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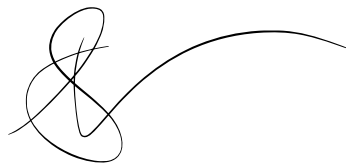
Dear Editors,

We would like to extend our thanks again to our reviewers for their time and effort in reviewing our manuscript. Your constructive feedback has vastly improved the clarity of our work. We express our thanks both here and in our acknowledgements section.

In the following document, we have again presented each reviewer's comments and the changes that have been made to address them. Our responses are italicized.

We hope the editor and reviewers find the improved manuscript satisfactory for publication.

Thank you again for your work, as it has improved our own,

A handwritten signature in black ink, consisting of a large, stylized 'S' followed by a long, sweeping horizontal line that curves upwards at the end.

Stephen R. Scherrer
Ph.D candidate

On behalf of all authors.

Predicting the doughnut effect: depth and range dependent variation in the performance of acoustic tag-receiver pairs resulting in close proximity detection interference

Rebuttle/Revision Letter – 2nd Submission

Reviewer 1:

1. Basic Reporting

The manuscript is much improved over the original version. I agree that the authors have addressed the reviewers' criticisms, and I found the text much easier to understand this time. (Note: I read the Word version with "track changes" in order to see what was changed and also the reviewers' comments relative to the original reviews. I did not manually check to verify that in the final version all the changes that the authors stated they made were complete).

I do have one significant complaint: there are a lot of minor grammatical and editorial mistakes! At this point this should be the responsibility of the authors to have collectively corrected, and not left to the reviewers. Although I support acceptance, it would likely be a good idea for the editor (or a proof reader) to go through the final corrected and submitted copy—I find this level of inattention to grammatical detail unsatisfactory.

Note added during submission: I have to judge the manuscript as deficient because the criteria requires "Clear and unambiguous, professional English used throughout.". To be clear, the paper needs minor further fixing prior to submission of a final copy, and the editor (or delegate) needs to make sure that the English errors are indeed addressed. (See my later list of errors that I found).

The manuscript draft that has been resubmitted has been proof-read by the lead author and two unaffiliated colleagues for overall grammatical and editorial errors.

2. Experimental Design

The corrections have been made to this section and make it much clearer.

No Comments

3. Validity of the Findings

Now Acceptable

No Comments

4. General Comments

I support publication, subject to:

- a. Correcting the minor editorial issues I have listed below.

All editorial issues noted by the reviewer (and a few others we found) have been addressed

- b. Having the authors **carefully** review for further errors—I am sure I have missed some (and simply don't have the time to do a full editorial review).

As noted in the basic reporting section, the manuscript has been proof read by both the lead author and two unaffiliated colleagues prior to resubmission.

5. Specific issues

(Line numbers are with reference to the "Track Changes" manuscript, with track changes turned on).

Note: Our Line numbers do not match those of the reviewer. In noting our changes, we reference the new line number for each item addressed.

Line 38 "...arrival time of multipaths". This isn't grammatically correct... it isn't the multipaths' arrival time that is relevant but rather the arrival time of the echo... "multipath" is the track that the interfering echo takes to move between the transmitter and the receiver, not something that the receiver receives and decodes. (Later I qq (sic))

Line 9: Corrected to "arrival of energy via multipaths to predict CPD occurrence and..."

Line 50. "These empirical estimations were consistent with mechanistic model predictions for CPDI affecting distances closer than 259-326 m from receivers". Grammar. CPDI did not affect distance(s). Rather, rephrase as "...CPDI affected detection at distances closer than..."

Line 27. Corrected as recommended

Line 61. Same issue as at Line 38, above. "CPDI results from combinations of depth and distance that produce multipaths arriving after a receiver's blanking interval". It is not the "multipaths that arrive, but the reflected echoes that travel a path long enough to delay arrival until after the receiver's blanking interval has ended. Suggest just changing to "CPDI results from combinations of depth and distance that produce reflected signals arriving after a receiver's blanking interval has ended".

Line 33. Corrected as recommended

Line 122. I had mentioned in my earlier review that I could not find the citation to Beveridge et al (2005) (and the citation has not been improved in this revised manuscript). However, the text states “A cruise report from the Ocean Tracking Network in the Sea of Gibraltar from 2005” and the reference is listed as “Beveridge I., Canals M., Rivera J., Sànchez A. 2005. Cruise Report RV Ramon Margalef “Ocean Tracking Network-Gibraltar II” (OTN-GIBALTAR II)”. Whatever else the OTN has done, it has not invented time travel... the OTN was not in existence until 2007, so there is no way the 2005 date can be correct. Fix.

The cruise report is dated 2012, not 2005. All references to this report were corrected.

