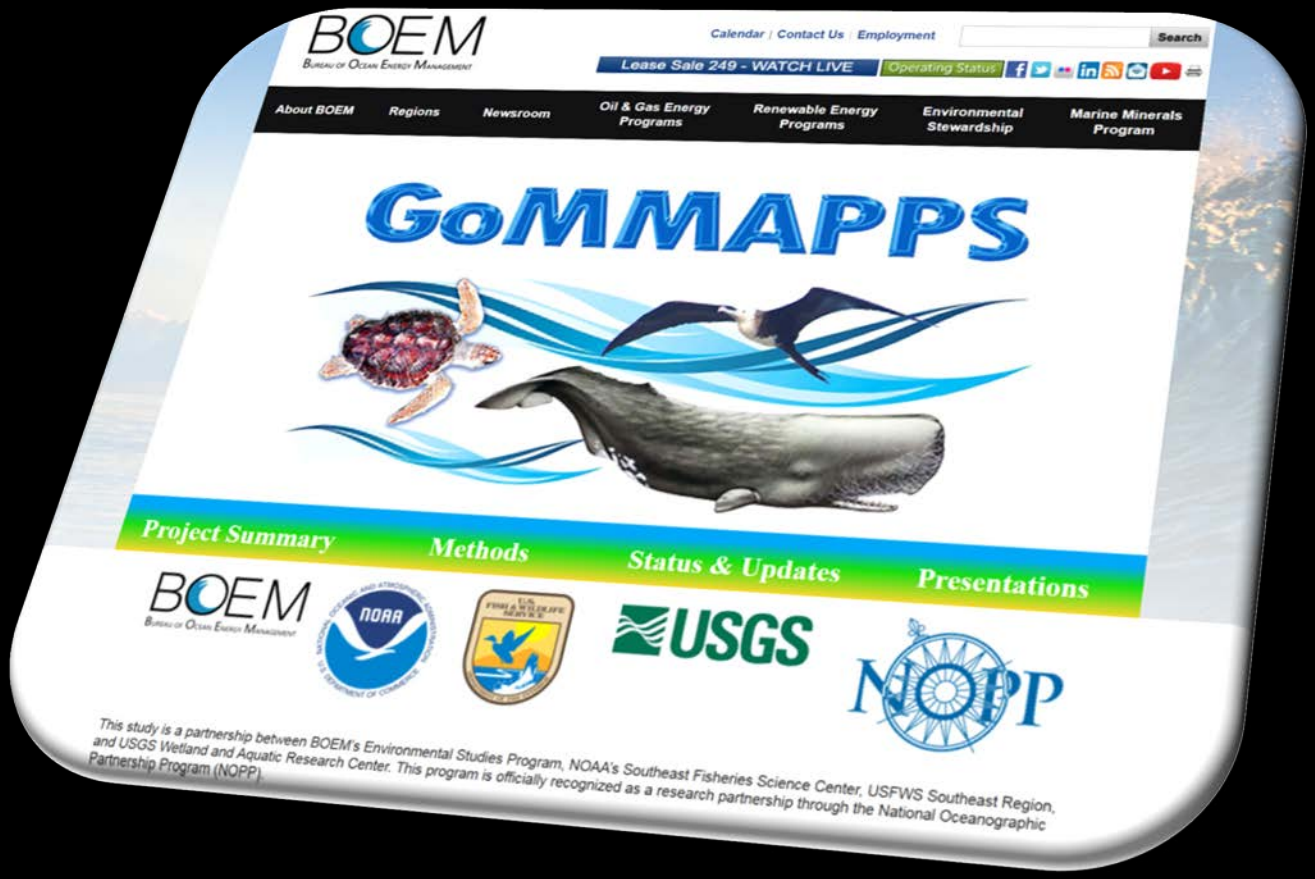
-- 2017 Seabird Update --



BOEM IRTM Meeting: New Orleans, LA; August 22-24, 2017

Jeff Gleason & Randy Wilson
U.S. Fish & Wildlife Service

Seabird Surveys:

Goal: Collect broad-scale information on the distribution and abundance of seabirds in the Gulf of Mexico to inform seasonally- and spatially-explicit density estimates

Null Model: The distribution, abundance and diversity of seabirds is not influenced by:

(1) Presence (e.g. density) and status (e.g., active) of offshore platforms;

(2) Proximal fisheries activities (e.g., trawling vessels);

(3) Proximal micro-habitat or forage indicators (e.g., Sargassum, menhaden);

(4) Oceanic physical features (e.g., depth, loop currents, eddies, salinity, etc.);

(5) Broad-scale weather conditions (e.g., fronts).

Seabird Surveys:

Goal: Collect broad-scale information on the distribution and abundance of seabirds in the Gulf of Mexico to inform seasonally- and spatially-explicit density estimates

Methods:

- ✓ **Vessel-based Surveys**

- ✓ **Aerial Surveys**

Seabird Surveys: Vessel

Vessel Survey Team:

- Jeff Gleason (Program Lead) *USFWS-Migratory Birds, Southeast Region*
- Pat Jodice *USGS South Carolina Cooperative Wildlife Research Unit / Clemson University*
- Plus Graduate Student
- Chris Haney Terra Mar Applied Sciences

Seabird Surveys: NOAA Vessels of Opportunity

2017 Surveys

- ✓ R/V *Oregon II*- 28 April to 13 May
- ✓ R/V *Oregon II*- 14 to 30 May
- ✓ R/V *Pisces*- 1 to 17 June
- ✓ R/V *Gordon Gunter* MMC Leg 1- (no seabird observers)
- ✓ R/V *Gordon Gunter* MMC Leg 2- 21 July to 5 Aug
- ✓ R/V *Gordon Gunter* MMC Leg 3- 9 to 25 Aug (in progress)
- o R/V *Gordon Gunter*, 1 to 15 Sept
- o R/V *Gordon Gunter*, 16 to 30 Sept
- o R/V *Gordon Gunter*, 11 to 25 Oct
- o R/V *Gordon Gunter*, 26 Oct to 11 Nov

84 days at sea completed + additional days at sea proposed
~146 days at sea for 2017

Seabird Surveys: NOAA Vessels of Opportunity (Methods)

R/V *Oregon II*- 28 April to 13 May & 14 to 30 May, spring plankton survey

- *Vessel makes relatively brief stops (for plankton collection) with long distances between stops*
- *Seabird surveys only conducted while vessel was under power between stops*

