Reviewed: 7/27/2021

Assessment of Habitat and Prey Availability Associated with the Distribution of Texas Diamond-backed Terrapin (*Malaclemys terrapin littoralis*)

Bryan Alleman and Dr. George Guillen
UHCL School of Science and Computer Engineering, Houston 77058
Environmental Institute of Houston

April 9, 2015
Texas Bays and Estuaries Meeting

University of Houston Clear Lake

Life History

Range from Cape Cod, MA to Corpus Christi, TX

Only US turtle species adapted to live in brackish and saltwater (*Spartina alterniflora)* marshes

- Keystone predator - diet consists of snails, clams and mussels, crabs, fish
- Sexually dimorphic:

Sex	Carapace Length (mm)	Weight (kg)	Head Width (mm)
Female	> 200	> 1.5	> 50
Male	~ 140	~ 0.4	~ 25

Background

Information on habitat preferences across range needed

Most prey availability studies from Atlantic Coast

-South Carolina: Tucker et al (1995)

- accessibility rather than abundance may be limiting factor in areas of high tidal variability
- 76-79% of dietary mass *Littorina* for all size classes (males and females)

-Connecticut: Whitelaw and Zajac (2002)

- availability may not be primary driver of terrapin distribution
- physical habitat important influence on accessibility to prey
- no *Littorina* present

Objective

Quantify habitat and available prey of terrapins in Texas, specifically the upper coast

Hypotheses

1. Are there habitat/prey differences between random and terrapin capture locations?

2. Are there temporal (seasonal) differences in habitat/prey at terrapin capture locations?

Study Sites


Austin
Houston
San Antonio
Corpus Christi
Nuevo Laredo
Google earth
100 mi
N


Austin
Houston
San Antonio
Corpus Christi
Nuevo Laredo
Google earth
100 mi
N


Texas Point NWR
Google earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
2 mi
N


North Deer Island
Greens Lake
South Deer Island
Sweetwater
Sportsmans Road
Google earth
2 mi
N

Methods

- Terrapin were captured by hand during random searches at each site
- Surveys were conducted by walking random transect lines
- Random sample locations along the transect line were chosen by timer set for times of 5-15 minutes while walking transect
- Prey abundance, plant community composition, and physical habitat within 1 m^2 quadrat

Methods

Prey abundance:

- *Littorina irrorata* counts
- *Uca* spp. burrows counts
- Noted presence of other potenitial prey

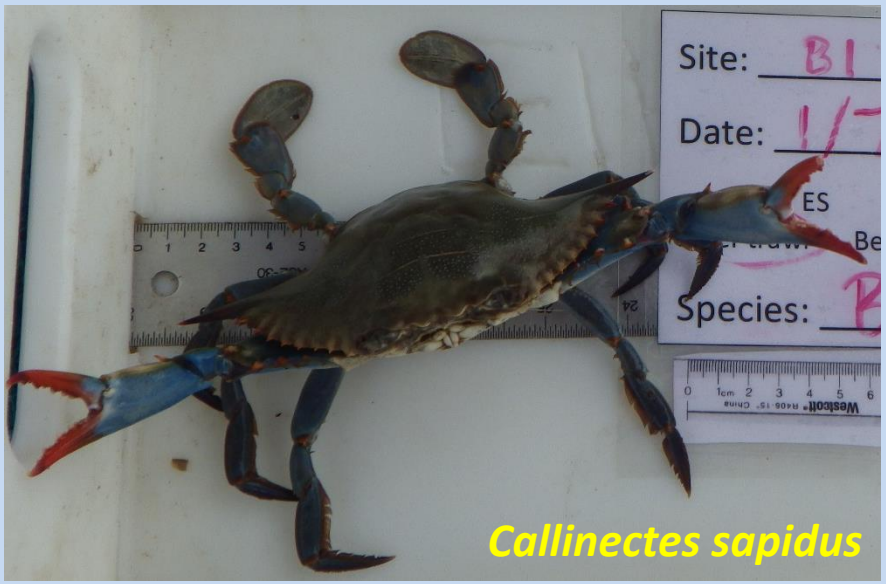
Habitat:

- Species composition
- vegetation coverage and height

Statistical Analysis:

- Random vs. Capture Locations
- Seasonal at Capture Locations
- Kruskal-Wallis test employed to test for group differences
- Dunn's Method (*post hoc*)

