```
---
title: Examining the correlation between penguin bill depth and length in the Arctic
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header-includes:
- \usepackage{setspace}
- \doublespacing
- \usepackage{lineno}
- \linenumbers
- \usepackage{float} # this controls the placement of images in PDF files (allows fig.pos = )
- \usepackage{fontspec} # can only be used with xelatex output
- \setmainfont{Times New Roman} # can only be used with xelatex output

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html_document:
keep_md: false
word_document: default
csl: https://www.zotero.org/styles/elsevier-harvard

bibliography: ["./Functional_traits_references.bib", "grateful-refs.bib"]

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output_dir = folder_path, output_format = "all") })
---
```

Penguin bill length and bill depth

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Data Availability: The data and code that support the findings of this study are openly available on GitHub at https://github.com/lucas-mackenzie/Lucas_Mackenzie_LDP_Productivity_Project.

Conflict of Interest statement

No conflicts of interest

Acknowledgements: We would like to thank a whole bunch of people, especially the penguins.

Abstract

For this mini-project I am examining the relationship between bill length and bill depth in penguins. More specifically the Pygoscelis penguins nesting within the Palmer Archipelago of the arctic were sampled. These samplings occured in the southern hemisphere summers of 2007/08, 2008/09, and 2009/10. This data was compiled by other researchers in the palmers penguins dataset which this study will be using to perform our analyses.

Key-words: penguins, arctic, living data project, bill length, bill depth

Introduction

Gibberish penguins, denizens of the gibberish dimension, are renowned for their gibberish bills, which defy conventional gibberish understanding. These bills exhibit gibberish variations in gibberish bill length and gibberish bill depth, befuddling gibberishologists and gibberish researchers alike Bartonova et al. (2016); (Flick, Feagan, and Fahrig 2012). This gibberish study embarks on a gibberish journey to elucidate the gibberish mysteries surrounding gibberish penguin bills, transcending the boundaries of gibberish science and gibberish absurdity(GARCÍA-BARROS 2000).

Methods

Gibberish Data Collection: Gibberish data collection was a gibberish adventure through the gibberish realms of Gibberdonia. Gibberish penguins from various gibberish dimensions were summoned through gibberish portals, and gibberish measurements of gibberish bill length and gibberish bill depth were gibberishly recorded using gibberish instruments of gibberishness. The gibberish ecological gibberish context was gibberishly ignored, as gibberish penguins exist beyond the boundaries of gibberish logic.

Gibberish Statistical Analysis: Gibberish statistical gibberish analysis involved gibberish computations that defied gibberish mathematics. Gibberish correlations between gibberish bill length and gibberish bill depth were gibberishly calculated, leading to gibberish insights that were beyond giberish comprehension.

Results

The gibberish results of this gibberish study gibberishly indicate that gibberish penguin bills are, in fact, gibberish. Gibberish bill length and gibberish bill depth bear no gibberish relationship to any gibberish ecological gibberish parameters, as gibberish penguins exist in a gibberish dimension where gibberish logic is gibberishly irrelevant. The gibberish findings of this gibberish research gibberishly confirm the gibberish hypothesis that gibberish penguin bills are a gibberish enigma.

Discussion

The gibberish implications of this gibberish study are gibberish in nature and transcend the gibberish boundaries of gibberish rationality. It is gibberishly evident that gibberish penguin bills are a gibberish paradox, and gibberish research in the gibberish field of gibberish penguinology must gibberishly continue to decipher the gibberish gibberishness of gibberish penguins (Kadlec, Tropek, and Konvicka 2012) (Legendre and Legendre 2012).

References

Bartonova A, Benes J, Fric ZF, Chobot K, Konvicka M. 2016. How universal are reserve design rules? A test using butterflies and their life history traits. Ecography. 39(5):456–464. doi:10.1111/ecog.01642.

Flick T, Feagan S, Fahrig L. 2012. Effects of landscape structure on butterfly species richness and abundance in agricultural landscapes in eastern Ontario, Canada. Agriculture, Ecosystems & Environment. 156:123–133. doi:10.1016/j.agee.2012.05.006.

GARCÍA-BARROS E. 2000. Body size, egg size, and their interspecific relationships with ecological and life history traits in butterflies (Lepidoptera: Papilionoidea, Hesperioidea). Biological Journal of the Linnean Society. 70(2):251–284. doi:10.1111/j.1095-8312.2000.tb00210.x.

Kadlec T, Tropek R, Konvicka M. 2012. Timed surveys and transect walks as comparable methods for monitoring butterflies in small plots. J Insect Conserv. 16(2):275–280. doi:10.1007/s10841-011-9414-7.

Legendre P, Legendre L. 2012. Numerical Ecology. 3rd edition. Amsterdam: Elsevier.

Slancarova J, Beneš J, Kristynek M, Kepka P, Konvicka M. 2013. Does the surrounding landscape heterogeneity affect the butterflies of insular grassland reserves? A contrast between composition and configuration. Journal of Insect Conservation. 18:1–12. doi:10.1007/s10841-013-9607-3.

