Access to the NPS Network
- Access to the SECN Estuarine Water-Quality Monitoring Database (EWQD), consisting of a Microsoft Access front-end and SQL backend. For access contact SECN Data Manager Wendy Wright (wendy_wright@nps.gov).
- Access to the NPS Power BI Report Server – Estuarine Water-quality Reports ([Estuarine Water Quality - Power BI Report Server](#))
- Microsoft Excel
- Populated field forms:
 - SECN Parkwide Assessment Location and Event Form (v2.5 or newer)
 - SECN Parkwide Assessment Water Sample Collection Form (v2. 5 or newer)
 - SECN Parkwide Assessment Hydrographic Profile Form (v2.6 or newer)
 - SECN Parkwide Assessment Sediment Sample Collection Form (v2.5 or newer)
- Laboratory analysis results in comma delimited format (.csv)
- Laboratory particle grain size distribution report (PDF)

Overview and Workflow

Data collection for the park-wide assessment of water-quality follows procedures outlined in SOP 1.2.02 *Park-wide Assessment Navigation and Field Evaluation of Sampling Locations*—Version 2.0 (Starkey and McCay 2022a), SOP 1.2.03 *Park-wide Assessment Field Water-Quality Measurements*—Version 2.0 (Starkey and Gregory 2022a), SOP 1.2.04 *Park-wide Assessment Water Sample Collection and Processing*—Version 2.0 (Starkey and Gregory 2022b), and SOP 1.2.05 *Park-wide Assessment Benthic Sediment Collection and Processing*—Version 2.0 (Starkey and McCay 2022b). Upon completion of fieldwork, the following paper forms are populated for each site: Location and Event Form, Water Sample Collection Form, Hydrographic Profile Form, and Sediment Sample Collection Form (Appendix A).

This SOP outlines the procedures necessary to enter, process and perform quality control measures on data recorded on the paper forms and data resulting from laboratory analysis of water and sediment samples. Figure 2 shows the general park-wide assessment data entry and processing workflow. The SECN Estuarine Water-Quality Monitoring Database (EWQD) procedures shown in white boxes are discussed below.

It is important to note that all paper forms must be entered in the database BEFORE attempting to enter results from the lab. In other words, the lab result is ‘attached’ to the sample event.

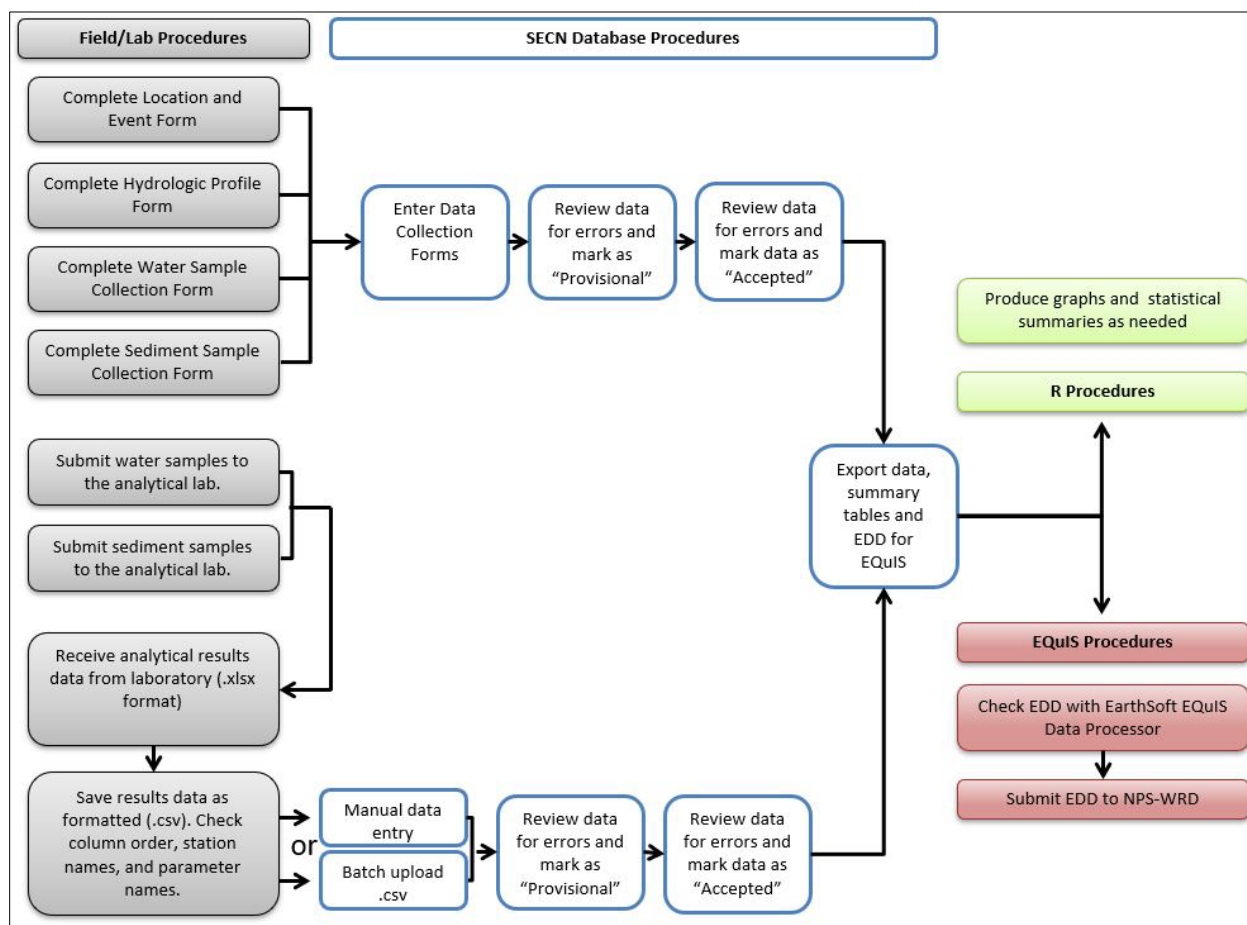


Figure 2. General park-wide assessment data entry and processing workflow. Arrows represent the flow of data and information between steps and across data systems.

SECN Estuarine Water-Quality Monitoring Database

The Southeast Coast Network (SECN) Estuarine Water-Quality Monitoring Database (EWQD) consists of an SQL Server back-end database and a Microsoft Access front-end user interface. Both applications can be accessed by multiple users simultaneously. The data entry component is designed for the manual entry of associated data sheets and lab data. The application component includes subsequent data analysis and data reporting required for both internal and external use. More details about the database can be found in SOP 2.2.07 *Estuarine Water-Quality Monitoring Data Management and Database Technical Documentation*—Version 2.0 (Wright et al. 2022).

Lookup Management

Prior to entry of park-wide assessment data, review the paper forms and lab results to determine if there is anything that needs to be added to the lookup tables in the database. The most common addition for park-wide assessment of water-quality is new personnel (protocol users). Less common additions or changes to the lookup tables are discussed separately below. If no additions are necessary, skip directly to data entry.

Add Personnel or Cooperators

1. Open the EWQD front end
2. From the Main Menu select “Lookup Manager” (Figure 3)

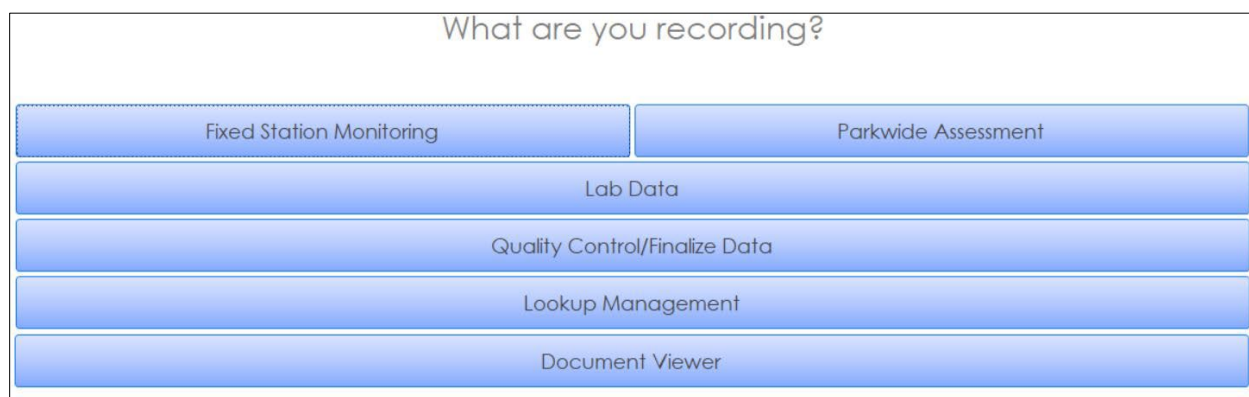
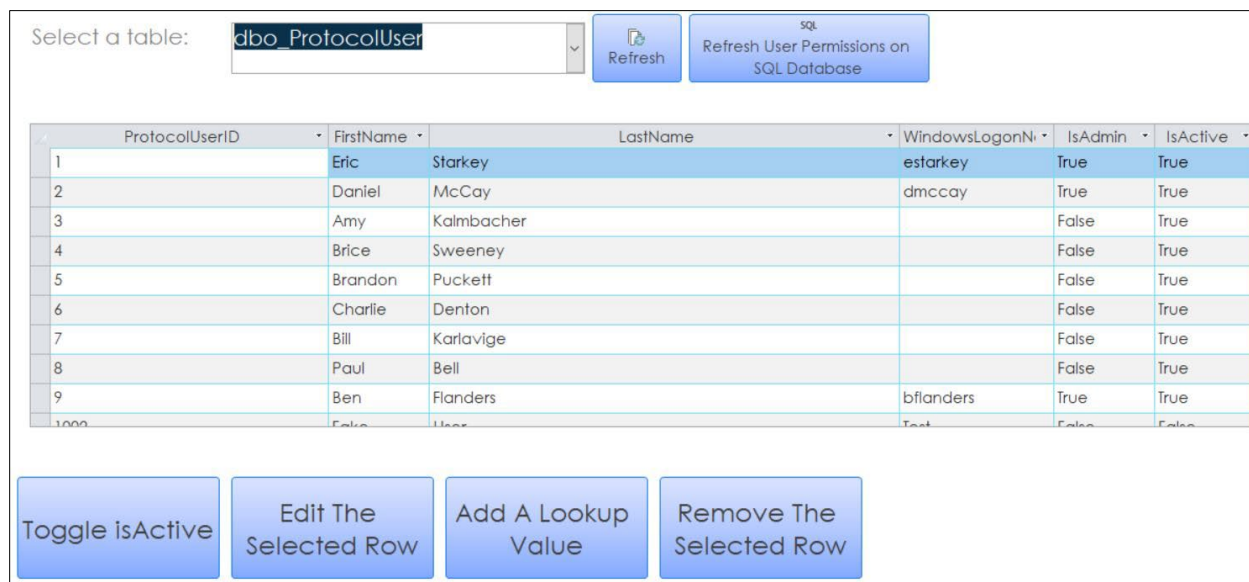


Figure 3. Estuarine Water-Quality Monitoring Database Main Menu.