Common Prey Items



Results

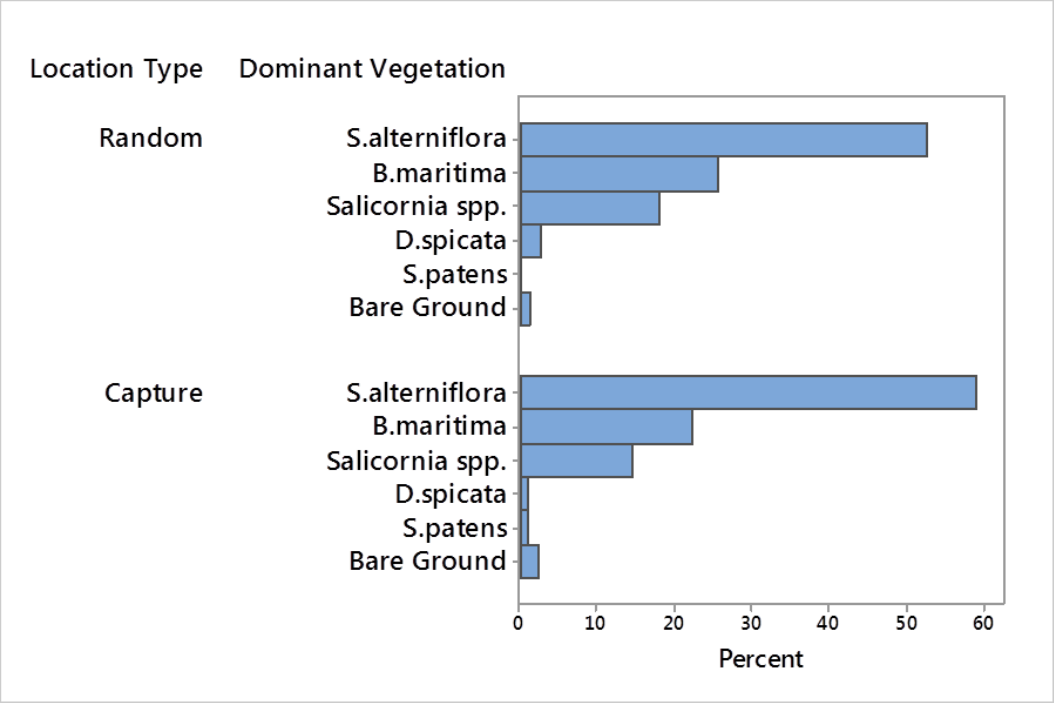
Location Differences

Results – Overall Patterns

Quadrats (n = 293)

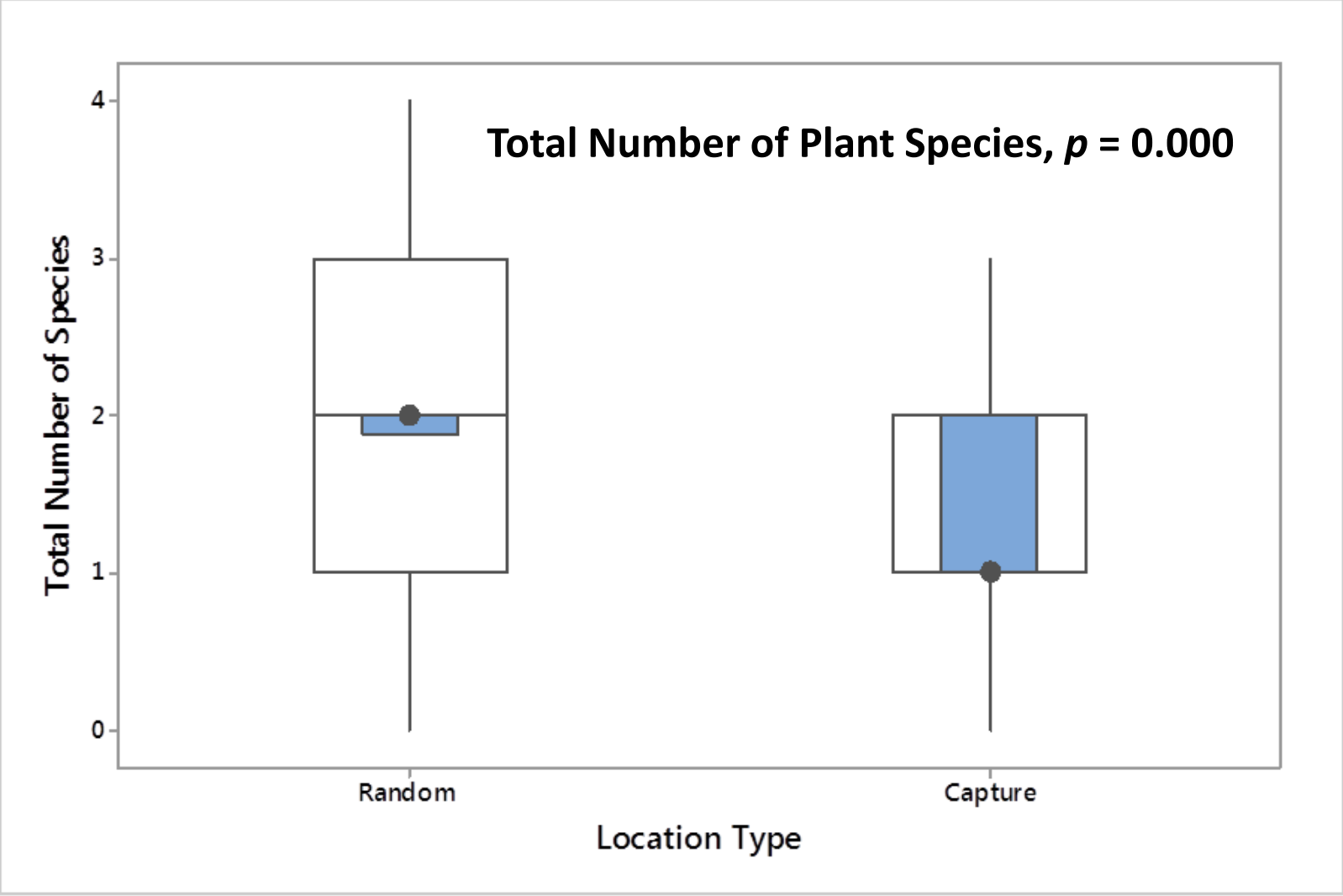
- Random (n = 78)
- Capture (n = 215)

No significant difference in *S. alterniflora* coverage (p = 0.372) or number of *L. irrorata* (p = 0.571) between random and capture locations

