

Verifying stereo-video camera length measurements by comparing hand capture methods of juvenile green sea turtles in Cape Eleuthera, the Bahamas



Office of Undergraduate Research

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AIM

- The goal of this project is to compare hand-captured sea turtle straight carapace lengths to stereo-video imaging, so that body measurement methods can be less invasive.

INTRODUCTION

- Lack of data on juvenile sea turtles makes it difficult to understand length distributions of each species.
- Typical capture methods for data collection include a “rodeoing” technique, which requires hand capturing a turtle via snorkeling.
- Juveniles can be hand-measured to obtain straight carapace lengths (SCL), but it can impose handling stress.
- Underwater stereo-video cameras are useful in quantifying data on juveniles without coming into physical contact with them.
- Stereo-video cameras offer a better understanding of juvenile growth rates, behaviors, and habitat preferences.

STEREO-VIDEO CAMERAS:

- Calibrated prior to recording turtles.
- Housed in aluminum structure.
- Two GoPro Hero 5 Black cameras 0.8 meters apart from each other, pointed 4° inward.
- Footage analyzed in EventMeasure software to measure SCL.

METHODS

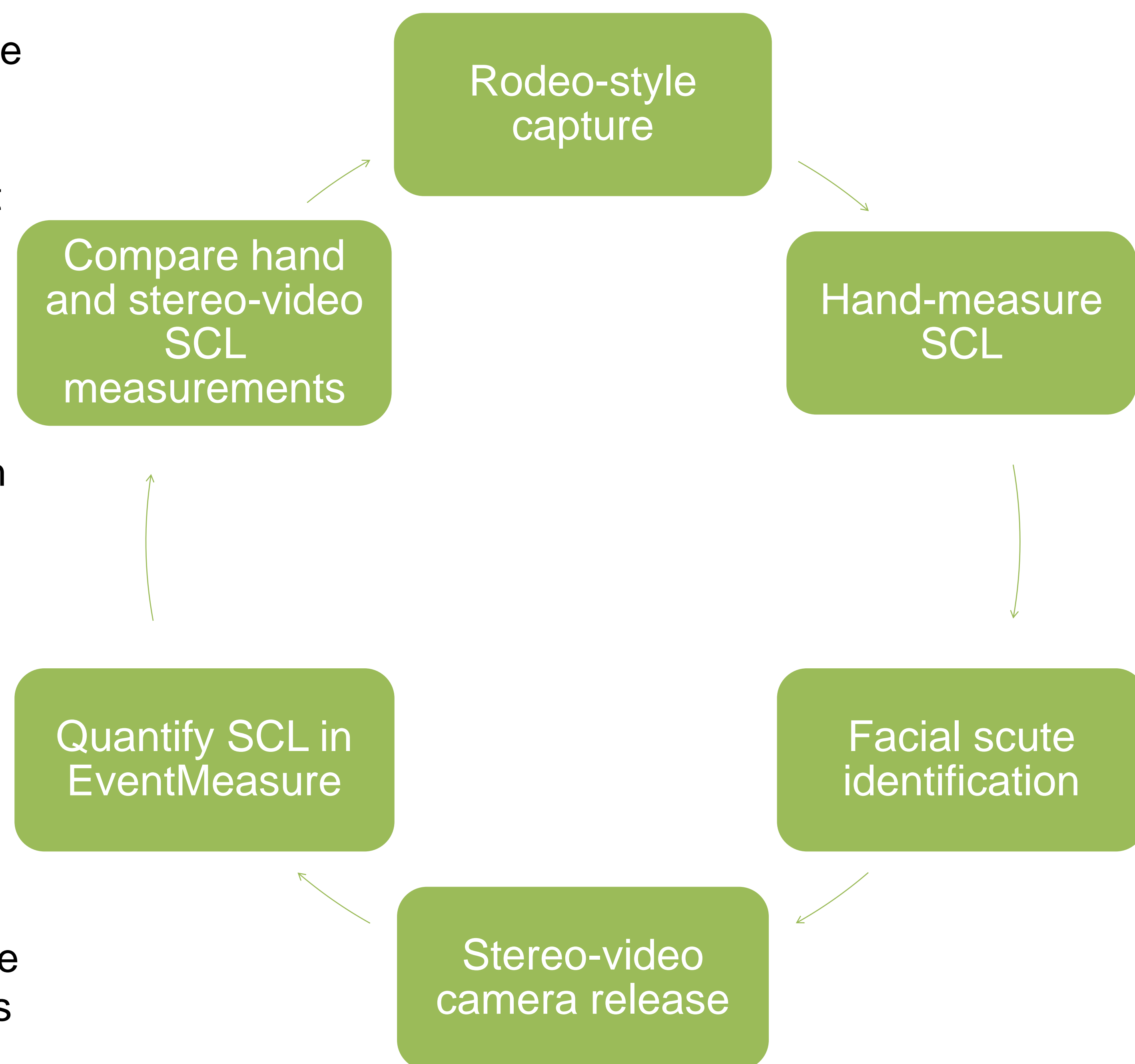


Figure 1. Flowchart demonstrating methods used to capture and analyze green sea turtles in Cape Eleuthera.

CAPE ELEUTHERA SITES

	Deep Creek	Rollin's Creek	Starved Creek
Number of visits:	4	3	1
Number of turtles:	12	12	6

