

Manna Fish Farms, Gulf of Mexico Finfish Farm Operations

Presenter: Kelly Lucas

Agent, University of Southern Mississippi,
Thad Cochran Marine Aquaculture Center

Overview

- Team introductions
- Applicant introduction, Manna Fish Farms
- Timeline
- Site requirements and species information
- Site screening
- Draft site plan and cage information
- Production plan and feed usage
- Next Steps

Introductions



- Donna Lanzetta, CEO and founder of Manna Fish Farms
- Mike Meeker, COO Manna Fish Farms, and inventor Storm Safe Submersible Cage
- Reg Blaylock & Anand Devappa Hiroji, University of Southern Mississippi
- Stephanie Showalter Otts & Kristina Alexander, University of Mississippi, MS-AL Sea Grant & Sea Grant Law Center
- Michael Chambers, University of New Hampshire & NH Sea Grant
- Ken Riley, James Morris Jr., Lisa C. Wickliffe, & Jon Jossart - NOAA, National Centers for Coastal Ocean Science
- Dan Warren, P&C Scientific, LLC

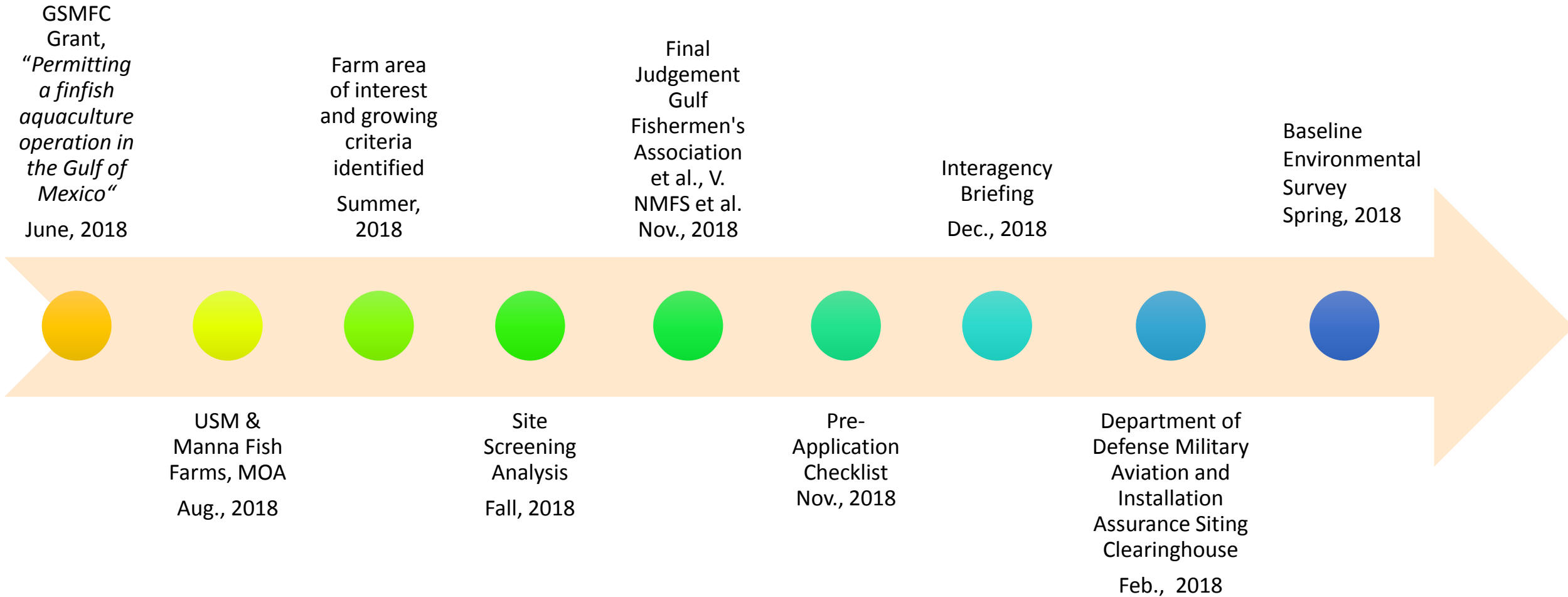


Manna Fish Farms

- Committed to:
 - Sustainability
 - Transparency
 - Best Aquaculture Practices
- Permitting Finfish Farms
 - Gulf of Mexico, off Pensacola FL
 - Northeast, off Eastern Long Island NY
- Learn more:
 - www.mannfishfarms.com
 - Social Media:
 - <https://twitter.com/mannafishfarms>
 - <https://www.facebook.com/mannafishfarms/>



Timeline of Past Events



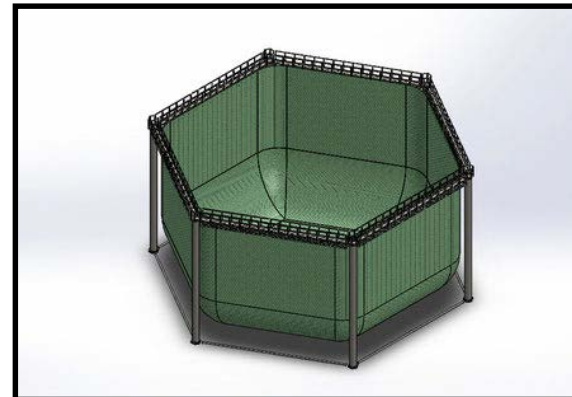
Timeline (Milestones Pending)

- Finalize 120 Acres of the 724 acres surveyed (June, 2018)
- Effluent Modeling (June, 2018)
- Structural Modeling (June, 2018)
- Additional Current Measurements (August & September 2018)
- EPA, National Pollutants Discharge Elimination System Permit Application (Summer, 2018)
- USACE, Section 10 Permit Application (Summer, 2018)
- USCG, CG-2554 Authorization, Private Aids to Navigation Application (Summer, 2018)

