Observing Patterns in UH Hilo MOP Turtle Tagging Data through Statistical Analyses

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Background

- Hawaiian green sea turtle (*Chelonia mydas*)
- Federal Endangered Species Act of 1973
- UH Hilo MOP and George Balazs turtle tagging

Objectives

1. Organize the UH Hilo turtle tagging dataset

2. Conduct summary statistics and look for any patterns among measurements

3. Identify directions for data collection and analysis for future tagging events

Study Site: Punalu'u Beach Park

Methods: Data Collection

The data collected and recorded includes:

- Turtle ID/tag number
- Date of observation
- Island, Site
- Species
- Sex
- Straight carapace length (SCL)
- Curved carapace length (CCL)
- Mass
- Tumor presence
- Other comments

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Methods: Cleaning the Dataset

RStudio packages "tidyr" and "dplyr"

- ○ fix typos
- ○ add or remove columns of data
- ○ filter out cells with 'N/A's or missing values
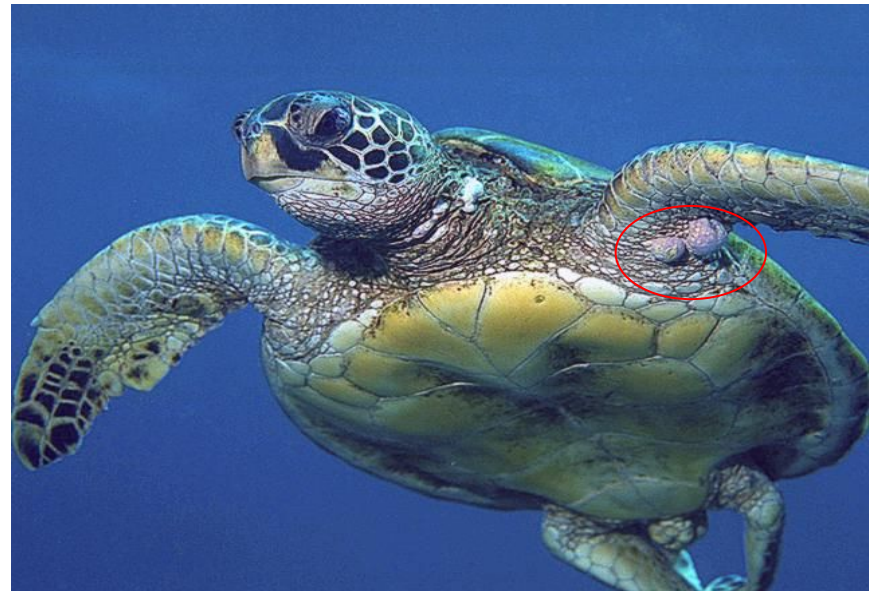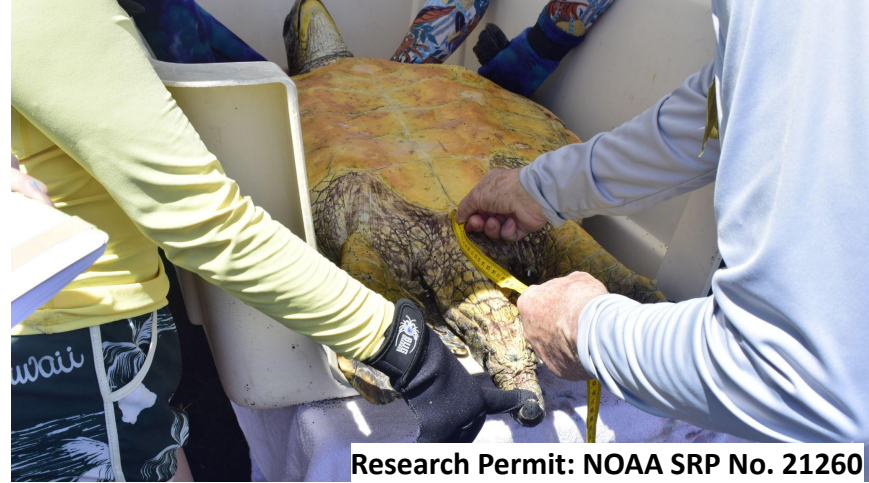
Methods: Statistical Analysis

