Wright et al 2017 Discussion

* Required

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The study used Dtags to describe killer whale diving behavior. Beyond GPS locations, describe the sensors on these tags and the type of information that they record.

Dtags were employed to record depth and three-dimensional body orientation using tri-axial accelerometers and magnetometers at sampling rates of 50Hz for 2009-2011 and 250Hz for 2012. The Dtags also recorded underwater sound, which enabled them to identify when orcas surfaced, resubmerged, and captured prey. The data from the Dtags was used to calculate accelerometry and dive type.

What explanation did the authors give for this key result? "...foraging dives by northern residents attained and often exceeded the expected depth distribution of Chinook salmon, their preferred prey."

The authors hypothesize that the orcas are diving deeper to increase their chances of encountering 4-5-year-old Chinook, which larger and prefer deeper depths. While they point out that this strategy is poor when abundance at shallower depths is high, under low abundance conditions when orcas have already passed shallower water strata, this may offer a chance to consume high-energy prey.

Describe an animal ecology question that could not be addressed well with 2D tracking data and explain why x,y locations would not be sufficient to address the question. What additional (ancillary) information, beyond x.y, would be useful to address this question. If you don't study animals or can't think of an example, you are welcome to find an example in the literature (please include the citation).

Many organisms exhibit diel vertical migrations to access better foraging prospects, ideal temperatures, or preferred habitats. In these cases, it may not be simple enough to know where an organism is in 2D space to predict why it is there. For instance, my current research investigates the role of bathymetric features on krill distributions, however most krill are observed using nets, which omit depth information (as they pass through a range of depths). It is very difficult to tell at which depth krill have been captured, and consequently, the characteristics of that 3D space. A portion of my research investigates using optical underwater imagery to capture krill's spatial distributions across the water column. In this manner, we can better identify environmental and biological covariates that may influence aggregation potential.

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