3. From the “Select a table” drop down, select “dbo_ProtocolUser” (Figure 4)



ProtocolUserID	FirstName	LastName	WindowsLogonName	IsAdmin	IsActive
1	Eric	Starkey	estarkey	True	True
2	Daniel	McCay	dmccay	True	True
3	Amy	Kalmbacher		False	True
4	Brice	Sweeney		False	True
5	Brandon	Puckett		False	True
6	Charlie	Denton		False	True
7	Bill	Karlavige		False	True
8	Paul	Bell		False	True
9	Ben	Flanders	bflanders	True	True
1000	False	None	Test	False	False

Figure 4. Estuarine Water-Quality Monitoring Database Lookup Manager with the dbo_ProtocolUser table selected.

4. Click “Add a Lookup Value”
5. Fill in the required information in the “Add a Lookup Value” window. Required fields are:
 - a. First Name
 - b. Last Name
 - c. Windows Logon Name (if applicable)
 - d. Is Admin (True or False); only the protocol lead, hydrological technician and data manager are set to True
 - e. Is Active (True or False)
6. Click “Submit”
7. Click “Refresh” (Figure 4) and ensure that the new protocol user is shown in the table

Other Lookup Table Additions

Less common items may also be added via the Lookup Manager; however, any additions or changes must be cleared by the SECN aquatic ecologist and SECN data manager. Edits to values in these tables should be avoided since changes may have broad implications. Lookup tables related to fixed-station water samples that may require additions include:

Dbo_Equipment

dbo_FiltrationMethod

dbo_HabitatType

dbo_Laboratory

dbo_MarineDebrisType

dbo_Method

dbo_Parameter

dbo_SiteObservation

dbo_Unit

dbo_WaterSampleType

Field Form Data Entry Procedures

Park-wide assessment data are recorded on paper datasheets (Appendix A) and subsequently entered into the EWQD within a week of a site visit. To begin data entry, open the database and click “Parkwide Assessment” on the Main Menu (Figure 3). All data for each site must be entered before proceeding to entry for the next site (i.e., Location and Event → Water Sample Collection → Hydrographic Profile → Sediment Collection).

Location and Event

Data from the Parkwide Assessment Location and Event Form will be entered in this step.

1. From the Parkwide Assessment Selection screen click “Create a New Parkwide Assessment” (Figure 5). Note that it is also possible to resume data entry from this screen by clicking “Lookup Incomplete Assessments.”

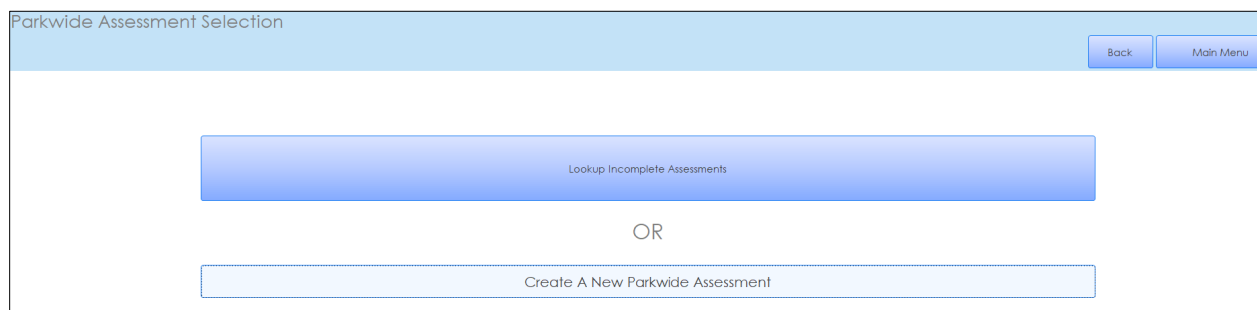


Figure 5. Estuarine Water-Quality Monitoring Database Parkwide Assessment Selection screen.

2. Populate all fields in the database Location and Event Form (Figure 6).

Parkwide Assessment Location And Event Form													
STATION FORM v1.1 (04/2017)		Back	Main Menu										
Station Name: REAL35_2019													
Water Body Name: Mosquito Lagoon		Staging Area: Haulover Canal Ramp											
GPS X: 0521653 Y: 3185902 UTM Zone: (17 or 18) 17 Datum (NAD83): NAD83 Location within 0.02 NM (37 m) of original sample draw? (Y/N) Yes													
HABITAT TYPE Tidal River Intertidal Marsh Open Water Rocky/Shell Bottom Oyster Bed Bayou/Inlet Coral Reef Other													
DAY Arrival Date (MM/DD/YY): 7/16/2019 Arrival Time (HH:MM): (EST) 11:30 Departure Date (MM/DD/YY): 7/16/2019 Departure Time (HH:MM): (EST) 12:00													
WEATHER Conditions at station: Wind (mph): 6.0 Temp (C): 29.40 Cloud Cover/Sky (% cloudy): 50 Other:													
SUBMERGED AQUATIC VEGETATION Present? No													
MARINE DEBRIS Present? No Select One Plastic Wood Glass Cans Other													
COMMENTS													
Recorded By: Eric Starkey Submit													
Location Note Photos <table border="1"> <thead> <tr> <th>Number (from camera)</th> <th>Camera Direction N., E., S., W</th> </tr> </thead> <tbody> <tr> <td>783</td> <td>N</td> </tr> <tr> <td>784</td> <td>E</td> </tr> <tr> <td>785</td> <td>S</td> </tr> <tr> <td>786</td> <td>W</td> </tr> </tbody> </table> Captured By: Eric Starkey				Number (from camera)	Camera Direction N., E., S., W	783	N	784	E	785	S	786	W
Number (from camera)	Camera Direction N., E., S., W												
783	N												
784	E												
785	S												
786	W												

Figure 6. Estuarine Water-Quality Monitoring Database Parkwide Assessment Location and Event Form.

- The station name will be formatted as PARK##_YYYY, where PARK is the four-letter park abbreviation, ## is the station number (typically 01-30) and YYYY is the year.
 - All times are in Eastern Standard Time (EST), 24-hour format.
- Review your input and click “Submit” when finished. **Note that once “Submit” is clicked you will no longer have access to this form, even if you resume an incomplete assessment. The only access is via the QC Manager (described later in this SOP).**

Water Sample Collection Form

Data from the Parkwide Assessment Water Sample Collection Form will be entered in this step.

1. Populate all fields in the database Water Sample Collection Form (Figure 7). Note that all times are in Eastern Standard Time (EST), 24-hour format.

Parkwide Assessment — Water Sample Collection Form
DATASHEET v2.2 (04/2019)

Sample Number: [View Discrete Event Information](#)

Water Sample Type: Filtration Method:

Collected By: Collection Date: Salinity: (PSU)

Collection Time: (EST) Secchi Depth: Low Tide Time: (EST)

Check if the secchi disk hit the ground before losing visibility ☐

Surface (0.5 m) ** Analysis:

TN	☒	TP	☒	Amount Filtered: (ml)	150
TDN	☒	TDP	☒	Filtered By:	Daniel McCay
DIN	☒	DIP	☒	Filtered Date:	7/16/2019
Comments:	Chl a ☒			Filtered Time: (EST)	11:50

Recorded By

Jump To A Sample:
(Changes will be saved)

Delete Current Sample Submit and Add Another Water Sample Submit And Continue

Figure 7. Estuarine Water-Quality Monitoring Database Parkwide Assessment Water Sample Collection Form.

2. Before clicking “Submit and Continue” Check to see if there was a QA/QC sample (blank or duplicate) collected at the same site on the same date. If so, proceed to the next step.
3. If a QA/QC sample (blank or duplicate) was taken, click “Submit and Add Another Water Sample” at the bottom of the screen (Figure 7). An empty form will appear and the “Sample Number” box will change to “2.”

4. Populate all fields in the Water Sample Collection form for the QC Blank or QC Duplicate.
5. Use professional judgement to double check that Secchi depth and salinity are within a reasonable range for the site and tidal window. Extreme values will be flagged by the database.
6. When finished with all entries, click “Submit and Continue.”

Hydrographic Profile

Data from the Parkwide Assessment Hydrographic Profile Form will be entered in this step.

1. Populate all fields in the database Hydrographic Profile Form (Figure 8).
 - a. Make sure that the “Date” is the same as that shown on the “Location and Event Form”.
 - b. Note that times is Eastern Standard Time (EST), 24-hour format.
 - c. Record all data for the parameters shown in the “Down” section before recording data in the “Up” section (Figure 8).

Figure 8. Estuarine Water-Quality Monitoring Database Parkwide Assessment Hydrographic Profile Form.

- d. Check that all “down” readings are similar to “up” readings. Some minor variation is expected depending on current velocities and wave action. In general, “down” readings should be within 25% of the “up” readings. Extreme readings will be flagged by the database.

2. Review your input and click “Submit” when finished.

Sediment Sample Collection Form (if applicable)

Data from the Parkwide Assessment Sediment Sample Collection Form will be entered in this step.

Note that only every other park-wide assessment includes sediment sampling. If no samples were collected click “Skip” at the top right of the form (Figure 9). DO NOT SUBMIT A SEDIMENT SAMPLE COLLECTION FORM IF NO SEDIMENT WAS COLLECTED.

Figure 9. Estuarine Water-Quality Monitoring Database Parkwide Assessment Sediment Sample Collection Form.

1. Populate all fields in the database Sediment Sample Collection Form (Figure 9).
 - a. Make sure that the “Date” is the same as that shown on the “Location and Event Form.”
 - b. Note that times are Eastern Standard Time (EST), 24-hour format.

2. Before clicking “Submit all Samples,” check to see if there was a duplicate sample collected at the same site on the same date. If so, proceed to the next step.
3. If a duplicate sample was taken, click “Add Another Sample” at the bottom of the screen (Figure 9). An empty form will appear and the “Sample Number” box will change to “2.”
4. Populate all fields in the Sediment Sample Collection form for the duplicate.
5. When finished with all entries, click “Submit All Samples.”

Review Input

After submission of a sediment sample collection form or skipping entry of a sediment sample, you will be asked to “Review your input”.

1. After double checking that all forms have been entered click “Next” (Figure 10).

Review your input

Route Summary:

Parkwide Assessment Info:

Water Sample Count: 1
 Normal Sample Count: 1
 QC Blank Count: 0
 QC Duplicate Count: 0

Sediment Sample Count: 1

Hydrologic Profile Increment Count: 6

Next

Figure 10. Estuarine Water-Quality Monitoring Database Parkwide Assessment ‘Review Your Input’ screen.

2. You will then be given the option to “Enter Another Form” or “Exit” to the Parkwide Assessment Selection screen.

Analytical Laboratory Results—Data Verification Procedures

Laboratory results are received as an electronic Microsoft Excel file from the contracted analytical laboratory and subsequently entered in the SECN Estuarine Water-Quality Monitoring Database (EWQD). Prior to data entry, all laboratory results must be reviewed for errors and inconsistencies (pay close attention to site names and sample dates). In some cases, additional information and clarification may be required from the contracted analytical lab. Once the data have passed the initial screening, review the normal and quality control (QC) sample results. Note that when clerical errors have been corrected, all data are entered into the EWQD. Additional application of QC measures to

meet data quality objectives may be conducted during data export and reporting (e.g., censoring data below the method detection limit).

Review All Sample Results and QC Codes

Check the laboratory data qualifier codes (QC codes) for any issues that may indicate problems with the handling or processing of the sample (e.g., hold times exceeded, torn filter, foil pouch damaged). Use this check as an opportunity to identify and correct problems with sample handling and processing prior to the next round of sampling. In some cases, staff may need to be retrained on proper handling technique and procedures.