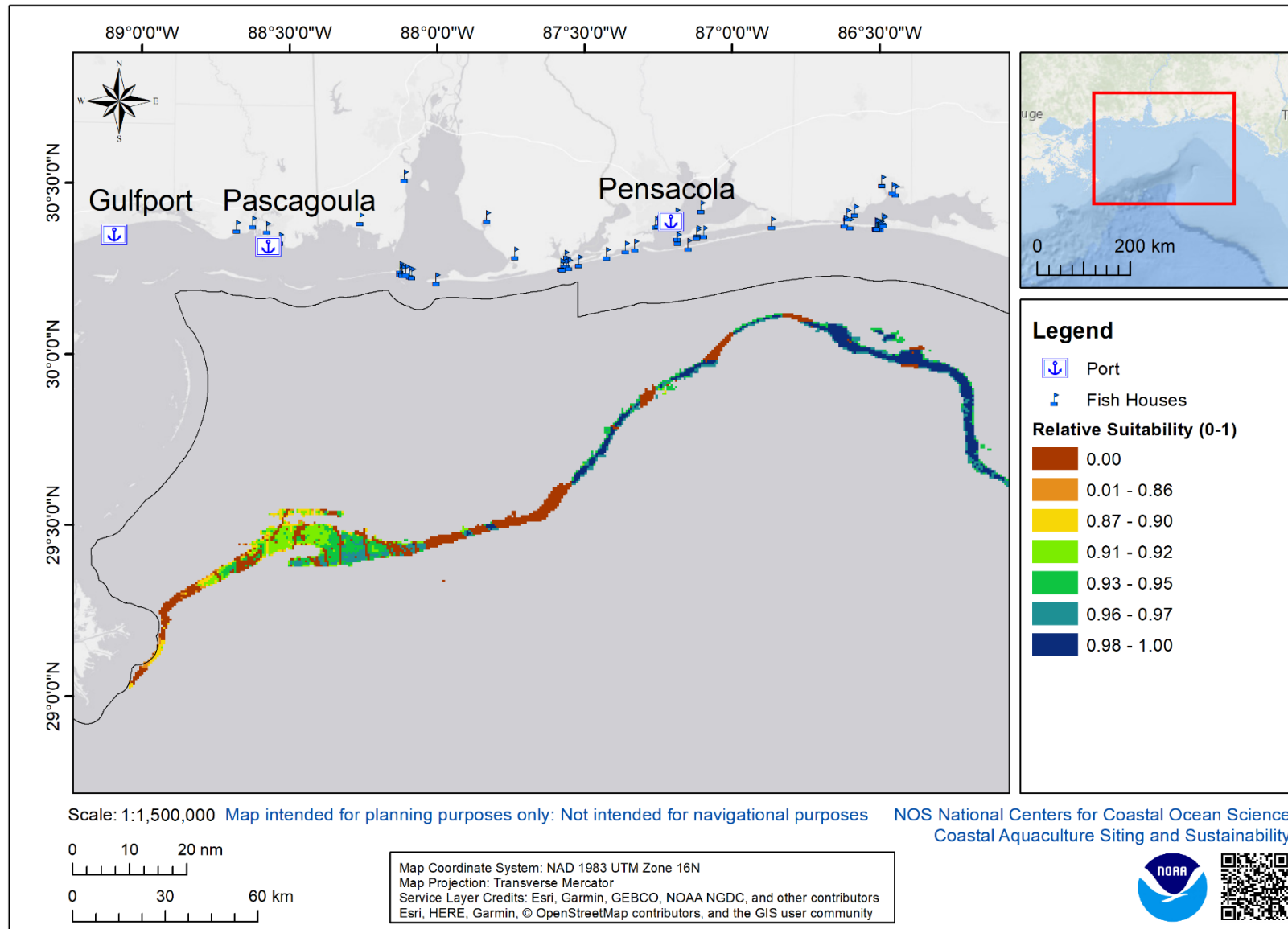
Manna Fish Farms Offshore Demonstration Project



- Commercial-scale aquaculture demonstration project
- **Area of interest:** Mississippi, Alabama, Florida panhandle
- **Depth requirements:** 50 – 55 meters
- **Preferred Ports:** Pascagoula/Gulfport, MS or Pensacola, FL (Minimize farm to port distance and user conflicts)
- **Sea water temperature:** 6 – 30 °C
- **Current Speed:** > 0.15 m/s
- **Species:** *Red drum (*Sciaenops ocellatus*)
Almaco jack (*Seriola rivoliana*)
Striped bass (*Morone saxatilis*) *and others.*



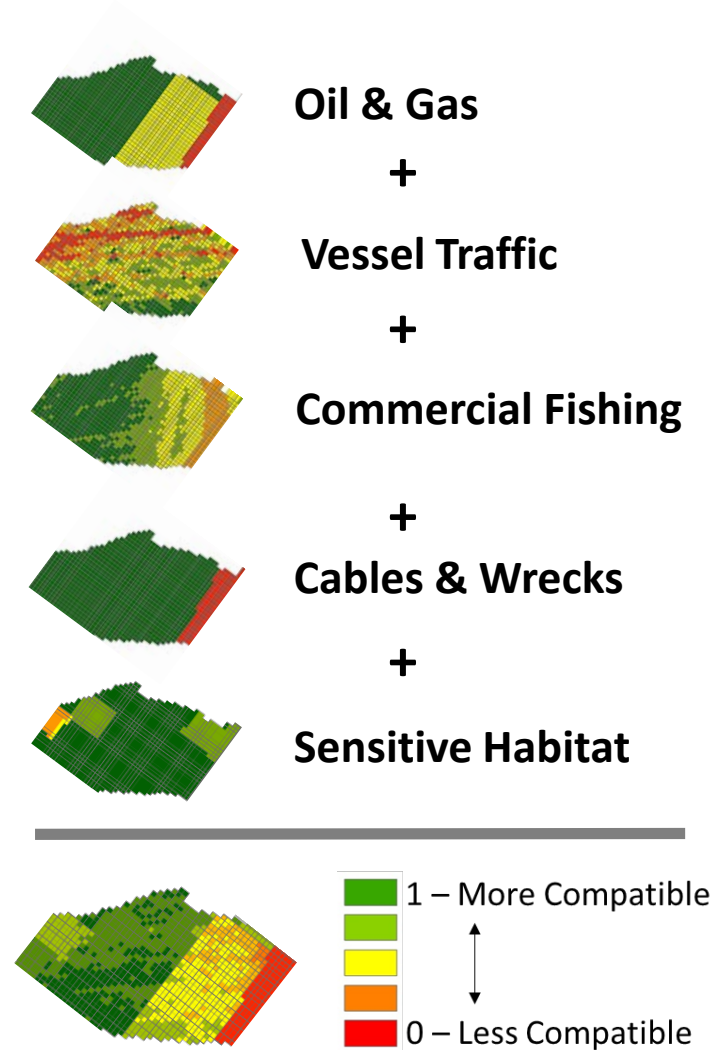
Relative Suitability within Area of Interest



Data Considered

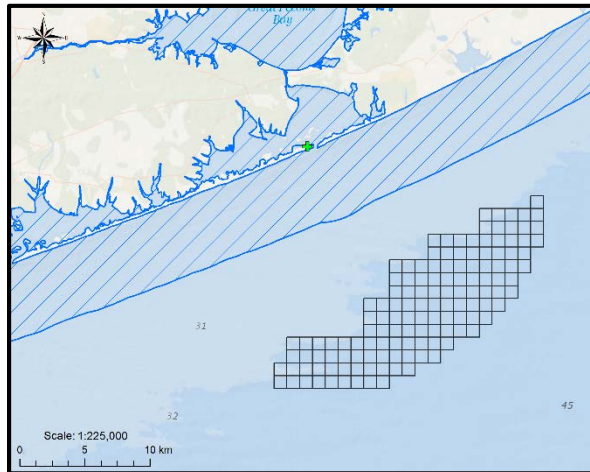
- Bathymetry
- Military
- Unexploded Ordnance
- Shipping Lanes
- AIS Vessel Traffic
- Shrimp Vessel Activity
- Submarine Cables
- Artificial Reefs
- Lightering Zones
- Oil & Gas Platforms
- Oil & Gas Well
- Oil & Gas Active Leases
- Oil & Gas Pipelines
- Shipwrecks and obstructions
- Deep Sea Coral

