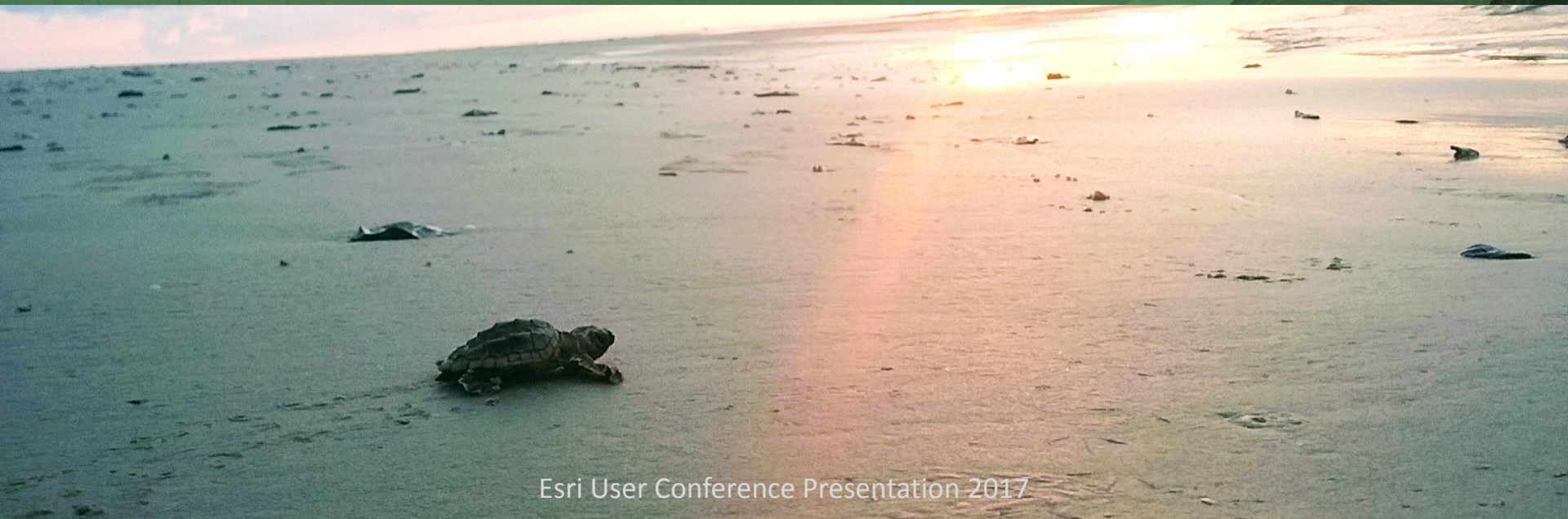
Spatial Analysis
Loggerhead Sea Turtle Nest Depredation
St Catherines Island

