

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.mannafishfarms.com
 - Social Media:
 - <https://twitter.com/mannafishfarms>
 - <https://www.facebook.com/mannafishfarms/>



Timeline of Past Events

GSMFC
Grant,
*“Permitting
a finfish
aquaculture
operation in
the Gulf of
Mexico”*
June, 2018

Farm area
of interest
and growing
criteria
identified
Summer,
2018

Final
Judgement
Gulf
Fishermen's
Association
et al., v.
NMFS et al.
Nov., 2018

Interagency
Briefing
Dec., 2018

Baseline
Environmental
Survey
Spring, 2019

USM &
Manna Fish
Farms, MOA
Aug., 2018

Site
Screening
Analysis
Fall, 2018

Pre-
Application
Checklist
Nov., 2018

Department of
Defense Military
Aviation and
Installation
Assurance Siting
Clearinghouse
Feb., 2019

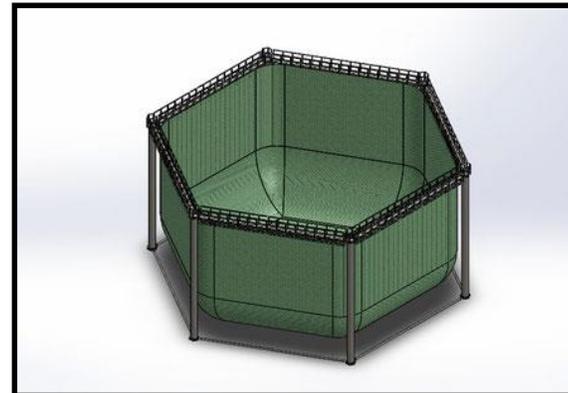
Timeline (Milestones Pending)

- Finalize 120 Acres of the 724 acres surveyed (Summer, 2019)
- Effluent Modeling (Summer, 2019)
- Structural Modeling (Summer, 2019)
- Additional Current Measurements (Aug., Sept., Oct. 2019)
- EPA, National Pollutants Discharge Elimination System Permit Application (Summer, 2019)
- USACE, Section 10 Permit Application (Summer, 2019)
- USCG, CG-2554 Authorization, Private Aids to Navigation Application (Summer, 2019)