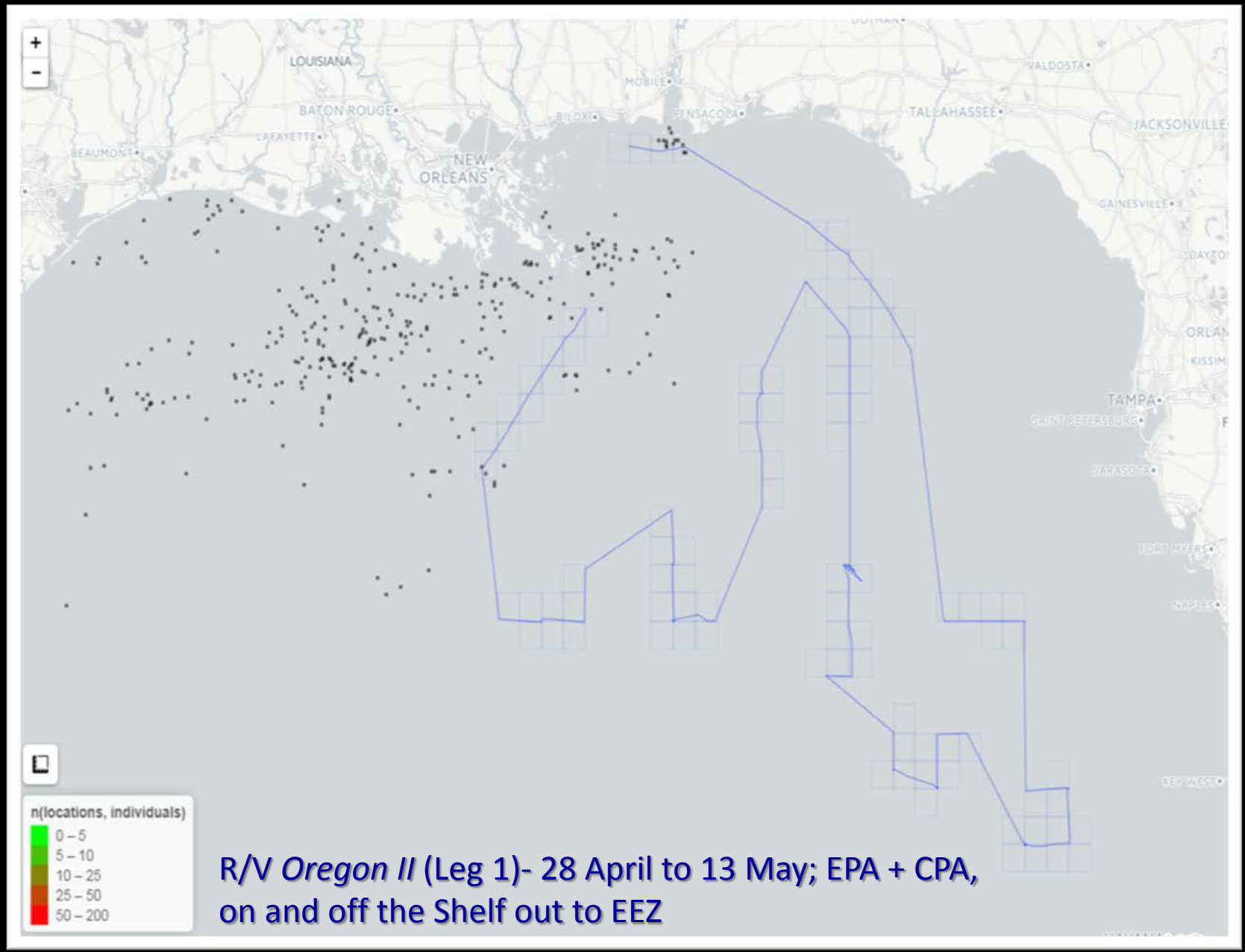
R/V *Pisces*- 1 to 17 June, spring/summer reef fish survey

- *Vessel spends considerable time stationary (for fish surveys) with short movements between stops*
- *Seabird surveys (point survey) were conducted while the vessel was stationary (circa 10hr/day), as well as, when the vessel was under power en-route to next reef fish stop (transect survey)*

R/V Gordon Gunter- 21 July to 5 August, Marine Mammal Cruise

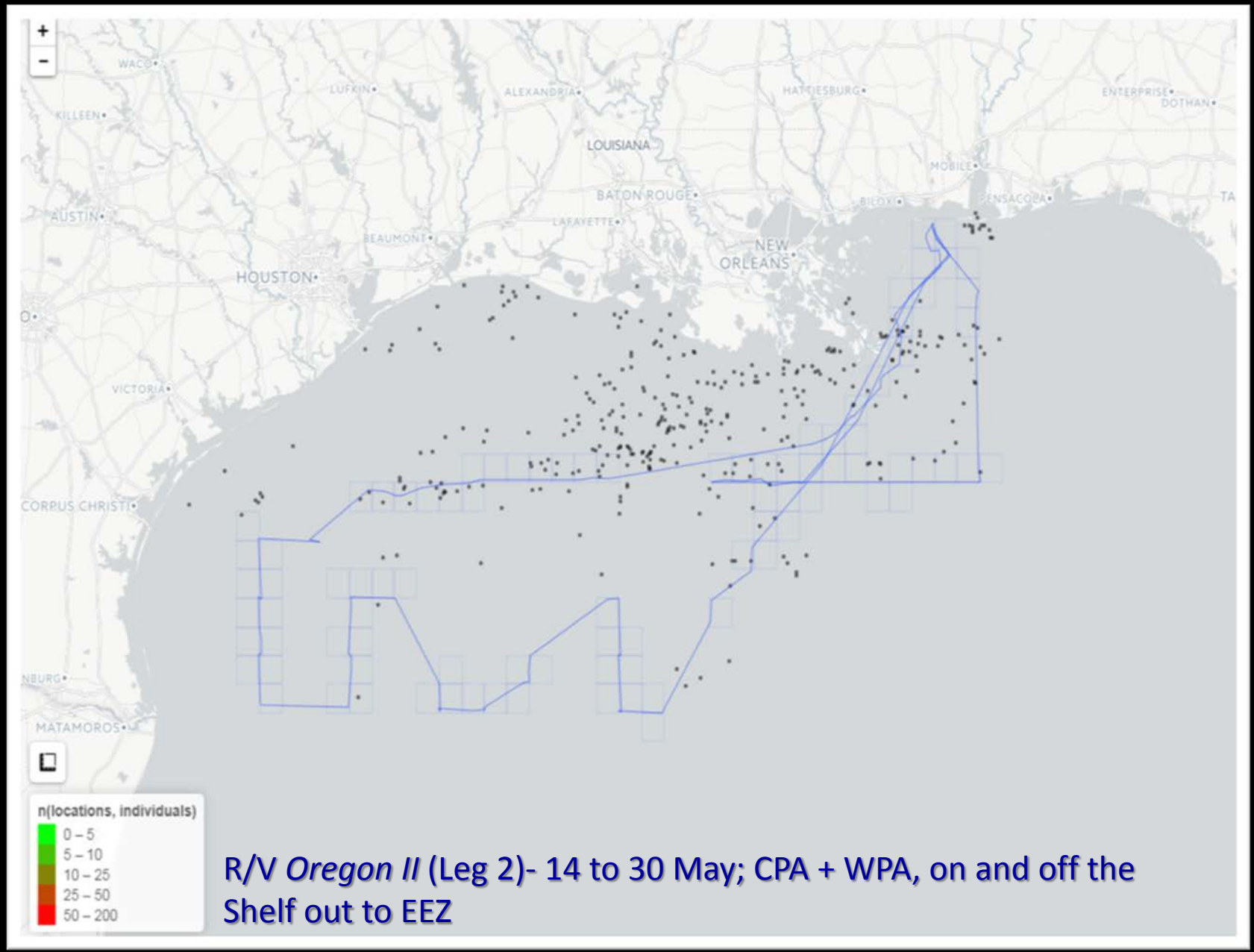
- *Vessel is continuously under power traversing Marine Mammal transects*
- *Seabird surveys (transect surveys) were conducted for circa 12-13hrs/d*
- *Seabird observers alternated 1hr "breaks"; 1 observer was always on flying bridge*

Seabird Surveys: NOAA Vessels of Opportunity (Spatial Coverage)