Review QC Blanks and Duplicate Results

Results of quality control blanks and duplicates are reviewed and compared to requirements for acceptable data shown below (modified from British Columbia Ministry of Environment 1998). This initial assessment of blanks and duplicates is used to correct systemic sampling and handling issues that need to be dealt with as soon as they are identified.

- **Field Blanks**—Blanks are designed to detect contamination that contributes to imprecision and bias. Rules of thumb for assessing contamination are (1) not more than 5% of the blanks will exceed the 'method detection limit' and (2) blanks will not exceed 10% of the environmental levels (based on existing data for a site) or 10% of the level of interest (e.g., a criterion or objective). These rules are data quality objectives for contamination. If concentrations indicate contamination that contributes to imprecision and bias, staff will be retrained on sampling techniques and procedures.
- **Field Duplicates**—Duplicates provide a rough estimate of the overall precision associated with the field technique and laboratory analysis. When the data values for replicate samples have low variability, then contamination during collection or analysis is unlikely and uncertainty associated with data collection can be ruled out. When the data have high variability, contamination may have occurred during collection/analysis or because of environmental conditions that were highly variable.

Precision can be expressed as a relative percent mean difference when duplicates were collected as per the absolute value of the following equation:

$$\frac{\text{data value A} - \text{data value B}}{\frac{(A + B)}{2}} * 100$$

The relative percent mean difference increases rapidly as the analytic value approaches the method detection limit (MDL). Consequently, the use of relative percent mean difference is limited to analytical values that are at least five times the MDL. The following is a 'rule of thumb' criterion for precision values (above which the data need to be viewed with caution):

- 25% relative difference for duplicates (i.e., a value exceeding 25% is considered too imprecise)

Analytical Laboratory Results—Data Entry Procedures

Nutrients

Laboratory results are received as an electronic Microsoft Excel file from the contracted analytical laboratory and subsequently entered into the EWQD.

Direct Entry

While direct data entry is possible for each analyte, the batch upload feature described in the next section is more efficient and prevents transcription errors. For these reasons, consider using batch upload for data resulting from a park-wide assessment.

1. Open the EWQD and click “Lab Data” on the Main Menu (Figure 3).
2. On the next screen, click on “Water Nutrient Analysis”. The Nutrient Analyte Lab Data Entry screen will appear (Figure 11).

Figure 11. Estuarine Water-Quality Monitoring Database Nutrient Analyte Lab Data Entry screen.

3. Select the correct Station Name, Collection Date and Sample Type from the drop-down menu. This list corresponds to data entered from the Water Sample Collection Forms (fixed-station and park-wide). If the correct station name, collection date, and sample type combination is not shown, check to see if the water sample form has been entered and has a data processing level of “Provisional” or “Accepted.”
4. Populate all columns in each row for each analyte (parameter) result. In other words, Total Nitrogen (TN), Total Phosphorus (TP), Total Dissolved Nitrogen (TDN), Total Dissolved Phosphorus (TDP), Dissolved Inorganic Nitrogen (DIN), Dissolved Inorganic Phosphorus (DIP), Chlorophyll *a* Active (Chla), etc. will each have a row.

5. Use professional judgement to review each entry for validity and check that it is within a reasonable range for the site, season, and tidal window. Extreme values will be flagged by the database.
6. When all data entry has been completed click “Submit Data.”

Batch Upload

The batch upload feature in the Estuarine Water-Quality Monitoring Database allows for quick entry of results for multiple analytes and stations. When a properly configured file is uploaded, this feature increases entry efficiency and prevents transcription errors. This section will address both file configuration and upload procedures.

Formatting the Results File (.xlsx to .csv)

The analytical laboratory returns results to the Southeast Coast Network in a Microsoft Excel file. This file must be formatted and saved as a comma delimited (.csv) file so that it can be uploaded into the database using a lab-specific parser. The steps in this section and template in Appendix B are for results supplied by Chesapeake Biological Laboratory. If a different analytical lab is contracted the parser and template will change.

1. Open the raw unformatted file in Microsoft Excel (Figure 12). Raw files are stored on the SECN server in the “Raw” folder for a given park and year (e.g., S:\Monitoring\EstuarineWaterQuality\Parkwide_Assessment\Data\CAHA-CALO_2021\Raw).

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	NUTRIENT ANALYTICAL SERVICES LABORATORY DATA REPORT														
2	Chesapeake Biological Laboratory														
3	146 Williams Street / P.O. Box 38														
4	Tel: 410-326-7252														
5	http://www.umces.edu/nutrient-analytical-services-laboratory														
6	Jerome M. Frank- Laboratory Manager														
7	The following person accepts responsibility for the contents of this report:														
8															
9	Name: Jerome M Frank Signature: JMF Date: 10/4/2019														
10															
11															
12	NELAC Certificate 12066														
13	Date of Issue: 6/28/2017														
14															
15															
16	Client: NPS														
17	Project ID: SECN CANA Coastal Assessment														
18	Reference #:														
19	POC: Starkey														
20	Address:														
21															
22															
23															
24	Sample ID	Sample Date	Received Date	NASL ID	Matrix	Prep Date	Analysis Date	Parameter	<MDL/RL	Result	Unit	MDL/RL	Method	Analyst	Qualifiers/Comments
25	CANA01_2019	7/16/2019	7/23/2019	CANA1	W	8/8/2019	8/8/2019	NH4	L/BR	0.013	mg/L	0.013/0.039	SM4500G	CLH	
26	CANA01_2019	7/16/2019	7/23/2019	CANA1	W	8/8/2019	8/8/2019	NO2		0.0023	mg/L	0.0007/0.0022	EPA 353.2	CLH	
27	CANA01_2019	7/16/2019	7/23/2019	CANA1	W	8/8/2019	8/8/2019	PO4	L/BR	0.0034	mg/L	0.0034/0.0102	EPA 365.1	CLH	
28	CANA01_2019	7/16/2019	7/23/2019	CANA01	W	8/16/2019	8/16/2019	NO23		0.0099	mg/L	0.0007/0.0056	EPA 353.2 CADMIUM	KB	32
29	CANA01_2019	7/16/2019	7/23/2019	CANA1	W	8/12/2019	9/5/2019	TDP		0.0168	mg/L	0.0015/0.0045	EPA 365.1	KB	
30	CANA01_2019	7/16/2019	7/23/2019	CANA1	W	8/12/2019	9/5/2019	TDN		0.80	mg/L	0.05/0.15	EPA 353.2	KB	
31	CANA01_2019	7/16/2019	7/23/2019	CANA1	W	8/19/2019	9/11/2019	TP		0.0460	mg/L	0.0015/0.0045	EPA 365.1	KB	32
32	CANA01_2019	7/16/2019	7/23/2019	CANA1	W	8/19/2019	9/11/2019	TN		1.21	mg/L	0.05/0.15	EPA 353.2	KB	32
33	CANA01_2019	7/16/2019	7/23/2019	CANA01BX4	P	8/7/2019	8/8/2019	Chla		19.75	ug/L	0.69/0.69	EPA 445.0, SM10200H.3 NLK		

Figure 12. Raw lab results report .xlsx screen shot.

2. Go to “File,” “Save As.”
 - a. Change the file type to comma delimited (.csv).

- b. Save the file to the Formatted folder on the SECN server (e.g., S:\Monitoring\EstuarineWaterQuality\Parkwide_Assessment\Data\CAHA-CALO_2021\Formatted).
3. Do not remove any header metadata (i.e., lines 1:23 in Figure 12).
4. If needed, modify the station names in the Sample ID column so they match the SECN station naming convention (e.g., PARK##_YYYY) as recorded on the water sample collection form (Appendix A).
5. Stations with QA/QC samples (Blanks and Duplicates) will have the station name followed by BLANK or DUP (e.g., CANA03_2019 BLANK, CANA04_2019 DUP) (Figure 13).

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	NUTRIENT ANALYTICAL SERVICES LABORATORY DATA REPORT														
2	Chesapeake Biological Laboratory														
3	146 Williams Street / P.O. Box 38														
4	Tel: 410-326-7252														
5	http://www.umces.edu/nutrient-analytical-services-laboratory														
6	Jerome M. Frank- Laboratory Manager														
7															
12	NELAC Certification #	12066													
13	Date of Issue:	6/28/2017													
14															
15															
16	Client:	NPS													
17	Project ID:	SECN CANA Coastal Assessment													
18	Reference #:														
19	POC:	Starkey													
20	Address:														
21															
24	Sample ID	Sample Date	Received Date	NASL ID	Matrix	Prep Date	Analysis Date	Parameter	<MDL/RL	Result	Unit	MDL/RL	Method	Analyst	Comments
52	CANA03_2019 BLANK	7/18/2019	7/23/2019	CANA3 BLANK	W	8/8/2019	8/8/2019	NH4	L/BR	0.013 mg/L		0.013/0.03	SM4500G	CLH	
53	CANA03_2019 BLANK	7/18/2019	7/23/2019	CANA3 BLANK	W	8/8/2019	8/8/2019	NO2		0.0023 mg/L		0.0007/0.03	EPA 353.2	CLH	
54	CANA03_2019 BLANK	7/18/2019	7/23/2019	CANA3 BLANK	W	8/8/2019	8/8/2019	PO4	L/BR	0.0034 mg/L		0.0034/0.03	EPA 365.1	CLH	
55	CANA03_2019 BLANK	7/18/2019	7/23/2019	CANA03 BL	W	8/16/2019	8/16/2019	NO23	L	0.0007 mg/L		0.0007/0.03	EPA 353.2	KB	32
56	CANA03_2019 BLANK	7/18/2019	7/23/2019	CANA3 BLANK	W	8/12/2019	9/5/2019	TDP		0.0029 mg/L		0.0015/0.03	EPA 365.1	KB	
57	CANA03_2019 BLANK	7/18/2019	7/23/2019	CANA3 BLANK	W	8/12/2019	9/5/2019	TDN		0.06 mg/L		0.05/0.15	EPA 353.2	KB	
58	CANA03_2019 BLANK	7/18/2019	7/23/2019	CANA3 BLK	W	8/19/2019	9/11/2019	TP	BR	0.0025 mg/L		0.0015/0.03	EPA 365.1	KB	32
59	CANA03_2019 BLANK	7/18/2019	7/23/2019	CANA3 BLK	W	8/19/2019	9/11/2019	TN	L	0.05 mg/L		0.05/0.15	EPA 353.2	KB	32
60	CANA03_2019 BLANK	7/18/2019	7/23/2019	CANA03BLKB	P	8/7/2019	8/8/2019	Chla	L/BR	0.69 ug/L		0.69/0.69	EPA 445.0	NLK	
70	CANA04_2019 DUP	7/17/2019	7/23/2019	CANA4 DUP	W	8/8/2019	8/8/2019	NH4	L/BR	0.013 mg/L		0.013/0.03	SM4500G	CLH	
71	CANA04_2019 DUP	7/17/2019	7/23/2019	CANA4 DUP	W	8/8/2019	8/8/2019	NO2		0.0024 mg/L		0.0007/0.03	EPA 353.2	CLH	
72	CANA04_2019 DUP	7/17/2019	7/23/2019	CANA4 DUP	W	8/8/2019	8/8/2019	PO4	L/BR	0.0034 mg/L		0.0034/0.03	EPA 365.1	CLH	
73	CANA04_2019 DUP	7/17/2019	7/23/2019	CANA04 DUP	W	8/16/2019	8/16/2019	NO23	L	0.0007 mg/L		0.0007/0.03	EPA 353.2	KB	32
74	CANA04_2019 DUP	7/17/2019	7/23/2019	CANA 4 DUP	W	8/12/2019	9/5/2019	TDP		0.0152 mg/L		0.0015/0.03	EPA 365.1	KB	

Figure 13. Formatted lab results .csv screen shot.

