Distribution and Density of Sea Turtles in the Gulf of Mexico

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Sea Turtles

5 species in the Gulf of Mexico

- loggerhead
- green
- Kemp's ridley
- hawksbill
- leatherback

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The overarching goal of this project is to collect broad-scale information on the distribution and abundance of sea turtles in the Gulf of Mexico to inform seasonally- and spatially-explicit density estimates

<u>Tasks</u>

1. **Broadscale aerial surveys: NMFS and USFWS, imaging**
2. **Habitat modeling**
3. **Satellite tracking**
4. **Genetic composition and connectivity**

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Broadscale aerial surveys: NMFS and USFWS flights.
Imaging: February 2018 and July 2018

Mississippi Sound
Transect lines every 2km
Randomly select 20 to fly per day
Fly = 5-7 days

Loggerhead - St. Andrew Bay , FL

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Habitat modeling

Two phases to habitat modeling:

1. Model historic satellite tracking and aerial survey data to help guide future surveys
2. Model data collected during GoMMAPPS

<u>Historic Satellite Tracking</u>

Kemp's ridleys (*n* = 63) in partnership with Dr. Donna Shaver at PAIS

loggerheads (*n* = 63)

species distribution models (SDM): frequently used to predict the distribution of target species based on habitat relationships inferred from species occurrence

Ensemble Ecological Niche Model (EENM) : multiple modeling approaches by combining algorithms from different classes

We applied EENM to identify potential foraging habitats

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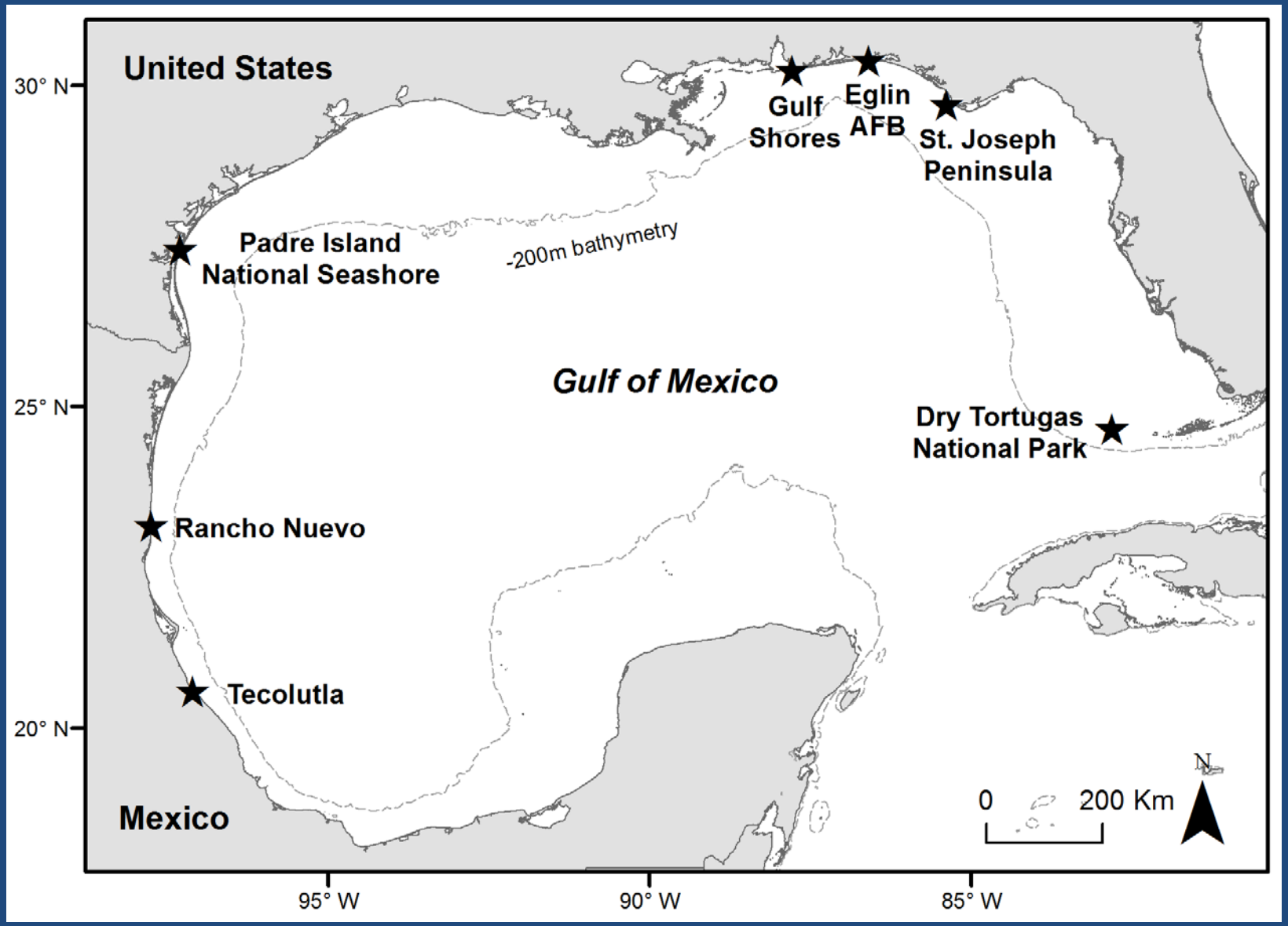
United States
Gulf Shores
Eglin AFB
St. Joseph Peninsula
Padre Island National Seashore
-200m bathymetry
Gulf of Mexico
Dry Tortugas National Park
Rancho Nuevo
Tecolutla
Mexico
30° N
25° N
20° N
95° W
90° W
85° W
0
200 Km
N