Summary statistics

Group turtles by…

- Sex: male vs female
- Tumor Presence: present vs absent
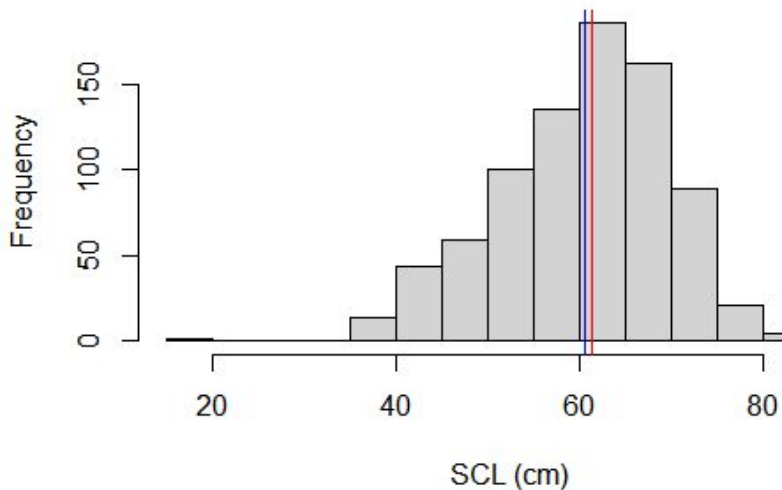
Wilcoxon Signed Rank Test