6. Remove all rows that have the Parameter CHL-TOTAL and CHL-PHAEO. These are not stored in the database.
7. Change Parameter CHL-ACTIVE to Chla. Use Find and Replace in Excel to make this easier (ctrl + F).
8. Check that all parameters are named correctly (i.e., TDN, TDP, NH4, NO2, NO23, PO4).
9. Raw results from the lab are typically sorted by parameter and then sample date. To make it easier to spot missing data or entry issues, use Microsoft Excel to sort the results by Sample ID and then Sample Date (Figure 14).

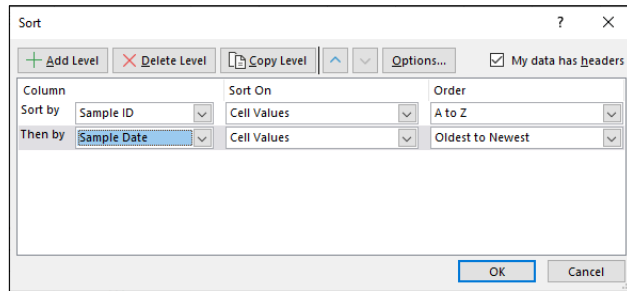


Figure 14. MS Excel Sort Window.

- a. In Microsoft Excel, highlight the headers and all data. Start in Row 24 (i.e., the row with column headers).
 - b. Go to “Data.”
 - c. Click “Sort.”
 - d. Populate Sort by: Colum “Sample ID”, Sort On “Cell Values”, Order “A to Z.”
 - e. Click “Add Level.”
 - f. Populate Then by: “Sample Date”, Sort On “Cell Values”, Order “Oldest to Newest.”
 - g. Click “OK.”
10. Double check that all data are in order by sample date and that each station has all corresponding data.
 - a. All sample dates will have data for the following parameters: Chla, NH4, NO2, NO23, PO4, TP, TN, TDN, and TDP.
 11. Remove any blank rows.
 12. Save the file.

Database Input

1. Open the EWQD and click “Lab Data” on the Main Menu (Figure 3).
2. On the next screen, click on “Water Nutrient Analysis.” The Nutrient Analyte Lab Data Entry screen will appear (Figure 11).
3. Click “Batch Upload” (Figure 11).
4. Read and click “OK” in the warning box. “All data on the current sheet will be cleared. Make sure to check data entry results for errors.”
5. Select the formatted .csv data file.

- From the Data Scraper Extra Info Popup select the correct analytical lab and click Confirm (Figure 15).

Figure 15. Estuarine Water-Quality Monitoring Database Data Scraper Extra Info Popup screen with Chesapeake Bio Lab selected.

- Depending on the amount of data contained in the .csv, the Water Nutrient Analysis screen may take several minutes to populate with data (Figure 16). If the screen has not populated with data after approximately 10 minutes, contact the SECN data manager for assistance.

Nutrient Analyte Lab Data Entry											Submit Data	
DATABASE v1.0 (09/2019)				Batch Upload							Back	Main Menu
Sample	Collection Date	Laboratory	Analysis Date	Parameter	Result	UnitID	Method Detection	Lower rQui	Method	Comment		
REAL01_2019	7/16/2019	Chesapeake Bio Lab	8/8/2019 NH4		0.013	mg/L	0.013	0.0390	SM4500G			
REAL01_2019	7/16/2019	Chesapeake Bio Lab	8/8/2019 NO2		0.0023	mg/L	0.0007	0.0022	EPA 353.2			
REAL01_2019	7/16/2019	Chesapeake Bio Lab	8/8/2019 PO4		0.0034	mg/L	0.0034	0.0102	EPA 365.1			
REAL01_2019	7/16/2019	Chesapeake Bio Lab	8/16/2019 NO23		0.0099	mg/L	0.0007	0.0056	EPA 353.2 C/F 32			
REAL01_2019	7/16/2019	Chesapeake Bio Lab	9/5/2019 TDP		0.0168	mg/L	0.0015	0.0045	EPA 365.1			
REAL01_2019	7/16/2019	Chesapeake Bio Lab	9/5/2019 TDN		0.8	mg/L	0.05	0.1500	EPA 353.2			
REAL01_2019	7/16/2019	Chesapeake Bio Lab	9/11/2019 TP		0.046	mg/L	0.0015	0.0045	EPA 365.1	32		
REAL01_2019	7/16/2019	Chesapeake Bio Lab	9/11/2019 TN		1.21	mg/L	0.05	0.1500	EPA 353.2	32		
REAL01_2019	7/16/2019	Chesapeake Bio Lab	8/8/2019 Chla		19.75	ug/L	0.69	0.6900	EPA 445.0. SA			
REAL02_2019	7/15/2019	Chesapeake Bio Lab	8/8/2019 NH4		0.013	mg/L	0.013	0.0390	SM4500G			
REAL02_2019	7/15/2019	Chesapeake Bio Lab	8/8/2019 NO2		0.0025	mg/L	0.0007	0.0022	EPA 353.2			
REAL02_2019	7/15/2019	Chesapeake Bio Lab	8/8/2019 PO4		0.0034	mg/L	0.0034	0.0102	EPA 365.1			
REAL02_2019	7/15/2019	Chesapeake Bio Lab	8/16/2019 NO23		0.0016	mg/L	0.0007	0.0056	EPA 353.2 C/F 32			
REAL02_2019	7/15/2019	Chesapeake Bio Lab	9/5/2019 TDP		0.0207	mg/L	0.0015	0.0045	EPA 365.1			
REAL02_2019	7/15/2019	Chesapeake Bio Lab	9/5/2019 TDN		0.82	mg/L	0.05	0.1500	EPA 353.2			
REAL02_2019	7/15/2019	Chesapeake Bio Lab	9/11/2019 TP		0.08	mg/L	0.0015	0.0045	EPA 365.1	32		
REAL02_2019	7/15/2019	Chesapeake Bio Lab	9/11/2019 TN		1.38	mg/L	0.05	0.1500	EPA 353.2	32		
REAL02_2019	7/15/2019	Chesapeake Bio Lab	8/8/2019 Chla		21.69	ug/L	0.69	0.6900	EPA 445.0. SA			

Figure 16. Estuarine Water-Quality Monitoring Database populated Nutrient Analyte Lab Data Entry screen.

- Check all entries against the original Microsoft Excel results provided by the lab. Be sure to look for any missing lines, station names, sample dates, parameter names or method detection limits (MDLs). Any missing information may indicate an issue with the formatting of the .csv file. Blanks and duplicate sample ID's may need to be selected manually from the drop down, which appears in each row of the first column of the Nutrient Analyte Lab Data Entry form (Figure 16).

- Use professional judgement to review each entry for validity and check that it is within a reasonable range for the site, season, and tidal window. Extreme values will be flagged by the database.

- Click “Submit Data.”

Sediment

Laboratory results are received as an electronic Microsoft Excel file (EDD) from the contracted analytical laboratory and subsequently entered into the EWQD.

Direct Entry

Direct entry is possible but not suggested for sediment analytes due to the volume of data (70 analytes per site, or 2,100 analyte results per park per park-wide assessment). Use the batch upload feature described in the next section.

Batch Upload

Formatting the Results File (.xlsx to .csv)

The analytical laboratory returns results to the Southeast Coast Network in a Microsoft Excel file (.xlsx). This file must be formatted and saved as a comma delimited (.csv) file so it can be uploaded into the database using a lab-specific parser. The steps in this section and template in Appendix B (Table B-2) are for results supplied by Advanced Environmental Laboratories, Inc. (AEL). If a different analytical lab is contracted the parser and template will change.

- Open the raw unformatted file in Microsoft Excel (Figure 17). Raw files are stored on the SECN server in the “Raw” folder for a given year (e.g., S:\Monitoring\EstuarineWaterQuality\Parkwide_Assessment\Data\CAHA-CALO_2021\Raw).

	A	C	F	G	H	I	J	K	L	M	N	O	P
	AEL Proj#	Client Sa	Matrix	Tests Description	Method	CAS	Parameter	Dilution	Adjusted Detec	Adjusted Reportin	Final Result	Units	Qualifier Only
1	J1909342	CANA-06	Soil	AL,6010B,SO,ICP	SW-846 6010	7429-90-5	Aluminum	2	2.8	11	740 mg/Kg		
2	J1909342	CANA-06	Soil	AL,6010B,SO,ICP	SW-846 6010	7440-50-8	Copper	1	0.7	2.8	0.7 mg/Kg	U	
3	J1909342	CANA-06	Soil	AL,6010B,SO,ICP	SW-846 6010	7439-96-5	Manganese	1	0.28	1.1	4.1 mg/Kg		
4	J1909342	CANA-06	Soil	AL,6010B,SO,ICP	SW-846 6010	7439-92-1	Lead	1	0.28	1.1	0.56 mg/Kg	I	
5	J1909342	CANA-06	Soil	AL,6010B,SO,ICP	SW-846 6010	7440-36-0	Antimony	1	0.7	2.8	0.7 mg/Kg	U	
6	J1909342	CANA-06	Soil	AL,6010B,SO,ICP	SW-846 6010	7439-89-6	Iron	1	2.8	11	700 mg/Kg		
7	J1909342	CANA-06	Soil	AL,6010B,SO,ICP	SW-846 6010	7440-47-3	Chromium	1	0.14	0.56	1.7 mg/Kg		
8	J1909342	CANA-06	Soil	AL,6010B,SO,ICP	SW-846 6010	7440-66-6	Zinc	1	0.7	2.8	2.1 mg/Kg	I	
9	J1909342	CANA-06	Soil	AL,6010B,SO,ICP	SW-846 6010	7440-02-0	Nickel	1	0.28	1.1	0.47 mg/Kg	I	
10	J1909342	CANA-06	Soil	AL,6010B,SO,ICP	SW-846 6010	7440-38-2	Arsenic	1	0.7	2.8	0.7 mg/Kg	U	
11	J1909342	CANA-06	Soil	AL,6010B,SO,ICP	SW-846 6010	7440-43-9	Cadmium	1	0.07	0.28	0.07 mg/Kg	U	
12	J1909342	CANA-06	Soil	DRY WEIGHT	SM 2540G	PMOIST	Percent Moisture	1	0.001	0.001	29 %		
13	J1909342	CANA-06	Soil	HG,7471A,SO,CVAA	SW-846 7471A	7439-97-6	Mercury	1	0.00092	0.0066	0.0017 mg/Kg	I	
14	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	90-12-0	1-Methylnaphthalene	1	0.0039	0.011	0.0039 mg/Kg	U	
15	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	86-73-7	Fluorene	1	0.0049	0.011	0.0049 mg/Kg	U	
16	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	120-12-7	Anthracene	1	0.0059	0.011	0.0059 mg/Kg	U	
17	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	53-70-3	Dibenzo[a,h]anthracene	1	0.0058	0.011	0.0058 mg/Kg	U	
18	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	56-55-3	Benzo[a]anthracene	1	0.007	0.011	0.007 mg/Kg	U	
19	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	205-99-2	Benzo[b]fluoranthene	1	0.0071	0.011	0.0071 mg/Kg	U	
20	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	191-24-2	Benzo[g,h,i]perylene	1	0.008	0.011	0.008 mg/Kg	U	
21	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	4165-60-0	Nitrobenzene-d5	1					
22	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	92-94-4	p-Terphenyl-d14	1					
23	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	206-44-0	Fluoranthene	1	0.0064	0.011	0.0064 mg/Kg	U	
24	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	321-60-8	2-Fluorobiphenyl	1					
25	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	91-57-6	2-Methylnaphthalene	1	0.0039	0.011	0.0039 mg/Kg	U	
26	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	85-01-8	Phenanthrene	1	0.0052	0.011	0.0052 mg/Kg	U	
27	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	218-01-9	Chrysene	1	0.0073	0.011	0.0073 mg/Kg	U	
28	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	193-39-5	Indeno(1,2,3-cd)pyrene	1	0.0064	0.011	0.0064 mg/Kg	U	
29	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	83-32-9	Acenaphthene	1	0.0043	0.011	0.0043 mg/Kg	U	
30	J1909342	CANA-06	Soil	PAH,8270C,SIM,SO	SW-846 8270C (SIM)	207-08-9	Benzo[k]fluoranthene	1	0.0068	0.011	0.0068 mg/Kg	U	

Figure 17. Raw sediment lab results EDD .xlsx screen shot.

