

SEAN Sea otter monitoring SOP 7: Post-processing - geocoding digital images

Revision History Log:

Previous SOP version	Effective Date	Revised By	Changes Made	New SOP version
-	September 2018	Jamie Womble	Initial version	1.0

Summary

Geocoding images is accomplished using the RoboGEO application. RoboGEO is given a folder of image files and a tracklog taken at the same time (acquired in SOP 6 and finalized in SOP 15). RoboGEO then embeds the associated latitude, longitude, and altitude in the EXIF metadata section of each image file. The RoboGEO application documentation is available at <http://www.RoboGEO.com>.

Georeferencing may be done under two different circumstances: 1) as a field check of data collection after each flight; or 2) in the SEAN office after all aerial surveying is complete in order to create the formal SO_C deliverable.

Detailed Steps

Before starting RoboGEO, one must first have successfully completed the image download and renaming as well as the tracklog download specified in SOP 6. If SOP 7 is being executed for post-flight quality assessment in the field, the tracklog input may be a non-validated file downloaded from the GPS. If, however, this is for producing a valid accepted SO_C Geocoded Photos deliverable then the tracklog file must be a fully-validated and formally accepted SO_E product.

When done for daily field quality assessment, the computer is self-contained and typically not connected to the NPS network. For this the “photo folder”, referenced below, will be “C:\Sea_otter\yyyy\photos\” where yyyy is the year of survey effort. The “tracklog folder” will be “C:\Sea_otter\yyyy\tracks\”. These must have been previously populated with images and tracklogs during SOP 6.

When this SOP is, instead, performed for final preparation of the formal SO_C deliverable in the office, the photo folder is on the NPS network at “\\sean.glba.nps.gov\Data\SEAN_Data\Work_Zone\SO\SO_C\yyyy\”. The tracklog folder is “\\sean.glba.nps.gov\Data\SEAN_Data\Work_Zone\SO\SO_E\yyyy\”. Be certain the SO_E has been formally accepted before using it.

1. Set RoboGEO Preferences

1. Before using RoboGEO certain operational parameters must be set.
2. Each subsequent time RoboGEO is used, confirm that the parameters are still correct.
3. After updating a preference setting, be certain to click on the ‘save value’ button to confirm the change.

4. Set Edit Original Images to True (Figure SOP7.1). This allows the program to make changes to the original images files.

