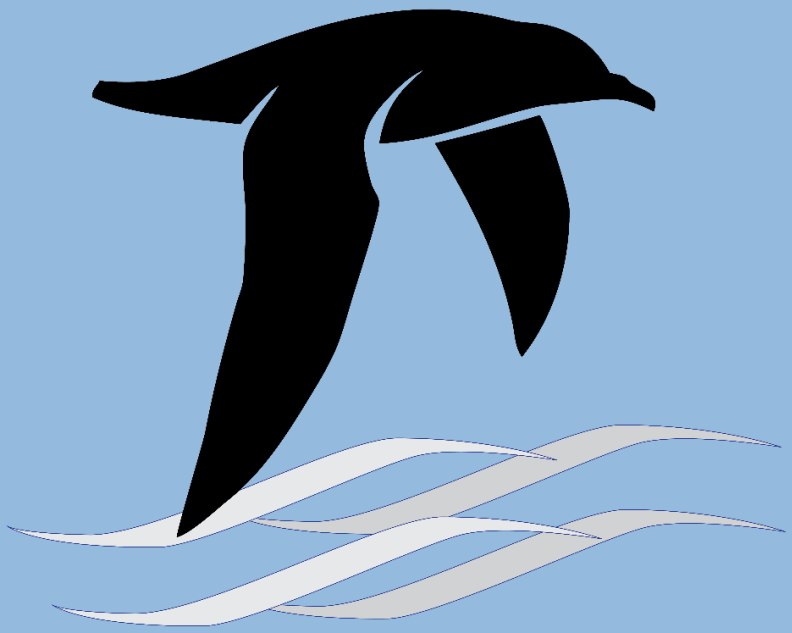
SeaScribe



USER MANUAL

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1 Purpose

The seabird survey application for Android and iOS devices, hereafter referred to as SeaScribe, was developed to fill a need for a modern data collection application for seabird survey efforts. The challenge was to create an intuitive, flexible application that would be cross-platform for Android and iOS environments and usable on both phones and tablets. This application is freely available and is gaining wide acceptance and use. It is specifically designed to greatly increase data standardization and allow more thorough data recording, as well as increase the speed of post-survey processing while reducing data errors. We also expect that this program will make digital marine surveys collected by citizen-scientists more accessible.

2 System requirements

SeaScribe runs on smartphones or tablets running Android version 6 and up (Android version 7 recommended) and iOS version 10 and up. While future OS versions may be compatible with SeaScribe, we make no guarantee that it will do so.

There is no minimum size allowed for use, however, we suggest use of a screen size no smaller than 7". The application was optimized for a 10" screen and we recommend this sized tablet for optimal usability of the application.

Devices must have a built-in GPS or be able to obtain location services through an attached GPS via Bluetooth or some other method. Location services must be enabled for the position information to be recorded in the survey app. A testing tool is provided in SeaScribe to test whether the GPS is operational. More information about this tool is provided later (see 6.2).

The device must be able to communicate via Wi-Fi or other data connection to the internet and must have a valid email account and/or Dropbox account to be able to export data. It is best if these accounts are set up prior to using SeaScribe.

We have done only limited testing of wireless keyboards and pointing devices (e.g., mice, trackballs) but they should be able to be used with SeaScribe as long as they work with the device itself. Use of wireless keyboards and pointing devices may assist with data entry.

3 Installing SeaScribe

3.1 Android

Installing the app to an Android device is very easy. You can visit the Google Play store and search for SeaScribe. Tap “INSTALL” to install the app. You may need to provide a password. Accept the special permissions to continue to install. The application will be downloaded and installed.

Alternatively, download the installer file (SeaScribe.apk) from http://www.briloon.org/seascribe or otherwise obtain a copy of the installer. Browse to the file on your device and click on the installer file. You must agree to allow the app to use certain functions such as the microphone and location services, etc. You must also change security settings to allow installation of third party applications. You must have installation rights on your device as well, which may be controlled by your organization. Seek IT support if you cannot install this app successfully

3.2 Apple

To install the Apple iOS version on an iPhone or iPad, open the App Store on your device and search for SeaScribe. Click “install” to install the application. The application will be downloaded and installed. You may be asked to provide a password for your account. Once successfully installed, you can click open or tap on the application on the device window.

4 Removing SeaScribe

4.1 Android

Go to the device's settings, select Apps or Application Manager, touch the app you want to uninstall and touch uninstall. You may also be able to drag the app to the trash in the application folder. Deleting the app will also remove all of the data. Make sure you have removed whatever data you would like to keep prior to uninstalling.

4.2 Apple

Long-press the icon for the app and click the "X" on the upper corner of the app. Agree to deletion of the app and all of its data. You can also remove an app by going to Settings – General – Storage & iCloud Usage – Storage – Manage Storage – SeaScribe – Delete App. Agree to deletion of the app and all of its contents. Deleting the app will also remove all of the data. Make sure you have removed whatever data you would like to keep prior to uninstalling.

5 Standard Survey Methods

There are two major survey methods in use today: the line transect method (distance sampling) and strip transect method. Some also use a hybrid method, but in our opinion there is no real benefit to such a method as it makes analysis more complicated with limited benefits. We generally advocate use of the **line transect method** (distance sampling) as estimates of true abundance are of greatest accuracy because they account for differences in detectability and can include effects of observer bias and other environmental effects (e.g., sea state or light conditions) on abundance estimates (Buckland et al., 2001; Ronconi and Burger, 2009).

Buckland, S.T., Anderson, D.R., Burnham, K.P., Laake, J.L., Borchers, D.L., Thomas, L., 2001. Introduction to distance sampling: estimating abundance of biological populations, New York New York USA. doi:10.1007/s00531-004-0408-5

Ronconi, R., Burger, A., 2009. Estimating seabird densities from vessel transects: distance sampling and implications for strip transects. Aquat. Biol. 4, 297–309. doi:10.3354/ab00112

5.1 Line transect method (distance sampling)

Conduct surveys looking forward from one side of the vessel (plane or ship) in a bow-to-beam arc extending to 90° on one side (0-90° or 270-360° depending on what side you are on). Observations should be made on the side of the vessel that provides the best visibility (e.g., the least glare), changing sides throughout the survey as necessary to maintain good viewing conditions, but recording the change of sides in SeaScribe. Scan continuously using the naked eye or binoculars to identify birds, marine mammals, sea turtles, and other fauna or objects in the distance. Regularly scan horizontally ahead for diving birds, or for sitting birds that may flush off of the water. Scan vertically for flying birds. Record distance to the object or group in meters and angle to the object in degrees from the front (bow 0°) of the vessel, 90° being the starboard (or right) side and 270° being the port (or left) side relative to the bow (front) of the vessel. Record the number observed in the group (being 1 or more objects). The distance and angle must be recorded for the center of the group when it is first sighted. When densities are high and the observer struggles to keep up with entry, record as many distances and angles as possible without missing objects to record. Modeling methods can correct detections without distance measurements, but DO NOT change monitoring protocols under these conditions (e.g., switch from a line transect to a strip transect to reduce the number of objects for observers to count). At the beginning of the survey, and every 15-30 minutes throughout the observation period, record Beaufort sea state, visibility code, and the side the observer is viewing from. SeaScribe will prompt you for this information at a user-defined time (15 minutes default). Update this information whenever the observer changes or conditions visibly change.

The most difficult aspect of this method is the estimation of distance. Observers should practice estimating distance for objects of different sizes at different known distances prior to starting surveys. There are methods that can be used as well to assist with distance estimation such as creating a distance ruler, for which a tool is provided in SeaScribe (see 6.9.2).

5.2 Strip transect method

Conduct the strip transect method from one side of the vessel or the other, whichever has the best visibility (e.g., the least glare), changing sides throughout the survey as necessary to maintain good viewing conditions. In the strip method, all objects are counted within an area 300 m from the centerline of the vessel (300 m distance and 90˚ arc). Primarily the observer should watch the forward 90 degree quadrant, but occasionally look behind to determine if birds are following the vessel. Use a reliable estimate of the strip boundary from the observation position such that the observer can quickly determine if an object is within the strip or not. Scan continuously using the naked eye or binoculars to identify birds, marine mammals, sea turtles, and other fauna or objects in the distance. Regularly scan horizontally ahead for diving birds, or for sitting birds that may flush off of the water. Scan vertically for flying birds. At the beginning of the survey, and every 15-30 minutes throughout the observation period, record Beaufort sea state, visibility code, and the side the observer is viewing from. SeaScribe will prompt you for this information at a user-defined time (15 minutes default). In addition, update this information whenever the observer changes or conditions visibly change. If you record any incidental observations outside of the 300 m strip, such as for rare animals or marine mammals, make sure to record the distance (>300 m) or that these are out-zone (outside 300 m zone) birds somehow so they can be removed from analysis of relative density.

6 Using SeaScribe

SeaScribe was designed to be as intuitive as possible considering the complexity of the task. The main entry to the application is the main menu when you first bring up the app. Start here to access all areas of the application.

6.1 Main menu

When you start SeaScribe you will see a main window with four menu buttons (Figure 1):

1. "Start New Survey" – the entry point for starting a new survey.
2. "Existing Surveys" – access existing survey data.
3. "Settings" – application settings.
4. "Tools" – ancillary tools available to assist with surveying.

Click one of the blue buttons to advance to the next screen. Each will be explained below.

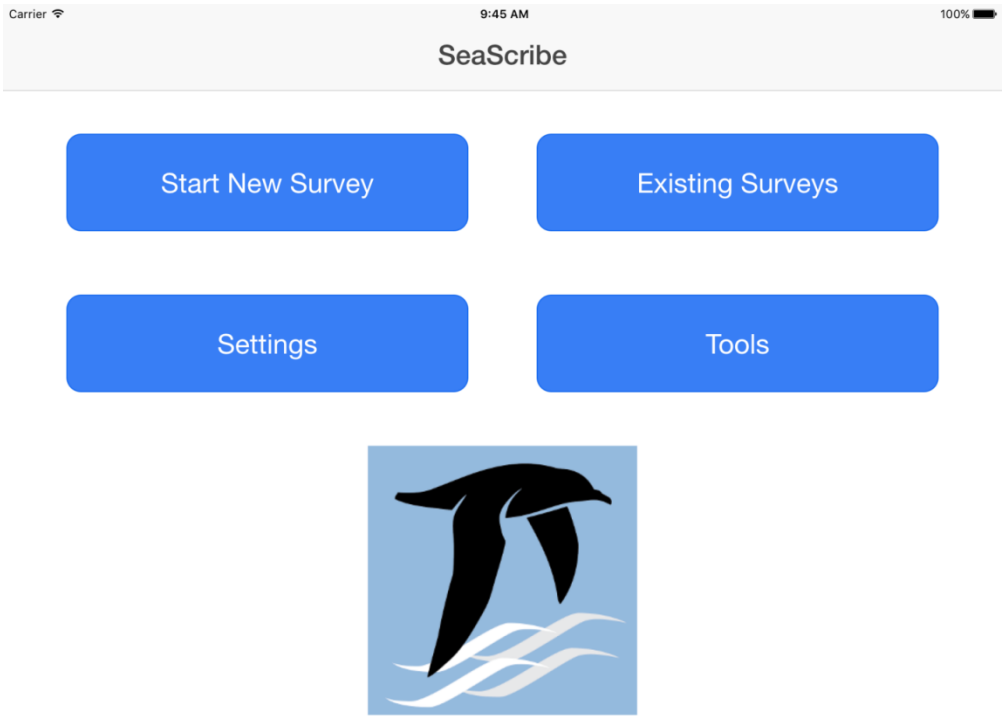


Figure 1. Main menu.

6.2 Start New Survey

This is the primary screen for beginning a new survey, where a survey is considered a collection of one or more transects – a transect being an un-interrupted period of observation during a survey. It is up to the user to determine how they want to define a survey rather than a new transect period under an existing survey. This screen asks the user to provide information about the survey itself, including the survey name, methodology, observers taking part and their experience, survey platform, survey region and sub-region, species list, and ancillary fields (Figure 2).

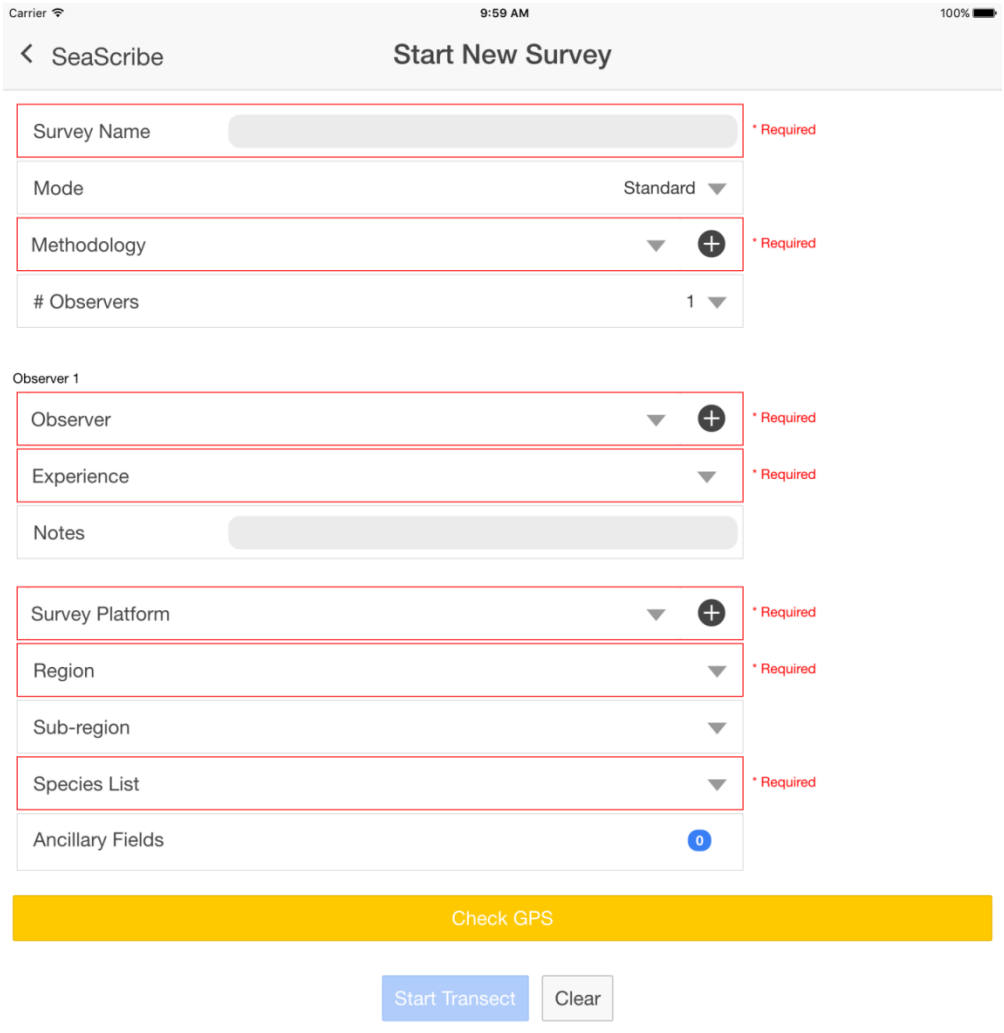


Figure 2. Start new survey screen

Filling out the form:

Note that for all fields, a red outline here indicates a problem with data entry, in most cases a field that is required but not yet filled in.

1. Enter the survey name (required) – this can be any alphanumeric entry up to 100 characters in length.

2. Enter the mode – either “standard” or “audio only”. This provides a fork for the application for data entry later on, either as full data entry capabilities and including audio and photos or “Audio Observations Only” which provides a data entry window with audio recording buttons only to simplify this type of data entry. Standard is default.
3. Methodology – select the stored methodology or click “+” to add a new methodology (Figure 3). This allows the user to define the survey methodology and stores it for later selection. Once this is entered, you can simply select it in the drop down, speeding up data entry in the future.
    a. Enter a methodology name in alphanumeric format up to 100 characters (required). This is a name you will select later if using this methodology again when setting up a new survey.
    b. Select the survey type (required): fixed width (strip), line transect (distance sampling), or combined.
    c. Select the counting methodology: continuous, snapshot, or vector (required).
    d. Select if one or both sides of the vessel are being used to count (required) – this is important as it helps determine the primary viewing area of the observer.
    e. Ancillary fields – here you can add or modify any additional fields to the observation form. Use this subform to add ancillary fields, remove or create and add new ancillary fields to the observation form. Ancillary fields are beyond the core set of default fields and are meant to allow observers to record additional information for specific research needs (see 6.3). These fields added here with a methodology are always added when this methodology is selected, saving time in the future once set up.
    f. Click “Save” to accept the “New Methodology” and return to the “Start New Survey” form. Click “Clear” to start over. Click the “< Start New Survey” at top left to return to the “Start New Survey” form.

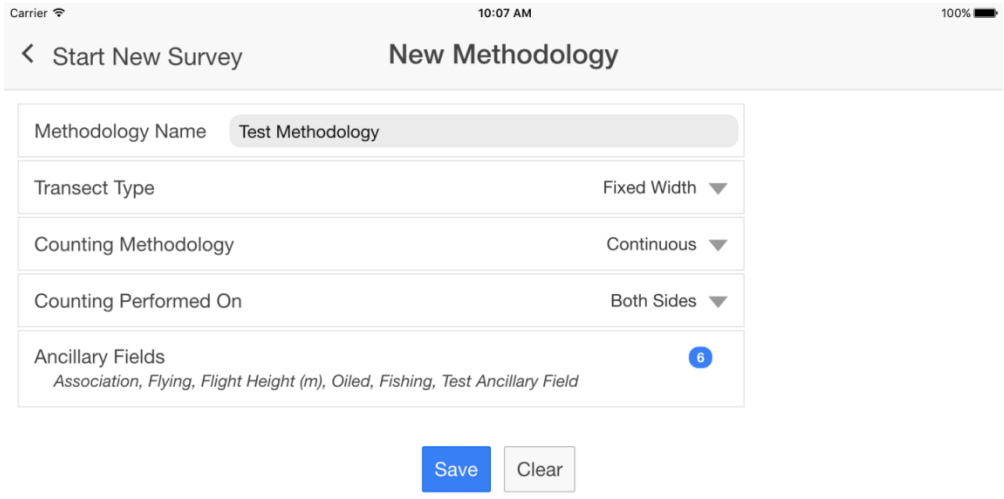


Figure 3. New methodology subform.

4. Enter the number of observers and add observer(s) contact information. This will automatically create the number of observer fields (observer 1, observer 2, etc.). If you have not already done so, you must populate this list of observers by going to the “New Observer” subform (Figure 4).

Once you add the observer, you can select them from the dropdown box and then enter their experience level and any notes about their experience such as years of experience, whether they have good knowledge of marine mammals, turtles, or other taxa, etc. Continue to do this for each observer that is observing during the survey. You will be able to select each observer in the observations form later on and have the opportunity to add observers then as well if they are not entered here.

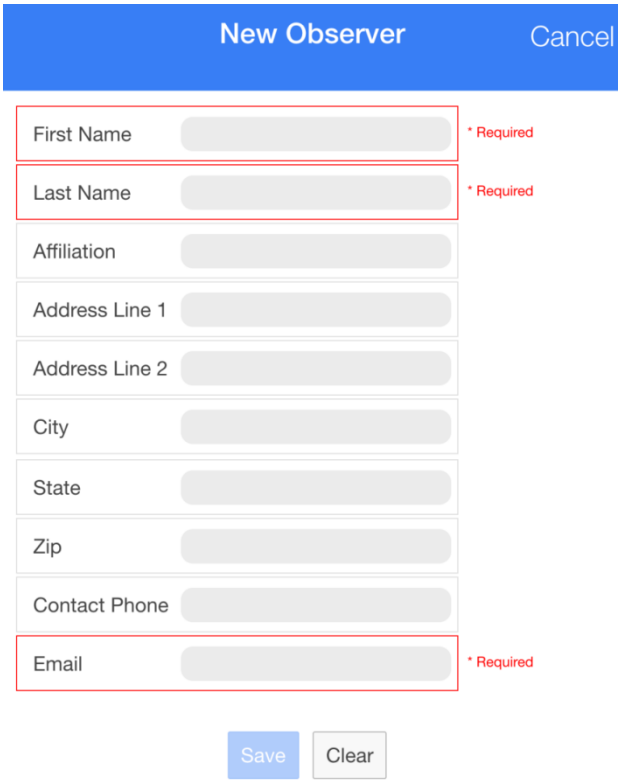


Figure 4. New observer subform.

5. Select the survey platform or add a new survey platform if necessary. Click the "+" to go to the "New Survey Platform" subform (Figure 5). Entering the platform name and type (watercraft, aircraft, or point location). Click "Save" to accept or "Clear" to clear the form to start over. "Cancel" (top right) exits without saving.

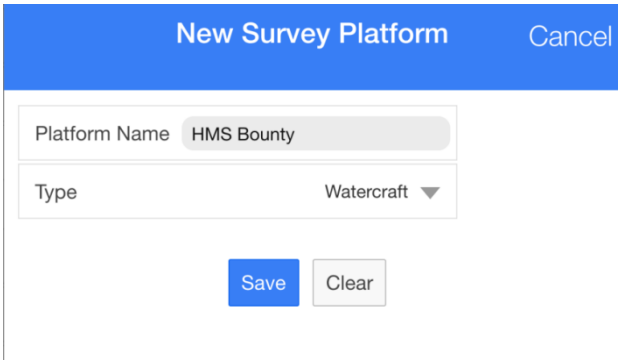


Figure 5. New survey platform subform.

6. Select the Region from the list: North Atlantic Ocean, North Pacific Ocean, or Arctic Ocean (required).
7. Select the sub-region if desired.
8. Select the species list that will be used to populate and validate the species selected in the observation form. Currently, SeaScribe provides lists that support the Northwest Atlantic Seabird Catalog database (formerly the Northwest Atlantic Seabird Compendium[1]) and the North Pacific Pelagic Database[2]. The species lists have different codes for different species, species groups, and objects so it is important to select the correct species list to support the geographic area you are observing in.
9. The ancillary fields added in the methodology will be displayed, check for accuracy. If you want to modify the ancillary fields, you can do so by clicking here, but any changes to the ancillary fields will create a new methodology.
10. Click the Check GPS bar to test the GPS for operation. If the GPS is able to return a location, the bar will turn green. If the bar does not turn green (see Figure 6), you may need to improve your view of the sky to allow for better GPS signal. Also, check to make sure that Location Services are enabled which allows the device to access GPS and provide locations to the app. On Android devices, you may be able to use an external Bluetooth GPS receiver by connecting to the external GPS and enabling "Allow mock locations" under the Debugging section of Developer options in settings. Install a third party GPS app to test the external GPS before using.
11. Click "Start Transect" once all required fields are entered and the Start Transect button is not grayed out. Click "Clear" if you want to clear the fields and start again.

[1] O'Connell, A. F., B. Gardner, A. T. Gilbert, and K. Laurent, 2009, Compendium of Avian Occurrence Information for the Continental Shelf Waters along the Atlantic Coast of the United States, Final Report (Database Section - Seabirds). Prepared by the USGS Patuxent Wildlife Research Center, Beltsville, MD. U.S. Department of the Interior, Geological Survey, and Bureau of Ocean Energy Management Headquarters, OCS Study BOEM 2012-076.
[2] Drew, G.S., Piatt, J.F., and Renner, M., 2015, User's guide to the North Pacific Pelagic Seabird Database 2.0: U.S. Geological Survey Open-File Report 2015-1123, 52 p., doi: 10.3133/ofr20151123 (report) doi:10.5066/F7WQ01T3 (database)

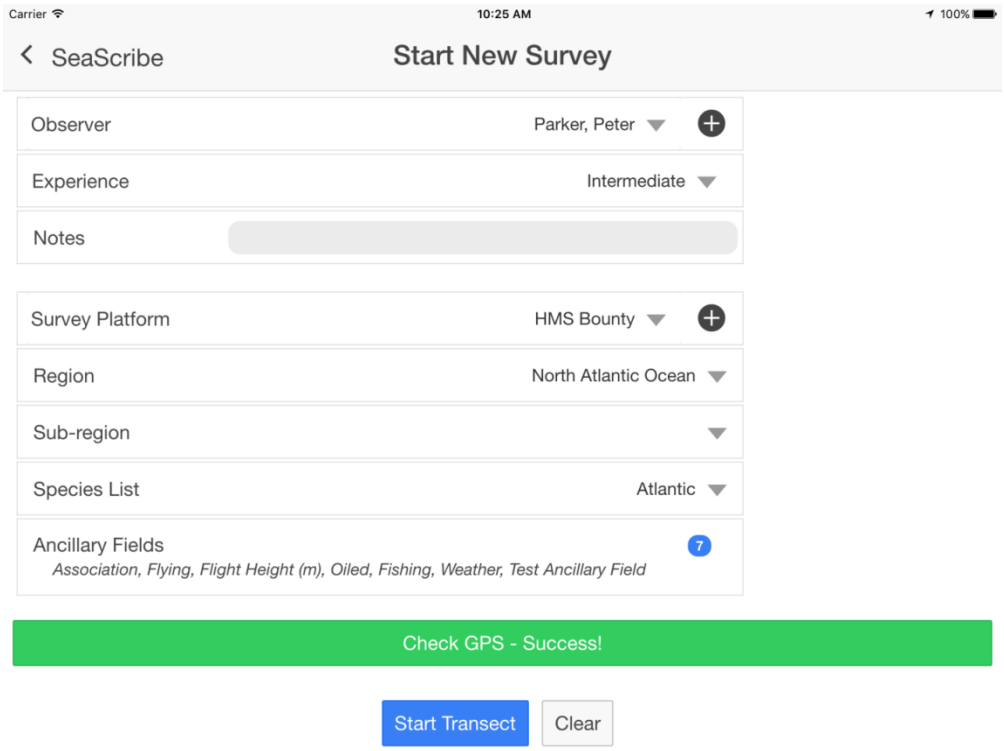


Figure 6. Check GPS success.

6.3 Adding ancillary fields to the observation form

Adding and removing ancillary fields is easy. When you select the Ancillary Fields field, you are brought to the "Select Ancillary Fields" form (Figure 7). In this form, you can add available fields to the selected fields list on the right of the form using the right arrow (>), remove it with left arrow (<), add all (>>), or remove all (<<). If you need to create and add a new ancillary field, click the "+" button and the "New Ancillary Field" subform will pop up. Click "Save" to save the ancillary field list to the methodology.