Pearson's Correlation Test

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Results: Summary Statistics

- From January 20, 1978 to July 9, 2018

- 1,220 recorded turtle observations

- 5 females, 26 males, 790 unidentified

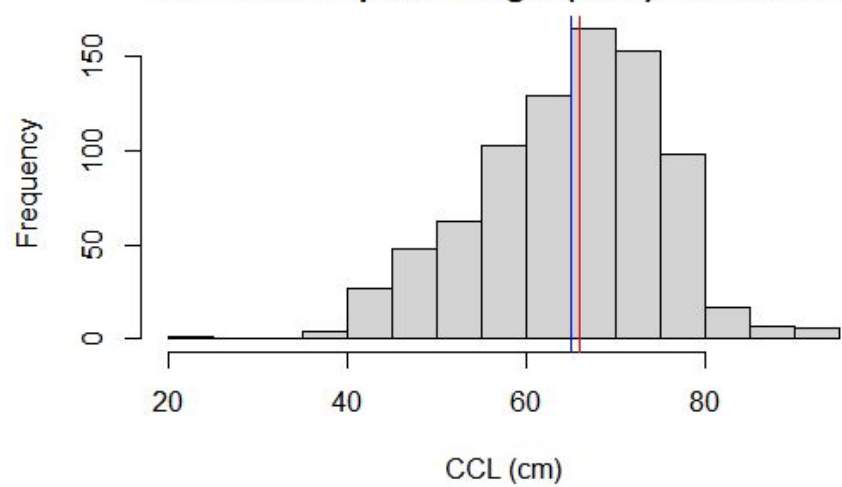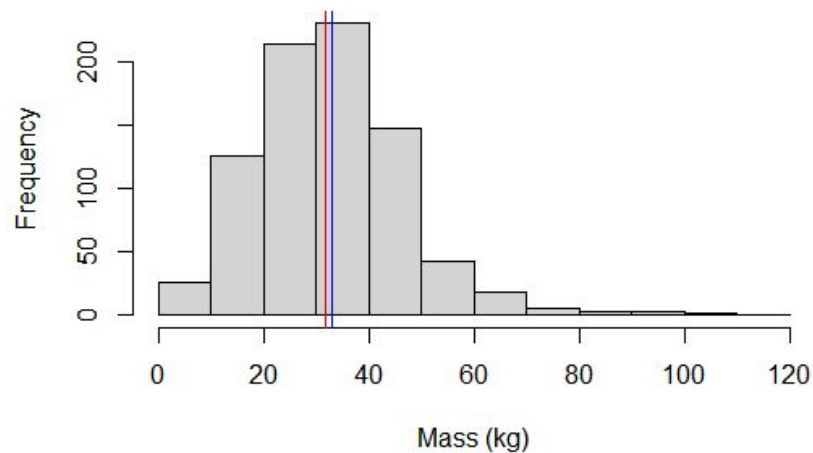- 23 tumors present, 790 tumors absent, and 8 unidentified
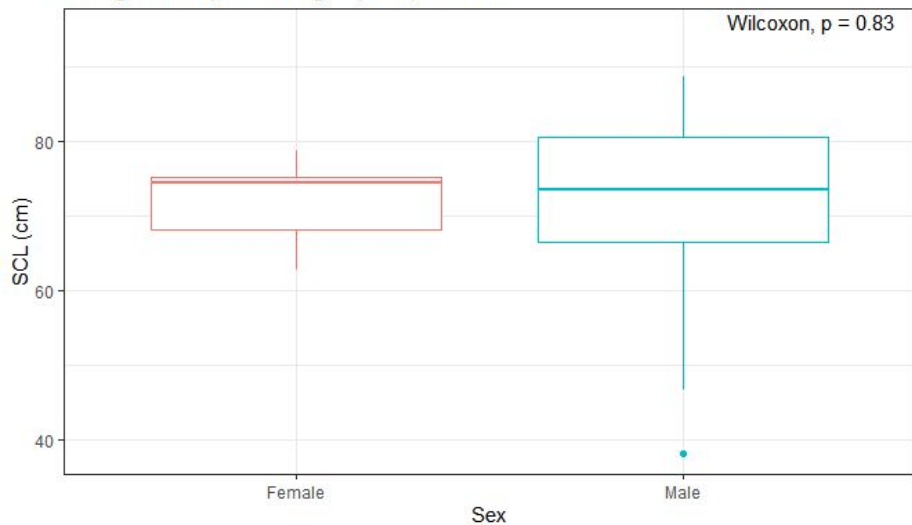