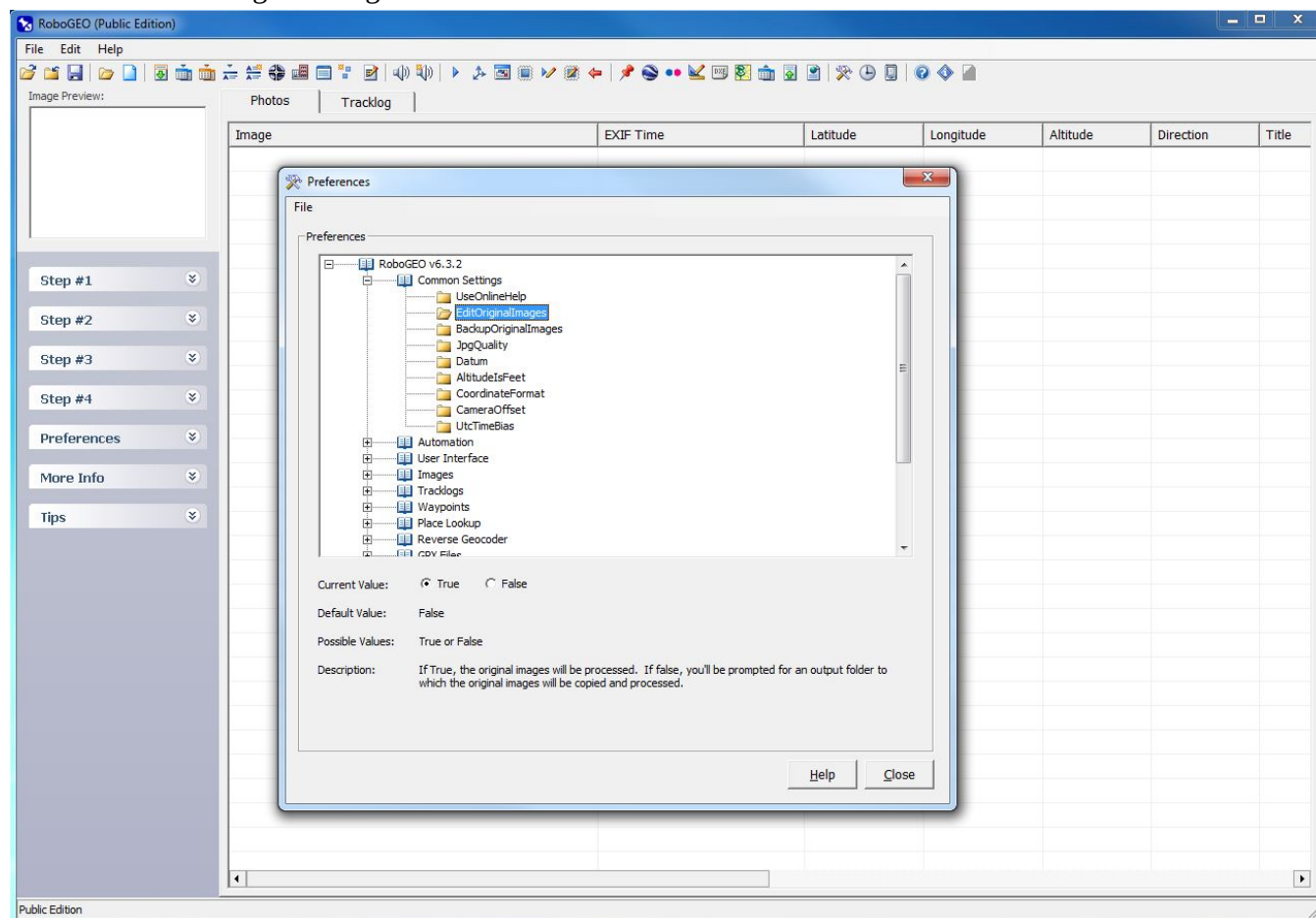


Figure SOP7.1. Setting EditOriginalImages parameter to TRUE in RoboGEO.

5. Set Altitude is Feet to **False** (Figure SOP7.2). This causes the recorded altitude to display in meters. Meter is the required unit for the GPX output. One can still choose to have the GPS unit display altitude in feet on the screen.