Siting Model

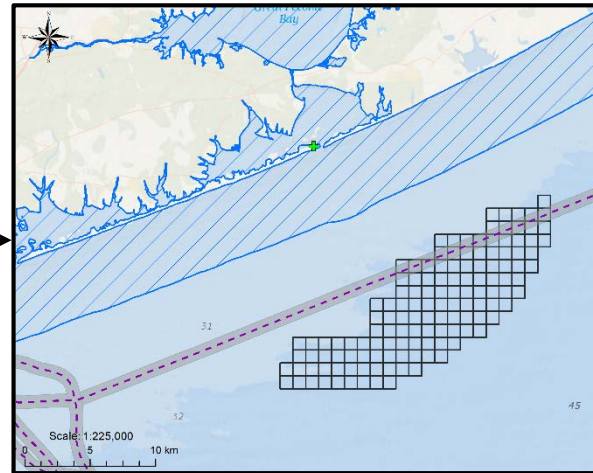


Suitability Model Methodology

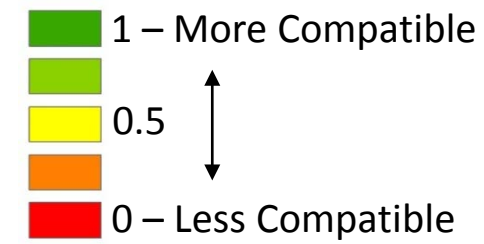
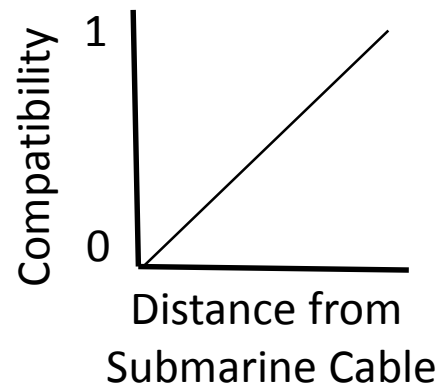
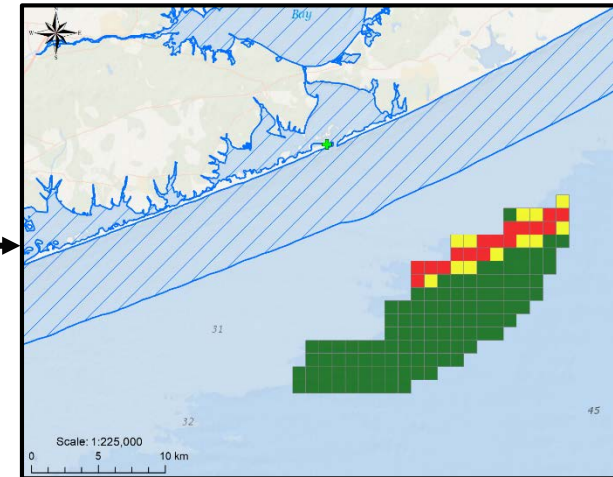
Gridded area of interest



Submarine cable intersects area of interest

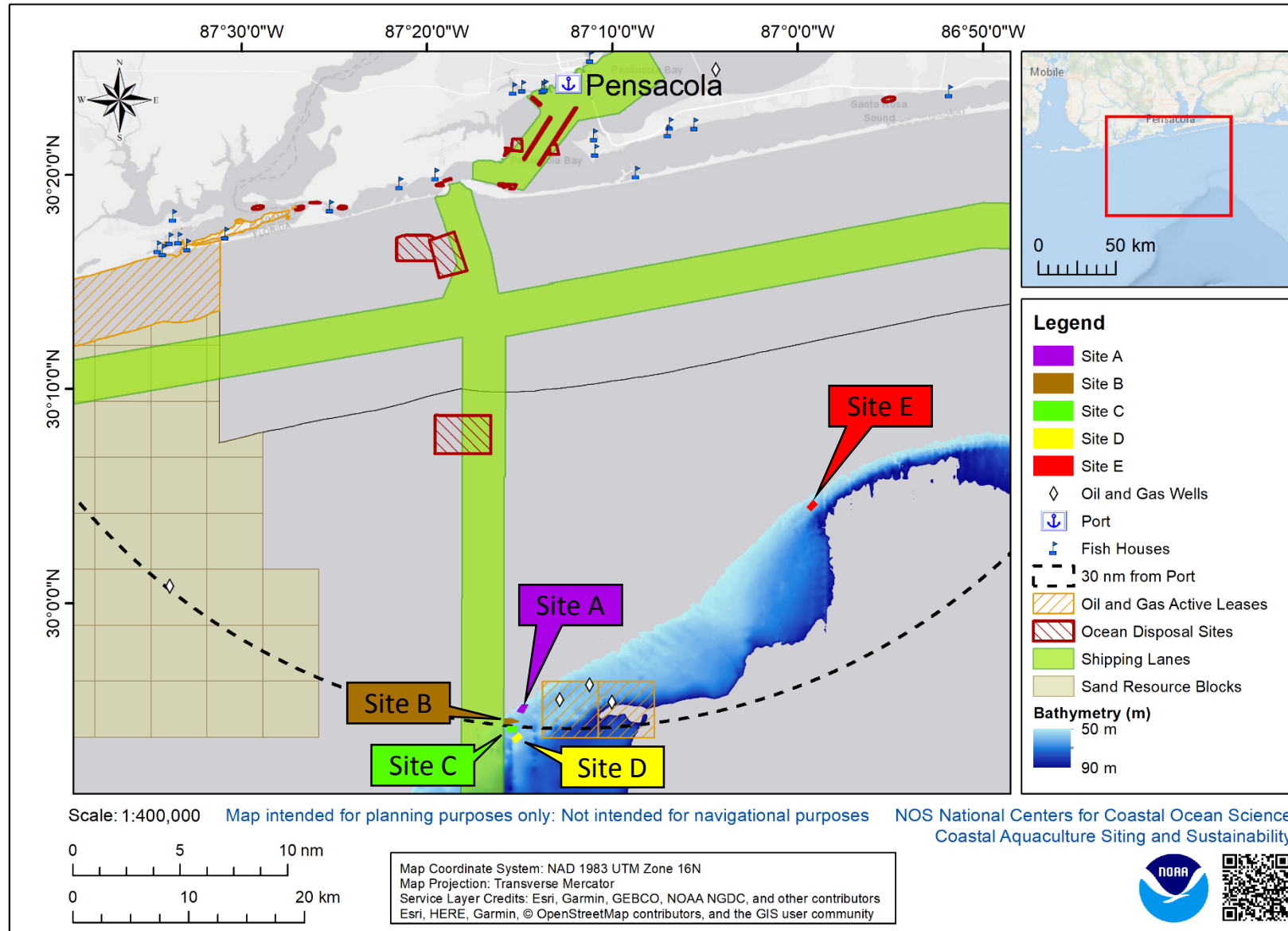


Grid cells far from submarine cable are assigned higher weights than those nearby