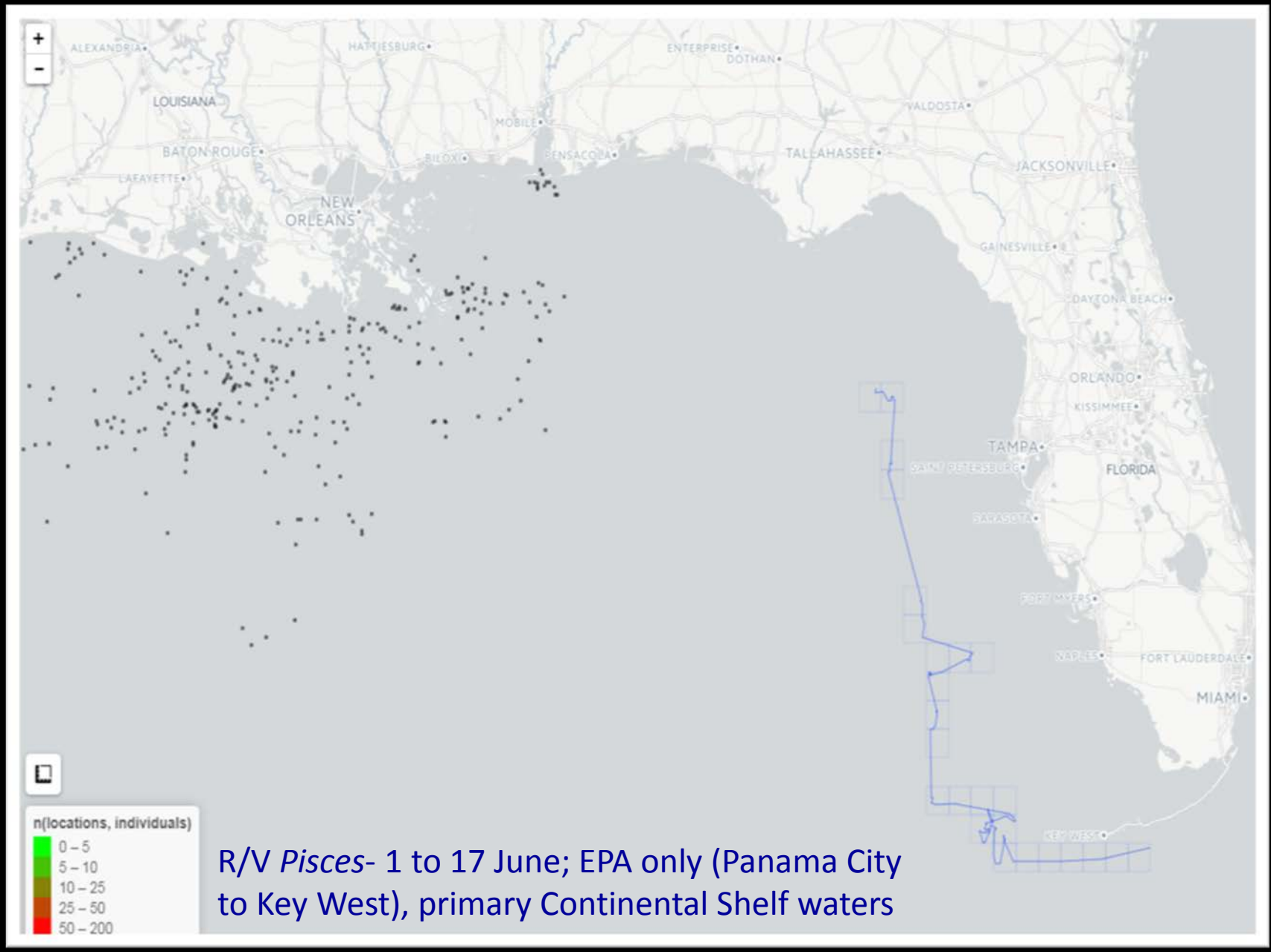
R/V *Oregon II* (Leg 1)- 28 April to 13 May; EPA + CPA, on and off the Shelf out to EEZ

Seabird Surveys: NOAA Vessels of Opportunity (Spatial Coverage)



R/V *Oregon II* (Leg 2)- 14 to 30 May; CPA + WPA, on and off the Shelf out to EEZ

Seabird Surveys: NOAA Vessels of Opportunity (Spatial Coverage)



Seabird Surveys: NOAA VOOs- Preliminary "Results"

Vessel	Obsv. Days	Detections	# Species
R/V *Oregon II*	12	>350	17
R/V *Oregon II*	13	>1,100	22
R/V *Pisces*	14	>600	16
R/V *Gordon Gunter*	15	>1,300	23

- ✓ *Data are preliminary and represent raw uncorrected counts*
- ✓ *Data collected to date have far exceeded our expectations!!!*

Seabird Surveys: Lessons Learned & Future Efforts

Lessons Learned:

- ✓ Not all VOOs are optimal for transect-based seabird surveys.
- ✓ Out-year survey efforts will strategically target VOOs that maximize time "On Transect", while still getting broad spatial & temporal coverage
- ✓ Two seabird observers per vessel/leg is required

Future efforts:

2018: 2 Marine Mammal Cruises (Winter & early Fall) + 1 spring plankton cruise + 1 fall plankton cruise. **2018 Projection ~150-154 DAS**

2019: 1 Marine Mammal Cruise (Summer) + 1 or 2 spring plankton cruises + 1 or 2 fall plankton cruises. **2019 Projection ~94-128 DAS**

Seabird Surveys:

Goal: Collect broad-scale information on the distribution and abundance of seabirds in the Gulf of Mexico to inform seasonally- and spatially-explicit density estimates.

Methods:

- ✓ **Vessel-based Surveys**

- ✓ **Aerial Surveys**

Seabird Surveys: Aerial

Aerial Survey Team:

- Randy Wilson (Program Lead) *USFWS-Migratory Birds, Southeast Region*

- Jim Lyons (Survey Design/Data Management) *USGS Patuxent Wildlife Research Center*
- Plus Post-Doc/Contractor – data management

- Emily Silverman (Survey Design/Data Management) *USFWS-Population & Habitat Assessment*

- Elise Zipkin (Data Analysis & Modeling) *Michigan State University*
- Plus Graduate Student – data analysis & modeling

- *Ryan Theel (Spatial Analysist)* *USFWS-Ecological Services, Southeast Region*

- Mark Koneff (Pilot-Biologist) *USFWS-Migratory Bird Surveys*

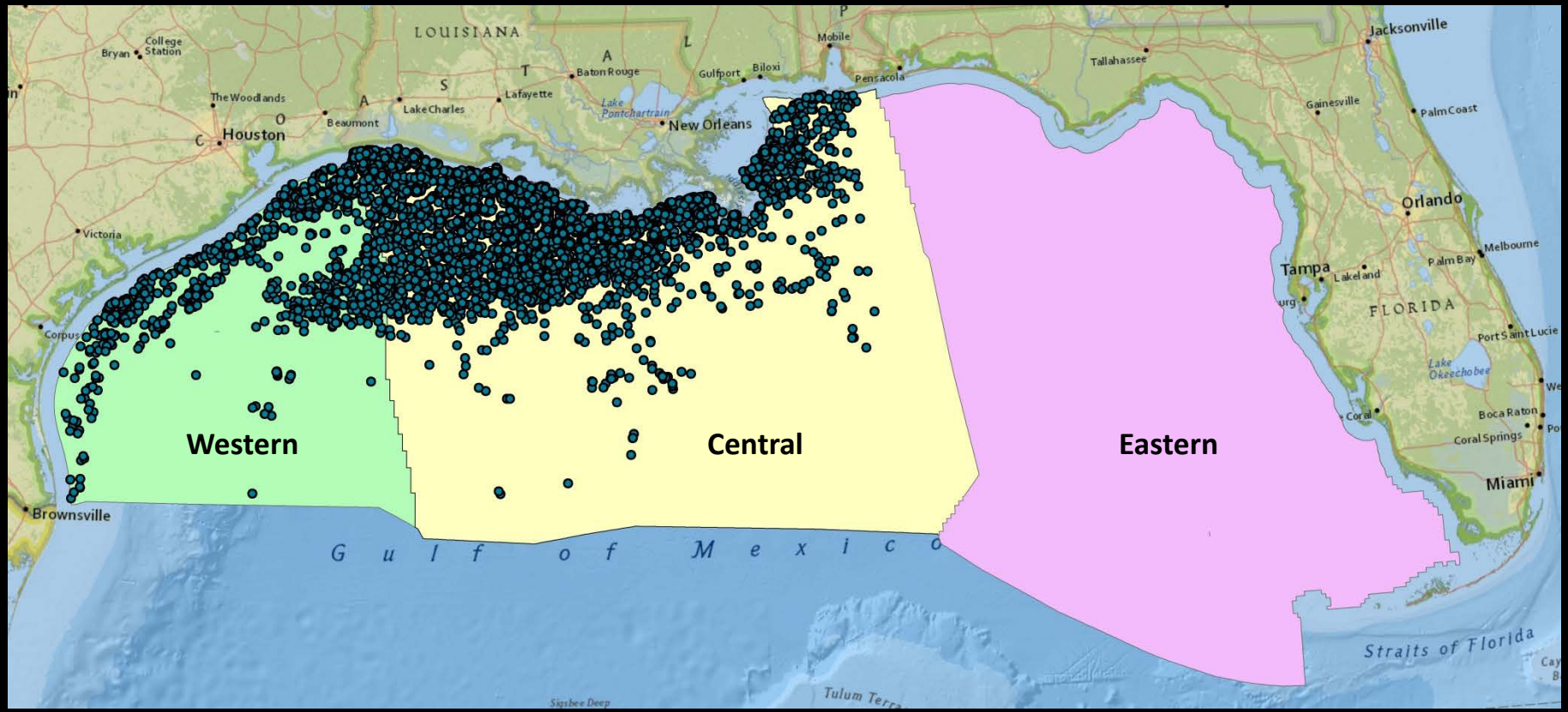
- Jim Wortham (Pilot-Biologist) *USFWS-Migratory Bird Surveys*