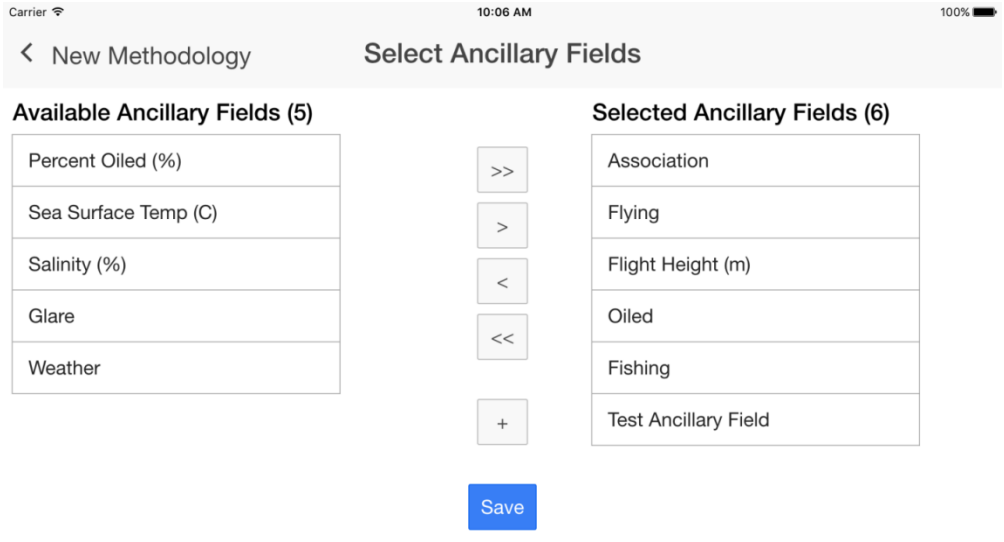


Figure 7. Add and remove ancillary fields form.

To create a new ancillary field (Figure 8):

1. Give the field a unique name.
2. Tell it how frequently the observation should be recorded – every observation or only periodically change.
3. Determine the sort order; where it shows in the observation form.
4. Choose the input control (numeric, text, select from a list).
    a. When using select from a list, you tell the application how many selections you would like and then enter the selections to create the dropdown list in the observation field.
    b. Scroll down the form to complete and enter “Save” to save, “Clear” to clear the form and start over or “Cancel” to exit without saving the new ancillary field.

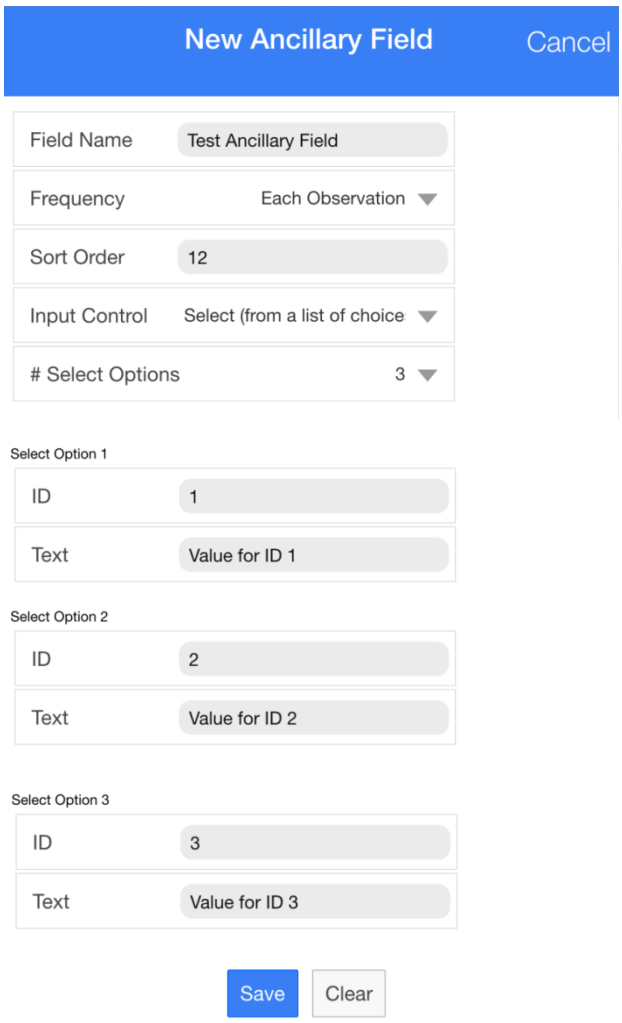
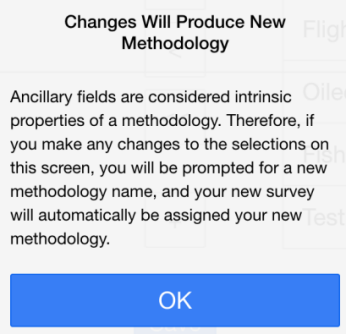
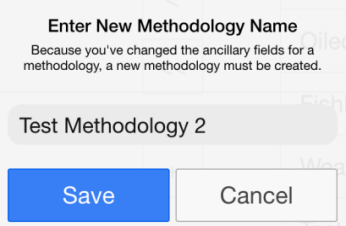


Figure 8. Create new ancillary field.

However, ancillary fields are considered intrinsic to the methodology, for which you will be warned.



That is, if you change ancillary fields for a methodology that has already been created, you must then change the name of the methodology and this popup box will prompt for a new name.



6.4 Starting a transect

Once you have clicked "Start Transect" at the end of the "Start New Survey Form" you will enter the Start Transect form. Here you will enter the initial conditions for the start of the survey and confirm the system date/time are correct. This is important as it provides a backup date/time for observations if the GPS fails to provide it.

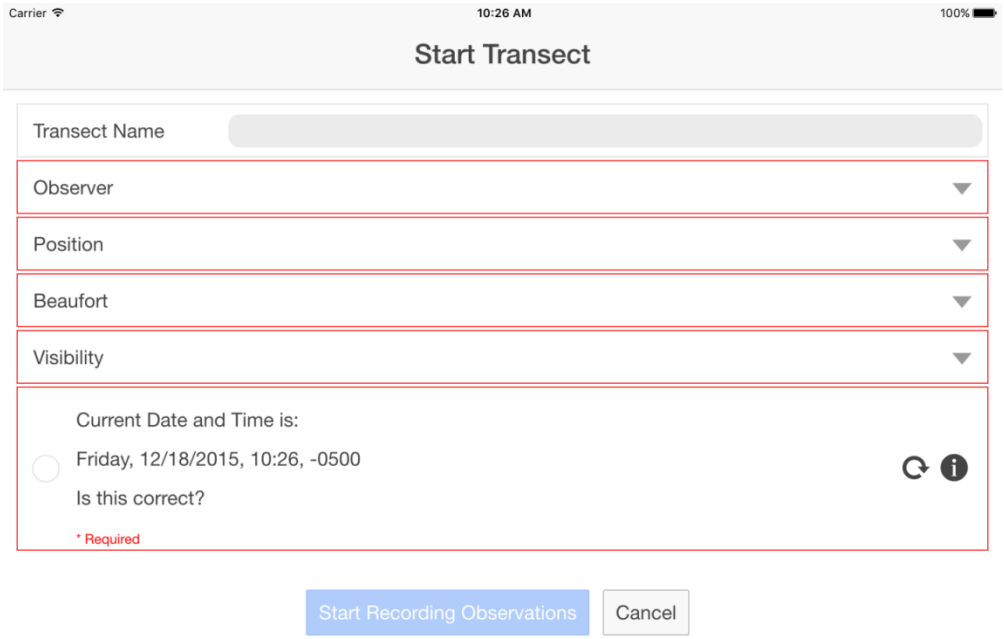


Figure 9. Blank start transect form.

1. Enter the Transect Name if one is used.
2. Select the Observer from the list you entered initially (required).
3. Enter the observation Position (port or starboard) (required).
4. Enter the Beaufort sea state (0-12, required, see 6.9.1).
5. Enter the Visibility category: 0-300m, 300-500m, 500m-1km, 1-3km, 3-5km, unlimited (required).
6. Check that the date is correct. If it is not, you must correct it with the device's date/time settings since this date/time used here is pulled from the system clock. If it is correct, click the radio button to confirm.
7. Once you are finished and all required fields have been filled in, click the "Start Recording Observations" button (Figure 10) to proceed to the observation form or "Cancel" to exit.

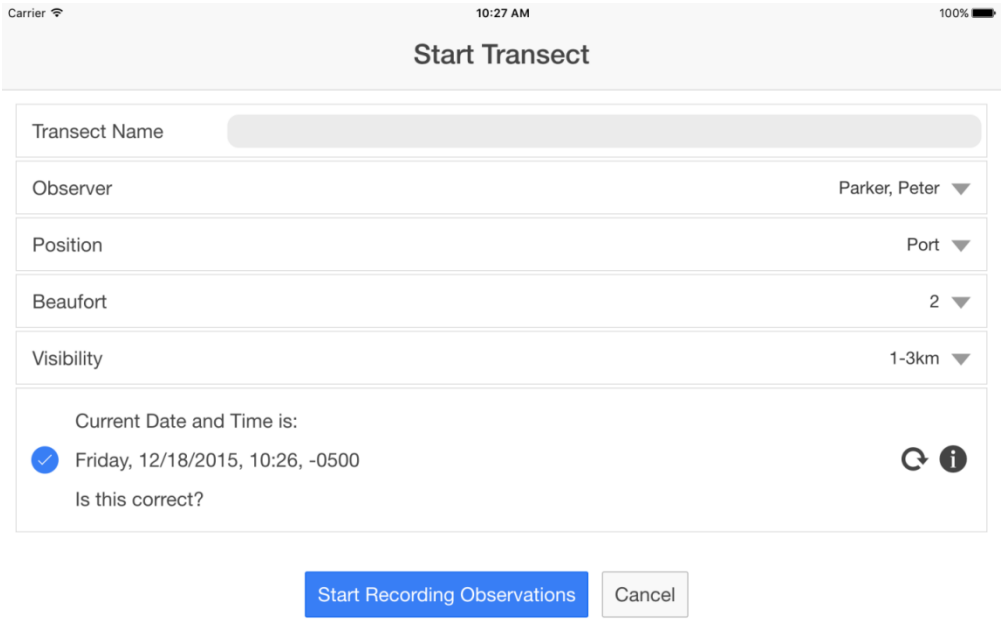


Figure 10. Filled in start transect form.

6.5 Recording Standard Observations

You will see on entry to the observation form that it is split into a header bar and four viewing panes (Figure 11):

1) Data entry – main part of the form for recording all observation related data.
2) Map – the map of the survey area including survey track(s) and observation points.
3) Spreadsheet – data records are shown here and can be edited.
4) Action pane – pane for holding various buttons including the save observation, clear data, take picture, record audio, and stop transect buttons.

Viewing panes can be manipulated in size to maximize or minimize one pane over another by dragging the grey bars left or right or up and down.

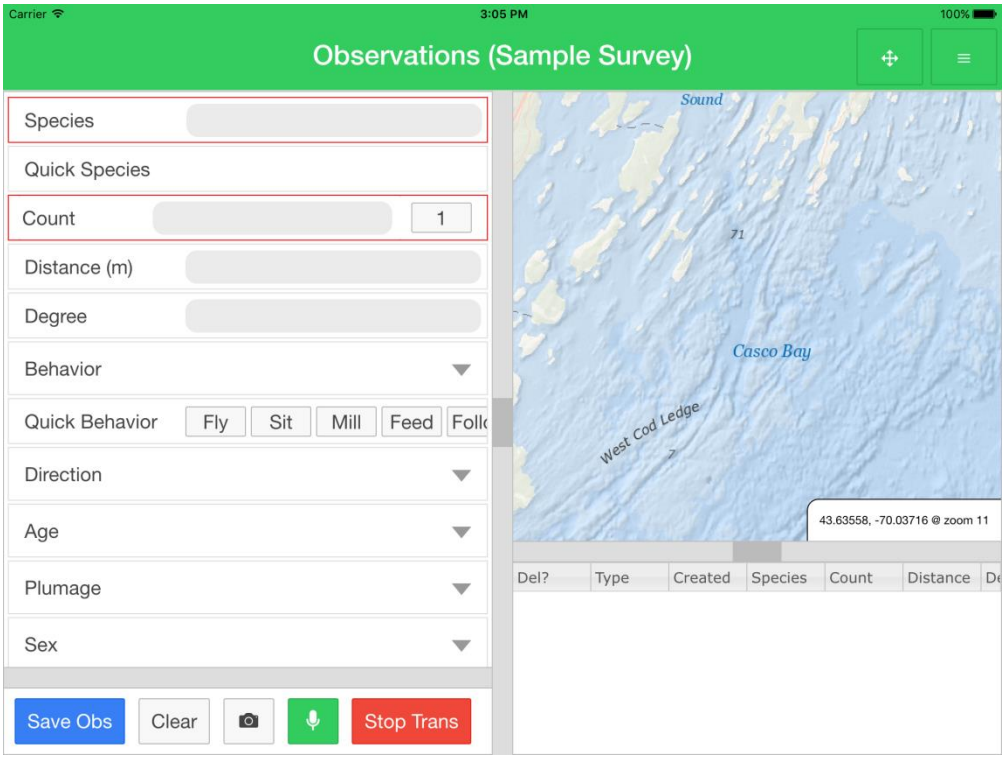


Figure 11. The observation form window with four panes.

6.5.1 Observation form header bar

The bar will be green when SeaScribe is successfully acquiring a location and turns red when GPS signal is lost. While SeaScribe will continue to function and observations can be saved, no positional information will be recorded, only the system date-time stamp will recorded for that observation which can be used to estimate position in post-processing if speed and direction are known.

There are two buttons at the right hand side of the bar: and for layout and options.

6.5.1.1 Layout observation form button

allows the user to select a pre-defined layout. Click this button to access it.

The following options are available:

1) Maximize data-entry area.

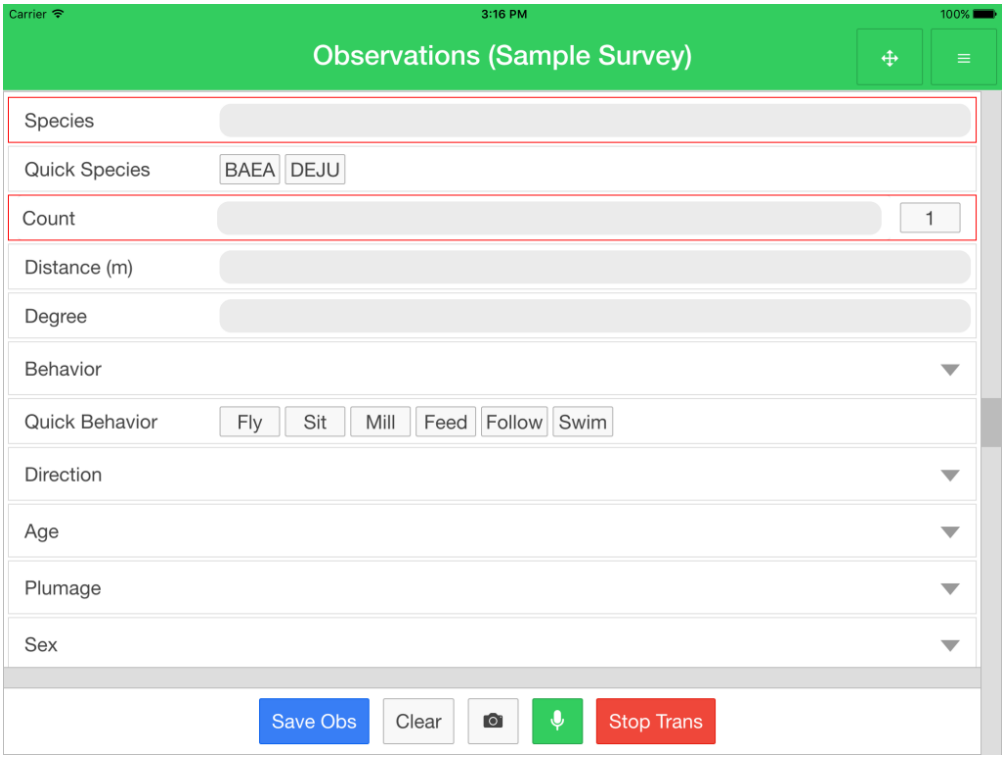


Figure 12. Maximized data entry in observation form.

2) Maximize map area (Figure 13).

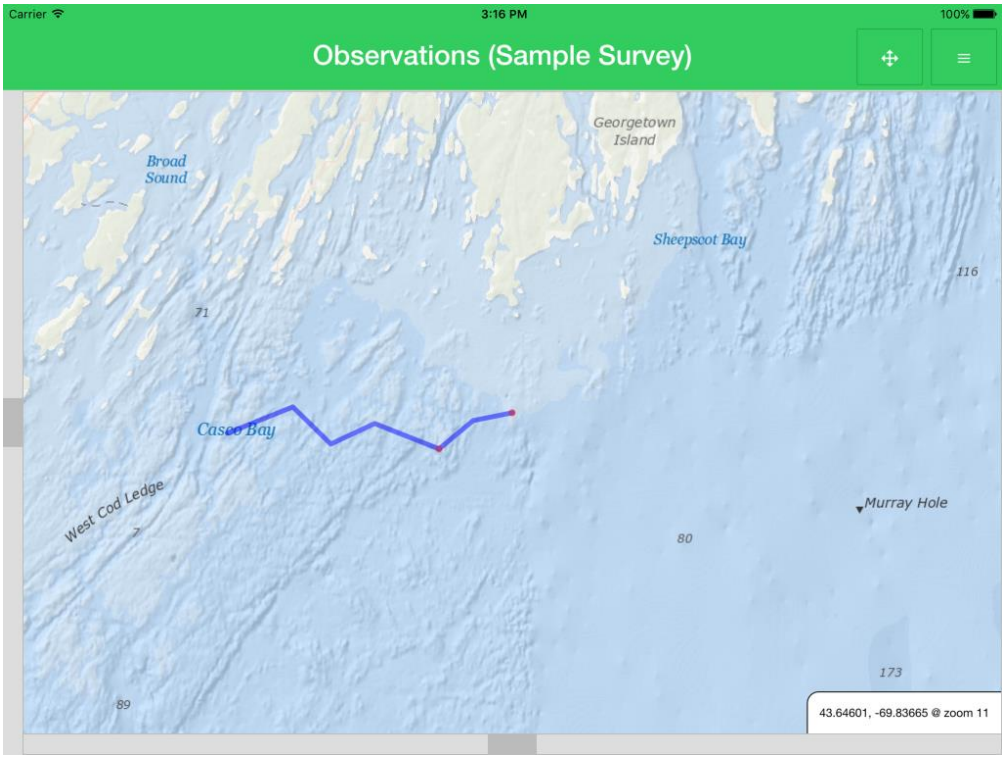


Figure 13. Maximized map area in observation form.

3) Maximize spreadsheet area (Figure 14).

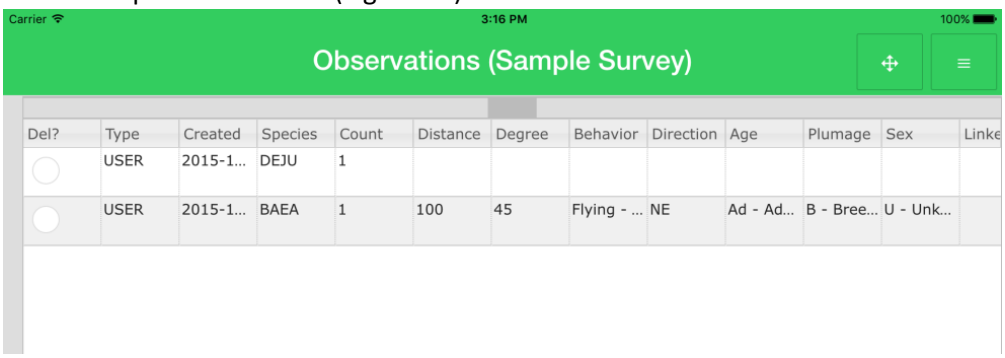


Figure 14. Maximize the spreadsheet area in observation form.

4) Reset layout.

6.5.1.2 Options and tools button in the observation form

gives access to various tools and options for the observation form (Figure 15):

1) Center Map – center map on current location.
2) Reset Map Zoom to Default.
3) Fit Map to Course – fit the map to the transect lines.
4) Show Offline Map Cache – if maps were cached while online (see 6.9.3.7), you can switch to the map cache that is stored on the device.
5) View Online Map – switch to online map display if internet is available for viewing.
6) Disable GPS Heartbeat – turn off the GPS heartbeat which records the current position every X seconds as designated in the settings (see 6.8.1).
7) Disable Center Map on Latest GPS – do not move map to center on latest GPS position.
8) Show/hide GPS Settings during Heartbeat – show the GPS settings during the GPS heartbeat.
9) Show all Transects on Map – map all of the transects recorded from the survey to show prior transects.
10) Show Illustrated Beaufort Scale – show Beaufort sea state chart for reference (see 6.9.1).
11) Show Distance Estimation Guide – show the distance estimation tool for calculating measurements to put on a guide for distance references (see 6.9.2).
12) Stop Transect.

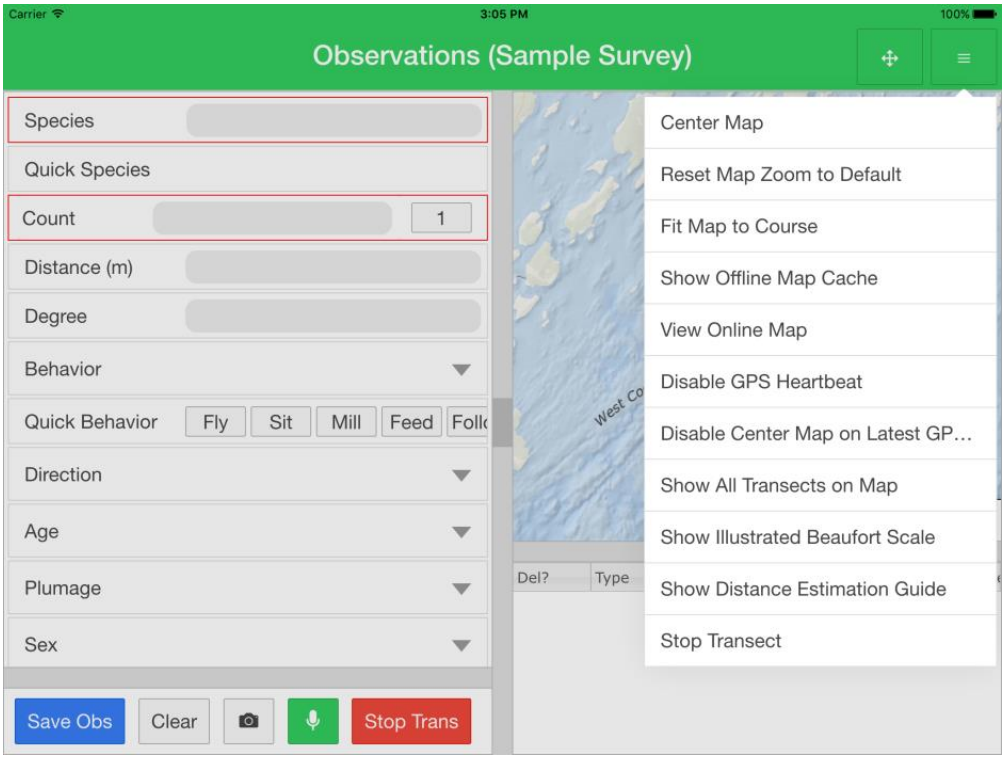


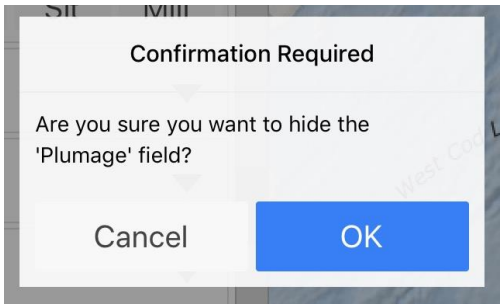
Figure 15. Observation form tools and options.

6.5.2 Entering observations into the observation form

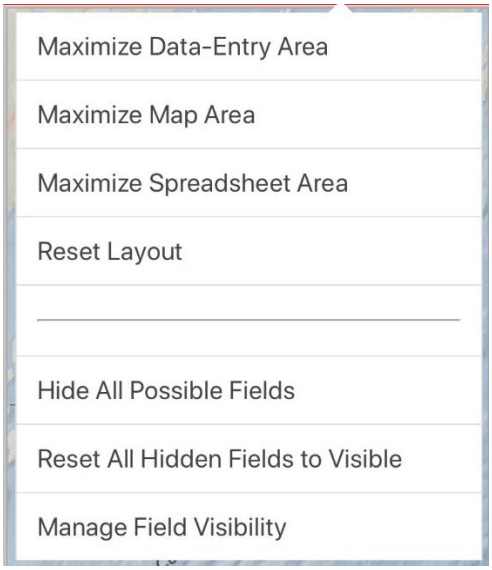
Entering observations can be as simple as entering the species and count, but can include many other observation fields and as recommended should include the distance and angle to every observed animal, for which the layout of the fields was optimized. The default fields are described below, but the app can be customized to include ancillary fields as well. The observation fields are broken into two categories: non-persistent (entered every record as needed) and persistent fields (are carried from one record to the next until the user changes the values).

6.5.2.1 Hiding fields in the observation form (new function in version 1.3.6)

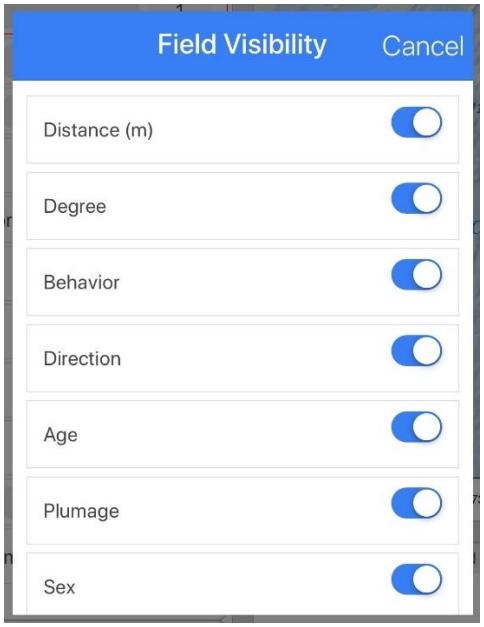
It is possible to hide data entry fields in the observation form by long-pressing the field and confirming that you want to hide that field.