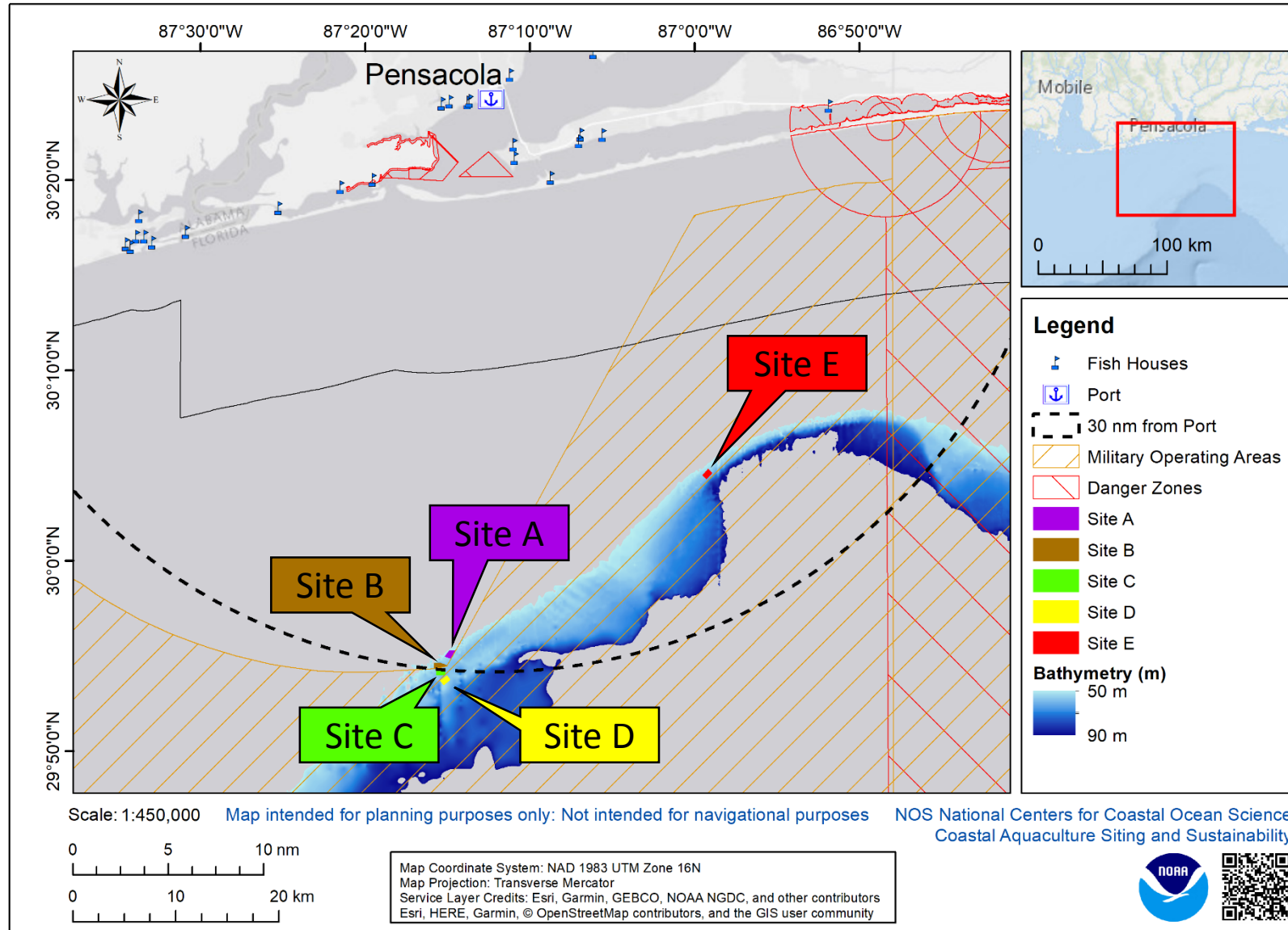


For demonstration purposes only

Navigation and Other Factors

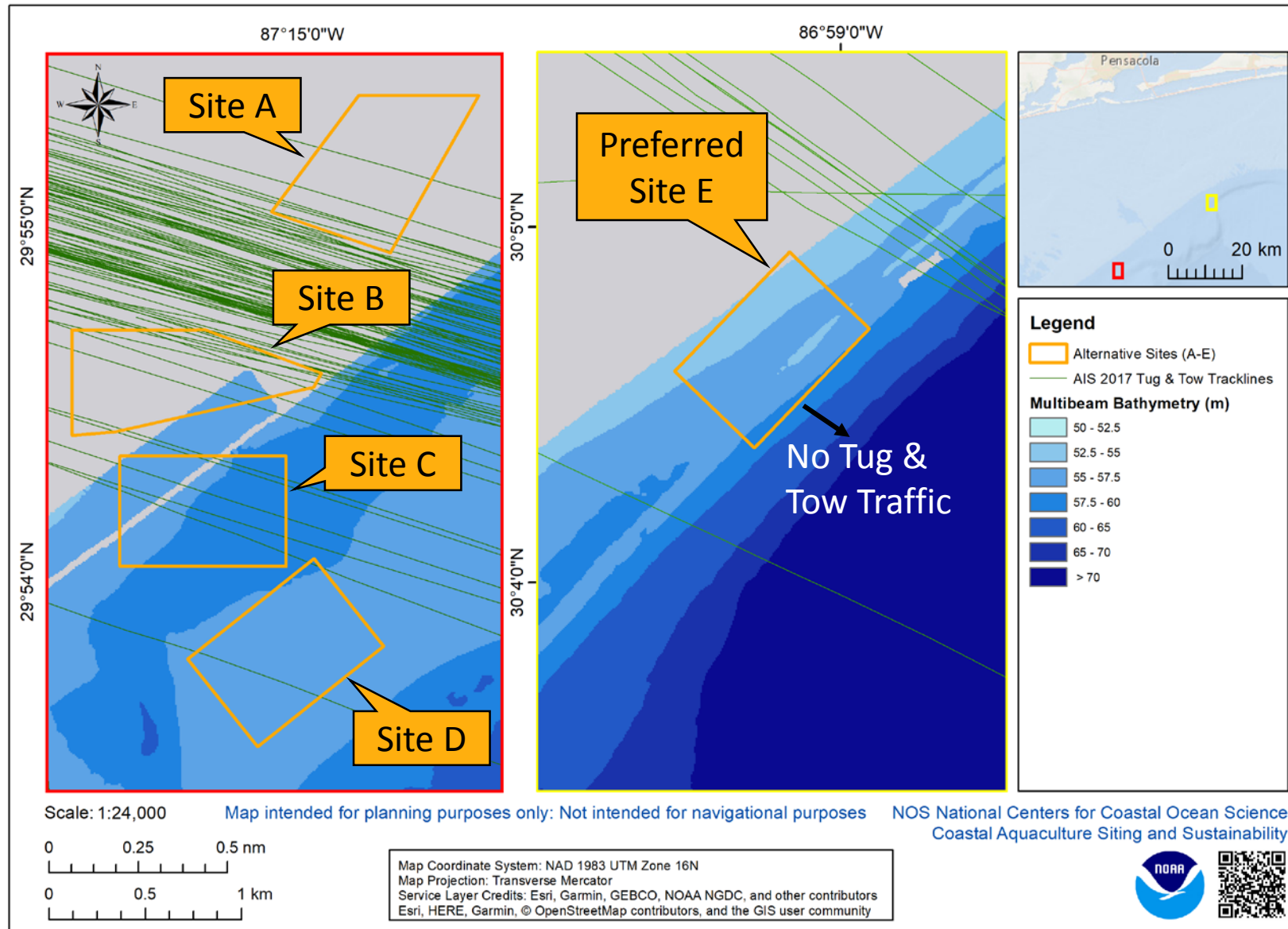


Sites (50-m depth)