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Satellite tracking

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Nesting

- **loggerheads and Kemp's - Hart et al. (2012), Shaver et al. (2013), Hart et al (2014), Foley et al (2015), etc**
- **greens**

In-water

- **loggerheads, Kemp's ridleys, greens**

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Date		Capture Lat	Capture Long	Species	Life Stage	Left Tag	Right Tag	PIT Tag	Sat Tag #	CCL	Wt
7/16/2017	NW FL	30.39347	-86.73447	Cm	Adult	LLK505	LLK506	982000363850401	161466	112.5	NA
8/7/2017	NW FL	29.73082	-85.39328	Cm	Adult	MMA181	MMA180	982000402162456	161459	101.3	NA
9/20/2017	NW FL	30.38497	-86.81900	Cm	Juv	LLK575	LLK676	982000364216044	142658	41.0	8.0
11/3/2017	MS	30.19212	-88.52798	Cm	Juv	MMM897	MMM898	982000402169949	142659	37.3	5.9
11/2/2017	MS	30.20783	-88.51325	Lk	Juv	MMM899	MMM900	982000402169942	172667	53.0	24.5
11/3/2017	MS	30.19445	-88.52437	Lk	Juv	MMM895	MMM896	982000402170318	161455	40.0	9.0
11/4/2017	MS	30.19958	-88.52220	Lk	Juv	MMM893	MMM894	982000402169444	161463	48.0	13.5
11/4/2017	MS	30.18955	-88.53252	Lk	Adult	MMM891	MMM892	982000402169949	172668	67.7	45.0
12/5/2017	S. LA	29.08201	-90.22892	Cm	Juv	KMH311	KMH312	985154000388757	170670	52.2	17.5
1/25/2018	LA	29.77950	-88.75696	Cc	Adult	BSC2001	BSC2002	985111000918374	172681	77.2	64

