

README

FISH 6003: Statistics and Study Design for Fisheries

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Major assignment

Background:

This is the project folder for the MAJOR ASSIGNMENT in the Winter 2020 semester.

Dataset:

These data were obtained from Murillo-Posada et al., 2019. This raw data was made available at <https://peerj.com/articles/7278/#supp-10> as part of their publication with PeerJ.

This dataset contains Catch Per Unit Effort (CPUE, kg-tail / (diver x hour)) data of two species of spiny lobster, *Panurlirus gracilis* and *P. penicillatus* in the Galapagos Marine Reserve (GMR). This study was conducted to evaluate the factors that influence the catch of these spiny lobsters. As such, this dataset contains information on the port of origin of fishers, the month and year fishing occurred, sea surface temperature, the islands and region within the Reserve where fishing occurred, lat/lon coordinates, diving hours, and CPUE. The metadata is presented in a table below. These data were obtained during the study using a) semi-structured interviews with fishers at the main landing ports and data gathered; and b) data gathered from onboard observers who participated in the fishing trips.

The *P. gracilis* dataset contains 3186 observations and 16 variables.

The *P. penicillatus* dataset contains 5086 observations and 16 variables.

These datasets were combined for the purposes of this assignment, and an extra variable was added for “species”.

WHAT ARE THE DATA? HOW MANY POINTS? WHAT ARE THEY MEASURING? HOW ARE THEY MEASURED?

Constraints of use: There are no use constraints on this data.

Research questions:

Which measured variables influence CPUE of spiny lobsters in the GMR?

Do these variables influence CPUE of each species differently?

Is the CPUE of each species influenced by the time of day fishing occurs, and are they influenced in the same way?

Make sure to update the list of files below

COMMAND_FISH6003_Major

```
|  
|- COMMAND_FISH6003_Major.Rproj  
|  
|- README.pdf # You're reading it.
```

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| - data/
| +- DatasetS1.csv # Raw data for Panulirus gracilis
| +- DatasetS2.csv # Raw data for Panulirus penicillatus
|
| - part2/
| +- LASTNAME_MajorPart2_Fillable.rmd # Template RMarkdown file for Part 2
|
| - part3/
| +- LASTNAME_Major_Assignment_Part3_fillable.rmd # Template RMarkdown file for Part 3
|
| - R/
| +- 6003Functions.R # Script containing a few convenience functions
|
| - analysis/
| +- 001_DataSetup.R # Code to produce tidy dataset
| +- 002_Exploration.R # Data exploration goes here
| +- 003_Analysis.R # Analysis code goes here
|
| - source_paper/
| +- Murillo-Posada et al. - 2019.pdf # Paper where the data came from
|

```

Metadata

This table contains descriptions of all variables present in the dataset.

Variable	Definition	Units / Categories	Sources
HOME_PORT	Port of origin of fishermen.	In Galapagos there are three main ports: Ayora, Baquerizo, Villamil	Obtained by the onboard observers and from satellite data (MODIS)
MONTH	Fishing months: Fishing is done for four months a year: September to December.	Sep, Oct, Nov, Dec	
YEAR	The years considered for the study	2002,2003, 2004, 2005, 2006, 2007, 2008	
SST	Sea Surface Temperature	°C	
FISHING_SCHEDULE	Fishing is done during the night or during the day	Daytime or nighttime	
DATA_SOURCE	Fishing Monitoring System: With Observers on board and Landings	Observers, Landing	

Variable	Definition	Units / Categories	Sources
MACROZONE	The islands are divided into macrozones when there are areas of different abundance and distribution	Darwin, Española, Fernandina, Floreana, Genovesa, Isabela, Isabela Norte y Este, Isabela Oeste, Isabela Sur, Marchena, Pinta, Pinzon, Rabida, San Cristobal N y O, San Cristobal S y E, Santa Cruz, Santa Fe, Santiago, Wolf	
ILAND	Islands where the fishery is carried out	Darwin, Española, Fernandina, Floreana, Genovesa, Isabela, Marchena, Pinta, Pinzón, Rábida, San Cristóbal, Santa Cruz, Santa Fe, Santiago, Wolf	
REGION	Fishing Region: Galapagos was divided into three large fishing areas	West, North, Centre-South	
DISTANCE	Distance from the fishing site to the nearest Fishing Port	Km	Distance measured in the Google Earth, from each home port to the ground
LAT	Coordinates of latitude	Degree	Obtained by the onboard observers <i>in-situ</i> . Fishing ground annotated through interviews were associated to their coordinates registered for fishing observers previously.
LON	Coordinates of longitude	Degree	
DIVERS	In the Galapagos Islands fishing is done with the Hooka diving modality, and the diver is the minimum sampling unit	Diver	
DIVING HOURS	The number of hours that divers fish for lobster	Hours	
CPUE	Observed values of a CPUE (indicator of relative abundance)	Kg- tail / (diver x hour)	
SPECIES	Species of the spiny lobster of the genus <i>Pandalus</i> sp. captured during fishing	<i>gracilis</i> , <i>penicillatus</i>	

Sources: the Galapagos National Park Service.