



Benthic Marine Community and Marine Fish Monitoring Database User Guide

National Park Service
Inventory and Monitoring Program
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Change History

New Version #	Revision Date	Author	Summary of Change	Previous Version #
1.02	3/25/2011	Kelly Kozar	Added instructions for using the Quality Review Tool and the Data Summary Tool.	1.01
1.03	1/8/2020	Kim Weisenborn	Updated overall document formatting to fall in line with other updated user guide documents. Updated content to follow current updates to database.	1.02
1.04	3/30/2022	Kim Weisenborn	Updated steps for downloading and uploading the database from the PACN SharePoint site. Added procedures for enabling content and macros before using the database. Reorganized the structure for a few general content sections. Updated query lists.	1.03

Only changes in this specific user guide 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, summary of changes made along with the new version number.

Abstract

This document will guide the user through the data entry process for data collected for the Pacific Island Network Benthic Marine Community and Marine Fish Monitoring protocols.

File Name

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Recommended Citation

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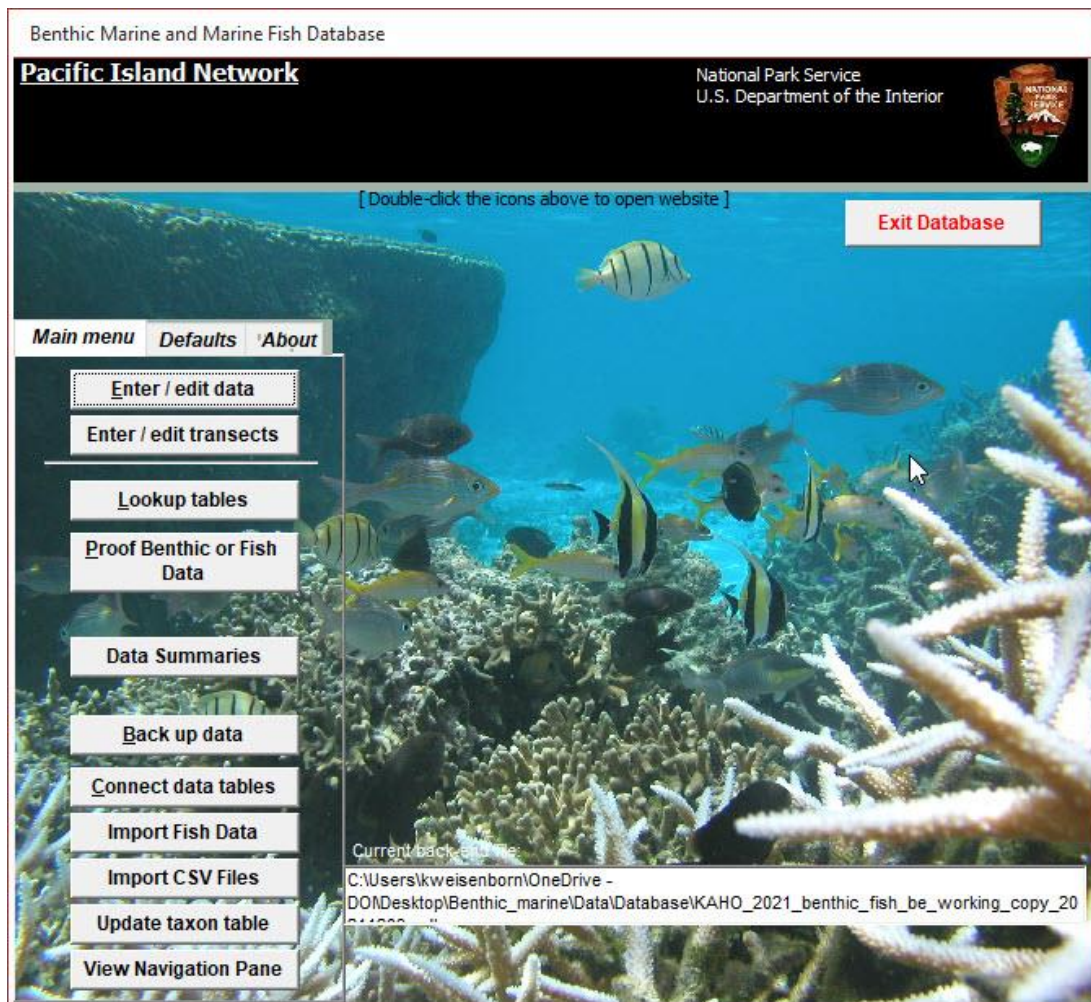
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Introduction

The Pacific Island Inventory and Monitoring Network (PACN I&M) Benthic Marine Community and Marine Fish Monitoring Database is the main storage location for all data related to the Benthic Marine Community and Marine Fish Monitoring Protocols. Two types of data entry occur here—first is the import of files for benthic cover and marine fish and second is manual data entry for rugosity, growth, and settlement.



PACN Benthic Marine and Marine Fish Database – Application Startup Form

Working database copies for each park will be made available in the [Benthic Marine Community project workspace](#) in the [PACN I&M SharePoint \(SPO\) site](#)¹ at the beginning of the field season to facilitate prompt data entry and edits by the PACN Marine Biological Technician at each park. At

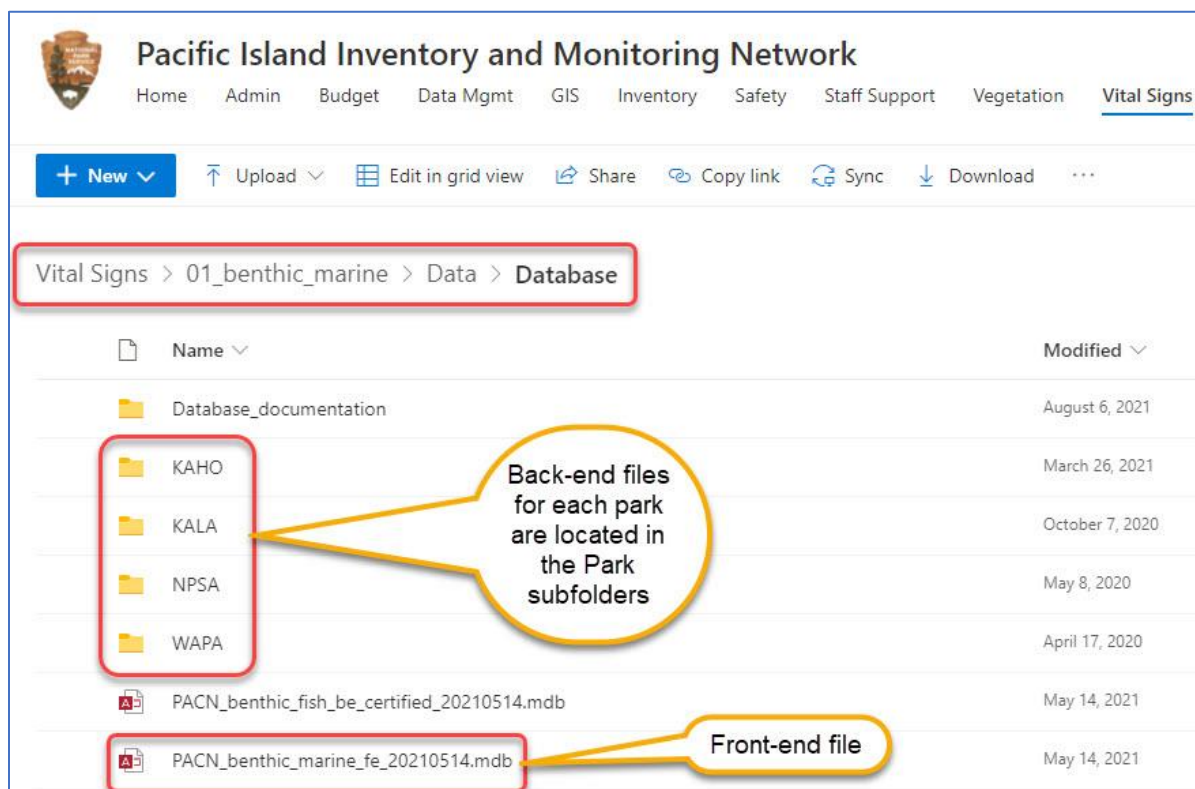
¹ PACN I&M SharePoint (SPO) site, <https://doimsp.sharepoint.com/sites/nps-PWR-PACNIM> (accessed 30 March 2022).

the end of the field season, working database files will be consolidated by the PACN data management staff and imported into the master database file once certified.

For any questions regarding the Benthic Marine Community and Marine Fish Monitoring Protocols, including data interpretation, please contact the PACN Marine Ecologist, Sheila McKenna (Sheila_McKenna@nps.gov). For data management questions, please contact the PACN Data Manager, Kelly Kozar (kelly_kozar@nps.gov).

Installing the Database

The Benthic Marine Community and Marine Fish Monitoring Database files are located in the [Benthic Marine Community project workspace](#) in the [PACN SharePoint site](#). There are two file types that make up the database, which are the front-end file located in the root of the “[Database](#)” folder; and the back-end file(s) for each park, which are located in the Park subfolders. For a user to utilize the database, both of these files will need to be downloaded onto the user’s local workstation. Instructions for properly downloading these files can be found below.



Location of Benthic Marine Community Monitoring front-end and back-end database files in SharePoint

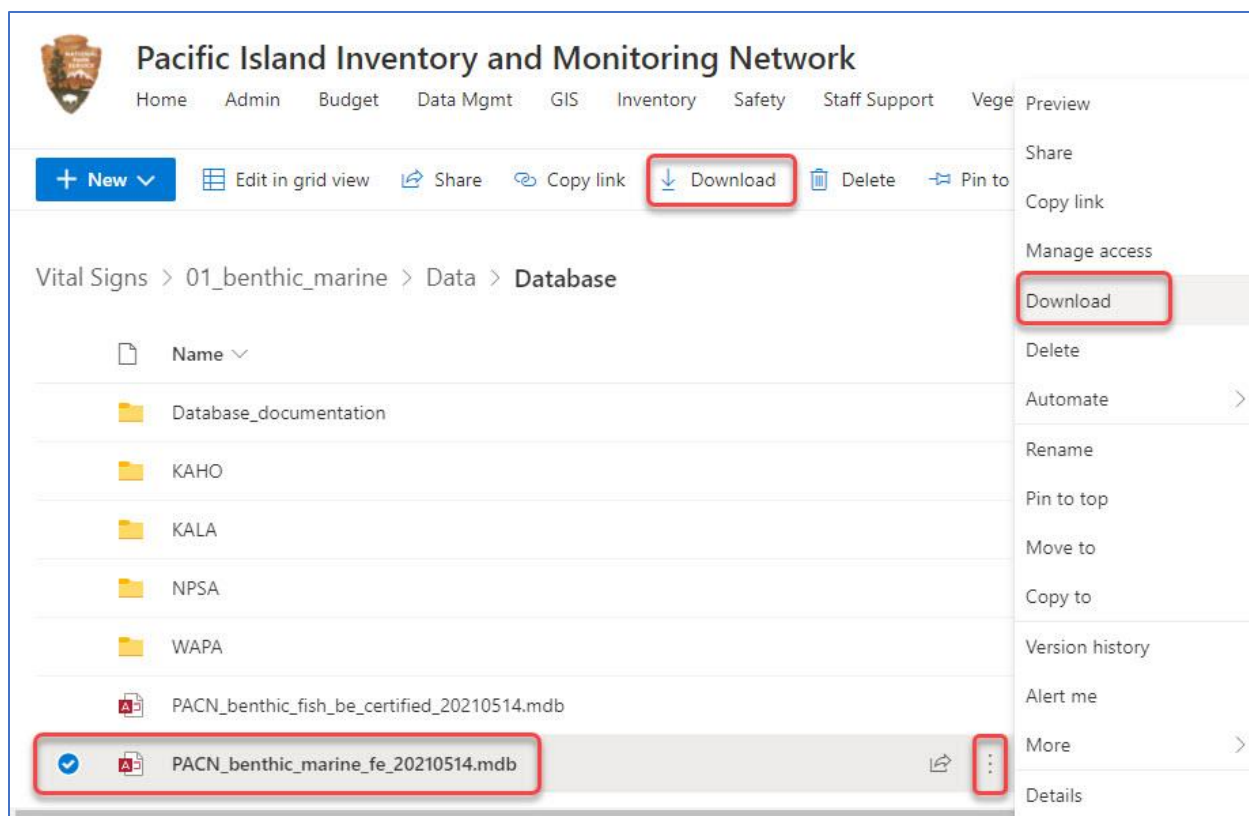
Front-end (FE) Database File

The front-end database file is the main interface for the database. In other words, it is the visual portion of the database in which the user interacts. Updates made to the front-end file are infrequent and made by the PACN data management staff. When new versions of the front-end file are released, the PACN data management staff will email staff members to let them know that a new version is available on SharePoint and will need to be downloaded the next time a user is to use the database. When this occurs, the user can delete the older local copy of the front-end file from their local workstation, since it will no longer be relevant, before downloading the new front-end file. The front-end file only needs to be downloaded once per each new version released, and it is to remain as a local copy on the user's computer. Therefore, it is **never** to be uploaded back to the PACN SharePoint site. Versions of the front-end file are indicated by the date stamp at the end of the filename (e.g., PACN_benthic_marine_fe_20210514².mdb).

Downloading FE from SharePoint

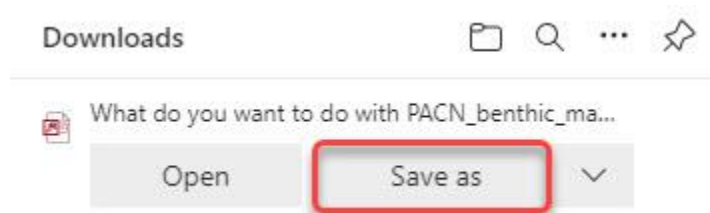
1. Navigate to the “[Database](#)” folder in the SharePoint.
2. Select the front-end file to download. There are two options for downloading the file (see figure below):
 - a. Choose the “**Download**” button in the library's navigation bar.
 - b. Click the vertical  ellipse next to the filename and select “**Download**”.

² Data stamp is in the format “YYYYMMDD” for the 4-digit year, 2-digit month, and 2-digit day.

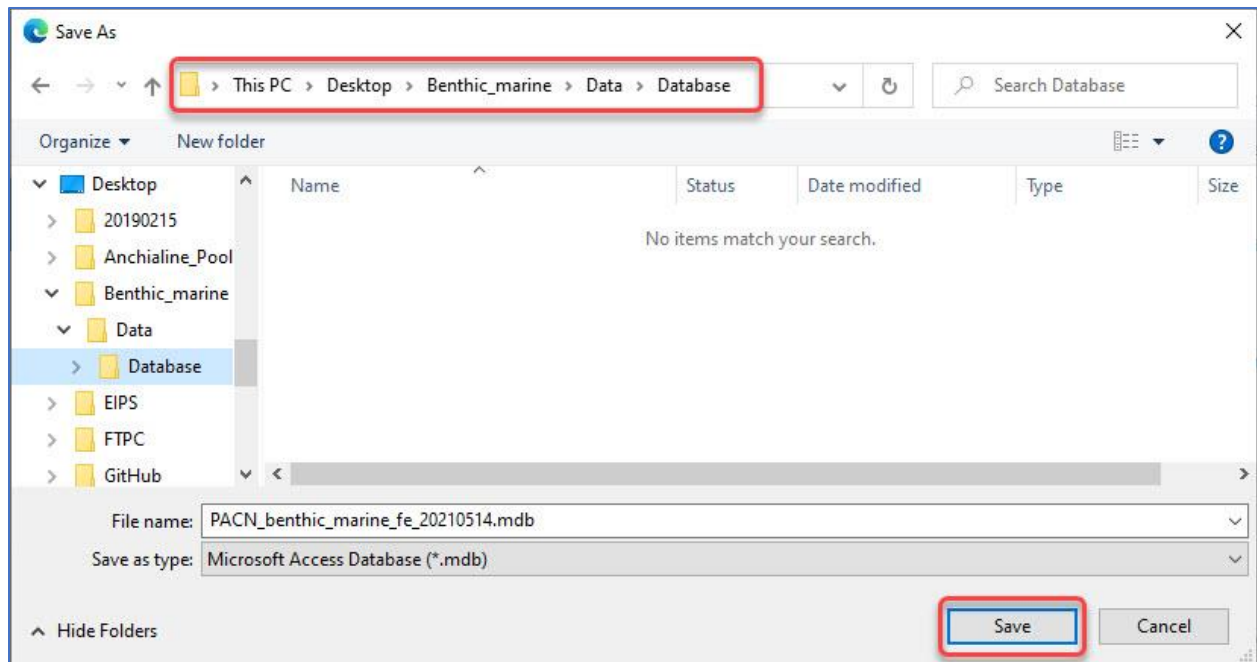


Downloading the front-end file from SharePoint

3. A message will appear in the Downloads prompt in the top-right corner of SharePoint asking if you want to open the file or save as. Choose **“Save as”**.



4. A window will open prompting you to select a location to save the file. Navigate to the user’s local workspace “Database” folder for Benthic Marine (e.g., C:\Users\[UserName]\Desktop\Benthic_marine\Data\Database) and click **“Save”**.



Location on user's local workstation on where to save the front-end file

Back-end (BE) Database File

The back-end database file (e.g., [PARK]³_[YEAR]⁴_benthic_fish_be_working_copy_[YYYYMMDD]⁵.mdb) is the main storage component for the data that is entered into the database. The user will need to ensure that they are the only one utilizing the back-end file before they download the file and start using it. This is done by checking out the back-end file first before downloading the file.

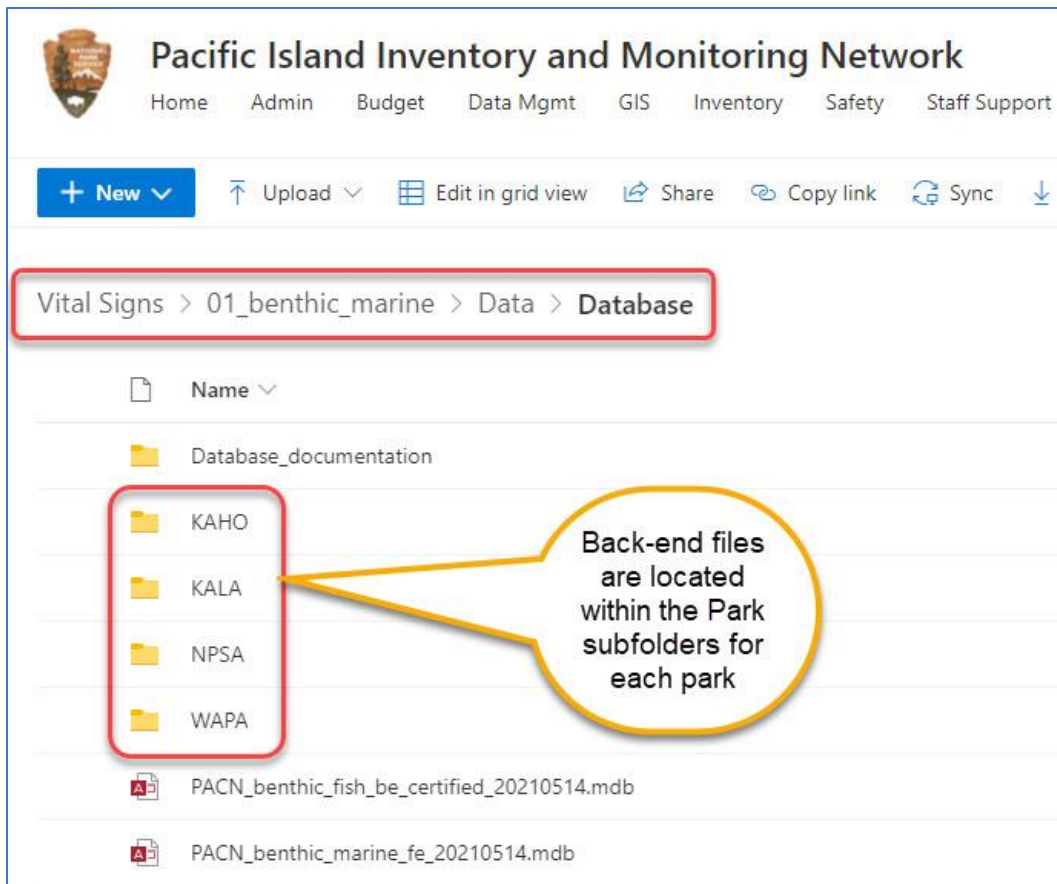
Checking Out BE from SharePoint

1. Navigate to the Park subfolder for the park's data you are working with, located in the "[Database](#)" folder in SharePoint.