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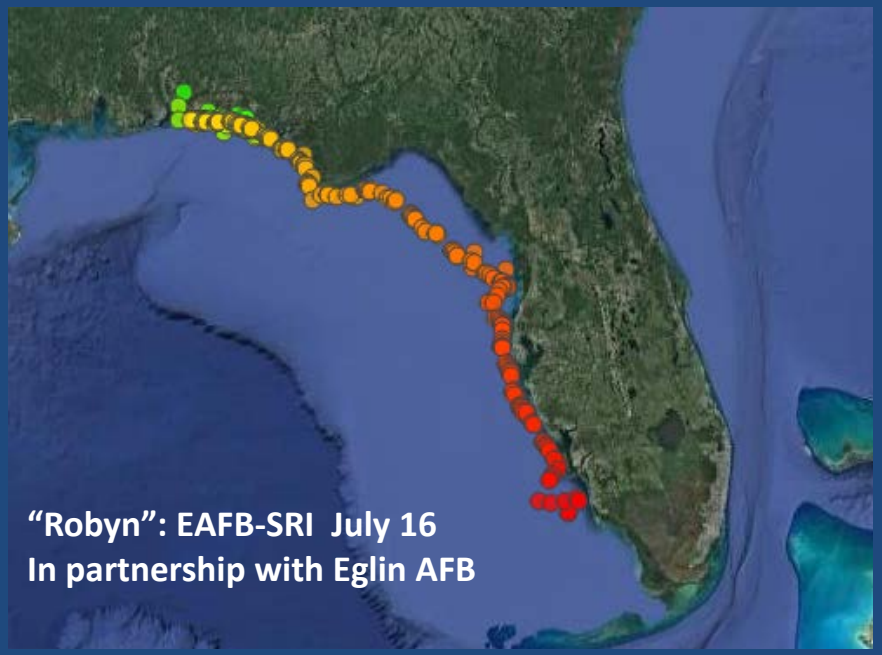
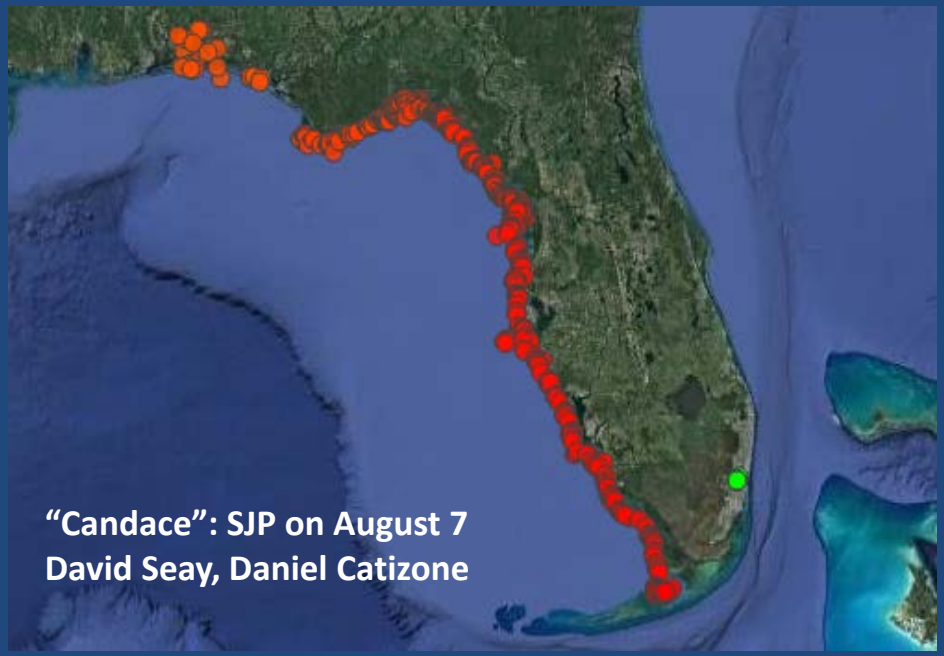
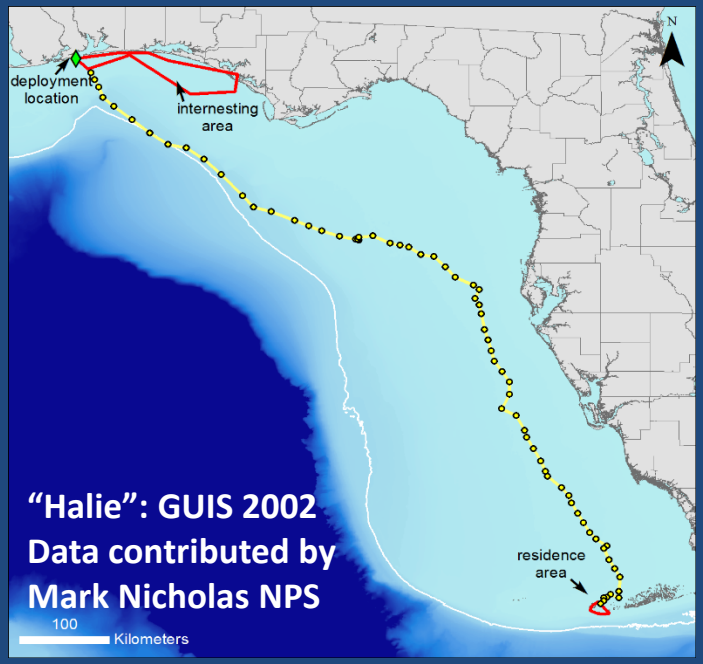


