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
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.

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

Historic Satellite Tracking
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
Satellite tracking
Nesting
• greens

In-water
• loggerheads, Kemp’s ridleys, greens
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<th>Capture Location</th>
<th>Capture Lat/Long</th>
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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
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)
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?
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
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
Questions?