Straight Carapace Length (SCL) Distribution

Curved Carapace Length (CCL) Distribution

Turtle Mass Distribution

Straight Carapace Length (SCL) vs Sex — Wilcoxon, p = 0.83

Curved Carapace Length (CCL) vs Sex — Wilcoxon, p = 0.89

Mass vs Sex — Wilcoxon, p = 0.87
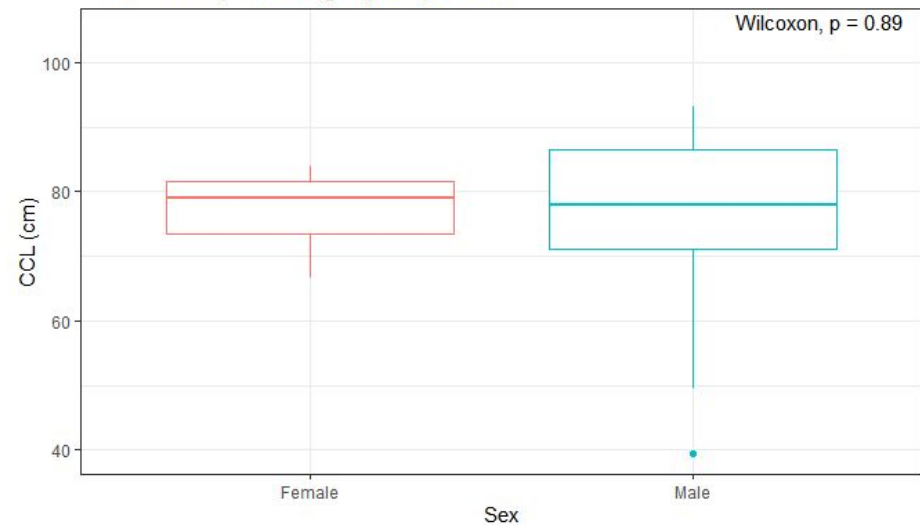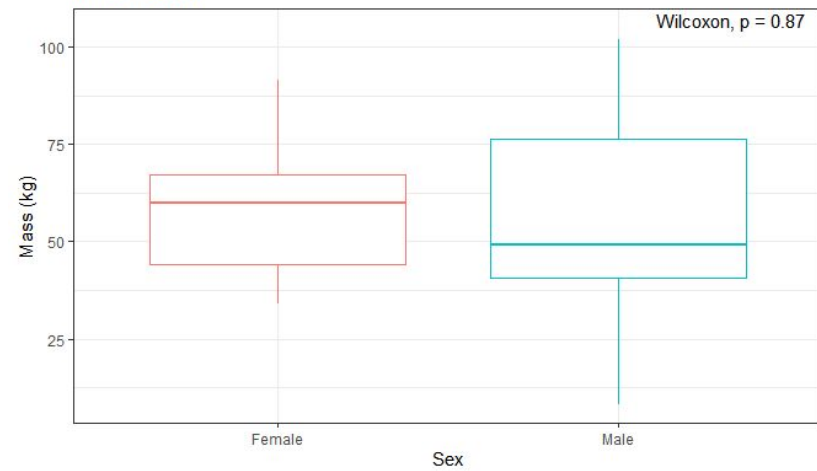
Straight Carapce Length (SCL) vs Tumor Presence