Field visibility can be changed using the button which given the following options:



Where you can reset the field visibility, hide all fields, or manage individual field visibility.



6.5.2.2 Non-persistent fields

- Species – enter the four letter species or species group code or starting typing in the name and SeaScribe will return a list of matches that you can select (Figure 16). In order to speed up data entry, SeaScribe keeps a record of the most recorded codes and adds them to the quick species selector below the species entry field. The program will continue to update this list so that you have an up to date list of species codes to choose from. This can greatly speed up data entry.

Figure 16. Example of species typeahead for filtering species codes.

If a species code is entered that is not in the application database, SeaScribe prompts for additional information about this code when you go to save the observation (Figure 17). Please enter the common name for the object and type (bird, marine mammal, sea turtle, fish, or other). If this was an error in data entry, you may cancel and change the species code.

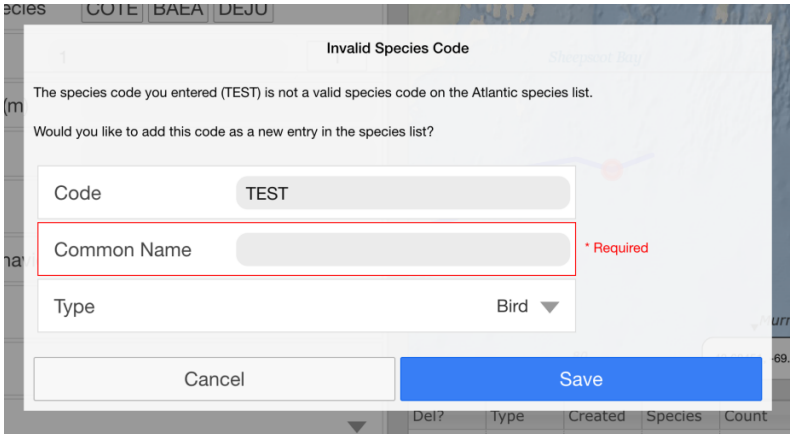


Figure 17. Entering additional information about a new species code.

- Count – counts can be entered as any whole number or use the quick pick “1” value.
- Distance – distance to object in meters.
- Degree – bearing to object with the front of the vessel equal to 0 degree, right side 90 degrees, left side 270 degrees, etc.
- Behavior – select the behavior of the animal from the list.

- Quick Behavior – press the quick behavior button to speed up behavioral code entry. These can be changed in the settings of the app.
- Direction – cardinal movement of the object.
- Age – age code of the animal.
- Plumage – plumage code of the animal.
- Sex – male, female, or unknown.
- Linked With – is a unique identifier that allows the observer to link species observations records together so that one can associate species that have been observed together.
- Comment – any additional comments about the observation.

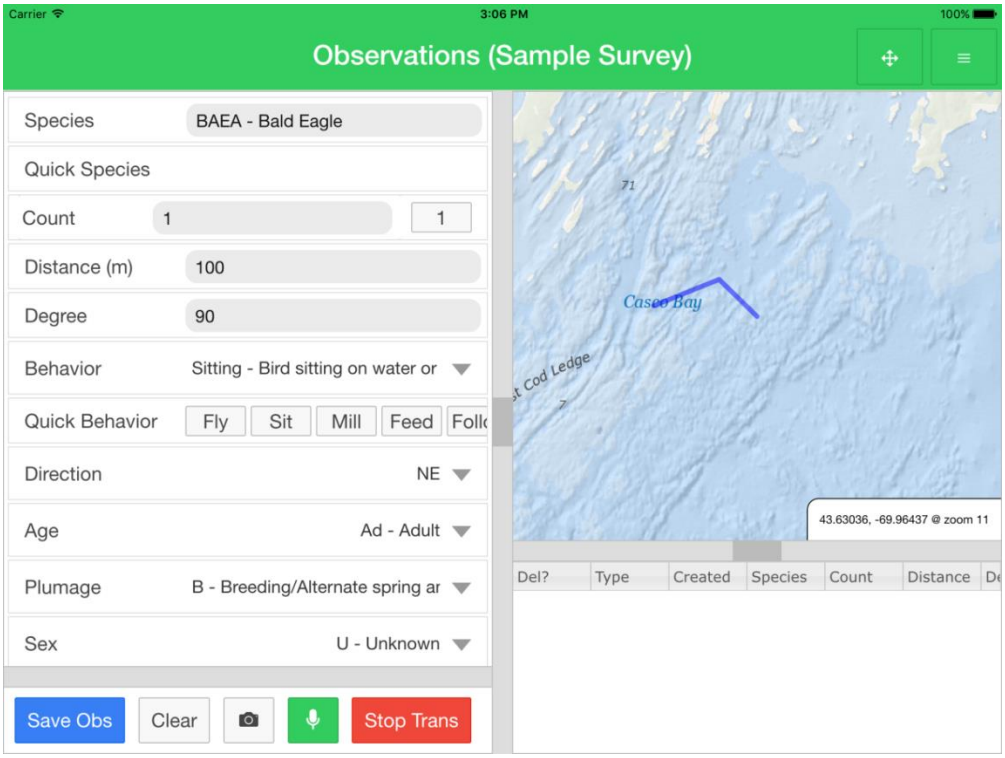


Figure 18. Example of filled in fields in the observation form.

Ancillary fields are typically found below these such as “Flight height (m)” and “Oiled” fields below (Figure 19), but sort order can be set when adding these fields (see 6.3).

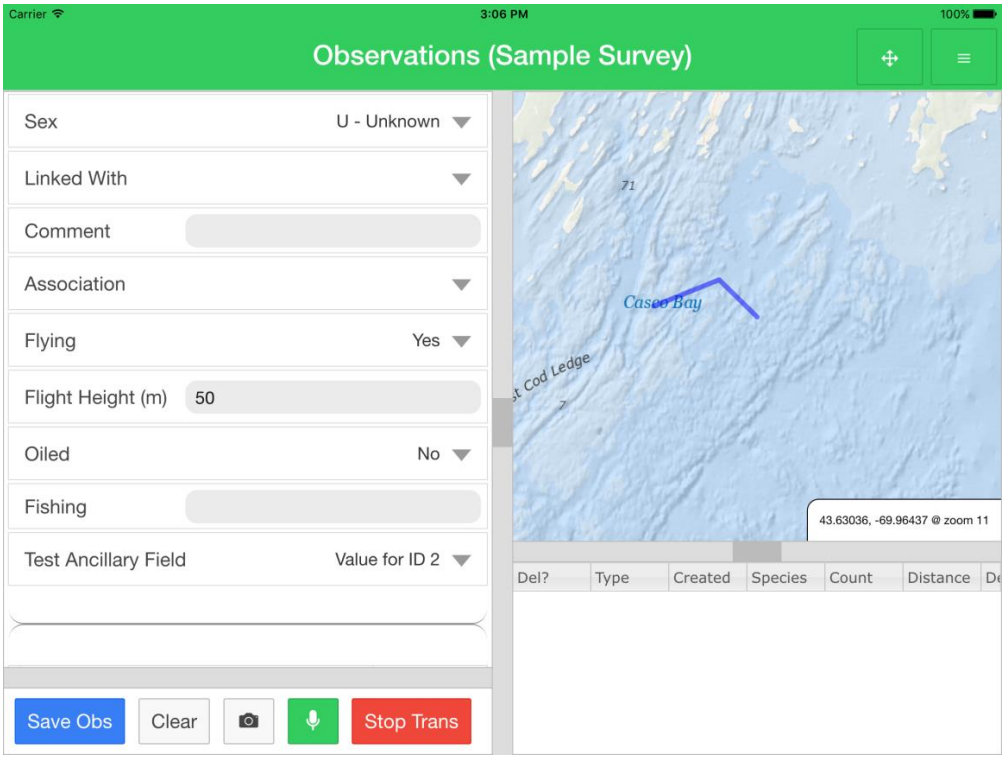
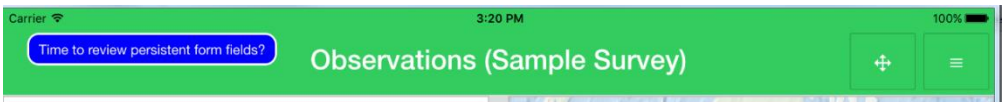


Figure 19. Example ancillary fields in the observation form.

6.5.2.3 Persistent fields

Persistent fields are ones that normally do not change, or change infrequently and are recorded in each record until the user changes them. SeaScribe will prompt for the user in the header bar with a blue "Time to review persistent form fields" alert. You can change the alert schedule in the settings. Other persistent fields can be added as a customization by the user, such as the weather code below in Figure 20.



- Observer – select the observer or add an observer using the "+" button if not already entered during initial survey setup.
- Position – side of the vessel observations are being made on.
- Beaufort – the sea state code.
- Visibility – the visibility category.

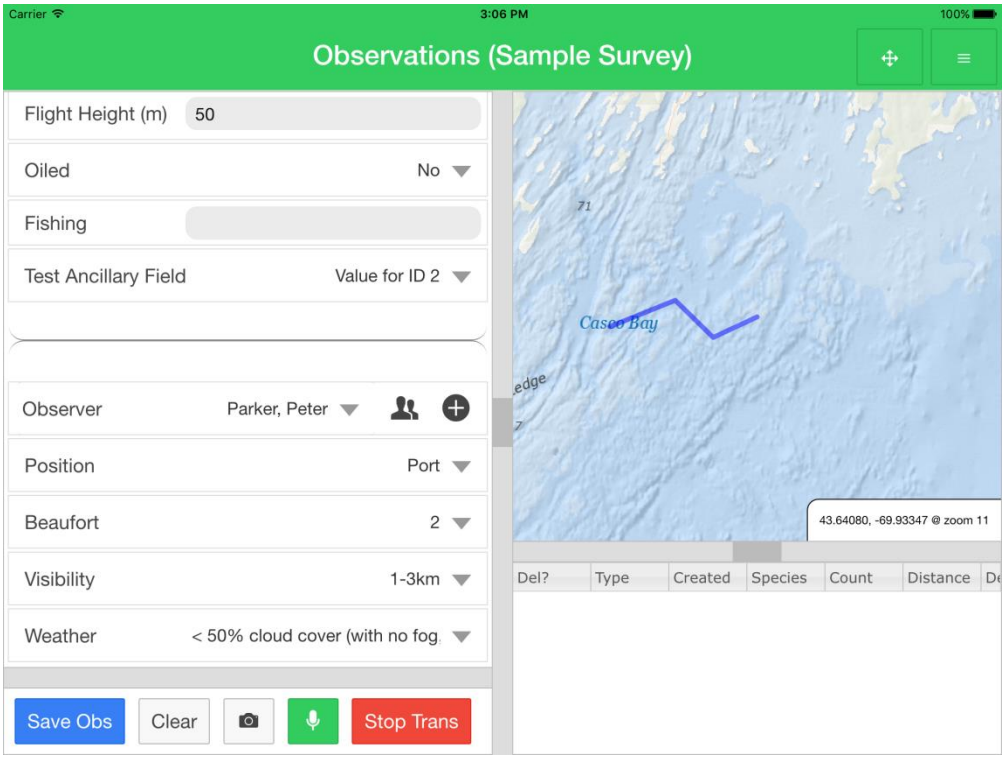


Figure 20. Example of persistent fields in the observation form.

6.5.2.4 Entering observations when two observers are active

SeaScribe is not specifically set up to record observations from two active viewers, however because of it's flexibility a method is available to successfully record observations from two viewers and provide data about which observer has observed the animal. This is a work around which is not yet tied to the observer table. Future versions may be set up for multiple concurrent observers removing the need to follow this process. The following method is prescribed:

1) At the start of a new survey, create a new methodology for multiple concurrent observers (Figure 22).

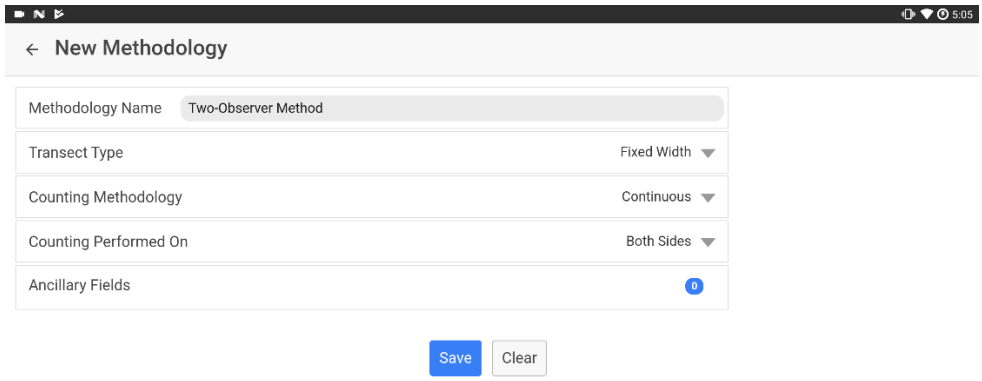


Figure 21. Create new two-observer methodology.

2) Add a new ancillary fields by clicking the "+" button to create a new ancillary field, "Observer 2" (Figure 22). This will be a persistent select field, with 3 options (the number of observers that will be present in total on the vessel).

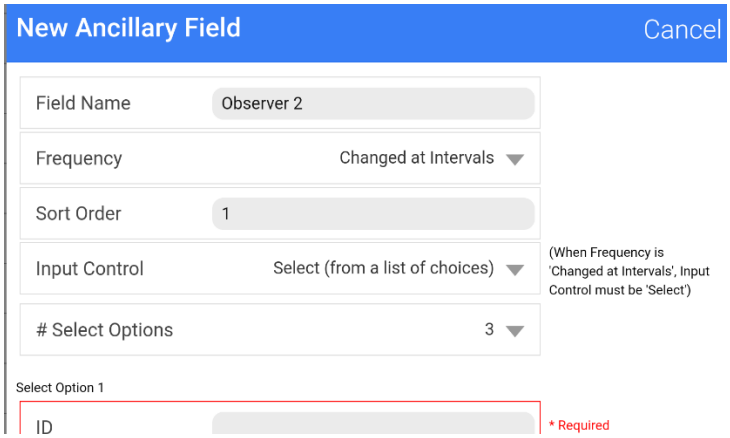


Figure 22. Add observer two names persistent field.

3) Fill in the names of the three observers and save (Figure 23). Note that entering the observer names here is duplication of effort; they'll also need to be defined as observers in the main Start New Survey page.

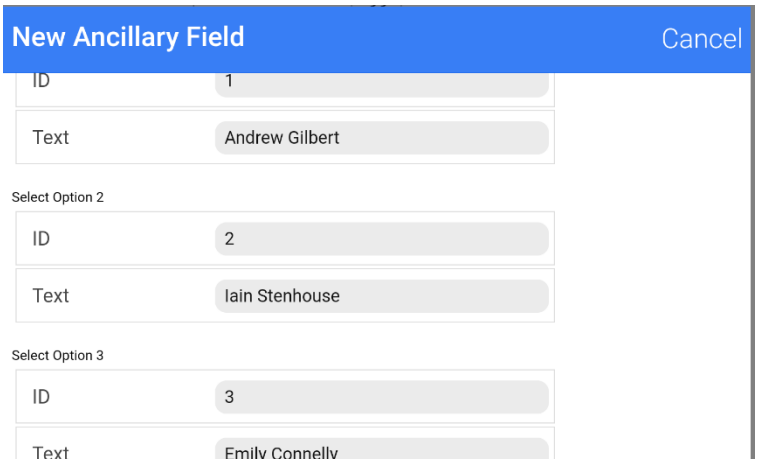


Figure 23. Add observer two names options.

4) Return to the Ancillary Fields page, and clicked the "+" button again to add another field, "Observer 2 Position" (Figure 24). This will be a persistent field (Frequency = "Changed at Intervals") with 2 options (one for each side, Figure 25).

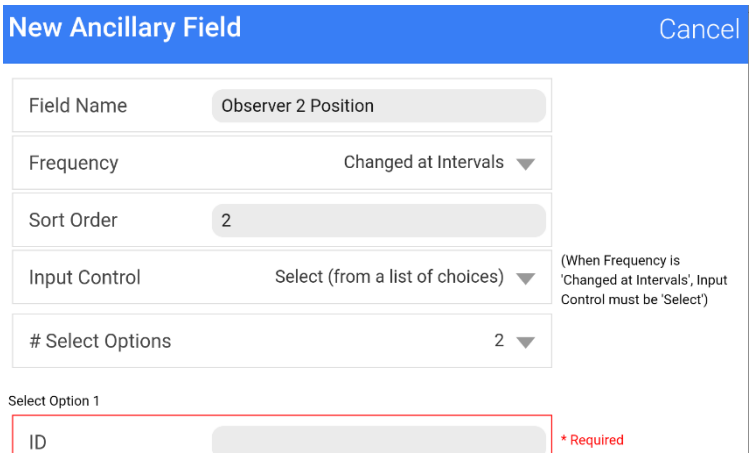


Figure 24. Add observer two position persistent field.

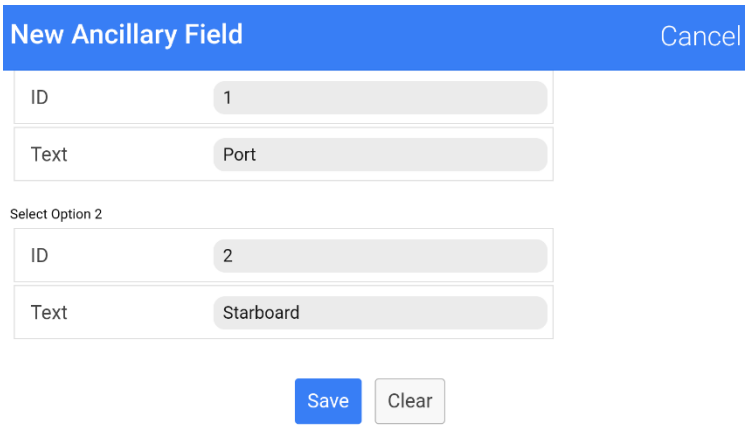


Figure 25. Add observer two position options.

5) Return to the Ancillary Fields page, and click the "+" button again to add another field, "Reporting Observer" (Figure 26); this will be a non-persistent (Frequency = "Each Observation") select field with 2 options ("Observer 1" and "Observer 2", Figure 27). This will be selected each time an observation is made to designate which of the observers reported the observation. Alternatively, you could create a selection with the names of all observers and use this as the selected observer. One could then ignore the persistent observer field. Saving returns you to the "select ancillary fields" screen showing the newly created and selected ancillary fields (Figure 28).

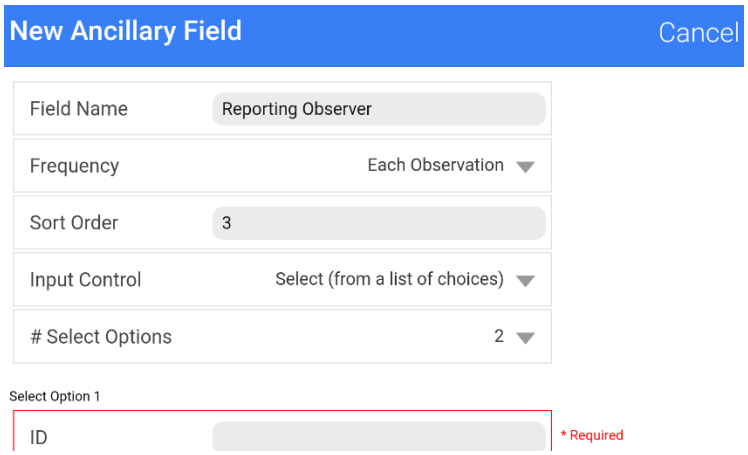


Figure 26. Add reporting observer ancillary field control.

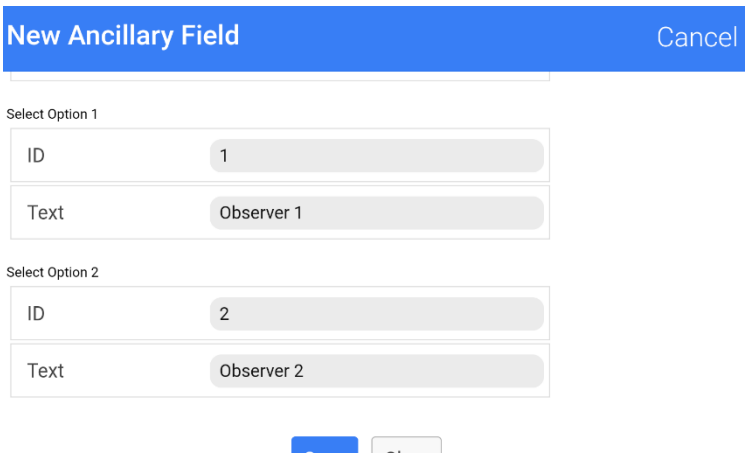


Figure 27. Add reporting observer ancillary field observer options.

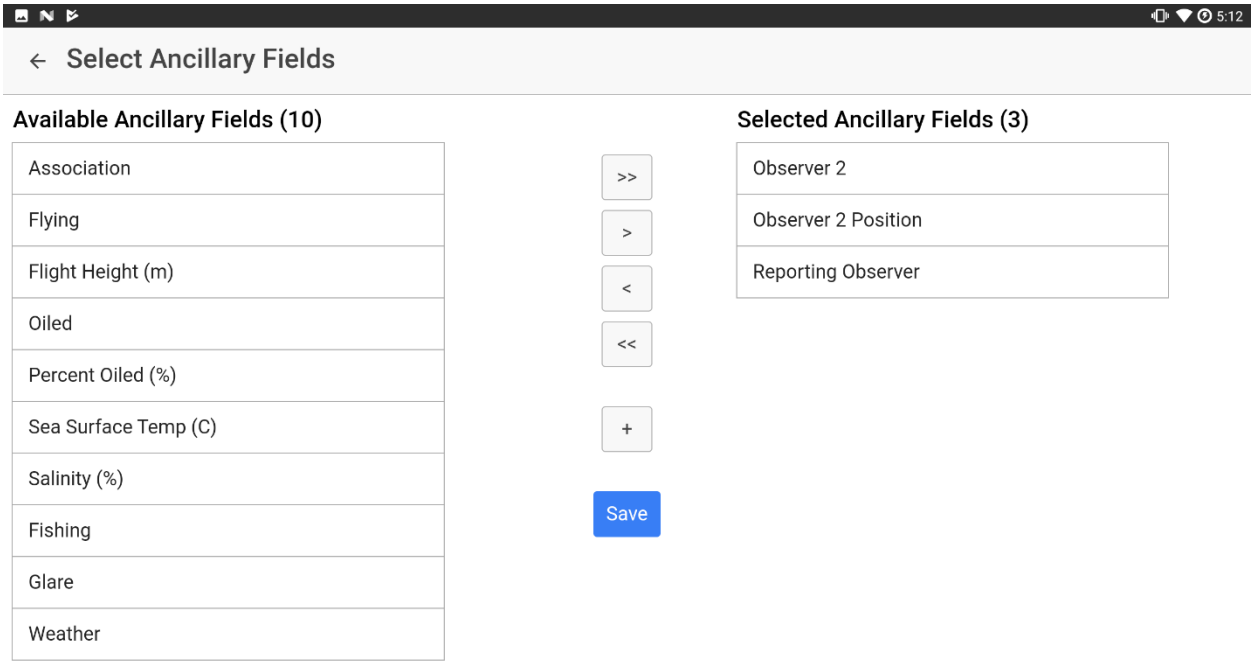


Figure 28. Addition of three ancillary fields to perform two observer method.

6) The three new ancillary fields will show up as selected and you can now "Save" the methodology (Figure 29).

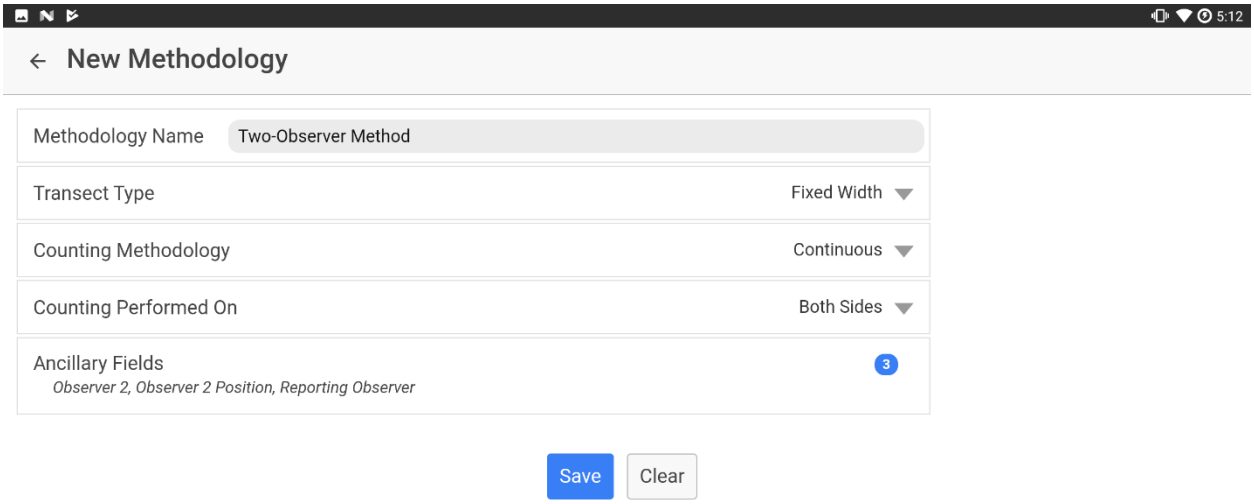


Figure 29. Finalized two observer methodology.

7) Back in the Start New Survey page specify the number of observers coming on the trip, the individuals, and their experience levels (Figure 30).