Line 108: “...acoustic ranging experiments (Beveridge et al., 2012).”

Line 115: “...power outputs (Beveridge et al., 2012).”

Line 890: “Beveridge I., Canals M., Rivera J., Sànchez A. 2012. Cruise Report RV Ramon Margalef “Ocean Tracking Network-Gibraltar II” (OTN-GIBALTAR II). Barcelona, Spain. University of Barcelona.”

After having difficulty locating the report online ourselves, we have shared a pdf of the document as a supplemental file for reviewers, editor and staff reference.

Line 369. Fix spelling! “under fitting bais” should be “under fitting bias”

Line 298: Corrected as recommended

Line 377. Delete the comma in “the basis term for each, assessed”.

Line 301: Corrected as recommended

Line 407. Change to “A field site was selected off Sand Island,”.

Line 330: Corrected as recommended

Line 411. Change “water properties presumed similar to the deep water ranging experiment site due to their relative what???, and a standing agreement...”.

Line 333: Sentence revised for clarity “...isobath, water properties presumed similar to the deep water ranging...”

Line 358. Change “, using a Poisson distribution.” to “, using a Poisson distribution to model the error distribution”.

Line 287: Corrected as recommended

Line 362. Change “Mixed Gam Computational” to “Mixed GAM Computational”. (i.e., capitalize all letters in the acronym).

Line 291: Corrected as recommended

Line 513. Change “multipath were predicted” to either “multipath was predicted” or “multipaths were predicted”.

Line 425. Changed. “One in which multipaths were predicted to arrive”

Line 529. Fix the possessive form, change “50 m was deployed at it’s target depth,” “50 m was deployed at its target depth,”.

Line 440: Corrected as recommended

Line 533. Change “prevented recovery of the remaining for a...” to “prevented recovery of the remaining units for a...”.

Line 445: added the word “Unit”. “...recovery of the remaining unit for...”

Line 558. Change “We suspect multipath arrivals of the first ping of the synchronization interval may occur before the subsequent ping and resulting in failure of the receiver to” to “We suspect multipath arrivals of the first ping of the synchronization interval may occur before the subsequent ping, and resulting in failure of the receiver to...”.

Line 469: Added the comma and removed the word and “...subsequent ping, resulting...”

Line 670. Change “...transmissions were detected ranged 840 and 846” to “..transmissions were detected ranged between 840 and 846”.

Line 577: Corrected as recommended

Line 677. Change “There were 8 GAMs with equal to or within 2 AIC values of the lowest” to “There were 8 GAMs with values equal to or within 2 AIC values of the lowest”.

Line 584: Changed for clarity to “There were 8 GAMs with AIC values equal to or within 2 AIC values of the lowest, and thus best fit, model.”

Line 700-702. I am missing something. The sentence says, “During the shallow water ranging experiment, on average, tag transmissions were detected to a distance of 278 and 290 m (Range including standard error: 277 – 290 m) from the receiver”. Unless the standard error is ≤ 1 m, the “range including the standard error” can’t be this small, because it is nearly identical to the quoted range.

Predicted detection rates, and their associated standard error, at each distance are those fit by the smoother of the GAM’s distance term and in this instance, represents associated error < 1. Variability in the number of detections per hour is significantly less for tags at greater distances, because there tends to be less range. Visually extrapolating variability from the plotted data points is misleading as it exaggerates actual variability as the majority of detections from the 300 m tags also were undetected. 41% of hourly detections from 300m tags were detected by a single receiver were two or less (below our 3 detection threshold). There were only 10 instances where the tags at approx. 600 m and 1200 m from the receiver were detected during the experiment. These low values further constrain the model fit and associated SE.

Line 745. Change “Shapiro-Wilk’s tests” to “Shapiro-Wilks’ tests”.

This error has been corrected as recommended throughout the paper at the following locations:

Line 448

Line 497

Line 627

Line 662

Line 905. Delete the comma.

Line 720. Corrected as recommended

Line 947-48. Change “This indicates that the deeper receiver detected more individual pings of but failed to detect the transmissions” to “This indicates that the deeper receiver detected more individual pings of but failed to detect the transmissions”.

Line 774: Corrected as recommended

Line 976-7. Change “In several instances, CPDI was not observed in field results, but present in the tank experiment analogue.” to “In several instances, CPDI was not observed in field results, but was present in the tank experiment analogue.”.

Line 800: Corrected as recommended

Line 997. Change “Studies where receivers are attached dynamic platforms such as vessels, gliders,” to “Studies where receivers are attached to dynamic platforms such as vessels, gliders,”.

Line 822: Corrected as recommended

Line 1022. Delete “as a multipath”. (Redundant, given the wording of the sentence).