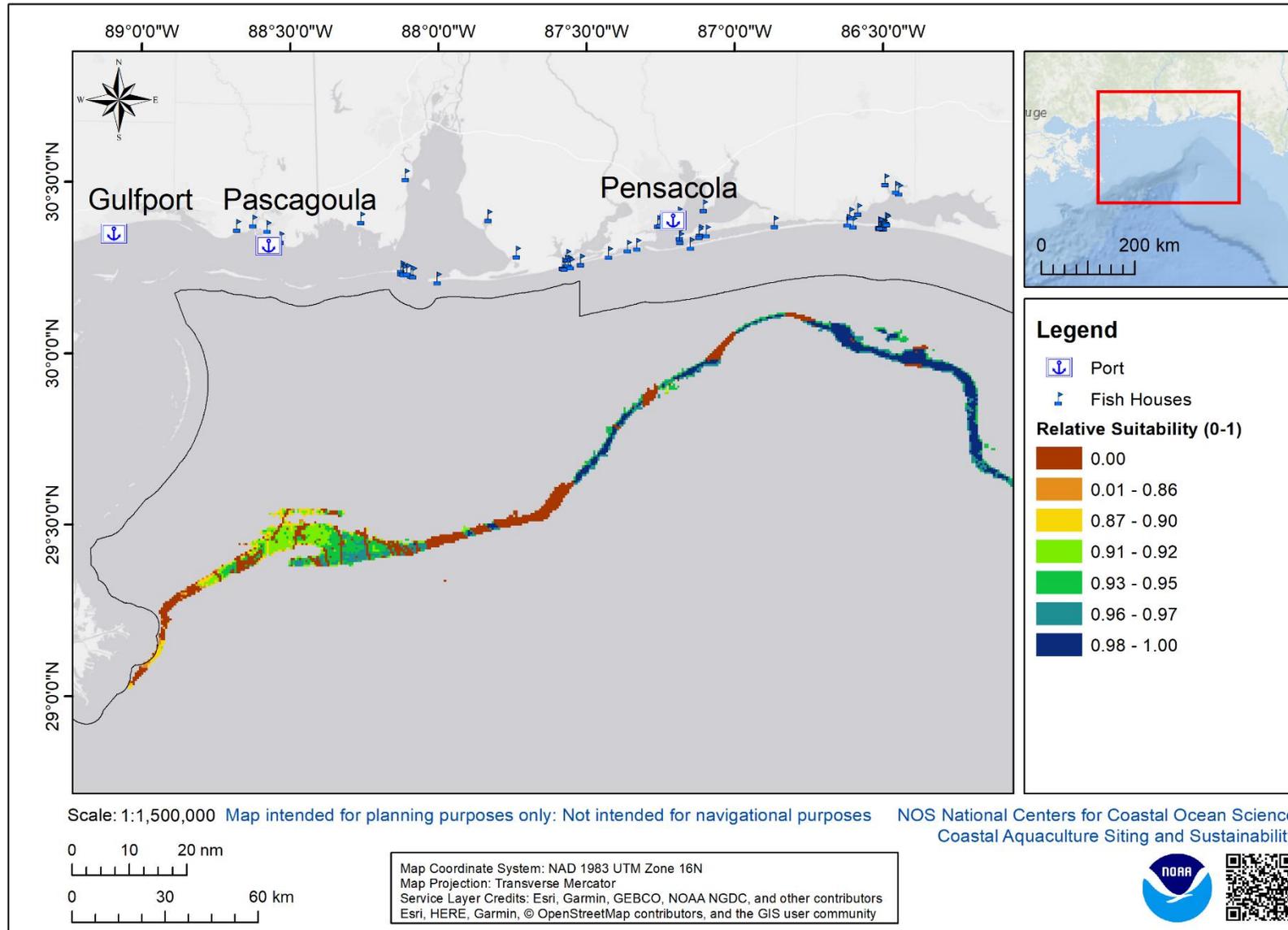
Manna Fish Farms Offshore Demonstration Project



- 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.*



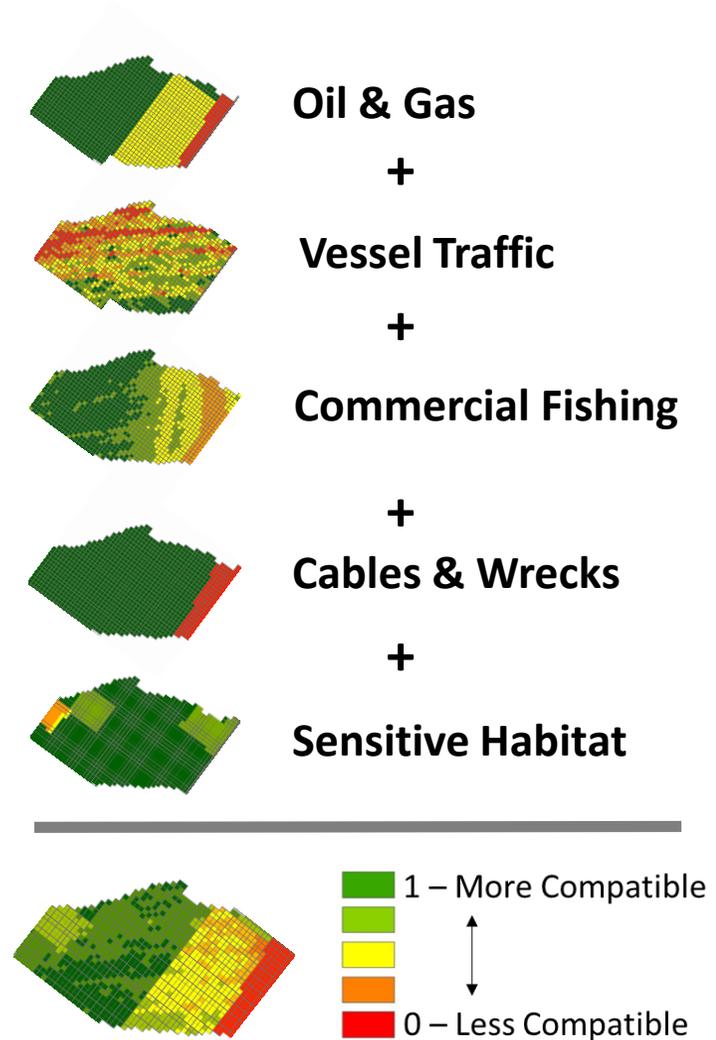
Relative Suitability within Area of Interest