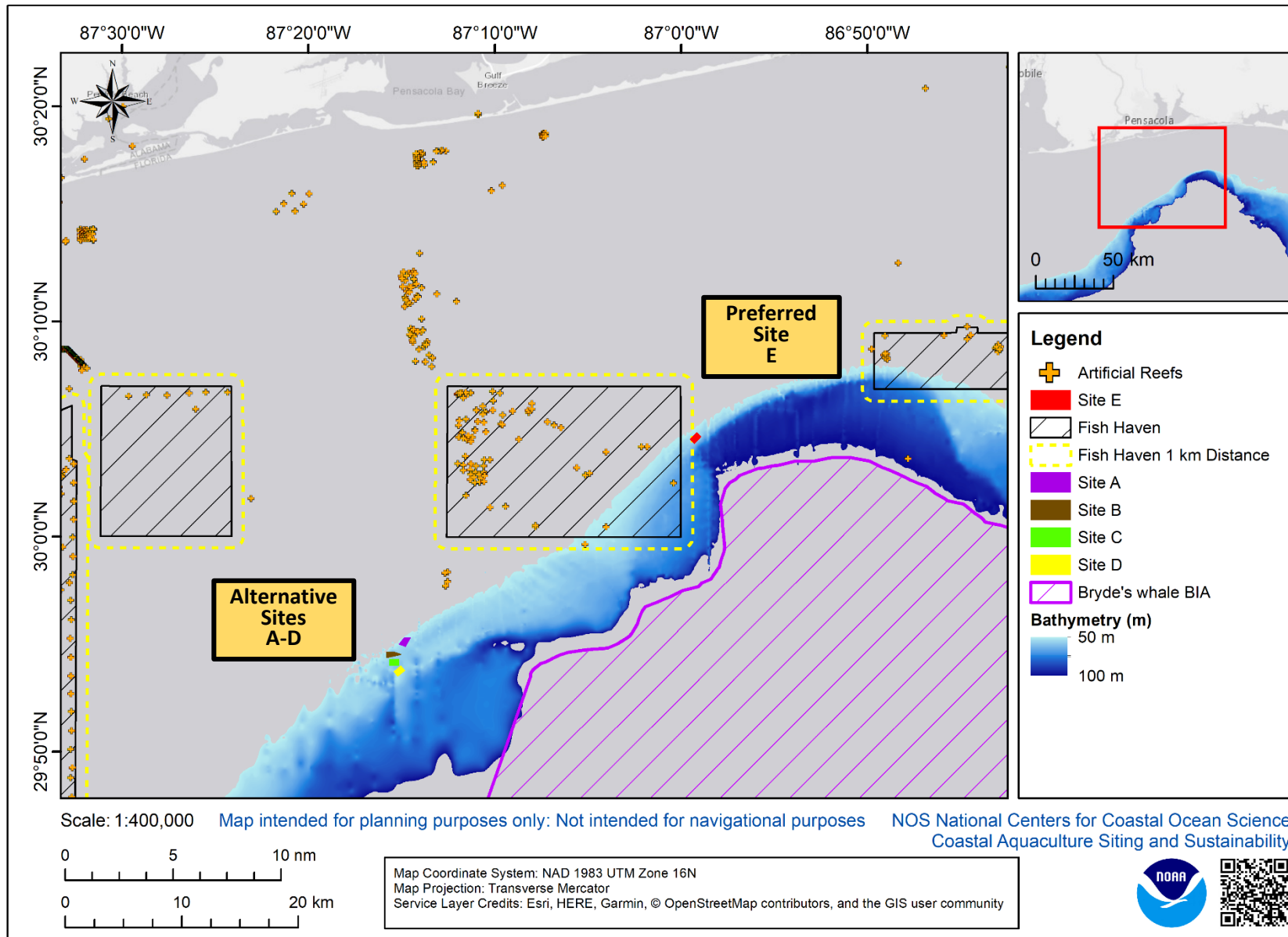




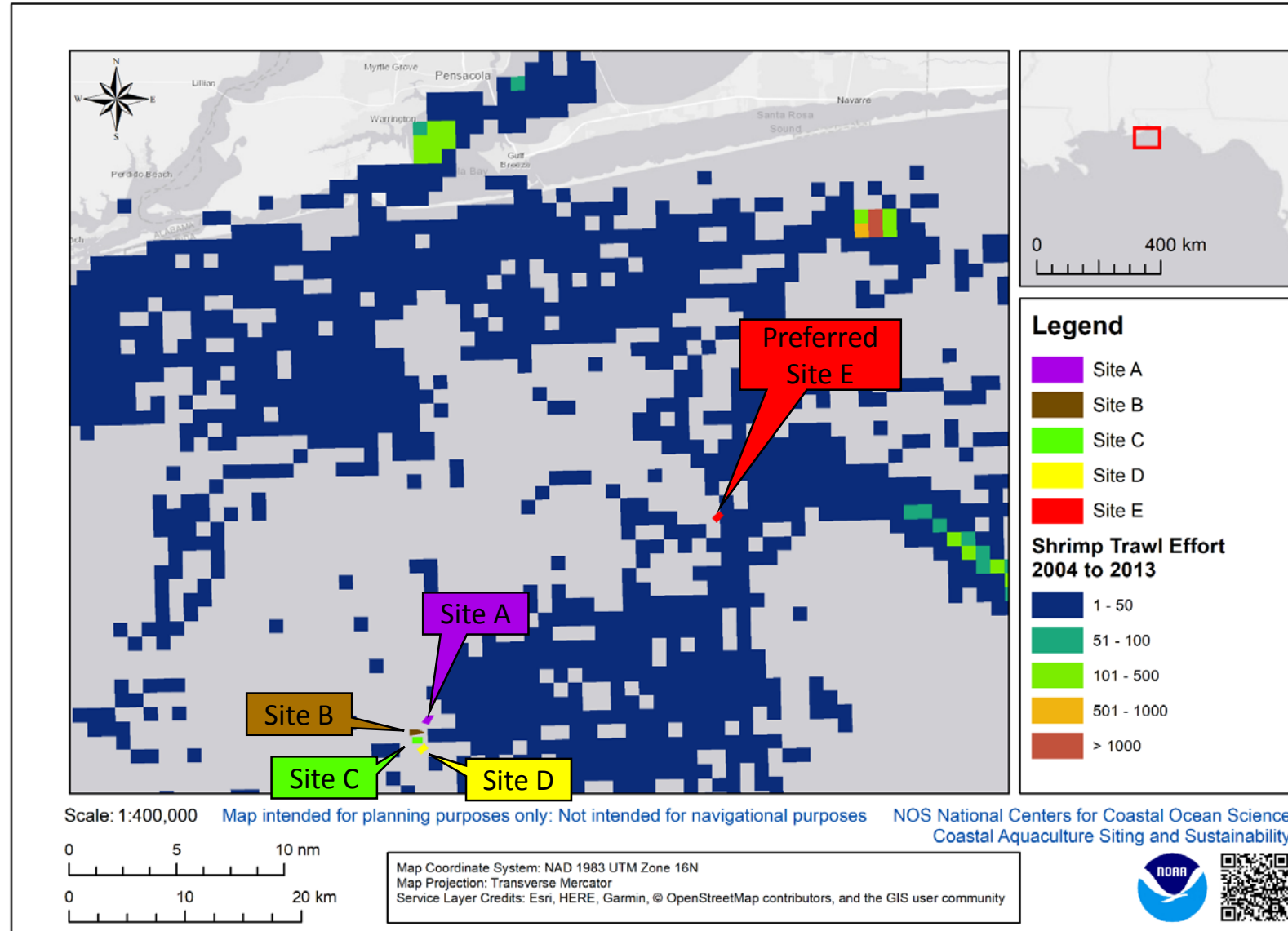
Vessel Traffic Assessment



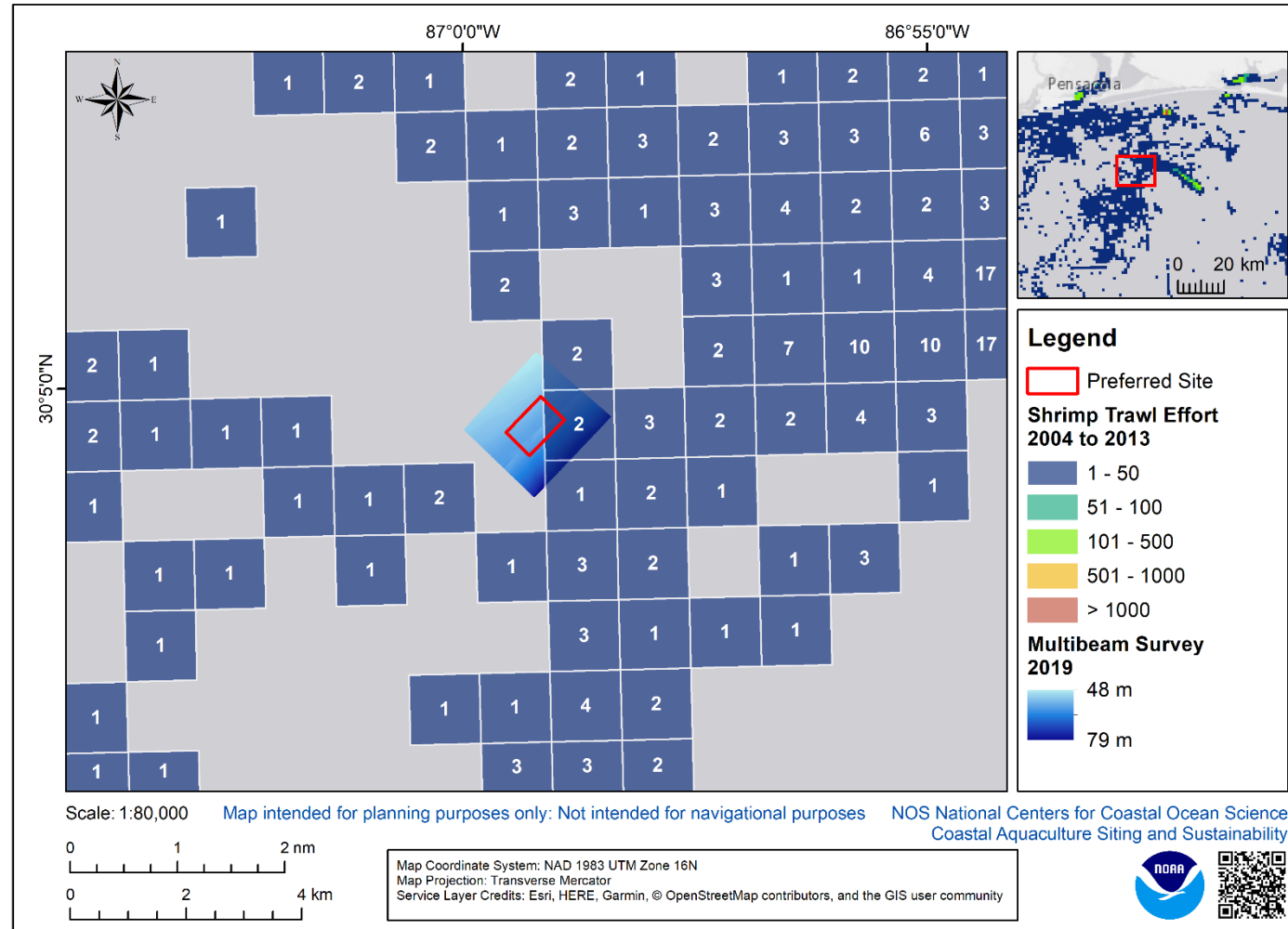
Preferred Site and Alternatives



Shrimp Trawl Effort 2004 to 2013



Shrimp trawl effort (sum 2004-2013) and preferred site



*More information on the shrimp data, which encompasses all species of shrimp important to Gulf of Mexico fisheries, can be found at: <http://gulfcouncil.org/wp-content/uploads/A-7a-White-Paper-on-Artificial-Reefs.pdf> (GMFMC 2015).