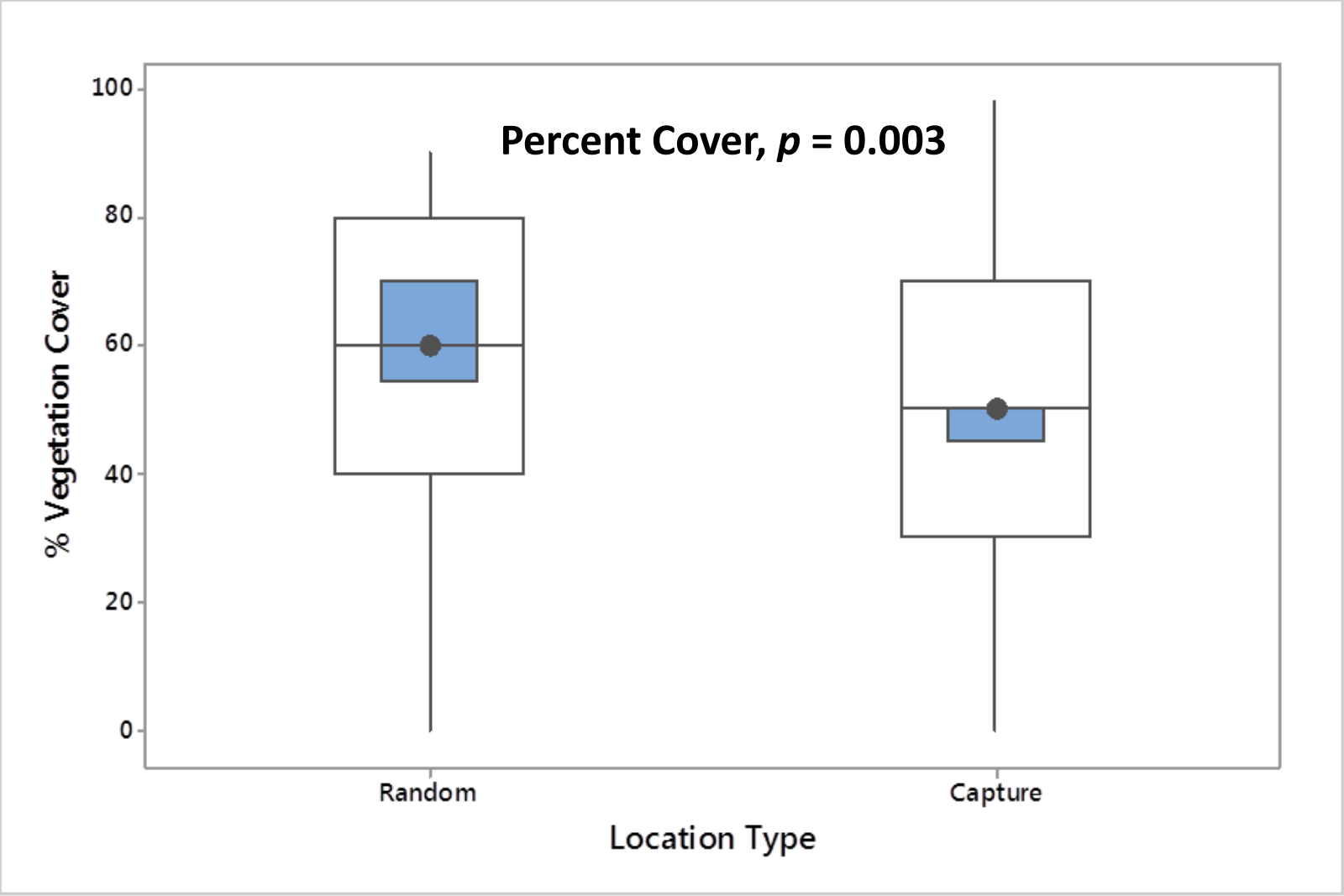


Percentage of quadrats where the listed species was the dominant plant species found within.