RESULTS

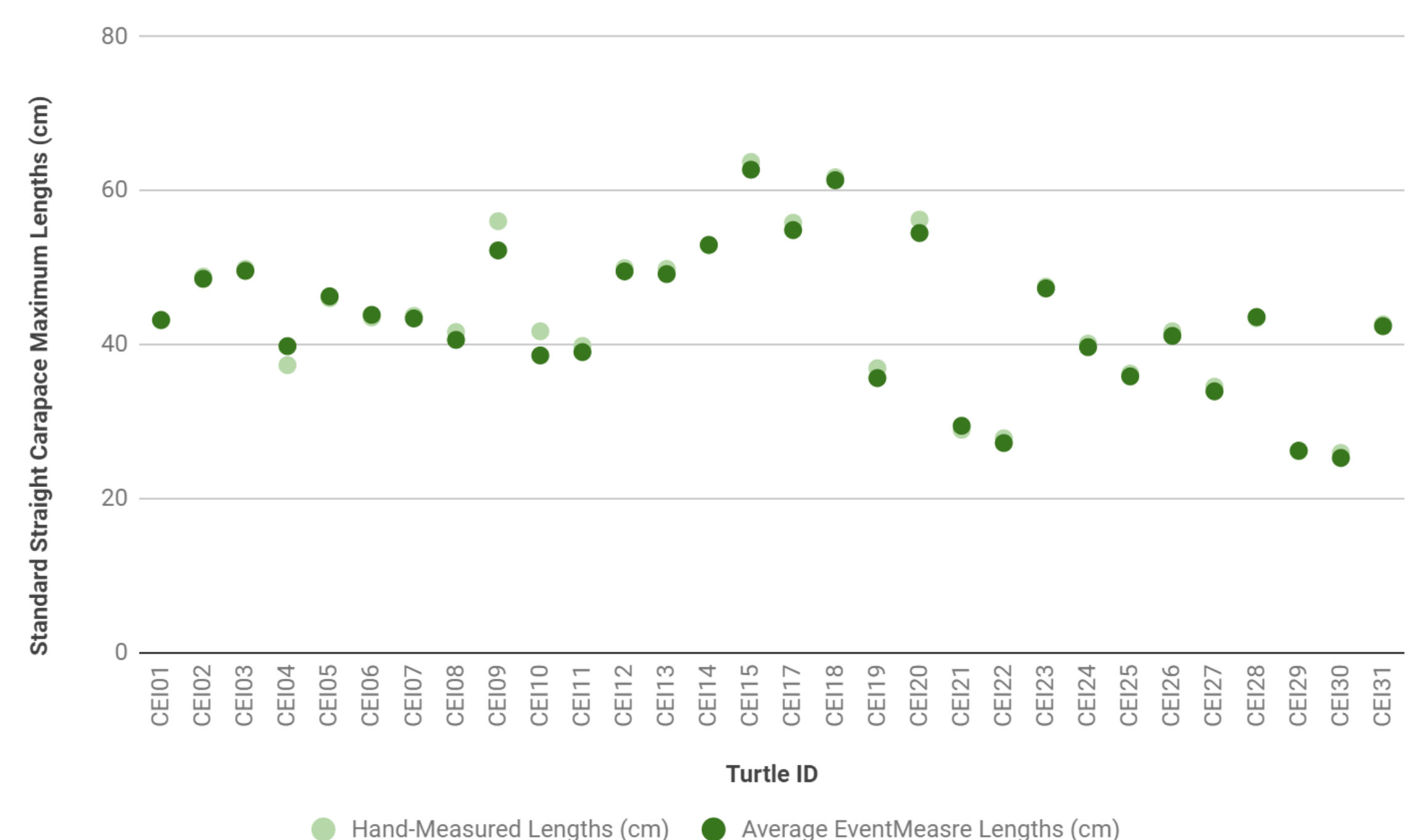


Figure 2: Scatter graph comparing hand-measured straight carapace lengths to average stereo-video lengths.

