Incorporating dive behaviour into models of marine animal movement

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Abstract

The Abstract must not exceed 350 words and should list the main results and conclusions, using simple, factual, numbered statements.

1. Models of animal movement often only consider horizontal movement over 2 dimensions. Incorporating vertical movement in these models offers the potential to improve our understanding of the drivers of animal movement.

2. Here we describe a state-space model that incorporates a random walk on both horizontal and vertical movements, and estimates the covariance between them. The model is flexible to allow both parameters to be conditioned on covariates, offering insights into the drivers of animal movement.

3. outline the main results

4. identify the conclusions and the wider implications.

keywords: A list in alphabetical order; not exceeding eight words or short phrases; The most important key-words should appear in the title; and the abstract; as well as the key-word list.

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1 INTRODUCTION

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2 MATERIALS AND METHODS

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2.1 Equations

The deterministic part of the model is defined by this **in-line equation** as $\mu_i = \beta_0 + \beta_1 x$, and the stochastic part by the **centered equation**:

$$\frac{1}{\sqrt{2\pi}\sigma} e^{-(x-\mu_i)^2/(2\sigma^2)}$$

2.2 Tables

Table 1: This is a GLM summary table.

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	-0.02	0.11	-0.15	0.88
x	2.00	0.12	16.76	0.00

2.3 Plots

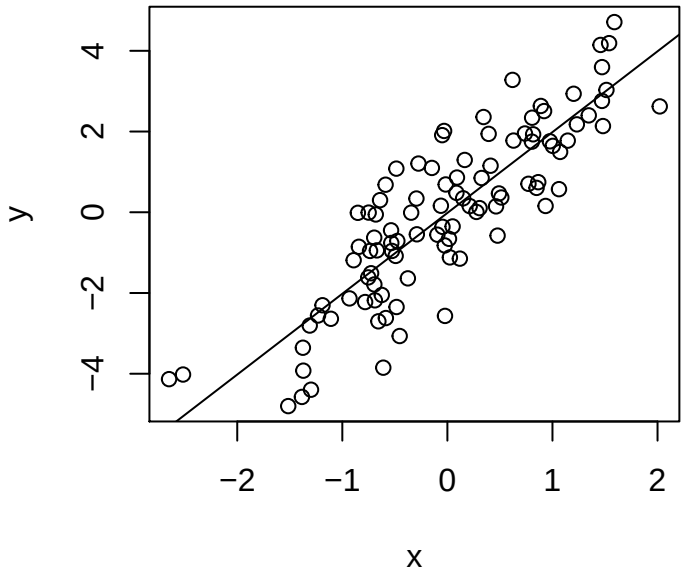

Figure 1: Relationship between x and y. The solid line is least-squares linear regression.

2.4 Citations

The relationship was first described by Halpern, Regan, Possingham, & McCarthy (2006). However, there are also opinions that the relationship is spurious (Keil, Belmaker, Wilson,

Unitt, & Jetz, 2012). We used R for our calculations (R Core Team, 2016), and we used package.

3 RESULTS

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4 DISCUSSION

5 CONCLUSION

6 ACKNOWLEDGEMENTS

This project was made possible through a travel award from the Canada-UK Foundation.

7 AUTHORS' CONTRIBUTION

8 DATA ACCESSIBILITY

REFERENCES

Halpern, B. S., Regan, H. M., Possingham, H. P., & McCarthy, M. A. (2006). Accounting for uncertainty in marine reserve design. *Ecology Letters*, *9*(1), 2–11. doi:10.1111/j.1461-0248.2005.00827.x

Keil, P., Belmaker, J., Wilson, A. M., Unitt, P., & Jetz, W. (2012). Downscaling of species distribution models: A hierarchical approach. *Methods in Ecology and Evolution*, *4*(1), 82–94. doi:10.1111/j.2041-210x.2012.00264.x

R Core Team. (2016). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from https://www.R-project.org/