"Robyn": EAFB-SRI July 16
In partnership with Eglin AFB



"Candace": SJP on August 7
David Seay, Daniel Catizone



"Halie": GUIS 2002
Data contributed by
Mark Nicholas NPS

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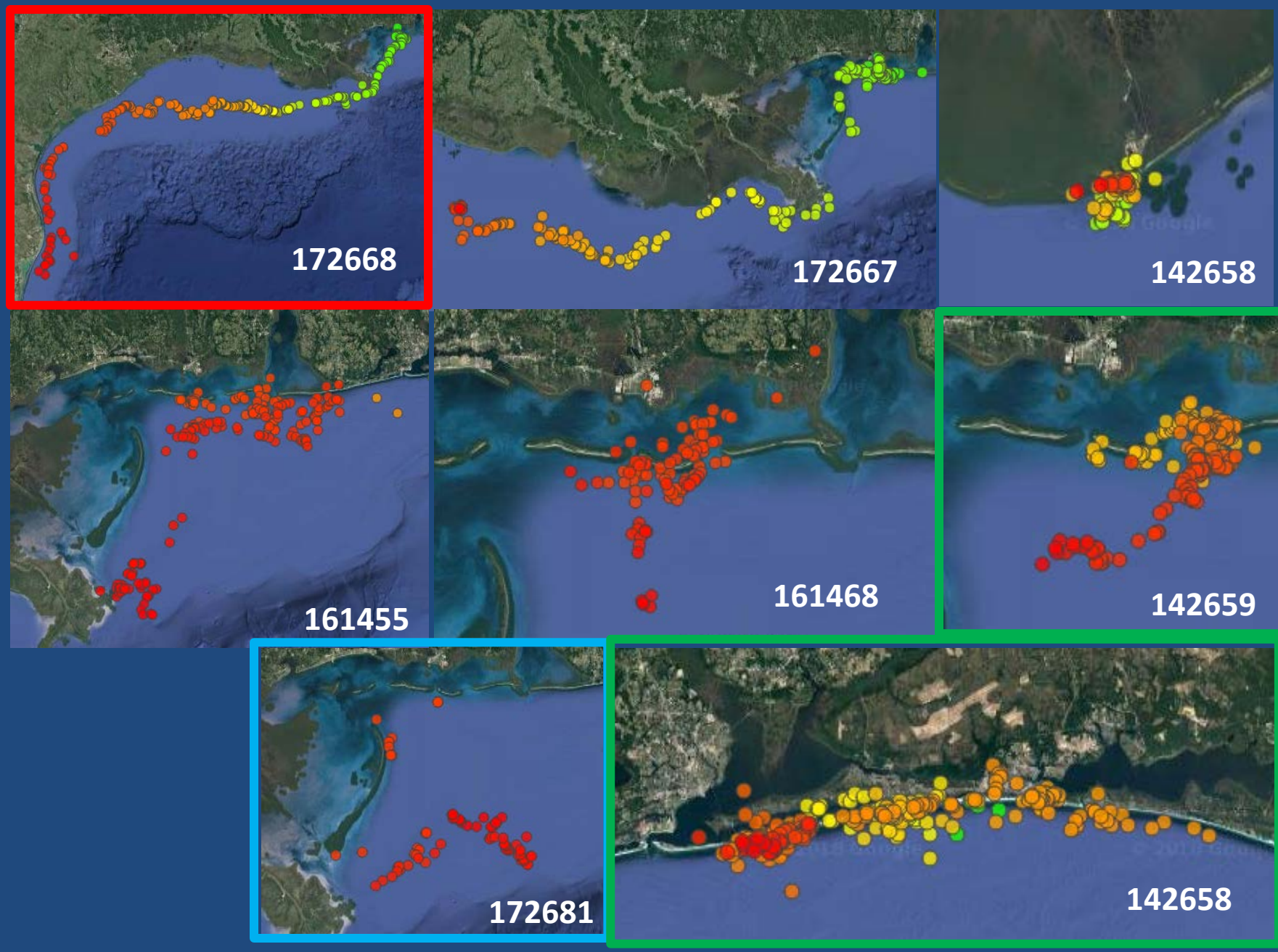