Data Considered

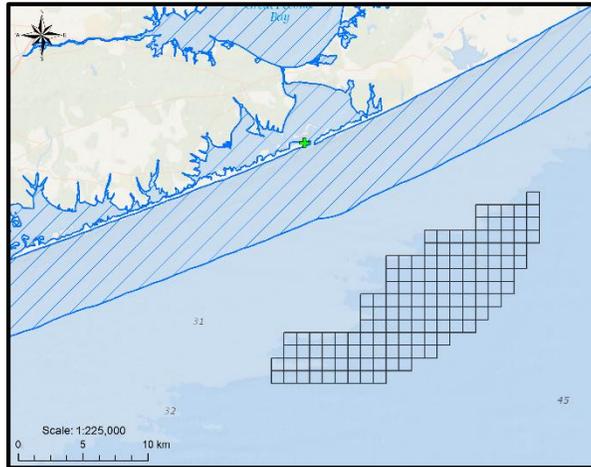
- Bathymetry
- Military
- Unexploded Ordnance
- Shipping Lanes
- AIS Vessel Traffic
- Shrimp Vessel Activity
- Submarine Cables
- Artificial Reefs
- Lightering Zones
- Oil & Gas Platforms
- Oil & Gas Well
- Oil & Gas Active Leases
- Oil & Gas Pipelines
- Shipwrecks and obstructions
- Deep Sea Coral

Siting Model

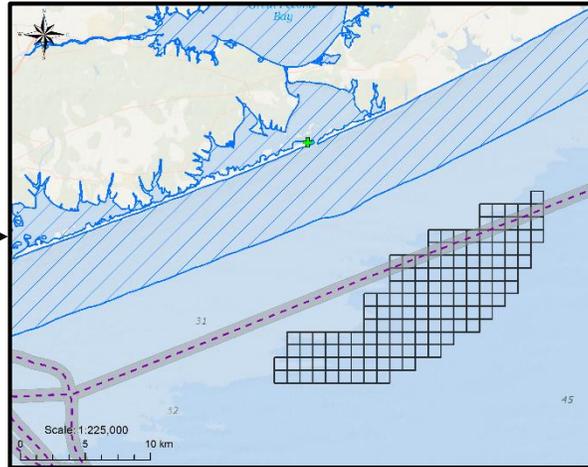


Suitability Model Methodology

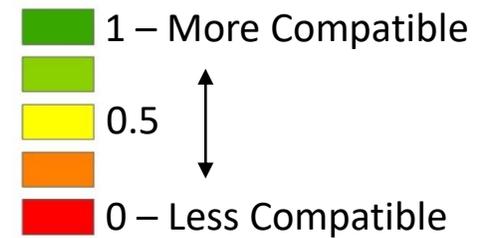
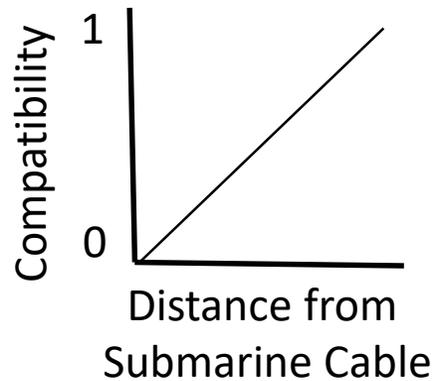
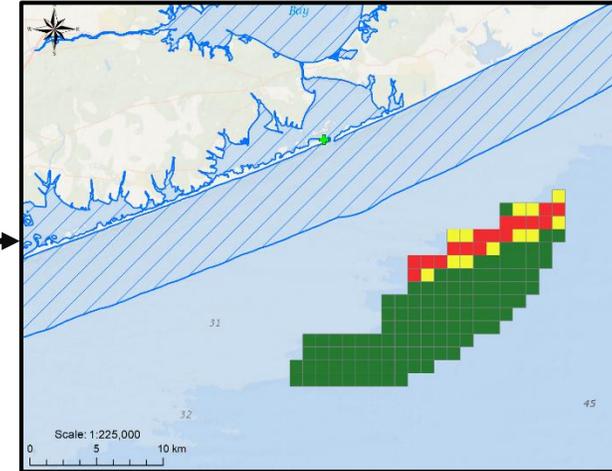
Gridded area of interest



