

Comparison of two passive acoustic detectors of harbour porpoise echolocation clicks

Vladislav Kosarev¹, Ansgar Diederichs¹, Caroline Hoeschle¹, Chris Pierpoint² & Signe Nielsen³



Introduction

We compare the performance of two automatic porpoise detection systems during simultaneous deployment – Wireless Detection System (WDS) and Porpoise Detector (C-POD).

Methods

We present the results of two simultaneous deployments during two monitoring projects. The systems were deployed in SE North Sea from 13-14 Sep 2013 and 27-28 Sep 2013. Hydrophones of both systems were positioned 20–50 cm from each other, attached to a buoy and deployed at a depth of 4m below sea surface (Fig. 1-2).

Results

The number of simultaneously detected clicks/minute on both systems varied between deployments (Fig.4). The detections could often be highly synchronized (Fig. 3). At other times detections were asynchronous despite the proximity of the hydrophones. R^2 of regression line varied between 0 and 51% (Fig. 4) and was 27% for the combined deployments.



Fig. 1. WDS buoy with C-POD on the deck of research vessel.



Fig. 2. WDS hydrophone (yellow cable) with C-POD.

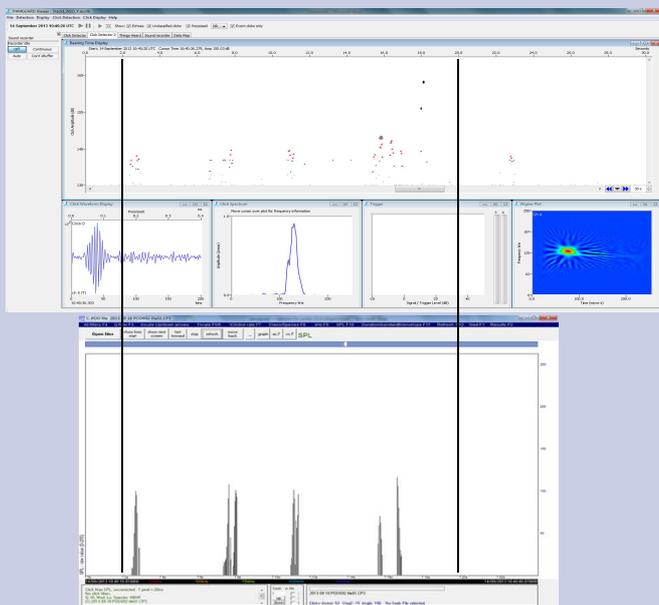


Fig. 3. A harbour porpoise event simultaneously detected by WDS (above, software PAMguard) and C-POD (below, software CPOD.exe) on 14.09.2013 at 10:40 UTC. The vertical black lines delimit the same time period on both displays.

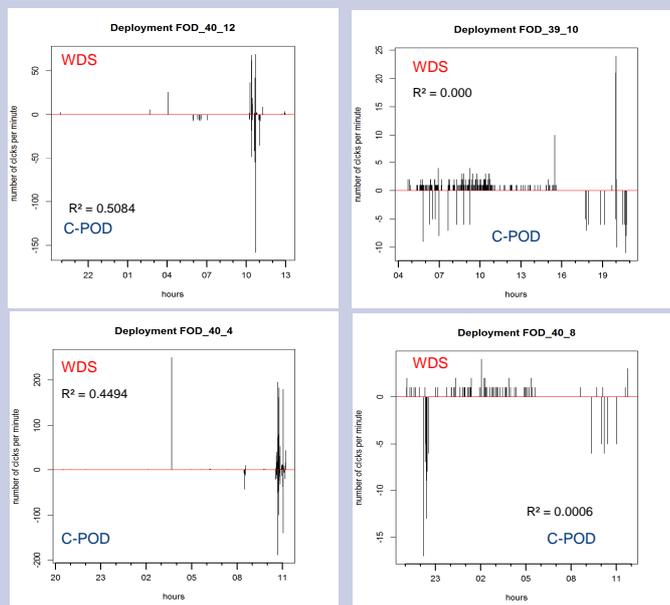


Fig. 4. Simultaneous detections of porpoises by WDS and C-POD during one deployment period. Positive y values represent WDS clicks per minute; negative values the C-POD clicks per minute.

Conclusion

Both systems detected harbour porpoises, however, detections do not always match temporally between systems. The WDS system detects individual harbour porpoise clicks, CPOD.exe is designed to detect click trains - differences in the data processing methodologies may explain some of the variation in detection times. The narrow beam pattern of harbour porpoise echolocation signals may cause further differences. It is concluded that detection rates of harbour porpoise recorded as clicks per unit time are specific to the system in use, thus cross-calibration of detection rates in field trials is strongly recommended.

1. BioConsult SH GmbH & Co KG, v.kosarev@bioconsult-sh.de, www.bioconsult-sh.de, 2. Seiche Measurements Limited, www.seiche.eu.com, 3. RWE Innogy GmbH: Offshore Wind Development, signe.nielsen@rwe.com