



NABat

Embedding and Exporting Stationary Acoustic Metadata in Kaleidoscope

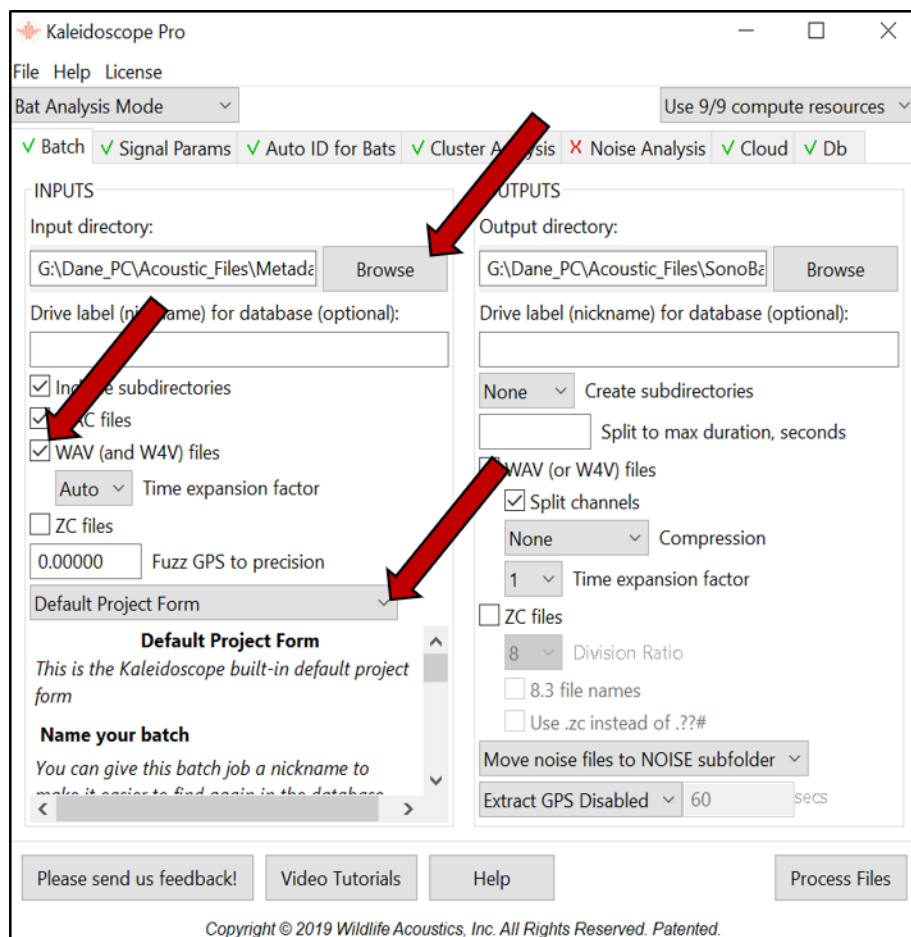
The following document provides guidance for embedding and exporting metadata in stationary acoustic recordings using Kaleidoscope auto ID software. Guidance for processing mobile transects can be found at https://www.sciencebase.gov/catalog/file/get/5e3de185e4b0edb47be3d6e6?name=Kaleidoscope_Mobile_Transect_Guide.pdf.

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Embedding Survey Metadata

1. Open Kaleidoscope and click "Browse" to select the input directory of the folder containing your .wav/.zc files. Select the box beside the type of input files (WAV/ZC).

NOTE: Select a folder containing all data for a single detector deployment (all nights at a single site). This is the broadest selection for which all files will share the same metadata (SITE NAME, LATITUDE, LONGITUDE, etc.).



2. Download the required NABat metadata forms from <https://www.sciencebase.gov/catalog/item/5dcdd2b5e4b069579760b15a> (NABat_Metadata_Form_Kaleidoscope_Stationary.xml for use with steps 1-9 and NABat_Stationary_Meta_Output_Only_KPRO.xml for use with steps 12-18). Next, click the drop-down menu above the "Default Project Form" and select "Add or Replace a Project Form." Navigate to NABat_Metadata_Form_Kaleidoscope_Stationary.xml and select the file. The NABat metadata form will now load in the bottom of the INPUTS section (the left half of the Kaleidoscope window).
3. Complete all metadata fields for which you have data. Required fields are listed below. Some fields require specific formatting. Hover the pointer over a field for formatting tips and/or a list of accepted entries.

