

# MONITORING GOPHER TORTOISE BURROW CHANGES AT GTMNERR; PRE AND POST HURRICANE

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## ABSTRACT

The Coastal Strand foredune habitat at Guana Tolomato Matanzas National Estuarine Research Reserve (GTMNERR) was surveyed for gopher tortoise (*Gopherus polyphemus*) burrow population density and other characteristics following the occurrence of two hurricanes in just under a single year. The burrows were evaluated based on their activity status (Active, Inactive or Abandoned) and size. Burrows were surveyed between the northernmost boundary Southward towards the North Beach Parking. These data collected in Fall 2017 was compared to previous data collected from the same site in Spring 2016 (pre-hurricanes) and post Hurricanes Matthew/Irma in the Fall of 2017. Most of the burrows were found facing the beach side of the dunes, and higher frequencies were noted at higher elevations than previously recorded.

## INTRODUCTION

Flagler College Capstone research students studied disturbance ecology within the coastal strand at the GTMNERR North Beach access. Following the recent hurricane activity, data regarding gopher tortoise population dynamics and burrow activity was compared for pre and post hurricanes. We predict that hurricanes result in changes in burrow location, activity and size class.

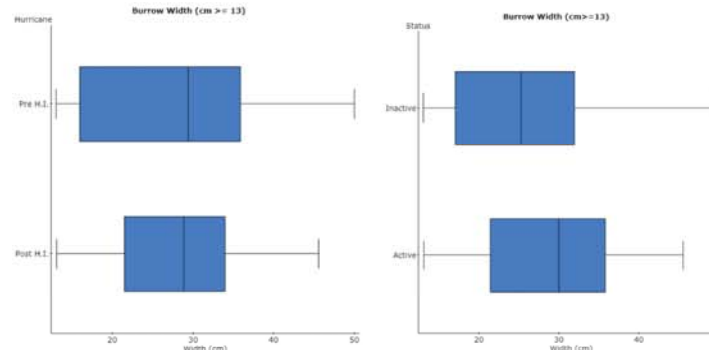
## FIELD METHODS



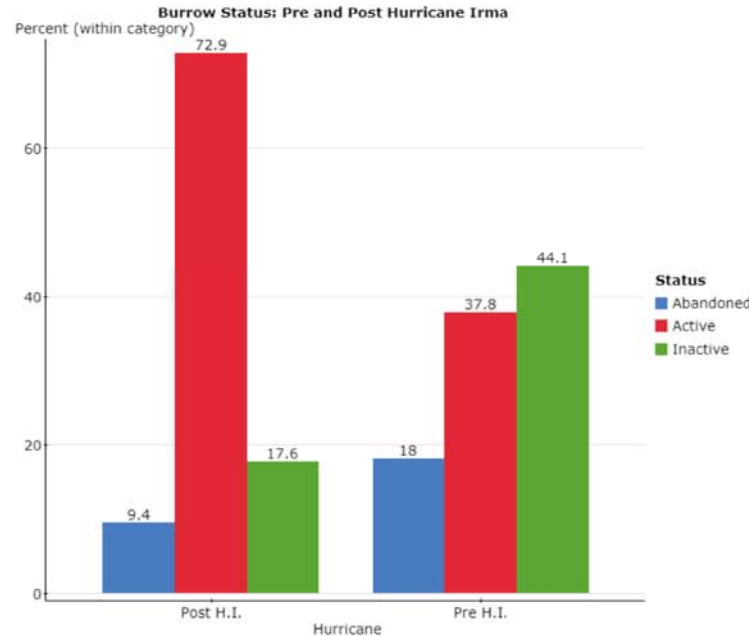
## STATISTICAL ANALYSIS

Hurricane	n	Mean	Std. dev.	Min	Q1	Median	Q3	Max	IQR	Range
Post H.I.	154	28.43	8.31	13.1	21.5	28.9	34	45.6	12.5	32.5
Pre H.I.	78	27.71	10.71	13	16	29.4	35.90	50	19.90	37

Difference	Sample Diff.	Std. Err.	DF	T-Stat	P-value
$\mu_1 - \mu_2$	0.72863797	1.3855897	125.28907	0.5258685	0.5999



This stack boxplots represent the relationship between the width of the burrows before and after the hurricane, including only those burrows that are 13 cm or greater in width.



This split bar graph shows that after the hurricane, the percent of active burrows found had increased considerably from 37.8% to 72.9% while the percent of inactive burrows decreased considerably from 44.1% to 17.6%.



## CONCLUSION

With the data we have analyzed, we were able to support two of our working hypotheses. Changes in both activity status and location have been observed between pre-disturbance burrows and post-disturbance burrows. However, we were not able to support the third part of our hypothesis, as we did not observe a significant change in burrow size after the hurricanes.

Because this experiment is comparative, rather than one with a control, we cannot conclude that hurricanes are the cause of the observed change in burrow activity or location, but we can make the suggestion.

Overall, because we have chosen to support two out of our three working hypotheses, we consider our findings to be worth pursuing. Not much is known about the coastal strand in terms of gopher tortoises, or their populations' reactions to disturbance events such as hurricanes. Since both the coastal strand and its resident gopher tortoise population appear to be sensitive to such disturbances, it is important to gain knowledge on the effects in order to mitigate them and protect these unique and valuable assets to Northeast Florida.

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