³ [PARK] = park code (e.g., AMME_WAPA, KALA_HALE, NPSA, WHI [stands for west Hawaii for parks ALKA, KAHO, PUHE, and PUHO])

⁴ [YEAR] = 4-digit year corresponding with the sampling year

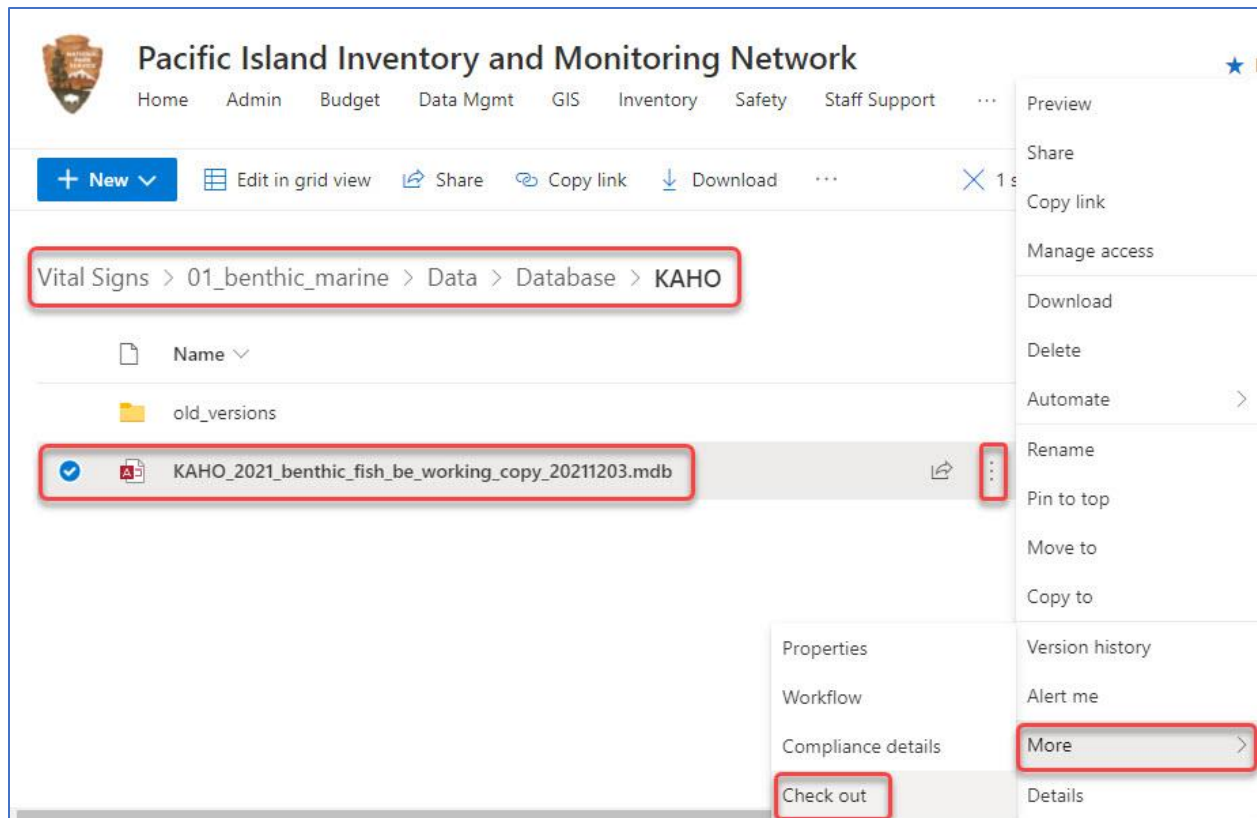
⁵ [YYYYMMDD] = 4-digit year, 2-digit month, 2-digit day date stamp (e.g., 20210917)



Back-end database files are located in the Park subfolders for each park

2. Select the back-end file for the park you are working with and click the vertical ellipse next to the filename and select **“More”** > **“Check out”**.

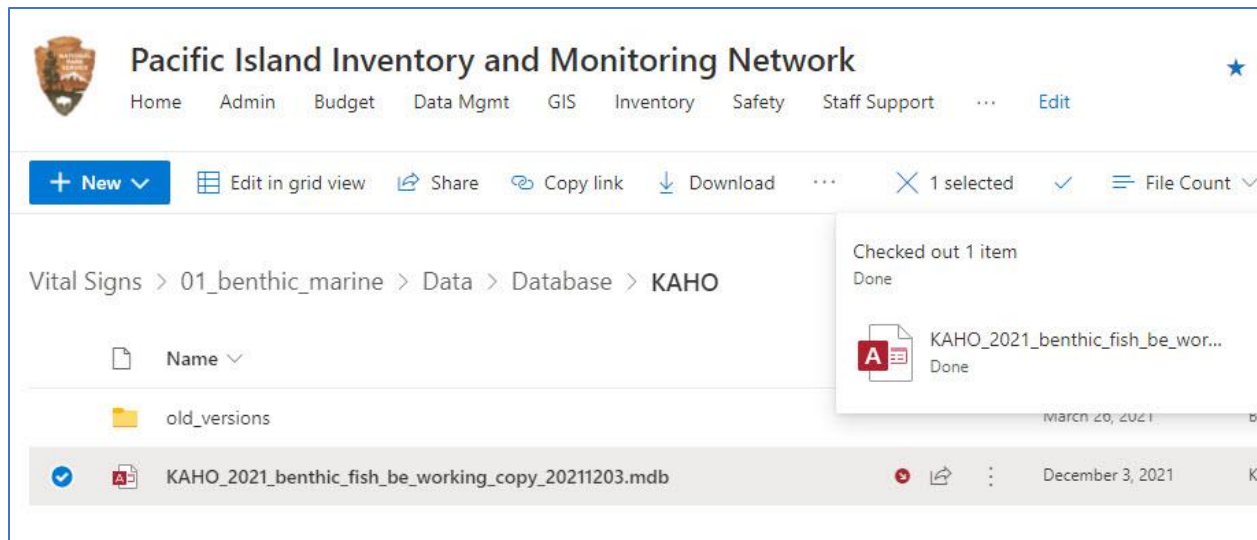




Example of checking out the KAHO back-end file from SharePoint

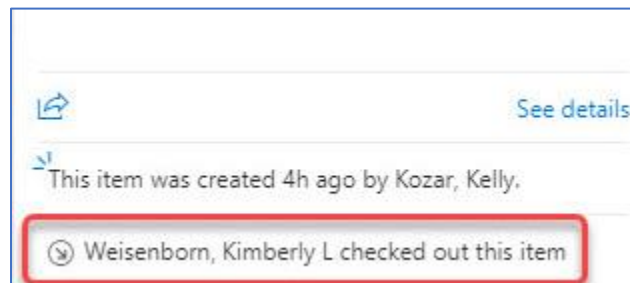
- Once checked out a red circle with an arrow  will appear to the right of the filename indicating that you have the file checked out, and no one else will be able to access the file.

Note: If you notice a white circle with a gray arrow  next to a filename, this is an indicator that the file is checked out by someone else. **Also Note:** Microsoft® Access files are unfortunately still able to be downloaded, unlike Word or Excel files. **Never download an Access file and work in it if it is checked out!**



Checked out back-end file with indicating red circle with an arrow in SharePoint

4. If you need the file but it's checked out, you can view which user has it checked out so you can contact them.
 - a. Navigate to the SharePoint library where the file is stored.
 - b. Find the file in the list of files.
 - c. With your mouse, point at the file name. A small window pops up that contains details about the file, including who has it checked out.

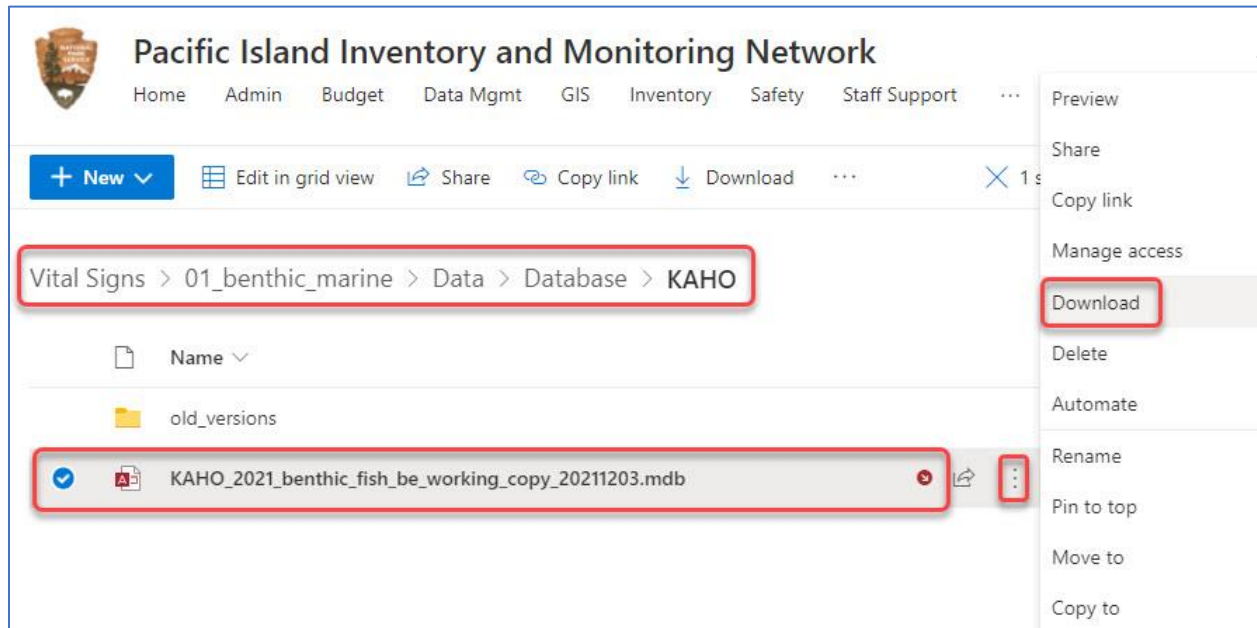


Viewing which user has a file checked out in SharePoint

Downloading BE from SharePoint

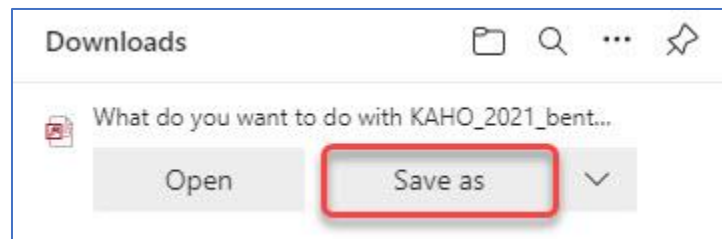
1. Navigate to the Park subfolder for the park's data they are working with, located in the ["Database"](#) folder in SharePoint.
2. Select the back-end file that you just checked out to download. There are two options for downloading the file:
 - a. Choose the **"Download"** button in the library's navigation bar.

- b. Click the vertical ellipse  next to the filename and select “**Download**”.

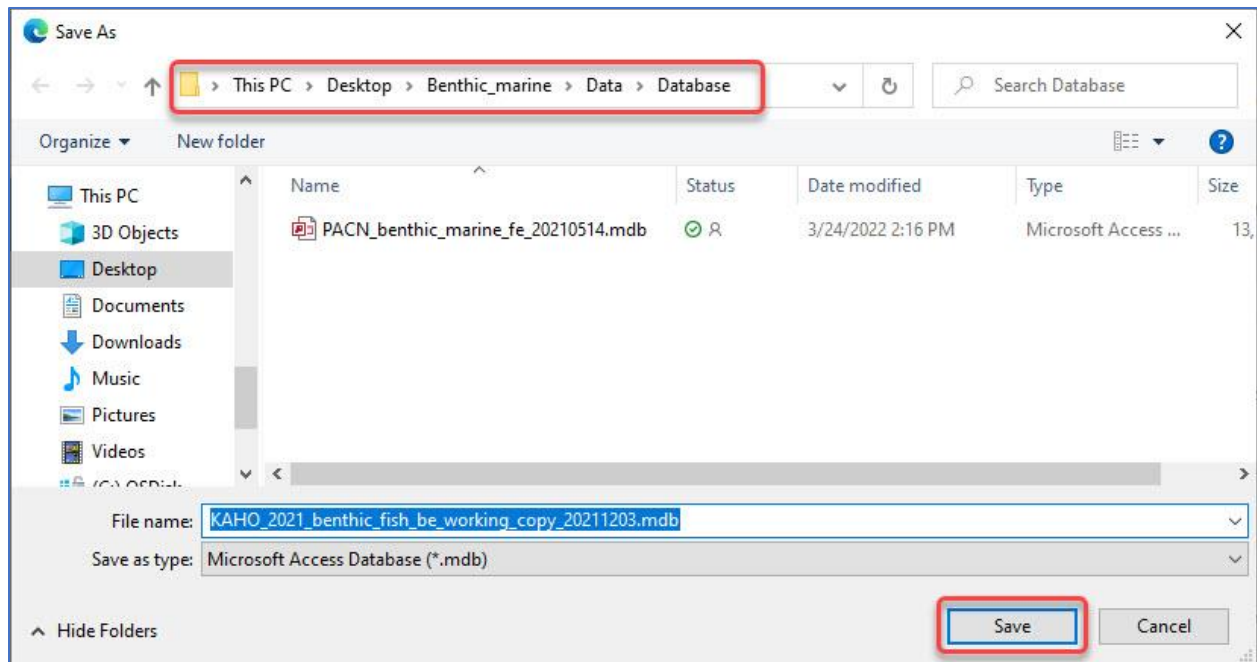


Downloading the back-end file from SharePoint

3. A message will appear in the Downloads prompt in the top-right corner of SharePoint asking if you want to open the file or save as. Choose “**Save as**”.



4. A window will open prompting you to select a location to save the file. Navigate to the user’s local workspace “Database” folder for Benthic Marine (e.g., C:\Users\[UserName]\Desktop\Benthic_marine\Data\Database) and click “**Save**”.

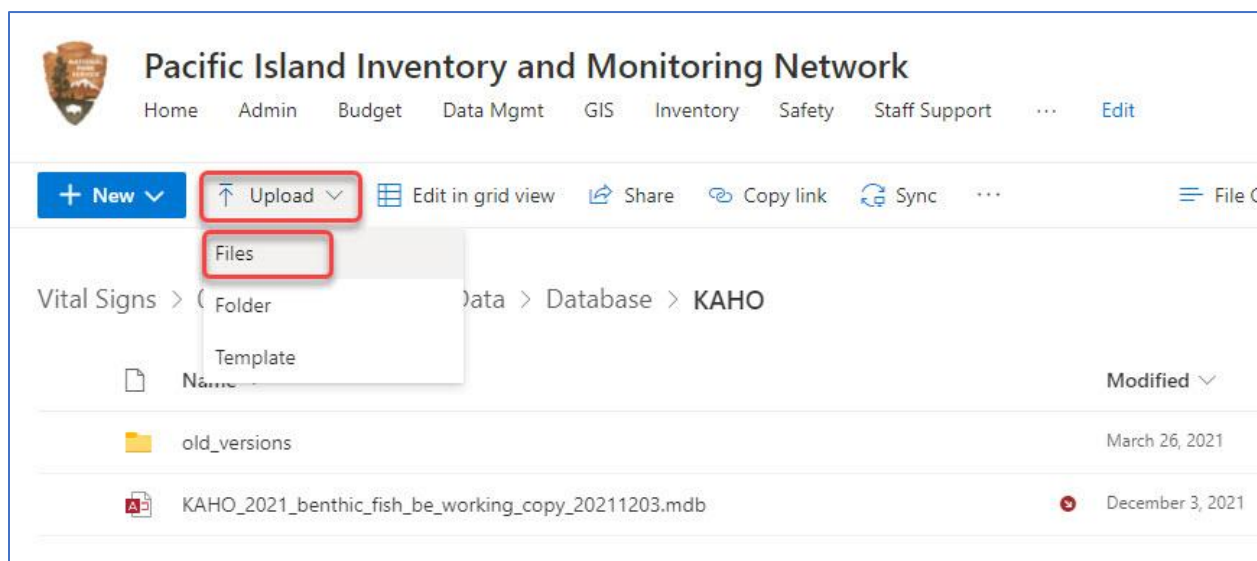


Location on user's local workstation where to save the back-end file

5. After each data entry session for a day, the database backend file needs to be uploaded back to the Benthic Marine Community Monitoring project workspace in SharePoint. See the [Uploading BE to SharePoint](#) section below for details.

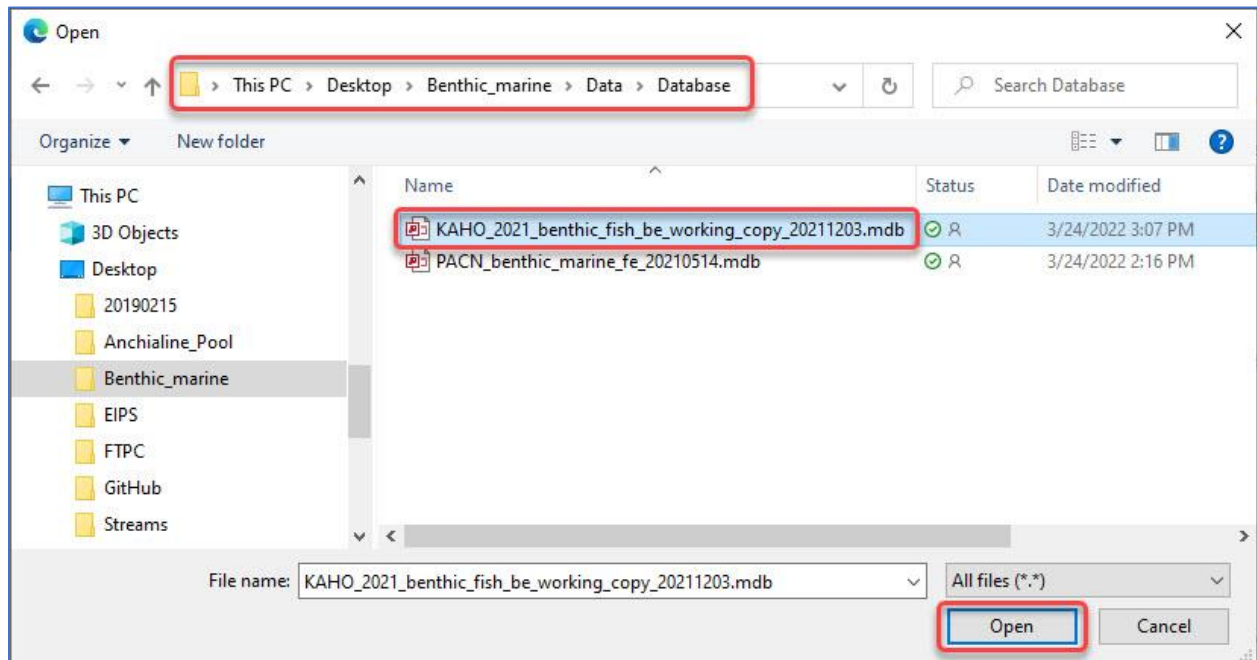
Uploading BE to SharePoint

1. Navigate to the Park subfolder for the park's data you are working with, located in the "[Database](#)" folder in SharePoint.
2. From the toolbar at the top, click "**Upload**" > "**Files**".