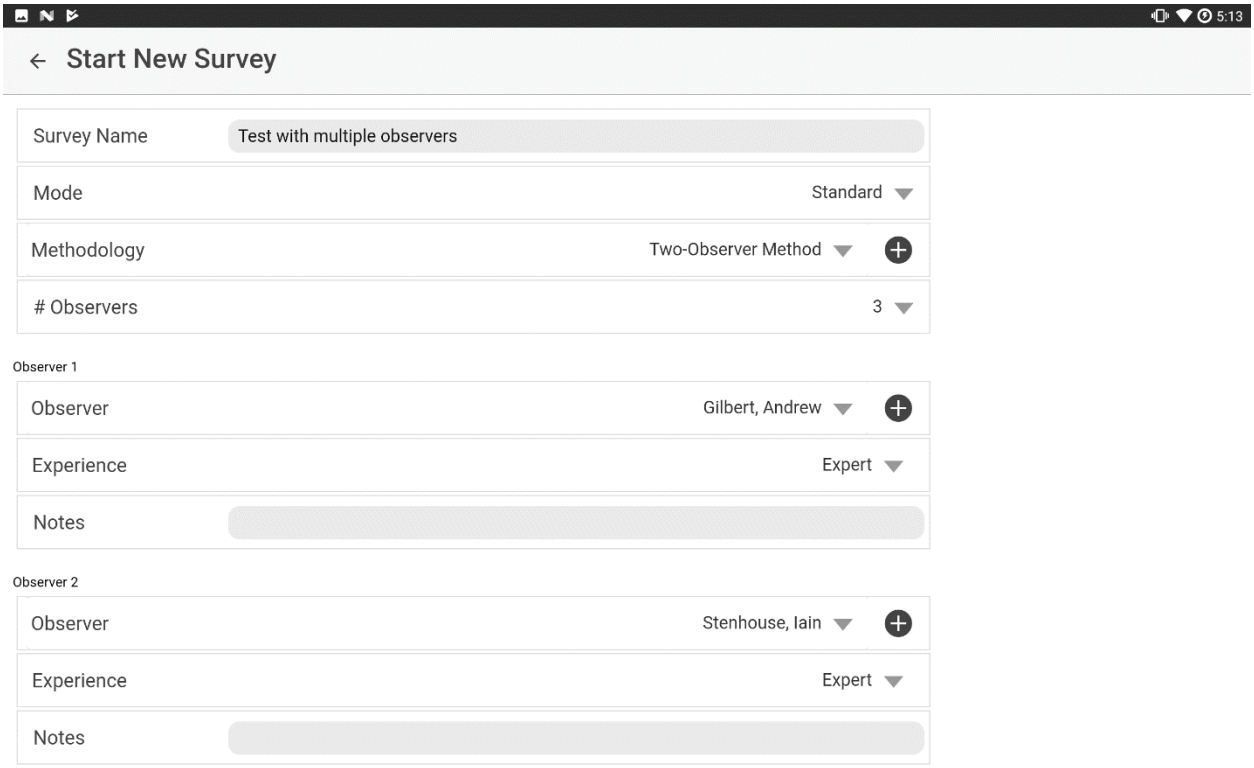


Figure 30. Two observers active experience entry form.

8) Click Start New Transect.
9) At the Start Transect page, identify which two of the three observers are on-duty, and their positions (Figure 31).

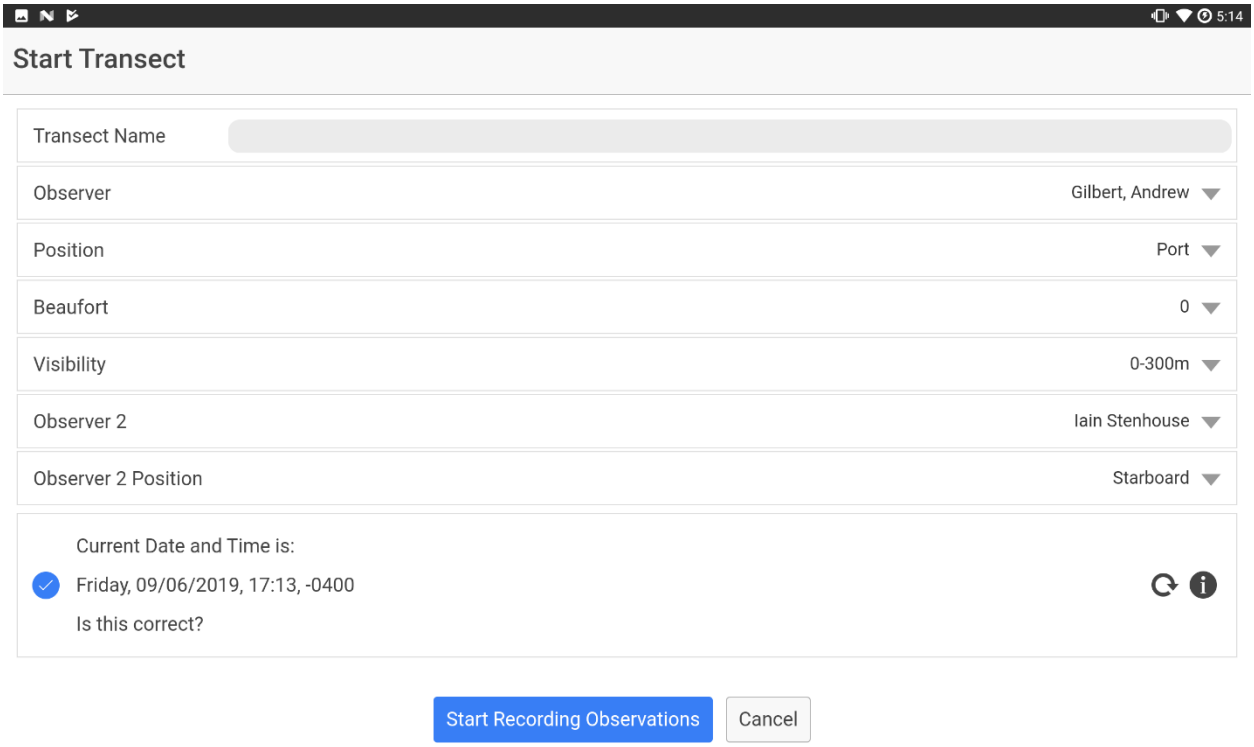


Figure 31. Start transect window entry form with two observers active.

10) Click Start Recording Observations.
11) In the Observations page change who is assigned to each position.
12) Enter who is reporting the actual observation during each recorded observation.

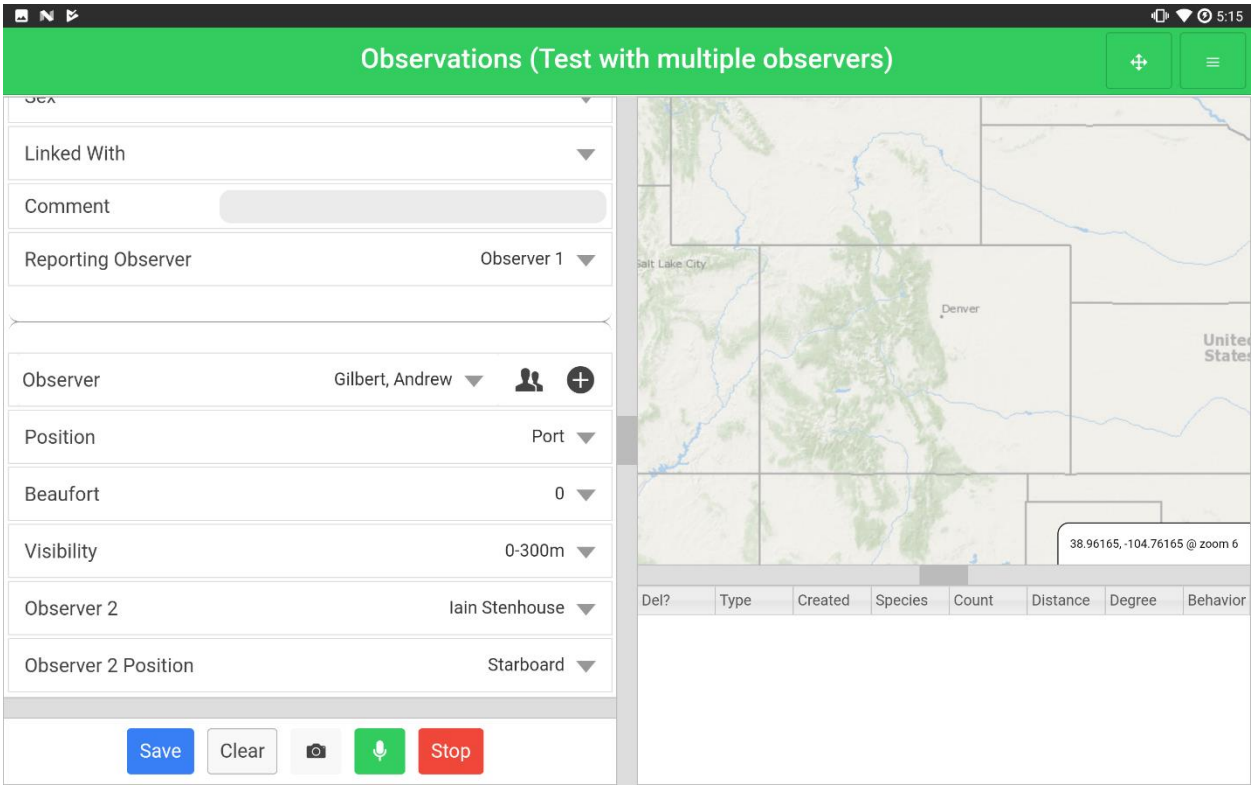


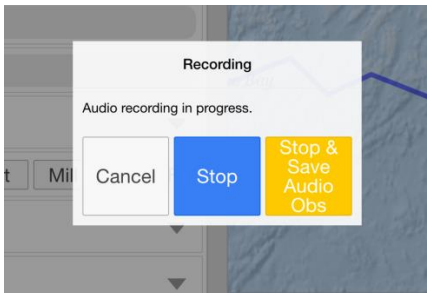
Figure 32. Observation entry form with two observers active.

6.5.2.5 Associating audio and pictures with records

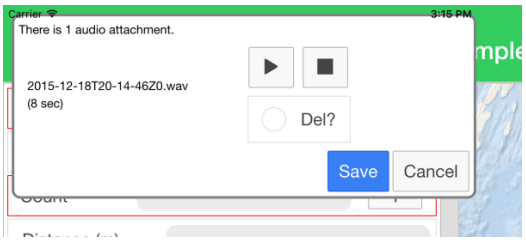
Using the buttons, the user can take photos using the onboard camera and/or record audio and associate these image and audio files with an observation record. These files are also exported and associated with the record for ease of reviewing and archiving later.

Selecting the camera button gives you access to the camera device and its functionality, allowing you to "retry" or "ok" the picture for saving.

Selecting the green audio recording (microphone) button allows the user to record a segment of audio and save it to the observation.



The audio file can later be played and deleted or saved if necessary by clicking on the audio field in the record for that observation in the spreadsheet view.



6.5.3 Mapping pane

The map pane allows the user to track the progress of the survey as well as shows the observations in increasing size markers with larger counts (Figure 33). The observation circle marker has a number of settings including color, radius multiplier, radius minimum and radius maximum allowing the user to customize these markers. The blue line below shows the track of the survey and can be customized for color in settings (see 6.8.2). If you would like to display all the tracks from transects for the survey go to the observation options and click “Show All Transects on Map.”

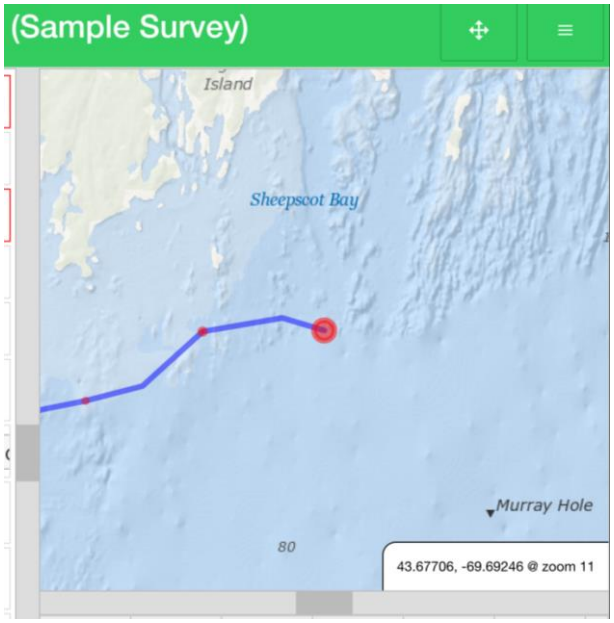


Figure 33. Observations with increasing size marker depending on count and survey track line.

The map displays the current map center location and zoom level of the map in the lower right of the map window. The default is for the map view to shift to keep the last position centered in the window, but this can be disabled by going to the observations form options (see 6.5.1.2). The map is dynamic and can be manipulated by touching the map and dragging it and can be zoomed out or in by using two fingers to pinch or spread fingers apart. You can always re-center the map by going to the options for the form in the header bar (see 6.5.1.2).

The map defaults to online streaming of map content. If you do not have internet access, the map will show no content in the background, though the track and observation points will continue to display. If you anticipate not having internet connection while conducting the survey, it is advised that you download a map cache for the anticipated survey area at multiple zoom levels (see 6.9.3.7). Doing so will allow the map background to display properly once the “Show Offline Map Cache” button is clicked

in the options button of the header bar (see 6.5.1.2). If no maps are available in the map cache, the following will be shown:

Download map content prior to beginning the survey when internet is available.

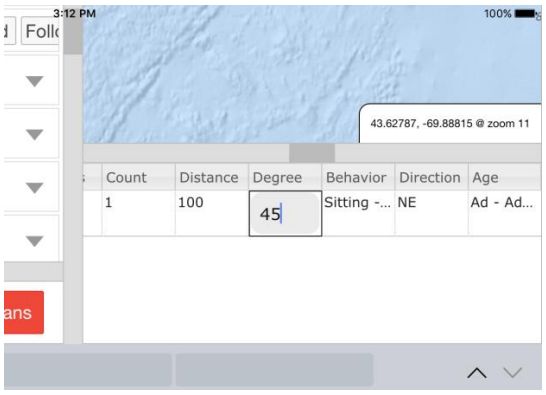
Other options are available for the map including resetting the map zoom to default, fit the map to course, and disable center map on latest GPS.

6.5.4 Spreadsheet pane

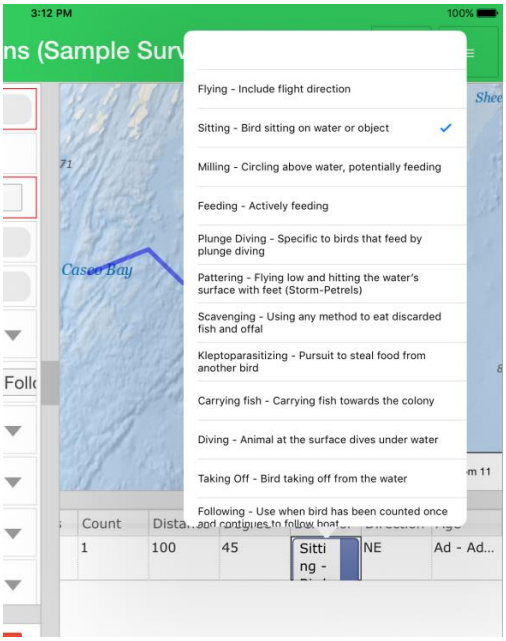
The spreadsheet pane shows the observation records as they are entered and allows the user to make edits to these observations while still collecting data. The user can maximize this pane for easier viewing and editing if necessary by clicking the layout options button in the header (see 6.5.1.1).

6.5.4.1 Editing records in the spreadsheet pane

To edit records, simply scroll to the desired record to edit and click in the cell for editing. Clicking on a cell will bring up the appropriate keyboard or dropdown list. If it's a text or number field simply type in the field.

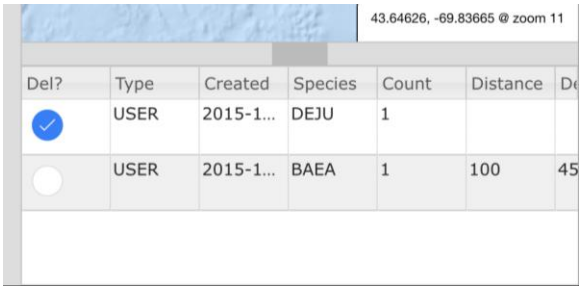


If it's a dropdown list, click the cell and then click the list shown again and it will expand to allow selection of the correct entry.

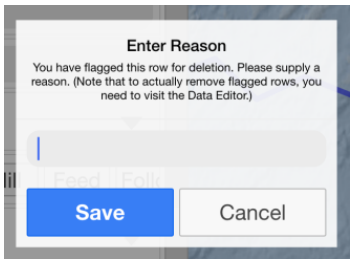


6.5.4.2 *Marking a record for deletion in the spreadsheet pane*

The first column of the spreadsheet view allows you to mark the record for deletion.



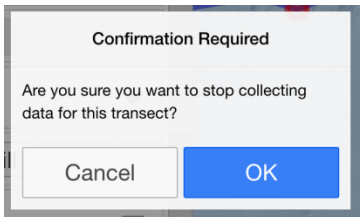
We do not include the ability to make deletions during the survey to prevent accidental deletion, so we provide a way to flag a record for deletion later, after which they can be processed for deletion in the data editor once the transect is complete (6.7.2.1). When a record is flagged for deletion, a reason must be entered in the popup box.



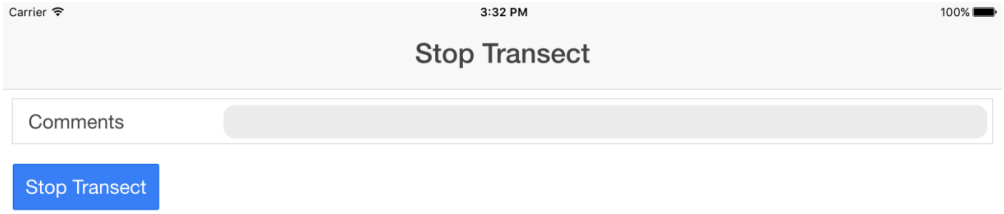
6.5.5 Finishing the transect

When you have finished the transect, you may click the “Stop Trans” button in the button pane or in the options button list. Once you have clicked this button it confirms that you want to stop collecting data

for this transect. Click “OK” to accept or click “Cancel” to return to the observation form and continue the transect. Caution, once you click “OK”, there is no way to continue, you must start a new transect and then merge the two transects later in post-processing if they need to be continuous for analysis purposes.



Once you have confirmed that you want to end the transect, you will be given the opportunity to add comments about the transect if you want. Click “Stop Transect” to exit.



6.6 Recording Audio-Only Observations

In some surveys, it may be necessary to perform audio-only data entry during the survey. This is common when performing aerial surveys where animals are passing by at high rates of speed and entering data in the standard data entry form could result in missed animals. We have provided an audio-only data entry form with simple, large buttons for recording audio observations and saving records (Figure 34). Each audio file is geo-referenced and the record of which can be seen in the spreadsheet view. Click “Record” to start recording an observation and “Save obs” to stop recording and save the observation audio file. Clicking “Cancel” will cancel the current audio recording. Click “Stop Trans” to exit the current transect.

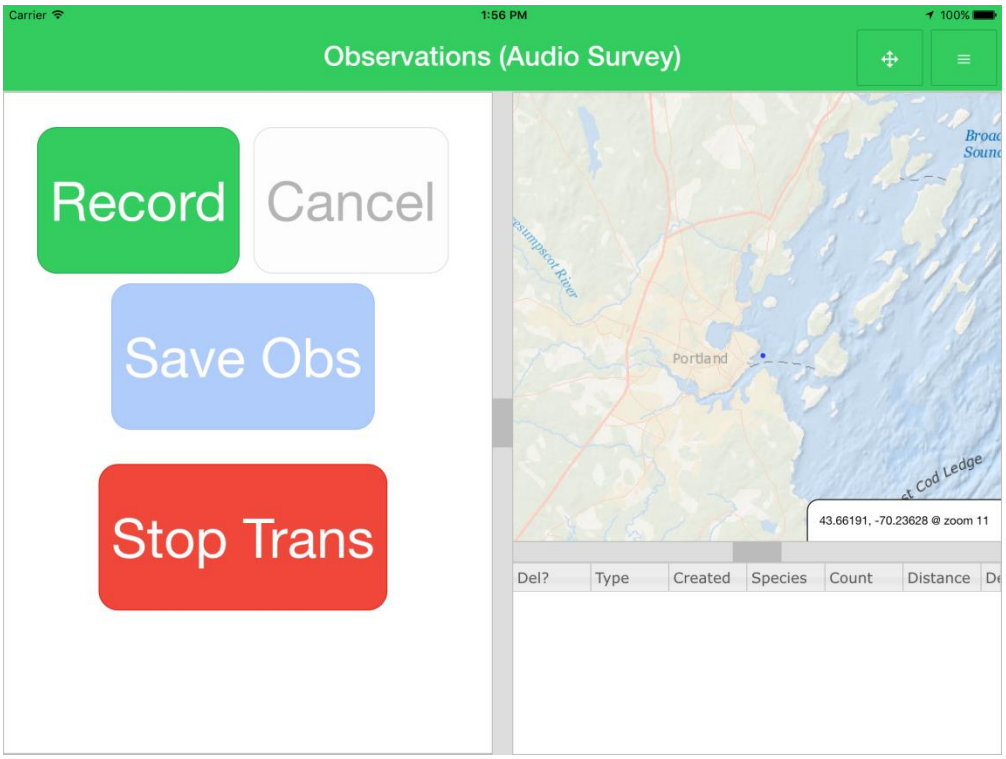


Figure 34. Audio-only data entry form.

6.7 Existing Surveys

Within "Existing Surveys", the user can see the list of existing surveys, most recent first, and corresponding transects, also most recent first (Figure 35). There are different operations that can be performed when selecting surveys or transects of chosen surveys.

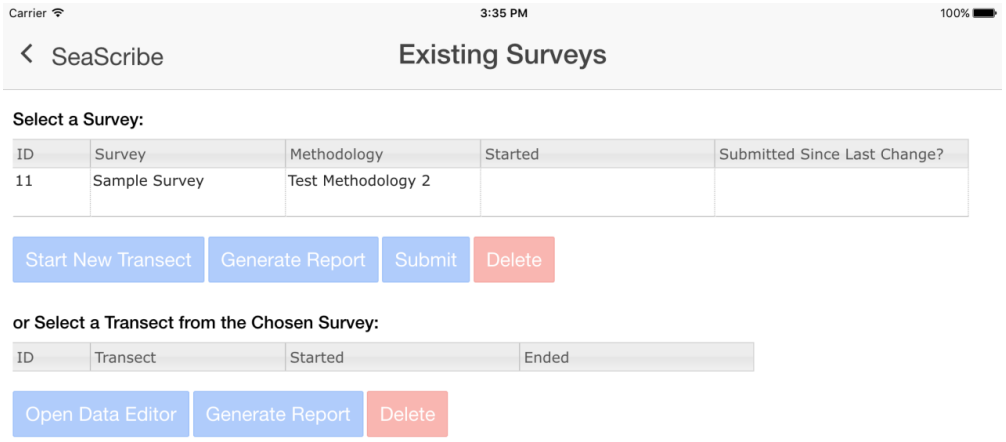


Figure 35. Existing surveys screen.

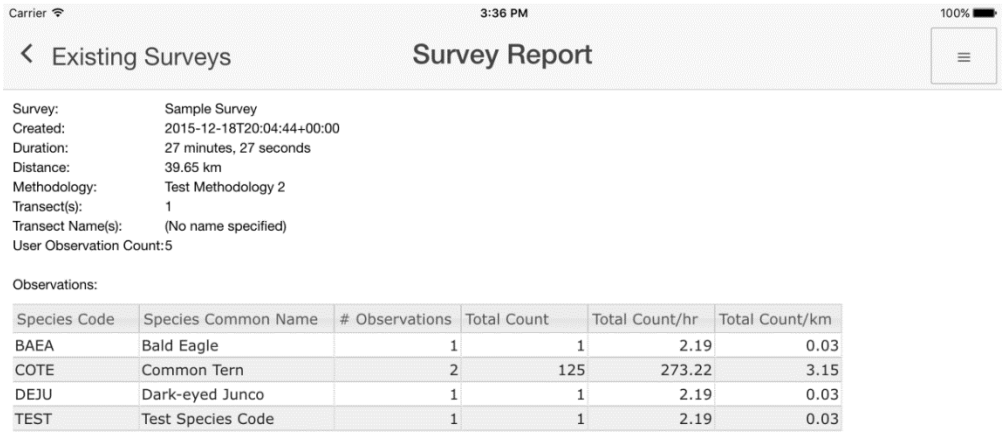
6.7.1 Operations on surveys

6.7.1.1 Start new transect

This button allows you to start a new transect within an existing survey. This brings you back to the "Start Transect" form (see 6.4) where you can continue to add data to the survey.

6.7.1.2 Generate survey report

You can generate a summary report for the survey by selecting the survey of interest and pressing "Generate Report". An on-screen report will be created with information about the survey including survey name, duration, distance traveled, methodology, number of transects, transect name(s), and number of users along with a summary table of observations to included observed species, number observed, total count, counts/hour, and counts/km (Figure 36).



Species Code	Species Common Name	# Observations	Total Count	Total Count/hr	Total Count/km
BAEA	Bald Eagle	1	1	2.19	0.03
COTE	Common Tern	2	125	273.22	3.15
DEJU	Dark-eyed Junco	1	1	2.19	0.03
TEST	Test Species Code	1	1	2.19	0.03

Figure 36. The survey report tabulating a survey.

Within the survey report screen, if you click the upper right button on the screen ≡, you are given the option to "Submit Report" via email or Dropbox in HTML format. This report can be read in any web browser and will show up in email content as well.

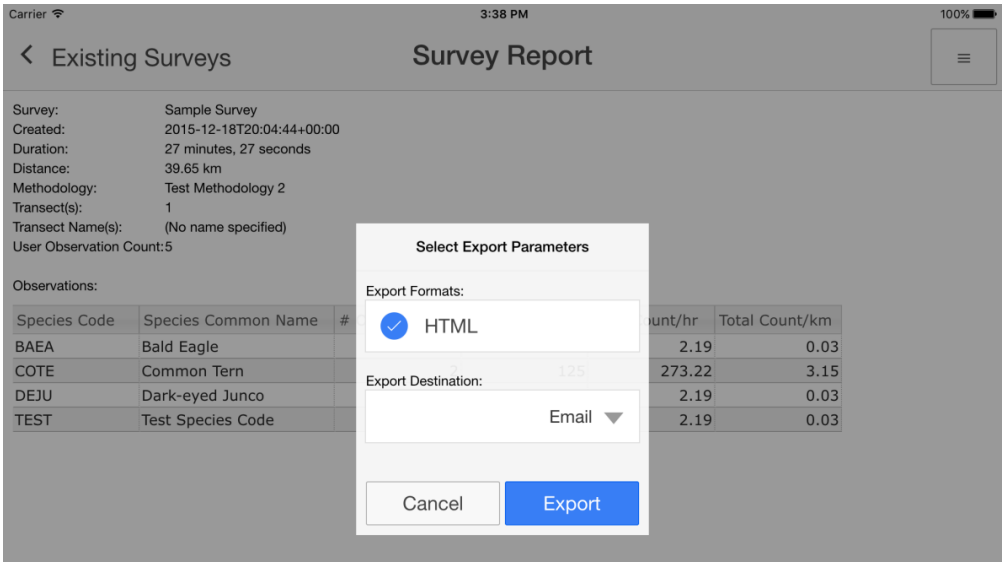


Figure 37. Survey report exporting parameters.