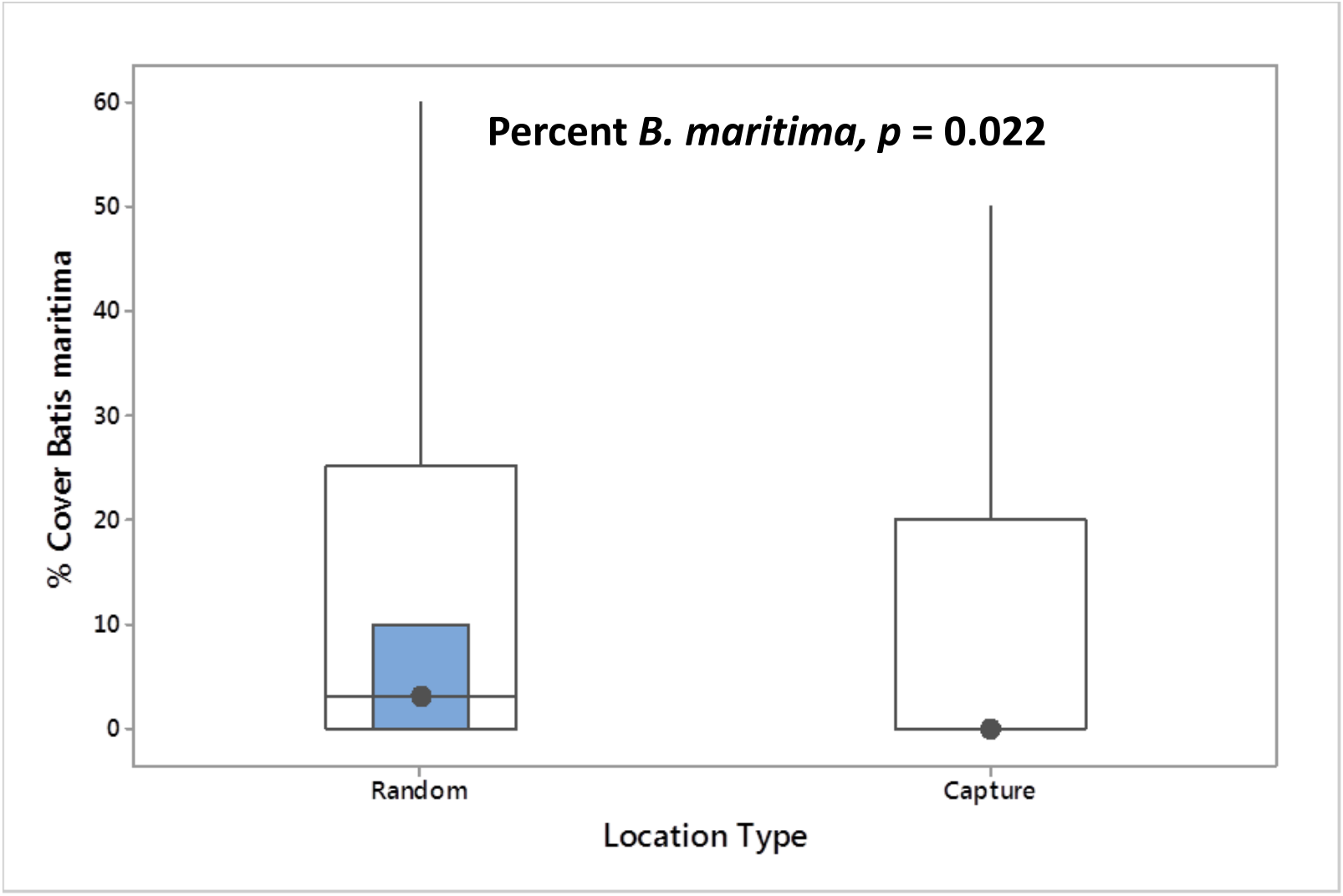
Number of Plant Species vs. Location



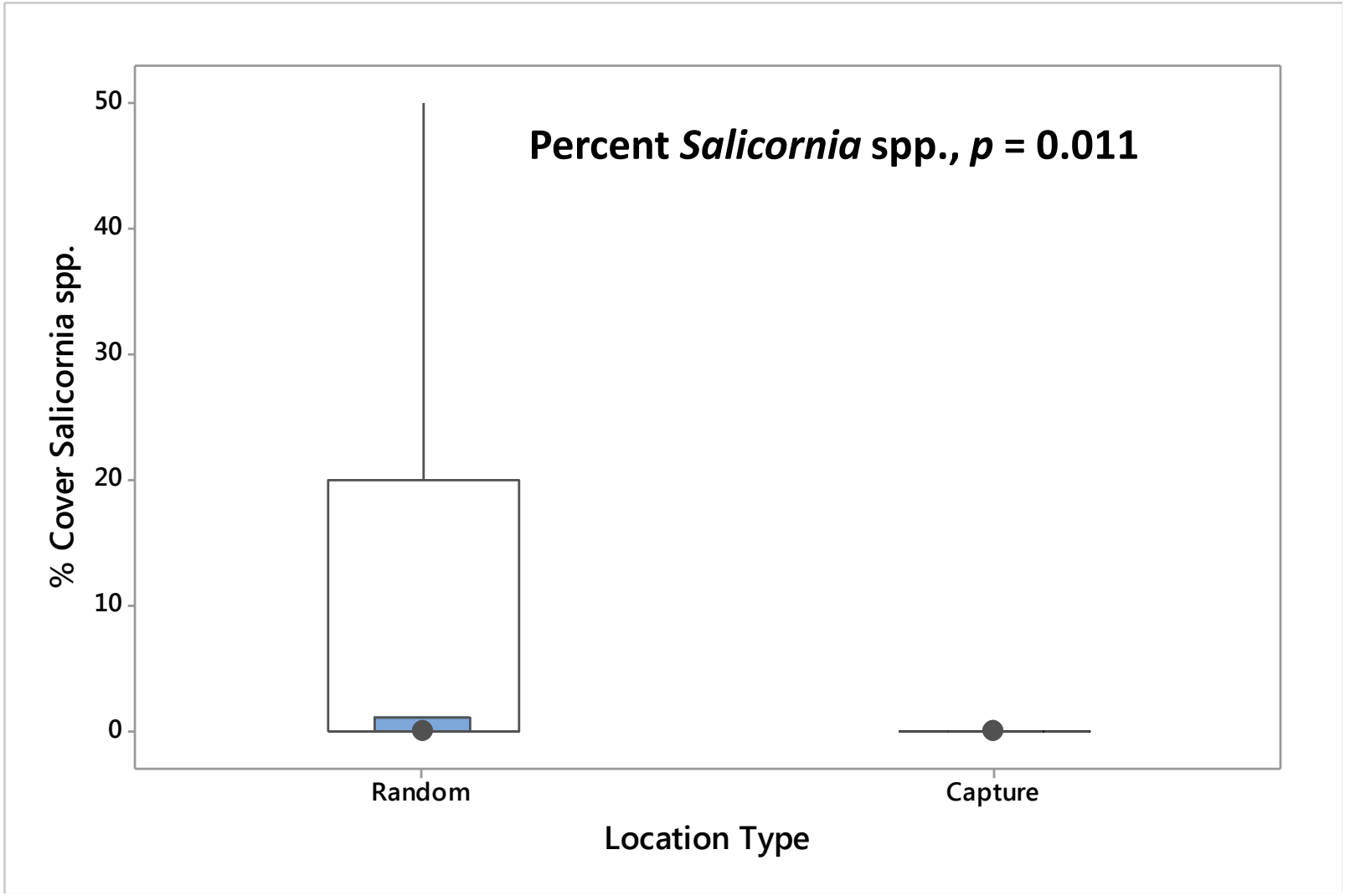
Percent Cover vs. Location



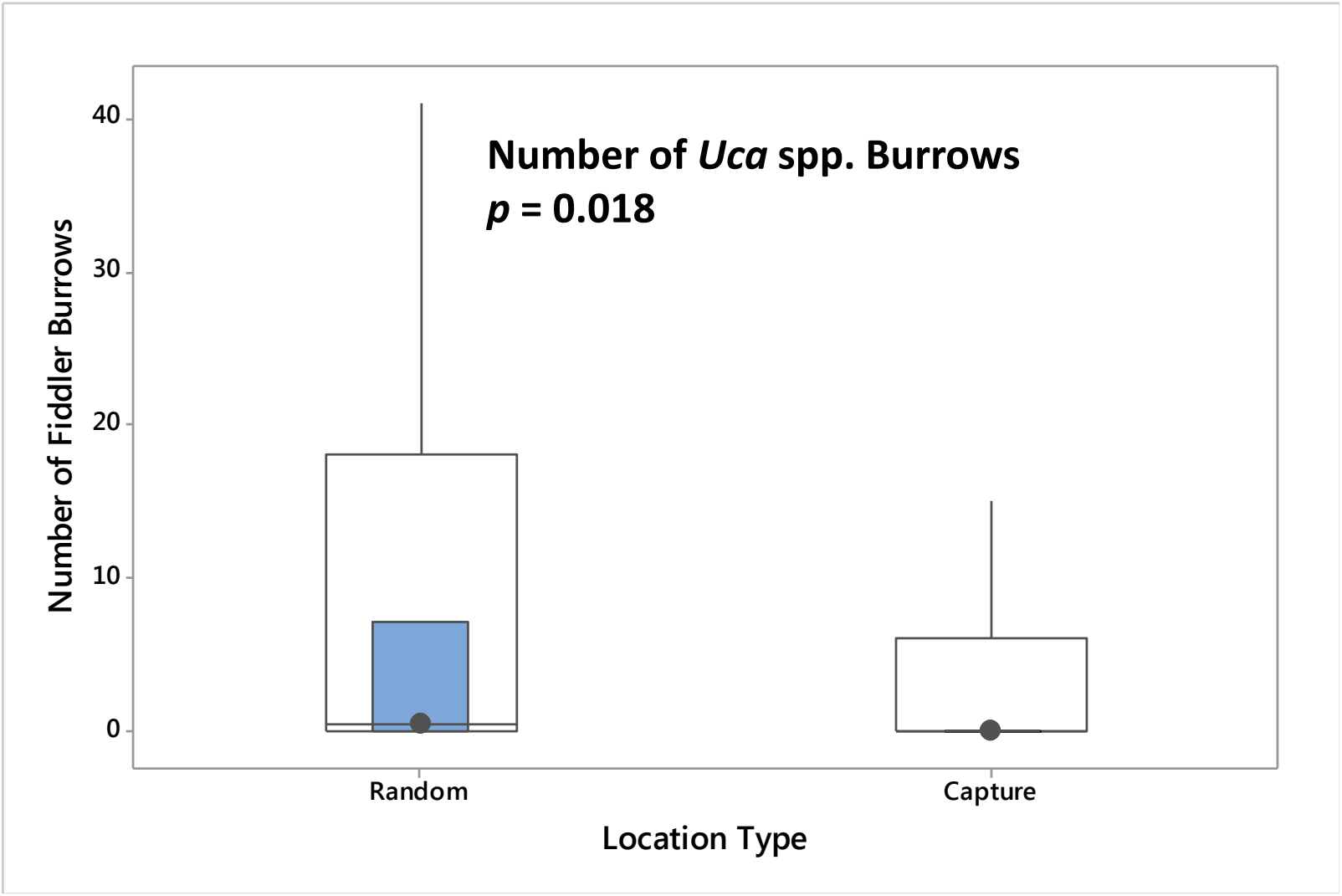
% *B. maritima* vs. Location



% Salicornia vs. Location

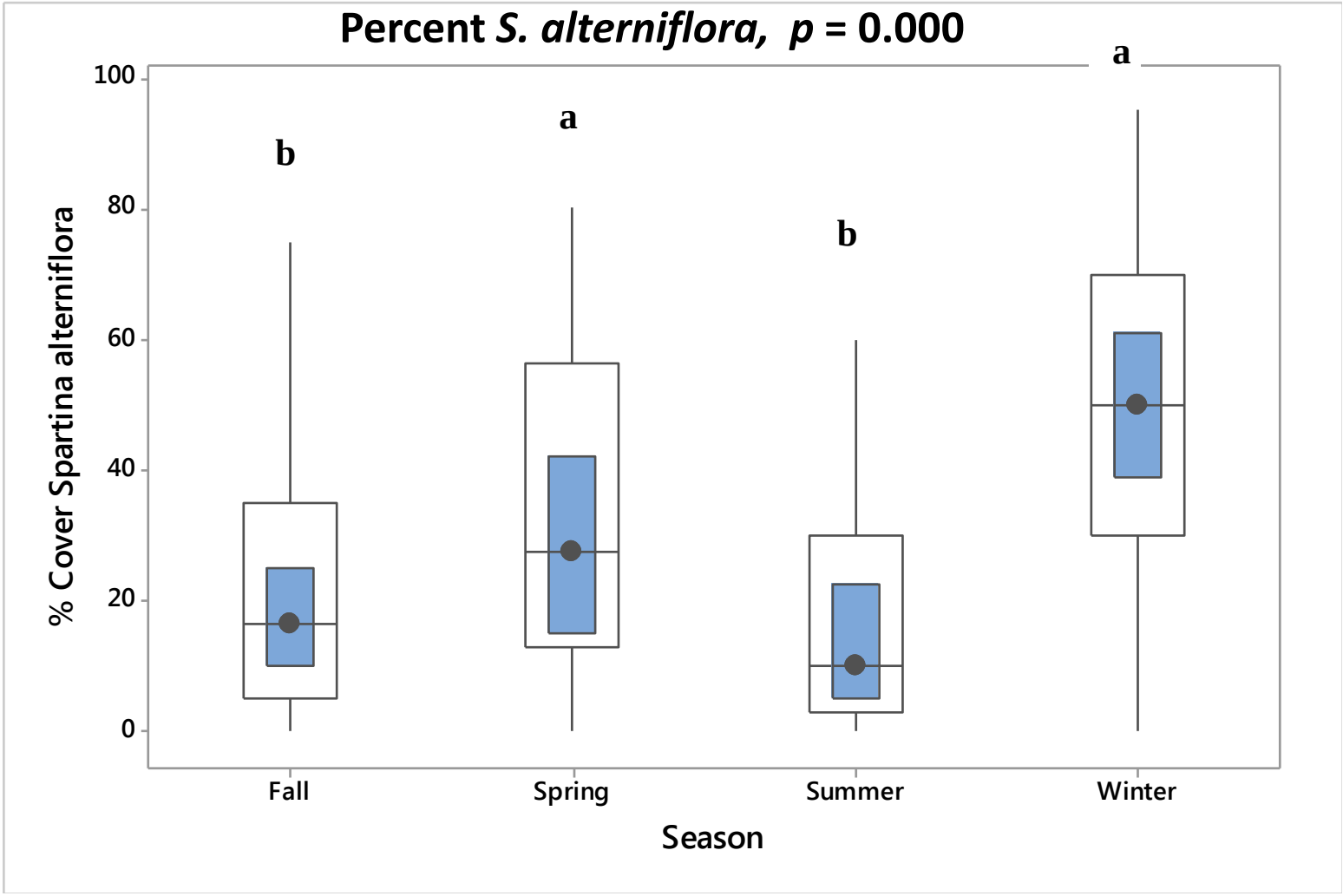


No. Fiddler Crab burrows vs. Location

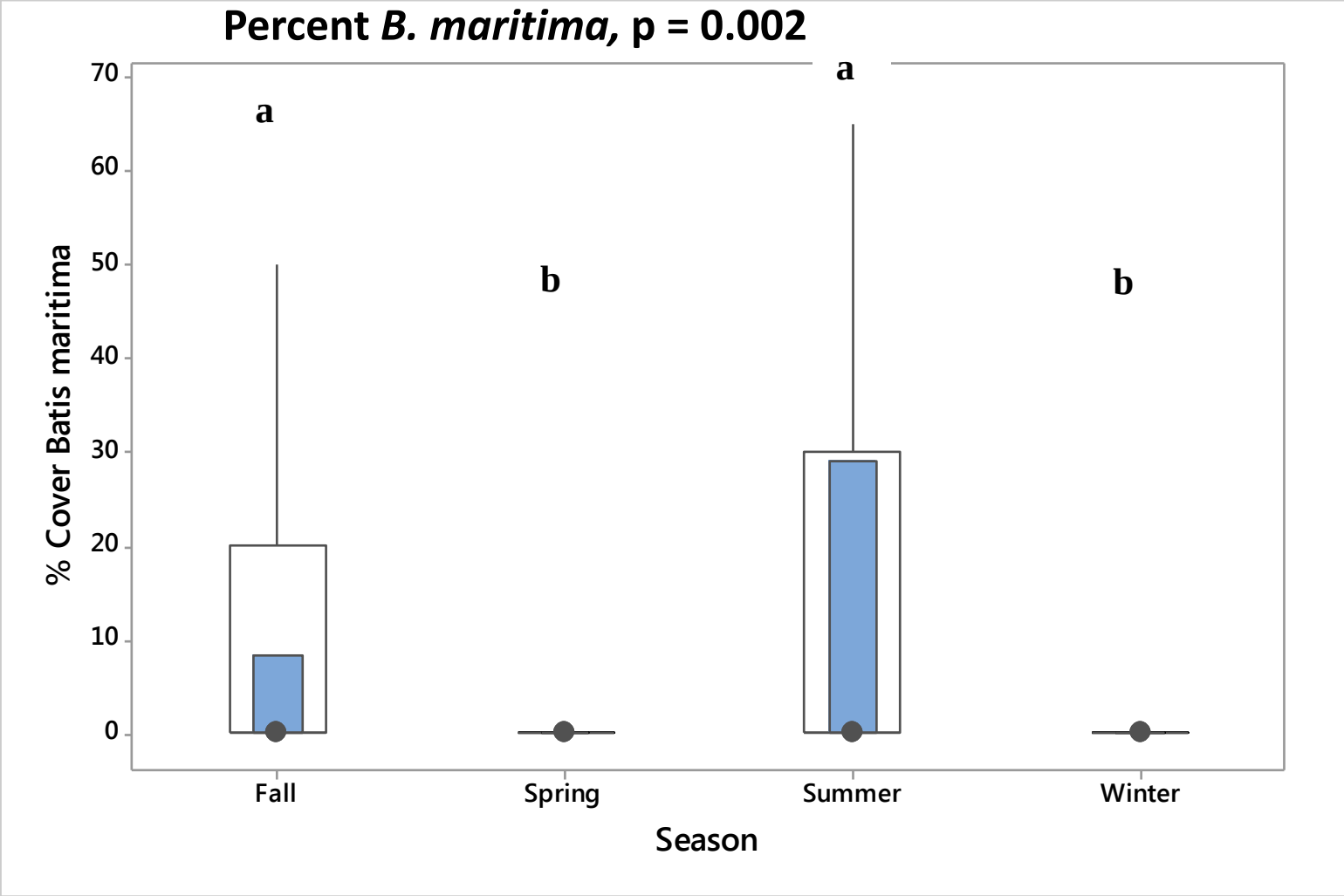