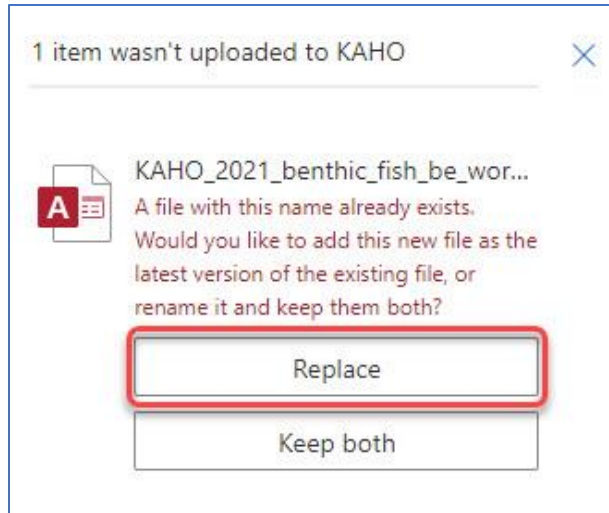
Uploading back-end file to SharePoint

3. A window will open prompting you to select the file from your PC that you want to upload to SharePoint. Navigate to the user's local workspace "Database" folder for Benthic Marine (e.g., C:\Users\[UserName]\Desktop\Benthic_marine\Data\Database) and select the back-end file, then click "**Open**".



Uploading the back-end file from the user's local workstation to SharePoint

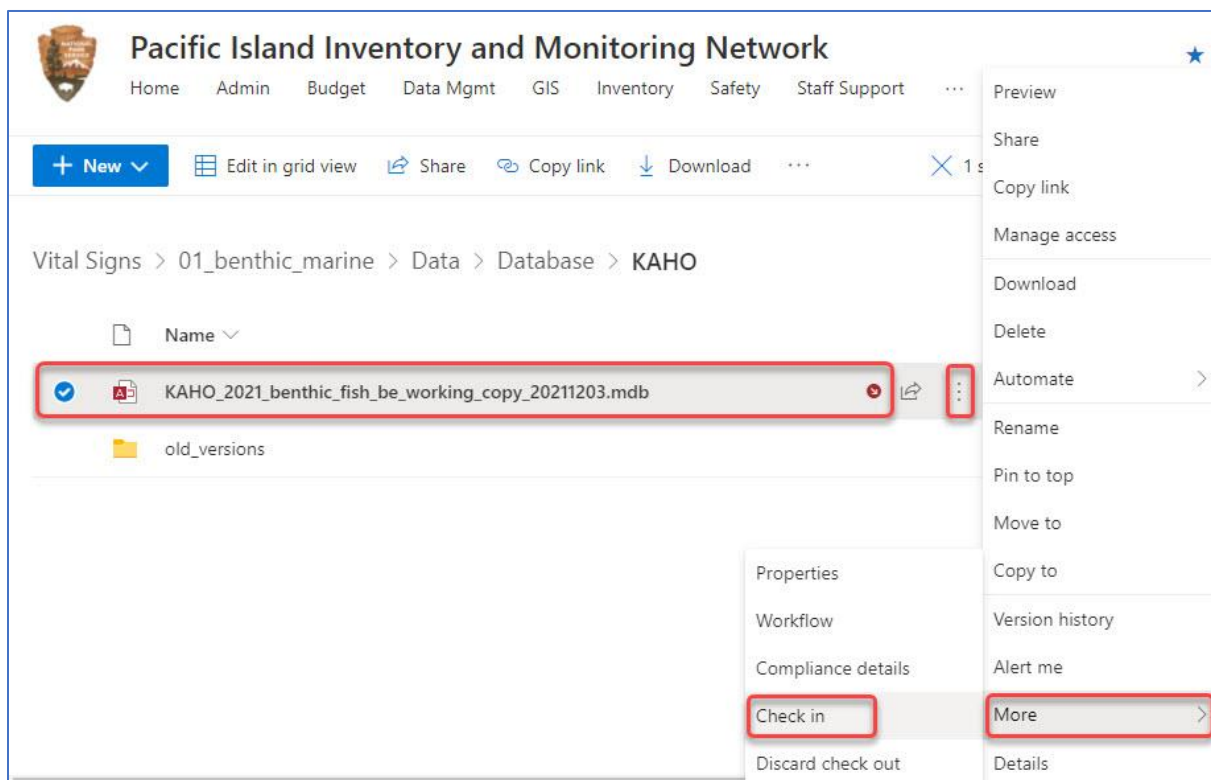
4. The files or folder will upload, and a confirmation message will appear.
5. If you are uploading an existing file, then you will receive a message asking if you want to replace the file or keep them both.
 - a. Select "**Replace**" to overwrite the existing file and add the new file as the latest version. This will move the overwritten file to the version history. **Note:** This is the preferred method unless there is a specific reason to have two copies of the file.



6. After successfully uploading the back-end file to SharePoint, the next step is to check the database back in. See the [Checking BE into SharePoint](#) section below for details.

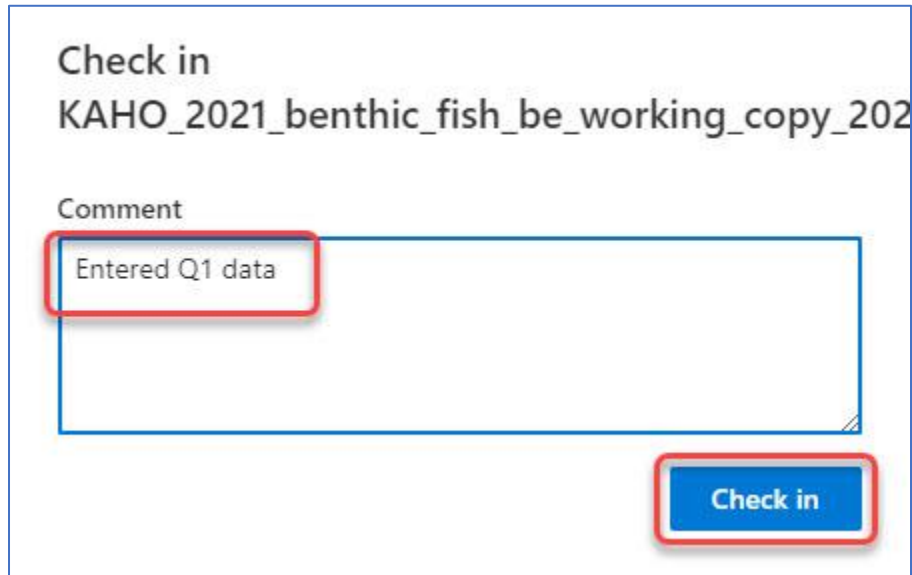
Checking BE into SharePoint

1. Select the back-end file that you just uploaded and click the vertical ellipse  next to the filename and select **“More”** > **“Check in”**.



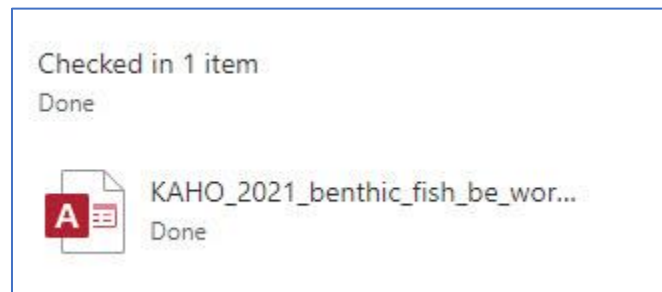
Checking in the back-end file into SharePoint

2. A window will open prompting for comments to the changes that were made to the database file. Fill in the Comment text box and click “**Check in**”.



Make a comment about changes made to back-end file upon checking file into SharePoint

3. A message will appear stating that the database file has been checked in.



4. The file will now be checked in and available for others to use.

Starting the Database

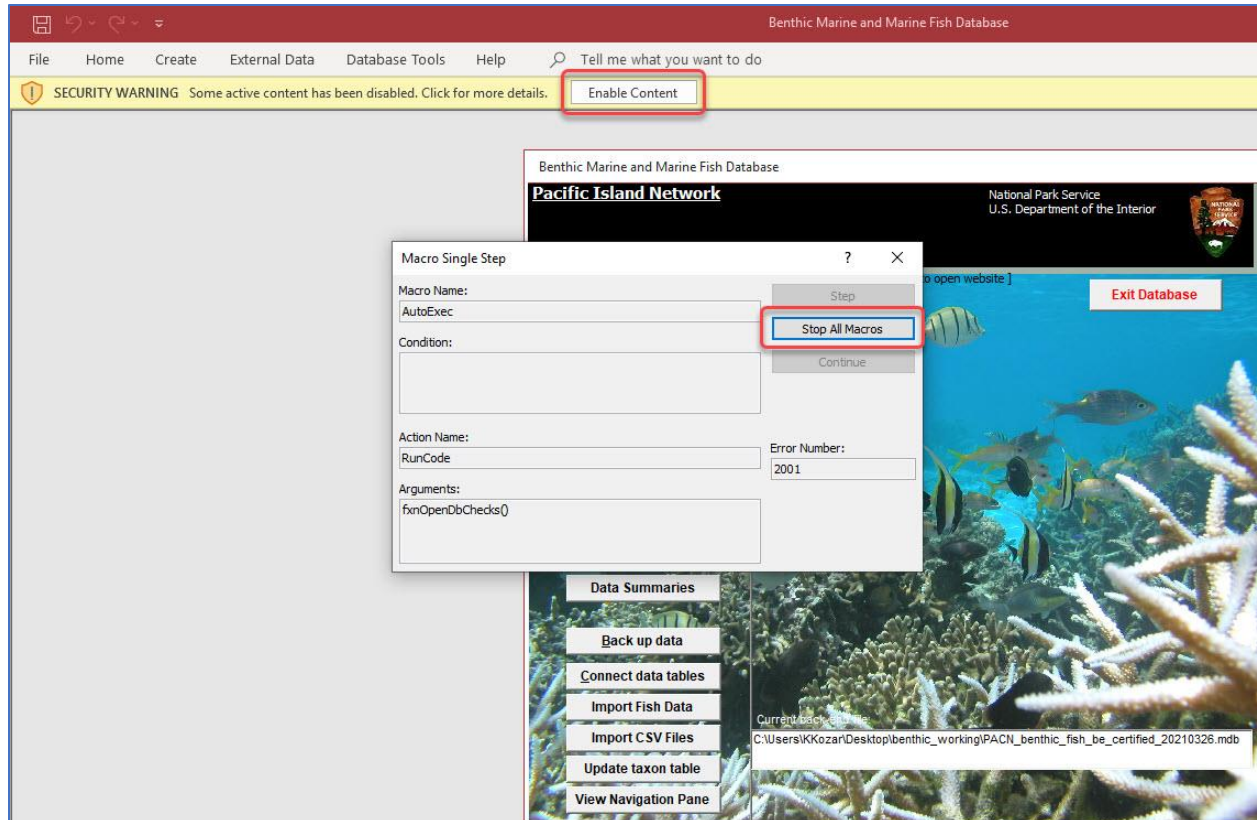
To start the application:

1. Navigate to the user’s local workspace “Database” folder for Benthic Marine (e.g., C:\Users\[UserName]\Desktop\Benthic_marine\Data\Database) and double-click on the recently downloaded front-end file.

Note: see [Downloading FE from SharePoint](#) section for steps on downloading the FE from SharePoint to the user’s local workstation if you have not already done so.

2. Upon opening the database, macros and content may need to be enabled:

- a. A Macro Single Step prompt window will appear. Click **“Stop All Macros”** (see below).
- b. Click **“Enable Content”** at the top yellow security warning ribbon.



Stopping all macros and enabling content in the front-end file

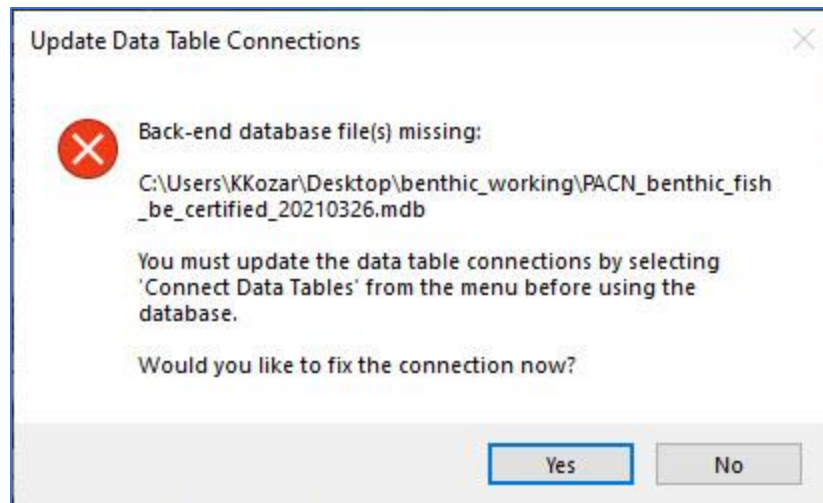
- c. An error message may open indicating that the back-end is missing. Proceed to the next section, [Connect Data Tables](#), for steps on re-linking the front-end file to the correct back-end file.

Connect Data Tables

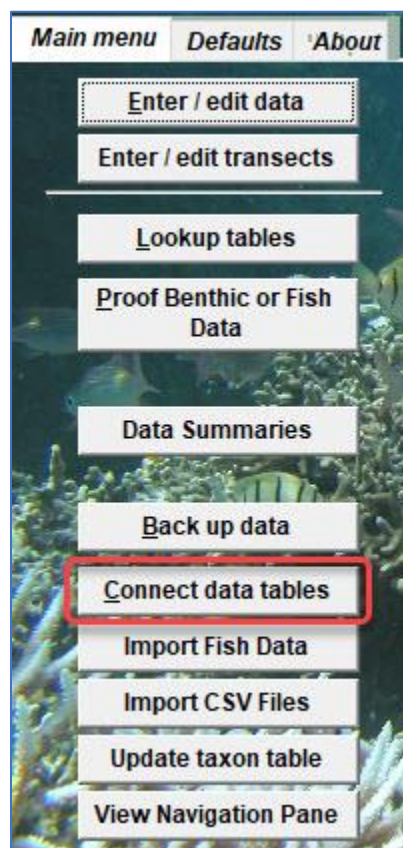
The front-end database file must be properly linked to the correct back-end database file on the user's local workstation in order to use the database. It's good practice to relink the front-end and back-end files each time when using the database just to make sure they are linked to the proper files.

1. Upon opening the database application, if the front-end is not linked to the proper back-end an Update Data Table Connections message window will appear stating that the back-end file cannot be found.

Click **“Yes”** to re-link the front-end file to the correct back-end file (or **“No”** to cancel).



Or, if upon opening the database no prompt occurs, the user can relink the front-end file to the back-end file by clicking the “**Connect data tables**” button from the Main Menu tab.



Accessing the File Linking Utility Form to re-link front-end and back-end files form the Main Menu

2. The File Linking Utility Form will open. The *Current name* field displays the back-end file name, and the *Path* filed displays the file path for the currently linked back-end file. To update the linked data file, click “**Browse**”.

Update Data Table Connections

Update links to back end database tables Close form

Data tables are stored in one or more separate database files. Check the filename and location on your computer for the following and use the browse button to change the file Update links

Back-end data NRDT back-end database file

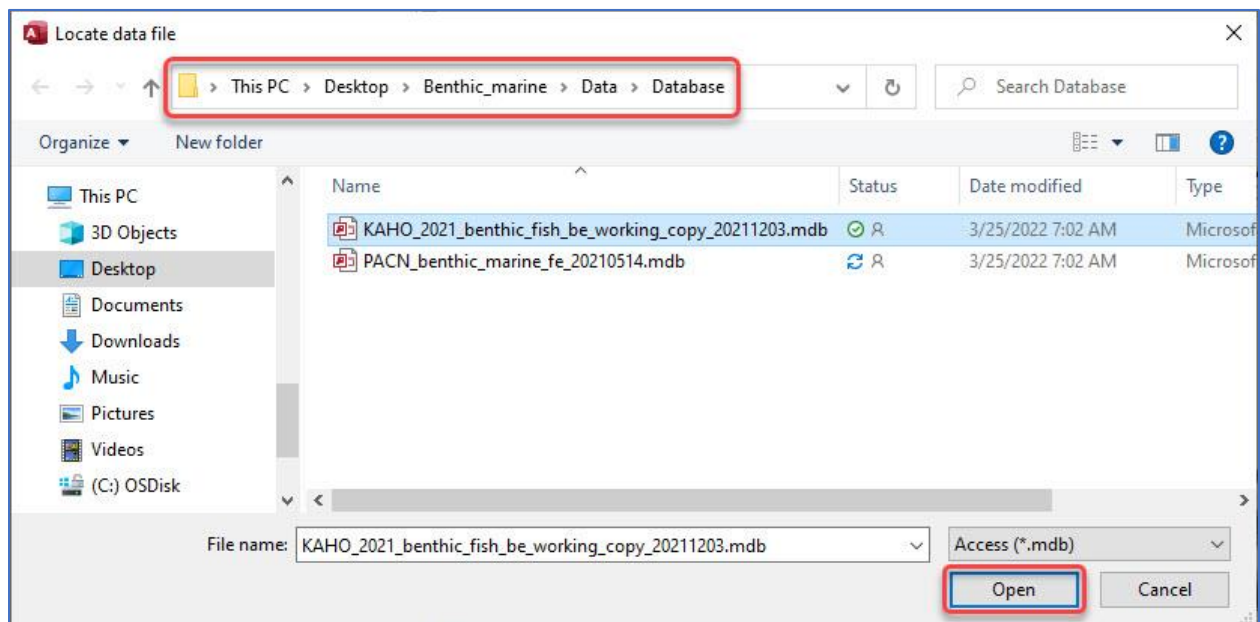
Current
name: KAHO_2021_benthic_fish_be_working_copy_20211203.mdb
Path: C:\Users\kweisenborn\OneDrive - DOI\Desktop\Benthic_marine\Data\Database\KAHO_2021_ben

New file: Browse

Path:

Update Data Table Connections Form

3. The *Locate data file* window will open. From here, navigate to the current back-end version of the database saved on your local directory (see [Back-end \(BE\) Database File](#)), select the file, and click “**Open**”.



4. Back on the File Linking Utility Form, the *New file* and *Path* fields will be updated with the selected filename and file path. Click “**Update Links**” to update the back-end file connection.