Submarine cable intersects area of interest

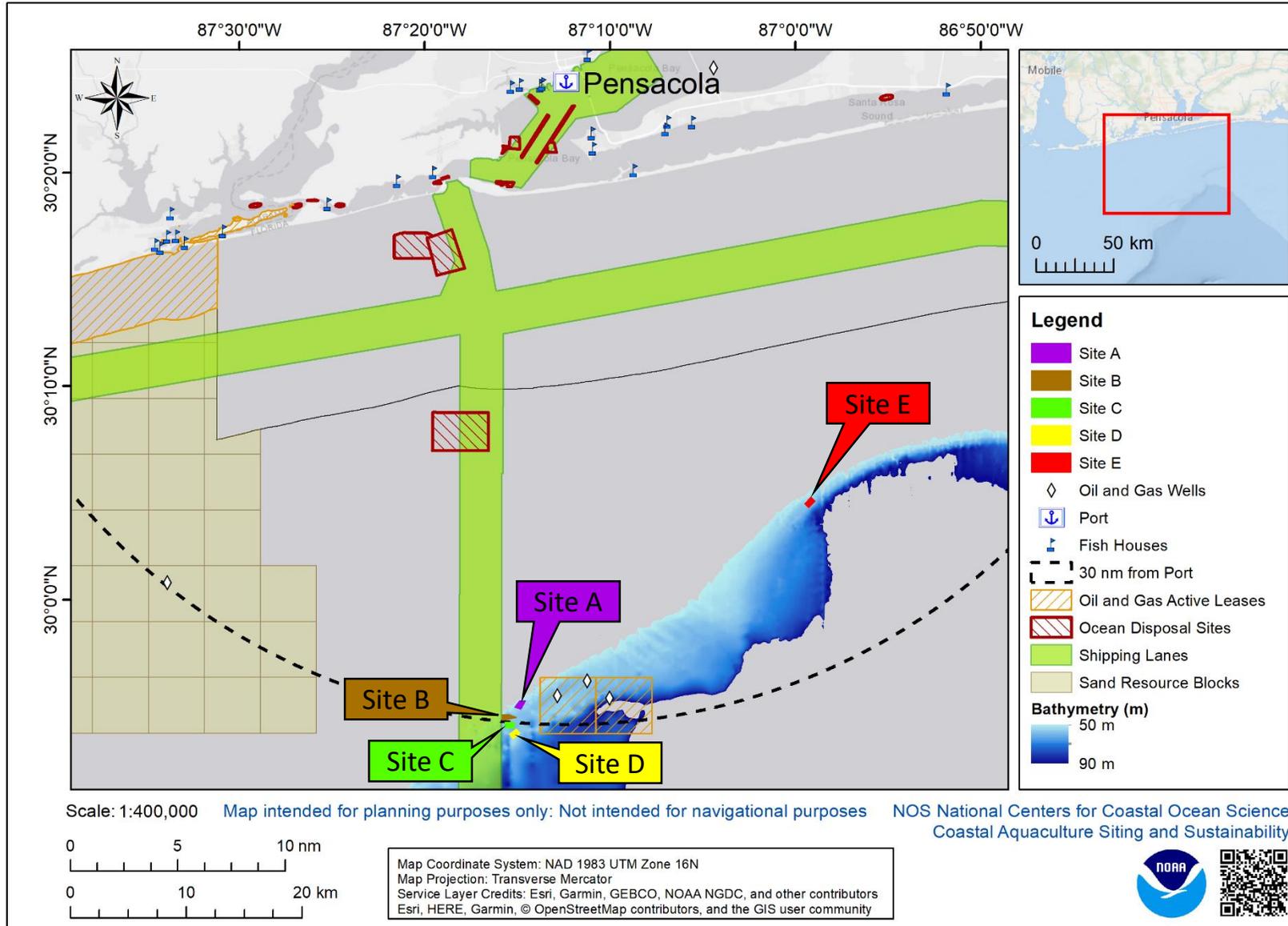


Grid cells far from submarine cable are assigned higher weights than those nearby