Wilcoxon, p = 0.84
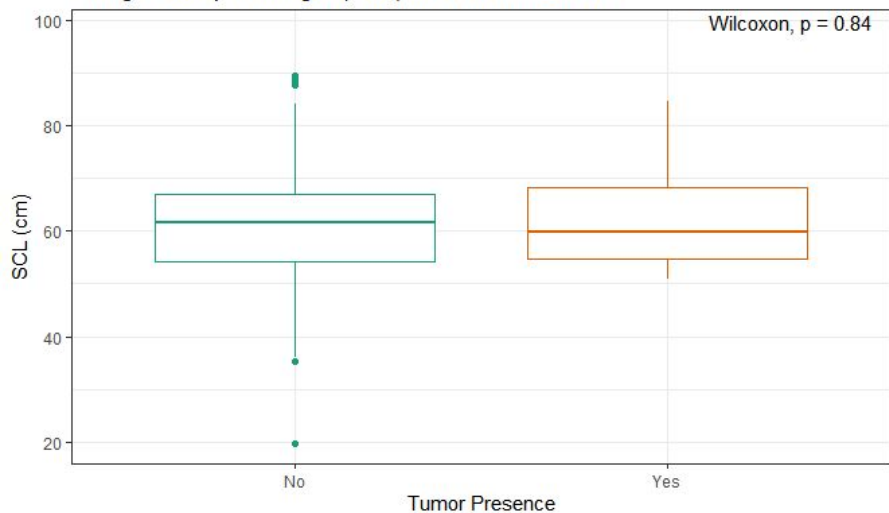
Curved Carapace Length (CCL) vs Tumor Presence

Wilcoxon, p = 0.88
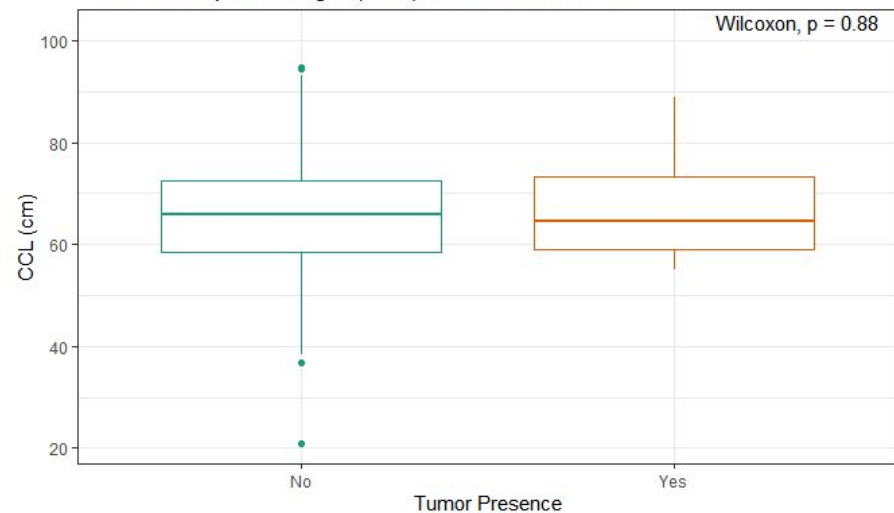
Mass vs Tumor Presence