Preliminary Results

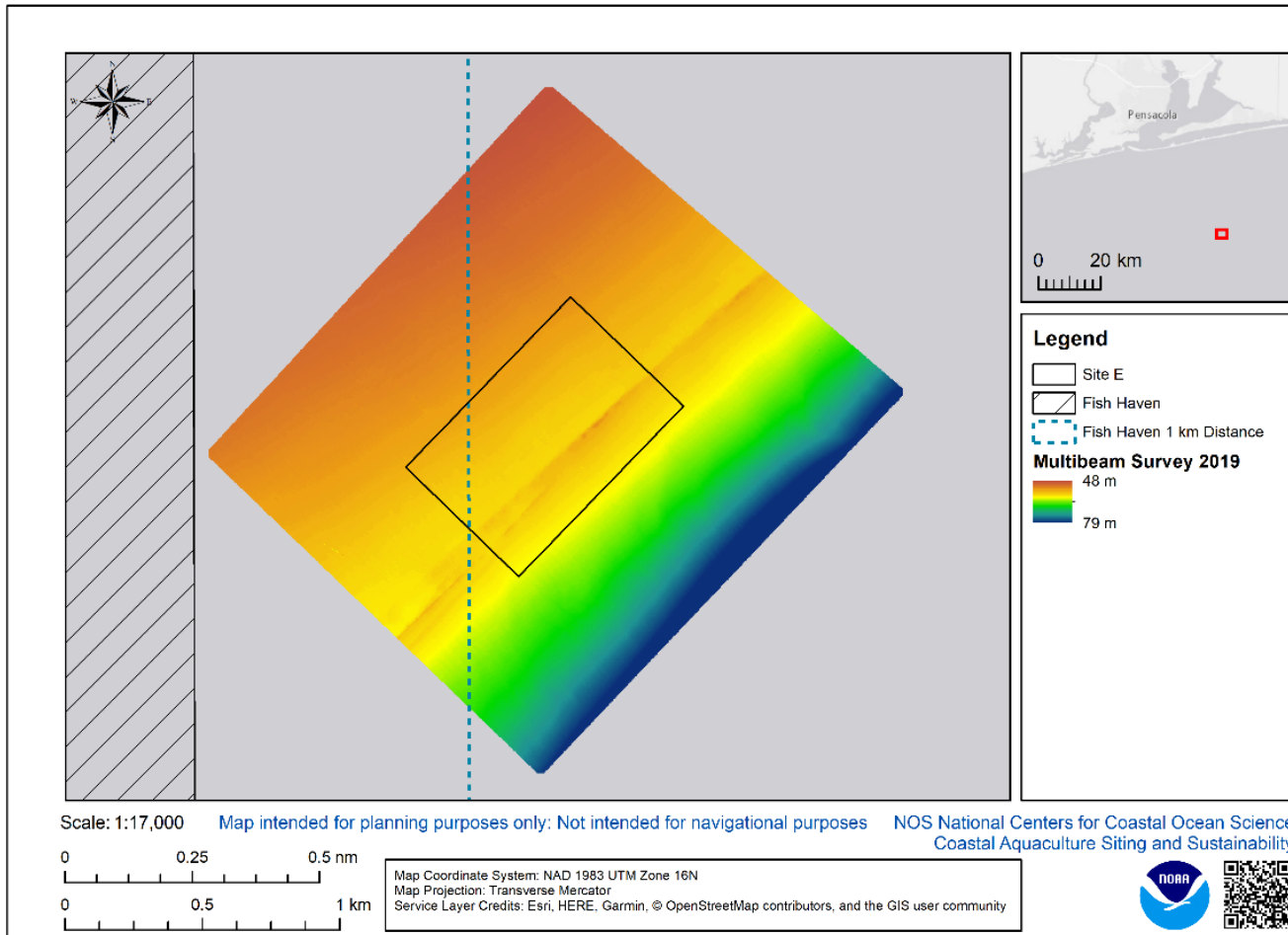
Baseline Environmental Survey



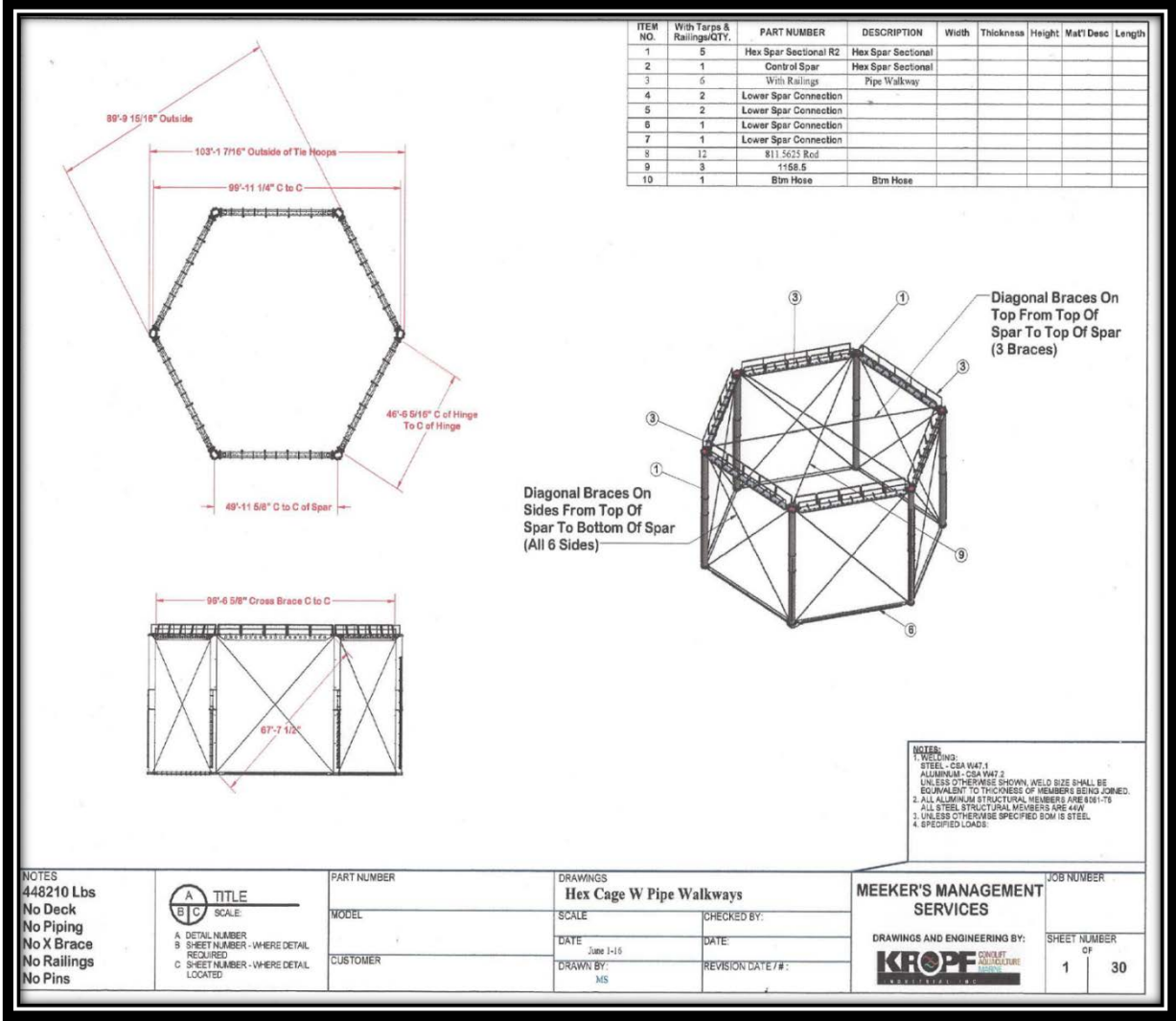
Results of multibeam survey
completed April 2019