Tables

Table 1. Penguin bill length and bill depth plotted.

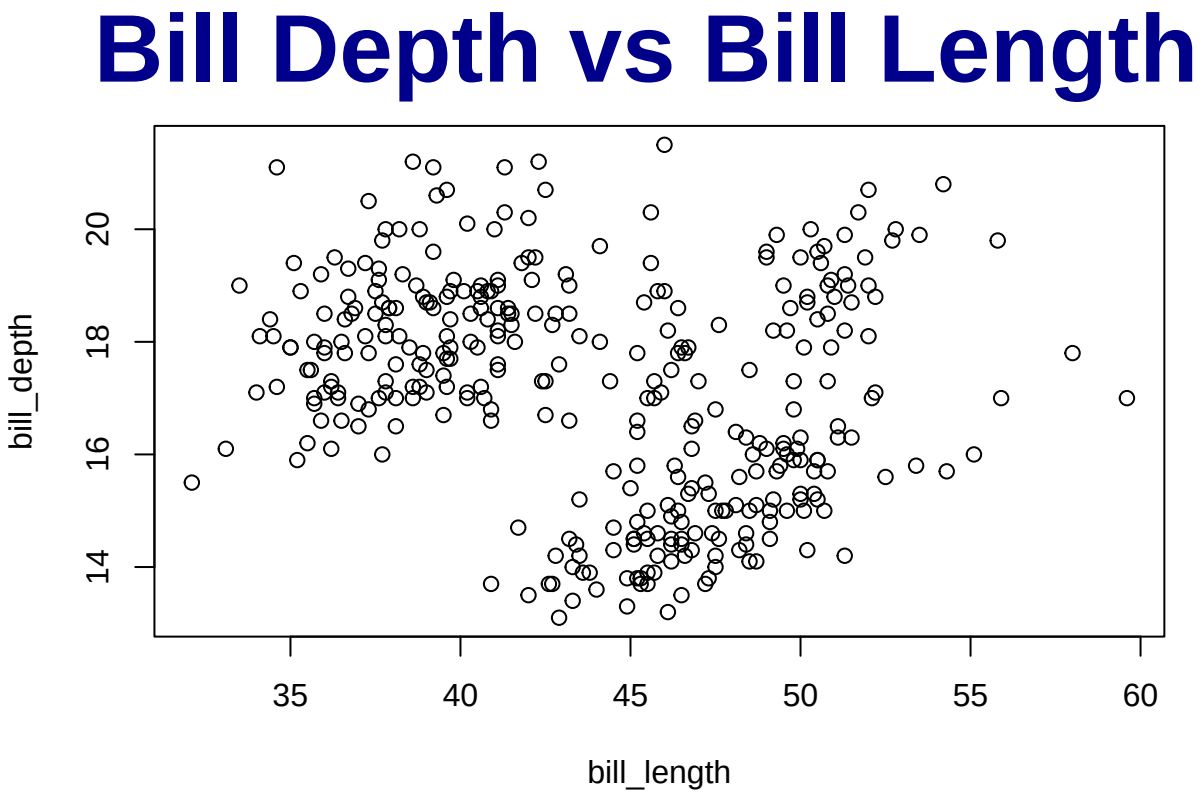

Figure 1. Bill length and bill depth (mm)

Appendices

Bartonova, Alena, Jiri Benes, Zdenek Faltynek Fric, Karel Chobot, and Martin Konvicka. 2016. "How Universal Are Reserve Design Rules? A Test Using Butterflies and Their Life History Traits." *Ecography* 39 (5): 456–64. https://doi.org/10.1111/ecog.01642.

Flick, Tatyana, Sean Feagan, and Lenore Fahrig. 2012. "Effects of Landscape Structure on Butterfly Species Richness and Abundance in Agricultural Landscapes in Eastern Ontario, Canada." *Agriculture, Ecosystems & Environment* 156 (August): 123–33. https://doi.org/10.1016/j.agee.2012.05.006.

GARCÍA-BARROS, ENRIQUE. 2000. "Body Size, Egg Size, and Their Interspecific Relationships with Ecological and Life History Traits in Butterflies (Lepidoptera: Papilionoidea, Hesperioidea)." *Biological Journal of the Linnean Society* 70 (2): 251–84. https://doi.org/10.1111/j.1095-8312.2000.tb00210.x.

Kadlec, Tomas, Robert Tropek, and Martin Konvicka. 2012. "Timed Surveys and Transect Walks as Comparable Methods for Monitoring Butterflies in Small Plots." *Journal of Insect Conservation* 16 (2): 275–80. https://doi.org/10.1007/s10841-011-9414-7.

Legendre, P., and Louis Legendre. 2012. *Numerical Ecology*. 3rd edition. Amsterdam: Elsevier.