Select the export destination (Email or Dropbox) and select “Export” or “Cancel” (Figure 37). If you choose email and an email client is set up then the html report will be attached to a generated email in the email client on the device. Enter a recipient to send. If you choose to export via Dropbox and no Dropbox account is linked to SeaScribe, the program will request an email and password to link (Figure 38).

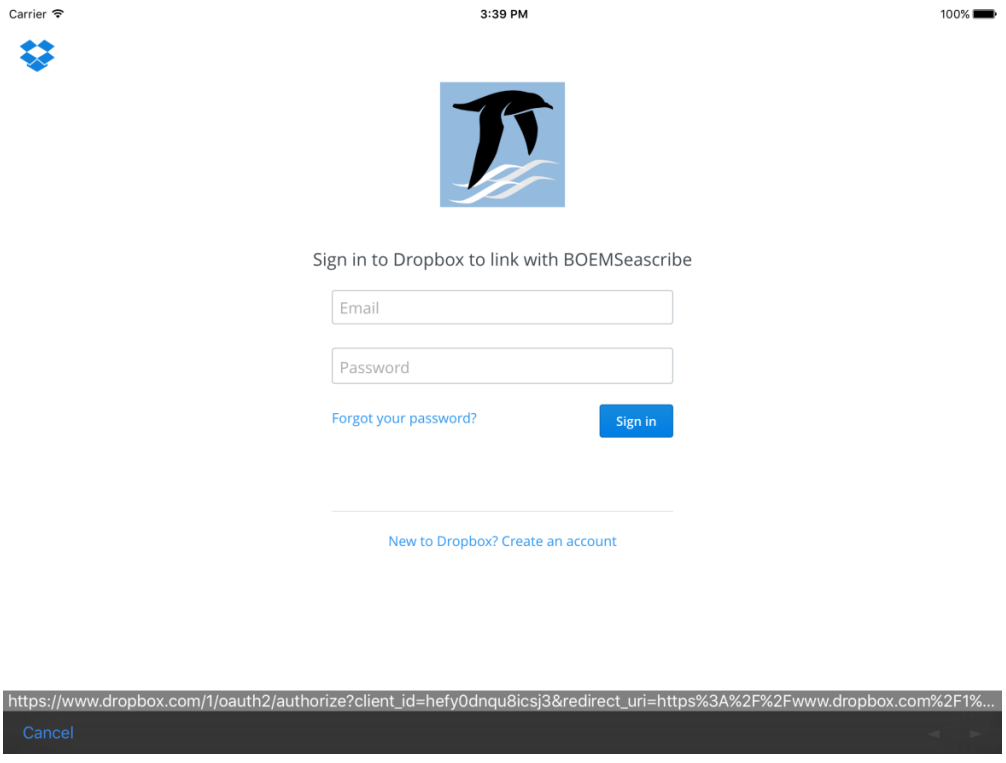


Figure 38. Dropbox sign in form for linking Dropbox to SeaScribe.

6.7.1.3 Submit survey data

To submit data by email or Dropbox, select one or more surveys. Selected surveys will be highlighted in blue and can be unselected by clicking the selected (blue) row. Click “Submit” for selected survey(s) to submit all of the data collected for the survey(s) including all transects. Like report submission, data submission gives you options for the export destination, email or Dropbox, as well as export format options (Figure 39): JSON (JavaScript object notation) and CSV (comma-separated value). JSON is a lightweight data-interchange format popular for programming and the web (http://www.json.org/). Using JSON, all fields and metadata are stored in this text-based format and only a single file is exported per survey. CSV data is presented in tabular format, ready to be loaded into statistical software or GIS programs for example. When selecting CSV, in addition to the data, metadata about the survey is provided separately as a JSON file, and the trip report in HTML (total of three files).

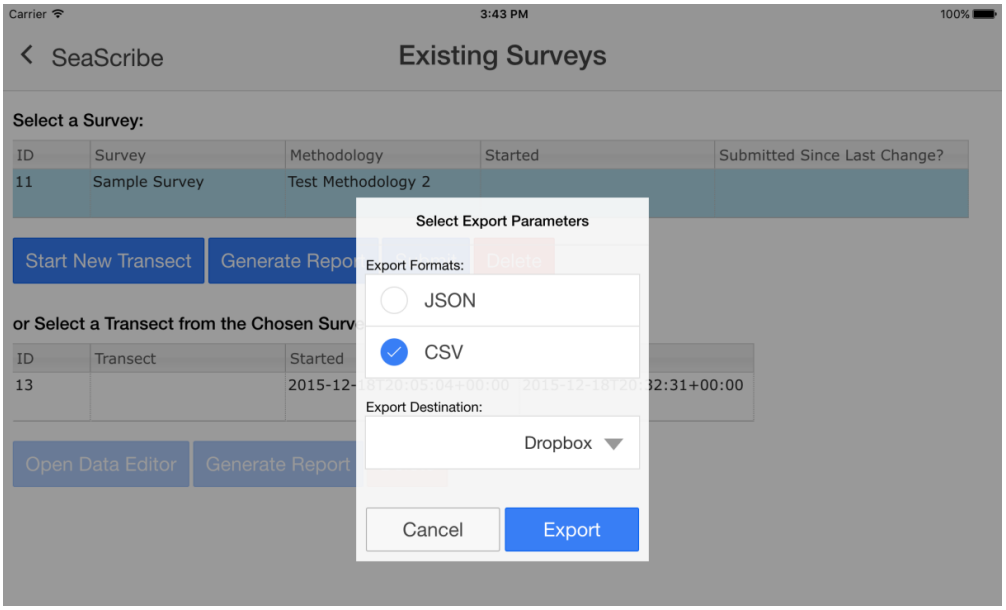
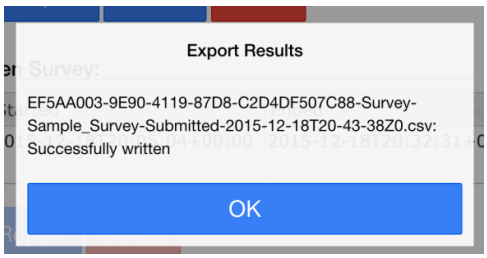


Figure 39. Submitting data for existing surveys.

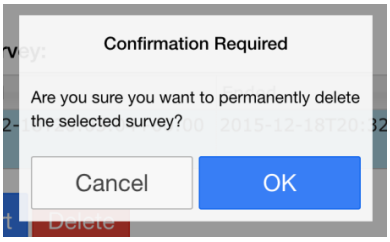
You will see that once data are submitted that the column “Submitted since Last Change?” will be filled in with either Email and/or Dropbox. Successful export will generate an email with attachment(s) when submitting by email, but note that SeaScribe can’t verify whether or not the email has been sent. Check your sent email box for confirmation of submission. If results have been successfully written to Dropbox, an “Export Results” dialog box will be shown.



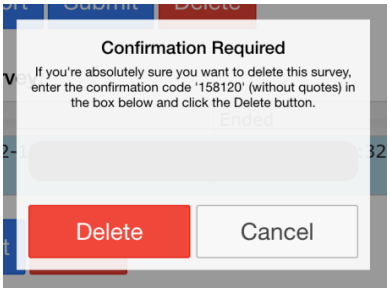
If submitting data directly to BOEM, the address 'boemseascribe@boem.gov' can be used to submit data. This address is monitored by personnel at BOEM.

6.7.1.4 Delete a survey

To delete survey level data, select one or more surveys. Selected surveys will be highlighted in blue and can be unselected by clicking the selected (blue) row. Click "Delete" for selected survey(s) to delete all of the data collected for the survey(s) including all transects. Confirmation is required.



Click "OK" to confirm and proceed to the next confirmation step or "Cancel" to exit. In the next step, you will be provided a confirmation code to enter to execute the deletion. This is a safety mechanism to protect the user from accidental deletion. Enter the code and click "Delete" to delete or "Cancel" to exit.



After deletion, the survey and associated transect(s) will be removed from the list (Figure 40).

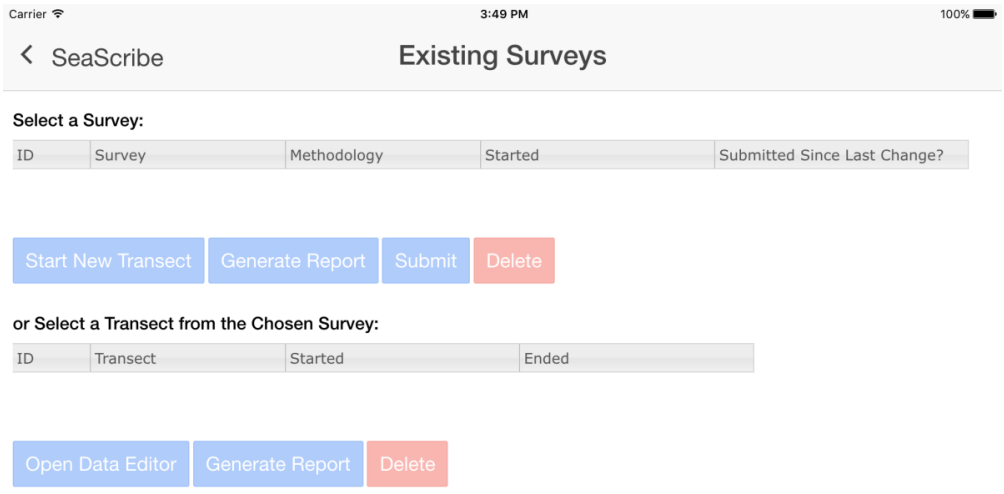


Figure 40. Transect removed after deletion from list of transects.

6.7.2 Operations on transects

When a transect is selected after selecting a survey, you can “Open Data Editor”, “Generate Report”, and “Delete”.

6.7.2.1 Data editor

You can edit observations for a particular transect by selecting the transect and clicking the “Open Data Editor” button which takes you to the editor screen (Figure 41).

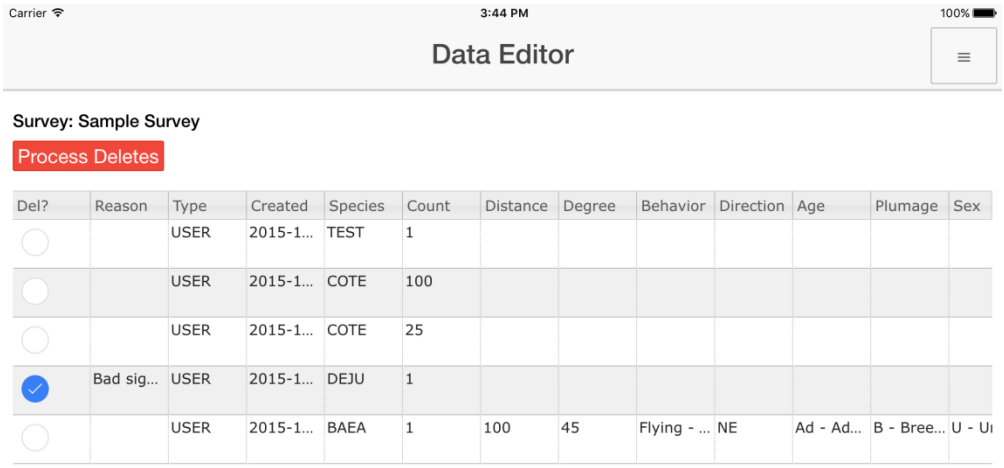


Figure 41. The data editor screen.

If you click on the options button at the top right you have access to three options: “Start New Transect for this Survey”, “Submit Survey”, and “Exit”.

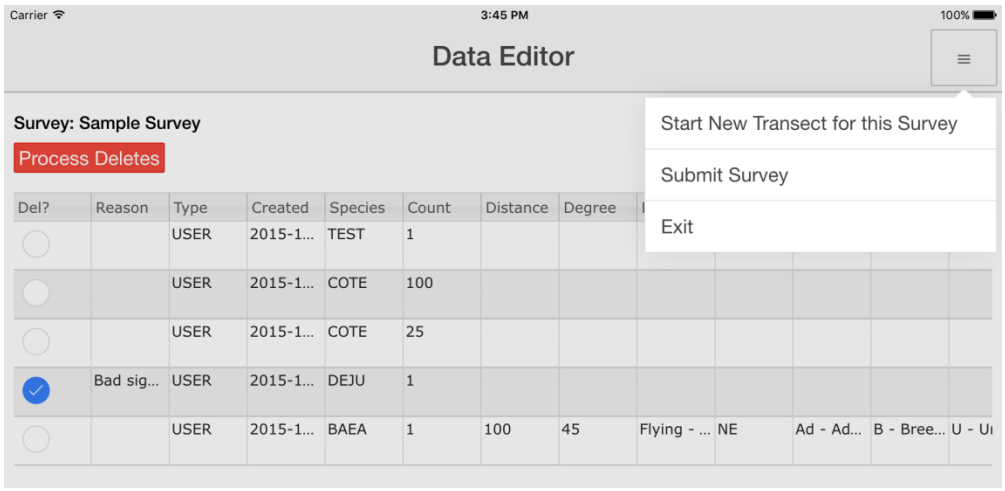


Figure 42. Options in the data editor.

In the data editor, like on the real-time spreadsheet view of the observations form (see 6.5.4), you can edit data fields (Figure 43, Figure 44).

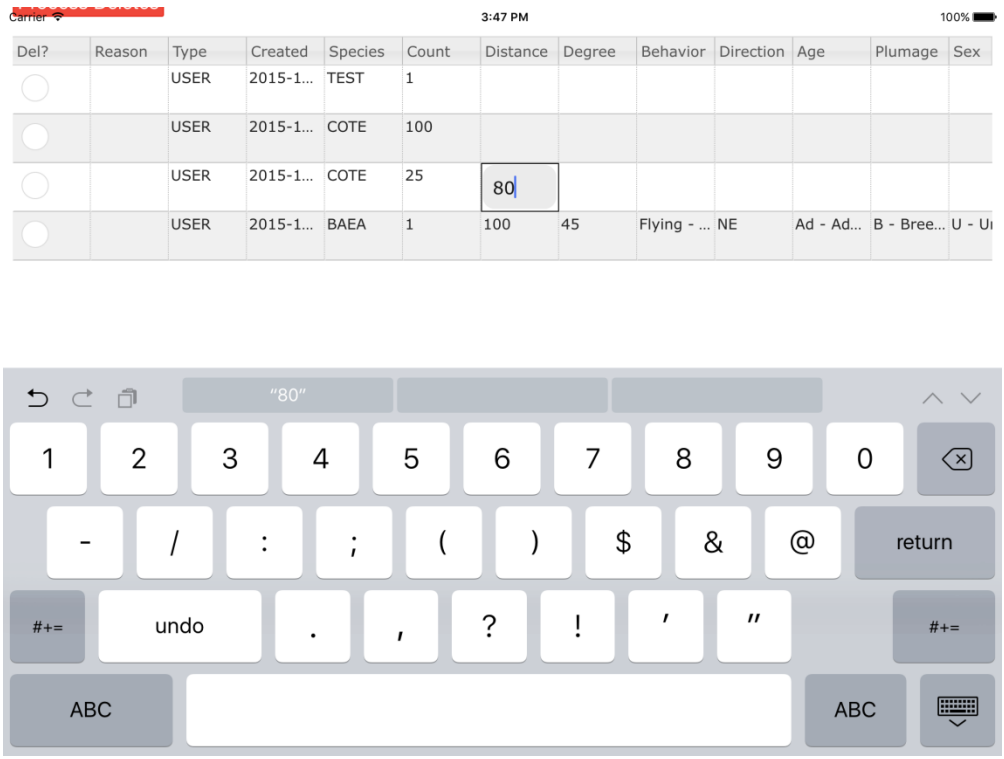


Figure 43. Editing text fields in the data editor.

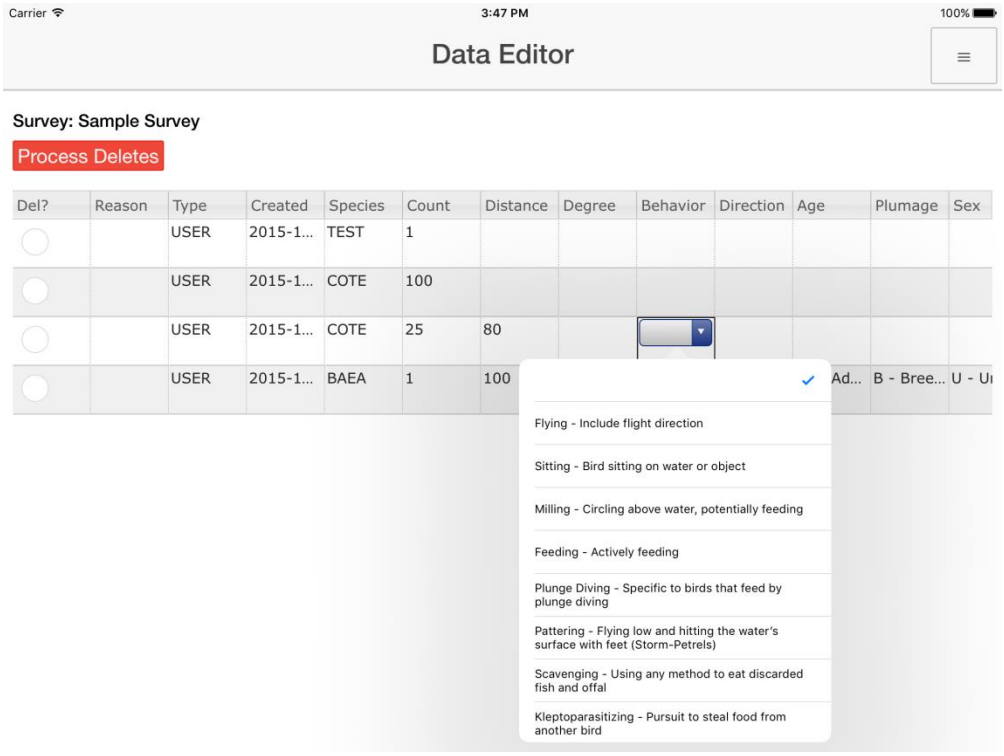


Figure 44. Editing dropdown fields in the data editor.

You can also process records for deletion here that you marked while recording data or marked here in data editing. Mark any additional records you may wish to delete and click the

button.

6.7.2.2 Generate transect-level report

You can generate a summary report for a transect by selecting the transect of interest and pressing "Generate Report". An on-screen report will be created with information about the transect including survey name, duration, distance traveled, methodology, number of transects, transect name(s), and number of users along with a summary table of observations to included observed species, number observed, total count, counts/hour, and counts/km (see Figure 36 for similar report at the survey level).

Within the survey report screen, if you click the upper right button on the screen , you are given the option to "Submit Report" via email or Dropbox in HTML format. This report can be read in any web browser and will show up in email content as well.

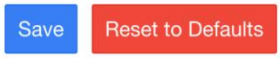
Select the export destination (Email or Dropbox) and select Export or Cancel (Figure 37). If you choose email and an email client is set up then the html report will be attached to a generated email in the email client on the device. Enter a recipient to send. If you choose to export via Dropbox and no Dropbox account is linked to SeaScribe, the program will request an email and password to link (Figure 38).

6.7.2.3 Delete a transect

To delete transect level data, highlight a transect in blue by selecting it (unselected by clicking the selected blue row). Click "Delete" for the selected transect to delete all of the data collected for this transect. Confirmation is required. After deletion, the transect will be removed from the list.

6.8 Settings

SeaScribe has a number of settings that allows the user to customize many things within the program. You can access the settings from the main menu of SeaScribe (see Figure 1). The settings are grouped into the following categories: GPS, mapping, map cache navigator, user interface, hotkeys, alerts, export and system. SeaScribe comes with default settings, which can always be reset by clicking the reset button at the bottom of the form. If any settings are outside of the required bounds, SeaScribe will suggest the upper or lower limit and also prompt you with a red box around it to enter a value.



6.8.1 GPS settings

The first category of settings is related to GPS function (Figure 45).

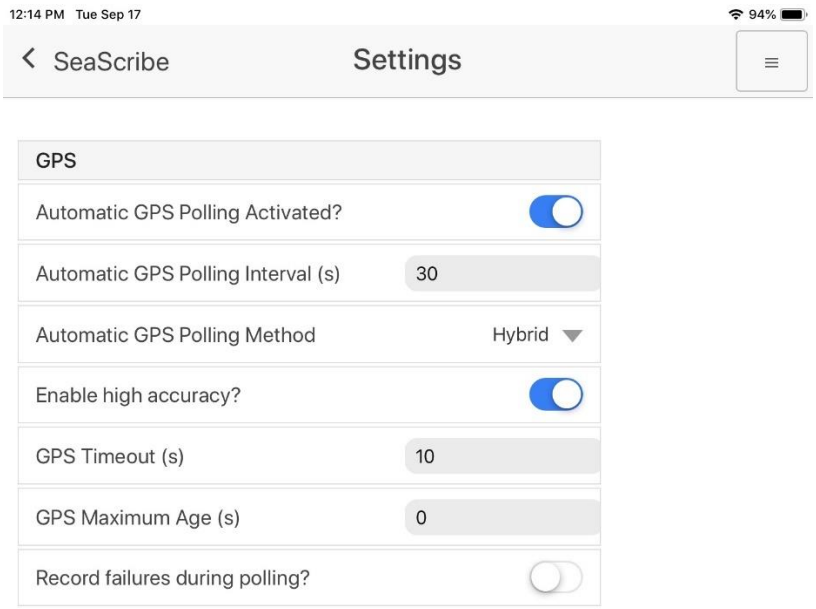


Figure 45. GPS function settings.

The following settings are available:

1) Automatic GPS Polling Activated – you can either enable or disable the polling function of the GPS. Automatic polling means that SeaScribe will request a location from the GPS and record this location along with the persistent field data at the set polling interval. Having polling on allows the user to record the track and thus effort for the survey. If the survey is a fixed survey effort, however, such as a seawatch, you may not want the location information being constantly recorded since it is of the same position (enabled or disabled, default = enabled).
2) Automatic GPS Polling Interval (s) – the polling interval in seconds (see above) (5-3600 s, default = 30 s).
3) Automatic GPS Polling Method – the method used to acquire the GPS location: interval, positional, hybrid (default). This was instituted in version 1.3.6 to deal with issues relating to Apple iPads not successfully acquiring GPS locations. Choices are:

    1. Interval: This is the historical method SeaScribe has always used which seems to work well for the Android platform and passes GPS locations upon request.

    2. Positional: Watches the location at all times, passing GPS locations to SeaScribe when requested as for heartbeat positions or observations. Discards intermediate positions.

    3. Hybrid: A hybrid method of the two above. We recommend keeping this settings as "Hybrid". Default.

4) Enable high accuracy – enable (default)/disable high accuracy locations on the devices.
5) GPS Timeout (s) – when GPS signal is poor, the GPS can "timeout" causing no location to be returned to SeaScribe. This timeout issues a warning in SeaScribe. The timeout interval can be lengthened if signal is poor and timeout occur regularly or shortened as necessary (1-60 s, default = 10 s).

6) GPS maximum age (s) – maximum age of the location from GPS that SeaScribe will use for a position. 0 means it will use the latest except for when there is a GPS error.
7) Record failures during polling – when a request for GPS coordinates fails, do you want to record the error message to the database (enabled or disabled, default = disabled).

6.8.2 Mapping settings

Here you can adjust settings related to mapping in the observation form (Figure 46).

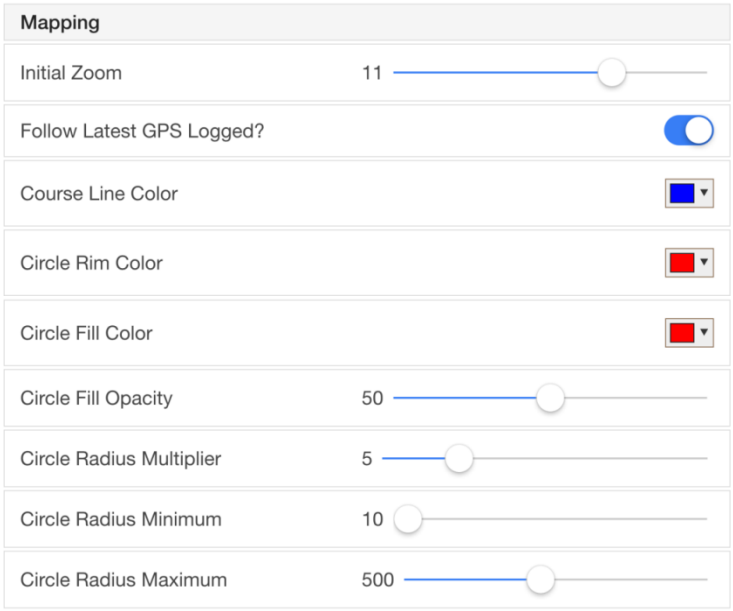


Figure 46. Mapping function settings.

Mapping options include:

1) Initial zoom level (1-15, default = 11).
2) Follow Latest GPS Logged – move the map to follow the latest GPS position logged (enabled or disabled, default = enabled).
3) Course Line Color – select one of fifteen colors (default = blue).
4) Circle Rim Color – select one of fifteen colors (default = red).
5) Circle Fill Color – select one of fifteen colors (default = red).
6) Circle Fill Opacity – set the opacity of the circle fill from transparent (0) to opaque (100) (default = 50).
7) Circle Radius Multiplier – this sets the multiplier of the observation point circle radius; this factor is responsible for the circle size increasing as the observation count increases (1-20, default = 5).
8) Circle Radius Minimum – this sets the minimum of the observation point circle radius (10-100, default = 10).
9) Circle Radius Maximum – this sets the maximum of the observation point circle radius (100-1000, default = 500).