Update Data Table Connections

Update links to back end database tables Close form

Data tables are stored in one or more separate database files. Check the filename and location on your computer for the following and use the browse button to change the file **Update links**

Back-end data NRDT back-end database file

Current
name: KAHO_2021_benthic_fish_be_working_copy_20211203.mdb
Path: C:\Users\kweisenborn\OneDrive - DOI\Desktop\Benthic_marine\Data\Database\KAHO_2021_ben

New file: KAHO_2021_benthic_fish_be_working_copy_20211203.mdb Browse

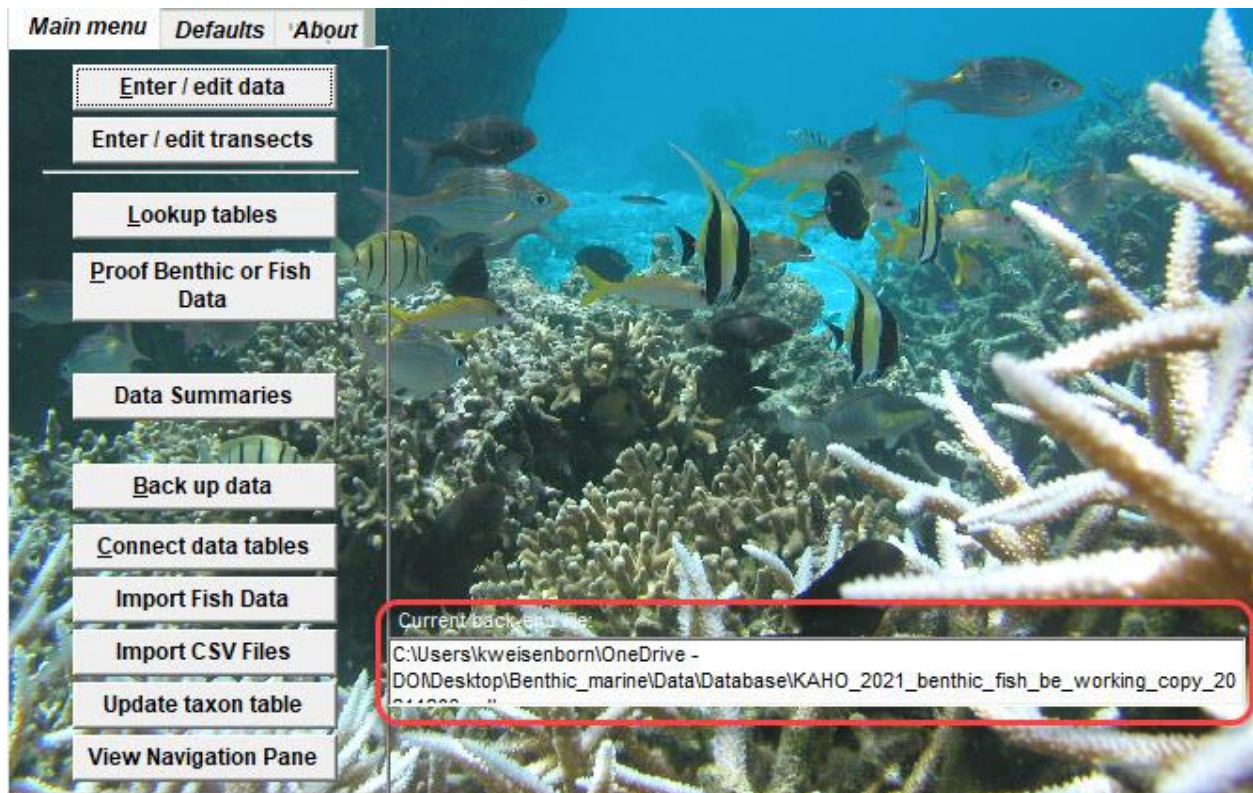
Path: C:\Users\kweisenborn\OneDrive - DOI\Desktop\Benthic_marine\Data\Database\KAHO_2021_ben

Updating the front-end and back-end file links

5. A message window will appear stating that all links are updated. Click “OK” to close the message window a return to the main application.



6. The *Current back-end file* field on the bottom-right of the Benthic Marine and Marine Fish Database Application Startup Form will now be updated with the current back-end file.



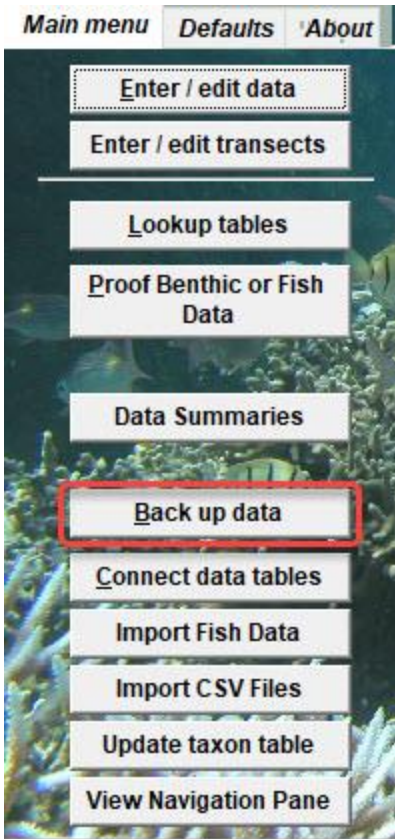
Current back-end file displayed on the Benthic Marine and Marine Fish Database Startup Form

Back Up Data

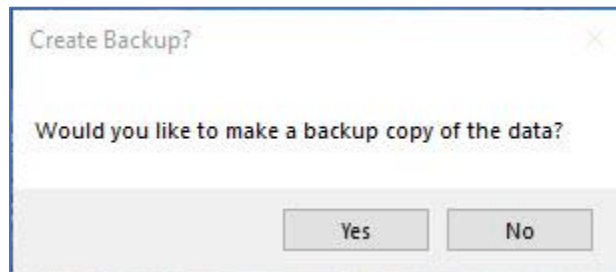
The application can be programmed to automatically ask the user to create a backup upon startup or exit of the database. This will ensure that the initial data starting point can be recovered should irreversible errors or problems occur during the data entry session. Backup copies are used for the current field season only and will not be archived. To establish these features, see [Automatic Backups](#) under the [Defaults](#) section

To manually create a backup:

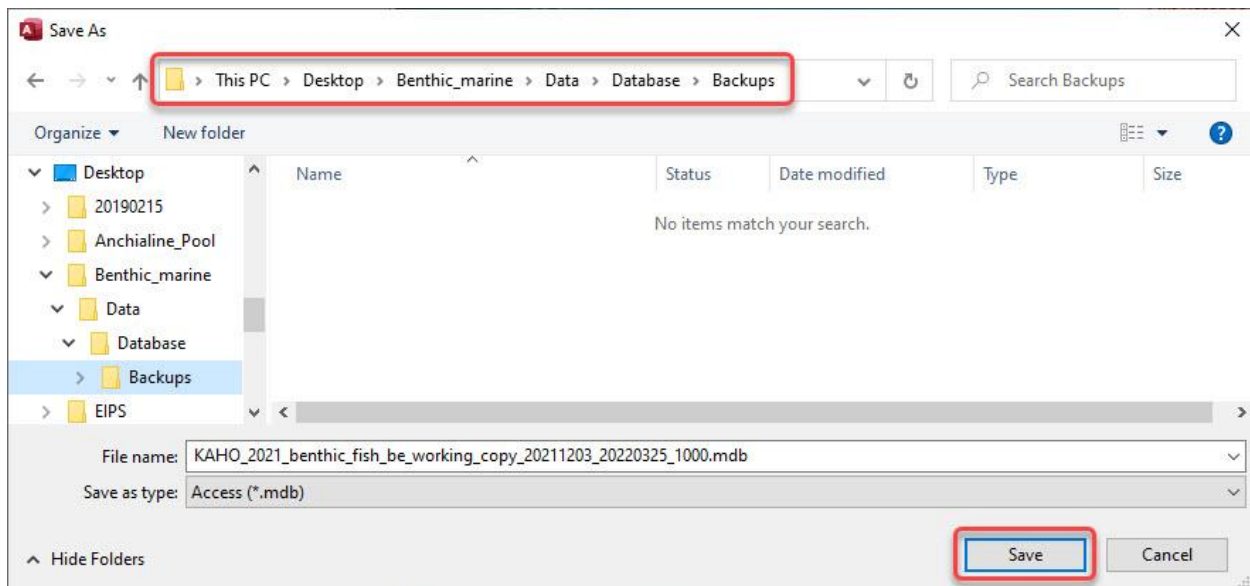
1. Click the “**Back up data**” button from the Main Menu tab to create a backup.



2. A prompt window will open asking if you want to create a backup copy of the data. Click “**Yes**” to make a backup, or “**No**” to cancel the operation.

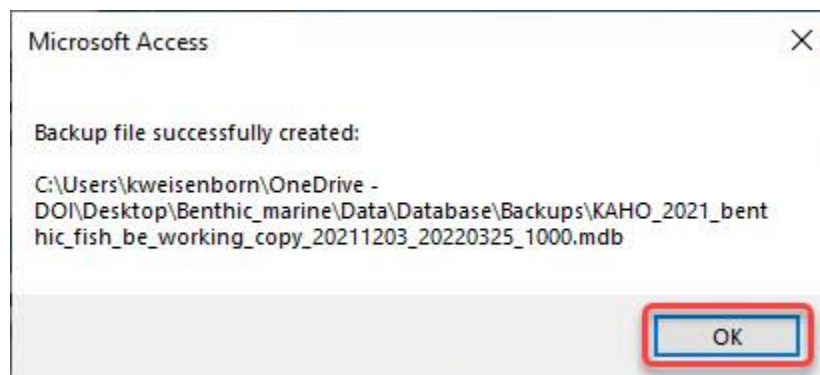


3. If “Yes”, a window will open prompting you to choose a location to save the backup file (e.g., C:\Users\[UserName]\Desktop\Benthic_marine\Data\Database\Backups – this is the recommended folder structure; you may need to create a new folder called, “Backups”). Select a location and click “**Save**”.



Example of where to save a backup copy of the back-end file on a local directory

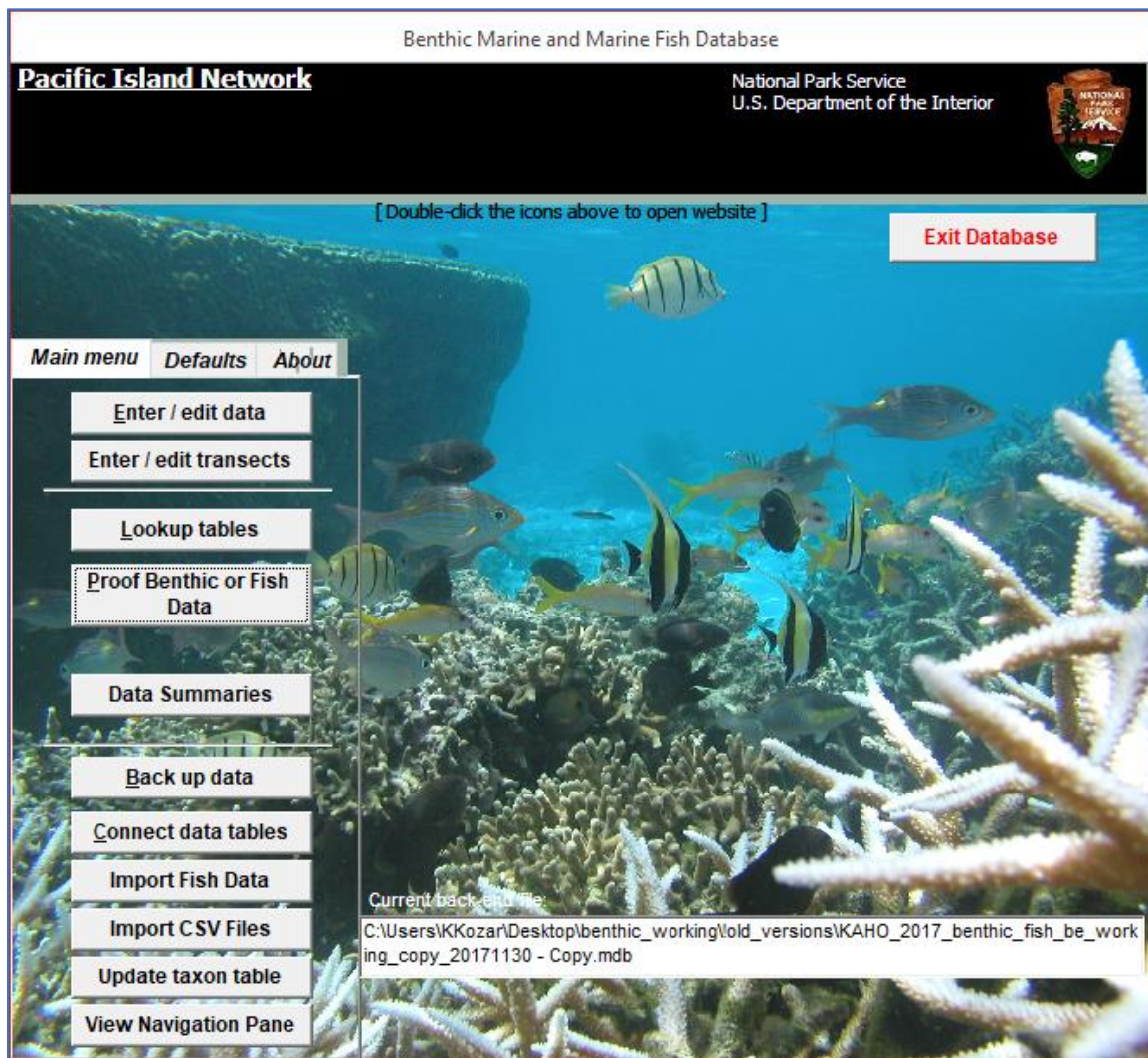
4. A Microsoft Access window will open indicating that the back-up file was saved successfully. Click “OK” to close the window and return to the application.



The database application also contains an automatic backup feature that can be setup through the *Defaults* tab on the Application Startup Form that opens automatically when the application starts. For information on how to setup this automatic feature, see the [Automatic Backups](#) section.

Features of the Application Startup Form

The Application Startup Form is the entry point for the application, and therefore the first thing users will usually see when opening the application.



Application Startup Form

Double-clicking “Pacific Island Network” at the top left of the form will open the website for the Network (<https://www.nps.gov/im/pacn/index.htm>). Double-clicking the NPS Arrowhead or the title National Park Service at the top right of the form will open a browser and navigate to the National Park Service website (www.nps.gov).

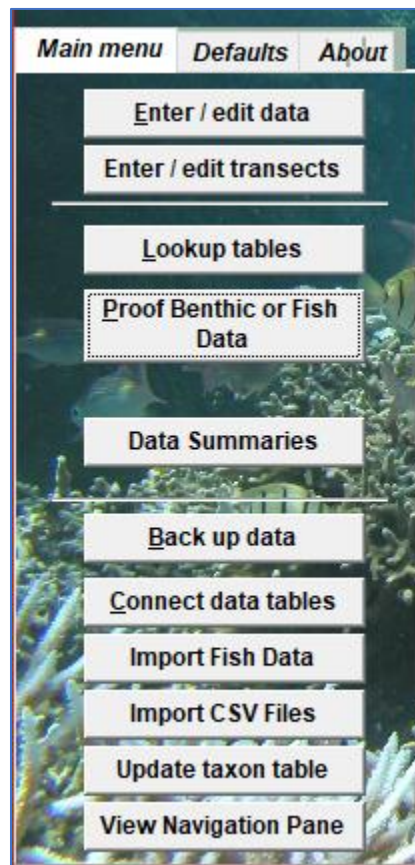
Also, at the top right of the form is an “**Exit Database**” button which can be used to close the application. If prompted to back up the data upon closing the database, see the [Back Up Data](#) section.

A tabbed menu resides at the lower left corner of the form. It contains the tabs [Main Menu](#), [Defaults](#), and [About](#). Each of the tabs will be examined in more detail in the sections that follow.

At the bottom right-center of the form is a box that displays the current location of the back-end data file to which the application is linked.

Main Menu

The Main Menu tab on the Application Startup Form is what users will see when the application is started. It provides buttons to [enter/edit data](#), [enter/edit transects](#), [manage lookup tables](#), [proof data](#), [data summaries](#), [back up data](#), [connect data tables](#), [import fish data](#), [import CSV files](#), [update taxon table](#), and [view the navigation pane](#).



Main Menu tab on the Application Startup Form

Enter / Edit Data

Under the Main Menu tab on the Application Startup Form, click the “**Enter / edit data**” button to open the Data Gateway Form.

Data Gateway Form

This form displays location and event information for each record and is designed to help the user determine which record to edit/view. This form will open when the “**Enter/edit data**” button is clicked on the Main Menu tab on the Application Startup Form.

By default, the Data Gateway Form starts off with a filter (a criteria that limits which records are displayed) for the default park that was selected on the application Defaults tab located on the Application Startup Form (see the Defaults section).

Park*	Transect*	Transect Type*	Year*	Visit dates*	Entered/updated*
KALA	1	Fixed	2006	25 Apr 2006	2008 Sep 08 17:40
KALA	1	Fixed	2006	02 Aug 2006	2008 Jun 03 11:56
KALA	1	Temporary	2006	08 Aug 2006	2008 Aug 18 11:21

Data Gateway Form

Additional filters for *Data Type*, *Transect*, *Year*, and *Visit Date* can be set by selecting from the drop-down lists at the top of the form in the Filters box. Filters can be removed by clicking the “**Filter Is On**” toggle button. The button will toggle up and say, “Filter Is Off” when the filter is removed. When the filter is removed, all records will be displayed. To clear all filters and turn the filter off, click the “**Clear Filters**” button. Optionally, a specific filter can be removed by highlighting and deleting the text that is currently displayed in one of the filter controls.

In addition to filters, there are sorting options for the records on the Data Gateway Form. Double-clicking any of the column headings will cause the records to be sorted in ascending order by that column value. The column heading will change to a ***bold italic*** format to indicate that it is the column being used to determine sort order. If the same column is double-clicked a second time, the records will be sorted in descending order by that column value.

Double-clicking a *Visit Date* (in blue) will open the Main Data Form (includes Event data) for that particular record. To add a new data entry record, click the “**Add a new record**” button at the top of the Data Gateway Form.

Main Data Form

The Main Data Form is used to select a park, transect type, and transect, as well as to enter event information, enter information about the people who participated in the sampling event, and enter data certification information.

Main Data Form

Benthic Marine Monitoring

Park: [Instructions](#) [Close Form](#)

Fixed/Temporary: Transect: [Add New Transect](#) [Edit Transect](#) [Add New Record](#)

Sampling Events

Sampling Date (mm/dd/yy): Notes: Observer(s): Role:

(Tile Deployment Date)

Was rugosity measured? ☐ [View Data](#)

Data Enterer:

[Add Data Enterer/Observer](#) [Delete Event](#)

Use this if a data enterer or observer is not listed in drop-down list

Benthic Cover **Settlement** **Growth** **Fish**

This form is populated by importing CSV files.