2. Go to “File,” “Save As.”
 - a. Change the file type to comma delimited (.csv).
 - b. Save the file to the Formatted folder on the SECN server (e.g., S:\Monitoring\EstuarineWaterQuality\Parkwide_Assessment\Data\CAHA-CALO_2021\Formatted).
3. Do not remove any header metadata (i.e., row 1 in Figure 17).
4. If needed, modify the station names in the ‘Client Sample ID’ column so that they match the SECN station naming convention (i.e., PARK##_YYYY) as recorded on the sediment sample collection form (Appendix A).
5. Check that all parameters are named correctly. Parameter labels can be found in the SECN Estuarine water-quality database data dictionary (S:\Data Management\Databases\EstuarineWaterQuality\2020 Database (Active)\Data Dictionary) and in the SECN Estuarine Water-Quality Monitoring Database Lookup Manager (dbo_Parameter) table.
6. Raw results from the lab are typically sorted by sample site and sample date. To make it easier to spot missing data or entry issues, use Microsoft Excel to sort the results by Client Sample ID and then Parameter.
 - a. In Microsoft Excel, highlight the header and all data. Start in Row 1 (i.e., the row with column headers).
 - b. Go to “Data.”
 - c. Click “Sort.”
 - d. Populate Sort by: “Client Sample ID”, Sort On “Cell Values”, Order “A to Z.”
 - e. Click “Add Level.”
 - f. Populate Then by: “Parameter”, Sort On “Cell Values”, Order “A to Z.”
 - g. Click “OK.”
7. Double check that all data are in order by station and then parameter and that each station has all corresponding data.

Table 1. All sites will have data for the following parameters.

Parameters A–D	Parameters E–Z
1-Methylnaphthalene	Endosulfan I
2-Fluorobiphenyl	Endosulfan II
2-Methylnaphthalene	Endosulfan Sulfate
4,4'-DDD	Endrin
4,4'-DDE	Endrin Aldehyde
4,4'-DDT	Fluoranthene
Acenaphthene	Fluorene
Acenaphthylene	gamma-BHC (Lindane)
Aldrin	Heptachlor
alpha-BHC	Heptachlor Epoxide
Aluminum	Indeno(1,2,3-cd)pyrene
Anthracene	Iron
Antimony	Lead
Aroclor 1016 (PCB-1016)	Manganese
Aroclor 1221 (PCB-1221)	Mercury
Aroclor 1232 (PCB-1232)	Methoxychlor
Aroclor 1242 (PCB-1242)	Naphthalene
Aroclor 1248 (PCB-1248)	Nickel
Aroclor 1254 (PCB-1254)	Nitrobenzene-d5
Aroclor 1260 (PCB-1260)	Percent Moisture
Arsenic	Phenanthrene
Benzo[a]anthracene	p-Terphenyl-d14
Benzo[a]pyrene	Pyrene
Benzo[b]fluoranthene	Selenium
Benzo[g,h,i]perylene	Tetrachloro-m-xylene
Benzo[k]fluoranthene	Tetrachloro-m-xylene
beta-BHC	Tin
Cadmium	TOC High Range

Parameters A–D	Parameters E–Z
Chlordane (technical)	TOC Low Range
Chromium	Total Organic Carbon
Chrysene	Toxaphene
Copper	Zinc
Decachlorobiphenyl	–
Decachlorobiphenyl	–
delta-BHC	–
Dibenzo[a,h]anthracene	–
Dieldrin	–

8. Remove any blank rows.

9. Save the file (Figures 18 and 19).

	A	C	F	G	H	I	J	K	L	M	N	O	P
1	AEI Projec	Client San	Matrix	Tests_Descrip	Method	CAS	Paramete	Dilution	Adjusted	Adjusted	Final Resu	Units	Qualifier
2	J1909342	CANA-01	Soil	PAH,8270C,SIF	SW-846 82	90-12-0	1-Methylr	1	0.017	0.05	0.017	mg/Kg	U
3	J1909342	CANA-01	Soil	PAH,8270C,SIF	SW-846 82	321-60-8	2-Fluorob	1					
4	J1909342	CANA-01	Soil	PAH,8270C,SIF	SW-846 82	91-57-6	2-Methylr	1	0.017	0.05	0.017	mg/Kg	U
5	J1909342	CANA-01	Soil	Pesticides,808	EPA 8081	72-54-8	4,4'-DDD	5	0.0043	0.026	0.0043	mg/Kg	U
6	J1909342	CANA-01	Soil	Pesticides,808	EPA 8081	72-55-9	4,4'-DDE	5	0.0033	0.026	0.0033	mg/Kg	U
7	J1909342	CANA-01	Soil	Pesticides,808	EPA 8081	50-29-3	4,4'-DDT	5	0.0073	0.026	0.0073	mg/Kg	U
8	J1909342	CANA-01	Soil	PAH,8270C,SIF	SW-846 82	83-32-9	Acenaphtl	1	0.019	0.05	0.019	mg/Kg	U
9	J1909342	CANA-01	Soil	PAH,8270C,SIF	SW-846 82	208-96-8	Acenaphtl	1	0.025	0.05	0.025	mg/Kg	U
10	J1909342	CANA-01	Soil	Pesticides,808	EPA 8081	309-00-2	Aldrin	5	0.0039	0.026	0.0039	mg/Kg	U
11	J1909342	CANA-01	Soil	Pesticides,808	EPA 8081	319-84-6	alpha-BHC	5	0.0044	0.026	0.0044	mg/Kg	U
12	J1909342	CANA-01	Soil	AL,6010B,SO,I	SW-846 6C	7429-90-5	Aluminum	10	16	62	2700	mg/Kg	
13	J1909342	CANA-01	Soil	PAH,8270C,SIF	SW-846 82	120-12-7	Anthracen	1	0.026	0.05	0.026	mg/Kg	U
14	J1909342	CANA-01	Soil	AL,6010B,SO,I	SW-846 6C	7440-36-0	Antimony	1	0.78	3.1	0.78	mg/Kg	U
15	J1909342	CANA-01	Soil	PCB,8082A,SO	SW-846 8C	12674-11-1	Aroclor 10	5	0.049	0.26	0.049	mg/Kg	U
16	J1909342	CANA-01	Soil	PCB,8082A,SO	SW-846 8C	11104-28-1	Aroclor 12	5	0.095	0.26	0.095	mg/Kg	U
17	J1909342	CANA-01	Soil	PCB,8082A,SO	SW-846 8C	11141-16-1	Aroclor 12	5	0.23	0.26	0.23	mg/Kg	U
18	J1909342	CANA-01	Soil	PCB,8082A,SO	SW-846 8C	53469-21-1	Aroclor 12	5	0.063	0.26	0.063	mg/Kg	U
19	J1909342	CANA-01	Soil	PCB,8082A,SO	SW-846 8C	12672-29-1	Aroclor 12	5	0.17	0.26	0.17	mg/Kg	U
20	J1909342	CANA-01	Soil	PCB,8082A,SO	SW-846 8C	11097-69-1	Aroclor 12	5	0.11	0.26	0.11	mg/Kg	U
21	J1909342	CANA-01	Soil	PCB,8082A,SO	SW-846 8C	11096-82-1	Aroclor 12	5	0.056	0.26	0.056	mg/Kg	U
22	J1909342	CANA-01	Soil	AL,6010B,SO,I	SW-846 6C	7440-38-2	Arsenic	1	0.78	3.1	0.78	mg/Kg	U
23	J1909342	CANA-01	Soil	PAH,8270C,SIF	SW-846 82	56-55-3	Benzo[a]a	1	0.031	0.05	0.031	mg/Kg	U
24	J1909342	CANA-01	Soil	PAH,8270C,SIF	SW-846 82	50-32-8	Benzo[a]p	1	0.043	0.05	0.043	mg/Kg	U
25	J1909342	CANA-01	Soil	PAH,8270C,SIF	SW-846 82	205-99-2	Benzo[b]f	1	0.031	0.05	0.031	mg/Kg	U
26	J1909342	CANA-01	Soil	PAH,8270C,SIF	SW-846 82	191-24-2	Benzo[g,h	1	0.035	0.05	0.035	mg/Kg	U
27	J1909342	CANA-01	Soil	PAH,8270C,SIF	SW-846 82	207-08-9	Benzo[k]f	1	0.03	0.05	0.03	mg/Kg	U
28	J1909342	CANA-01	Soil	Pesticides,808	EPA 8081	319-85-7	beta-BHC	5	0.003	0.026	0.003	mg/Kg	U
29	J1909342	CANA-01	Soil	AL,6010B,SO,I	SW-846 6C	7440-43-9	Cadmium	1	0.078	0.31	0.078	mg/Kg	U
30	J1909342	CANA-01	Soil	Pesticides,808	EPA 8081	57-74-9	Chlordane	5	0.11	0.26	0.11	mg/Kg	U
31	J1909342	CANA-01	Soil	AL,6010B,SO,I	SW-846 6C	7440-47-3	Chromium	10	1.6	6.2	5.3	mg/Kg	I

Figure 18. Formatted sediment lab results .csv screen shot.

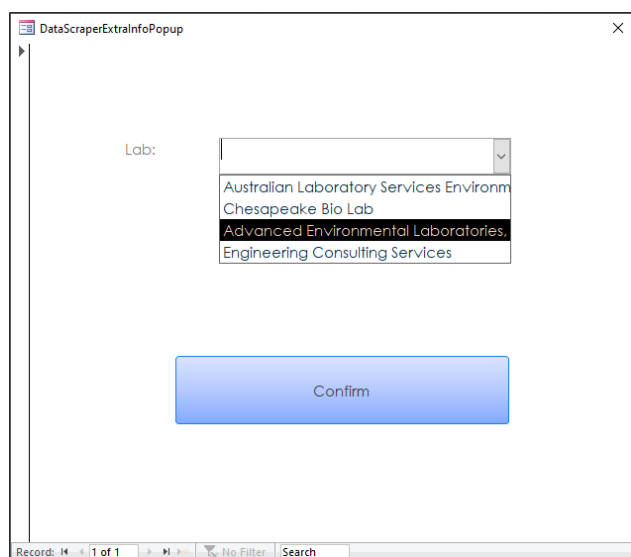


Figure 21. Estuarine Water-Quality Monitoring Database Data Scraper Extra Info Popup screen with AEL selected.

