**README file for the paper:**

**Fishing and habitat condition differentially affect size spectra slopes of coral reef fishes**

Paul G. Carvalho\*, Fakhrizal Setiawan, Karizma Fahlevy, Beginer Subhan,Hawis Madduppa, Guangyu Zhu, Austin T. Humphries. *Ecological Applications*. 2021.

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**size\_spectra\_analysis.r** (last updated 01/20/2021) contains code developed in R version 4.0.3 that completely replicates the analyses conducted for the paper. The file “functions.r” is loaded in this script and required for the code to run properly (see description of this file below). In addition, three GitHub packages are required for these analyses and are loaded on lines 20-22. This code quantifies size spectra slopes, runs Generalized Additive Models, and conducts multi-model inference. Code to create plots in the main paper and supplemental information are also included in this file.

**functions.r** (last updated 01/20/2021) contains code developed in R version 4.0.3. The statistical and plotting functions defined in this file are used in “size\_spectra\_analysis.r”. Many of the functions were adopted from https://github.com/andrew-edwards/fitting-size-spectra. The statistical functions calculate the log-likelihood for fitting size spectrum slope and calculate 95% CI. The plotting functions *trophic.plots*, *slope\_regAndFunc*, and *slope\_reg* calculate size spectrum slopes based on trophic role (carnivore vs. herbivore) and region of Indonesia where data were collected (Raja Ampat, Wakatobi, and Lombok). The primary purpose of these functions was to condense the code in “size\_spectra\_analysis.r”.

**fish\_size\_spectra\_data.csv** contains underwater visual census data collected in Indonesia (regions: Raja Ampat, Wakatobi, and Lombok) from January 2018 to July 2018. Data include site names, transect number, species identifications, estimated size (cm), functional groups, trophic roles (i.e., carnivore, herbivore, and other), and parameter values for converting length (cm) to mass (g and kg).

**drivers\_size\_spectra\_data.csv** contains site and habitat data (collected from January 2018 to July 2018) that were used in the Generalized Additive Models to explain site differences in size spectra slopes. Data include site names, site coordinates, site population gravity values (a metric of human population density), hard coral cover (percentage), algae cover (percentage), and structural complexity (see methods section for details on the classification).

**https://github.com/andrew-edwards/fitting-size-spectra** contains the original code for fitting size spectra slopes.

**https://github.com/m-clark/visibly** contains code for color palettes and other plotting aesthetics in R.

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