

Standard Operating Procedure #23

Data Entry and Verification

Version 1.0 (November 7, 2018)

Change History

New Version #	Revision Date	Author	Changes Made	Reasons for Change	Previous Version #

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

Purpose

This SOP describes the general procedures for entry and verification of field data in the working project database for the Pacific Island Network Anchialine Pool Monitoring Protocol. Refer to protocol sections Overview of Database Design and Data Entry and Processing for related guidance and a clarification of the distinction between the working database and the master database. Water quality data will be entered in the PACN Water Quality Database. The remaining data will be entered into the Anchialine Pools Database. Both databases are functionally similar and have specific user guides to aid in proper data entry.

Data Entry

The following are general guidelines to keep in mind:

1. Data entry will be conducted by the PACN Field Lead or other qualified field technician at their duty station.
2. Data entry should occur as soon after data collection as possible so that the PACN Field Lead keeps current with data entry tasks and catch any errors or problems as close to the time of data collection as possible.
3. The working database application will be found in the project workspace, which for this protocol is in the I:\vital_signs\06a_fw_animals_anchialine_pools\Data\Database folder.

4. The project workspace should be replicated on the user's workstation hard drive as the connection to the networked server is too slow for efficient data entry (see SOP # 21 Workspace Setup and Project Records Management). Entering data on the user's workstation instead of the networked drive will for enhanced performance.
5. Users should copy the front-end and back-end databases onto their workstation hard drives to the replicated project workspace on their workstations (e.g., C:\Users\KKozar\Desktop\Anchialine_Pools\Data\Database).
6. Once in the correct folder on the user's workstation, user's should open the front-end database and link the back-end database.
 - a. The front-end database, used for data entry and edits, may be considered "disposable" because it does not contain any data, but rather acts as an interface with data residing in the back-end working database.
 - b. The back-end database contains the data and data tables and should be backed up daily.
7. Each data entry form is patterned after the layout of the field form and has built-in quality assurance components such as pick lists and validation rules to test for missing data or illogical combinations.
8. As data are being entered, the person entering the data should visually review each data form to make sure that the data on screen match the field forms. This should be done for each record prior to moving to the next form for data entry.
9. After each data entry session, the PACN Field Lead or other technician should upload the working copy of the database onto the networked server.
 - a. Place a copy of the back-end database in the I:\vital_signs\06a_fw_animals_anchialine_pools\Data\Database\backups folder, updating the date stamp at the end of the file name to the current day's date (e.g., Anch_pools_be_20181107.mdb) before uploading.
10. Update the database log that is in the I:\vital_signs\06a_fw_animals_anchialine_pools\Data\Database folder. Include the date and name of the technician entering data. Use the database log to keep notes on data entry, including suggestions for updates, errors encountered, and who entered or proofread the data.

Data Verification

Data verification checks that the digitized data match the source data. The following guidelines regarding data verification should be followed:

1. The Aquatic Ecologist is responsible for specifying in the project protocol one or more of the data verification methods available and ensuring proper execution. At the discretion of the Aquatic Ecologist, additional verification methods may be applied.
2. Data verification is carried out by staff thoroughly familiar with data collection and entry.
3. All records (100%) should be verified against original source data using the method below.
 - a. Visual review after data entry: Upon completion of data entry, all records are compared with the original values from the hard copy. Errors are clearly marked and corrected in the database as soon after data entry as possible. Reliability increases if someone other than the person keying the data performs the review. Alternatively, two technicians (one reading from the original data and one checking the entered data) can perform this review. Questionable data should be flagged in the database.
4. A subset of randomly selected records (at least 10%) should be reviewed after initial verification by the Aquatic Ecologist. If accuracy is not at least 90%, the entire data set should be verified again.
5. A record of the verification process for each data set, including number of iterations and results, will be prepared by the PACN Data Manager as part of formal metadata generation.
6. Spatial data collected as part of the project will be viewed in a GIS and visually inspected for accuracy (e.g., points located outside park boundaries, upland locations occurring in water).

Database Instructions

The first action to be taken is to make sure the data entry workspace is set up properly either on a networked drive or the user's computer if networked server connections are too slow for efficient data entry. If you are unclear about where the data entry workspace should be contact the PACN Data Manager (see SOP #21 Workspace Setup and Project Records Management for more information).

1. Store the back-end database file in the database folder in the project workspace. The back-end file has “_be_” as part of its name.
2. The user's copy of the front-end database should also be stored in the same folder.
3. If it doesn't already exist, also create a folder in the same folder named “backups” for storing daily backups of the back-end database file.

4. Open the front-end database. The first thing it will do is to ask to update the links to the back-end database file. This will only need to be done once for each new issue of the front-end database.

Important Reminders for Daily Database Use

1. A copy of the front-end will need to be copied to your workstation if the project workspace is set up on the networked server. Do not open up and use the front-end on the network as this ‘bloats’ the database file and makes it run more slowly.
2. The front-end application will automatically prompt you to make a backup upon initially opening the application.
3. To save drive space and network resources, backup files should be compacted by right-clicking on the backup file in Windows Explorer and selecting the option: “Add to Zip file”. Older files may be deleted at the discretion of the PACN Field Lead.
4. New issues of the front-end application may be released as needed through the course of the field season. If this happens, there should be no need to move or alter the back-end file. Instead, the front-end file may be deleted and replaced with the new version, which will be named in a manner reflecting the update (e.g., Anch_pools_2015_v2.mdb).

Working Database Functions

The working front-end application has the following functional components, which are accessed from the main application switchboard form that opens automatically when the application starts:

Data Entry and Review

1. Data entry/edit: After clicking on the Enter/Edit button on the main switchboard, the data gateway form will open. From here, data for a particular sampling date and location can be reviewed and edited if necessary. By choosing the option “Add a New Record” the data entry form will open and new data may be entered.
2. Locations - opens a form to enter and edit pool location information.
3. Quality Review Tool – opens a form that shows the results of pre-built queries that check for data integrity, missing data, and illogical values, and allows the user to fix these problems and document the fixes. See SOP #24 Data Quality Review and Certification.
4. Data Summary Tool – opens a form that shows a list of summary queries for data analysis.

Other Functions

1. Enter/edit observers – allows the user to add or edit observers for the anchialine pool monitoring.
2. Search pool images – all users to browse through anchialine pool images.
3. Import/export data – allows users to import Hydrolab data or export data to Excel.

4. Reports – allows users to generate prebuilt reports.
5. Edit taxon table – allows users to add or edit the taxon in the database.
6. Add References – allows users to add or edit references in the database.
7. View navigation pane – allows the user to view the database objects (tables, queries and forms).
8. Manage lookups – opens a tool for managing the lookup values for the project data set (e.g., species list, list of project personnel, etc.).
9. Back up data – creates a date-stamped copy of the back-end database file.
10. Connect back-end database – Verifies the connection to the back-end working database file and provides the option to redirect or update that connection.
11. Set system defaults – username, declination, current park, coordinate datum.
12. View release history – opens a form describing known bugs and changes made to the front-end database since its first release.

General Use Instructions

To view detailed instructions for entering and editing data, see the Anchialine Pool Monitoring Database User Guide, available from the PACN Data Manager or in the PACN Digital Library (see SOP #21 Workspace Setup and Project Records Management for more information).