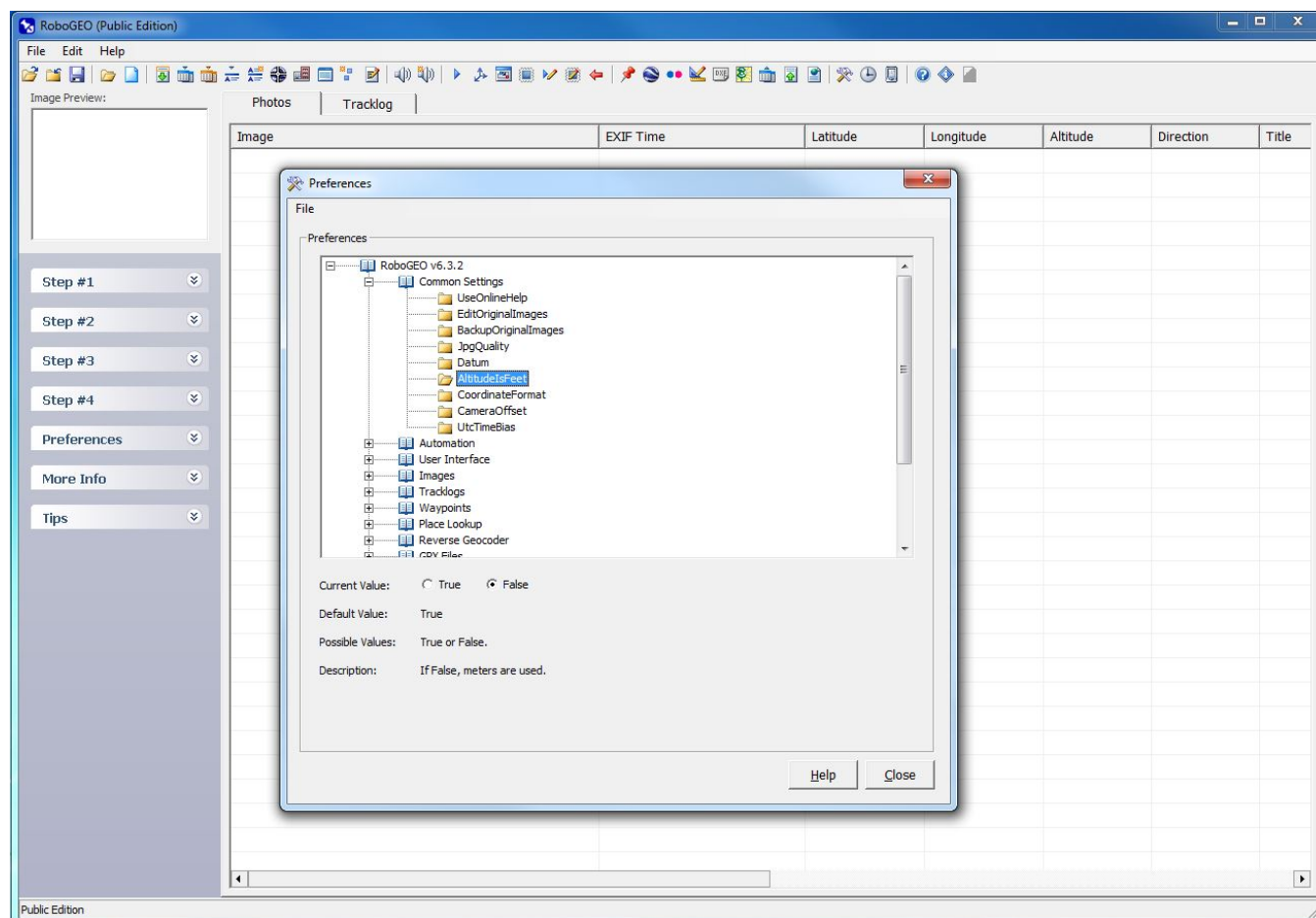


Figure SOP7.2. Setting AltitudeIsFeet parameter to FALSE in RoboGEO.

6. Set Camera Offset to **0** (Figure SOP7.3). The only time this should be changed is when the camera had not been properly synchronized with the GPS.

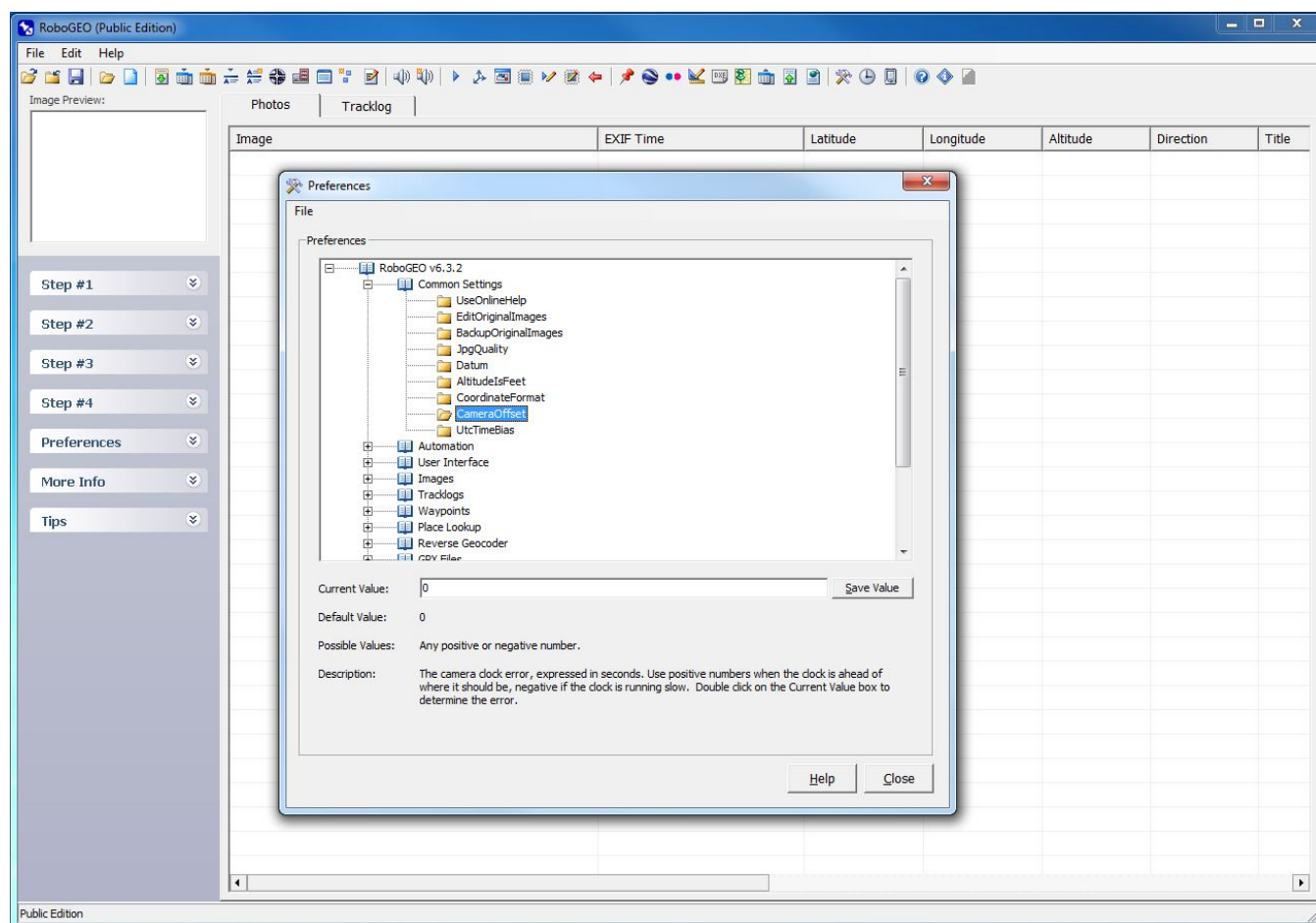


Figure SOP7.3. Setting CameraOffset parameter to zero in RoboGEO.