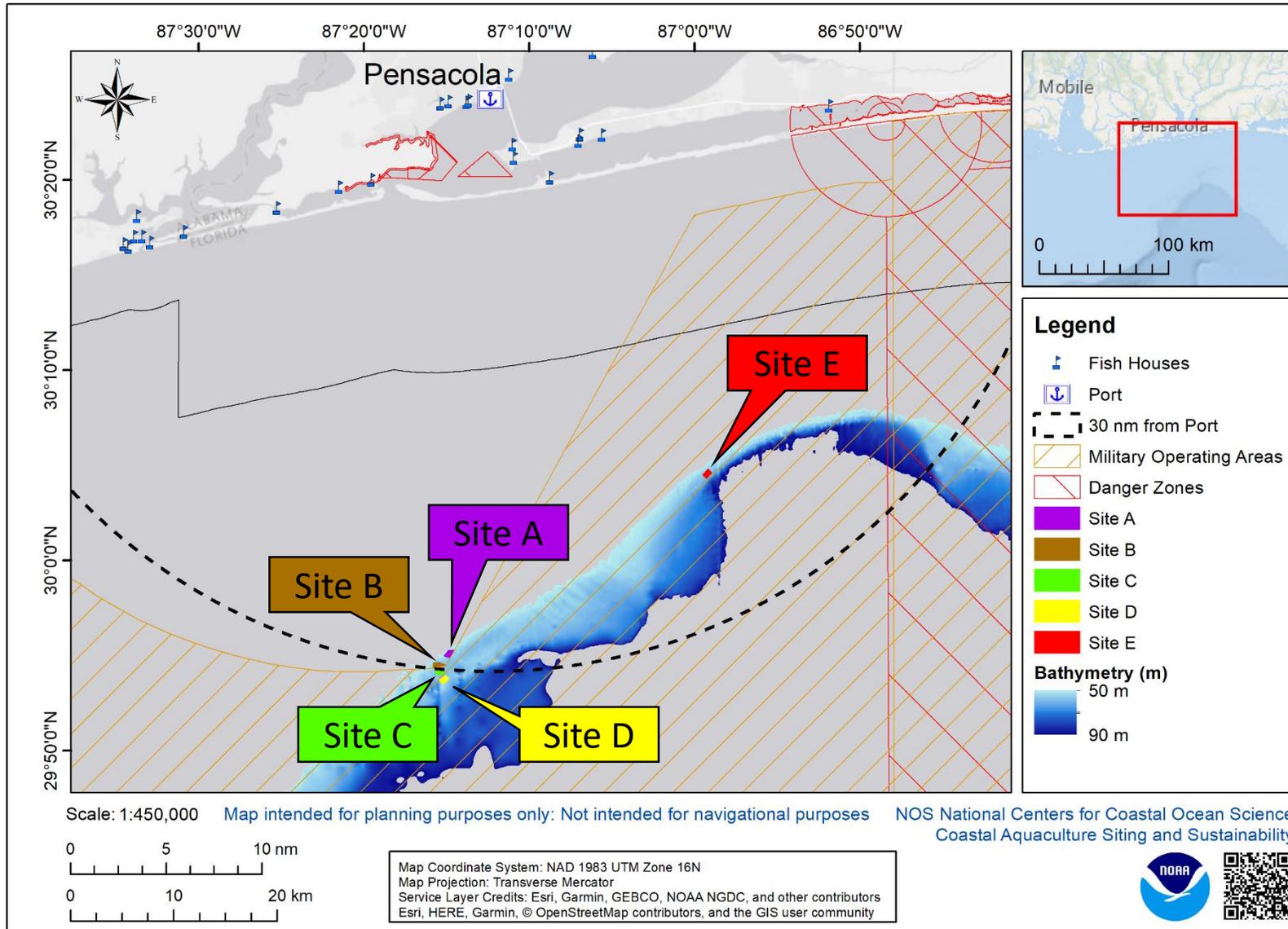


For demonstration purposes only