- Surveyed 0.5 km beyond area of interest
- 2-m resolution
- Depths confirmed 55 m
- Minimal slope across site
- Small ridge detected
- Sand substrate

Side-scan and sub-bottom
survey May 2019



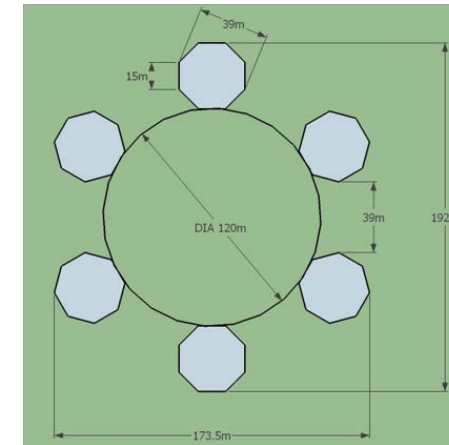
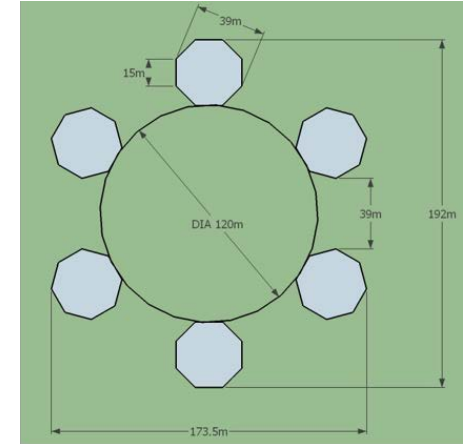
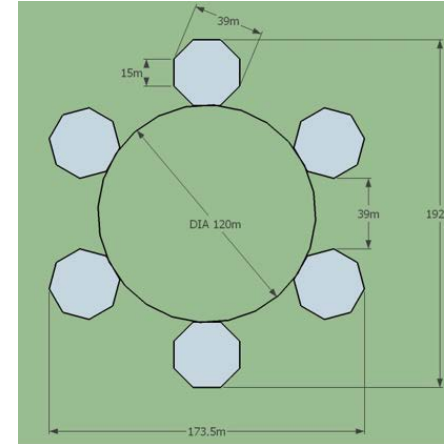
Storm Safe Submersible



Storm Safe Cage Site Plan



- 18 Cages
- 9000m³/cage
- 6 cages per circular array
- Each array (14 Acres)
- Final design and mooring decisions will be guided by information from the Baseline Environmental Survey.



Production Timeline with Feed Usage

Year(s)	No. of Cages Stocked	Cages/fish production stage	Production (lbs/year)	Est. Feed Usage Max (lbs/day)
Year 0 - 1	2	2	600,000	17,000
Years 2 - 3	4	2	1,200,000	18,520
		2		
Years 3 -4	12	4	3,600,000	63,680
		4		
		4		
Years 4-5	18	6	5,400,000	95,520
		6		
		6		

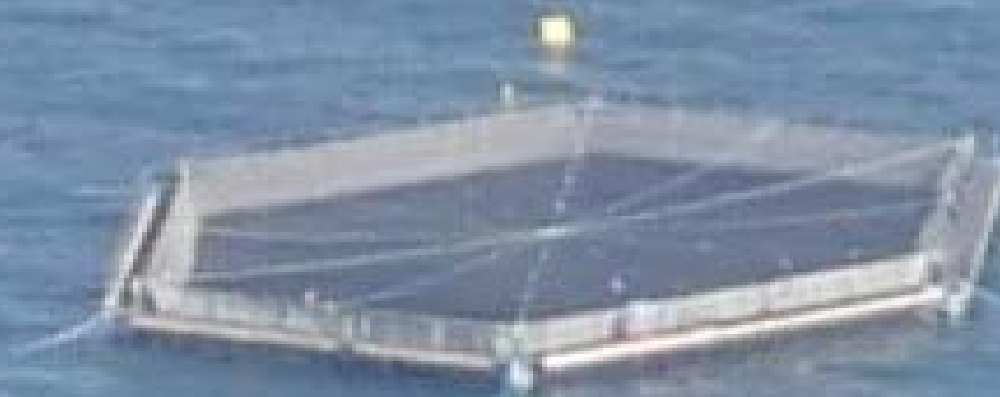
Additional Feed Information

Cage Size	Initial Biomass Stocked per cage	Final Harvest est. per cage	Initial daily feed per cage	Feed @ Initial. Harvest per cage
9000 (m ³)	5,750 (kg)	135,000 (kg)	138 (kg/day)	3,864 (kg/day)
317,832 (ft ³)	11,500 (lbs)	297,000(lbs)	276 (lbs/day)	7,728 (lbs/day)

Type	Slow sinking pellet with estimated 35-50% protein and 10% lipid
Mechanism	Feeding by vessel in the beginning moving to feed buoy or barge
Feed Frequency	Will vary by species and biomass. Feed calculations for initial stocking were calculated at a feed conversion rate (FCR) 1.2 and FCR 1.5 for final harvest.

Next Steps

- Get stakeholder feedback for additional considerations
- Baseline environmental survey data (700 plus acres)
 - Marine Archaeological analysis
 - Finalize 120 acre farm site
 - Structural modeling
 - Discuss mooring, materials and structure with NOAA Protected Resources
- Provide Feed and effluent characteristics to the EPA for discharge models
- Submit for EPA, NPDES Permit
 - Best Management Practices Plan
 - Environmental Monitoring Plan (Includes baseline sampling)
 - Emergency Response Plan
 - Quality Assurance Plan
- Submit for USACE, Section 10 Permit and CG 2554 Authorization
- Operations Plan
- Health Management Plan



Contact information

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