7. Set UTC Time Bias to **480** for Alaska Daylight Time (ADT) (Figure SOP7.4). If, for some reason, RoboGEO is used to georeference images taken outside of ADT consult the RoboGEO documentation for an appropriate value.

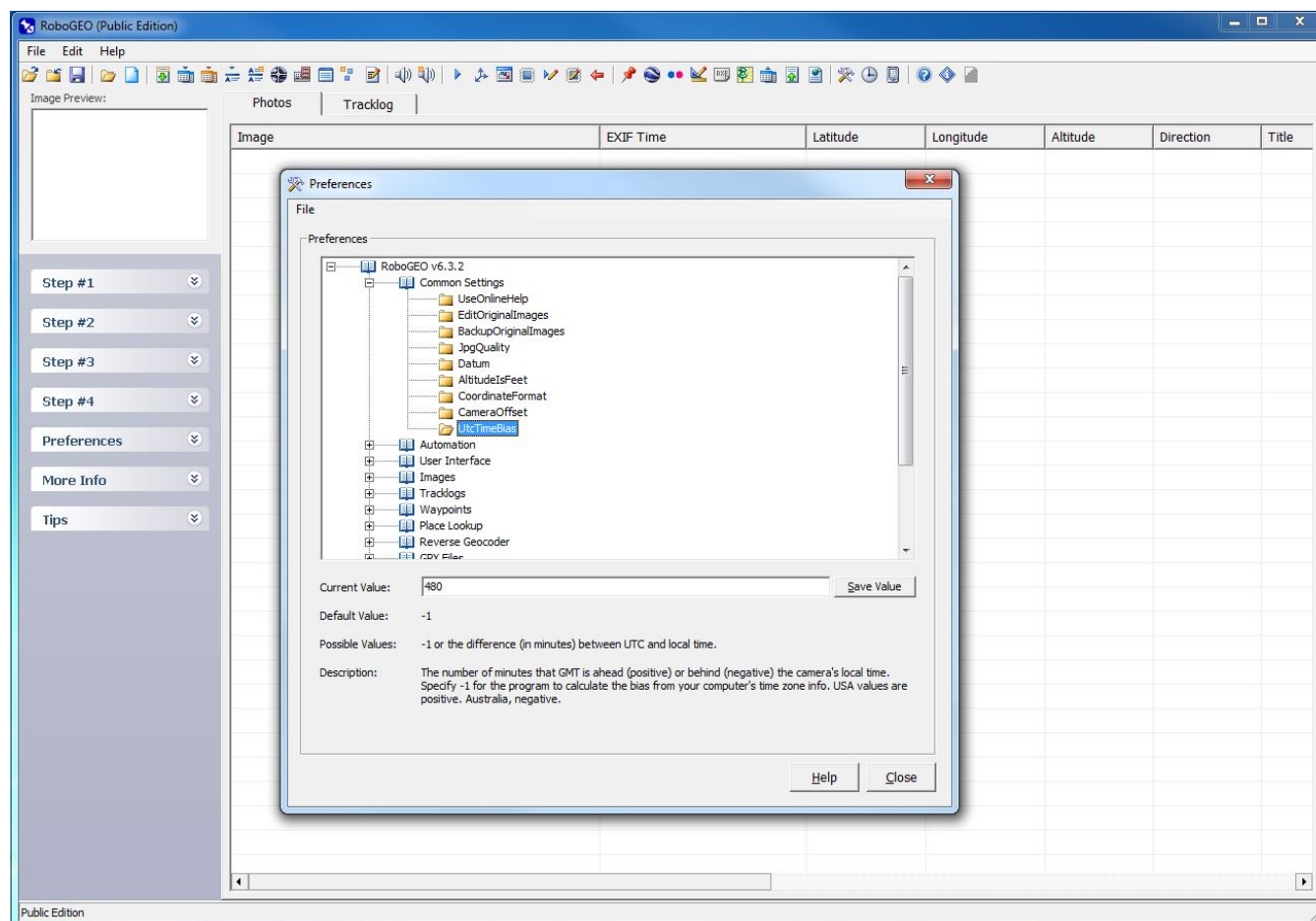


Figure SOP7.4. Setting UtcTimeBias parameter to 480 in RoboGEO.

8. All other settings may be left at the default.
2. Ensure the timestamps on the photo files are in sync with the tracklog file.
 1. Under the 'step #2' heading within the left tool panel of RoboGEO (Figure SOP7.5), click on 'Select an Entire Folder'.
 2. Browse to the directory containing all of the images for that aerial survey. RoboGEO will load each of the images into the grid and show the paths for each image as well as the EXIF time the photo was taken, based on camera time.
 3. Make sure the 'Image' column is sorted ascending and select the first image (this should be image 0001). A preview image should be displayed of your GPS screen showing the time (SOP 4 calls for the first image of an aerial survey to be this photo).
 4. Double click on the image preview and confirm that the time shown on the GPS screen in the photo matches the EXIF time for the first photo as shown in RoboGEO.