- Steve Earsom (Pilot-Biologist) *USFWS-Migratory Bird Surveys*

Seabird Surveys: Aerial

Objective: Conduct low-level (200 ft), aerial surveys in the nearshore environment (<50NM) from Brownsville, TX to the Florida Keys.

Potential Issue: High density of oil & gas platforms (>7,000) and associated air traffic supporting O&G industry in the BOEM Central and Western Planning Units



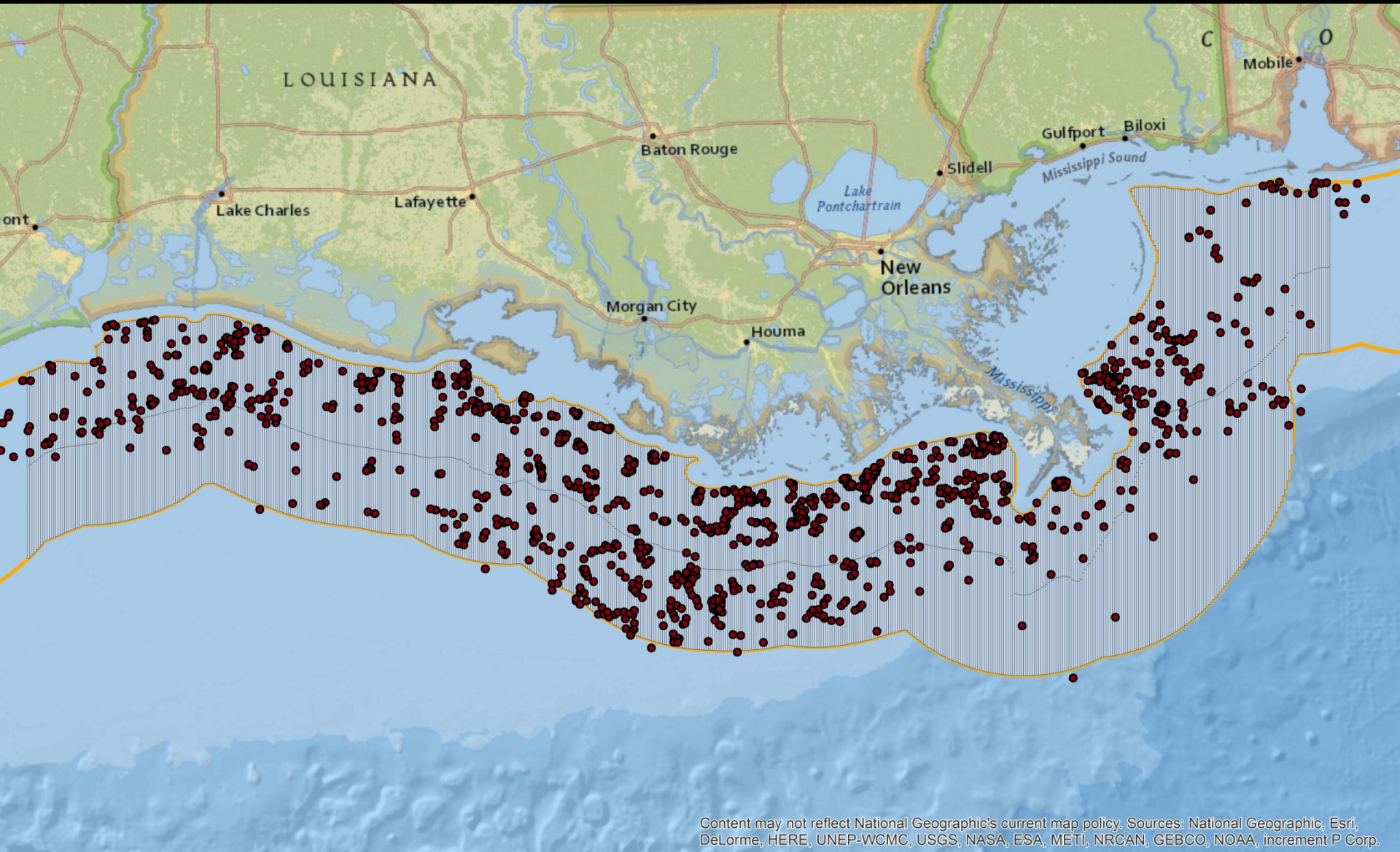
Seabird Surveys: Aerial

2017 Field Season

- ✓ Tested two survey designs off the Louisiana Coast (10nm to 50 nm offshore)
  - ➢ Standard Transects
  - ➢ Transect within Hexagon Plot
- ✓ Tested double observer protocols
  - ➢ Pilot did not count
  - ➢ Utilized 3 observers (right front, right rear, & left rear)