7. Depending on the amount of data contained in the .csv, the Sediment Analyte Lab Data Entry screen may take several minutes to populate with data (Figure 22). If the screen has not populated with data after approximately 10 minutes, contact the SECN data manager for assistance.
8. Check all entries against the original Microsoft Excel results provided by the lab. Be sure to look for any missing lines, station names, sample dates, parameter names or method detection limits (MDLs). Any missing information may indicate an issue with the formatting of the .csv file, parameter name, or units.
9. Use professional judgement to review each entry for validity and check that it is within a reasonable range for the site. Extreme values will be flagged by the database.
10. Click “Submit Data.”

Sediment Analyte Lab Data Entry									
DATABASE v 0.6 (05/2020)									
Sediment Sample ID	LaboratoryName	Analysis Date	Parameter	Result	Unit	MethodDe	LowerQuc	Method	Comment
REAL01_2019 7/16/20	Advanced Environmental	8/6/2019	ARSENIC	0.7800	mg/kg	0.7800	3.1000	EPA 6010	
REAL01_2019 7/16/20	Advanced Environmental	8/7/2019	ANTIMONY	0.7800	mg/kg	0.7800	3.1000	EPA 6010	
REAL01_2019 7/16/20	Advanced Environmental	8/6/2019	ALUMINUM	2700.0000	mg/kg	16.0000	62.0000	EPA 6010	
REAL01_2019 7/16/20	Advanced Environmental	8/6/2019	CADMIUM	0.0780	mg/kg	0.0780	0.3100	EPA 6010	
REAL01_2019 7/16/20	Advanced Environmental	8/6/2019	MANGANESE	21.0000	mg/kg	0.3100	1.2000	EPA 6010	
REAL01_2019 7/16/20	Advanced Environmental	8/6/2019	ZINC	5.8000	mg/kg	0.7800	3.1000	EPA 6010	
REAL01_2019 7/16/20	Advanced Environmental	8/6/2019	NICKEL	1.3000	mg/kg	0.3100	1.2000	EPA 6010	
REAL01_2019 7/16/20	Advanced Environmental	8/6/2019	COPPER	2.8000	mg/kg	0.7800	3.1000	EPA 6010	
REAL01_2019 7/16/20	Advanced Environmental	8/7/2019	CHROMIUM	5.3000	mg/kg	1.6000	6.2000	EPA 6010	
REAL01_2019 7/16/20	Advanced Environmental	8/7/2019	IRON	2600.0000	mg/kg	31.0000	120.0000	EPA 6010	
REAL01_2019 7/16/20	Advanced Environmental	8/6/2019	LEAD	0.3100	mg/kg	0.3100	1.2000	EPA 6010	
REAL01_2019 7/16/20	Advanced Environmental	7/22/2019	Percent Moist	37.0000	%	0.0010	0.0010	SM 2540G	
REAL01_2019 7/16/20	Advanced Environmental	8/7/2019	MERCURY	0.0090	mg/kg	0.0010	0.0072	EPA 7471	
REAL01_2019 7/16/20	Advanced Environmental	7/25/2019	BENZO(k)FLUO	0.0300	mg/kg	0.0300	0.0500	EPA 8270/PA	
REAL01_2019 7/16/20	Advanced Environmental	7/25/2019	ANTHRACENE	0.0260	mg/kg	0.0260	0.0500	EPA 8270/PA	
REAL01_2019 7/16/20	Advanced Environmental	7/25/2019	BENZO(a)PYRE	0.0430	mg/kg	0.0430	0.0500	EPA 8270/PA	
REAL01_2019 7/16/20	Advanced Environmental	7/25/2019	BENZO(a)ANTH	0.0310	mg/kg	0.0310	0.0500	EPA 8270/PA	
REAL01_2019 7/16/20	Advanced Environmental	7/25/2019	ACENAPHTHEN	0.0190	mg/kg	0.0190	0.0500	EPA 8270/PA	

Figure 22. Estuarine Water-Quality Monitoring Database populated Sediment Analyte Lab Data Entry screen.

Particle Grain Size Distribution

Particle grain size results are received as a PDF file from the contracted analytical laboratory and subsequently entered into the Estuarine Water-Quality Monitoring database (Figure 23).

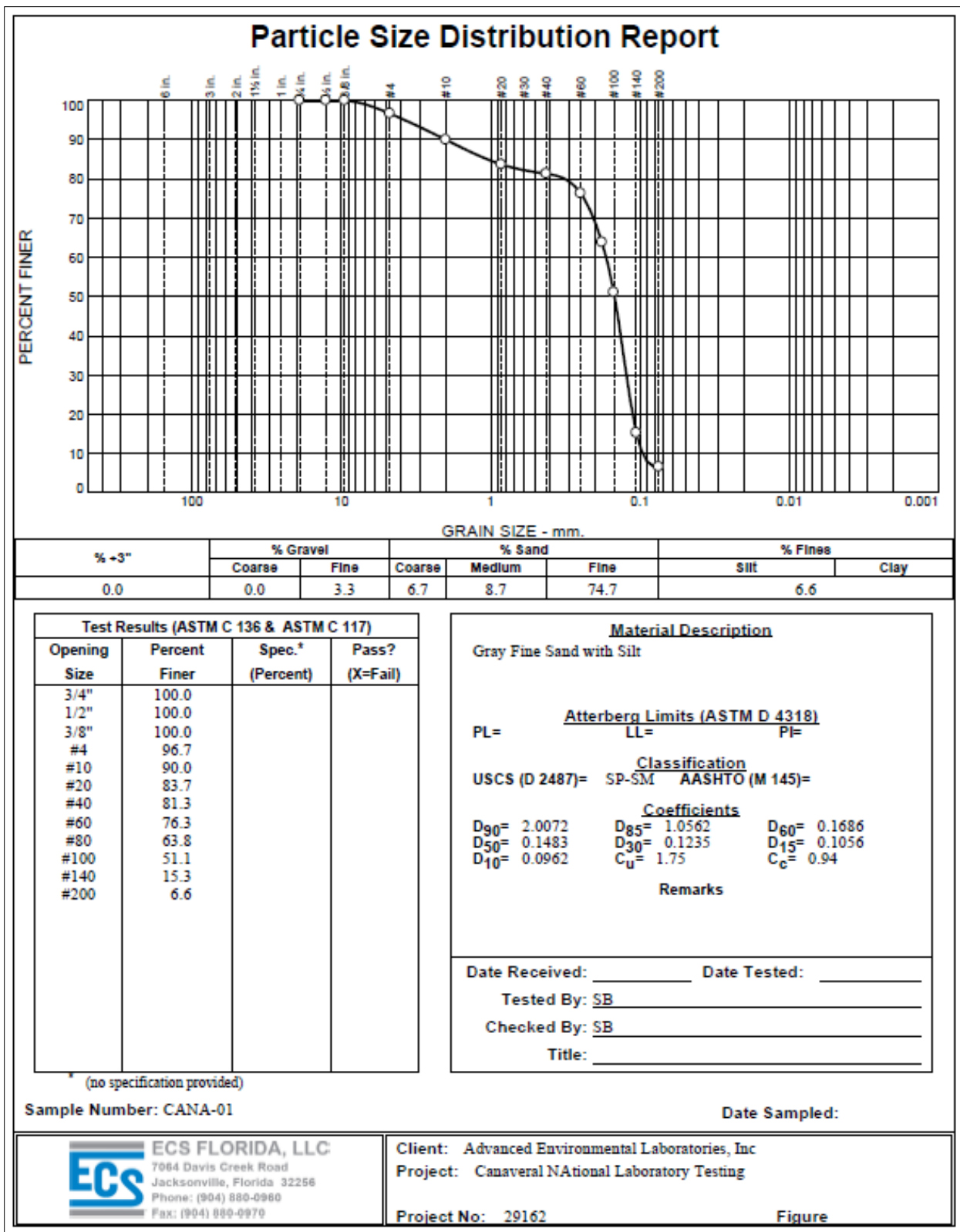
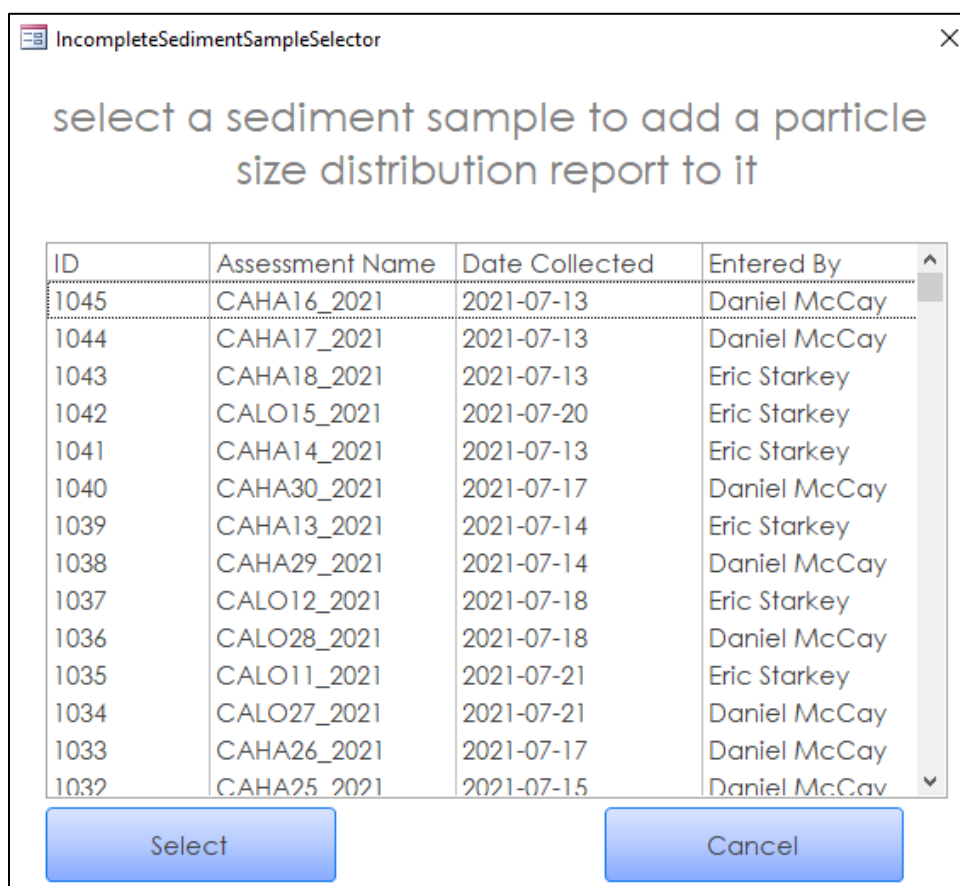


Figure 23. Example of particle size distribution report.

Direct Entry

1. Open the EWQD and click “Lab Data” on the Main Menu (Figure 3).
2. On the next screen, click on “Particle Grain Size Distribution”.
3. From the “Incomplete Sediment Sample Selector” window, select the “Assessment Name” corresponding to the monitoring station shown on the lab report (Figures 23 and 24). Click “Select.”