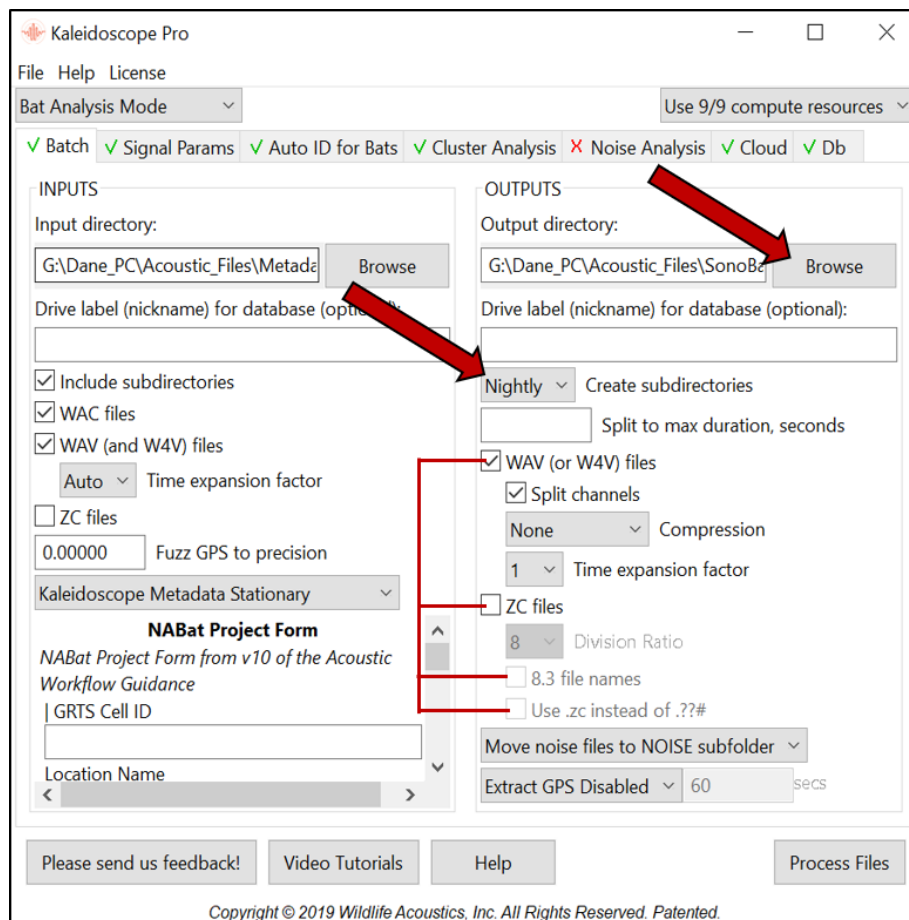
Required NABat metadata fields:

GRTS Cell ID *OR* Lat/Long
 Location Name
 Software Type

Survey Start Time
 Survey End Time
 Species List

* [link to species list guidance in step 6](#)

- Once all required metadata fields (and any additional fields for which you have data) have been completed, select the desired output directory to save processed files by clicking "Browse" in the top right of the window.