Frame:
 Analysis Date:
 Frame Identifier:
 Disease:

Benthic Data Certified: ☐
 Benthic Data Certified By:
 Benthic Data Certified Date:

Taxon ID Code: Point: X: Y:

Record: 1 of 1 No Filter Search

Fish Data Certified: ☐
 Fish Data Certified By:
 Fish Data Certified Date:

Growth Data Certified: ☐
 Growth Data Certified By:
 Growth Data Certified Date:

Main Data Form

Parks and transects that were previously entered can be selected from a drop-down list; new parks and transects can be entered by choosing a park from the drop-down list then clicking the “**Add New Transect**” button (see Transect Information Form section below).

Event information entered here includes:

- Sampling Date
- Rugosity (if *Was rugosity measured?* is checked, then the Rugosity Form will open [see Rugosity Form section below])
- Data Enterer
- Event Notes
- Fish and Growth data certified

Information about people who participated in the sampling event can be entered in the *Observer(s)* box. Contacts and their role can be selected from the drop-down lists. If a new contact needs to be

entered, click the “**Add Data Enterer/Observer**” button to open the Contacts Form (see Contacts Form section below).

There are four tabs for entering data: **Benthic Cover**, **Settlement**, **Growth**, and **Fish**. However, no data entry occurs into the **Benthic Cover** tab—this data is imported from a function through the Main Menu tab (see Import CSV Files section below).

Transect Information Form

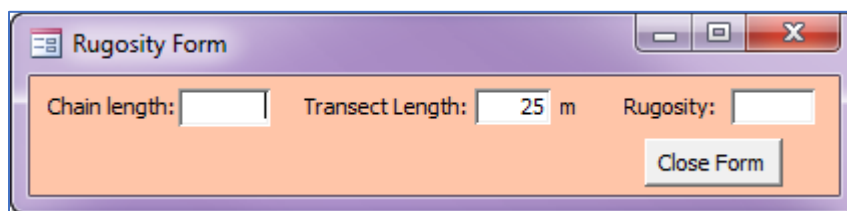
If the *Transect* drop-down list on the Main Data Form does not include the transect you need, click on the “**Add New Transect**” button. This will open the Transect Information Form, which is used to enter transect information. Likewise, you can click on the “**Enter / edit Transect**” button from the Main Data Form if you need to update transect information. Values entered here include:

- Park
- Transect
- Transect Type
- Compass Bearing
- Depth
- Start Latitude/Longitude Coordinates, Latitude/Longitude Direction, and Coordinate System
- Estimated Horizontal Error and Accuracy Notes
- Transect Notes
- Station established date, Station Status, and Station discontinued date

Transect Information Form

Rugosity Form

Rugosity is not measured at every sampling event. If it is measured, check the box next to the *Was rugosity measured?* field on the Main Data Form—doing so will open the Rugosity Form.

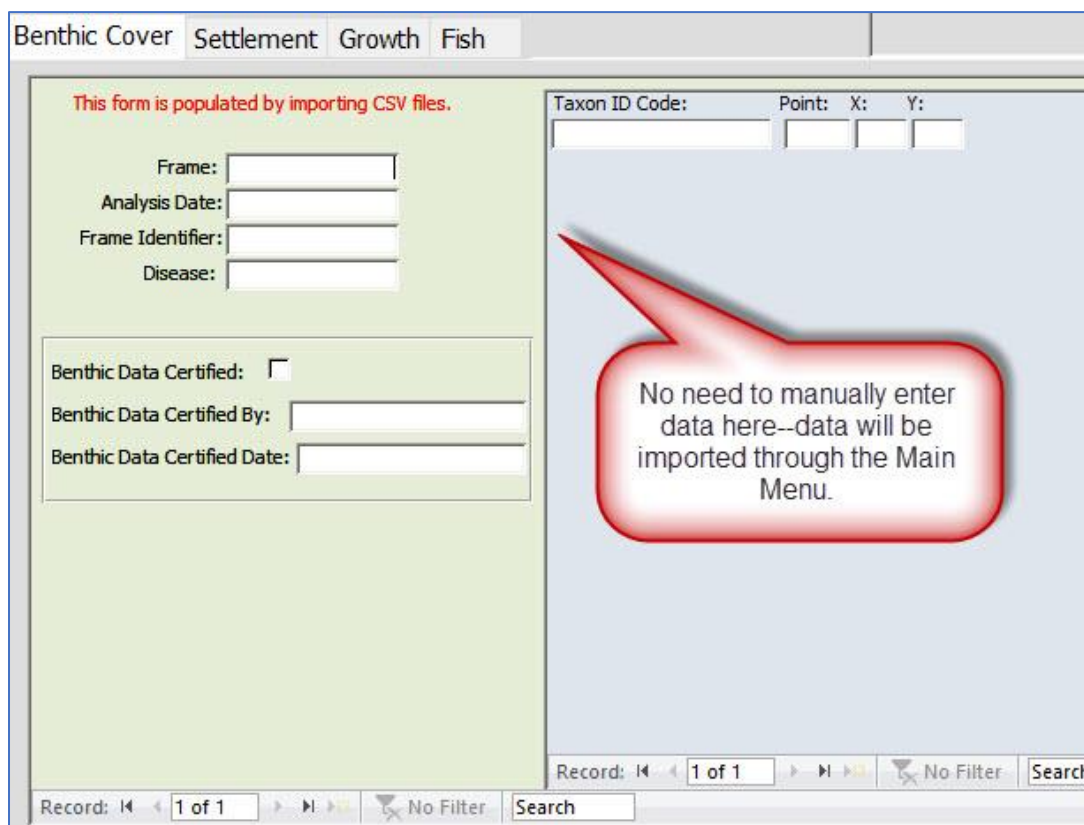
A screenshot of a software window titled "Rugosity Form". The window has a purple title bar with standard minimize, maximize, and close buttons. The main area has an orange background. It contains three input fields: "Chain length:" followed by an empty text box, "Transect Length:" followed by a text box containing "25" and a unit "m", and "Rugosity:" followed by an empty text box. A "Close Form" button is located in the bottom right corner.

Rugosity Form

Enter the *Chain length* and if the default value of 25 for the *Transect Length* is incorrect, enter the correct length. *Rugosity* is calculated, based on the chain length and transect length.

Benthic Subform

The Benthic Subform is located under the **Benthic Cover** tab on the Main Data Form. No data needs to be manually entered in this subform—data is imported from a function through the Main Menu tab (see Import CSV Files section below).

A screenshot of the "Benthic Cover" subform within a larger application window. The subform has a light green background. At the top, a red message states: "This form is populated by importing CSV files." Below this, there are four input fields: "Frame:", "Analysis Date:", "Frame Identifier:", and "Disease:". Further down, there is a checkbox labeled "Benthic Data Certified:" which is currently unchecked, followed by two more input fields: "Benthic Data Certified By:" and "Benthic Data Certified Date:". To the right of these fields, there is a light blue area with a "Taxon ID Code:" label and a "Point:" label with sub-labels "X:" and "Y:". A red speech bubble points to this area with the text: "No need to manually enter data here--data will be imported through the Main Menu." At the bottom of the window, there is a status bar with "Record: 1 of 1", "No Filter", and a "Search" button.

Benthic Cover Subform on the Main Data Form

Settlement Subform

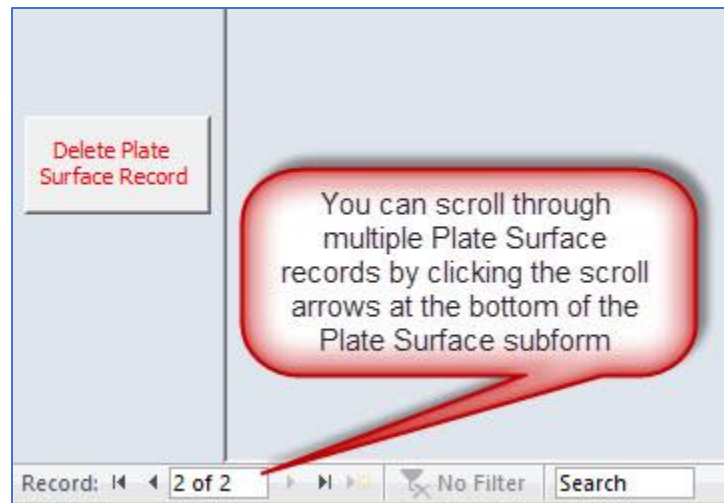
The Settlement Subform is located under the **Settlement** tab on the Main Data Form. This form displays data about coral settlement into settlement plates. Note: settlement data is only collected on Fixed transects.

The screenshot shows the 'Settlement' subform within a larger application window. The top navigation bar includes tabs for 'Benthic Cover', 'Settlement', 'Growth', and 'Fish'. The 'Settlement' tab is selected. The form is split into two main color-coded sections: a light green section on the left for general settlement data and a light blue section on the right for plate-specific data. The green section includes a 'CRA' dropdown, 'Plate number', 'Retrieved Plate Date (MM/DD/YY)', 'Duration' in days, a 'Settlement Data Certified' checkbox, and fields for 'Settlement Data Certified By' and 'Settlement Data Certified Date'. The blue section features a 'Plate Surface' dropdown, a 'Next Surface' button, a 'Taxon Code' dropdown, and input fields for 'Polyp Count', 'Length (mm)', and 'Width (mm)'. A 'Delete Record' button is located next to the 'Taxon Code' field. At the bottom of the form, there is a status bar showing 'Record: 1 of 1', a 'No Filter' indicator, and a 'Search' field.

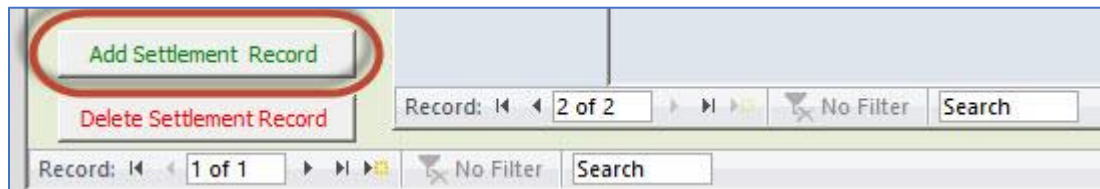
Settlement Subform on the Main Data Form

Settlement plates are attached to CRAs, which are placed at specific distances along and from the transect. In the light green area of the form, first select the *CRA* number (1, 2, or 3) from the drop-down list. Enter the *Plate number* that is associated with this CRA, then enter the date the plate was retrieved in the *Retrieved Plate* field. *Duration* in days is automatically calculated.

In the light blue area to the right, choose a *Plate Surface* from the drop-down list. Next, enter the Taxon Code(s) for the species observed, polyp counts, and measurements associated with the selected plate surface type. When ready to move on to the next *Plate Surface* type, click the “**Next Surface**” button to create a new record. Go through all the surfaces and enter species for all sides of the plates until complete. You can scroll through the records entered by clicking the scroll arrows below the Plate Surface subform.



If retrieving plates from more than one *CRA*, click on the “**Add Another Settlement Record**” button (in green text) until data for all plates for that transect have been entered.



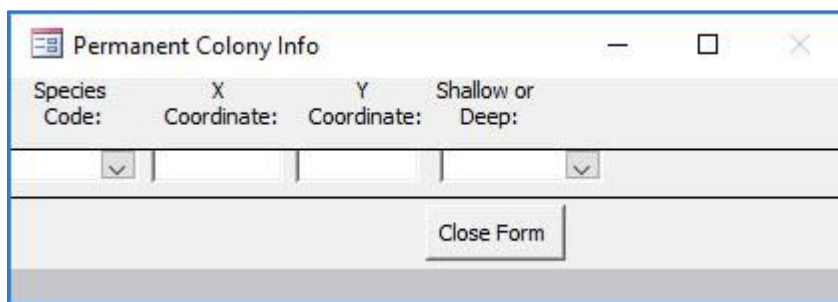
Growth Subform

The Growth Subform is located under the **Growth** tab on the Main Data Form. This form displays data about coral growth.

Benthic Cover		Settlement		Growth		Fish	
Colony Number:	Fate:	Length:	Width:	Height:	Re-measure?		
						View Permanent Info	Delete Record
Record: 1 of 1		No Filter		Search			
Species Code:	X Coordinate:	Y Coordinate:	Shallow or Deep:				

Growth Subform on the Main Data Form

Enter the colony number in the *Colony Number* field. If the colony number has not previously been entered, the following Permanent Colony Form will open (see below). Enter the colony number information in this form. You must enter data in all the fields.

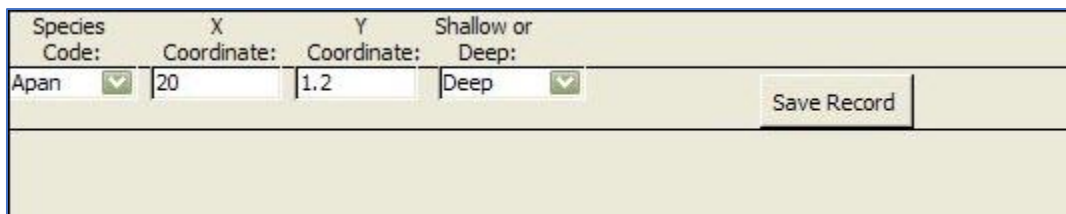


The image shows a window titled "Permanent Colony Info" with a standard Windows interface (minimize, maximize, close buttons). Inside the window, there are four input fields: "Species Code:" with a dropdown arrow, "X Coordinate:" with a text box, "Y Coordinate:" with a text box, and "Shallow or Deep:" with a dropdown arrow. Below these fields is a "Close Form" button.

Permanent Colony Form

After entering the colony number information, the remaining growth information—fate, length, width, height, and re-measure—can be filled in. To view past records for the colony, click the “**View Permanent Info**” button. The record can also be deleted by clicking the “**Delete Record**” button next to the record that you wish to permanently delete.

A subform below the coral growth subform will be populated with the relevant data.

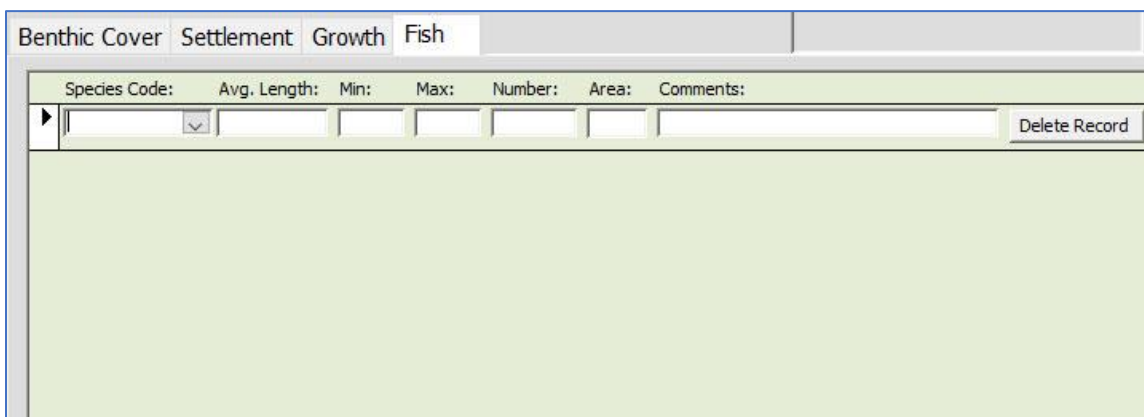


The image shows a subform titled "Colony History on Growth Subform". It has a header section with four fields: "Species Code:" (dropdown with "Apan" selected), "X Coordinate:" (text box with "20"), "Y Coordinate:" (text box with "1.2"), and "Shallow or Deep:" (dropdown with "Deep" selected). To the right of these fields is a "Save Record" button. Below the header is a large empty area for data entry.

Colony History on Growth Subform

Marine Fish Subform

The Marine Fish Subform is located under the **Fish** tab on the Main Data Form. This form displays information on fish detected during the sampling event.



The image shows a subform titled "Marine Fish Subform". It has a header section with seven fields: "Species Code:" (dropdown), "Avg. Length:" (text box), "Min:" (text box), "Max:" (text box), "Number:" (text box), "Area:" (text box), and "Comments:" (text box). To the right of these fields is a "Delete Record" button. Below the header is a large empty area for data entry.

Marine Fish Subform on the Main Data Form

Marine fish are counted along the transect. Enter the species found, the average length, the minimum and maximum length, the number of fish, and any comments in this subform. Fish data is imported from an Excel® spreadsheet. See the section Import Fish Data for information on how to import fish data.

Contacts Form

The Contacts Form is used to enter details about individuals who participate in data gathering for the protocol and who enter information in the database. This form can be opened from the Main Data Form by clicking the “**Add Data Enterer/Observer**” button.

The screenshot shows the 'Main Data Form' window. At the top, there are buttons for 'Add New Transect' and 'Edit Transect'. On the right side, there are buttons for 'Close Form' (green) and 'Add New Record' (blue). Below these, there is a section for 'Observer(s): Role:' with two drop-down menus. To the right of these menus are two buttons: 'Add Data Enterer/Observer' and 'Delete Event'. A red callout box with a speech bubble points to the 'Add Data Enterer/Observer' button. The text inside the callout box reads: 'Click on the "Add Data Enterer/Observer" button from the Main Data Form to open the Contacts Form to add a new observer or edit an existing observer'. Below the buttons, there is a note: 'Use this if a data enterer or observer is not listed in drop-down list'.

Contact Information Form

Values entered here include:

- First Name, Middle Initial, Last Name
- Organization
- Position/title
- Work Phone and Extension
- Email Address
- Address Information, including Address Type, Street Address, City, State, Zip Code, and Country
- Notes

An existing contact can be edited by selecting the contact from the *Search* drop-down list, selecting the contact of interest, and then clicking the “**Edit record**” button. A new contact record can be added by clicking the “**New record**” button.

Previously entered addresses can be selected from the *Address 1* drop-down list, and the associated Street Address, City, State, Zip, and Country values will automatically be filled in. The *Organization* and *Position/Title* drop-down lists will also allow selection from previously entered values or new entries.

Lookup Tables

Under the Main Menu tab on the Application Startup Form, click the “**Lookup tables**” button to open the Manage Lookup Tables Form. On the **Other lookup tables** tab, lookup tables can be selected from the *Table* drop-down list. When a lookup table is selected, the values will be displayed

in a datasheet below. If the table is listed as “Editable” in the drop-down list, then records can be edited, deleted, or added in the datasheet.

Manage Lookup Tables

Close

Other lookup tables

Table: Note: Only certain lookup tables allow edits. Please contact the Project Lead or Data Manager if you need to change the domain values for non-editable lookup tables.

Contact_ID	Last_Nam	First_Name	Middle_Init	Obsr_Code	Organiz	Position_Title	Address	Address
04D16625-83A	Beavers	Sallie			NPS	Marine Ecologist		Kaloko-Honokohau
5C0AFD8B-9D	Craig	Peter			NPS	Marine Ecologist		National Park of Ame
919509FE-B4C	Basch	Larry			NPS	Ecologist/Science Advisor		
C3323C02-057	Brown	Eric	K	EKB	NPS	Marine Ecologist		7 Puahi St, P.O. Box

Manage Lookup Tables Form

Proof Data

To select a percentage of either Benthic or Fish records to certify, the Benthic and Fish Data Proofing Switchboard can be used. Under the Main Menu tab on the Application Startup Form, click the “**Proof Benthic or Fish Data**” button to open the Benthic and Fish Data Proofing Switchboard.

Benthic and Fish Data Proofing Switchboard

Choose the park, year or start and end dates, and percentage of benthic records to be proofed.

Park

Data Type

Year

OR

Start Date **End Date**

Enter the percentage of records to proof in the field below, then press "Enter". This will generate a random selection of records.