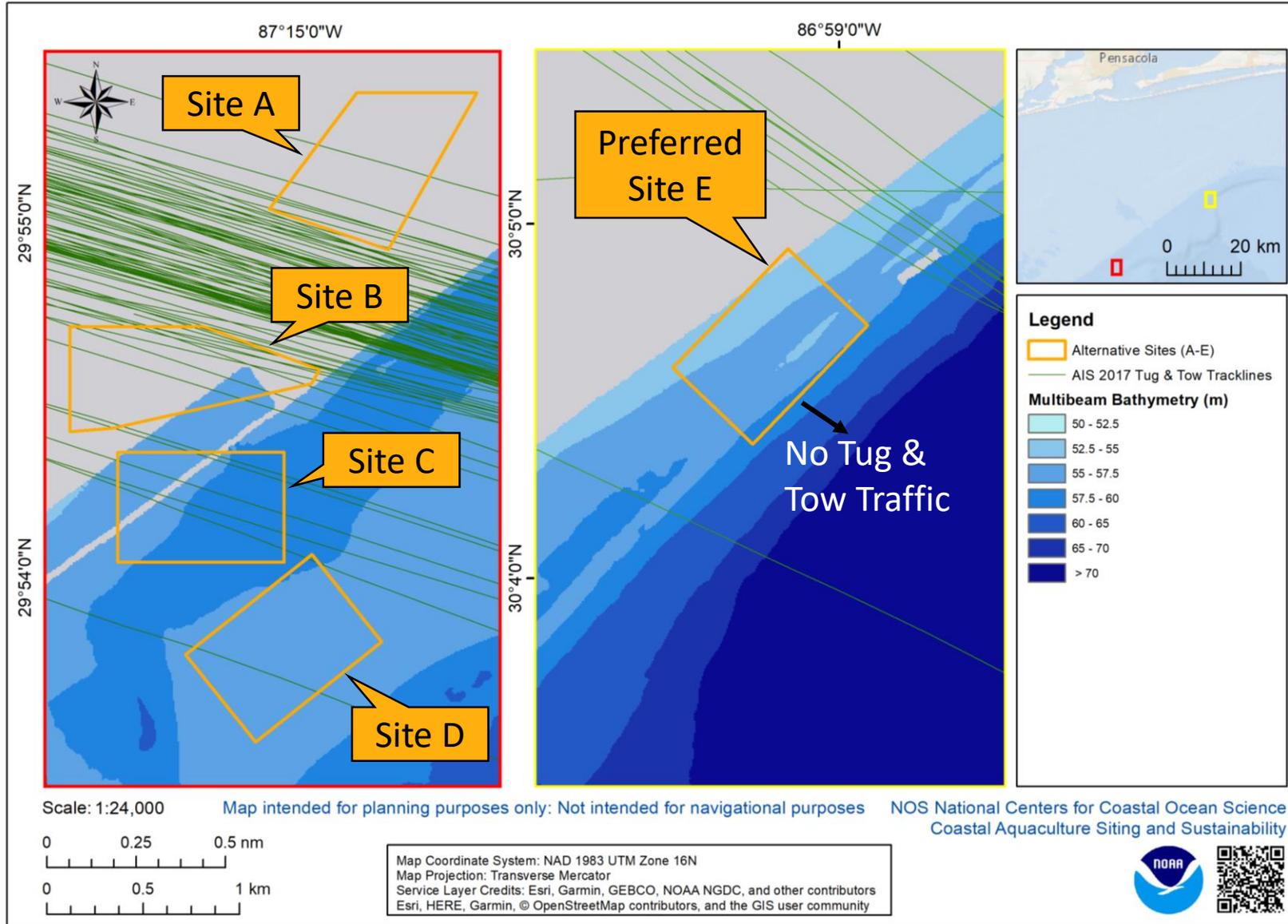
Navigation and Other Factors