Seasonal Differences at Capture Locations

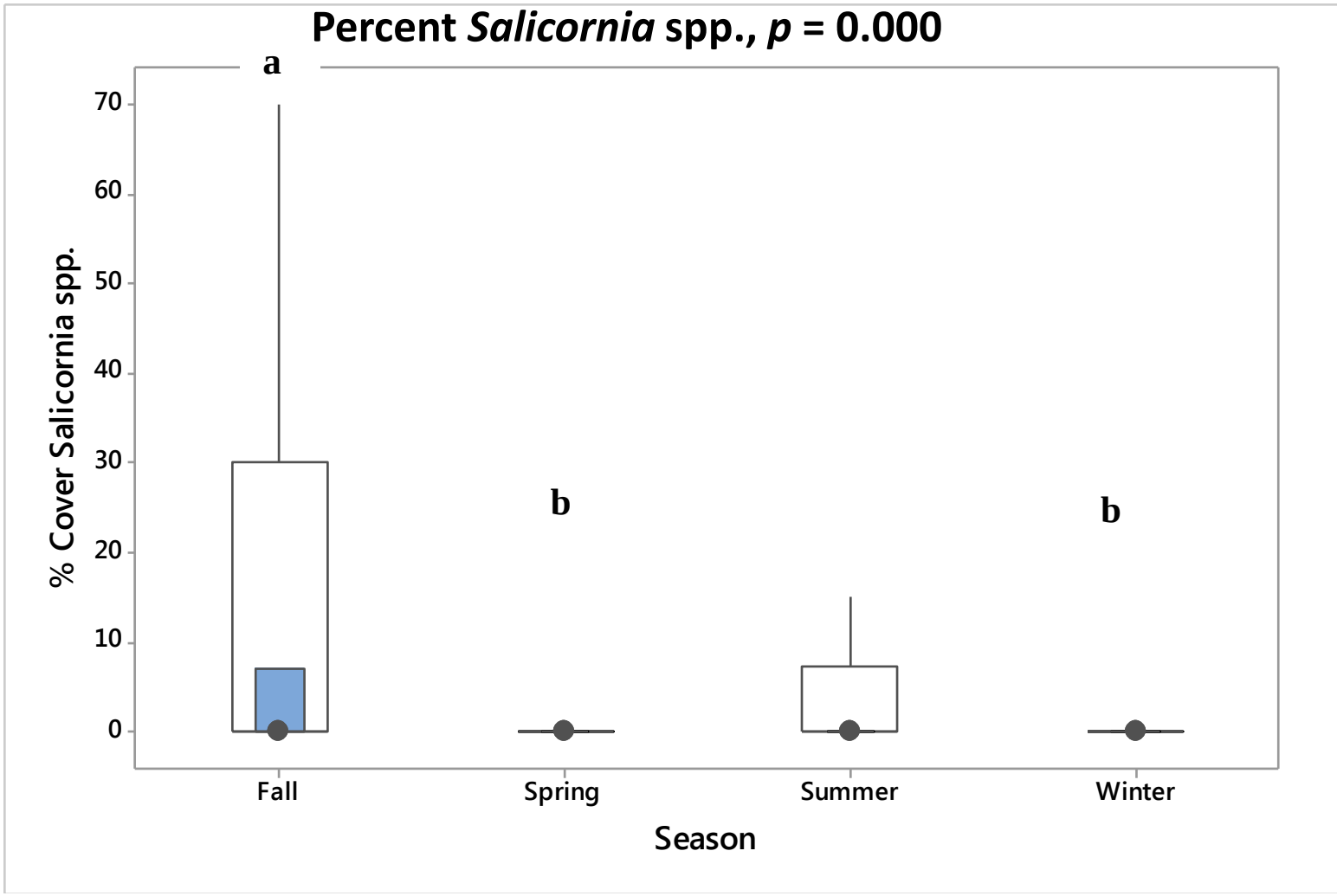
Smooth Cordgrass vs. Season



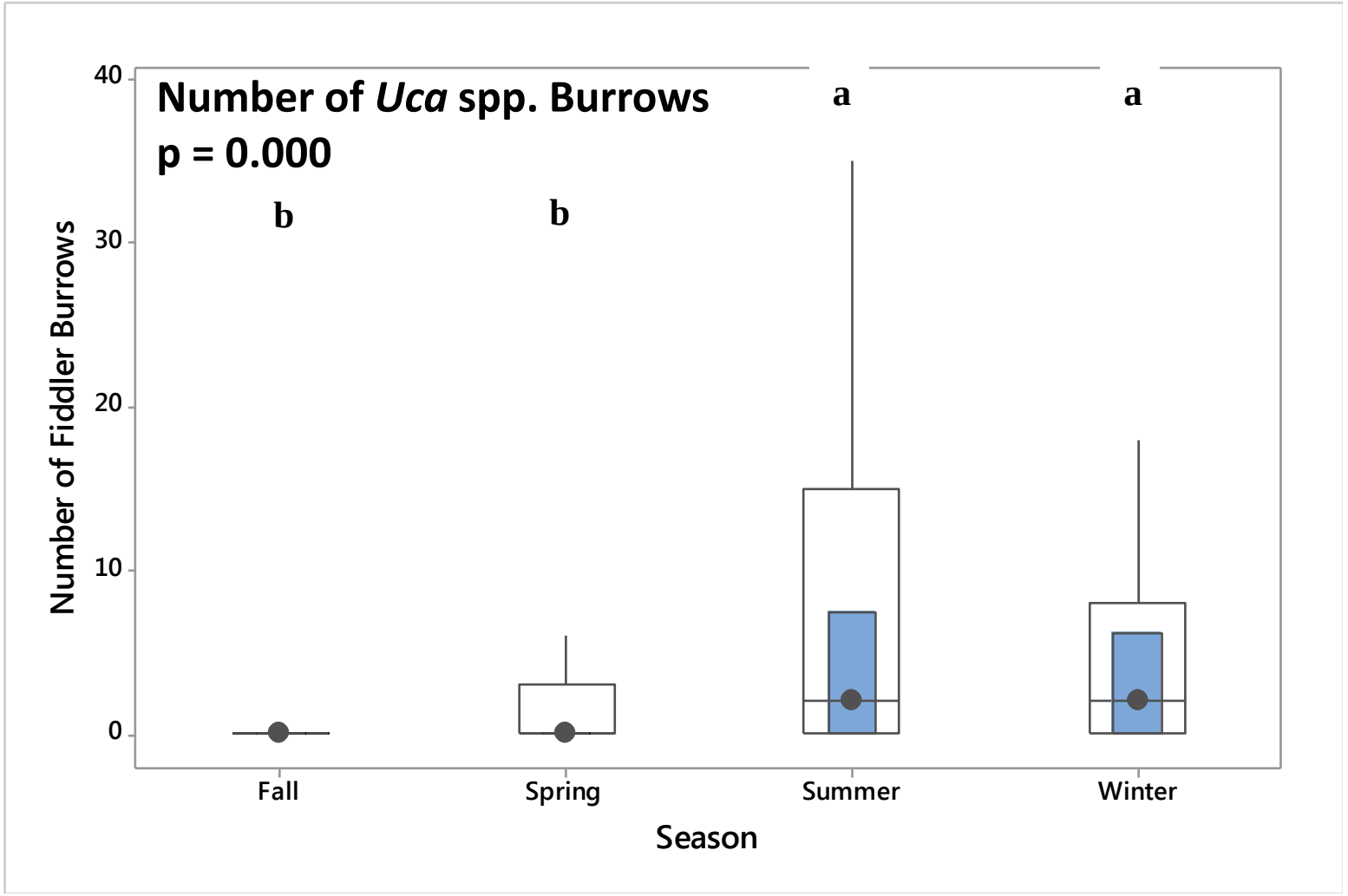
% *Batis maritim*a vs. Season



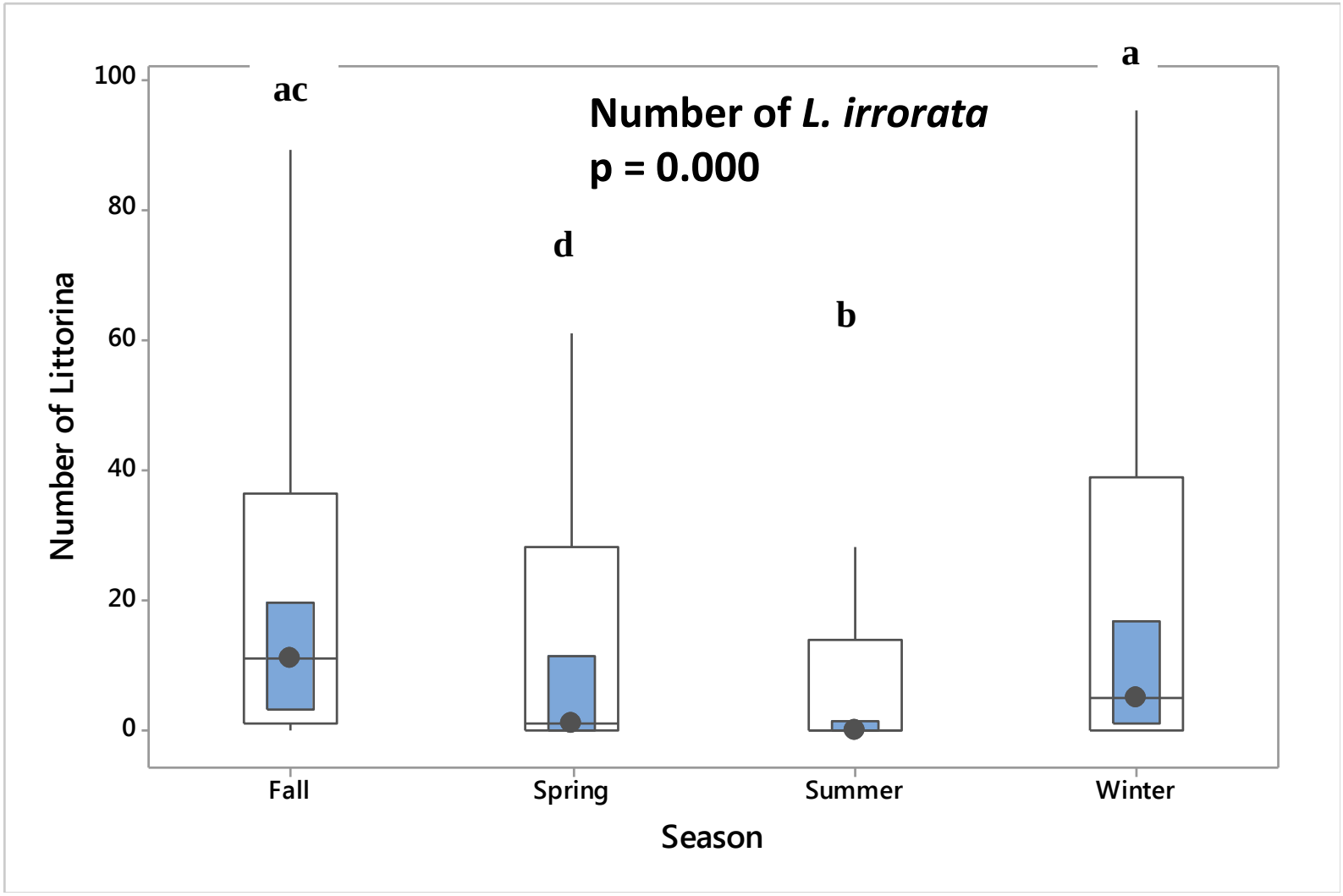
Percent Salicornia vs. Season



No. Fiddler Crab burrows vs. Season



No. *L. irrorata* vs. Season



Conclusions

Prey abundance not correlated with distribution of Texas Diamond-backed Terrapin

- agrees with previous studies

Vegetation composition likely affects distribution

However, differences in vegetative cover between random and capture locations may be due to observer bias

Seasonal changes in vegetation use by terrapin

- due to thermoregulation?
- predator avoidance?

Seasonal variation in prey numbers

- confirmed in diet analysis (*Uca*)

References

Tucker, Anton D., Nancy N. Fitzsimmons, and J. Whitfield Gibbons. 1995. Resource Partitioning by the Estuarine Turtle *Malaclemys terrapin*: Trophic, Spatial, and Temporal Foraging Constraints. Herpetologica 51: 167-181.

Whitelaw, D. M., & Zajac, R. N. (2002). Assessment of prey availability for diamondback terrapins in a Connecticut salt marsh. Northeastern Naturalist, 9(4), 407-418.

Acknowledgements

Environmental Institute of Houston:

- Staff and graduate students contributions in the field
- Equipment and funding

Texas Parks and Wildlife Department:

- Funding


Thank You!
Contact: alleman@uhcl.edu