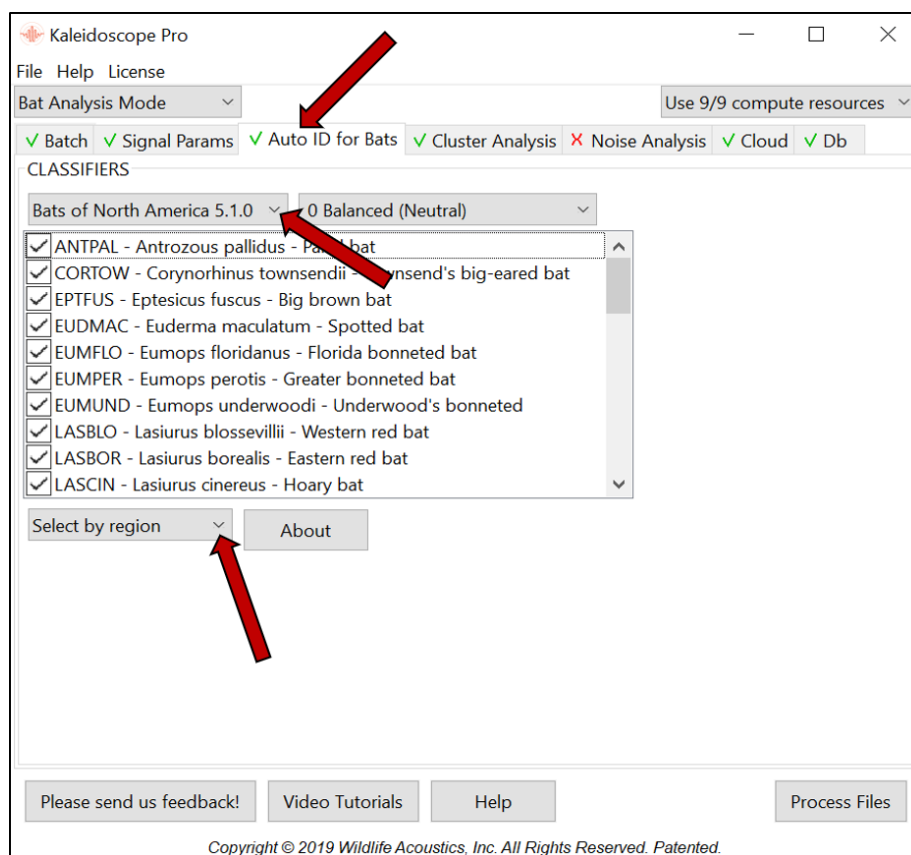


- Once the output directory has been selected, choose "Nightly" from the "Create subdirectories" drop-down menu to keep new files organized by detector night. Next, select the type of output files you wish to create, WAV or ZC (ZC files cannot be converted to WAV). **In order to successfully export metadata, you *must* select WAV or ZC files in the OUTPUTS window and create copies of the original files during this step. These copies will contain embedded metadata that will be the source of the "meta" output spreadsheet you will upload to NABat.**

Users with zero crossing files that end in the .# extension rather than .zc should select the "8.3 file names" and "Use .zc instead of .??#" options below "ZC files." Otherwise, Kaleidoscope will remove the seconds from the filename, increasing the likelihood of duplicate filenames

(resulting from distinct files recorded within the same minute) that will create errors when uploading metadata to the NABat database.

6. Next, click the "Auto ID for Bats" tab at the top of the window. Select "Bats of North America" from the "Classifiers" drop-down menu. Select "+ 1 More Accurate (Conservative)" from the drop-down menu at the top right. Next, select your state/region from the drop-down menu below the list of species. Species can be manually added or removed based on specific knowledge of species assemblages in your area, but this must be reflected in your NABat species list. (guidance on creating an NABat species list is available at https://www.sciencebase.gov/catalog/file/get/5e3de185e4b0edb47be3d6e6?name=Create_NABat_Species_List.pdf)
7. Click "Process Files" in the bottom right corner of the window.



8. When Kaleidoscope has finished processing, review the automated identifications and confirm or downgrade the Kaleidoscope ID (manual ID). *For stationary surveys, NABat guidance calls for one manual call verification per species per night in order to establish presence/absence. For mobile transects, NABat guidance calls for manual verification of all call files in order to estimate abundance.*
9. If the detector model you're using automatically embeds a date/time stamp into call files, these data should auto-populate and appear in the "Audio Recording Time" column of the Kaleidoscope "meta" output. If so, you may skip the renaming process. However, before uploading metadata to NABat, you should ensure that the "Audio Recording Time" column contains data. Otherwise, file names must adhere to NABat's naming format, and users should

follow the guidance in step 10. If the "Audio Recording Time" column successfully auto-populates, you may skip to step 11.