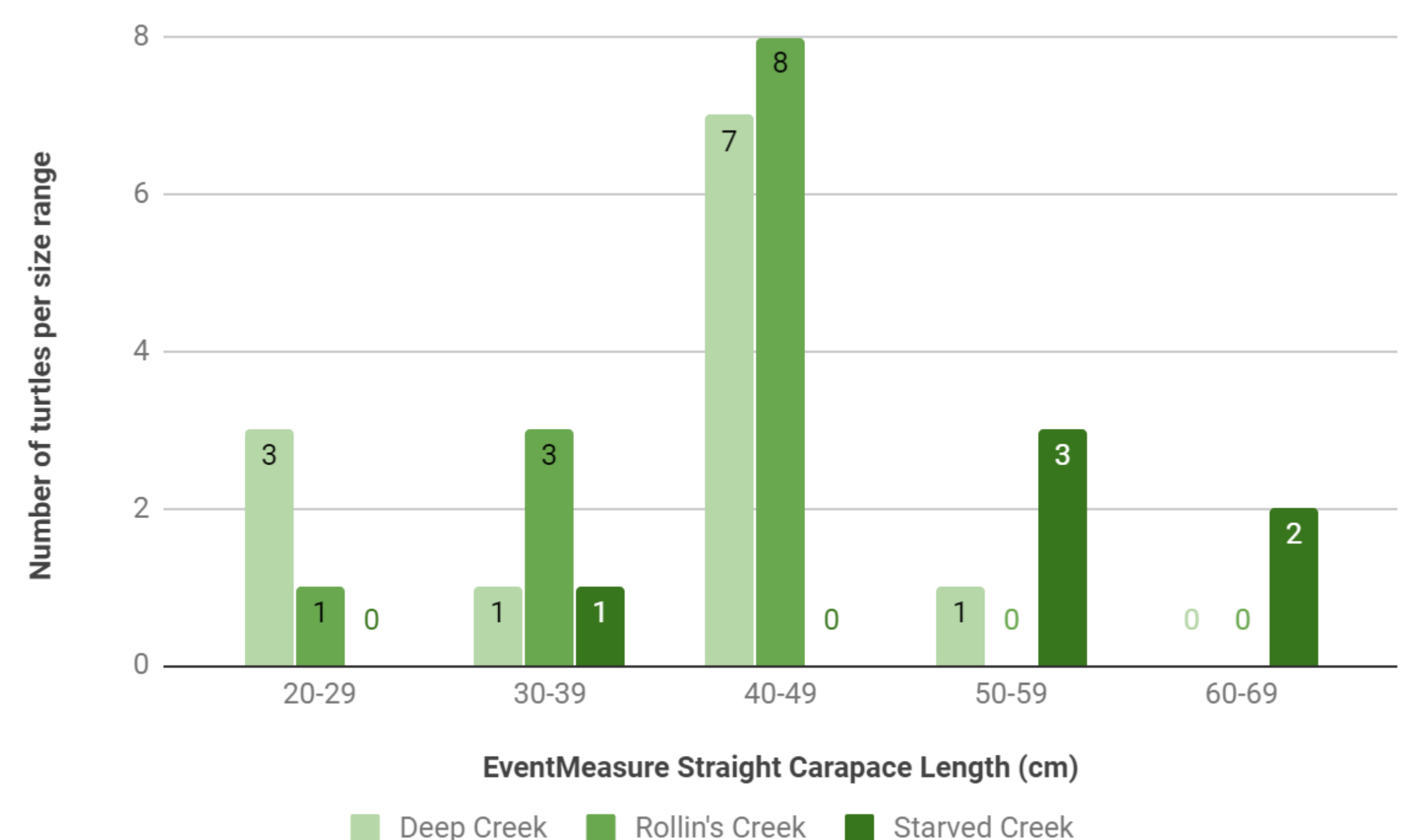


Figure 3: Frequency distribution of straight carapace length (cm) of juvenile green sea turtles at Deep, Rollin's, and Starved Creek.

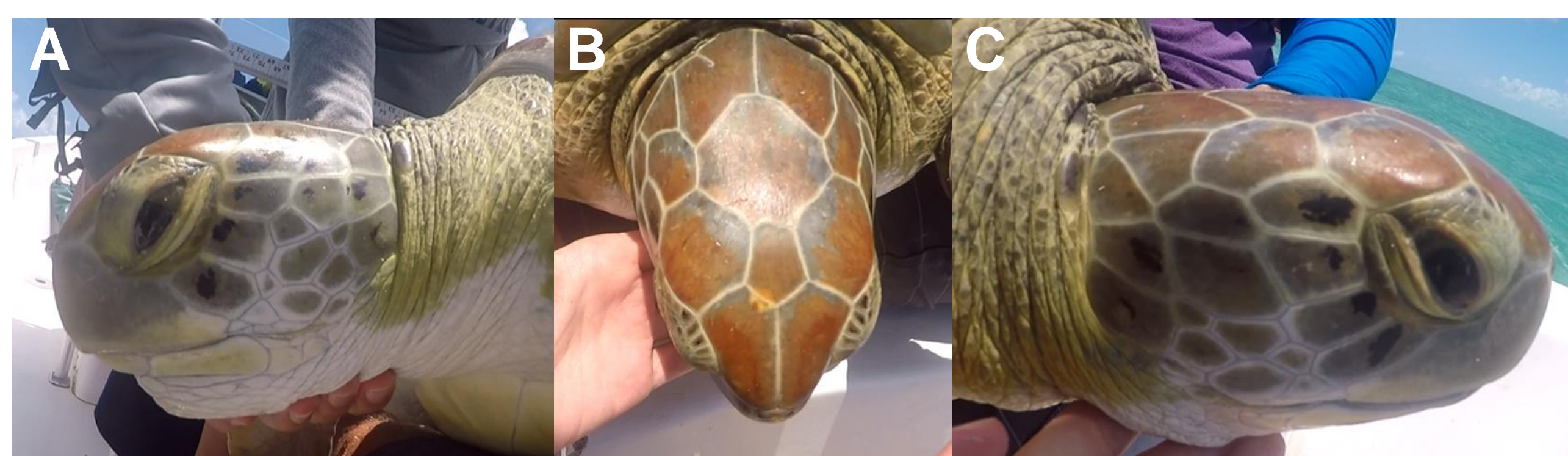


Figure 4: Images demonstrating left (A), dorsal (B), and right (C) facial scutes of turtle CEI35.

CONCLUSIONS

- Comparing Lengths:** The mean percent bias is -1.13%. The stereo-video measurements tend to slightly underestimate juvenile green sea turtle SCL. Stereo-video SCL is equivalent to physical hand measurements (see Fig. 1).
 - Length Frequency:** The highest frequency of juvenile sea turtles (n=15) was between 40-49 cm in length, and the lowest frequency of turtles (n=2) was between 60-69 cm.
 - Carapace Lengths:** Starved Creek contained the largest turtle SCL (60-69 cm), with Deep Creek and Rollin's Creek ranging between 20-56 cm.
- ## FUTURE WORK
- The data suggest that stereo-video cameras can replace physical hand measurements of sea turtle carapace lengths.
 - Photo ID of individuals will be paired with length measurements to assess growth rates.
 - Stereo video cameras can become a less invasive way of quantifying data on juvenile sea turtle lengths without coming into direct contact with them.

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