

Interactive comment on “What can seabirds tell us about the tide?” by Matthew Cooper et al.

Anonymous Referee #2

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Reviewer comments on

What can seabirds tell us about the tide?

This is a very well written paper, and a splendid example of cross-discipline imaginative, even opportunistic, research. Definitely worth publishing, and fittingly short and focussed in presentation.

The technique is probably unlikely to be used routinely in preference to small non-biological drifters, as tagging and recovery are labour intensive, and without firm control of the locations and pattern distribution of the bird “deployments”; numerical modelling is even in this paper, considered to give better estimates of currents in areas of interest.

Some specific comments follow:

Admiralty sources usually use the term “tidal streams” . . .

C1

Line 34 can we have an indication of differences where currents are weaker?

Line 37 perhaps delete “great” see above.

Line 50 location of expensive turbines would demand much more information than this technique can deliver. Don’t oversell!

Line 61 This is a critical assertion, skimmed over here. Are there other studies of the GPS-Razorbill behaviour to be more convincing?

Line 96 For a cross-discipline paper “colonial” could be defined en passant.

Line 107 need to specify precision. . ./accuracy. One hundredth of a degree? How many metres?

Line 145 using f for the multiplication factor is unfortunate as for tidal scientists f is used for the amplitude of the 18.6 years modulation of lunar tides. Alpha would be OK. Line 146 Scaling and normalising the observations according to the tidal range at Liverpool on the day is acceptable, but will also remove most of the variations due to diurnal and even shallow-water harmonics that are not local to Liverpool. There are elements of this procedure that will introduce some tidal noise.

Line 176 State that off shore tidal currents are seldom rectilinear, but take the form of ellipses. Hence the need for a definition.

Line 189 need to say why this is done, having already normalised currents at line 145.

Line 204 In relatively shallow water, it would be normal for the currents in the 6 hours before high water to be greater than on the ebb. . .due to the progressive wave part of the tide here. Does the model show this? See also line 231 etc.

Line 210 could say here that generally in this area $u \gg v$.

Line 219 Useful indication of the otherwise data quality, but how common are “timing errors”.

C2

Line 239 Wrong terminology. A degenerate ellipse is a point. Better to replace “degenerate” with “rectilinear”.

Line 244 Replace “predicted” with “computed”.

Line 247 while (Pugh 1987), a text book so simplified, is generally valid, it would be better to refer to more recent and original studies of the current profile in tidal streams. An alternative would be to interpret the results (and Figure 7) as a measurement of the factor they call f . Lines 286 to 288 could comment on this.

Line 255 is this an incipient bias in the method? Related to bird behaviour and travel time?

Lines 260 to 263 would bear repeating in the Abstract.

Line 265 Surely diving birds are diving for a purpose, and therefore very mobile when sub-surface! Probably also systematic eg upstream..

Line 268 “The non-systematic issues may be fixed. . .”

Line 270 delete “also”? Line 272 suggest paragraph break at “Anonymous”. Replace “corrected” with “eliminated”. line 284 But isn’t Figure 2 over the whole tidal cycle and without phase bias?

Line 293 How does this relate to the normalising (line 1450) which should have removed diurnal effects inter alia?

Line 299 see earlier. This could have been recast as a measure of the f factor as a function of current speed.

Line 302 “unlikely” need justification. Hence the need to refer to original papers on profiles.

Line 306 Somewhere near here the systematic possibilities of error could be summarised in bullet form for clarity and impact.

C3

Line 404 “curve is the sine curve..” say why these days were chosen?

Figure 6 the ellipses could all have a dot marking the HW time for Liverpool.

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C4