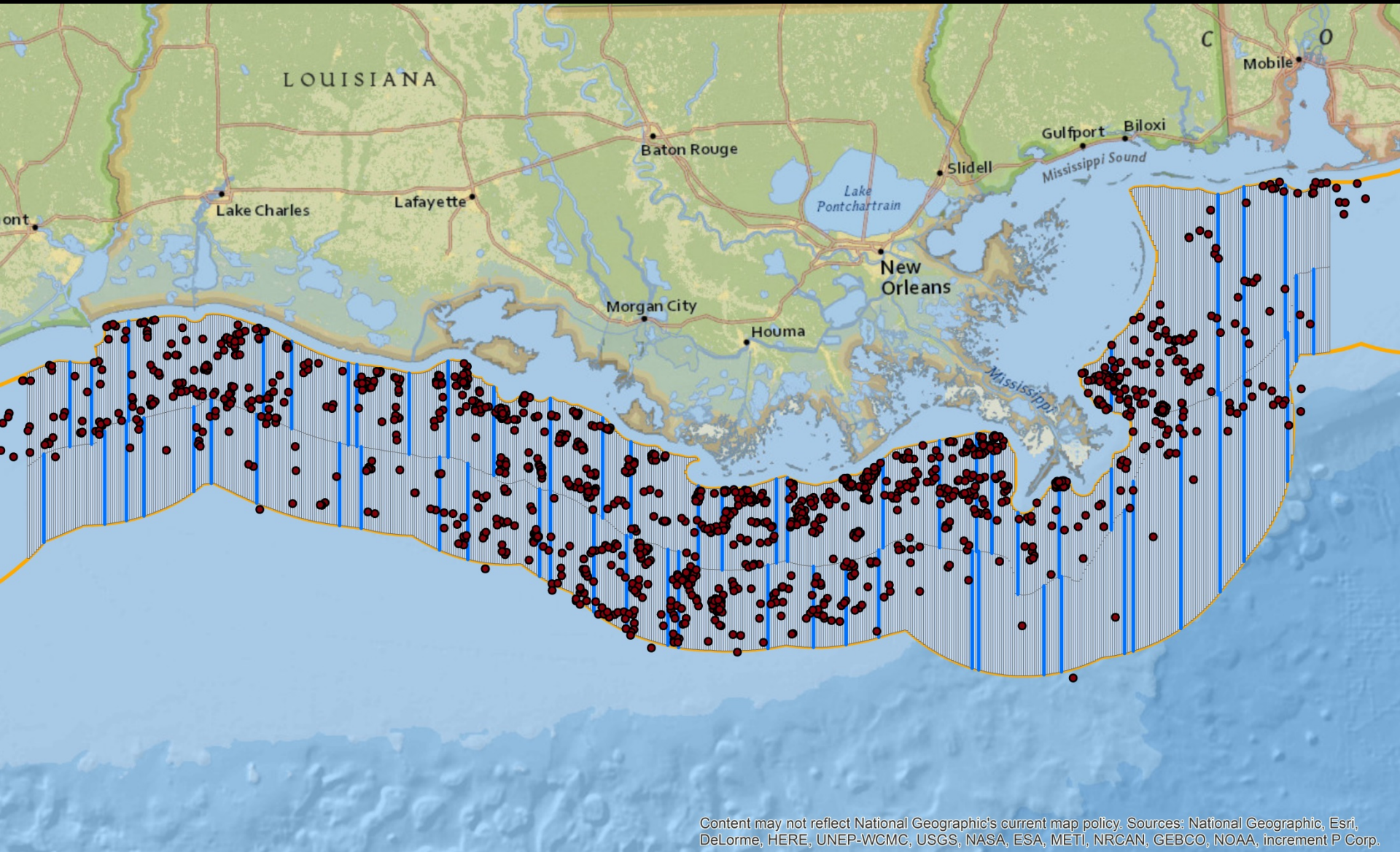
Standard Transects Available for Selection

Transects spaced 1-km apart w/in sampling frame; then broken into 2 segments



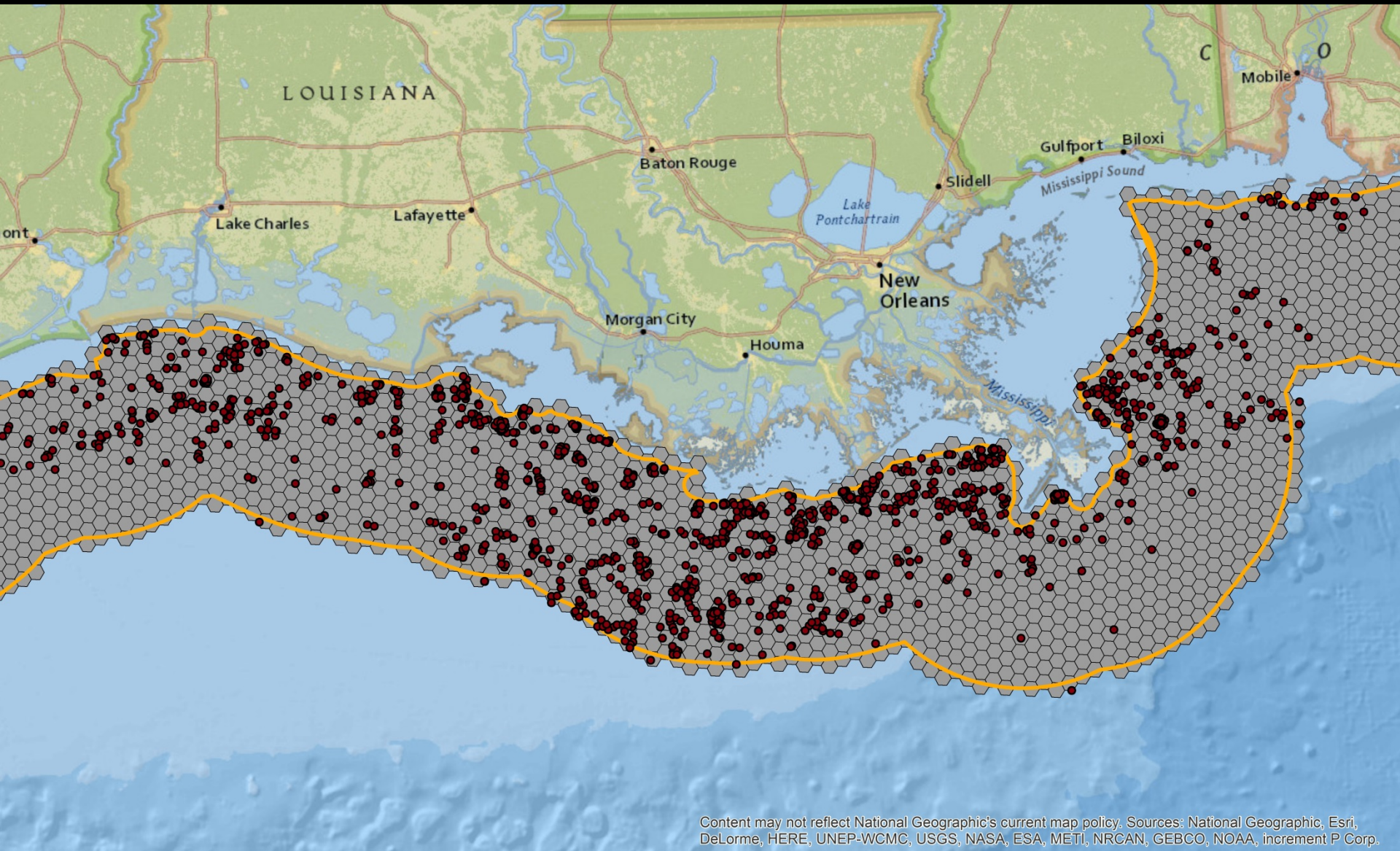
Selected Transects (n=60)

Selection via Generalized Random Tessellation Stratified (GRTS)