Wilcoxon, p = 0.98
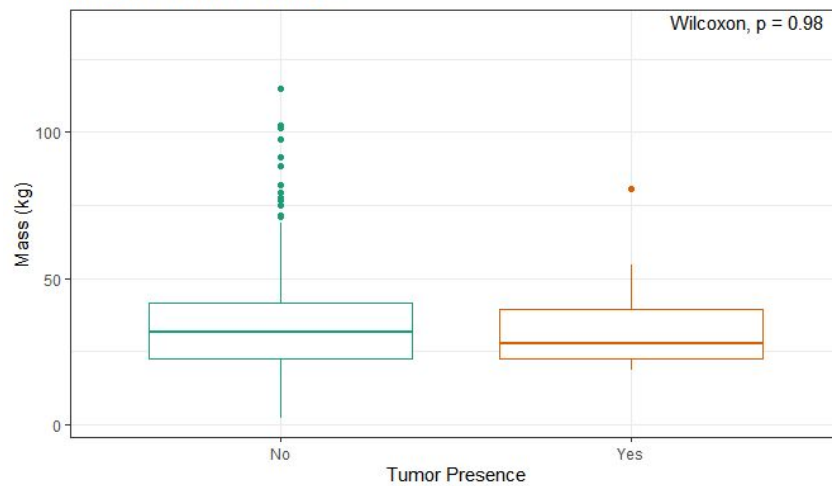
SCL vs Mass	CCL vs Mass	CCL vs SCL
$R = 0.94$, $p < 2.2e\text{-}16$	$R = 0.94$, $p < 2.2e\text{-}16$	$R = 1$, $p < 2.2e\text{-}16$
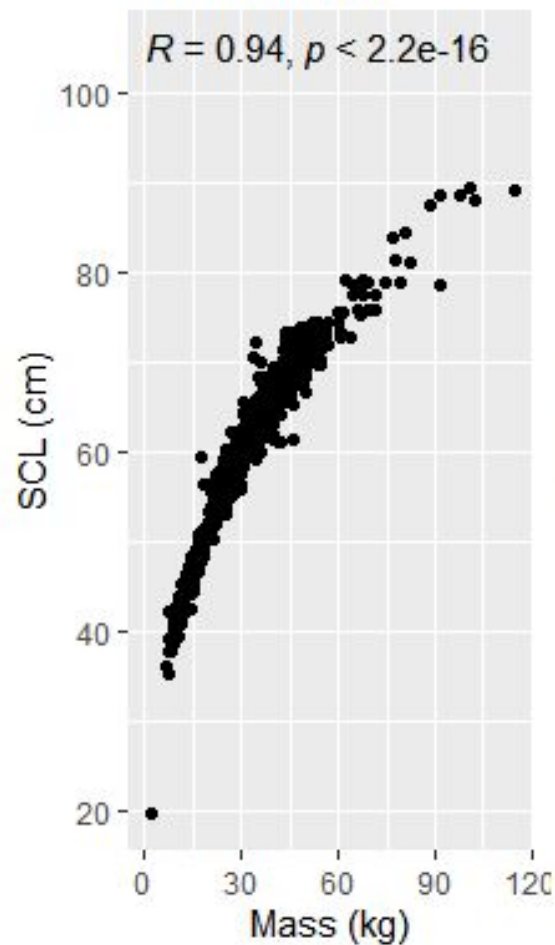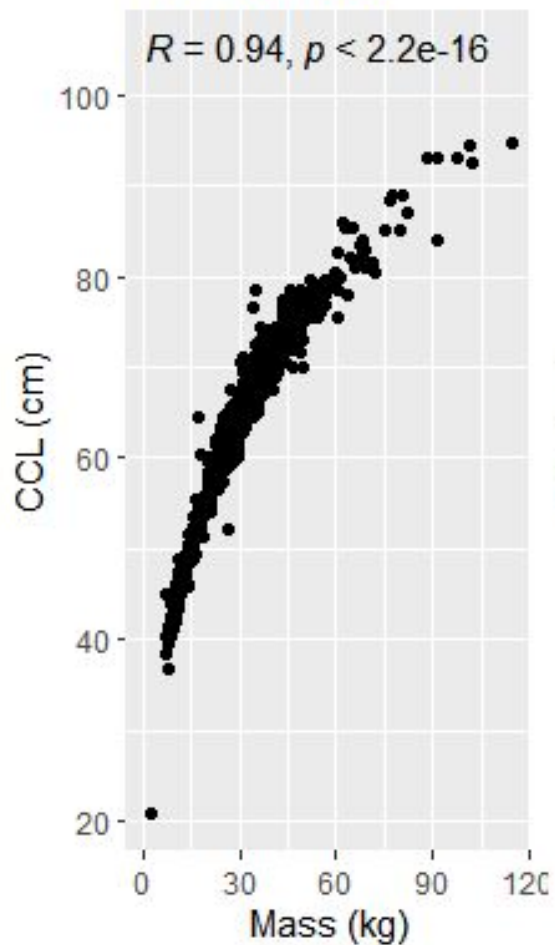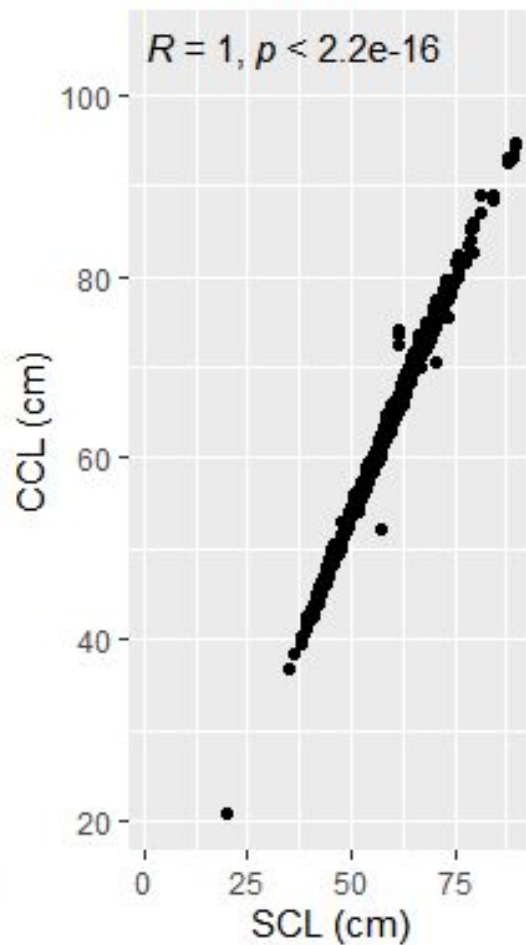
Discussion

- Sample size

- Juveniles vs adults

- Plastron and tail length measurements

- Compare recaptured turtle measurements

- Growth rates

Research Permit: NOAA SRP No. 15685-01

Broader Impacts & Conclusion

Why is it important to continue expanding this dataset?

Why is it important to continue turtle tagging?

What have we learned from past data collection/analysis? What can we continue learning?

A big thank you to…

UH Hilo Marine Option Program
George Balazs
Dr. John Burns
Lisa Parr

Mahalo to UH Manoa MOP for hosting this symposium!

Questions?