

CPOD.exe v2.n What's new?

Train filter : KERNO

All versions of CPOD.exe before v2.000 used the v1 train detection algorithm to find cetacean click trains in the data. This has been replaced by a new detector, the KERNO classifier, which uses more non-parametric methods and has major advantages:

1. More sensitive: especially in noise, including noise produced by reverberation of cetacean clicks in shallow water.
2. Fewer mis-classifications: especially of sonars as cetaceans, porpoises as dolphins, and vice versa. False positive cetacean Hi or Mod quality trains are generally around 1 false train click per million noise clicks. The error rate from sonars is higher.
3. Gives two levels of accuracy for the species classification. Most users will not need this.
4. Gives two levels of accuracy of the inter-click-intervals in a train. Most users will not need this either, but it may be of value in studies of behaviour.
5. Identifies trains with features of WUTS (weak unknown train sources). These are a problem in some seas.
6. Where it is known that there are no NBHF species (see below), or no other species, the absent group can be excluded from the classifier.

The main disadvantage is that it is slower as a result of auto-correlating multiple parameters, but it can run overnight processing batches of files. The estimated time to finish each file and the whole process is shown.

The species group **porpoise** has been renamed **NBHF** – narrow band high frequency – and covers all the species that produce such clicks, which includes some small delphinids and Kogia. The group **other cetaceans** or **dolphins** includes all other species, even if they make narrow band clicks.

All existing C-POD CP1 files can be re-analysed using the new version. Rename existing CP3 files to allow comparison. They can still be displayed in this version of CPOD.exe.

Do I need to re-analyse all my data? Ouch!

If you had easily enough true positives to give the statistical power you needed, and proportionately few false positives then you do not need to re-analyse your data, but you will need to keep a copy of CPOD.exe v1.054 to analyse any new data.

For users in areas with low densities the new version will greatly reduce the time taken analysing files as there will be many fewer false positives to inspect.

Acoustic scene analysis

Some basic noise source identification is included in CP3 files produced by the KERNO classifier:

- Sediment transport noise: this is the commonest source identified as a **continuous noise source** and the frequency is shown.
- Boat sonars and pingers: the detection sensitivity for these sources of long pulses is greatly improved. They contribute more false positives than random ambient sources because they often produce trains of pulses.
- Shrimp clicks are not continuous noise sources and are not specifically identified ... yet.

Train filtering

CP3 files produced by the KERNO classifier can be filtered by:

- Modal frequency (kHz): Useful to exclude some very specific sources.
- Number of clicks in the train. Look for very long trains and the distribution of very short trains as a quick way of finding interesting or anomalous things.
- Mean click rate: A quick way to find feeding or social buzzes.
- Mean sound pressure level. Useful to exclude WUTS.

These can be also used to limit together to refine any search for cetacean trains that did not get a species class from the KERNO classifier.

Error estimator

The Metadata page of the menu shows some qualitative comments on the reliability of the cetacean detections in any CP3 file produced by the KERNO classifier.

New navigation tools

The mouse wheel, if present, can be used to scroll backwards and forwards around a detection without the display skipping to the next detection. This is useful when visually validating detections.

CP3 files can be compared quickly – the display jumps to any screen where there is a difference between two files. This is useful for reviewing any edits made during visual validation of a CP3 file (which has to be given a different name).

A single time point can be saved within the file header so that you can return to it quickly.

Annotations and adding sightings

The presence, or suspicion, of boat sonar or continuous noise sources can be shown as text in high resolution displays.

Text for species seen can be added to the CP3 file and similarly shown. Ten user defined categories can be added to a pre-existing list, and their presence marked in any minute.

User-defined codes

Users can define any number of unique text codes that can be put in the Notes field of any file to denote mooring types etc. and these can be recognized and included in exported data for use in subsequent analyses.

Click rate graphs

The distribution of click rates can now be graphed for whatever part of the file is displayed.

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