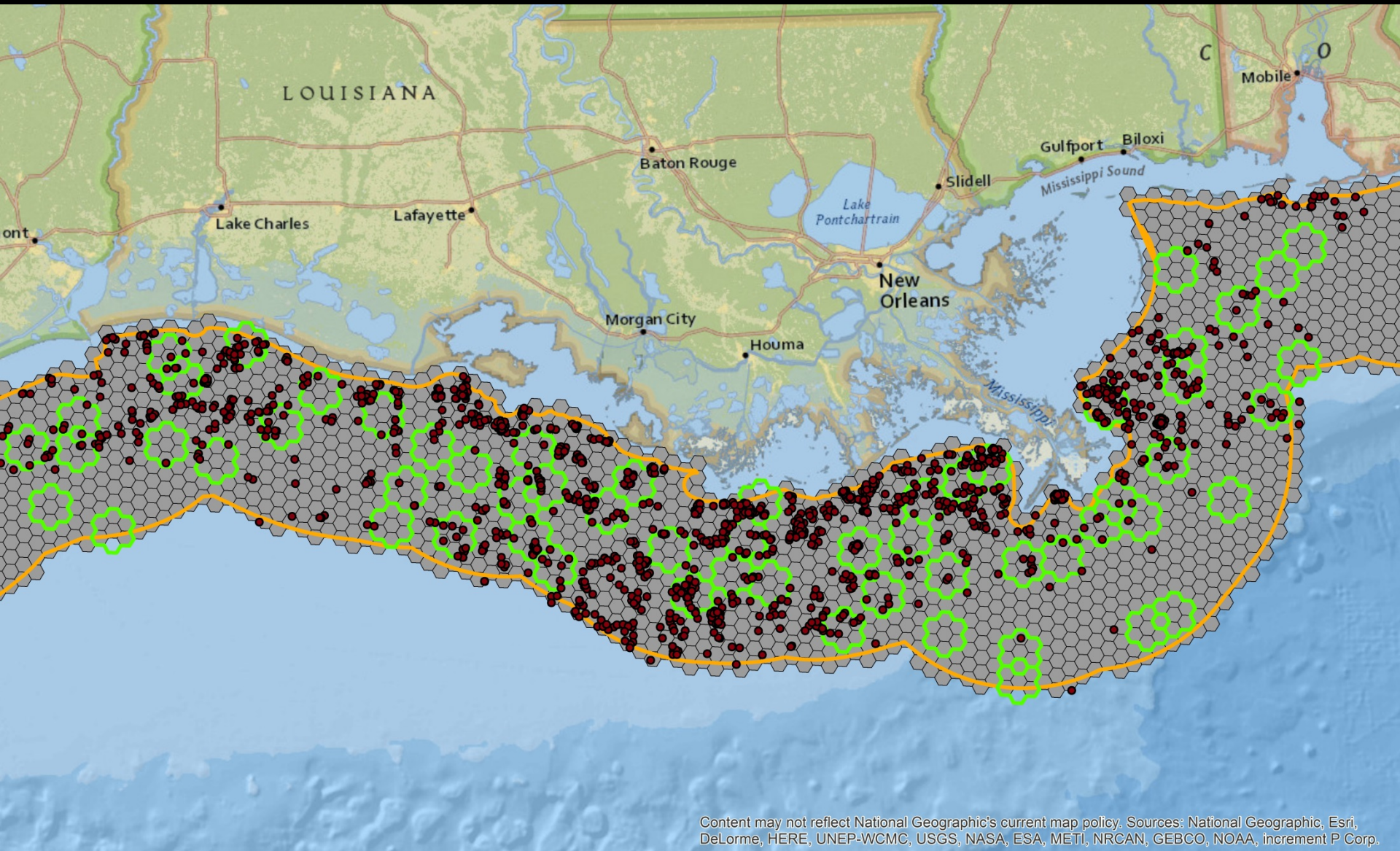
Hexagons Available for Selection

EPA hexagon grid for North America clipped to spatial framework



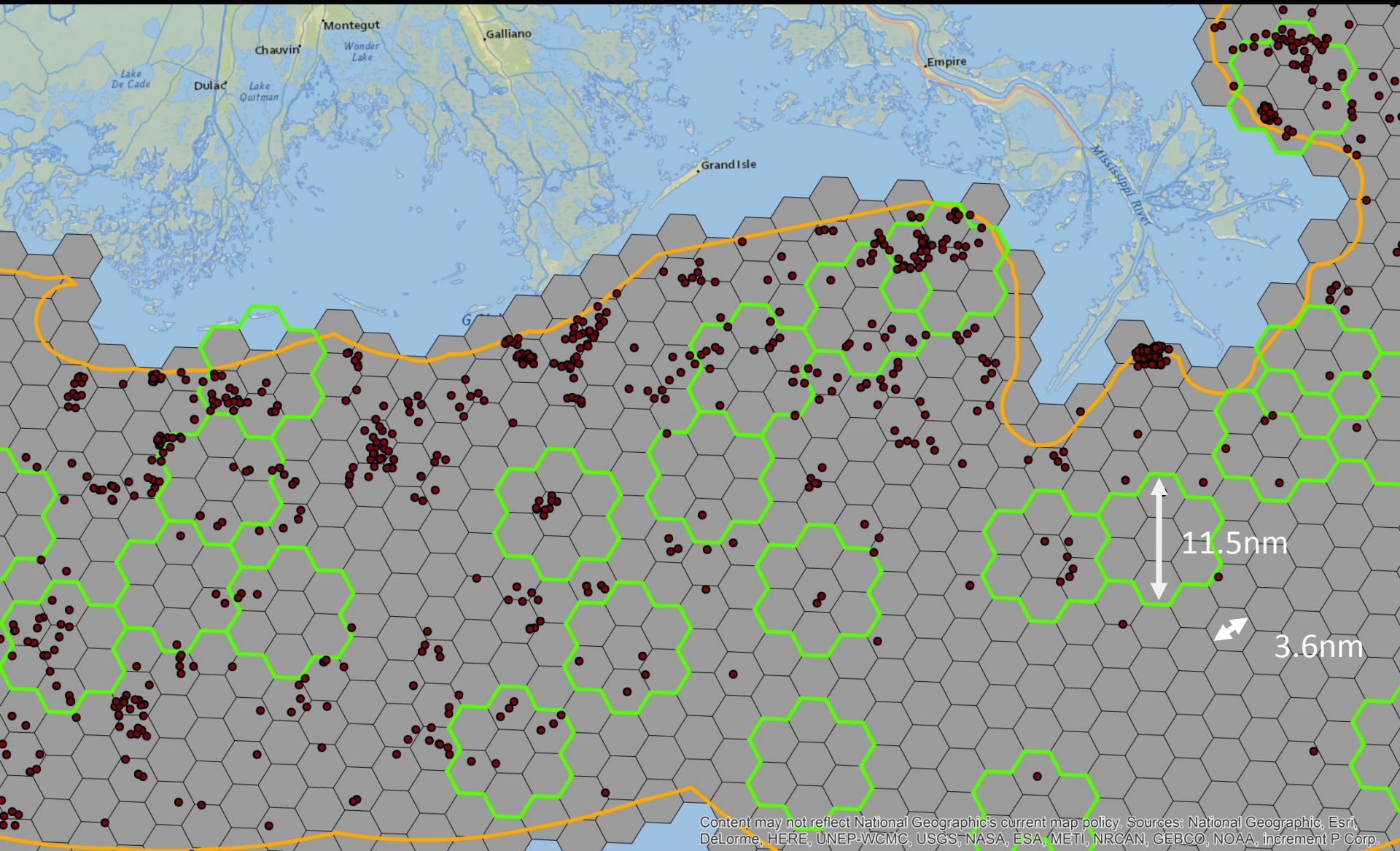
Selected Hexagon “snowflakes” (n=60)

Selection via Generalized Random Tessellation Stratified (GRTS)



Hexagon “Snowflakes”

A closer look showing the original central hexagon and it’s six nearest neighbors that comprise the “snowflake”



