Contents

1 BeyerBolgerNoor_Env872_EDA_FinalProject

1.1 Summary

This dataset was created for the Final Course Project for Environmental Data Analytics (ENV 872L) at Duke University, Fall 2023.

This dataset contains data from a study titled "Seagrass growth rates and physical characteristics and measures of water temperature and salinity during a simulated green turtle grazing experiment in The Bahamas, 1999 – 2000," done in 2022 by Johnson, Hanes, and Bolten. Data was collected to explore abiotic factors controlling seagrass growth and the effects of simulated green turtle grazing.

1.2 Investigators

Repository Creators:

Emma Beyer Nicholas School of the Environment, Duke University emma.beyer@duke.edu

Desa Bolger Nicholas School of the Environment, Duke University desa.bolger@duke.edu

Nusrat Noor Nicholas School of the Environment, Duke University nusrat.noor@duke.edu

Principal Researchers of study:

Dr. Robert Johnson University of Wisconsin-Madison robert.a.johnson@wisc.edu 0000-0003-4072-5623

Dr. Kathleen Hanes Washington University in St. Louis khanes@wustl.edu

Dr. Alan Bolten University of Florida abolten@ufl.edu 0000-0002-4834-2742

Dr. Karen Bjorndal University of Florida bjorndal@ufl.edu 0000-0002-6286-1901

1.3 Keywords

Seagrass, Bahamas, Green Turtles, Salinity, Temperature, Linear growth, Production Rates

1.4 Database Information

Data were collected from a study on seagrass (Thalassia testudinum) in Lee Stocking Island, Exumas, The Bahamas. More information can be found here: https://portal.edirepository.org/nis/mapbrowse?packageid=edi.422.1

Data were collected using the Data tool (EDI Data Portal).

csv files were saved as 'Temperature-Salinity.csv', 'Seagrass-structure.csv', 'Seagrass-production-rates.csv', 'Segrass-linear-growth-rates.csv', and 'Seagrass-aboveground-biomass.csv'.

Data were accessed 2023-11-01.

1.5 Folder structure, file formats, and naming conventions

Within the 'BeyerBolgerNoor_Env872_EDA_FinalProject' file you will find the 'Output', 'Data', and 'Code' files.

In the 'Output' file, you will find the final Rmarkdown report on our findings. This will be a single Rmarkdown file.

In the 'Data' file, you will find the data used within this analysis. Raw data was placed within the 'Raw' folder, processed data was placed in the 'Processed' file, and the metadata information was placed in the 'Metadata' file. Both the 'Raw' and 'Processed' files are in csv formats. The 'Metadata' files are in txt formats.

In the 'Code' file, you will find all the rmarkdown files and PDFs associated with the analysis of the data. This analysis was done in Rmarkdown files and then knit into PDF versions for reader accessability. Each Rmarkdown was named according to the analysis that was preformed.

1.6 Metadata

File: Temperature-Salinity.csv

Column Name	Description	Class of Data	Units
treatment	grazing treatment of "reference", "summer", or "winter".	chr	no units
date	date when the measurements were taken	chr	YYYY-MM-DD
exp_week	experimental week ID assigned throughout the experiment	int	no units
min_temp	minimum temperature taken on that day	num	degrees C
max_temp	maximum temperature taken on that day	num	degrees C
salinity	water salinity reading at each location	num	g/kg

File: Seagrass-structure.csv

Column Name	Description	Class of Data	Units
plot	number ID associated with each plot site	int	no units

Column Name	Description	Class of Data	Units
treatment	grazing treatment of “reference”, “summer”, or “winter”.	chr	no units
date	date when the measurements were taken	chr	YYYY-MM-DD
interval	number of times the variable has been measured	int	no units
exp_week	experimental week ID assigned throughout the experiment	int	no units
blade_length	seagrass blade length	num	cm
blade_width	seagrass blade width	num	cm
shoot_density	seagrass shoot density	num	number per meter squared
bps	number of seagrass blades per shoot	num	no units
lai	leaf area index	num	meter squared per meter squared

File: Seagrass-production-rates.csv

Column Name	Description	Class of Data	Units
plot	number ID associated with each plot site	int	no units
treatment	grazing treatment of “reference”, “summer”, or “winter”.	chr	no units
date	date when the measurements were taken	chr	YYYY-MM-DD
interval	number of times the variable has been measured	int	no units
exp_week	experimental week ID assigned throughout the experiment	int	no units
gr_mass	rate of seagrass mass growth (i.e., production), as dry mass	num	gram per meter squared per day

File: Seagrass-linear-growth-rates.csv

Column Name	Description	Class of Data	Units
plot	number ID associated with each plot site	int	no units
treatment	grazing treatment of “reference”, “summer”, or “winter”.	chr	no units
date	date when the measurements were taken	chr	YYYY-MM-DD
interval	number of times the variable has been measured	int	no units
exp_week	experimental week ID assigned throughout the experiment	int	no units

Column Name	Description	Class of Data	Units
gr_length	linear growth of seagrass	num	cm

File: Seagrass-aboveground-biomass.csv

Column Name	Description	Class of Data	Units
plot	number ID associated with each plot site	int	no units
treatment	grazing treatment of "reference", "summer", or "winter".	chr	no units
date	date when the measurements were taken	chr	YYYY-MM-DD
interval	number of times the variable has been measured	int	no units
exp_week	experimental week ID assigned throughout the experiment	int	no units
ag_biomass	above ground seagrass biomass, as dry mass	num	gram per meter squared

1.7 Scripts and code

File: temp_lineargrowth.Rmd Rmarkdown containing the analysis of temperature and salinity on seagrass linear growth.

File: temp_lineargrowth.pdf PDF of the Rmarkdown of the same name.

File: Seagrass_vs_Production_Rates.Rmd Rmarkdown containing the analysis of seagrass production rates and temperature.

File: Seagrass_vs_Production_Rates.pdf PDF of the Rmarkdown of the same name.

File: Salinity_vs_Production_Rates.Rmd Rmarkdown containing the analysis of seagrass production rates and salinity.

File: Salinity_vs_Production_Rates.pdf PDF of the Rmarkdown of the same name.

File: Final_Project.Rmd Rmarkdown containing all the graphs and analysis.

File: Final_Project.pdf PDF of the Rmarkdown of the same name.