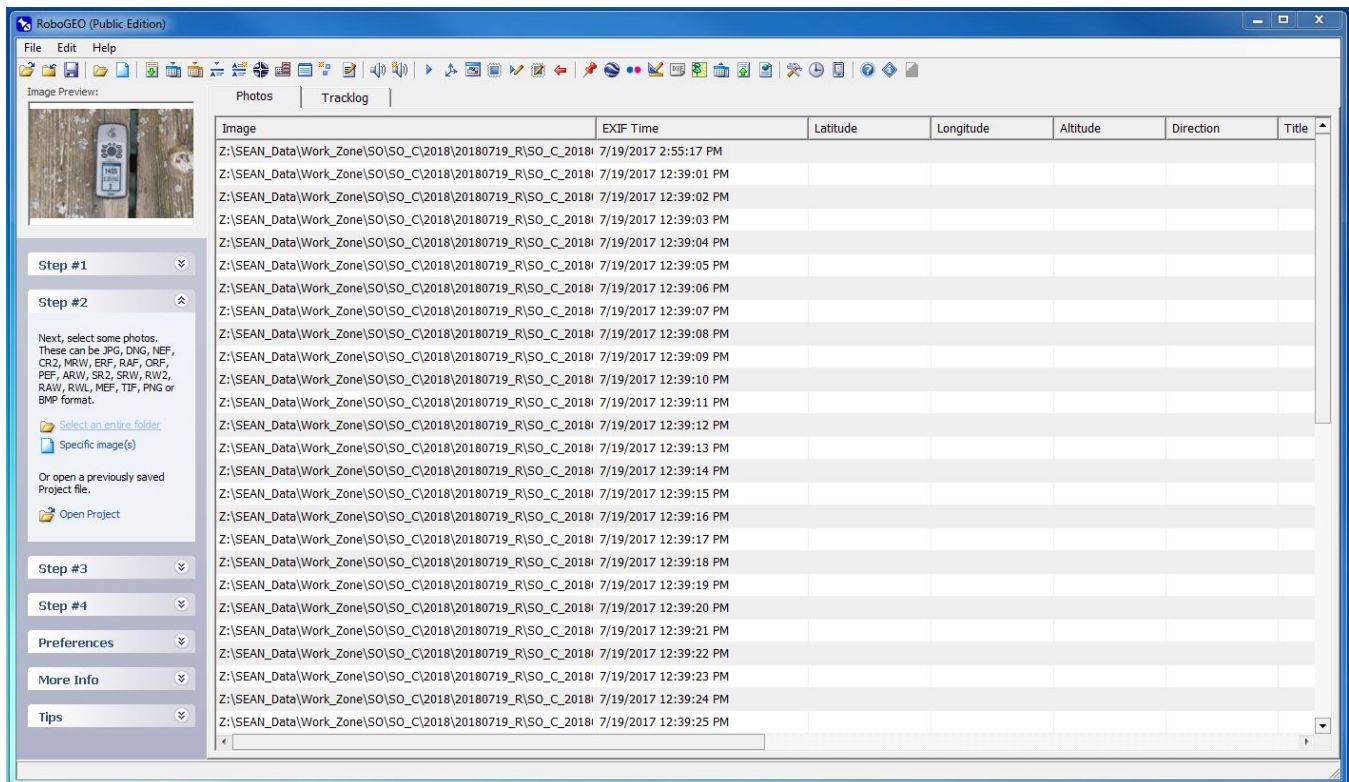


Figure SOP7.5. Select folder containing images ready to georeferenced in Step #2 in RoboGEO.

3. Confirm all images have geocoding coordinates available from the tracklog.
 1. Under the “Step #3” heading click on ‘From a tracklog file’ and browse to the GPX file for the aerial survey in the tracklog folder (created in SOP 6).
 2. Press the ‘Open’ button (Figure SOP 7.6).