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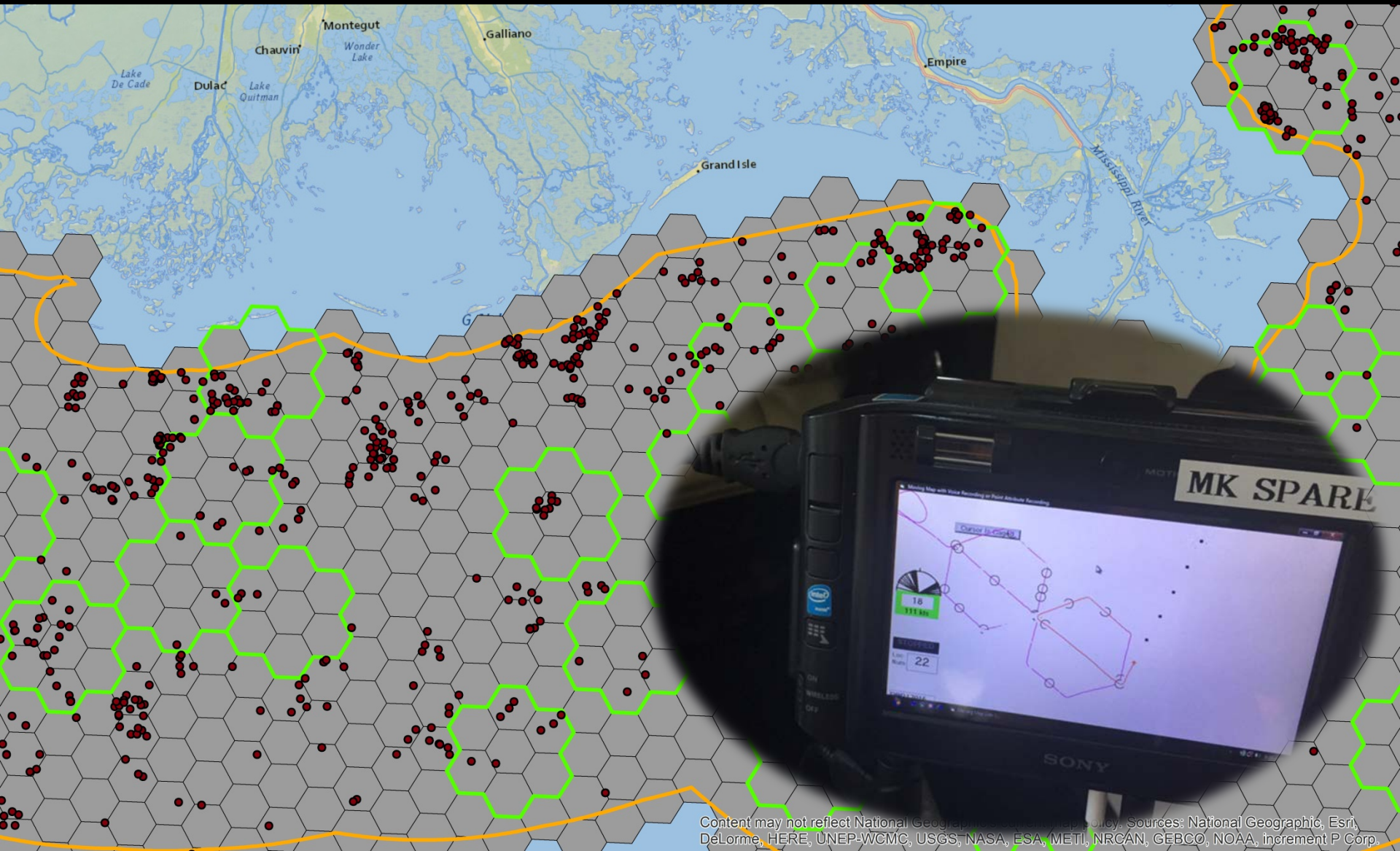


Evaluation of Detection Probabilities / Double Observers

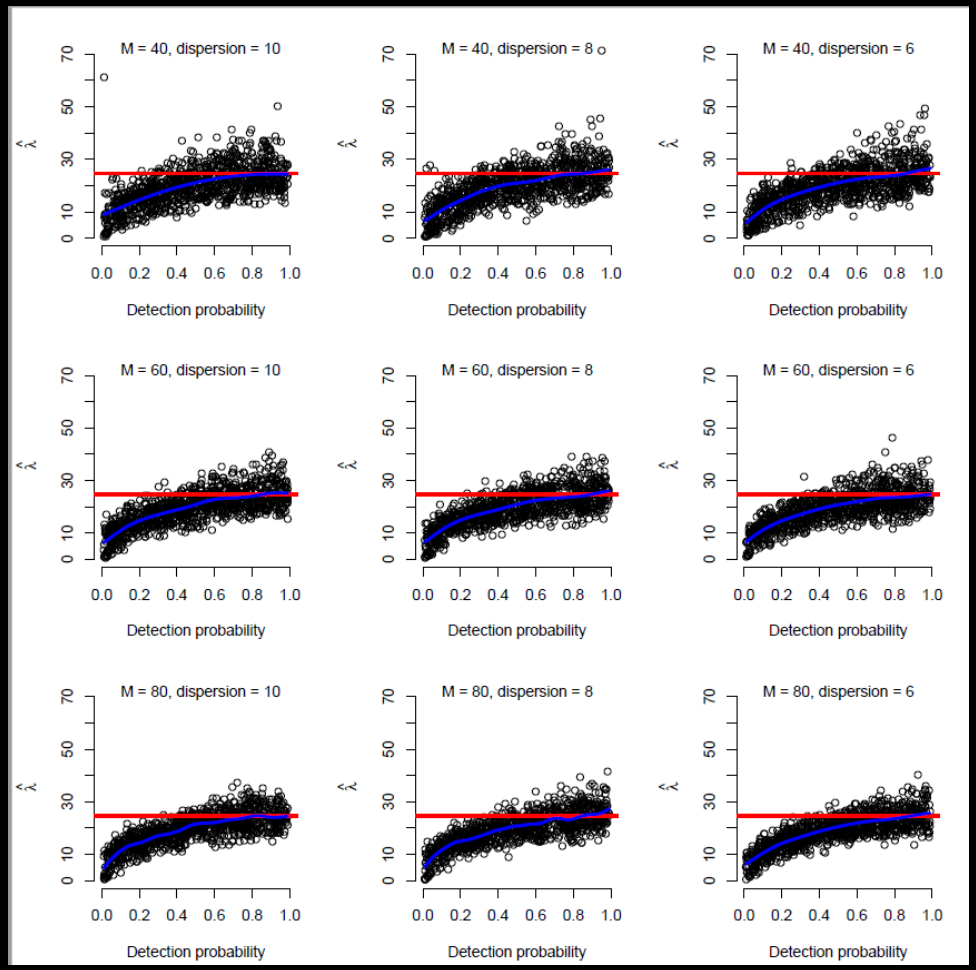


Day 1				Day 2				Day 3			
Morning		Afternoon		Morning		Afternoon		Morning		Afternoon	
P	1	P	2	P	3	P	1	P	2	P	3
3	2	1	3	2	1	2	3	3	1	1	2

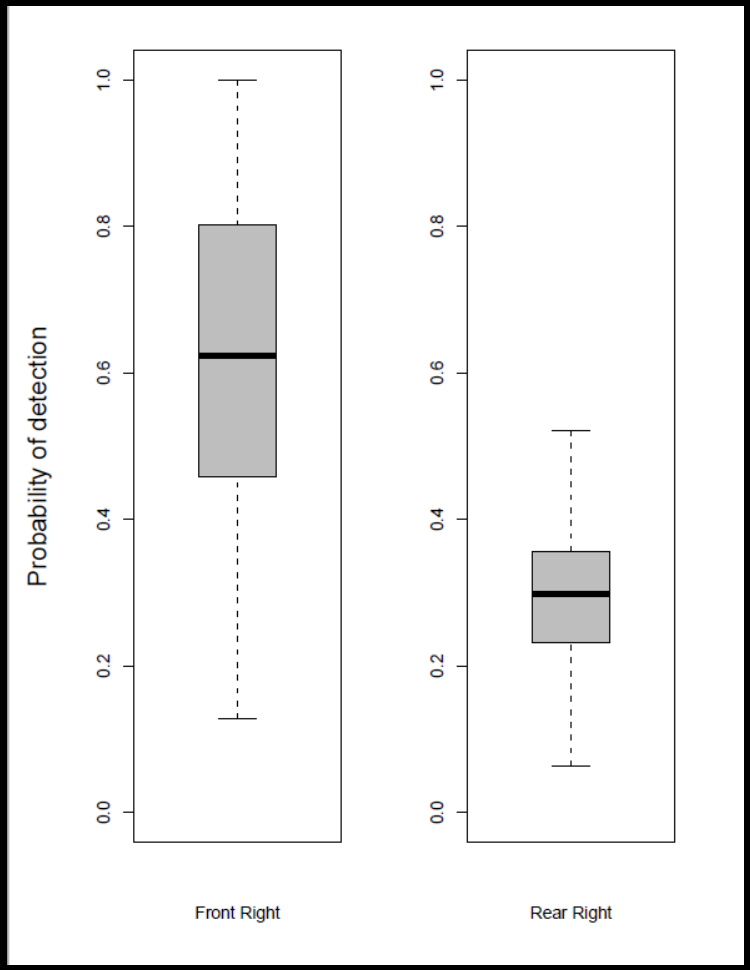
Day 4				Day 5				Day 6			
Morning		Afternoon		Morning		Afternoon		Morning		Afternoon	
P	1	P	2	P	3	P	1	P	2	P	3
3	2	1	3	2	1	2	3	3	1	1	2