ID	Assessment Name	Date Collected	Entered By
1045	CAHA16_2021	2021-07-13	Daniel McCay
1044	CAHA17_2021	2021-07-13	Daniel McCay
1043	CAHA18_2021	2021-07-13	Eric Starkey
1042	CALO15_2021	2021-07-20	Eric Starkey
1041	CAHA14_2021	2021-07-13	Eric Starkey
1040	CAHA30_2021	2021-07-17	Daniel McCay
1039	CAHA13_2021	2021-07-14	Eric Starkey
1038	CAHA29_2021	2021-07-14	Daniel McCay
1037	CALO12_2021	2021-07-18	Eric Starkey
1036	CALO28_2021	2021-07-18	Daniel McCay
1035	CALO11_2021	2021-07-21	Eric Starkey
1034	CALO27_2021	2021-07-21	Daniel McCay
1033	CAHA26_2021	2021-07-17	Daniel McCay
1032	CAHA25_2021	2021-07-15	Daniel McCay

Figure 24. Incomplete Sediment Sample Selector window.

4. On the Particle Grain Size Distribution screen (Figure 25), enter data for:
 - a. %± 3”, % Gravel (Coarse and Fine)
 - b. % Sand (Coarse, Medium and Fine)
 - c. % Fines (Silt + Clay)
 - d. Material Description

Particle Grain Size Distribution (Sediment Analysis)
v1.0 (3/2020)

% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt + Clay

Material Description:

Submit

Figure 25. Particle Grain Size Distribution screen.

- Click “Submit”
- Use professional judgement to review each entry for validity and check that it is within a reasonable range for the site. Extreme values will be flagged by the database.
- Repeat steps 1–5 until grain size data has been entered for each monitoring station.

Quality Assurance (QA) and Processing

As indicated in Figure 2 (SECN Estuarine Water-Quality Monitoring Database [EWQD] Procedures), all park-wide assessment data (field forms and lab results) are entered in the database and reviewed twice for quality assurance. This section outlines the procedures for the review of these records.

Data Processing Levels

Data processing levels indicate the level of review that has been applied to a given dataset within the database.

- | | |
|--------------|--|
| Raw: | Data have been entered but received no further review, or data have been reviewed and found to contain errors that need to be fixed. |
| Provisional: | The person that performed the data entry has checked all values against the original paper forms and found them to be free of errors. Considered the initial review. |
| Accepted: | An independent observer has checked all values against the original paper forms and found them to be free of errors. Considered the final review. |

Review of Field Forms (QA)

This process applies to all field forms (i.e., Station Location, Water Sample, Hydrographic Profile, Sediment Sample) and is the same for the initial and final review of data.

1. Obtain the original paper datasheets filed in the SECN Athens office.
2. Open the EWQD.
3. From the Main Menu, select “Quality Control/Finalize Data” (Figure 3).
4. From the “Quality Control Manager” screen, select the Form Type of interest (e.g., ParkwideSamplingLocation, ParkwideWaterSample, ParkwideHydrographicProfile, ParkwideSedimentSample; Figure 26).

FormType	Station Name	Date Deployed/Collected (If applicable)	Entered By	Date Entered	Current Data Processing Level	Data Processed By	Data Processing
ParkwideHydrologicProfile	REAL35_2019	2019-07-16	Eric Starkey	2021-06-18	Raw	Eric Starkey	2021-08-19
ParkwideSamplingLocation	REAL35_2019	2019-07-16	Eric Starkey	2021-06-18	Raw	Eric Starkey	2021-06-18
ParkwideSedimentSample	REAL35_2019	2019-07-16	Eric Starkey	2021-06-18	Raw	Eric Starkey	2021-08-19
ParkwideWaterSample	REAL35_2019	2019-07-16	Eric Starkey	2021-06-18	Raw	Eric Starkey	2021-08-19

New Processing Level: PROVISIONAL Continue

Figure 26. Estuarine Water-Quality Monitoring Database Quality Control Manager screen with a Parkwide Event selected.

5. After selecting the event of interest, use the drop-down menu to select the new processing level that will be applied to the data (i.e., Raw, Provisional, or Accepted; Figure 26).
 - a. Raw data can move up to Provisional.
 - b. Provisional data can move up to Accepted or back to Raw.
 - c. Accepted data are considered final and can no longer be moved back to Provisional or Raw. As a result, Accepted records do not appear in the list of forms that can be processed.
6. Click “Continue.”
7. Review all entries against the paper datasheet. In addition, use professional judgement to review each entry for validity and check that it is within a reasonable range for the site.

- a. If an error is found, it can be corrected but the database will automatically move the record back to the Raw processing level.
 - b. On the water sample form use the “Go To Sample” drop down to review QC Blanks and QC Duplicates.
 - c. If all data match the paper datasheet, click “Confirm and Apply New Processing Level” (Figure 27).
8. Repeat this process for all field forms recorded at a monitoring station (Station Location, Water Sample, Hydrographic Profile, Sediment Sample).

Parkwide Assessment — Water Sample Collection Form

DATASHEET v2.2 (04/2019)

Sample Number: 1 View Discrete Event Information

Water Sample Type: Normal Sample Filtration Method: Vacuum

Collected By: Daniel McCay Collection Date: 2019-07-16 Salinity: (PSU) 28.35

Collection Time: (EST) 11:45:00 Secchi Depth: .8 Low Tide Time: (EST) 18:11:00

Check if the secchi disk hit the ground before losing visibility ☐

Surface (0.5 m) **	TN	☒	TP	☒	Amount Filtered: (ml)	150
Analysis:	TDN	☒	TDP	☒	Filtered By:	▼
	DIN	☒	DIP	☒	Filtered Date:	2019-07-16
Comments:	Chl a	☒			Filtered Time: (EST)	11:50:00

Recorded By Eric Starkey ▼

Jump To A Sample:
(Changes will be saved)

1 ▼

Delete Current Sample

Submit and Add Another Water Sample

Current Processing Level RAW

New Processing Level PROVISIONAL ▼

Previously Processed By: Eric Starkey

Confirm And Apply New Processing Level

Figure 27. Estuarine Water-Quality Monitoring Database options to apply a new processing level to a park-wide water sample form.

Review of Analytical Laboratory Results (QA)

Nutrients/Chla

This process is the same for the initial and final review of data.

1. Obtain the original paper datasheets filed in the SECN Athens office.
2. Open the EWQD.
3. From the Main Menu, select “Quality Control/Finalize Data” (Figure 3).
4. From the “Quality Control Manager” screen, select the Form Type “ParkwideNutrientLabData” (Figure 28).

FormType	Station Name	Date Deployed/Collected (If applicable)	Entered By	Date Entered	Current Data Processing Level	Data Processed By	Data Processing Date
FixedSamplingLocation	FAKElake99		Ben Flanders	2021-04-29	Raw	Ben Flanders	2021-04-29
FiveStationNutrientLabData					NA		
ParkwideHydrologicProfile	REAL35_2019	2019-07-16	Eric Starkey	2021-06-18	Raw	Eric Starkey	2021-08-19
ParkwideNutrientLabData	REAL35_2019	2019-07-16	Eric Starkey	2021-06-18	NA		
ParkwideSamplingLocation	REAL35_2019		Eric Starkey	2021-06-18	Raw	Eric Starkey	2021-06-18
ParkwideSedimentSample	REAL35_2019	2019-07-16	Eric Starkey	2021-06-18	Raw	Eric Starkey	2021-08-19
ParkwideWaterSample	REAL35_2019	2019-07-16	Eric Starkey	2021-06-18	Raw	Eric Starkey	2021-08-19
SedimentLabData					NA		

New Processing Level: Processed in subsequent step Continue

Figure 28. Estuarine Water-Quality Monitoring Database Quality Control Manager with “ParkwideNutrientLabData” Form Type selected.

5. After selecting the “ParkwideNutrientLabData” form use the drop-down menu to select “Processed in subsequent step” (Figure 28).
6. Click “Continue.”
7. From the DPL Parkwide Nutrient Analyte Selector Screen (Figure 29). Select a Parkwide Assessment Station Name to process its analyte data.

RandomStationName	SampleDate	AcceptedAnalyteCount	UnprocessedAnalyteCount
REAL01_2019	7/16/2019	9	9
REAL02_2019	7/15/2019	9	9
REAL03_2019	7/18/2019	9	9

Select Cancel

Figure 29. Estuarine Water-Quality Monitoring Database DPL Parkwide Nutrient Analyte Selector screen.

8. Review the data shown in the Nutrient Analyte Lab Data QC spreadsheet (Figure 30) against the original results provided by the lab. In addition, use professional judgement to review each entry for validity and check that it is within a reasonable range for the site.

Nutrient Analyte Lab Data QC				Station/Assessment: REAL01_2019		Quick Change New DPLs (first select record(s) below)		Apply Data Processing Information		
Database v1.0 (09/2019)				Collection Date: 2019-07-16				RAW		
Sample Type: Normal Sample								PROVISIONAL	Back	
								ACCEPTED	Main Menu	
LaboratoryID	AnalysisID	Parameter	Result	UnitID	MethodDetectionLimit	LowerQuantificationLimit	MethodID	Comment	Current DPL	New DPL
Chesapeake Bio Lab	08-Aug-19 NH4		0.0130 milligrams pe		0.013	0.0390 \$M4500G			ACCEPTED	ACCEPTED
Chesapeake Bio Lab	08-Aug-19 NO2		0.0023 milligrams pe		0.0007	0.0022 EPA 353.2			ACCEPTED	ACCEPTED
Chesapeake Bio Lab	08-Aug-19 PO4		0.0034 milligrams pe		0.0034	0.0102 EPA 365.1			ACCEPTED	ACCEPTED
Chesapeake Bio Lab	16-Aug-19 NO23		0.0099 milligrams pe		0.0007	0.0056 EPA 353.2 C/ 32			ACCEPTED	ACCEPTED
Chesapeake Bio Lab	05-Sep-19 IDP		0.0168 milligrams pe		0.0015	0.0045 EPA 365.1			ACCEPTED	ACCEPTED
Chesapeake Bio Lab	05-Sep-19 IDN		0.8000 milligrams pe		0.05	0.1500 EPA 353.2			ACCEPTED	ACCEPTED
Chesapeake Bio Lab	11-Sep-19 IP		0.0460 milligrams pe		0.0015	0.0045 EPA 365.1	32		ACCEPTED	ACCEPTED
Chesapeake Bio Lab	11-Sep-19 IN		1.2100 milligrams pe		0.05	0.1500 EPA 353.2	32		ACCEPTED	ACCEPTED
Chesapeake Bio Lab	08-Aug-19 Chla		19.7500 micrograms		0.69	0.6900 EPA 445.0. \$H			ACCEPTED	ACCEPTED

Figure 30. Estuarine Water-Quality Monitoring Database Nutrient Analyte Lab Data QC screen.

- a. If an error is found, it can be corrected but the database will automatically move the record back to the Raw processing level.
 - b. If all data match the original lab results, click the New Data Processing Level (DPL) drop-down and select “Provisional” or “Accepted” for each analyte (row; Figure 30). See step d for a shortcut.
 - c. After selecting all the new DPLs click “Apply Data Processing Information” in the upper right (Figure 30).
 - d. Alternately, in place of steps b and c, use the “Quick Change New DPLs” feature (Figure 30).
 - i. Select the records that need to change to a new data processing level.
 - ii. Click “Raw,” “Provisional,” or “Accepted” and wait until each of the selected lines changes to the new DPL.
 - iii. Click “Apply Data Processing Information.”
9. If this was the initial review of the data (i.e., New DPL = Provisional), alert the secondary reviewer that the data are available for final review (i.e., New DPL = Accepted).
 10. When the final review has been completed, file paper copies of the lab results in the SECN Athens office.