6.8.3 Map cache navigator settings

These setting set define options in the map cache navigator (Figure 47).

Figure 47. Map cache navigator settings.

Settings include:

1) Show the Lowest Zoom Only – you can end up with a lot of tiles in the map cache, especially if you cache multiple zoom levels. This makes the Offline Map Cache display difficult to navigate, due to the sheer number of tiles. When Show Lowest Zoom Only is enabled, only tiles from the lowest zoom level will be displayed in the Offline Map Cache display. For example, if you cache zoom levels 10 to 12, only tiles from the level 10 set are shown (enabled or disabled, default = enabled).
2) Show Label Tiles – the ArcGIS ocean maps are split into two sets of tiles; terrain and labels, both are downloaded when the user requests to cache a map. In the Offline Map Cache display, the label tiles are small enough to be largely illegible, making their usefulness in that display minimal. This setting exists to once again reduce the number of tiles in the Offline Map Cache display (enabled or disabled, default = disabled).

6.8.4 User interface settings

Settings related to the user interface (Figure 48).

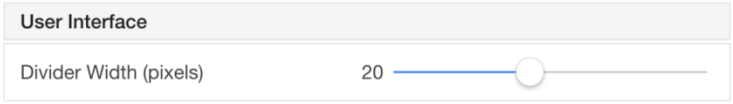


Figure 48. User interface settings.

1) Set the divider width between panes in the observation data entry form. A wider divider is easier to touch in the UI, but takes up valuable screen real estate.

6.8.5 Hotkeys settings

These are settings to control hotkeys (Figure 49). By default, only behavior has a hotkey field. If the user adds any hotkeys to age or plumage, the “Quick Age” and “Quick Plumage” fields are added to the observation form. The user can change the listed order if you click the blue “Show Reorder” button. Drag the values using the three lined symbol at right to the desired order. Click “Save” to save the hotkey settings or “Cancel” or click outside of the popup form to cancel and exit.

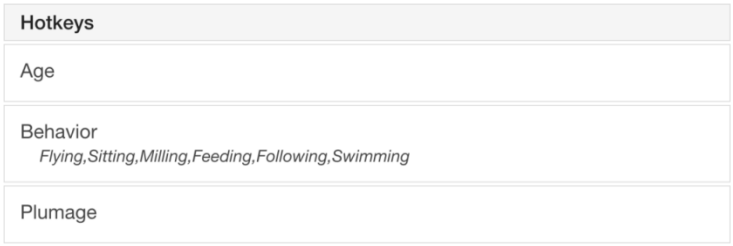


Figure 49. Hotkey settings.

1) Age – assign the ages as hotkeys to speed up data entry.
2) Behavior – assign the behavior hotkeys which have defaults as shown in the settings.
3) Plumage – assign the plumages as hotkeys to speed up data entry.

6.8.6 Alerts settings

Here the user can modify settings related to the persistent check alert (Figure 50).

Figure 50. Alerts settings.

1) Persistent Check Activated – will the blue persistent check alert appear in the observation form (see 6.5.2.3) or not (enabled to appear or disabled, default = enabled).
2) Persistent Check Interval – the interval at which the persistent check flag will appear in seconds (60-7200 s, default = 900 s).
3) Scroll to Persistent – set whether clicking the “Time to review persistent form fields” button (see 6.5.2.3) in the header of the observation form scrolls to the persistent fields or not (enabled to scroll or disabled, default = enabled).

6.8.7 Export settings

Settings related to data export.

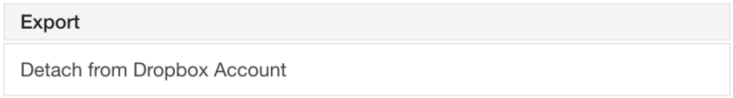


Figure 51. Export settings.

1) Detach from Dropbox Account – this setting allows the user to detach the device from Dropbox. This is a 3-step process including signing out of Dropbox, disassociating the application from the Dropbox account via a web browser, and restarting the app. You will be asked to click next to continue after explaining this process in a dialog box.

6.8.8 System settings

System settings can be changed here (Figure 52). Except for “About” and “Privacy Policy”, all of these options are designed to assist with debugging any issues that may arise. As such, we recommend leaving the default settings unless directed otherwise by a technical support representative.

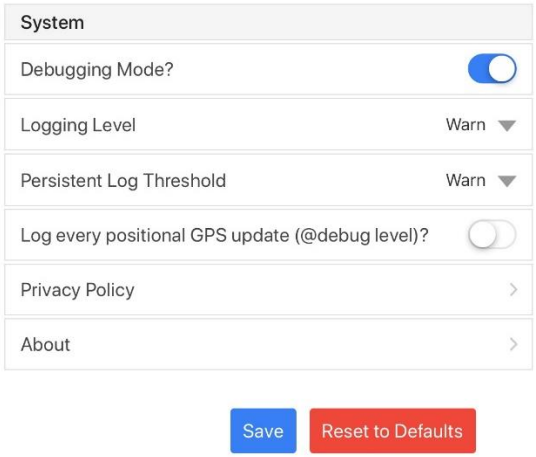


Figure 52. System settings.

1) Debugging Mode – if enabled, extra options are shown in the Manage Data page. These extra options are Export Database, View Persistent Logs, and View Device Info (enabled or disabled, default = disabled).
2) Logging Level – sets the transient logging level. Levels, in order from most voluminous to least, are Debug, Info, Warn, Error, and Fatal. This is of no practical use unless the device is directly connected to a developer workstation for debugging purposes; we recommend leaving the setting at Info (Trace, Debug, Info, Warn, Error, or Fatal; default = Info).
3) Persistent Log Threshold – sets persistent logging level. Levels, in order from most voluminous to least, are Debug, Info, Warn, Error, and Fatal. We recommend never setting this threshold below Info unless so directed by a technical support representative (Debug, Info, Warn, Error, or Fatal; default = Info).
4) Log every positional GPS update (@debug level) – log GPS positions when logging is set to debug and GPS setting is hybrid or positional.
5) Privacy Policy – SeaScribe’s privacy policy which briefly describes how SeaScribe collects, uses, and handles your information (Figure 53).

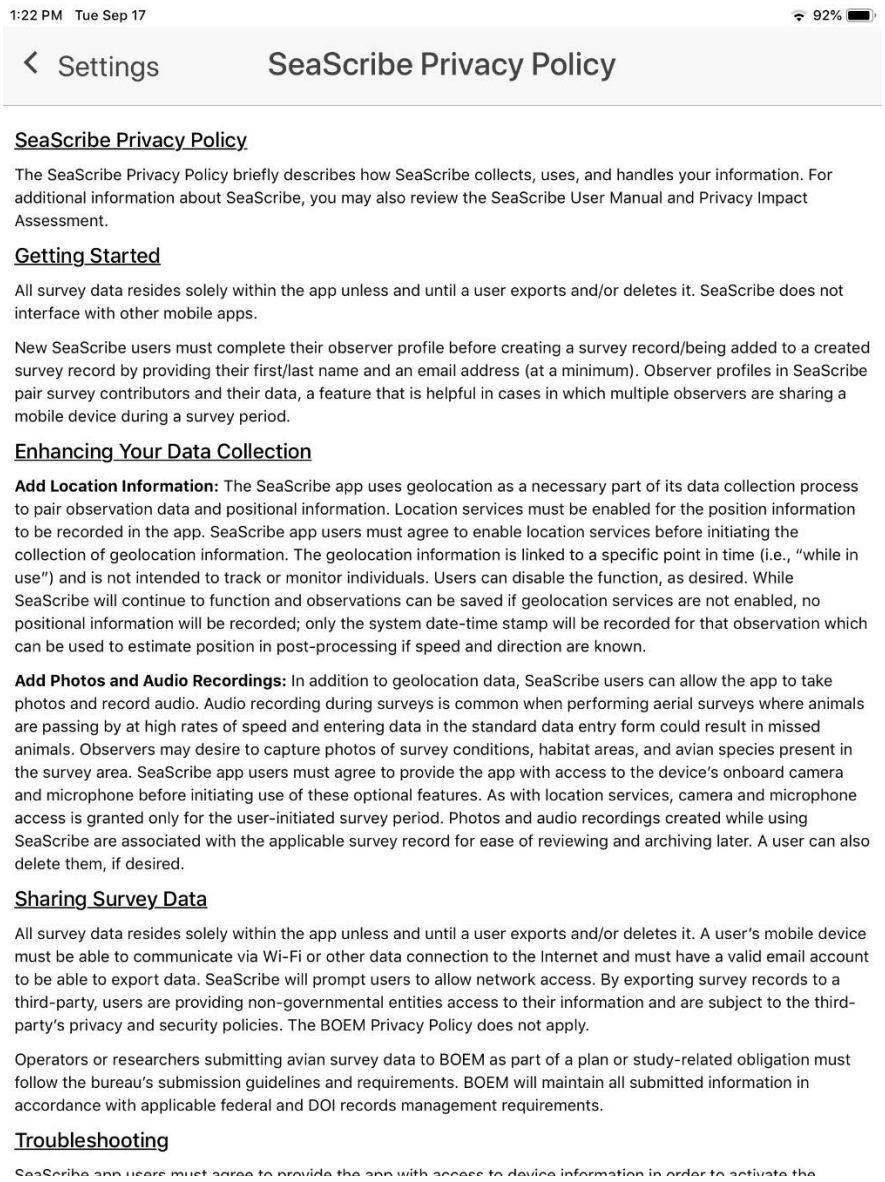


Figure 53. SeaScribe's privacy policy description.

6) About – this is not a setting at all, but provides details about SeaScribe (Figure 54): version, funders (BOEM) and creators (BRI and Tilson), mapping data and open source attributions as well as links to further information (press "Go" to open a web browser for more info and click the X to return to SeaScribe).

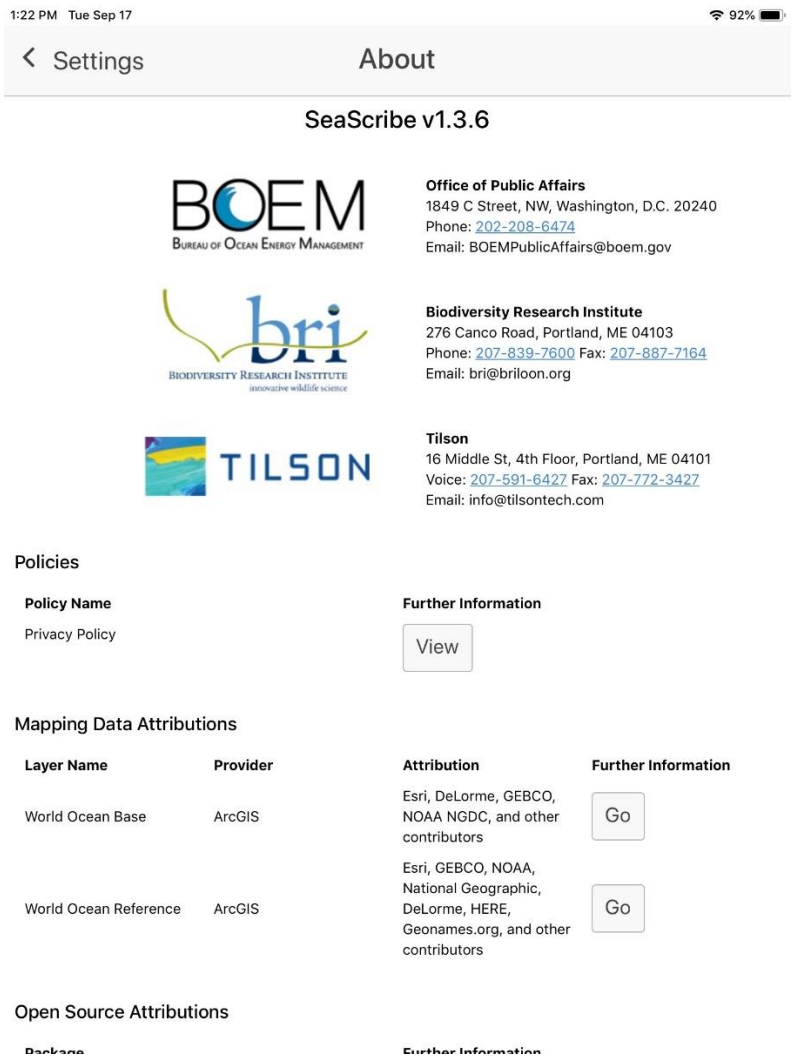


Figure 54. The about screen.

6.9 Tools

SeaScribe provides a few tools accessed from the “Tools” menu: illustrated Beaufort scale, distance estimation guide, manage data, offline maps, and GPS Tests, each of which will be described below (Figure 55).

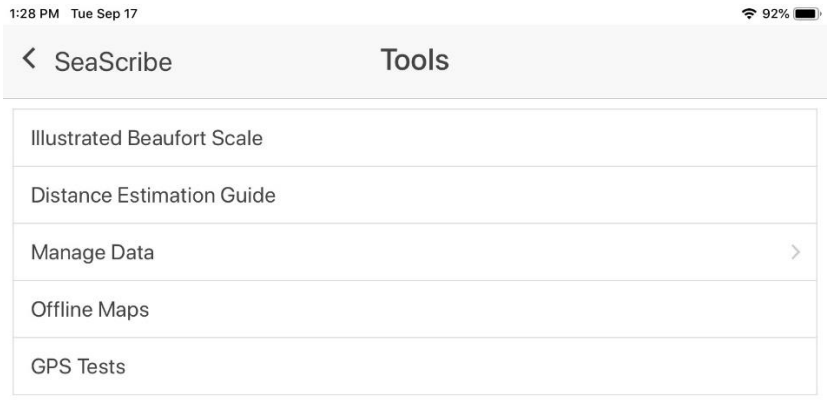


Figure 55. Tools menu.

6.9.1 Illustrate Beaufort Scale

This tool provides an illustrated guide to assessing Beaufort Scale (sea state)[3]. The conditions and an image are provided to assist the observer in correctly identifying Beaufort condition (Figure 56) which has an important effect on object detection. This scale is also accessible from the observation form options and tools button ≡ in the Observation Form.

[3] https://en.wikipedia.org/wiki/Beaufort_scale

0 - Calm

Wind Speed < 1 kmh / < 1 mph / < 1 knots / < 0.3 mps

Wave Height 0 m / 0 ft

Sea Conditions Flat.

Land Conditions Calm. Smoke rises vertically.

BEAUFORT FORCE 0
WIND SPEED: LESS THAN 1 KNOT

SEA: SEA LIKE A MIRROR

1 - Light Air

Wind Speed 1.1-5.5 kmh / 1-3 mph / 1-3 knots / 0.3-1.5 mps

Wave Height 0-0.2 m / 0-1 ft

Sea Conditions Ripples without crests.

Land Conditions Smoke drift indicates wind direction. Leaves and wind vanes are stationary.

BEAUFORT FORCE 1
WIND SPEED: 1-3 KNOTS

SEA: WAVE HEIGHT .1M (.25FT), RIPPLES WITH THE APPEARANCE OF SCALES, BUT WITHOUT FOAM CRESTS

2 - Light Breeze

Wind Speed 5.6-11 kmh / 4-7 mph / 4-6 knots / 1.6-3.3 mps

Wave Height 0.2-0.5 m / 1-2 ft

Sea Conditions Small wavelets. Crests of glassy appearance, not breaking.

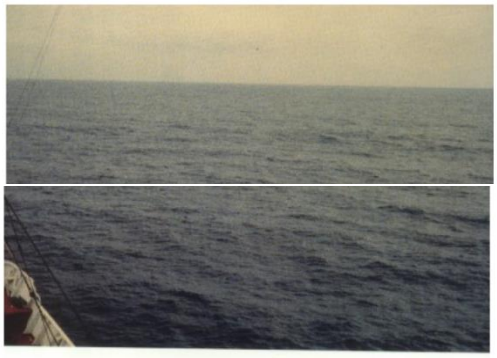
Land Conditions Wind felt on exposed skin. Leaves rustle. Wind vanes begin to move.

BEAUFORT FORCE 2
WIND SPEED: 4-6 KNOTS

SEA: WAVE HEIGHT .2-.3M (.5-1FT), SMALL WAVELETS, CRESTS HAVE A GLASSY APPEARANCE AND DO NOT BREAK

3 - Gentle Breeze

Wind Speed	12-19 kmh / 8-12 mph / 7-10 knots / 3.4-5.4 mps
Wave Height	0.5-1 m / 2-3.5 ft
Sea Conditions	Large wavelets. Crests begin to break; scattered whitecaps.
Land Conditions	Leaves and small twigs constantly moving, light flags extended.



BEAUFORT FORCE 3
WIND SPEED: 7-10 KNOTS

SEA: WAVE HEIGHT .6-1M (2-3FT), LARGE WAVELETS, CRESTS BEGIN TO BREAK, ANY FOAM HAS GLASSY APPEARANCE, SCATTERED WHITECAPS

4 - Moderate Breeze

Wind Speed	20-28 kmh / 13-17 mph / 11-16 knots / 5.5-7.9 mps
Wave Height	1-2 m / 3.5-6 ft
Sea Conditions	Small waves with breaking crests. Fairly frequent whitecaps.
Land Conditions	Dust and loose paper raised. Small branches begin to move.

BEAUFORT FORCE 4
WIND SPEED: 11-16 KNOTS

SEA: WAVE HEIGHT 1-1.5M (3.5-5FT), SMALL WAVES BECOMING LONGER, FAIRLY FREQUENT WHITE HORSES

5 - Fresh Breeze

Wind Speed	29-38 kmh / 18-24 mph / 17-21 knots / 8.0-10.7 mps
Wave Height	2-3 m / 6-9 ft
Sea Conditions	Moderate waves of some length. Fairly frequent whitecaps.
Land Conditions	Branches of a moderate size move. Small trees in leaf begin to sway.

BEAUFORT FORCE 5
WIND SPEED: 17-21 KNOTS

SEA: WAVE HEIGHT 2-2.5M (6-8FT), MODERATE WAVES TAKING MORE PRONOUNCED LONG FORM, MANY WHITE HORSES, CHANCE OF SOME SPRAY

5 - Fresh Breeze

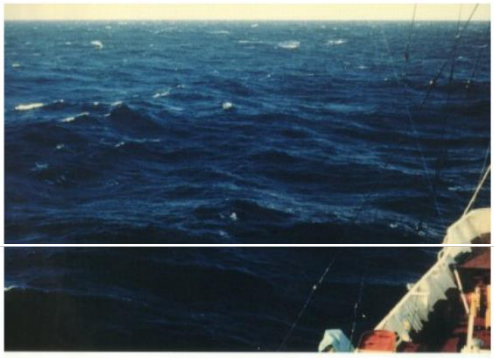
Wind Speed	29-38 kmh / 18-24 mph / 17-21 knots / 8.0-10.7 mps
Wave Height	2-3 m / 6-9 ft
Sea Conditions	Moderate waves of some length. Fairly frequent whitecaps.
Land Conditions	Branches of a moderate size move. Small trees in leaf begin to sway.

BEAUFORT FORCE 5
WIND SPEED: 17-21 KNOTS

SEA: WAVE HEIGHT 2-2.5M (6-8FT), MODERATE WAVES TAKING MORE PRONOUNCED LONG FORM, MANY WHITE HORSES, CHANCE OF SOME SPRAY

6 - Strong Breeze

Wind Speed	39-49 kmh / 25-30 mph / 22-27 knots / 10.8-13.8 mps
Wave Height	3-4 m / 9-13 ft
Sea Conditions	Long waves begin to form. White foam crests are very frequent. Some airborne spray is present.
Land Conditions	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult. Empty plastic bins tip over.



BEAUFORT FORCE 6
WIND SPEED: 22-27 KNOTS

SEA: WAVE HEIGHT 3-4M (9.5-13 FT), LARGER WAVES BEGIN TO FORM, SPRAY IS PRESENT, WHITE FOAM CRESTS ARE EVERYWHERE

7 - High Wind, Moderate Gale, Near Gale

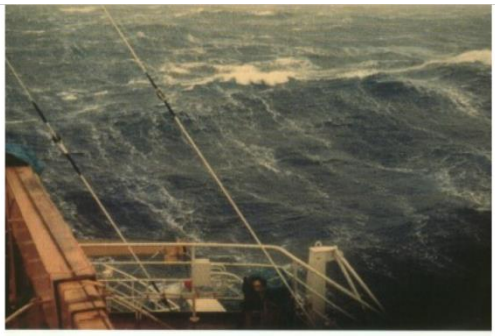
Wind Speed	50-61 kmh / 31-38 mph / 28-33 knots / 13.9-17.1 mps
Wave Height	4-5.5 m / 13-19 ft
Sea Conditions	Sea heaps up. Some foam from breaking waves is blown into streaks along wind direction. Moderate amounts of airborne spray.
Land Conditions	Whole trees in motion. Effort needed to walk against the wind.

BEAUFORT FORCE 7
WIND SPEED: 28-33 KNOTS

SEA: WAVE HEIGHT 4-5.5M (13.5-19 FT), SEA HEAPS UP, WHITE FOAM FROM BREAKING WAVES BEGINS TO BE BLOWN IN STREAKS ALONG THE WIND DIRECTION

8 - Gale, Fresh Gale

Wind Speed	62-74 kmh / 39-46 mph / 34-40 knots / 17.2-20.7 mps
Wave Height	5.5-7.5 m / 18-25 ft
Sea Conditions	Moderately high waves with breaking crests forming spindrift. Well-marked streaks of foam are blown along wind direction. Considerable airborne spray.
Land Conditions	Some twigs broken from trees. Cars veer on road. Progress on foot is seriously impeded.

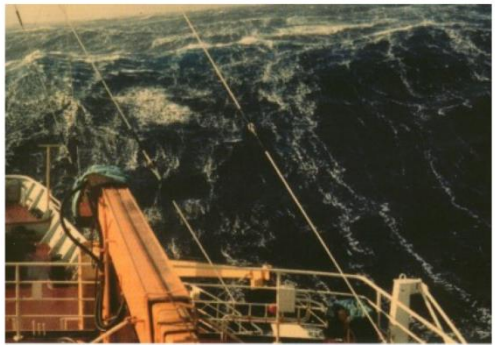


BEAUFORT FORCE 8
WIND SPEED: 34-40 KNOTS

SEA: WAVE HEIGHT 5.5-7.5M (18-25FT), MODERATELY HIGH WAVES OF GREATER LENGTH, EDGES OF CREST BEGIN TO BREAK INTO THE SPINDRIFT, FOAM BLOWN IN WELL MARKED STREAKS ALONG WIND DIRECTION.

9 - Strong Gale

Wind Speed	75-88 kmh / 47-54 mph / 41-47 knots / 20.8-24.4 mps
Wave Height	7-10 m / 23-32 ft
Sea Conditions	High waves whose crests sometimes roll over. Dense foam is blown along wind direction. Large amounts of airborne spray may begin to reduce visibility.
Land Conditions	Some branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over.



10 - Storm, Whole Gale

Wind Speed	89-102 kmh / 55-63 mph / 48-55 knots / 24.5-28.4 mps
Wave Height	9-12.5 m / 29-41 ft
Sea Conditions	Very high waves with overhanging crests. Large patches of foam from wave crests give the sea a white appearance. Considerable tumbling of waves with heavy impact. Large amounts of airborne spray reduce visibility.
Land Conditions	Trees are broken off or uprooted, structural damage likely.

BEAUFORT FORCE 10
WIND SPEED: 48-55 KNOTS

SEA: WAVE HEIGHT 9-12.5M (29-41FT), VERY HIGH WAVES WITH LONG OVERHANGING CRESTS, THE RESULTING FOAM, IN GREAT PATCHES, IS BLOWN IN DENSE WHITE STREAKS ALONG WIND DIRECTION. ON THE WHOLE, SEA SURFACE TAKES A WHITE APPEARANCE, TUMBLING OF THE SEA IS HEAVY AND SHOCK-LIKE, VISIBILITY AFFECTED.

11 - Violent Storm

Wind Speed	103-117 kmh / 64-73 mph / 56-63 knots / 28.5-32.6 mps
Wave Height	11.5-16 m / 37-52 ft
Sea Conditions	Exceptionally high waves. Very large patches of foam, driven before the wind, cover much of the sea surface. Very large amounts of airborne spray severely reduce visibility.
Land Conditions	Widespread vegetation and structural damage likely.

BEAUFORT FORCE 11
WIND SPEED: 56-63 KNOTS

SEA: WAVE HEIGHT 11.5-16M (37-52FT). EXCEPTIONALLY HIGH WAVES, SMALL-MEDIUM SIZED SHIPS MAY BE LOST TO VIEW BEHIND THE WAVES. SEA COMPLETELY COVERED WITH LONG WHITE PATCHES OF FOAM LYING ALONG WIND DIRECTION. EVERYWHERE, THE EDGES OF WAVE CRESTS ARE BLOWN INTO FROTH.

12 - Hurricane Force

Wind Speed	>= 118 kmh / >= 74 mph / >= 64 knots / >= 32.7 mps
Wave Height	>= 14 m / >= 46 ft
Sea Conditions	Huge waves. Sea is completely white with foam and spray. Air is filled with driving spray, greatly reducing visibility.
Land Conditions	Severe widespread damage to vegetation and structures. Debris and unsecured objects are hurled about.