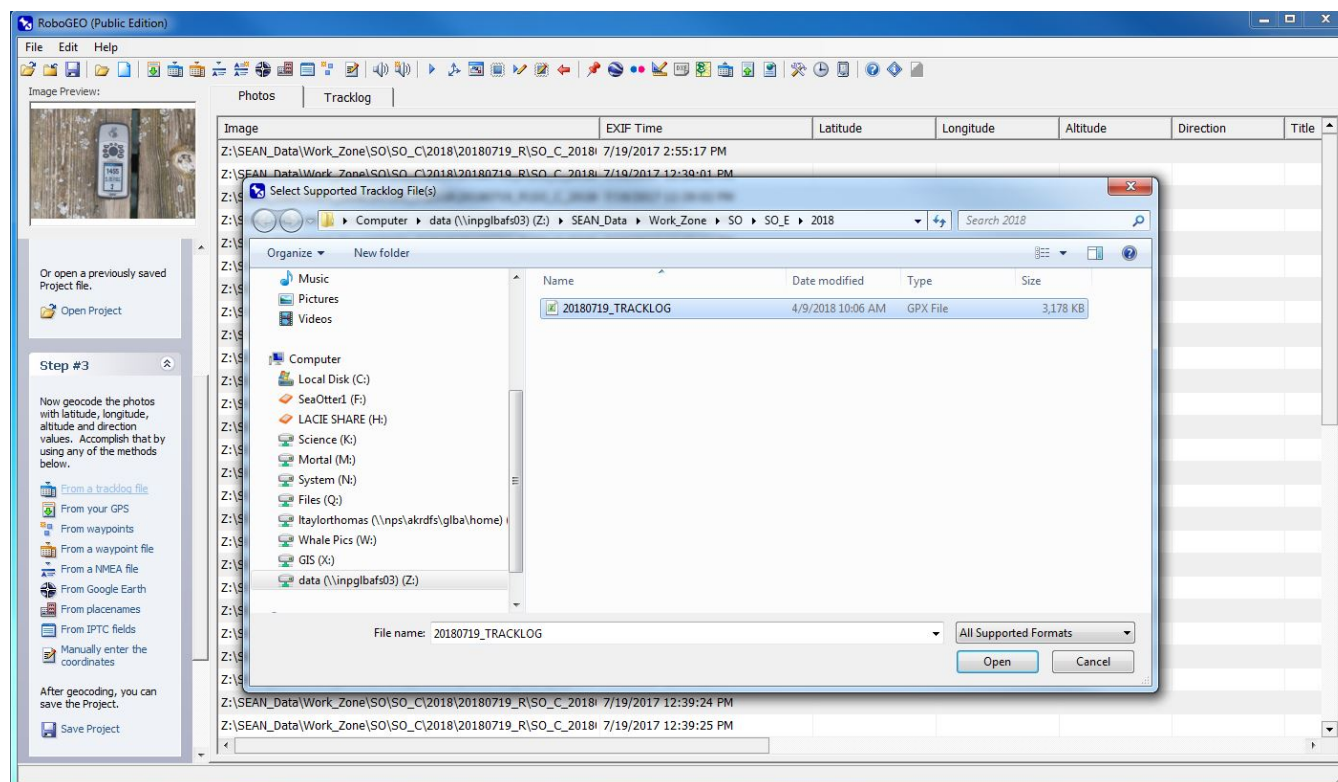
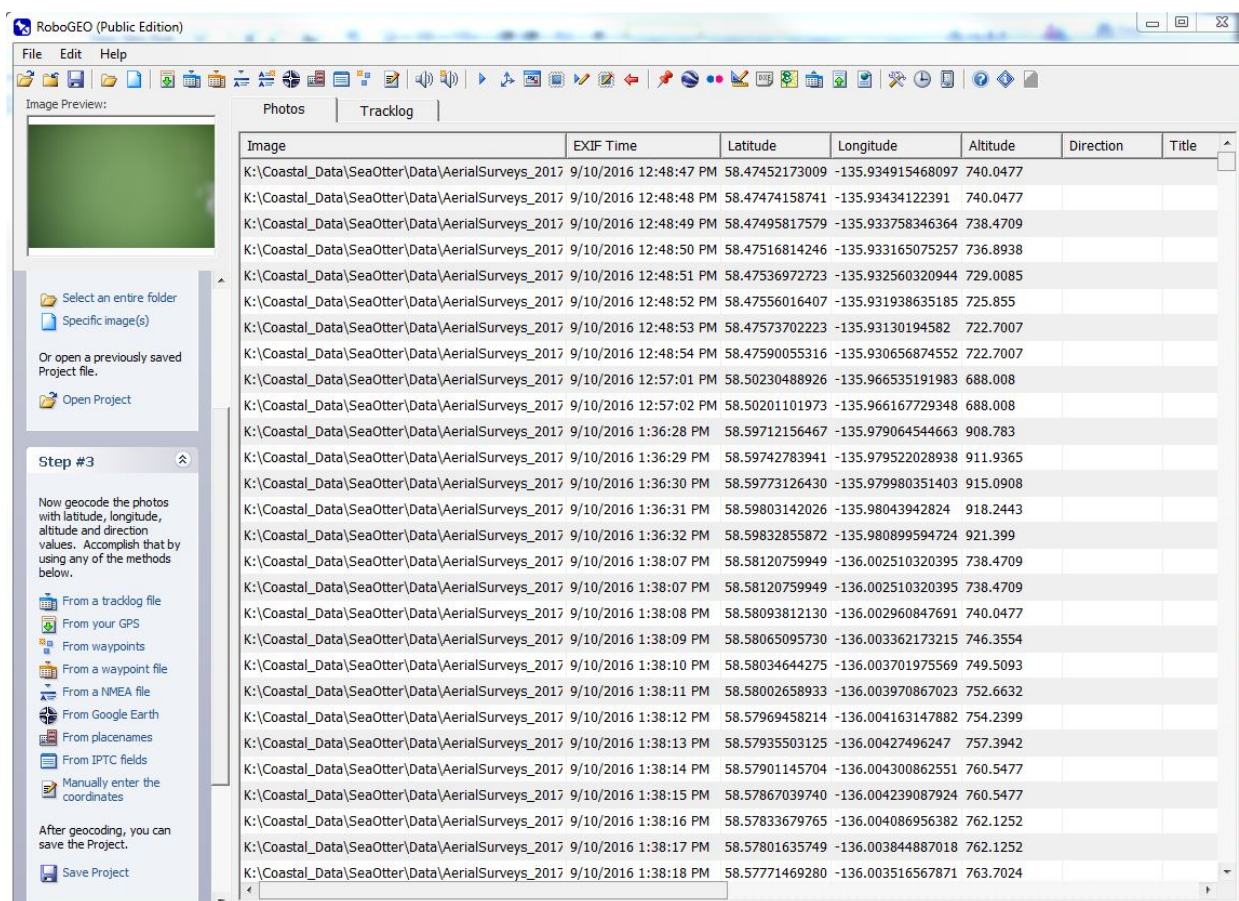