Benthic and Fish Data Proofing Switchboard

From the drop-down lists, select the *Park* and *Data Type* (Benthic or Fish), *Year* or *Start* and *End Dates*. Choose the year for which data is to be certified unless more than one year of data is to be certified, in which case choose the date range. In most cases, the year is usually. Then enter the percent of samples you want randomly sampled (usually 10%, typed in the field as “010”) and click the “**Enter**” button—this will open the Proofing Form. The number of records to be certified depends on the percentage chosen, and the number of total records.

Proofing Form										
Randomly selected sampling events for proofing.										Close
Date	Unit Code	Data Type	Transect	Type	Proofed	Corrected	Certified			
9/29/2017	KAHO	Benthic	13	Fixed	☐	☐	☐	View Record	Error Results	
9/19/2017	KAHO	Benthic	3	Fixed	☐	☐	☐	View Record	Error Results	
9/21/2017	KAHO	Benthic	7	Temporary	☐	☐	☐	View Record	Error Results	
					☐	☐	☐	View Record	Error Results	

Randomly selected sampling events generated for proofing

Click the “**View Record**” button next to the record you want to proof. This will open the record in the Main Data Form. When finished, click the “**Close Form**” button on the Main Data Form to return to the Proofing Form. Click the *Proofed*, *Corrected*, and *Certified* checkboxes once these tasks have been done. Once the *Certified* box is clicked, the certified fields in the Fish or Benthic tables will be updated automatically with the database user and date.

Clicking on the “**Error Results**” button on the Proofing Form will open the Error Results Form for that particular record. Enter the number of points reviewed for Benthic data, or the number of records for Fish data in the “Number of Total Points Reviewed” field. Enter the number of points or records corrected. The percent error is automatically calculated.

Error Results			
Unit Code:	KAHO	Transect:	10
Type:	Fixed	Date:	10/10/2018
Number of Total Points Reviewed:		1300	
Number of Points Corrected:		50	
Percent Error:		3.8	
Proof Date:	10/17/2019	Proofed by:	Sheila McKenna
Close			

Error results for a randomly selected sampling event, generated from the Proofing Form

When proofing is complete, click the “**Close**” button on the Proofing Form to return to the Benthic and Fish Data Proofing Switchboard.

For an overall summary of errors for the criteria selected on the Benthic and Fish Data Proofing Switchboard, click the “**Error Results**” button to open the Proofing Error Summary Form.

The screenshot shows a web form titled "Benthic and Fish Data Proofing Switchboard". The form has a light blue background and a white border. At the top, it says "Choose the park, year or start and end dates, and percentage of benthic records to be proofed." Below this, there are several input fields: "Park" with a dropdown menu showing "KAHO", "Data Type" with a dropdown menu showing "Benthic", and a "Year" dropdown menu showing "2017". Below the year field, there is an "OR" label and two empty text boxes for "Start Date" and "End Date". Further down, there is a text input field for "Enter the percentage of records" with the value "010%" and an "Enter" button. At the bottom of the form, there are three buttons: "Clear All", "Error Results", and "Close Form". A red callout bubble with a white border points to the "Error Results" button, containing the text: "Click the 'Error Results' button to view the Proofing Error Summary Form".

Benthic and Fish Data Proofing Switchboard

Choose the park, year or start and end dates, and percentage of benthic records to be proofed.

Park

KAHO

Data Type

Benthic

Year

2017

OR

Start Date End Date

Enter the percentage of records field below, then press "Enter". To a random selection of records

010%

Enter

Clear All **Error Results** Close Form

Click the "Error Results" button to view the Proofing Error Summary Form

The screenshot shows a window titled "Proofing Error Summary". Inside the window is a table with the following data:

Unit Code	Year	Total Points Reviewed	Total Points Corrected	Percent Error
KAHO	2017	3900	42	1.1

At the bottom right of the window is a "Close" button.

Proofing Error Summary Form

Observe the *Percent Error* rate. If the *Percent Error* rate is greater than 10%, you will be instructed to error check all records.

Certification

Data certification is a benchmark in the project information management process that indicates: 1) the data are complete for the period of record, 2) the data have undergone and passed the quality assurance checks, and 3) that the data are appropriately documented and in a condition for archiving, posting and distribution as appropriate. Because the data in this database may be entered at different times for the same sampling event, there are several data certification check boxes.

At the bottom of the Main Data Form there are two checkboxes for data certification—one for Fish Data and one for Growth Data. To declare a record as certified, check the box for the appropriate data to be certified. Once this box is checked, the person who certified the data, as well as the date certified, will automatically be populated.

Main Data Form

Benthic Marine Monitoring

Park: [Instructions](#) [Close Form](#)

Fixed/Temporary: Transect: [Add New Transect](#) [Edit Transect](#) [Add New Record](#)

Sampling Events

Sampling Date (mm/dd/yy): Notes: Observer(s): Role:

(Tile Deployment Date)

Was rugosity measured? ☐ [View Data](#)

Data Enterer:

[Add Data Enterer/Observer](#) [Delete Event](#)

Use this if a data enterer or observer is not listed in drop-down list

Benthic Cover **Settlement** **Growth** **Fish**

This form is populated by importing CSV files.

Frame:
 Analysis Date:
 Frame Identifier:
 Disease:

Benthic Data Certified: ☐
 Benthic Data Certified By:
 Benthic Data Certified Date:

Taxon ID Code: Point: X: Y:

Record: 1 of 1 [No Filter](#) [Search](#)

Fish Data Certified: ☐
 Fish Data Certified By:
 Fish Data Certified Date:

Growth Data Certified: ☐
 Growth Data Certified By:
 Growth Data Certified Date:

Certifying data in the Main Data Form

The certification check boxes for Benthic Cover and Settlement are on their respective subforms (see below).

Data Summary Tool

After the season's field data have been certified, data will be ready for summarization. The data summary tool contains queries that summarize and perform basic statistical calculations. These pre-built queries are developed based on what the project lead needs for their annual reports.

The following table shows the prebuilt queries for the data summary tool. The queries are named and numbered hierarchically so that data types are grouped together.

Query_name	Returns records meeting the following criteria
qs_a011_Benthic_Cover_point_count_per_park	Total number of benthic points analyzed per park per year. Can be filtered on Year, Park, Transect, Transect Type, and Date.
qs_a021_Benthic_Cover_point_count_per_transect	Total number of benthic points analyzed per transect per year. Can be filtered on Year, Park, Transect, Transect Type, and Date.
qs_b011_Benthic_Cover_species_count_per_park	List of benthic species with the total number of individuals detected per park per year. Shows benthic types (e.g., algae, coral, etc.). Can be filtered on Year, Park, Transect # and Type, Date, and Benthic Type.
qs_b021_Benthic_Cover_species_count_per_transect	List of benthic species with the total number of individuals detected per transect per year. Shows benthic types (e.g., algae, coral, etc.). Can be filtered on Year, Park, Transect # and Type, Date, Benthic Type, and Species.

Query_name	Returns records meeting the following criteria
qs_b031_Benthic_Cover_species_per_park	Summarizes the species recorded at a park for all monitoring. Can be filtered on Park, Year, and Species.
qs_b041_Benthic_ESA_species_detections	
qs_c011_Benthic_Cover_species_percent_cover_per_park	Benthic species percent cover per park per year, from highest to lowest. Must filter on Year and Park. Results will show percent cover amongst all benthic types. To see percent cover for one benthic type, filter on Benthic Type.
qs_c021_Benthic_Cover_species_percent_cover_per_transect	Benthic species percent cover per transect per year, from highest to lowest. Must filter on Year and Park. Results will show percent cover amongst all benthic types. To see percent cover for one benthic type, filter on Benthic Type.
qs_c031_Benthic_Cover_species_percent_cover_per_transect_xtab	Benthic species percent cover per transect per year, from highest to lowest. Must filter on Year and Park. Results will show percent cover amongst all benthic types. To see percent cover for one benthic type, filter on Benthic Type.
qs_d011_Benthic_Cover_species_richness_by_transect	Benthic species richness per transect per park per year, by benthic type. Can be filtered on Year, Park, Transect # and Type, Date, and Benthic Type.
qs_e011_Benthic_Cover_type_count_per_park	Total number of each type (algae, coral, etc.) of benthic species observed per park per year. Can be filtered on Year, Park, Transect Type, and Benthic Type.
qs_e021_Benthic_Cover_type_count_per_transect	Total number of each type (algae, coral, etc.) of benthic species observed per transect per park per year. Can be filtered on Year, Park, Transect # and Type, Date, and Benthic Type.
qs_d041_Benthic_Cover_species_richness_trend_by_transect_xtab	Benthic species richness per transect per park per year. Can be filtered on Park, Transect Number, and Benthic Type. Crosstab query.
qs_e011_Benthic_Cover_type_count_per_park	Total number of each type (algae, coral, etc.) of benthic species observed per park per year. Can be filtered on Year, Park, Transect Type, and Benthic Type.
qs_e021_Benthic_Cover_type_count_per_park_xtab	Total number of each type of benthic species observed per park per year. Algae types (Coralline, Turf and other algae) are grouped into Algae. Can be filtered on Year, Park, Transect Type and Benthic Type. Crosstab query.
qs_e031_Benthic_Cover_type_count_per_transect_algae	Total number of each type of benthic species observed per transect per park per year, with algae broken out into macroalgae (algae), turf algae, and coralline algae. Can be filtered on Year, Park, Transect # and Type, Date, and Benthic Type.
qs_e041_Benthic_Cover_type_count_per_frame	Total number of each type of benthic species observed per frame for each transect per park per year. Algae types (Coralline, Turf and other algae) are grouped into Algae. Can be filtered on Year, Park, Transect # and Type, Date, and Benthic Type.
qs_f011_Benthic_Cover_type_percent_per_park	Percent cover by benthic type per park per year. Can be filtered on Year, Park, and Transect Type.

Query_name	Returns records meeting the following criteria
qs_f021_Benthic_Cover_type_percent_per_transect	Percent cover by benthic type per transect per park per year. Can be filtered on Year, Park, Transect, Transect Type, and Date.
qs_f031_Benthic_Cover_type_percent_per_transect_algae	Percent cover by benthic type per transect per park per year, with algae broken out into macroalgae (algae), turf algae, and coralline algae. Can be filtered on Year, Park, Transect, Transect Type, and Date.
qs_f041_Benthic_Cover_type_percent_per_transect_xtab	Percent cover by benthic type per transect per park per year. Algae types (Coralline, Turf and other algae) are grouped into Algae. Can be filtered on Year, Park, Transect, Transect Type, and Date. Crosstab query.
qs_f051_Benthic_Cover_type_percent_per_transect_algae_xtab	Percent cover by benthic type per transect per park per year. Algae types are separated (Coralline and Turf from other algae). Can be filtered on Year, Park, Transect, Transect Type, and Date. Crosstab query.
qs_f061_Benthic_Cover_trend_stat_setup_xtab	Percent cover by benthic type per transect per park per year, formatted for statistical analysis. Algae types (Coralline, Turf and other algae) are grouped into Algae. Can be filtered on Year, Park, Transect, Transect Type, and Date. Crosstab query.
qs_g011_Benthic_Cover_top_ten_per_park_all_years	Top benthic species cover per park for all years combined, in descending order. Must filter on Park. Results will show percent cover amongst all benthic types. To see percent cover for one benthic type, filter on Benthic Type.
qs_h011_Coral_Cover_trend_xtab	Shows percent cover of coral per park, year, and transect. Can be filtered on Park and Transect. Crosstab query.
qs_h021_Coral_Cover_temporal_change_xtab	Shows change in % coral cover between start and end. Can be filtered on Park and Transect.
qs_h031_Macroalgae_Cover_trend_xtab	Shows percent cover of macroalgae per park, year, and transect. Can be filtered on Park and Transect. Crosstab query.
qs_h041_Macroalgae_Cover_temporal_change	Shows change in % macroalgae cover between start and end. Can be filtered on Park and Transect.
qs_h051_Corallinealgae_Cover_trend_xtab	Shows percent cover of coralline algae per park, year, and transect. Can be filtered on Park and Transect. Crosstab query.
qs_h061_Turfalgae_Cover_trend_xtab	Shows percent cover of turf algae per park, year, and transect. Can be filtered by Park and Transect. Crosstab query.
qs_i012_Disease_%_of_Frames_by_transect	Summarizes number of disease points per transect as well as the percent (# of frames with disease divided by number of frames). Can be filtered on Year, Park, Transect Type, Transect, and Date.
qs_i022_Bleaching_all_data	All bleaching data that was collected per park per year. Only fixed sites contain bleaching data. Can be filtered on Park, Transect, and Year.
qs_i032_Bleaching_taxon_bleached_per_category_per_park_per_year	The total number of points for each species that is bleached for each bleaching category. Can be filtered on Park, Transect, and Year.
qs_i042_Bleaching_taxon_summary_per_park_per_year	Bleaching summary per taxon per park per year. Includes the total number of points a species was

Query_name	Returns records meeting the following criteria
	detected in, the total number of points for each species where bleaching was detected, and the percent of points that were bleached per taxon.
qs_i052_Bleaching_taxon_summary_per_transect_per_year	Bleaching summary per taxon per park per year. Includes the total number of points a species was detected in, the total number of points for each species where bleaching was detected, and the percent of points that were bleached per taxon.
qs_i062_Bleaching_taxon_summary_per_transect_per_year_xtab	
qs_i072_Bleaching_taxon_percent_cover_per_transect_per_year	
qs_i082_Bleaching_number_frames_per_transect_per_year	The total number of frames that contain bleaching data per transect per year. Can be filtered on Park, Transect, and Year.
qs_i092_Bleaching_severity_per_transect_per_year	Bleaching severity per transect per year. Contains the number of frames for each bleaching severity. Can be filtered on Park, Transect, and Year.
qs_i102_Bleaching_severity_summary_per_transect_xtab	
qs_i112_Bleaching_number_coral_points_per_park_per_year	The number of points per park per year that are coral species. This is only for the fixed sites. Can be filtered on Park, Transect, and Year.
qs_i122_Bleaching_number_coral_points_per_transect_per_year	The number of points per park per year that are coral species. This is only for the fixed sites. Can be filtered on Park, Transect, and Year.
qs_i132_Bleaching_number_bleached_points_per_park_per_year	The number of points per park per year that are bleached. This is only for the fixed sites. Can be filtered on Park, Transect, and Year.
qs_i142_Bleaching_percent_bleached_per_park_per_year	The number of points per park per year that are coral species, the number of points bleached, and the total percentage bleached. This is only for the fixed sites. Can be filtered on Park, Transect, and Year.
qs_i152_Bleaching_frames_sampled	
qs_i162_Bleaching_frames_with_coral	All bleaching data that was collected per park per year. Only fixed sites contain bleaching data. Can be filtered on Park, Transect, and Year.
qs_i172_Bleaching_frames_no_coral_summary	
qs_i182_Bleaching_benthic_type_frame_summary_xtab	
qs_i192_Bleaching_frames_with_no_coral	
qs_i202_Bleaching_points_bleached_summary_xtab	
qs_i212_Bleaching_points_category_summary_xtab	
qs_i222_Bleaching_#_coral_points_bleached_per_transect	
qs_i232_Bleaching_percent_coral_cover_per_transect_per_year	
qs_i242_Bleaching_percent_bleached_per_transect_per_year	
qs_j013_Fish_surveys_completed	Summary of fish surveys completed in each park per year. Can be filtered on Year, Park, Transect, Transect Type, and Date.
qs_j023_Fish_surveys_completed_xtab	Summary of fish surveys completed in each park per year. Can be filtered on Year, Park, Transect, Transect Type, and Date. Crosstab query.
qs_j033_Fish_Summary_species_per_transect	Summary of all fish species detected per transect per park. Data includes trophic level, consumer data, the number of individuals per species, and average length. Can be filtered on Year, Park, Transect Type, Transect, Trophic, and Species.

Query_name	Returns records meeting the following criteria
qs_j043_Fish_Summary_totals_per_transect	Fish summary per transect per park per year. Data includes species richness, total number of individuals detected, biomass, and density per transect. Can be filtered on Year, Park, Transect Type, Transect, and Trophic.
qs_j053_Fish_Top_25_Density_per_park_all_years	Top 25 fish species with the highest density per park. Can be filtered on Park, and Trophic. This query shows results for all sampling years.
qs_j063_Fish_Top_25_Biomass_per_park_all_years	Top 25 fish species with the highest biomass per park. Can be filtered on Park, and Trophic. This query shows results for all sampling years.
qs_j073_Fish_Endemic-Invasive_Species_Density_per_park	Fish species sorted by the highest density per park. Can be filtered on Year, From Date and To Date, Park, and Trophic. If no Event filters chosen, will show results over all years for the park chosen.
qs_j083_Fish_Endemic-Invasive_Species_Density_per_park_per_year	Fish species sorted by the highest density per park. Can be filtered on Year, From Date and To Date, Park, and Trophic. If no Event filters chosen, will show results over all years for the park chosen.
qs_j093_Fish_Endemic-Invasive_Species_Biomass_per_park	Fish species sorted by the highest biomass per park. Can be filtered on Year, From Date and To Date, Park, and Trophic. If no Event filters chosen, will show results over all years for the park chosen.
qs_j103_Fish_Endemic-Invasive_Species_Biomass_per_park_year	Fish species sorted by the highest biomass per park. Can be filtered on Year, From Date and To Date, Park, and Trophic. If no Event filters chosen, will show results over all years for the park chosen.
qs_j113_Fish_Species_Richness_Trend_per_transect_xtab	Fish species richness per fixed transect per park for all years. Can be filtered on Park, Transect and Trophic. Crosstab query.
qs_j123_Fish_Consumer_Abundance(#/m2)_per_park_xtab	Fish consumer abundance (Density Number/m2) per park per year. Can be filtered on Year and Park. Crosstab query.
qs_j133_Fish_Consumer_Abundance(#/m2)_per_transect_xtab	Fish consumer abundance (Density Number/m2) per transect per park per year. Can be filtered on Year, Park, Transect Type, and Transect. Crosstab query.
qs_j143_Fish_Consumer_Biomass_per_park_xtab	Fish biomass (mt/km2 or g/m2) per consumer per park per year. Can be filtered on Year and Park. Crosstab query.
qs_j153_Fish_Consumer_Biomass_per_transect_xtab	Fish consumer biomass (mt/km2 or g/m2) per transect per park per year. Can be filtered on Year, Park, Transect Type, and Transect. Crosstab query.
qs_j163_Fish_Trophic_Abundance(#/m2)_per_park_xtab	Fish consumer abundance (Density Number/m2) per transect per park per year. Can be filtered on Year, Park, Transect Type, and Transect. Crosstab query.
qs_j173_Fish_Trophic_Abundance(#/m2)_per_transect_xtab	Fish consumer abundance (Density Number/m2) per transect per park per year. Can be filtered on Year, Park, Transect Type, and Transect. Crosstab query.
qs_j183_Fish_Trophic_Biomass_per_park_xtab	Fish biomass (mt/km2 or g/m2) per consumer per park per year. Can be filtered on Year and Park. Crosstab query.

