# Summary of key changes to the beaked/sperm whale detection system

Oct. 11, 2019

## STRUCTURAL CHANGES

* Both the beaked whale detector (BWD) and sperm whale detector (SWD) are now part of a larger package designated TWD (Toothed Whale Detector)
* From a usage point of view, not much has changed. The main difference is where you find things, and one script has a new name.

|  |  |
| --- | --- |
| Old system | New system |
| C:\Users\BeslinW\Documents\NL_Dev\TWD\TWD_v1-2_WIP\DEV\Struct_Old.png | C:\Users\BeslinW\Documents\NL_Dev\TWD\TWD_v1-2_WIP\DEV\Struct_New_Marked.png |

The main things to note are:

* + BWD and SWD each have their own folders and are accessed in much the same way as the (old) standalone versions
  + ***identifySpecies\_master.m*** is now ***BWDValidate\_master.m***
    - *SWDValidate\_master.m* for SWD
  + Support scripts including *createPresenceTable.m* and *subsetValidated.m* are stored directly within the main TWD folder

## NEW CODE

* Some additional support scripts have been added, including:
  + ***TWDPathTool***: very simple program that prompts the user to add the TWD folder to the top of the MATLAB path, or remove it from the path
    - Note that changes made by *TWDPathTool* apply only during the current session, unless you manually save the path in MATLAB
    - It’s a good idea to run this every time you start MATLAB and intend to use BWD/SWD, to ensure that older versions of the code won’t be used by accident
  + ***closeGhostWin***: Should you experience a hard crash (or use Ctrl+C) while running any of the *Validated\_master* scripts and the figures are still showing, run this code. This will delete hidden figures which cannot be closed with a “close all” command.
  + More to come!

## VALIDATION

* The validation process has a new “click sequence” figure, which is a stem plot showing the occurrence and amplitude of clicks ±2 seconds about the click currently being looked at
  + Amplitudes are the peaks of each click
  + The red stem is the focal click
  + The orange area plot below each stem is the RMS noise level
* The system for eliminating clicks in case there are too many works a bit differently between BWD and SWD
  + For BWD, segments are prioritized based on the proportion of target clicks within the segment (i.e. how many are beaked vs. non-beaked)
  + For SWD, all clicks should be target clicks, so instead segments are prioritized based on mean SNR of clicks

## THINGS TO NOTE ABOUT BWD

* There have been no changes to the BWD process itself. It should still give the same results as before.

## THINGS TO NOTE ABOUT SWD

* SWD does not use Triton. Start processing a dataset by running *SWD\_master.m* directly.
* Only Fs = 250000 Hz is supported
* The DetectionCriteria system is much simpler than with BWD
  + there is effectively just one “protocol” and “target”; spreadsheet files are stored directly within DetectionCriteria
  + there is no distinction between event-level and validation-level click discrimination
* SWD does not use reference spectra and the spectral overlay is not plotted during validation
* SWD is untested with long-duration (e.g. continuous) recordings and probably wouldn’t handle them well at the moment