Figure SOP7.6. Opening tracklog in RoboGEO.

3. RoboGEO then matches all the image timestamps with the tracklog and locates the proper latitude, longitude, and altitude values (Figure SOP7.7) for each image file.



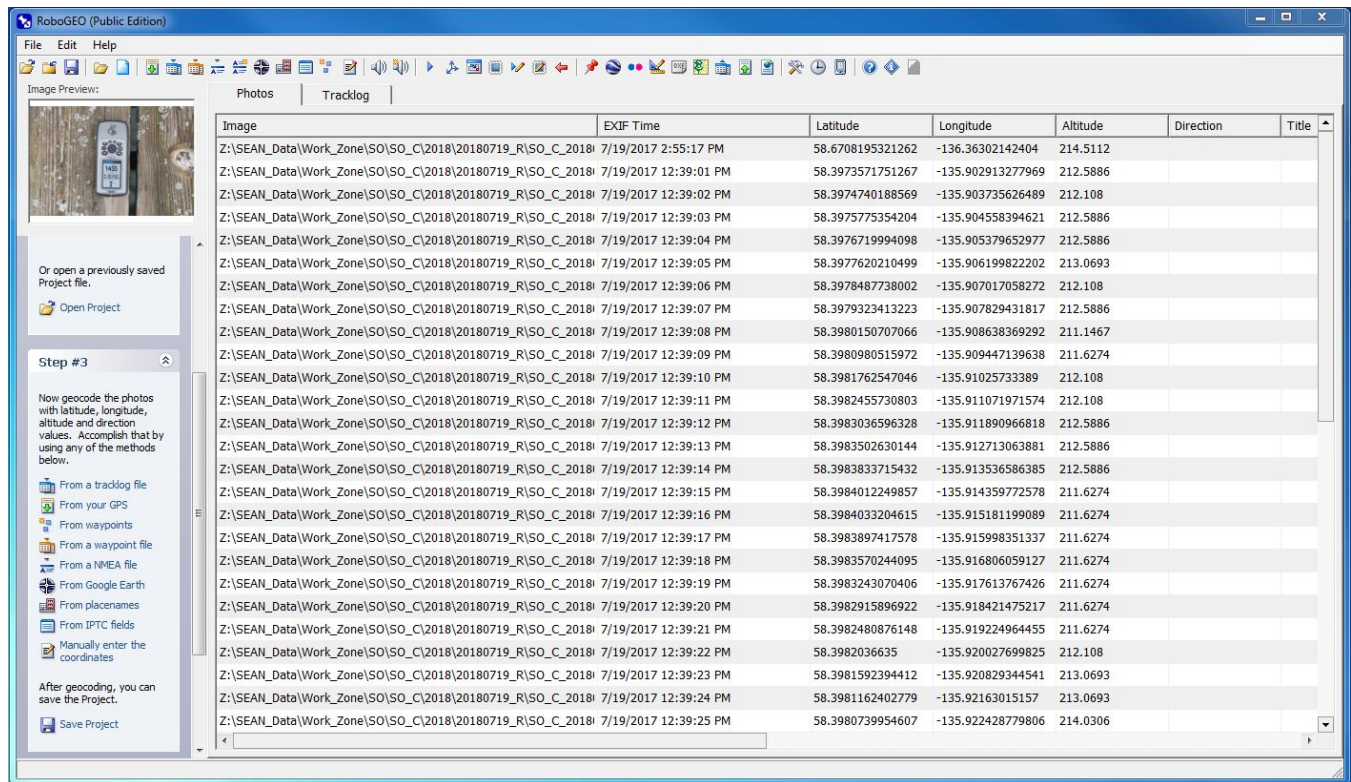


Figure SOP7.7. Confirmation by RoboGEO that spatial coordinates were located for each file.