Query_name	Returns records meeting the following criteria
qs_j193_Fish_Trophic_Biomass_per_transect_xtab	Fish biomass (mt/km2 or g/m2) per consumer per park per year. Can be filtered on Year and Park. Crosstab query.
qs_j203_Fish_Family_Average_per_park	Fish summary per family per park per year. Can be filtered on Year, Park, Transect Type, Transect, and Trophic.
qs_j213_Fish_Family_Summary_per_transect	Fish summary per family per transect per park per year. Can be filtered on Year, Park, Transect Type, Transect, and Trophic.
qs_j223_Fish_Species_Matrix_x_Biomass_per_transect_xtab	Individual fish species biomass (biomass_ha) per transect per park per year. Can be filtered on Year, Park, Transect Type, Transect, and Trophic. Crosstab query.
qs_j233_Fish_Species_Matrix_x_Number_per_transect_xtab	Individual fish species numbers (number_ha) per transect per park per year. Can be filtered on Year, Park, Transect Type, Transect, and Trophic. Crosstab query.
qs_j243_Fish_Trend_Stat_Setup	Fish summary per transect per park per year, formatted for statistical analysis. Data includes species richness, biomass, density, diversity and evenness per transect. Can be filtered on Year, Park, Transect Type, Transect, and Trophic.
qs_j253_Fish_ESA_species_detections	
qs_j263_Fish_Species_per_Park	Fish species per park. Can be filtered on Year, Time Frame, and Park.
qs_r016_Rugosity	Rugosity per transect per sampling visit. Can be filtered on Year, Park, Transect, Transect Type, and Date.
qs_r026_Rugosity_Repeated_Measures_xtab	Rugosity per fixed transect per park for all years in crosstab query. Can be filtered on Park and Transect. Crosstab query.
qs_r036_Rugosity_Summary	Summary of transects at each park per year where rugosity data was collected.
qs_s014_Settlement_by_Transect_Taxon_xtab	Coral settlement per transect per park per year. Can be filtered on Year, Park, and Transect. Crosstab query.
qs_s024_Settlement_Repeated_Measures_Transect_xtab	Settlement per transect per park per year. Can be filtered on Park and Transect. Crosstab query.
qs_s034_Settlement_CRA_x_Surface_x_Taxon	Sum of individuals of each genus/species per sq. meter by plate surface. Can be filtered on Year, Park, and Transect.
qs_s044_Settlement_Missing_Plates	Settlement records that do not have a genus code entered for the side surface. Can be filtered on Year, Park, and Transect.
qs_s054_Settlement_Missing_Plates_Total	The total number of settlement records that do not have a genus code entered for the side surface per transect. Can be filtered on Year, Park, and Transect.
qs_x015_Metadata_by_transect	Transect metadata, such as Latitude and Longitude coordinates, dates surveyed, and Bearing, Depth, Chain and Tap length, and Rugosity. Can be filtered by Year, Park, Transect Type, and Transect.
qs_x025_Sampling_Event_Observers	Sampling event observers and roles. Can be filtered by park, transect, transect type, and year.

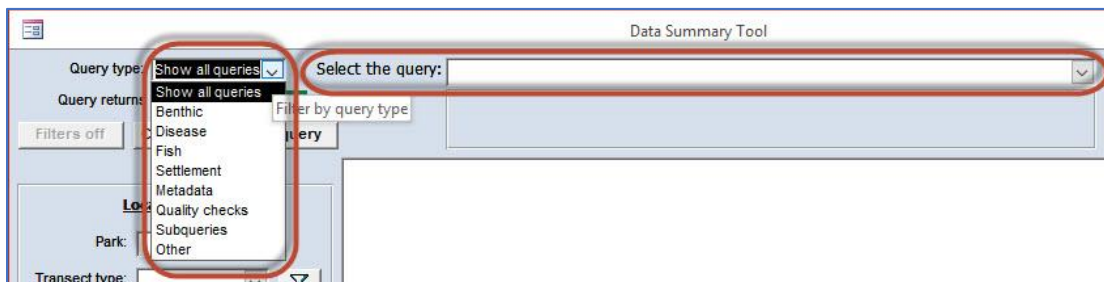
Query_name	Returns records meeting the following criteria
qs_x035_Sampling_Events_by_transect	Sampling events by transect per park per year. Can be filtered on Year, Park, Transect Type, and Transect.
qs_x045_Sampling_Events_by_park	Sampling events by park. Can be filtered on Year and Park.
qs_y015_Fish_Data_Entered	Fish data entered for each park, and the status of the data. Can be filtered on Year, Park, Transect Type, and Transect.
qs_y025_Fish_Certified_Data_per_Park	List of certified fish data per park per year. Can be filtered on Year and Park.
qs_z015_Benthic_Data_Entered	Benthic data entered for each park, and the status of the data. Can be filtered on Year, Park, Transect Type, and Transect.
qs_z025_Benthic_Certified_Data_per_Park	List of certified benthic data per park per year. Can be filtered on Year and Park.
qs_z035_Benthic_ESA_species_detections	NPSA benthic coral species that are listed under ESA. Includes transect and image point information.
qs_z045_Benthic_uncertified_data	List of uncertified benthic data per park transect per year. Can be filtered on Year, Park, Transect Type, and Transect.
qs_z085_Settlement_Certified_Data_per_Park	List of certified settlement data per park per year. Can be filtered on Year and Park.

Under the Main Menu tab on the Application Startup Form, click on the “**Data Summary Tool**” button to open the Data Summary Tool.

The screenshot shows the 'Data Summary Tool' window. At the top, there's a header bar with the title 'Data Summary Tool'. Below it, on the left, are controls for query selection: 'Query type: Show all queries' (dropdown), 'Select the query:' (dropdown), and a 'Query returns filtered results?' status indicator with a question mark. To the right of these are icons for various functions. Below the status indicator are three buttons: 'Filters off', 'Clear Filters', and 'Requery'. The main content area is divided into three filter sections: 'Location filters' with dropdowns for 'Park', 'Transect type', and 'Transect'; 'Event filters' with a 'Year' dropdown, 'From date', and 'To date' fields; and 'Data filter' with dropdowns for 'Trophic', 'Benthic Type', and 'Species'. At the bottom left, there's a section for 'Include uncertified data?' with two radio buttons: 'No (use only certified data)' (selected) and 'Yes (results are provisional)'. The right side of the window is a large empty area for displaying results.

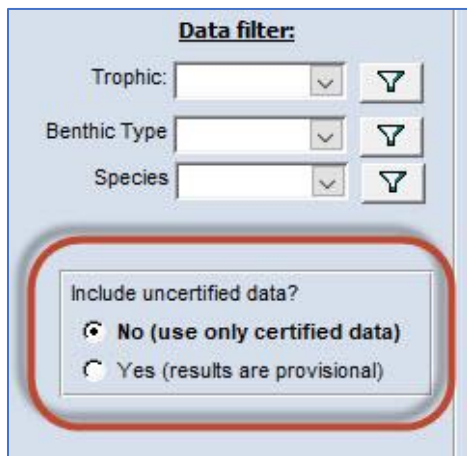
Data Summary Tool

The *Query Type* field in the top left hand corner contains a drop-down list of the available query types (see below). Choosing the query type will filter the list of available queries displayed in the *Select the query* field. Some query types may not have any corresponding queries. If this is the case, there will be no queries listed in the *Select the query* field.



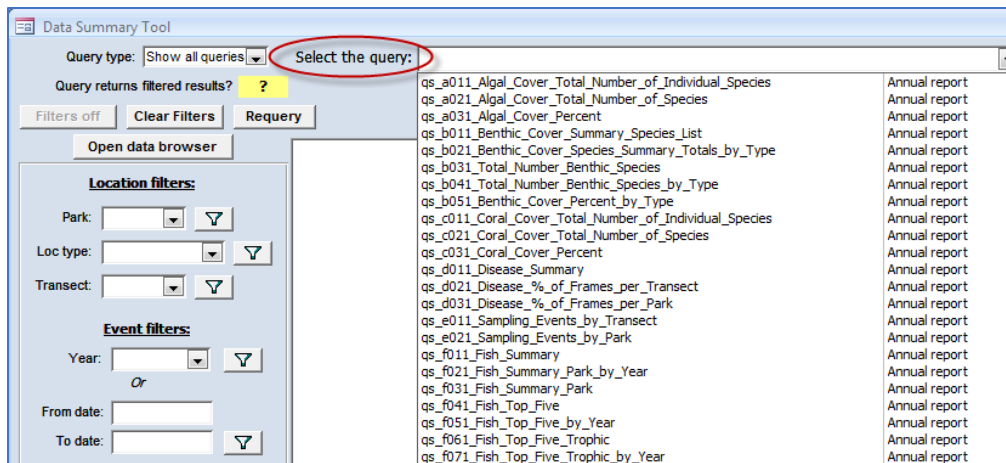
Query types drop-down list in the Data Summary Tool

At the bottom, left hand corner of the Data Summary Tool, under *Data filter*, there is an option available to include or not include uncertified data in the query results. The default option is set to “No (use only certified data)” —not to include uncertified data and to only display data that has been certified. If you wish to include provisional data (certified and uncertified data), select “Yes (results are provisional)” instead.



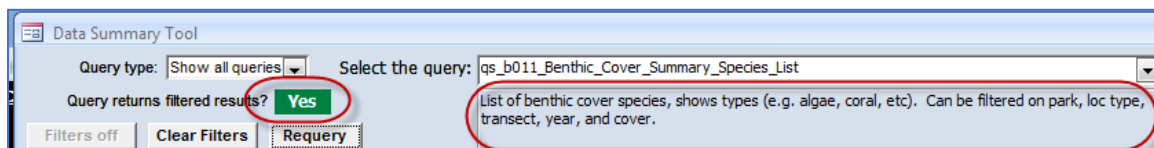
Displaying certified or uncertified data in the Data Summary Tool

To choose a query and view the results, choose from the list of available queries in the *Select the query* drop-down list.



Select a Query

Once a query is chosen, the description of the query will be displayed under the query name (see below). If the query returns filtered results, the box next to “Query returns filtered results?” will display “Yes”.



Query Description

Data Filters

Many queries have the functionality to be filtered. The available filters for the query chosen are listed in the query description. Filters for the Data Summary Tool are:

Location Filters

- Park
- Transect Type – Fixed or Temporary
- Transect

Event Filters

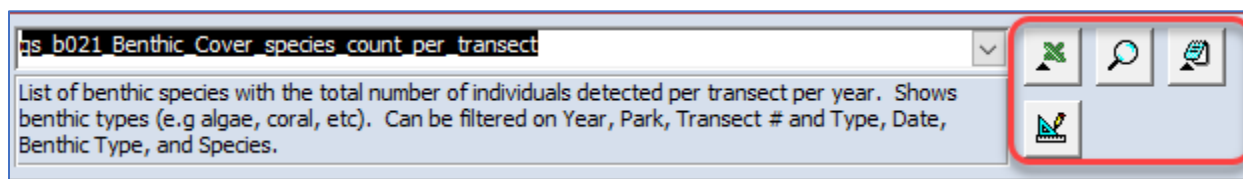
- Year – all data for the year chosen
- From date / To date – all data for the time frame chosen

Data Filters

- Trophic Level – Corallivore, Detrivore, Herbivore, Mobile Invertebrates, Piscivore, Sessile Invertebrates, Omnivore, Zooplanktivore, Herbivore/Sessile Invertebrate, Mobile/Sessile Invertebrate, Piscivore/Mobile Invertebrate, Sessile Invertebrate/Omnivore
- Benthic Type – Algae, Coral, Invert, Other, Substrate
- Species

Certified Data Filter

There are also options to view or export data located in the top-right corner of the Data Summary Tool.



Certified Data Filter Viewing Options

Clicking on an individual button will perform the following actions:



- Open the selected query in a new window



- Export the selected query to Excel



- Export the selected query to a text file



- View the selected query in design view

Turning Filters On

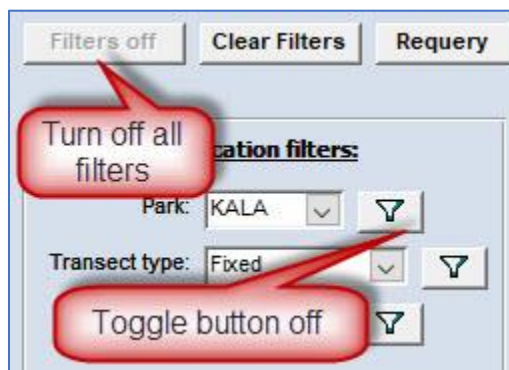
To use a filter, chose a value from the drop-down menu. For *Location filters*, the filters must be chosen in top-to-bottom order (i.e., *Park*, then *Transect type*, *Transect*, etc.) as one filter's drop-down list values are based on the filter value chosen above it.

Once a filtered value is chosen, it is automatically turned on. This is shown by the filter value being displayed in **blue**, the filter label font becoming **bold**, and the toggle button to the right of the filter being turned on, which is displayed as being sunken (see below). Results in the subform will be required and the filtered results displayed.

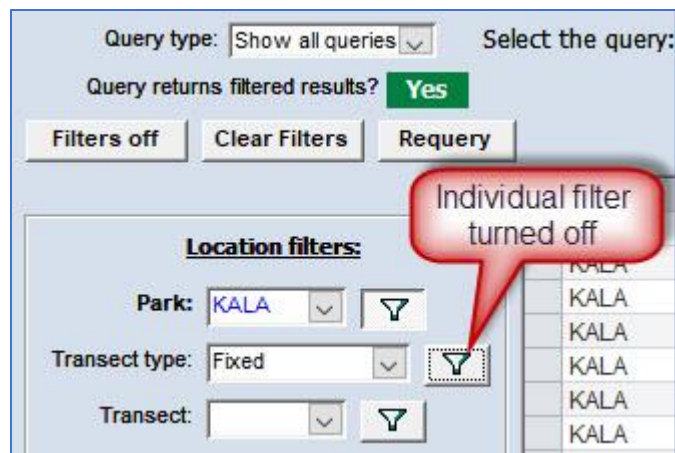


Turning Filters Off

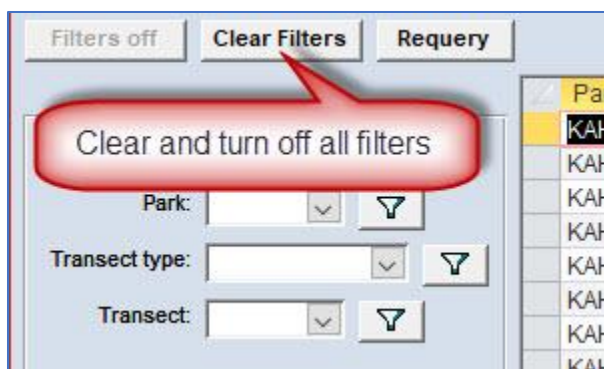
There are several options for turning filters off. To leave the chosen values in the filter boxes, but turn off the filters, click the “**Filters off**” button. The filters will be turned off, the filter values will be displayed in black, the filter labels will no longer be bold, and the toggle buttons will be turned off, which is displayed as being raised (see below).



To turn off individual filters, click on the toggle button to the right of the filter. The filter will be turned off, the filter value will be displayed in black, the filter label will no longer be bold, and the toggle button turned off (see below). To turn the filter back on, click the toggle button again.



To turn off all the filters and clear the filters of their values, click on the “**Clear filters**” button. All filters will be cleared and the query subform will be required to display all results.



Import CSV Files

CSV files containing benthic point data are imported into the database. These files are exported from the software package PhotoGrid® and include data for species identified in photos.

Under the Main Menu tab on the Application Startup Form, click the “**Import CSV Files**” button to open the CSV Import Information Form.

CSV Import Information Form

Enter the name of the person who identified the species in PhotoGrid® into the *Frame IDer* field. Then, click the “**Import CSV File**” button to open the Import CSV Data Form.

If bleaching data was collected, it is important that the *Was the bleaching data collected?* field is set to “**Yes**”. If bleaching data was not collected, set this field to “**No**”. Click the “**Browse**” button and navigate to the file to be imported. Then click on the “**Import File**” button.

Import CSV Data Form

If the file does not contain exactly 51 records for unbleached data and 52 records for bleached data, an error message will appear to fix the CSV file. This usually means that data was exported from

PhotoGrid® for an image frame twice. Go back and fix the CSV file before attempting to import the data again.

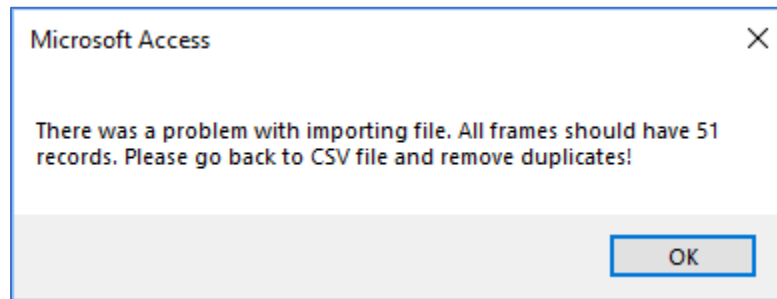
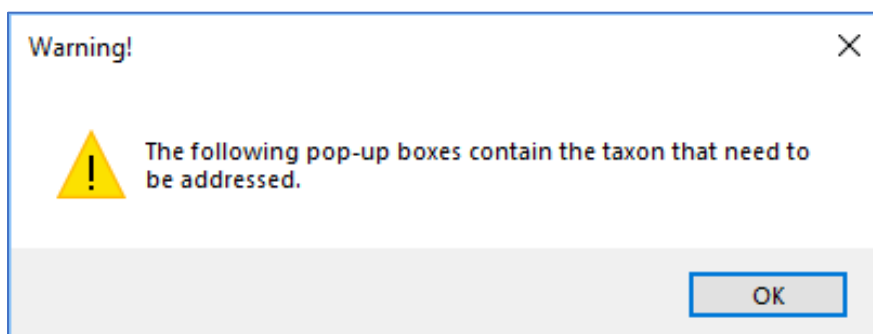
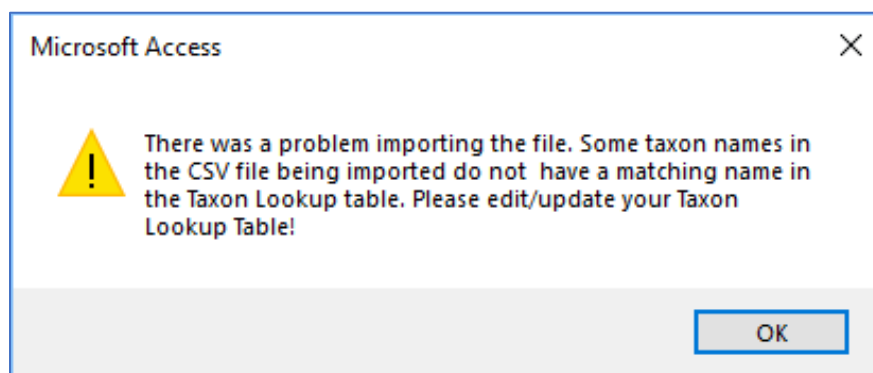
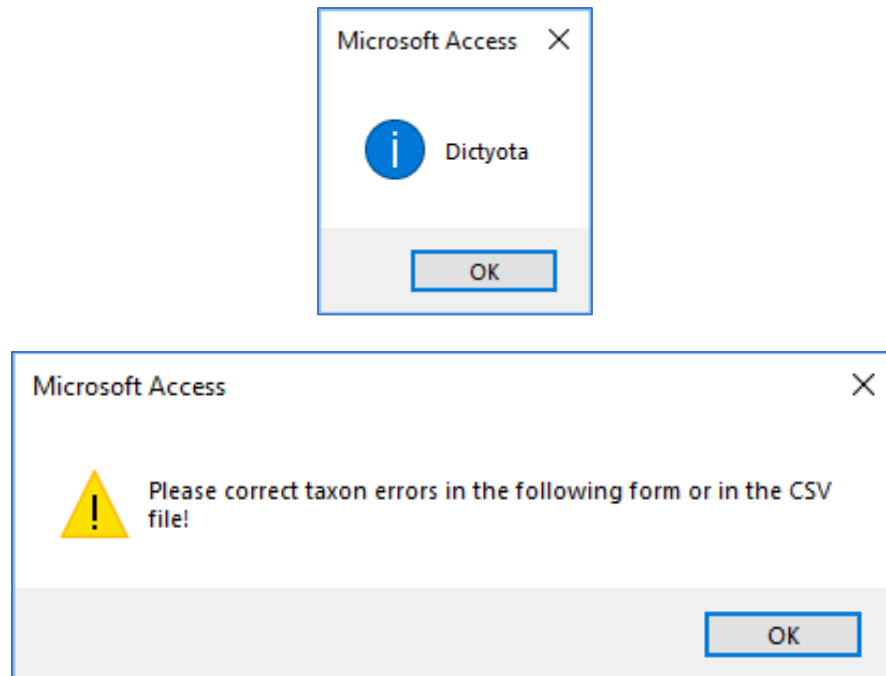


Image Frame Record Error

The import process will also check that all taxon in the CSV file to be imported exist in the database. If there are issues with any taxon in the CSV file, an error message will show with the taxon in the CSV import file that is not in the database.