10. To rename files, open the NABat file renamer (available for download at <https://github.com/talbertc-usgs/GuanoMDEditor/releases/tag/0.0.1>) or download the R script for renaming acoustic files (available for download at https://www.sciencebase.gov/catalog/file/get/5e3de185e4b0edb47be3d6e6?name=Rename_Acoustic_Files.R). If using the NABat file renamer, navigate to the folder containing the files you just created with metadata and IDs (this will be a subfolder within the output folder from step 4). Rename all files to ensure they are consistent with NABat naming format and to remove the _000 appended by Kaleidoscope:
 NABat naming format: GRTSID_SITENAME_YYYYMMDD_HHMMSS.wav/zc
 (e.g. 3773_SW_20190813_215333) ***Fields MUST be separated by an underscore. Any other symbol or character will cause errors and files won't be recognized by the NABat system.**
 Additional guidance on using the NABat file renamer is available at https://www.sciencebase.gov/catalog/file/get/5e3de185e4b0edb47be3d6e6?name=Preparing_Acoustic_Files.pdf
11. Repeat steps 1-10 for all deployments you wish to process. Once completed, steps 12-18 will allow users to simultaneously export metadata for all processed deployments into a single bulk upload CSV.
12. Return to the batch processing window, click "Browse" in the "Input directory" window, and select the parent folder containing all your processed deployments (the new files you created with metadata and IDs in steps 1-9). Select a new output directory. If the box beside "WAV files" or "ZC files" is still checked, unselect the box (you won't be creating new files this time, only a "meta" file containing NABat metadata).
13. Click the "Auto ID for Bats" tab and select "DISABLED" in the "CLASSIFIERS" drop-down menu.
14. Replace the NABat_Metadata_Form_Kaleidoscope_SurveyType.xml file from step 2 with NABat_SurveyType_Meta_Output_Only_KPRO.xml. The data entry window will no longer include NABat metadata fields, however, the form will still export the embedded metadata from steps 1-9.
15. Click "Process Files" in the bottom right corner of the window.
16. Navigate to the current output directory folder and open the "meta" file. Check to ensure all fields for which you entered data are filled, and ensure one or both of the Auto Id/Manual Id columns are filled.
17. Rename the file with a descriptive and unique name and save (the NABat system will automatically overwrite duplicate file names with the most recent version, so it is critical that your file name is unique). Next, open your NABat project page, click the blue "Upload Survey Data" button in the top right, select "Stationary Acoustic Point," click "Full Metadata," and select the Kaleidoscope "meta" file you just renamed.
18. Once the file is selected, a preview window will appear with any errors highlighted in red. Correct any errors (use the drop-down menus to determine the correct formatting and accepted inputs), save the updated file, click the refresh button in the top left of the preview window, and

Appendix: Accepted Categorical Values for NABat Stationary Acoustic Metadata

NABat|Activation start time:

YYYY-MM-DDTHH:MM:SS (e.g. 2019-07-13T20:30:00) ***NOTE: Date and time must be separated by T**

NABat|Activation end time:

YYYY-MM-DDTHH:MM:SS (e.g. 2019-08-15T06:30:00) ***NOTE: Date and time must be separated by T**

NABat|Detector type:

BINARY ACOUSTIC AR125|BINARY ACOUSTIC AR125-FG|BINARY ACOUSTIC AR180|BINARY ACOUSTIC AcroBat|BINARY ACOUSTIC iFR-V|PETTERSSON D1000x|PETTERSSON D240x|PETTERSSON D500x|PETTERSSON M500|TITLEY AnaBat Express|TITLEY AnaBat SD1|TITLEY AnaBat SD2|TITLEY AnaBat Swift|TITLEY AnaBat Walkabout|WILDLIFE ACOUSTICS EM-Touch|WILDLIFE ACOUSTICS EM-Touch2|WILDLIFE ACOUSTICS EM-TouchPRO|WILDLIFE ACOUSTICS

NABat|Microphone type:

Pettersson M500|TITLEY AnaBat Swift|Wildlife Acoustics SM3-U1|Wildlife Acoustics SMM-U1|Wildlife Acoustics SMM-U2|Wildlife Acoustics SMX-U1|Wildlife Acoustics SMX-US|Wildlife Acoustics SMX-UT|generic Directional|generic Extended Mic|generic Hi-Mic|generic Internal|generic Omni-directional|generic Regular

NABat|Microphone orientation:

e|n|ne|nw|s|se|sw|w

NABat|Type of clutter:

Building|Other|Rock|Vegetation|Water

NABat|Habitat type:

agriculture|barren land|forest-conifer|forest-deciduous|grassland|shrubland|urban|water|wetland

NABat|Weatherproofing:

TRUE|FALSE

NABat|Software Type

Kaleidoscope 3.x|Kaleidoscope 4.0.0|Kaleidoscope 4.3.x|Kaleidoscope 4.5.0|Kaleidoscope 4.5.4|Kaleidoscope 4.5.5|Kaleidoscope 4.5.x|Kaleidoscope 4.x|Kaleidoscope 5.0.x|Kaleidoscope 5.1.x|Kaleidoscope 5.2.x|Kaleidoscope 5.3.x|Kaleidoscope x