BEAUFORT FORCE 12
WIND SPEED: 64 KNOTS

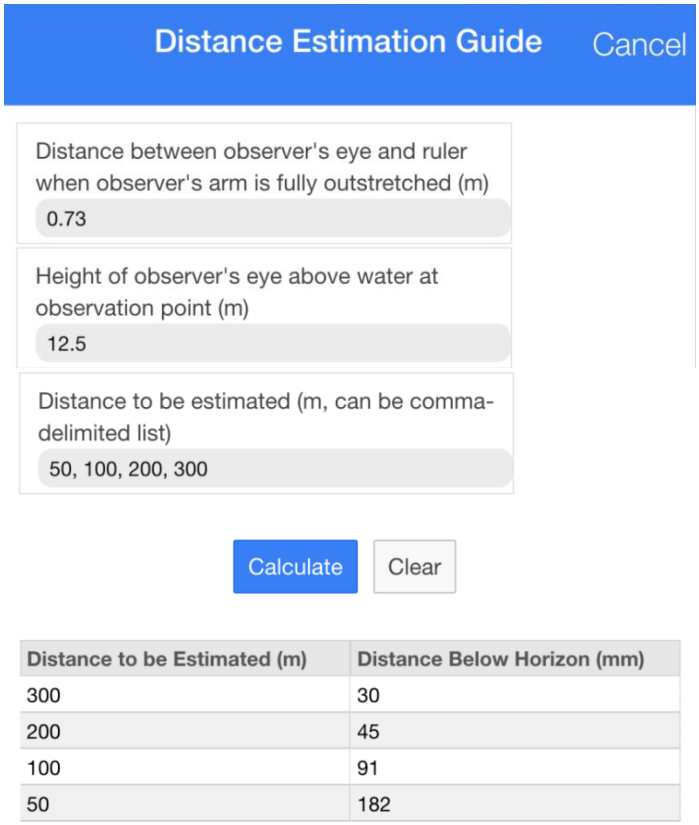
SEA: SEA COMPLETELY WHITE WITH DRIVING SPRAY. VISIBILITY VERY SERIOUSLY AFFECTED. THE AIR IS FILLED WITH FOAM AND SPRAY

Figure 56. Beaufort sea state scale descriptions.

6.9.2 Distance Estimation Guide

The distance estimation guide is a tool for calculating the measurements on a ruler necessary to estimate distance of the object using the horizon and markings on a ruler or window as a guide (Figure 57). Enter the distance between the observer and ruler (or window) when the observer's arm is fully outstretched (holding the ruler) or distance of the eye to the window which will have markings. Enter the distance above water in meters. Enter distances you would like estimated in a comma-separated list. Click "Calculate" and the list of distances (in meters) and distance below horizon in millimeters is given to be marked on the ruler or window[4].

[4] Gjerdrum, C., D.A. Fifield, and S.I. Wilhelm. 2012. Eastern Canada Seabirds at Sea (ECSAS) standardized protocol for pelagic seabird surveys from moving and stationary platforms. Canadian Wildlife Service Technical Report Series No. 515. Atlantic Region. Vi, 37 pp.



Distance to be Estimated (m)	Distance Below Horizon (mm)
300	30
200	45
100	91
50	182

Figure 57. Distance estimation tool.

6.9.3 Manage Data

The “Manage Data” window gives access to the database which stores the data behind the scenes for the application (Figure 58). Within this form you can select to: edit ancillary fields, edit survey platforms, edit observers, edit methodologies, reset all settings to defaults, delete and recreate database, export database, view persistent logs, view latest persistent logs from database, view database records counts, view device info, view GPS test data, and recovery.

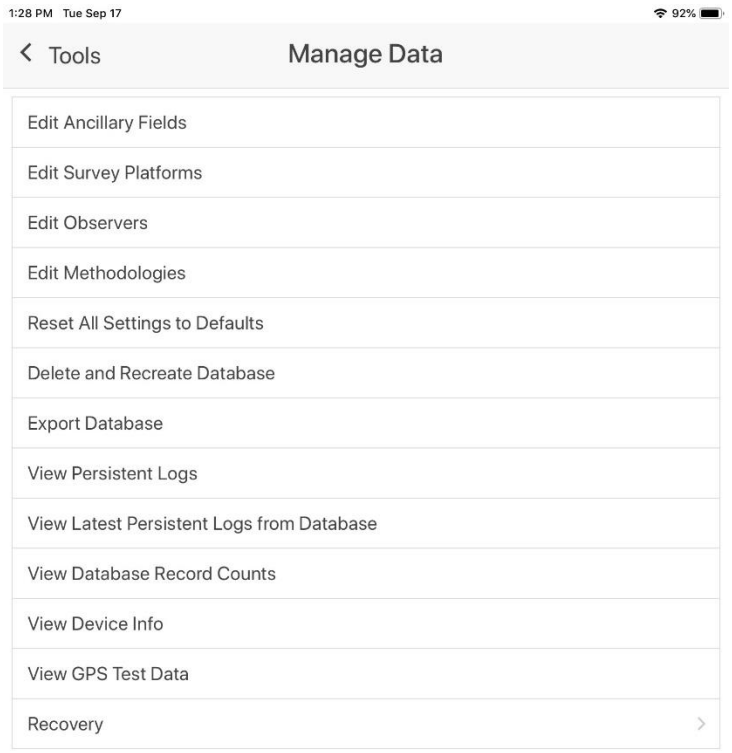
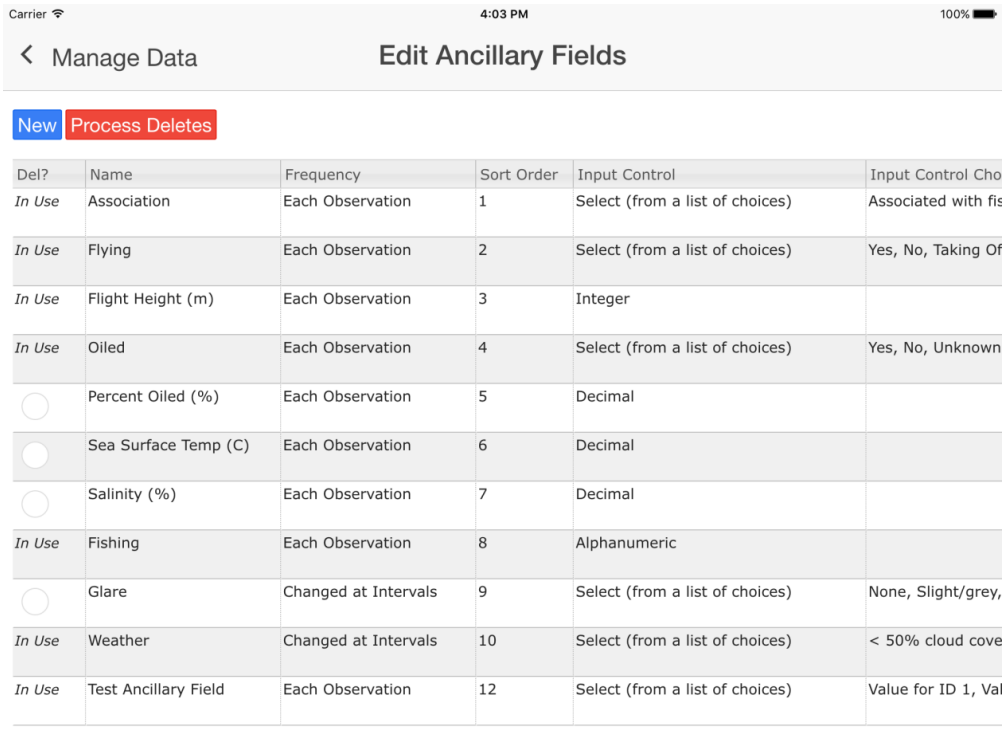


Figure 58. Manage data tools.

6.9.3.1 Edit ancillary fields

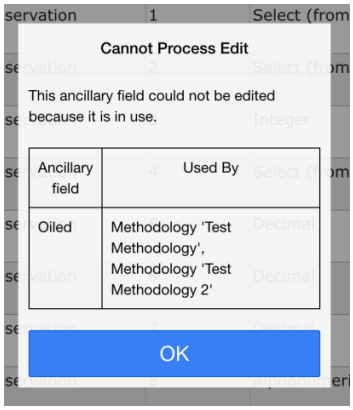
You will see in the edit ancillary fields table a list of the ancillary fields that have been added and the information about those fields (Figure 59). Here you can edit fields that are not in use, delete fields that have not been used, and add new fields.



Del?	Name	Frequency	Sort Order	Input Control	Input Control Cho
In Use	Association	Each Observation	1	Select (from a list of choices)	Associated with fis
In Use	Flying	Each Observation	2	Select (from a list of choices)	Yes, No, Taking Of
In Use	Flight Height (m)	Each Observation	3	Integer	
In Use	Oiled	Each Observation	4	Select (from a list of choices)	Yes, No, Unknown
○	Percent Oiled (%)	Each Observation	5	Decimal	
○	Sea Surface Temp (C)	Each Observation	6	Decimal	
○	Salinity (%)	Each Observation	7	Decimal	
In Use	Fishing	Each Observation	8	Alphanumeric	
○	Glare	Changed at Intervals	9	Select (from a list of choices)	None, Slight/grey,
In Use	Weather	Changed at Intervals	10	Select (from a list of choices)	< 50% cloud cove
In Use	Test Ancillary Field	Each Observation	12	Select (from a list of choices)	Value for ID 1, Val

Figure 59. Edit ancillary fields table.

To edit a field click the cell in a row you want to change that does not have the "*In Use*" designator. If the field is already in use and you try to edit it, a warning is given that the field can't be edited because it is in-use by the listed methodologies. Once the ancillary field has been used in survey, that field is locked from editing or deletion to preserve the information for that survey. You will need to add another ancillary field with the changes you desire.



To delete an unused ancillary field, click the open circle in the "Del?" column in the field of choice. Only those ancillary fields with rows that do not say "*In Use*" are able to be deleted. Click the red "Process Deletes" button to execute the ancillary field delete.

To add a new ancillary field, click the blue "New" button; doing so will open the "New Ancillary Field" dialog box where you can enter values for the new field. Click "Save" to save the new field or "Clear" to start over and "Cancel" to exit without creating a field (Figure 60).

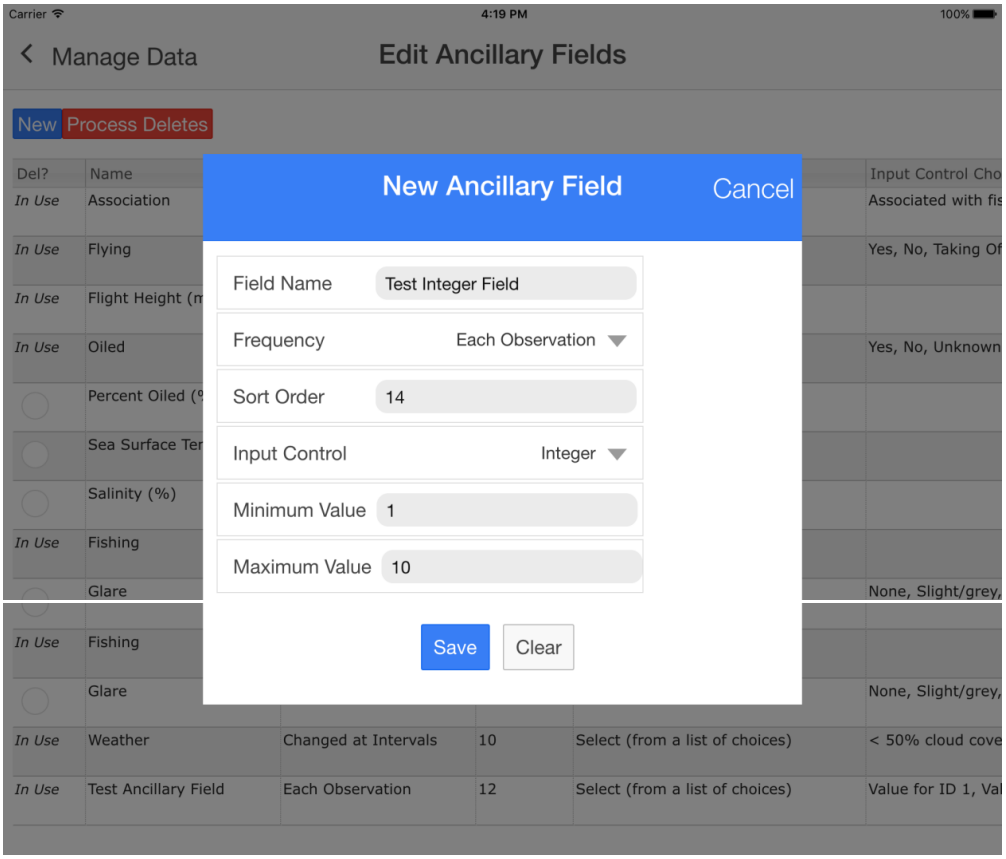
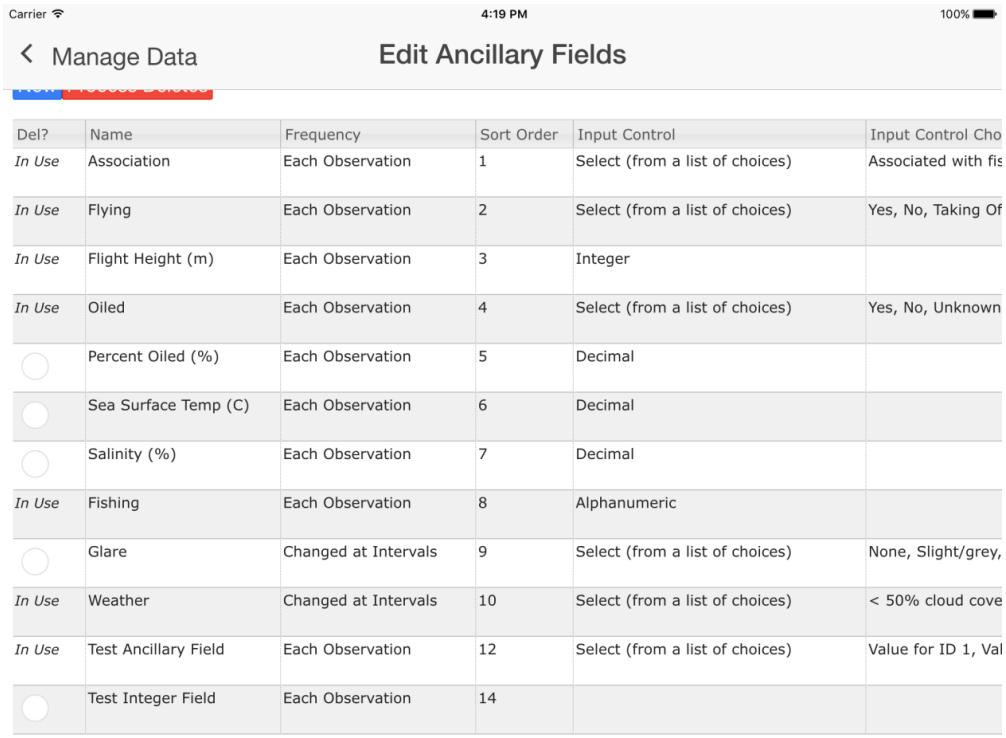


Figure 60. Enter a new ancillary field from the edit ancillary field form.

Once created, the new ancillary field gets listed in the table and is available for use in surveys (Figure 61).

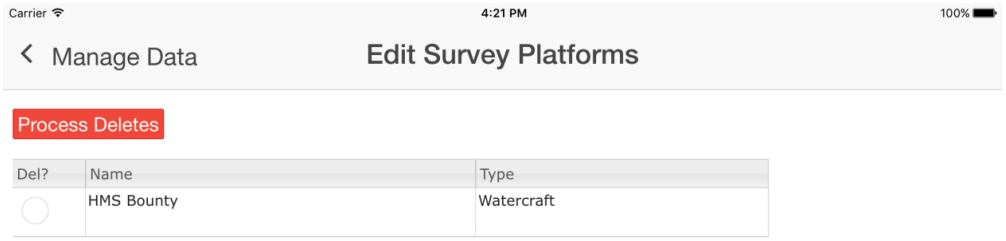


Del?	Name	Frequency	Sort Order	Input Control	Input Control Cho
In Use	Association	Each Observation	1	Select (from a list of choices)	Associated with fis
In Use	Flying	Each Observation	2	Select (from a list of choices)	Yes, No, Taking Of
In Use	Flight Height (m)	Each Observation	3	Integer	
In Use	Oiled	Each Observation	4	Select (from a list of choices)	Yes, No, Unknown
	Percent Oiled (%)	Each Observation	5	Decimal	
	Sea Surface Temp (C)	Each Observation	6	Decimal	
	Salinity (%)	Each Observation	7	Decimal	
In Use	Fishing	Each Observation	8	Alphanumeric	
	Glare	Changed at Intervals	9	Select (from a list of choices)	None, Slight/grey,
In Use	Weather	Changed at Intervals	10	Select (from a list of choices)	< 50% cloud cove
In Use	Test Ancillary Field	Each Observation	12	Select (from a list of choices)	Value for ID 1, Val
	Test Integer Field	Each Observation	14		

Figure 61. Addition of a new ancillary field.

6.9.3.2 Edit survey platforms

The user can edit survey platform information or delete survey platform(s) from the database (Figure 62). Select the cell in the platform of interest to edit or click the "Del?" cell and click "Process Deletes" to delete.



Del?	Name	Type
	HMS Bounty	Watercraft

Figure 62. Edit survey platforms.

To edit a text field simply click in the field and make the edits in the cell (Figure 63).

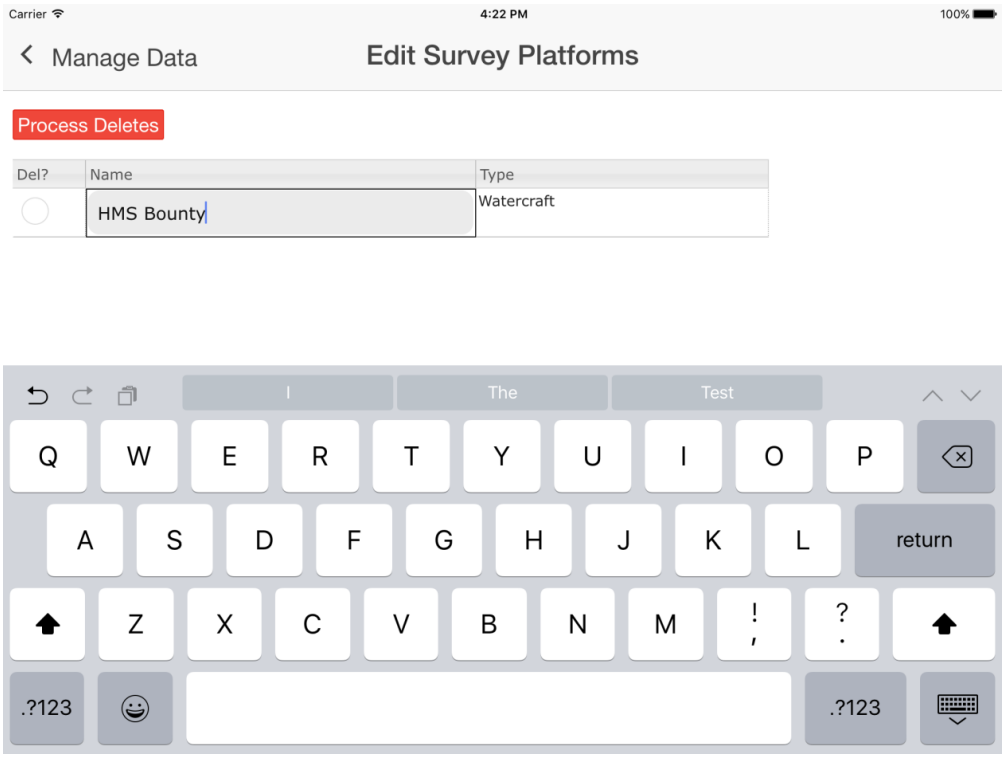


Figure 63. Edit a text field for a survey platform.

To change a dropdown click the dropdown box and select the desired entry (Figure 64).

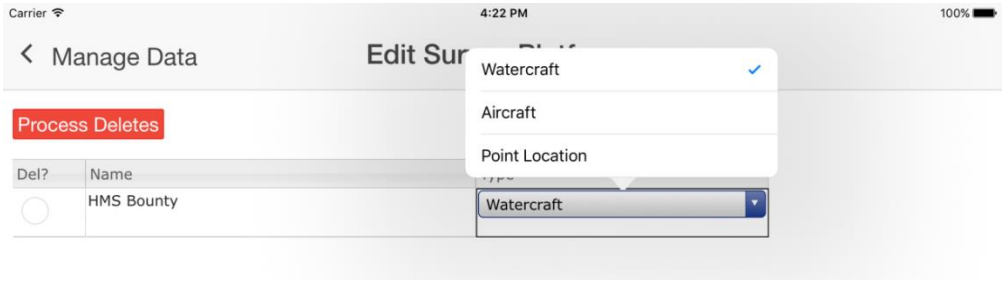


Figure 64. Changing a dropdown box for a survey platform.

6.9.3.3 Edit observers

The user can edit observer information or delete observer(s) from the database (Figure 65). Select the cell in the observer record to edit or click the “Del?” cell and click “Process Deletes” to delete. Editing observer fields follows in the same way as for survey platforms.

Figure 65. Edit observers data.

6.9.3.4 Edit methodologies

The user can edit methodologies or delete them from the database (Figure 66). Select the cell in the platform of interest to edit or click the "Del?" cell and click "Process Deletes" to delete.

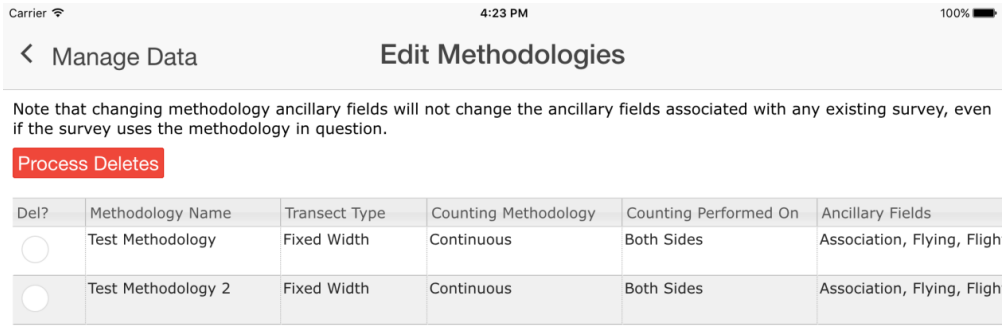


Figure 66. Edit methodologies.

To edit a text field simply click in the field and make the edits in the cell (Figure 67).

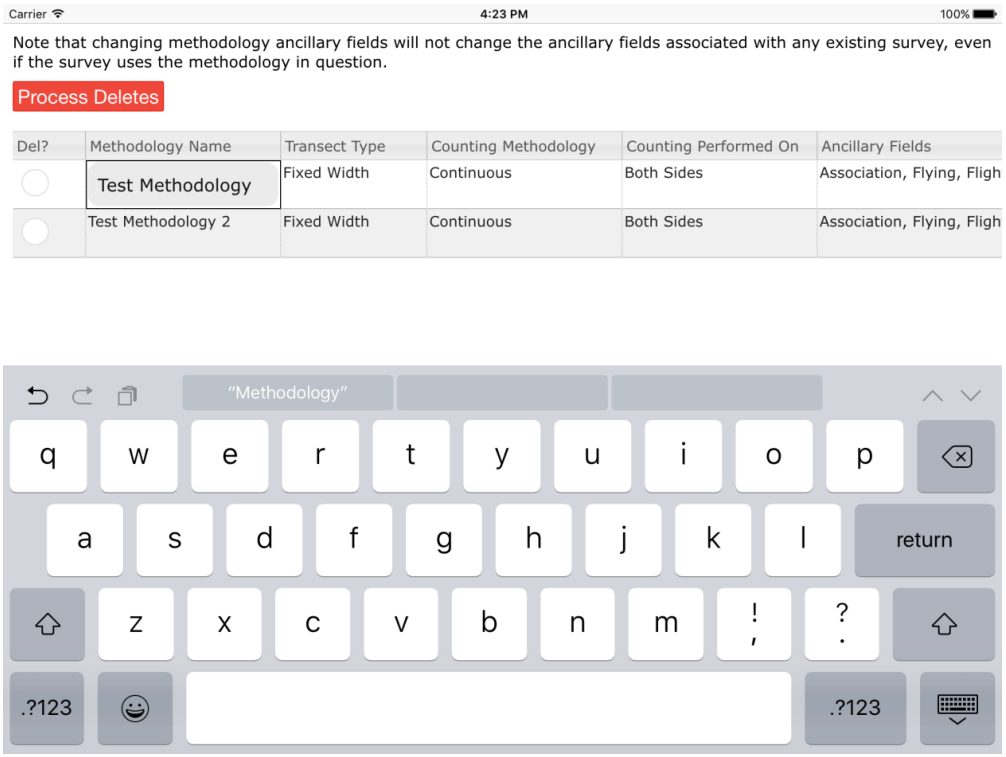


Figure 67. Edit a text field for a methodology.

To change a dropdown click the dropdown box and select the desired entry (Figure 68).

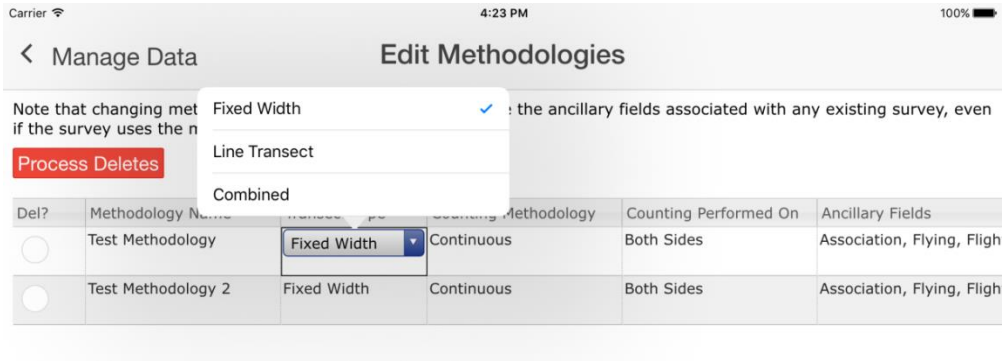


Figure 68. Changing a dropdown box for a methodology.

You can also modify the ancillary fields for a methodology using the select ancillary field dialog box (Figure 69).