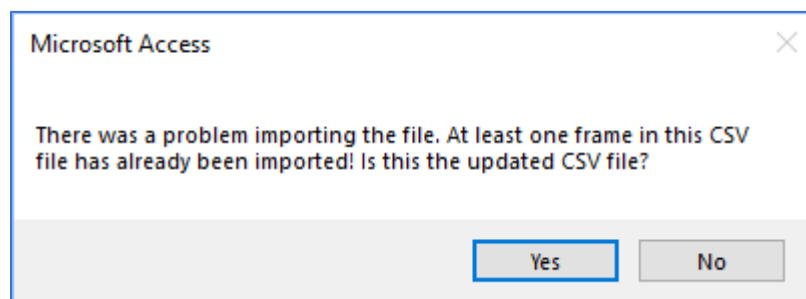




Taxon Name Error Message Boxes

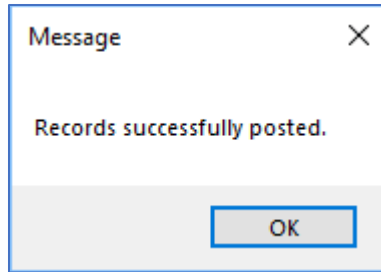
Go back and fix the CSV file with the correct taxon names before attempting to import the data again. The taxon names in the CSV file must exactly match the taxon names in the database. Misspelled taxon will be considered an error by the database. If there are newly detected taxon during benthic monitoring, contact the Data Manager for inclusion in the database. Once the CSV has been updated, import the CSV file using the same steps as before.

If the CSV file is updated after the data has been imported into the database, the updated CSV file can be re-imported into the database. Upon import, the database checks if the data has previously been imported. To confirm re-import, and a replacement of the existing data for the transect in the database, click “**Yes**” to the message box asking if the file to be imported is the updated CSV file.



Import Updated CSV Files

A message will appear when the data has been successfully updated.



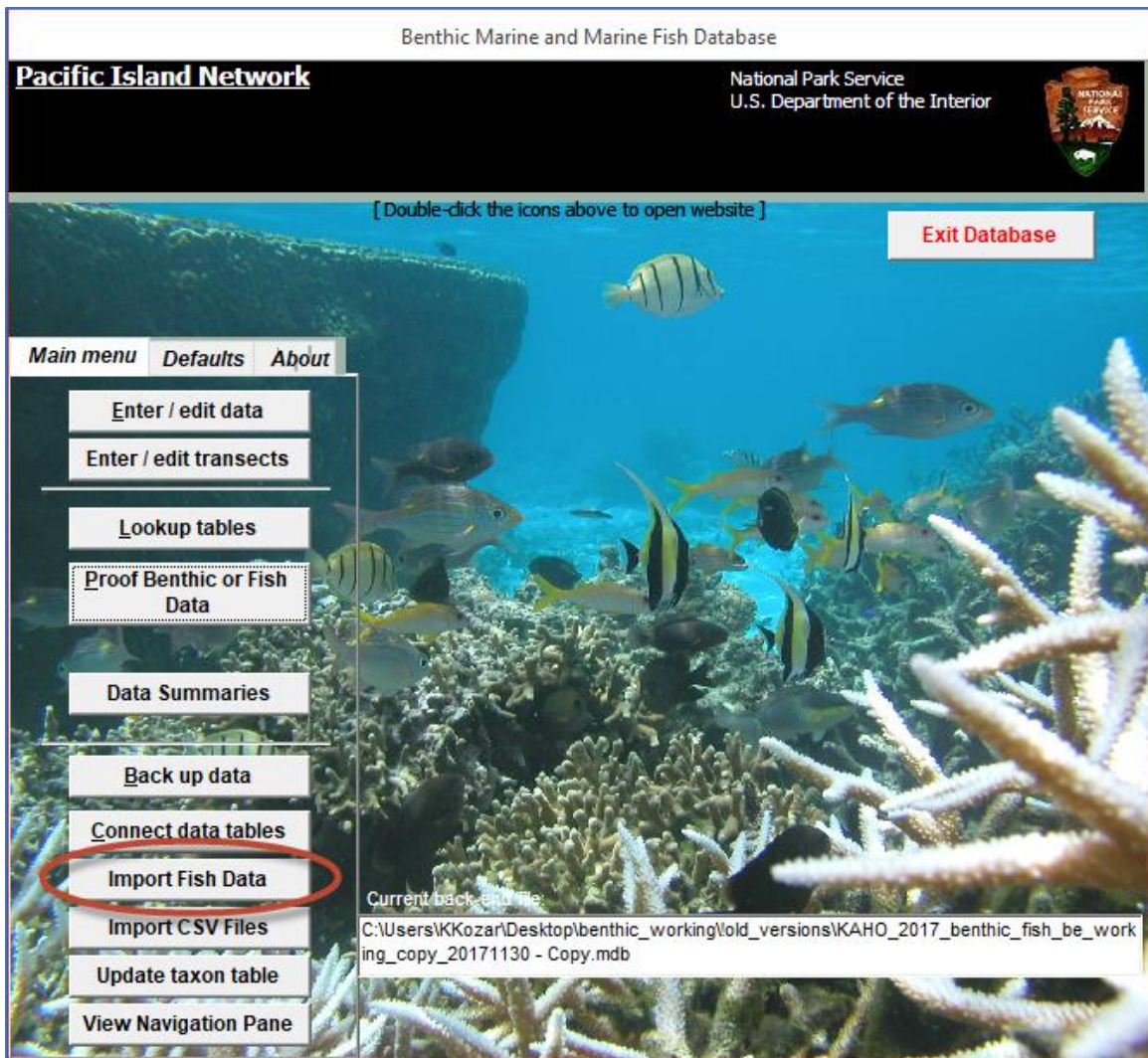
Import Success Message

Import Fish Data

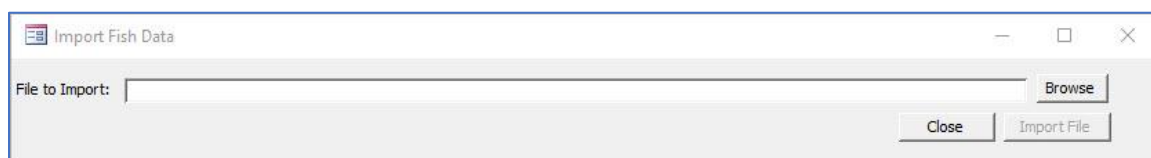
Fish data is imported from an Excel spreadsheet. In order for the import process to work, the header rows in the Excel spreadsheet **must be exactly** the headings shown below. *Year* is the sampling year, *Date* is the sampling event date, *Island* is the island name, *Location* is the four letter park code, *Station Type* is either Temporary or Fixed, *Transect#* is the transect number, and *Species* is the four letter species code. *Depth (m)*, *Number*, *Min (cm)*, *Max (cm)*, *AvgLgth* and *Area* are number fields.

Year	Date	Island	Location	Depth (m)	Obsr	Station Type	Transect#	Species	Number	Min (cm)	Max (cm)	AvgLgth	Area
------	------	--------	----------	-----------	------	--------------	-----------	---------	--------	----------	----------	---------	------

To import fish data, click the “**Import Fish Data**” button under the Main Menu tab.



The dialog box below will open. Click “**Browse**” to select the file to import. Once you have selected the file, click “**Import File**”



The import function will look for any existing sampling events for the locations of the fish data being imported. If the sampling event already exists, data will be imported and linked to that sampling event. If no sampling event exists, a sampling event will be created, and the data will be linked to the new sampling event.

The import function will also perform a check to ensure that the transects and species codes being imported already exist in the database. If they do not, a message will tell you which transects and

species codes are not in the database, and the import function will end before importing any fish data. Make the changes to the database or spreadsheet and retry the import process.

If fish data was imported successfully, a message box will notify you. To modify or check fish data, click on the sampling event (see *Visit Date* below) for the transect from the Data Gateway Form.

Update Taxon Table

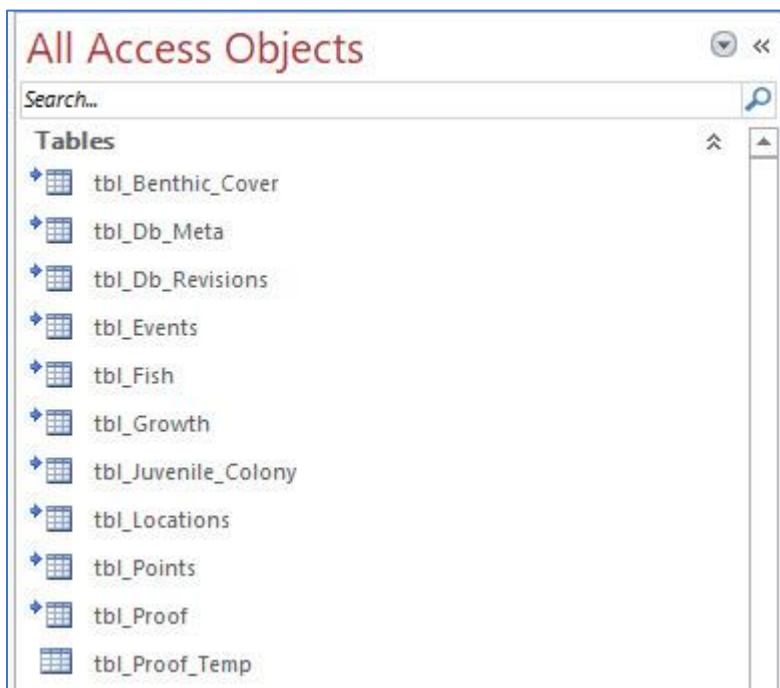
The taxonomy table that some fields draw upon will occasionally need to be updated. Under the Main Menu tab on the Application Startup Form, click the “**Update taxon table**” button to open the Add/Edit Taxon Form, where users can easily make updates to the table.

Add/Edit Taxon								
Aphia ID:	Type*:	Family*:	Species Code:	Genus*:	Species:	TaxonName*:	Synonym:	Hawaiian Name:
▶ 196099	Coral	Faviidae	FAVD			Favids		
	Coralline Alk		CALG			Coralline algae		
	Other		N/C			Non-Coral		
1839	Invert		ASCI			Ascidian		
	Substrate		SUBS			Substrate		

Add/Edit Taxon Form

View Navigation Pane

Under the Main Menu tab on the Application Startup Form, click the “**View Navigation Pane**” button to display the Microsoft Access® database window.

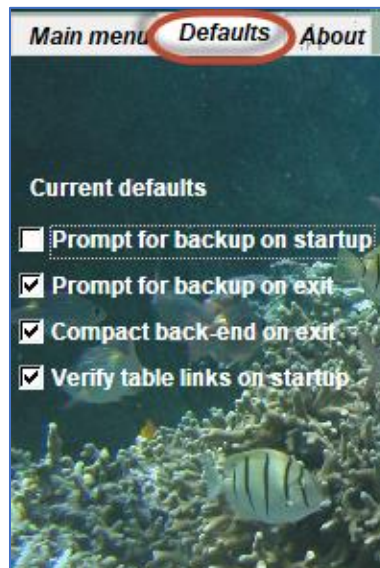


Microsoft Access® Navigation Pane

The Navigation Panel lists all of the tables, queries, forms, reports, pages, macros, and modules in the application. It is recommended that you exercise caution when working with objects directly in the database window. You can hide the Navigation Pane once you have opened it by clicking on the << arrows in the top left-hand corner of the window.

Defaults

The Defaults tab on the Application Startup Form provides feedback on the current default values, and check boxes for automatic backups on startup, backups on exit, data file compaction on backup, and link verification on startup. From the Application Startup Form, click on the Defaults tab to open the Current Defaults menu.

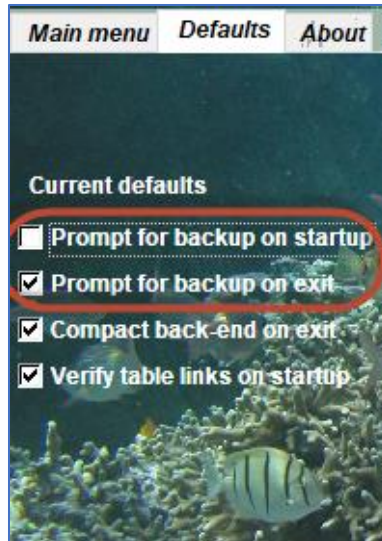


Defaults tab on the Application Startup Form

Automatic Backups

The application can be set to automatically prompt for backups every time it is started and/or every time it is closed using the “**Exit Database**” button on the Application Startup Form. Making backups before and after data entry sessions is a good habit to get into in the case of database corruption or data entry mistakes.

To prompt for backups at application startup or exit (or to turn prompts off), go to the Defaults tab on the Application Startup Form and select the desired backup prompt settings located under the Current Defaults section.

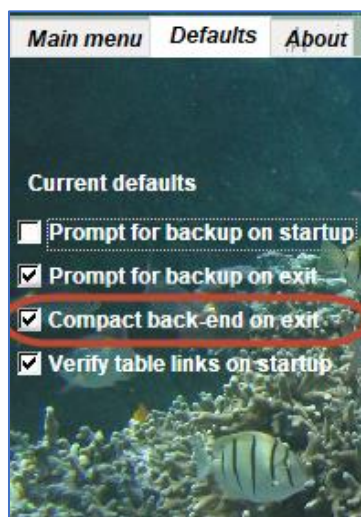


Backup Default

Backups can also be run manually by clicking the “**Back up data**” button under the Main Menu tab on the Application Startup Form.

Compact Back-End on Exit

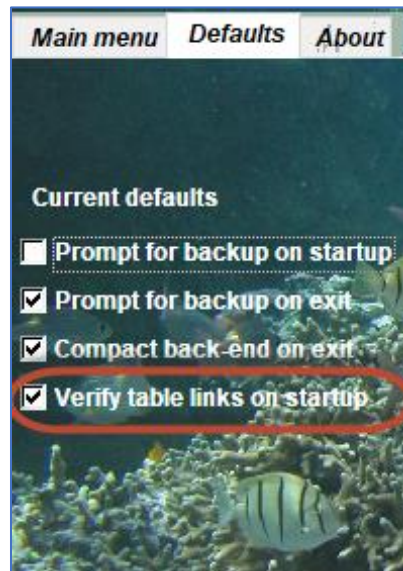
Compaction is a process whereby Microsoft Access® optimizes the organization of the file, making it smaller and quicker to access data. If you check the option to “Compact back-end on exit” (recommended), the application will compact the data file that is linked to the front-end when the application is closed using the “**Exit Database**” button on the Application Startup Form.



Compact Default

Verify Table Links on Startup

The application is structured with a front-end (user interface) and a back-end (data tables). In order for the application to work properly, the front-end must be linked to the tables in the back-end. If this check box is checked (recommended), the link to the back-end file(s) will be checked when the application is started.



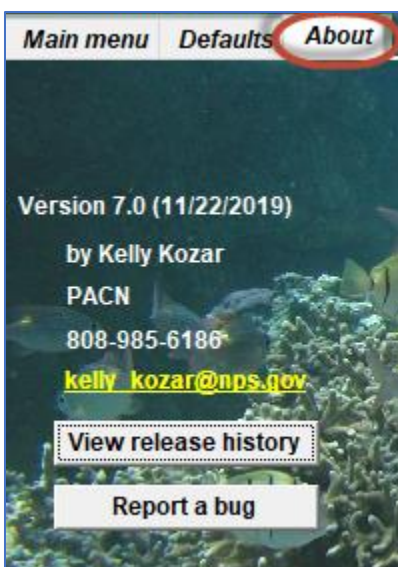
Verify Table Links Default

About

The About tab on the Application Startup Form presents information about the application, including:

- Version number
- Application author
- Author organization
- Author phone
- Author email (click to email)

Buttons for viewing release history and reporting bugs are also provided on the About tab.



About tab on the Application Startup Form

Release History

Under the About tab on the Application Startup Form, click the “**View release history**” button to open the Application Releases Form. This form provides information about all of the different versions of the application that have been released. It is filled in by the application developer before the application is distributed and is therefore read-only.

Included in the Application Releases Form are Database title, Version number, and release information about the application, information about the author of the application, and bug information.

Application Releases

Database title: Benthic Marine and Marine Fish Database

Version number: 6.00 Release date: 12/1/2010

File name: Benthic_fe_v6.mdb Release by: Kelly Kozar

Author phone: (808)985-6186 Author email: kelly_kozar@nps.gov

Author org code: PACN Author org. name: Pacific Island Network

Release notes: Added data summary tool and queries.

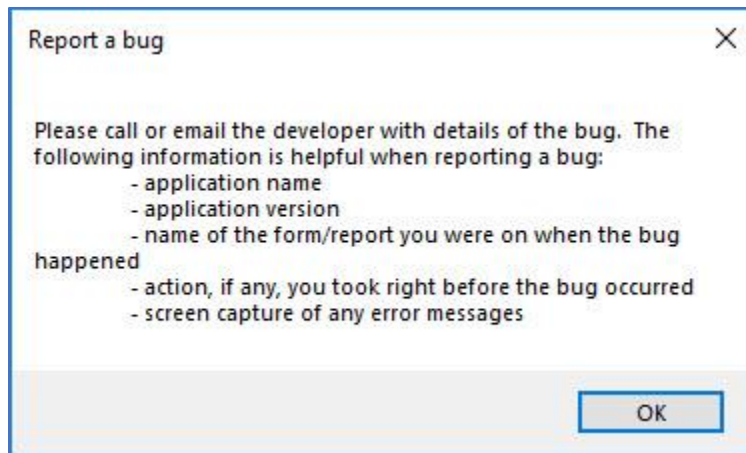
Known bugs:

Record: 1 of 6 No Filter Search

Application Releases Form

Report a Bug

Under the About tab on the Application Startup Form, clicking the “**Report a bug**” button will prompt the user to contact the application developer with the details of the bug.



Developer contact information is located above the “**Report a bug**” button.

The following information is useful when reporting a bug:

- Application name
- Application version
- Name of the form/report you were on when the bug happened
- Action, if any, you took right before the bug occurred
- Screen capture of any error messages