Tara Lopez

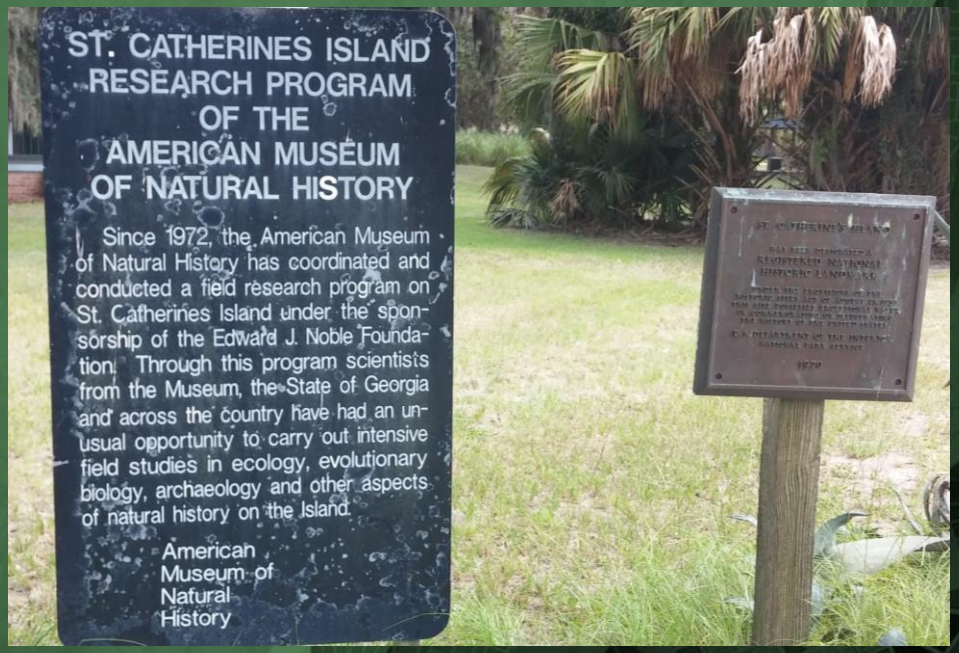


Esri User Conference Presentation 2017

GSUSTP@SCI Background

Georgia Southern University Sea Turtle Program at St Catherines Island

- Dr. Gale Bishop co-founded The St. Catherines Island Georgia Sea Turtle Program (SCISTP) 1990.
- Has monitored ## sea turtle nests since.
- Sea turtle research conservation under GaDNR and SeaTurtle.Org.
- Educate public.
- Involves students and teachers in conservation.



Abstract/Project Info

- **Abstract Summary**
  - Sea turtle nests on St. Catherines Island (SCI) face two major threats: washover of nests due to erosion caused by sea level rise and predation of nests by feral hogs (*Sus scrofa*) and raccoons (*Procyon lotor*). During the 2016 nesting season, St. Catherines Island had the highest percentage of predated nests out of all sea turtle nesting beaches on the entire Georgia coast. Nearly 40% of all sea turtle nests on SCI were lost to predators.
- **Goals/Purpose**
  - The purpose of this study is to use biostatistical and GIS techniques to analyze predation events on St. Catherines Island from 1999-2016. The ultimate goal of this project is to identify biostatistical and spatial relationships among predation, environmental and nesting variables in order to develop a research-based predator control program.
- **Key factors for analysis**

Statistical Package for the Social Sciences (SPSS)

- **Description**
- **Analysis factors**
- **Results/conclusions made**
- Nesting and environmental data from conservation reports from 1999-2008 were successfully cleaned, merged and imported in SPSS biostatistical software for analysis
- Analysis of data produced statistically significant results that can be used to improve sea turtle conservation efforts on St. Catherines Island
- Nests that are screened or caged or both are 50.6% LESS likely to be depredated than nests that are not screened or caged or both. This result is statistically significant.
- Nests that are NOT relocated are 2.627 times MORE likely to be washed out than nests that are left *in situ*. This result is statistically significant.
- Nests that are left *in situ* are 81.6% MORE likely to depredated than nests that are relocated. This result is statistically significant.
- This study highlights the need for further longitudinal analysis of the interactions among environmental and nesting variables

ArcMap

- Description
- Analysis factors
- Results/conclusions made

Loggerhead Sea Turtle Conservation

- Sea turtle importance to ecosystem
- Why they need conservation efforts
- Local threats to sea turtles
  - Lighting
  - Boats
  - Nets
  - Pollution
  - Beach habitat loss from erosion and human development
  - Predation

Loggerhead Sea Turtle Conservation

SCI Conservation

- Beach erosion
- Bone yards
- Washovers
- Predation

- DNR regulations on marine handling
  - Relocations
  - Data collection
  - Nest management (stakes, screens, cages)

SCI Conservation

Pictures

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Current Methods

- Bullet Points then pictures
- Plastic screens with metal rebar ground stakes
- Metal cages
- Tall wooden stake markers in orange paint placed directly above nest.

- Ossabaw Island has a yearly pig hunt during the nesting off season (Winter months) to control the massive hog population. SCI has waited too long and is now becoming overrun with hog. Out during the day, overcrowding the island, and destroying the beach and nests nightly.

Probable Solutions

- Bullet Points then pictures
- Electric fences
- Places marker stakes further away from nest
- Placing smaller marker stakes
- Specialized hunter per beach each night
- Night monitoring with red lights
- Using GPS and a pre determined measured buried rope attached to screen instead of marker stakes
- Organized hunting groups or missions (military, police, and civilian)