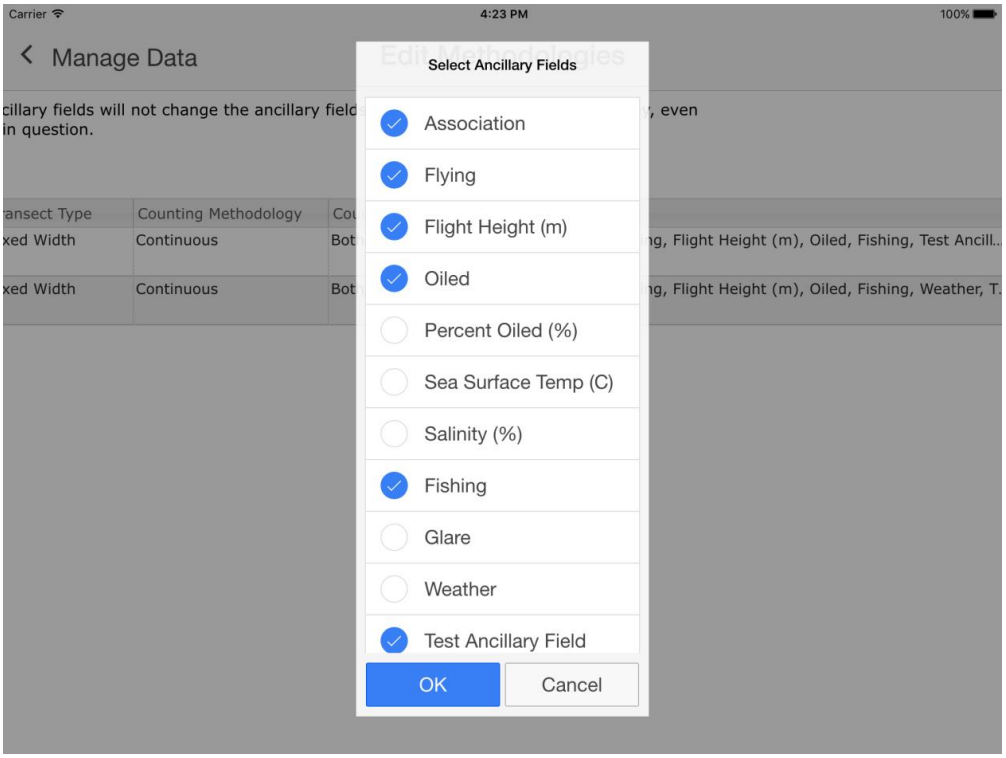
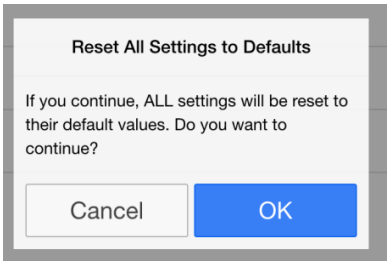


Figure 69. Modify ancillary fields dialog box in the edit methodologies window.

6.9.3.5 Reset all settings to defaults

You can perform a "factory reset" on the settings by clicking on the "Reset All Settings to Default" button which will bring up the following dialog box.



Click "Cancel" to exit or "OK" to accept the factory reset.

6.9.3.6 Delete and recreate the database

The database can be reset as well which will delete all data and reset to the base database. Caution should be taken as this will irreversibly delete **ALL DATA**. You will be asked to confirm deletion and enter a confirmation code to complete the database update.

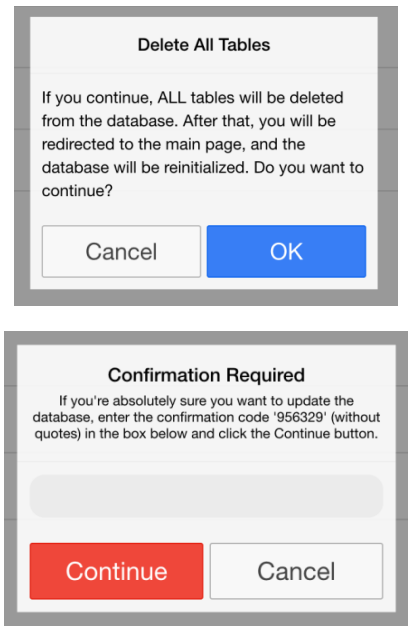
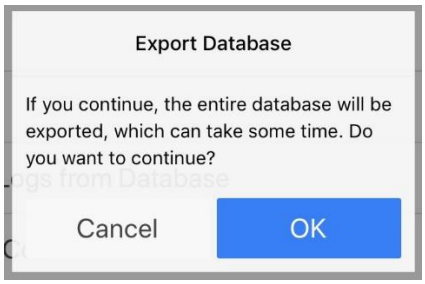


Figure 70. Delete and recreate the database.

6.9.3.7 Export database

Export the entire SeaScribe database for export or recovery. In practice we have found this can take a considerable amount of time so be patient.

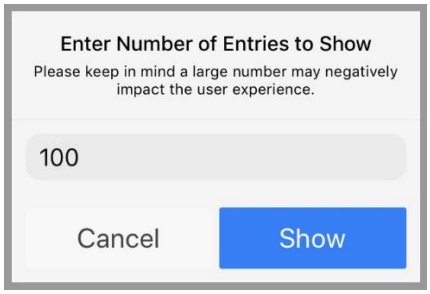


6.9.3.8 View persistent logs

This will allow you to view persistent logs if enabled.

6.9.3.9 View latest persistent logs from the database

Will show the latest X number of requested persistent log entries.



6.9.3.10 View database record counts

Show the number of records in the tables of the database (Figure 71).

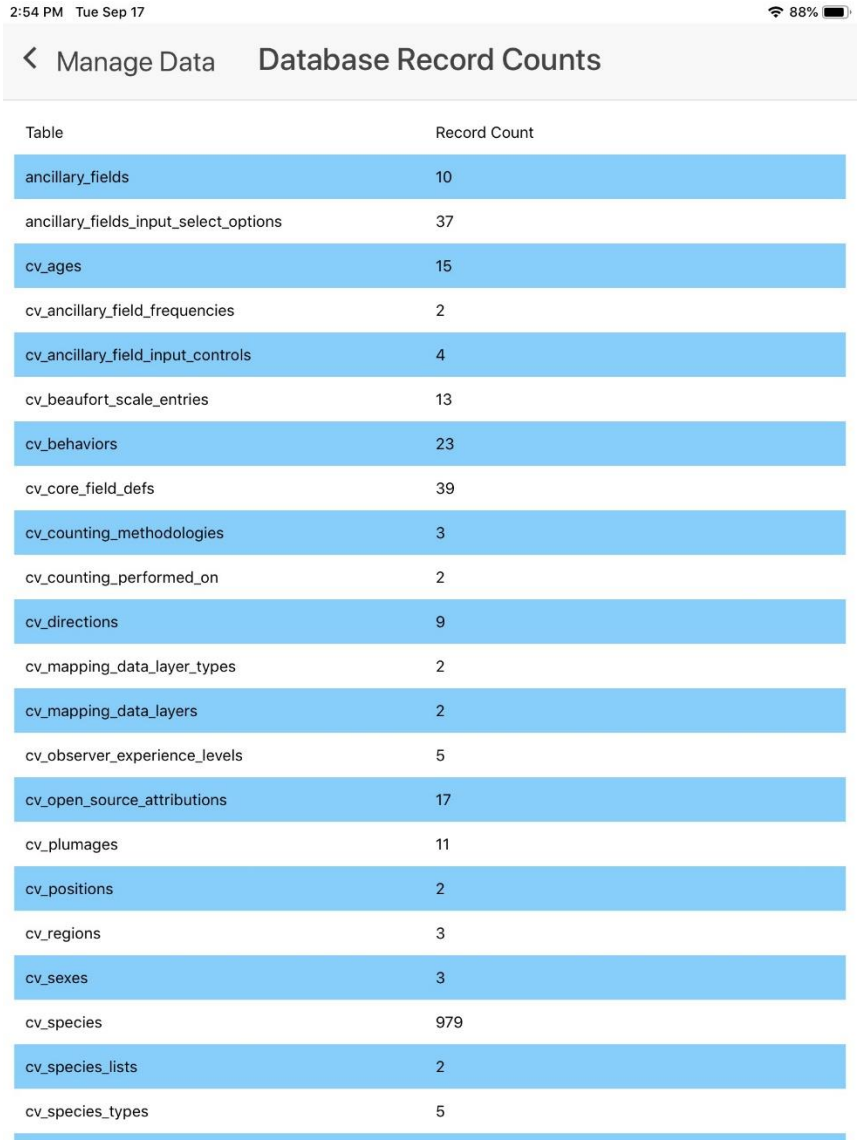


Table	Record Count
ancillary_fields	10
ancillary_fields_input_select_options	37
cv_ages	15
cv_ancillary_field_frequencies	2
cv_ancillary_field_input_controls	4
cv_beaufort_scale_entries	13
cv_behaviors	23
cv_core_field_defs	39
cv_counting_methodologies	3
cv_counting_performed_on	2
cv_directions	9
cv_mapping_data_layer_types	2
cv_mapping_data_layers	2
cv_observer_experience_levels	5
cv_open_source_attributions	17
cv_plumages	11
cv_positions	2
cv_regions	3
cv_sexes	3
cv_species	979
cv_species_lists	2
cv_species_types	5

Figure 71. SeaScribe database table record count.

6.9.3.11 View device info

This screen will show device specific info including model, OS, SeaScribe version, plugin versions, etc. This will mostly assist with debugging any issues if needed.

6.9.3.12 View GPS test data

View GPS test data if a GPS test was conducted using “GPS Test” in tools.

6.9.3.13 Recovery

Here you can backup SeaScribe to the local device and restore from the local device (Figure 72). Note that this function requires additional steps in order to restore to another device, if possible. No guarantee that this works as intended. The best option for backup and recovery is using Android or

Apple specific backup and restore features. For example, using iTunes to back and restore a device and its application to a computer to which it is connected.

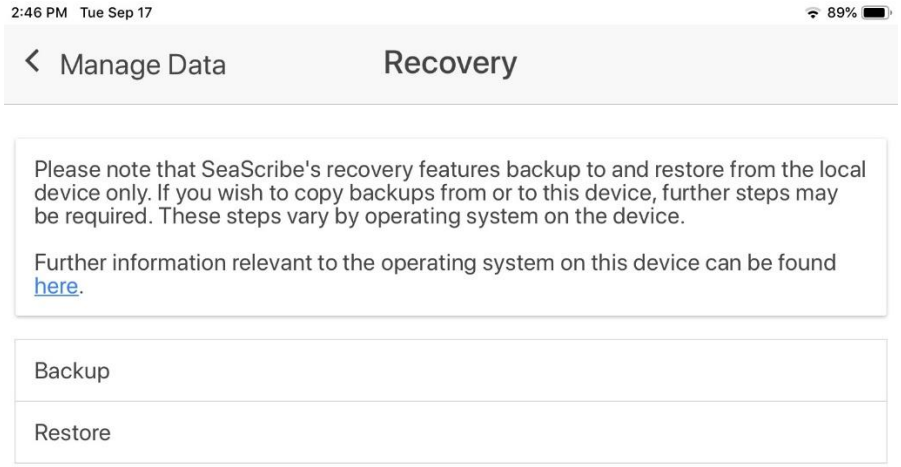


Figure 72. SeaScribe's backup and recovery function.

6.9.4 Offline Maps

Because access to the internet is typically unavailable during surveys, SeaScribe has a utility for caching maps while internet is available and using these maps while offline (Figure 73). This utility requires the user to move around the map and cache maps at various zoom levels. Pan to the area of the map that you think will be most useful for your survey efforts. By default the map centers on your current location, if known.

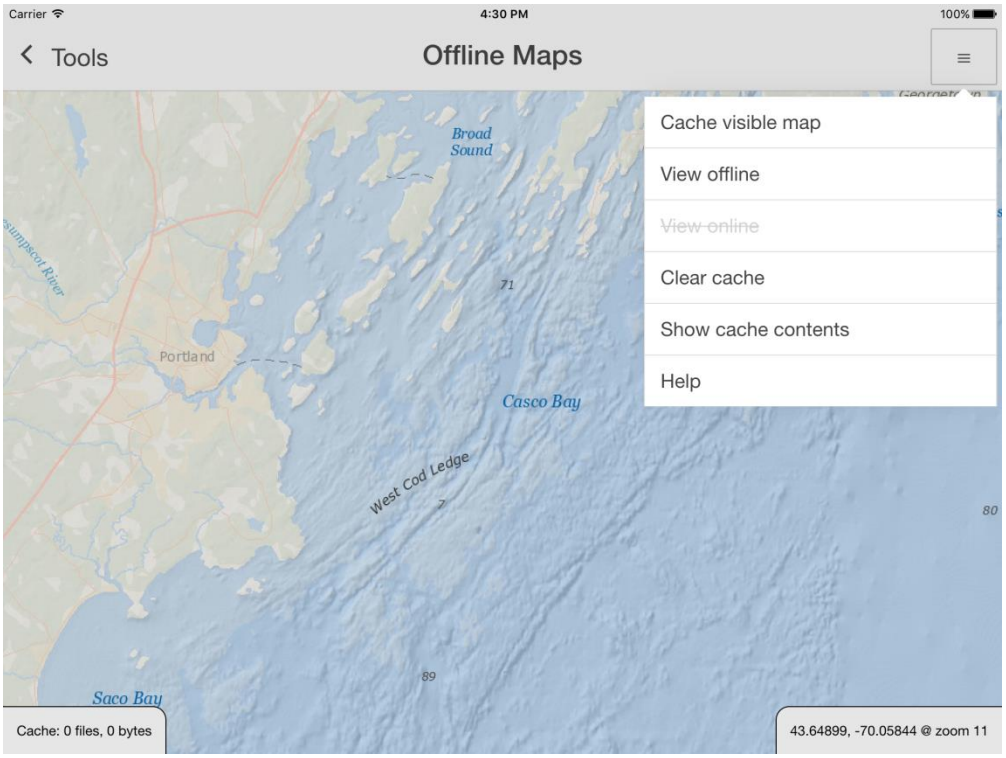
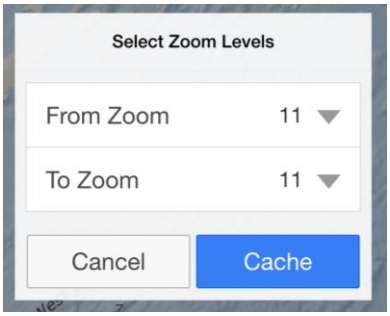


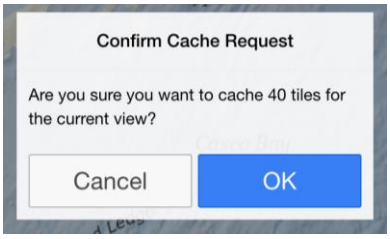
Figure 73. Offline map caching utility.

When you click on the menu button at the top right of the screen a suite of available options drop down including: cache visible map, view offline, view online, clear cache, show cache contents and help.

When you cache the visible map, you are asked to set zoom levels to the upper and lower bounds you wish to cache. SeaScribe allows multiple zoom levels of caching to speed up the process of caching maps. When you open the Cache maps dialog (below) it sets the “From Zoom” and “To Zoom” to the current zoom level.



You can cache three levels of zoom at a time. Select “From Zoom” and “To Zoom” and click “Cache” to begin downloading and caching map tiles or “Cancel” to exit. When you click “Cache” you will be asked to confirm the request for the specified number of tiles. As tiles are downloaded and cached, the progress will be followed at the lower left corner of the screen. SeaScribe uses the ESRI World Ocean Base and Reference maps which currently only have tiles up to zoom level 13; no tiles are available at zoom levels 14 or 15. If you zoom into level 14 or 15, the tiles are replaced by a blue warning tile that says “Map data not yet available”. Future versions of this base map may have more detailed map data at finer zoom levels (14-15).



A dialog box will show when the cache request is complete and the number of tiles and size of the cached tiles will be shown in the lower left hand corner of the screen (Figure 74).

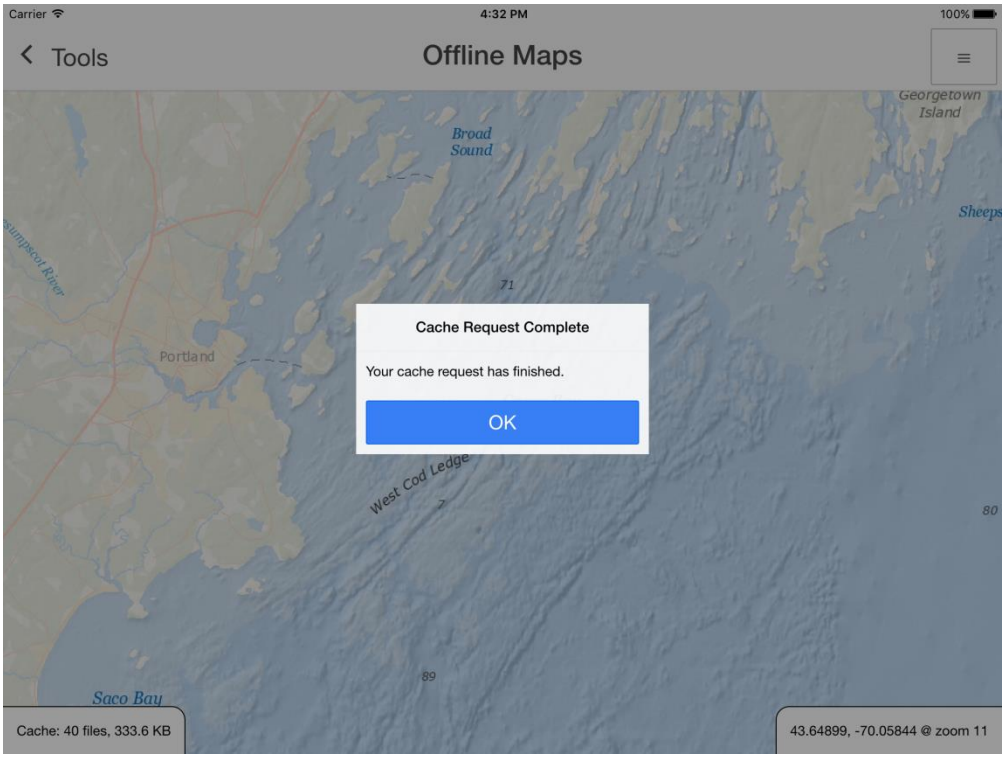


Figure 74. A completed map cache request.

By switching to offline mode, you can check to see if the needed map tiles have been cached for use later. Wherever map tiles are missing the map screen will show gray background (Figure 75). Switching back to online mode will allow you to download any additional tiles needed.

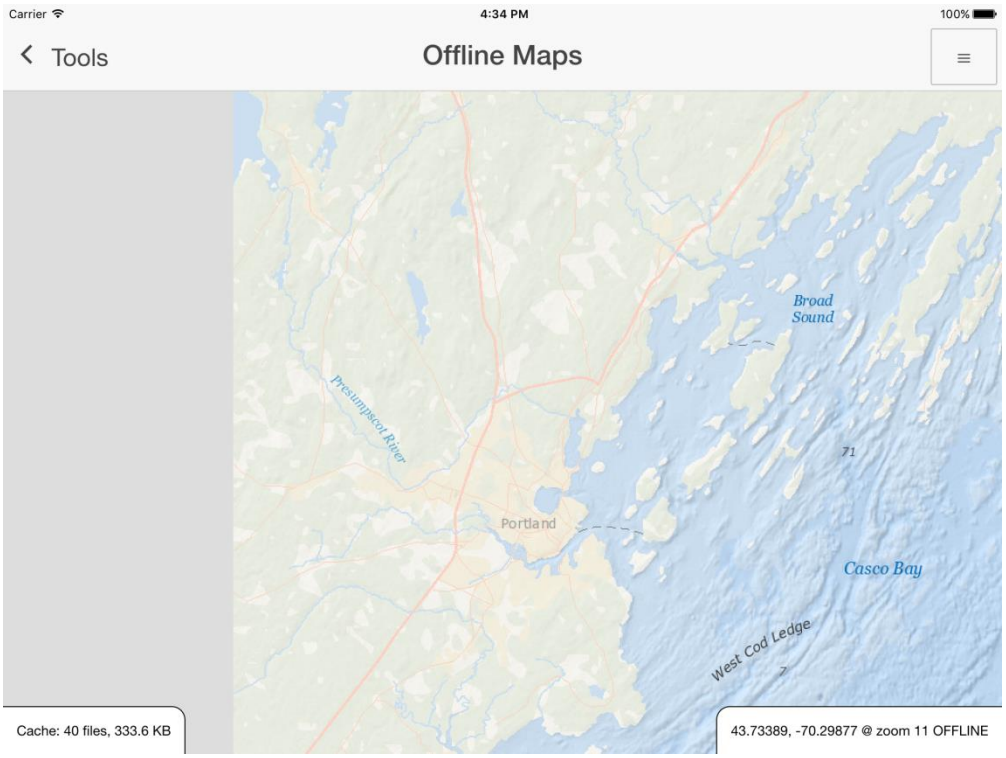


Figure 75. Offline map viewing with missing (gray) map tiles.

By selecting “Show cache contents” you can see the list of cached map tiles and go to a cached map tile by clicking the blue “Go” button next to the tile you want to pan to (Figure 76).

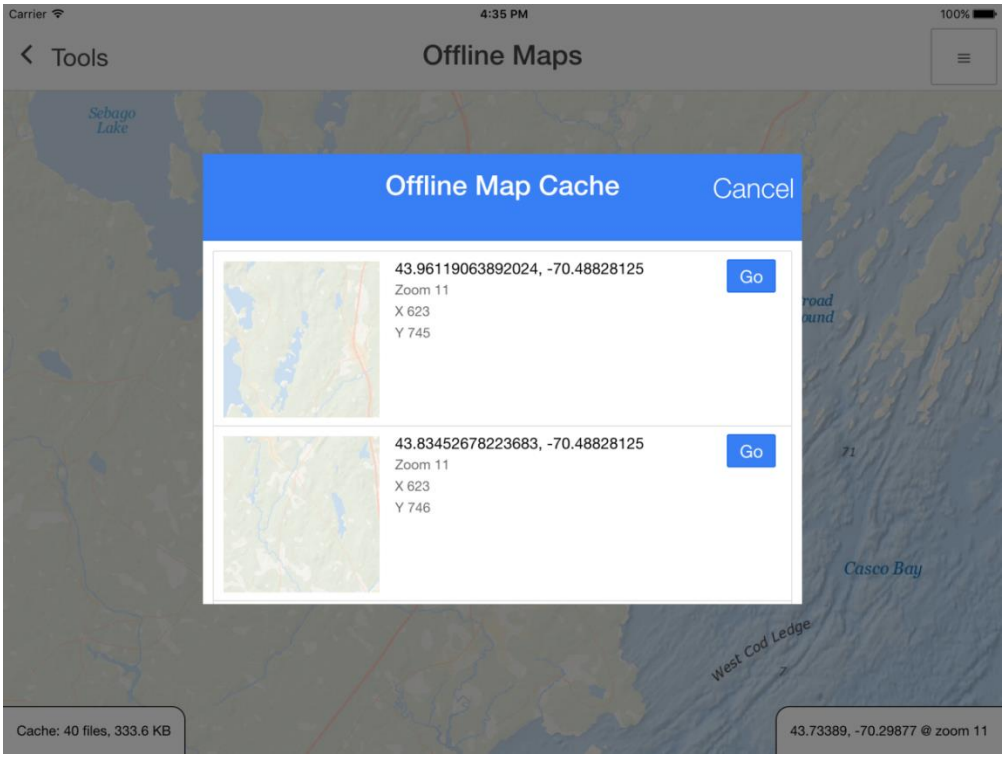
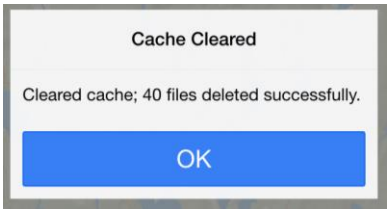


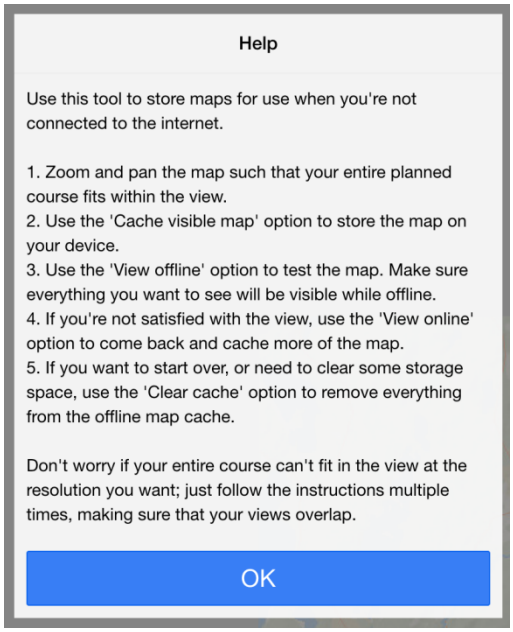
Figure 76. Offline map cache list.

Map tiles will be available until you clear the cache. Note that continuing to cache map tiles uses up storage on the device which will only be released when the map cache is cleared. You will be asked to confirm cache clearing.

Once confirmed the cache cleared dialog box will display.



Clicking help will give guidance about the processing of caching tiles.



6.9.5 GPS test

This tool allows the user to test GPS functionality and returns the latest 10 entries when enabled. Three options are available: get location now, start/stop interval collection, and start/stop positional collection (Figure 77).

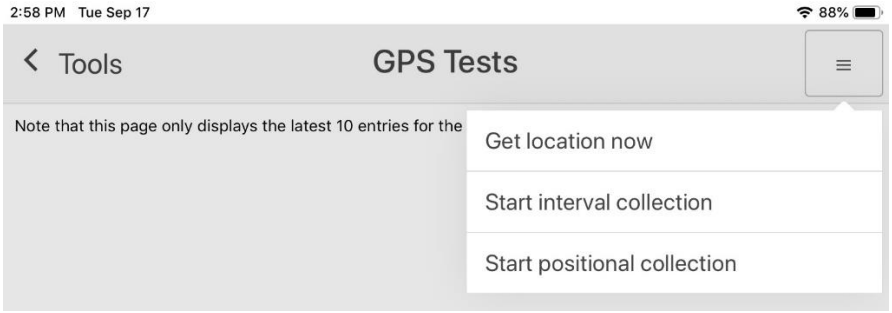


Figure 77. GPS test options dropdown menu.

This is mostly used for internal development testing, but can be used to determine if you are acquiring GPS locations using either the positional or interval GPS settings. If not, position unavailable errors are given (Figure 78).

Figure 78. Positions unavailable during the GPS testing.

6.10 Application errors and enhancement requests

Currently SeaScribe undergoes annual maintenance and upgrades to keep it working properly with the newest OS upgrades and add enhancements to the application. However, it is still possible that the user will encounter errors (bugs) in the software or want to make enhancement requests. All errors and enhancement requests should be directed to BOEM at boemseascribe@boem.gov. It is hoped that annually all bugs and enhancement requests will be considered and addressed. Feel free to direct all comments positive and negative to this address as well. We hope that SeaScribe will benefit the marine survey community for years to come.