Simulation Models to Evaluate Potential Sources of Bias in Abundance Estimates

Sample Size vs Dispersion

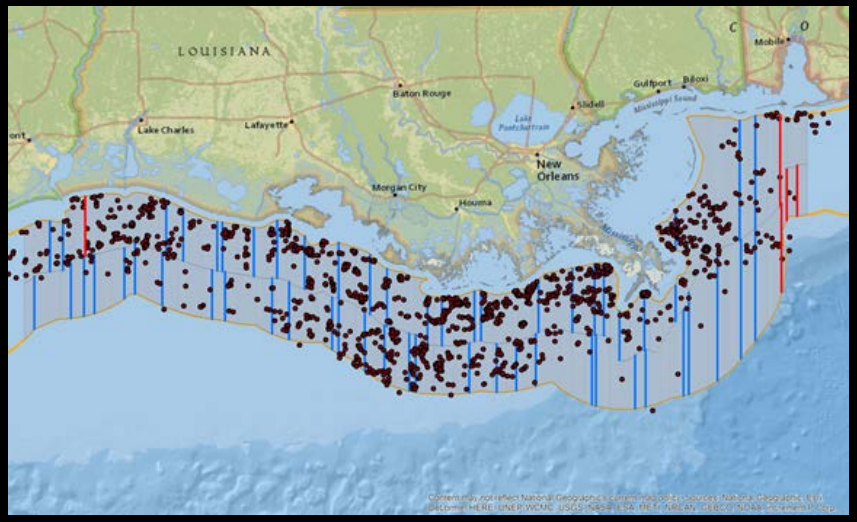


Double Observer

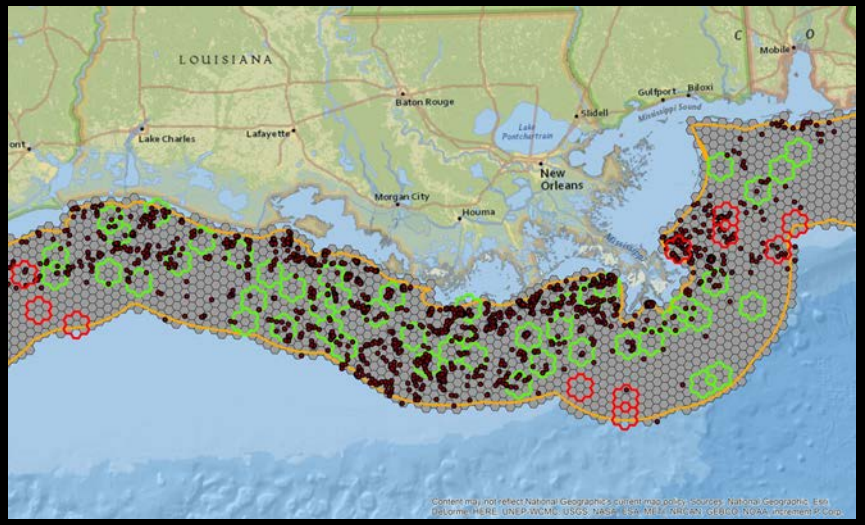


In Summary….

Completed 55 of 60 Transects



Completed 49 of 60 Transects



Lessons Learned

Logistical:

- Fuel limitations on MS Delta
- Weather can disrupt the best laid plans
- Transects tend to be a bit more (fuel) efficient

Operational:

- Both designs are feasible
- Hexagons require more of the pilots attention
- Pilots felt they could be an observer on transects but not hexagons
- Interactions with other air traffic was minimal
- Platforms did present obstacle as presumed

Biological:

- Overall bird numbers were low
- No apparent differences in survey design
- Need to expand survey closer to shore

Going forward with aerial surveys…

Analysis of summer 2017 data to inform:

- ✓ Survey Design (transects vs hexagons)
- ✓ Sampling Intensity (power analysis)
- ✓ Number of Observers (detection probabilities)

Future aerial surveys...

February 2018 | July 2018 | February 2019 | July 2019 | February 2020

Seabird Surveys: Wrap-up

Goal: Collect broad-scale information on the distribution and abundance of seabirds in the Gulf of Mexico to inform seasonally- and spatially-explicit density estimates

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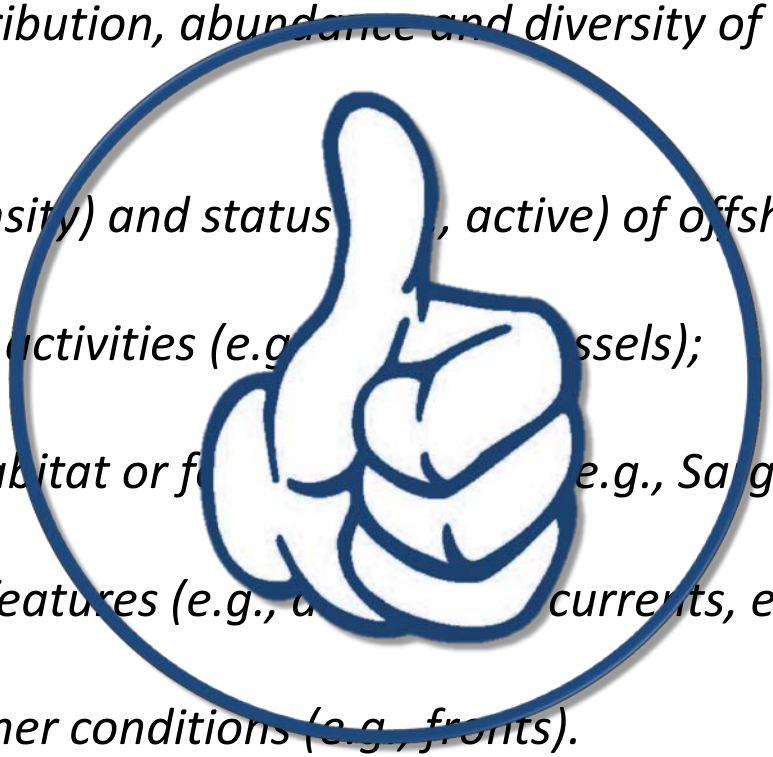

Acknowledgements:

- ✓ All the PIs on the GoMMAPPS Seabird Team. Without everyone's expertise and commitment, this effort would not be possible.

- ✓ USFWS staff for their leadership and support. Specifically, the Branch of Population Surveys provided Kodiak amphibious aircraft and pilot-biologists; National Wildlife Refuge System provided qualified observers; Ecological Services provided GIS support; and the Migratory Bird Program providing administrative support.

- ✓ NOAA staff, vessel crew, and particularly the Chief Scientists and IT Support on each of the respective vessels/legs for their assistance. Without their support and assistance the seabird vessel monitoring efforts would not have been possible or as successful.

- ✓ This study was funded by the U.S. Department of the Interior, Bureau of Ocean Energy Management through Intra-Agency Agreement M17PG00011 with the U.S. Department of Interior, United States Fish and Wildlife Service.