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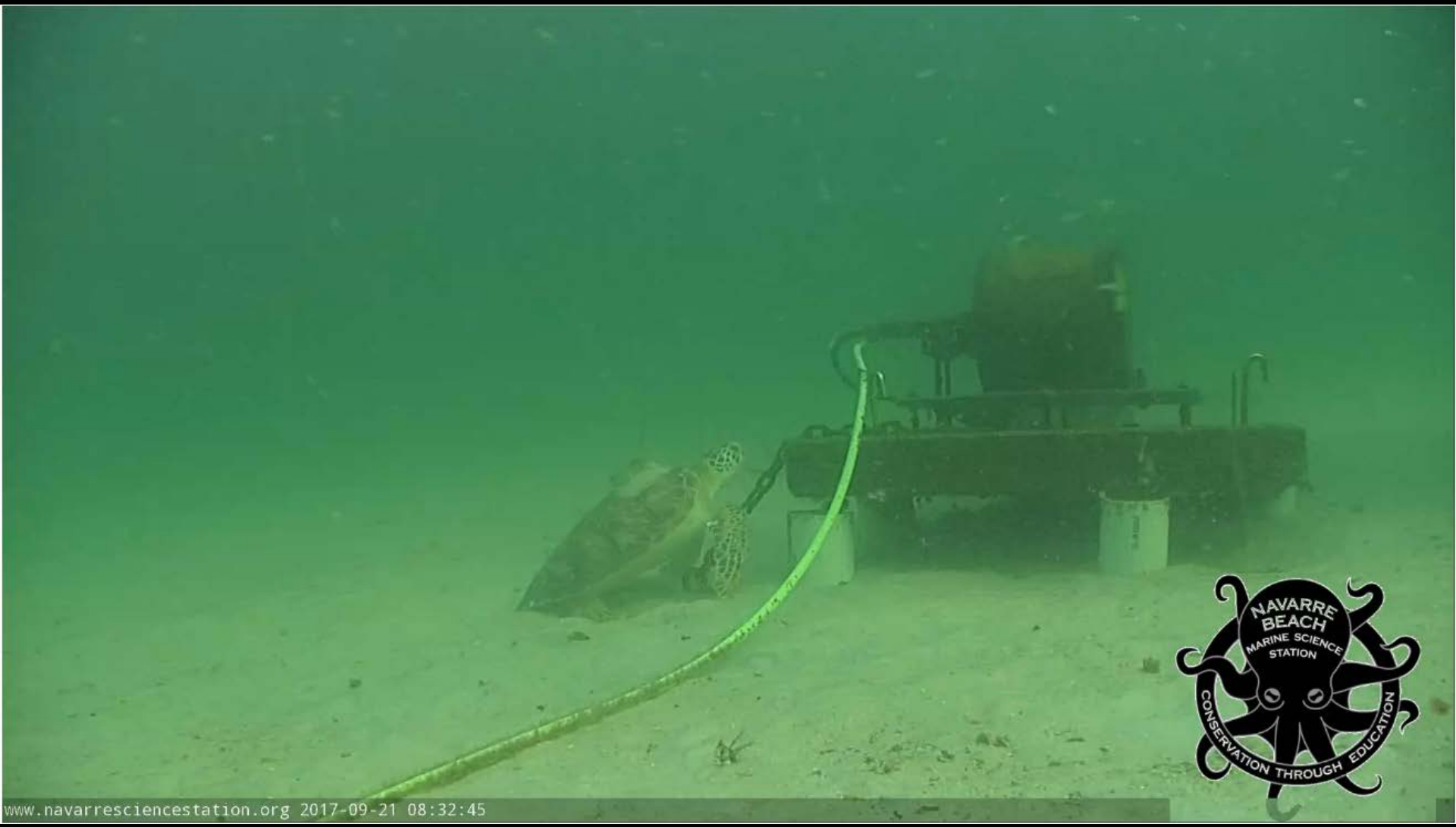
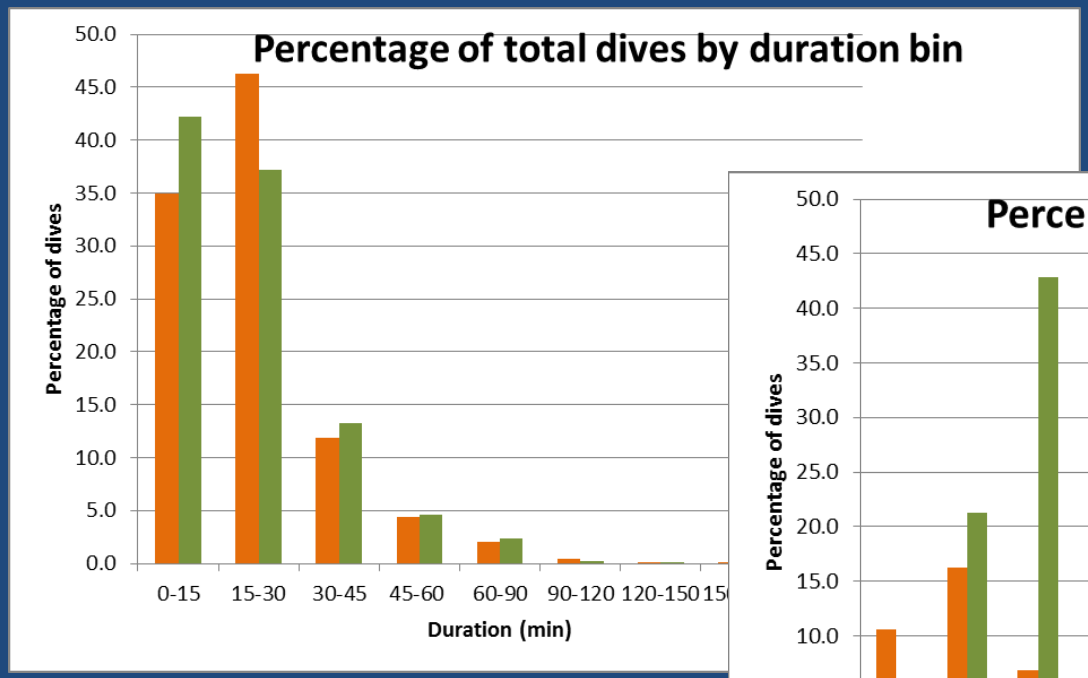
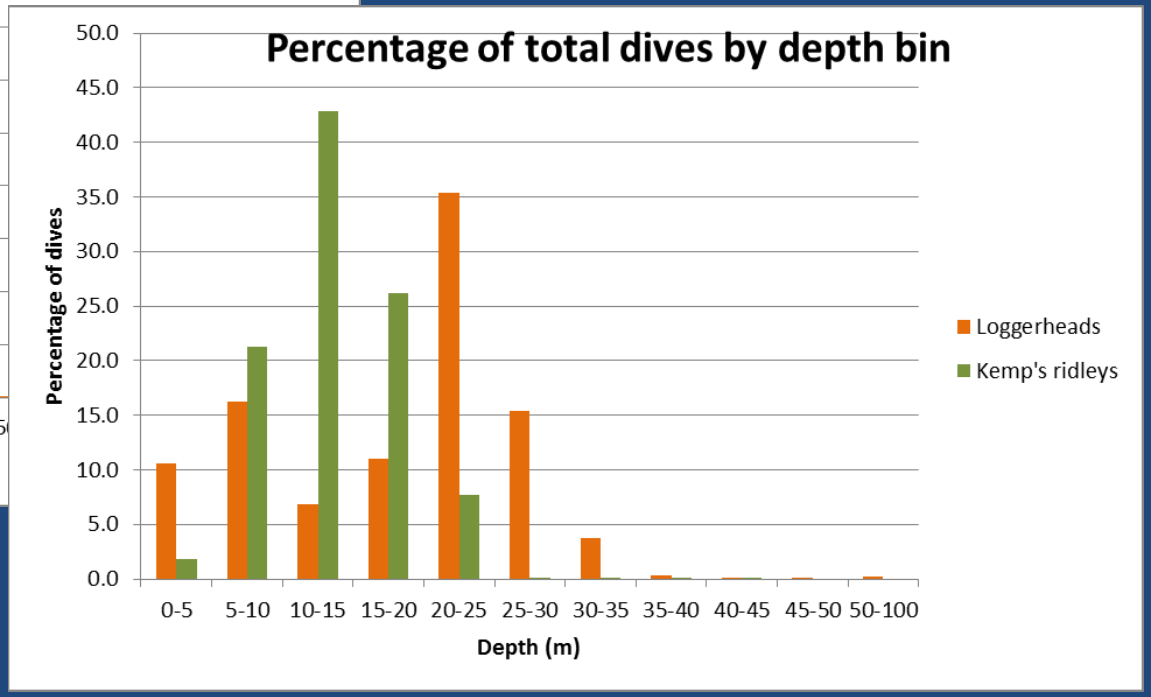

NAVARRE BEACH
MARINE SCIENCE STATION
CONSERVATION THROUGH EDUCATION
www.navarresciencestation.org 2017-09-21 08:32:45

BOEM's Minerals Management Program
Jessica Mallindine
Michael Miner

Deploying tags on turtles captured on relocation trawler; Kemp's = 10, Loggerheads = 15
Summarizing dive data
Contributes to GoMMAPPS = percent time at surface (0-2m)





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DEPTH INFORMATION

What proportion of time is spent in upper/middle/lower water column?

Are there species-specific or size-specific differences?

Are there seasonal differences?

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Genetic analyses

Dr. Brian Shamblin at University of Georgia – adult loggerheads, greens; juvenile greens, loggerheads

Dr. Ylenia Chiari and Dr. Scott Glaberman at the University of South Alabama – juvenile Kemp's ridleys

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Next steps

- Imaging surveys: Coastal AL and MS in February 2018 and July/Aug 2018
- Habitat modeling: combine satellite tracking data with NMFS aerial survey data
- Satellite tagging: TX waters (Chris Marshall Texas A&M, Donna Shaver PAIS)
  - Developing partnerships with MX researchers
    - Combine historic datasets
    - Deploy additional tags in MX
- Genetic analyses

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Questions?