4. Do a final audit of the draft georeferencing.

1. Be sure the latest version of the Garmin BaseCamp application has been installed on the workstation.
2. Export a new GPX file that reflects the proposed file geocoding.
 1. With the proposed geocoding still on the RoboGEO screen, click on the 'Export to GPX' link.
 2. Name the new GPX file 'SO_E_YYYYMMDD_t_GEOREF.GPX' so as not to overwrite the original GPX file in the tracklog folder.
3. Start BaseCamp (do NOT close RoboGEO) and open the SO_E_YYYYMMDD_t_GEOREF.GPX file.
4. BaseCamp displays tracks with a waypoint every place a photo was taken (Figure SOP7.8).
5. Examine this track and the waypoints carefully to make sure the georeferencing process appears to have worked properly.

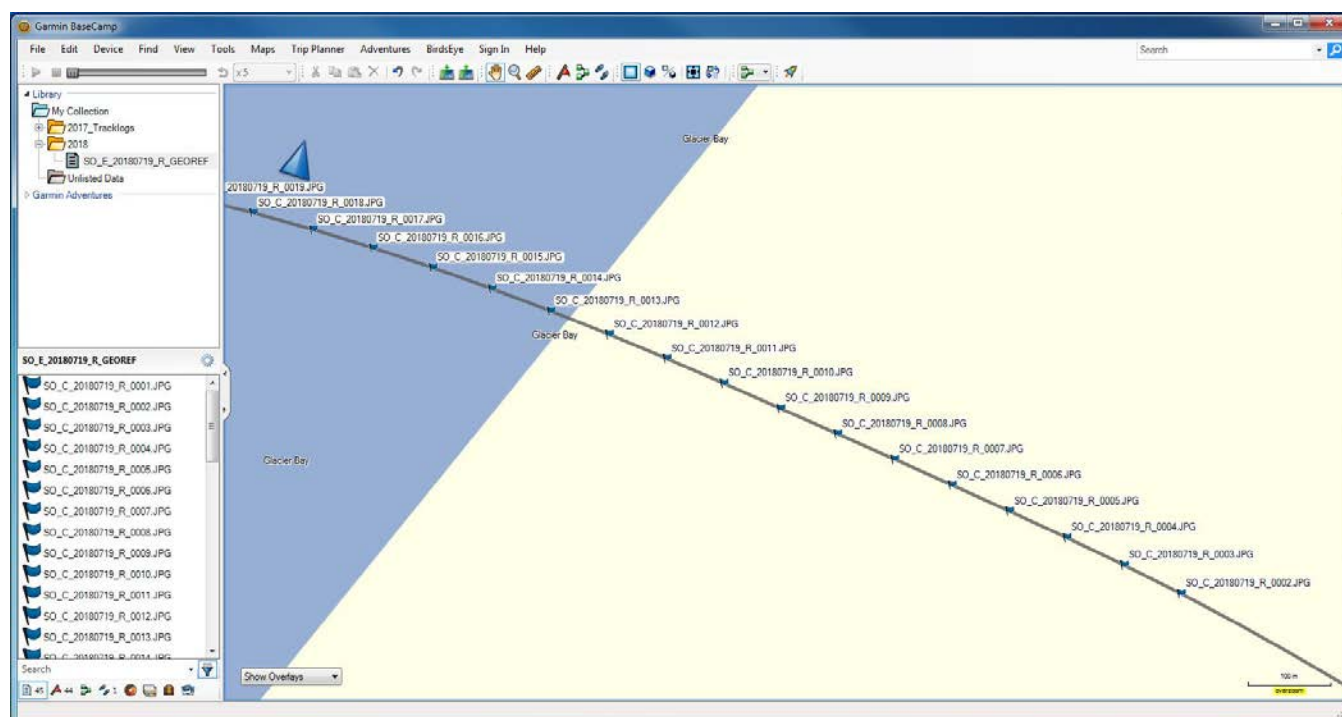


Figure SOP7.8. BaseCamp display of draft geocoding.

5. If this process was done for field quality assurance testing, it is complete.
6. If this process was done to create a final SO_C deliverable in the office, then update the image files' embedded metadata with the geospatial data generated by RoboGEO.
 1. When certain the georeferencing is of the best possible quality, return to RoboGEO and click on the 'Write the Location Data to the EXIF Headers' link under 'Step #3'.
 2. RoboGEO then permanently writes the location data to the image files.
 3. Once completed, close RoboGEO.
 4. The process for validating, accepting, and disseminating SO_C is given in SOP 13.