Line 838: Corrected as recommended

Line 1078. See my earlier comment to the Beveridge reference, which has to be incorrect (and is incomplete).

Addressed above.

Line 1096. Reference is incomplete: Gray AE. 2016. Fine scale movement of the lustrous pomfret (*Eumegistus illustris*) at Cross Seamount. University of Hawaii.

Line 913: Added “Master’s Thesis.” to citation

Line 1113. This reference is incomplete: Johnson P., Potemra J. 2011.

Line 931: Added “Honolulu. HI. University of Hawaii.”

Line 1136. Title of book misspelled... Medwin H., Clay CS. 1998. Fundamentals of Acoustical Oceanography.

Line 954: Fixed Spelling. “Fundamentals of Acoustical Oceanography.”

Figure 1. Fix grammar. “if it’s arriving intensity...” Change to “if the arriving intensity...” (Incidentally, “it’s” is the contracted form for “it is”, and does not indicate the possessive!).

Corrected as recommended

Figure 2. Fix grammar. “predicted to result in CPDI when for a receiver with a blanking interval lasting 260 ms...”.

Corrected as recommended

Figure 4. Fix grammar. “Map of ???, depicting the location of Experiments 1-4.”

Figure 4.’s title has been fixed. “Map of Oahu, Hawai`i depicting the location of Experiments 1-4.”

Figure 5. The graph needs to be re-worked before publication. The fonts used will be too small to be legible when reduced to one column format. (All the space that is needed for displaying this graph). The figure caption also needs multiple editing changes to be grammatically acceptable (and correct the spelling!): Current:

“Vemco Collision Calculator Results. The expected number of total detections recorded by a receiver each hour as a function of the number of tags present. As the number of tags detectable by the receiver increases, the probability of overlapping transmissions from multiple tags, leading to the rejection of both transmissions increases, effecting the Results shown are for tags with A69-1601 coding scheme and a 60 second nominal delay, the same parameters as those used in experiments 1-3.”.

Suggested: “Vemco Collision Calculator Results, showing the expected number of total detections recorded by a receiver per hour as a function of the number of tags present. As the number of tags detectable by the receiver increases, the probability of overlapping transmissions from multiple tags increases, leading to the rejection of both transmissions increases, effecting the ??? Results shown are for tags with A69-1601 coding scheme and a 60 second nominal delay, the same parameters as those used in experiments 1-3.”.

We enlarged figure 5’s title and axis text for readability.

We have also adjusted the figure legend to read, “Vemco Collision Calculator results showing the expected number of total detections recorded by a receiver per hour as a function of the number of tags present (Vemco, 2017). As the number of tags detectable by the receiver increases, the probability of overlapping transmissions from multiple tags increases, leading to the rejection of both transmissions. Results shown are for tags with A69-1601 coding scheme and a 60 second nominal delay, the same parameters used in experiments 1-3.”.

Figure 6. Delete the redundant plural from “resulting in detections records from the receivers...”, i.e., write “resulting in detection records from the receivers...”.

Corrected as recommended

Figure 9. Add the word “fewer” to the phrase “but detected substantially transmissions than the receiver not affected by CPDI (50 m depth).” in the figure caption.

Corrected as recommended

Reviewer 2:

1. Basic reporting

The authors did a great job addressing the issues and concerns raised by the reviewers. I believe all reviewer comments were adequately addressed and therefore recommend this manuscript for publication.

A few minor suggestions:

- Lines 53 and 56: Source Level is typically abbreviated SL (not SN).

Line 69 and 72. Corrected as Recommended.

- Line 61: Bathymetry is not a source which contributes to environmental background noise.

Line 77-79: Adjusted for clarity "Abiotic sources affecting passive acoustic telemetry systems include ocean tides and waves, stratification, weather events, and the absorptive and reflective acoustical properties of the environment."

- Line 62: Cetaceans produce noise as well (and in the frequency range of your pingers).

Line 80: Adjusted sentence to incorporate cetaceans. "Sources of biotic noise include snapping shrimp, mantis shrimp, urchins, some reef fish, and cetaceans"

- Line 218: It would be good to include a link to the Vemco collision calculator.

A reference to Vemco's website has been included with Figure 5's legend and in the references section.

Figure 5. "Vemco Collision Calculator results showing the expected number of total detections recorded by a receiver per hour as a function of the number of tags present (Vemco, 2017)."

Line 996: "Vemco. 2017. Collision Calculator. Available at <https://vemco.com/collision-calculator/> (accessed October 20, 2017)."

2. Experimental design

No comment.

No comments

3. Validity of the findings

No comment.

No comments

4. Comments for the Author

No comment.

No comments