Sediment

This process is the same for the initial and final review of data.

1. Obtain the original paper datasheets filed in the SECN Athens office.
2. Open the EWQD.
3. From the Main Menu, select “Quality Control/Finalize Data” (Figure 3).

- From the “Quality Control Manager” screen, select the Form Type “SedimentLabData” (Figure 31).

Quality Control Manager

Back Main Menu

Please Select a Single Processable Data Record:

Formtype	Station Name	Date Deployed/Collected (If applicable)	Entered By	Date Entered	Current Data Processing Level	Data Processed By
ParkwideNutrientLabData					NA	
ParkwideSamplingLocation	REAL35_2019		Eric Starkey	2021-06-18	Raw	Eric Starkey
ParkwideSedimentSample	REAL35_2019	2019-07-16	Eric Starkey	2021-06-18	Raw	Eric Starkey
ParkwideWaterSample	REAL35_2019	2019-07-16	Eric Starkey	2021-06-18	Raw	Eric Starkey
SedimentLabData					NA	

New Processing Level: Processed in subsequent step Continue

Figure 31. Estuarine Water-Quality Monitoring Database Quality Control Manager with “SedimentLabData” Form Type selected.

- After selecting the “SedimentLabData” form use the drop-down menu to select “Processed in subsequent step” (Figure 31).
- Click “Continue.”
- From the DPL Sediment Analyte Selector Screen (Figure 32). Select a Parkwide Assessment Station to process its analyte data.

DPLSedimentAnalyteSelector

Select a sediment sample below to process its analyte data.

Parkwide Assessment Name	Collection Date	AcceptedAnalyteCount	UprocessedAnalyteCount
REAL35_2019	7/16/2019	0	7

Select Cancel

Figure 32. Estuarine Water-Quality Monitoring Database DPL Sediment Analyte Selector screen.

8. Review the data shown in the Sediment Analyte Lab Data QC spreadsheet (Figure 33) against the original results provided by the lab. In addition, review each entry for validity and check that it is within a reasonable range for the site.

Sediment Analyte Lab Data QC							Assessment: REAL35_2019	Quick Change New DPLs (first select record(s) below)			RAW PROVISIONAL ACCEPTED	Apply Data Processing Levels	
Database v 1.0 (09/2019)							Collection Date: 7/16/2019					Back	Main Menu
Sediment Sample	LaboratoryName	Analysis Date	Parameter	Method	Unit	Result	MethodDetectionLimit	LowerQuc	Comment	Current Df	New DPL		
REAL35_2019	Advanced Environmental	8/6/2019	ARSENIC	EPA 6010	milligrams pe	.7800	0.7800	3.1000			RAW	RAW	
REAL35_2019	Advanced Environmental	8/7/2019	ALUMINUM	EPA 6010	milligrams pe	2700.0000	16.0000	62.0000			RAW	RAW	
REAL35_2019	Advanced Environmental	8/6/2019	CADMIUM	EPA 6010	milligrams pe	.0780	0.0780	0.3100			RAW	RAW	
REAL35_2019	Advanced Environmental	8/6/2019	CADMIUM	EPA 6010	milligrams pe	.0780	0.0780	0.3100			RAW	RAW	
REAL35_2019	Advanced Environmental	8/6/2019	MANGANESE	EPA 6010	milligrams pe	21.0000	0.3100	1.2000			RAW	RAW	
REAL35_2019	Advanced Environmental	8/6/2019	ZINC	EPA 6010	milligrams pe	5.8000	0.7800	3.1000			RAW	RAW	
REAL35_2019	Advanced Environmental	8/6/2019	NICKEL	EPA 6010	milligrams pe	1.3000	0.3100	1.2000			RAW	RAW	

Figure 33. Estuarine Water-Quality Monitoring Database Sediment Analyte Lab Data QC screen.

- a. If an error is found, it can be corrected but the database will automatically move the record back to the Raw processing level.
- b. If all data match the original lab results, click the New Data Processing Level (DPL) drop-down and select “Provisional” or “Accepted” for each analyte (row; Figure 33). See step d for a shortcut.
- c. After selecting all the new DPLs click “Apply Data Processing Information” in the upper right (Figure 30).
- d. Alternately, in place of steps b and c, use the “Quick Change New DPLs” feature (Figure 30).
 - i. Select the records that need to change to a new data processing level.
 - ii. Click “Raw,” “Provisional,” or “Accepted” and wait until each of the selected lines changes to the new DPL.
 - iii. Click “Apply Data Processing Information.”
9. If this was the initial review of the data (i.e., New DPL = Provisional), alert the secondary reviewer that the data are available for final review (i.e., New DPL = Accepted).
10. When the final review has been completed, file paper copies of the lab results in the SECN Athens office.

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- Wright, W., B. Flanders, and E. N. Starkey. 2022. Estuarine water-quality monitoring data management and database technical documentation—Version 2.0. Southeast Coast Network Standard Operating Procedure NPS/SECN/SOP—2.2.07. Southeast Coast Network, Athens, Georgia. Available at: <https://irma.nps.gov/DataStore/Reference/Profile/2284577> (last accessed June 2022).

Appendix A. Park-Wide Assessment Water Sample Collection Forms

SECN Parkwide Assessment: Location and Event Form v2.5 (01/2021)															
Station Information Station Name: _____ (e.g. CUIS27_2020, FOMA05_2018) Water Body Name: _____ Staging Area: _____ (e.g. access point/boat ramp) GPS UTM X: _____ UTM Y: _____ UTM Zone: _____ Datum (NAD83): _____ Zone 17 except CALO/CAHA = Zone 18 Location within 0.02 NM (37 m) of original sample draw? (circle one): YES NO (if no, explain in comments) HABITAT TYPE (check all that apply) ☐ Tidal River ☐ Intertidal ☐ Marsh ☐ Open water ☐ Rocky/shell bottom ☐ Oyster bed ☐ Bayou/inlet ☐ Coral reef ☐ Other _____ Location Note															
DAY Arrival Date (MM/DD/YY): _____ Arrival Time (HH:MM): _____ EST Departure Date (MM/DD/YY): _____ Departure Time (HH:MM): _____ EST WEATHER Conditions at station: Wind (mph): _____ Temp (°C): _____ Cloud Cover/Sky (% cloudy): _____ Other: _____ SUBMERGED AQUATIC VEGETATION Present? (Circle one) YES NO MARINE DEBRIS Present? (Circle one) YES NO Type (Circle one): Plastic Wood Glass Cans Other: _____ COMMENTS Photos <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; border-bottom: 1px solid black; width: 50%;">Number (From camera)</th> <th style="text-align: center; border-bottom: 1px solid black; width: 50%;">Camera Direction (N, E, S, W)</th> </tr> </thead> <tbody> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> </tbody> </table> Captured By: _____		Number (From camera)	Camera Direction (N, E, S, W)	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Number (From camera)	Camera Direction (N, E, S, W)														
_____	_____														
_____	_____														
_____	_____														
_____	_____														
_____	_____														
_____	_____														
Recorded By: _____ Computer Entry By / Date: _____ Accepted By / Date: _____															

Figure A-1. Example of paper field form “Parkwide Assessment: Location and Event.”

SECN Parkwide Assessment: Hydrographic Profile Form

v2.6 (01/2022)

Station Name: _____ Date (MM/DD/YY): _____ Time (EST): _____
(e.g. CUIS27_2020, FOIA05_2018)

Barometric Pressure (mmHG): _____ Total Depth (m): _____

Field Meter QC Check

Field Meter Instrument #: _____ Date (MM/DD/YY): _____ QC'd by: _____

PROFILE Note: Take readings while lowering the sonde at 0.1 m, 0.5 m, and every 1.0 m from depths 1.0 m to 10.0 m, and every 5 m thereafter if the site is greater than 10m deep. Take the last measurements 0.5 m from the bottom. Data collection while retrieving the sonde (UP) serves as a QA/QC measure.

	Sample Depth (m)	Water Temp (°C)	D.O. (mg/l)	Salinity (PSU)	pH (Units)	Turbidity (FNU)	Chla (µg/l)
DOWN							
UP							

COMMENTS: Check here for comments ☐ and write comments on back for form.

Recorded By: _____ Computer Entry By / Date: _____

Accepted By / Date: _____

Figure A-2. Example of paper field form “Parkwide Assessment: Hydrographic Profile.”

v2.5 (01/2021)

Figure A-3. Example of paper field form “Parkwide Assessment: Water Sample Collection.”

v2.5 (01/2021)

Figure A-4. Example of paper field form “Parkwide Assessment: Sediment Sample Collection.”

Appendix B. Batch Upload Template

All metadata should be placed before the header row (see Table B-1 and B-2). For nutrients, the ‘scraping’ of data occurs on a row where ‘SampleID’ occurs in the first column. For sediment, the ‘scraping’ of data occurs on a row where ‘AEL Project Number’ is populated.

All column headers (including optional columns) should be included in lab data reports. Values within these columns may be optional.

Table B-1. Synoptic Nutrient Template.

Sample ID	Sample Date	Received Date	NASL ID	Matrix	Prep Date	Analysis Date	Parameter	<MDL/RL	Result	Unit	MDL/RL	Method	Analyst	Comments	AEL Project Number	AEL Sample Number	Client Sample ID	Site	Sample_Type	Matrix	Tests_Description	Method	CAS	Parameter	Dilution	Adjusted Detection Limit	Adjusted Reporting Limit	Final Result	Units	Qualifier_Only	Qualifiers	Spike_Recovery	Spike_LCL	Spike_UCL	Analyst	Date of Analysis	Analysis Time	Prep Method	Prep Date	Received Date	Collection Date	Collect Time	Lab ID	% Moisture	Result_Type	
The parkwide-assessment name	The date that the water sample event occurred on (OPTIONAL)	(OPTIONAL)	(OPTIONAL)	(OPTIONAL)	(OPTIONAL)	Date	A standard NPS parameter name. (See WQX data dictionary for more information)	(OPTIONAL)	Decimal (10,4)	A standard NPS unit name. (See WQX data dictionary for more information)	Two values separated by a ' / ' with no space. (Decimal (7,4)/Decimal(7,4))	A standards NPS method value. (See WQX data dictionary for more information)	(OPTIONAL)	(OPTIONAL) with a maximum of 250 characters.	(OPTIONAL)	(OPTIONAL)	Parkwide Assessment name.	(OPTIONAL)	(OPTIONAL)	(OPTIONAL)	(OPTIONAL)	(OPTIONAL)	A standard NPS method name. See WQX dictionary for more information.	A standards NPS CAS value. (See WQX dictionary for more information)	A standards NPS parameter value. (See WQX data dictionary for more information)	(OPTIONAL)	Decimal with maximum precision of 4, and total value size of 7	DECIMAL (7,4)	DECIMAL (10,4)	A standard NPS unit value. (See WQX data dictionary for more information)	(OPTIONAL)	(OPTIONAL)	(OPTIONAL)	(OPTIONAL)	(OPTIONAL)	(OPTIONAL)	Date	(OPTIONAL)	(OPTIONAL)	(OPTIONAL)	(OPTIONAL)	Date	(OPTIONAL)	A standardized laboratory name. This value should be standardized across all of a particular laboratory' s reports.	(OPTIONAL)	(OPTIONAL)