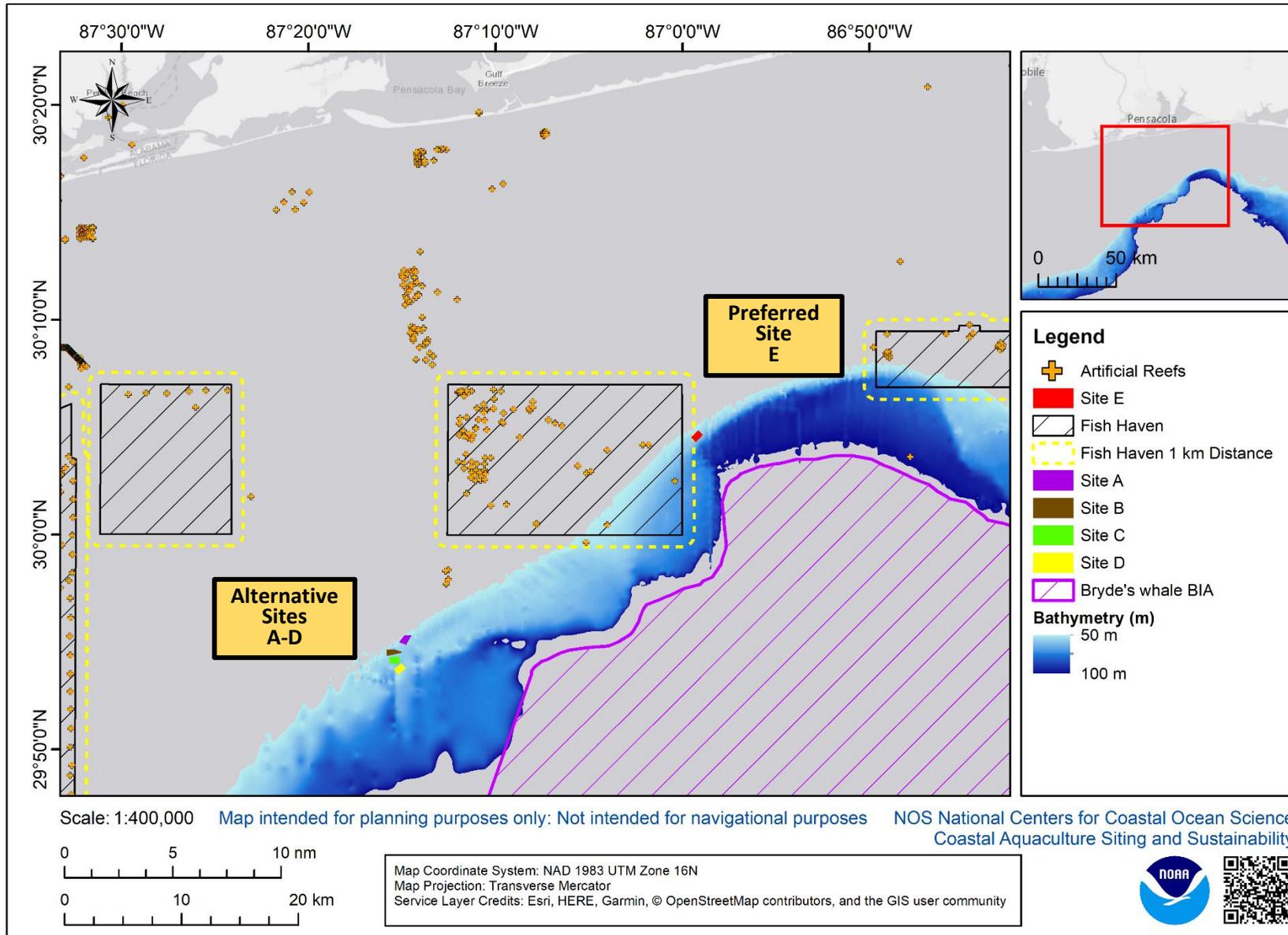
Sites (50-m depth)



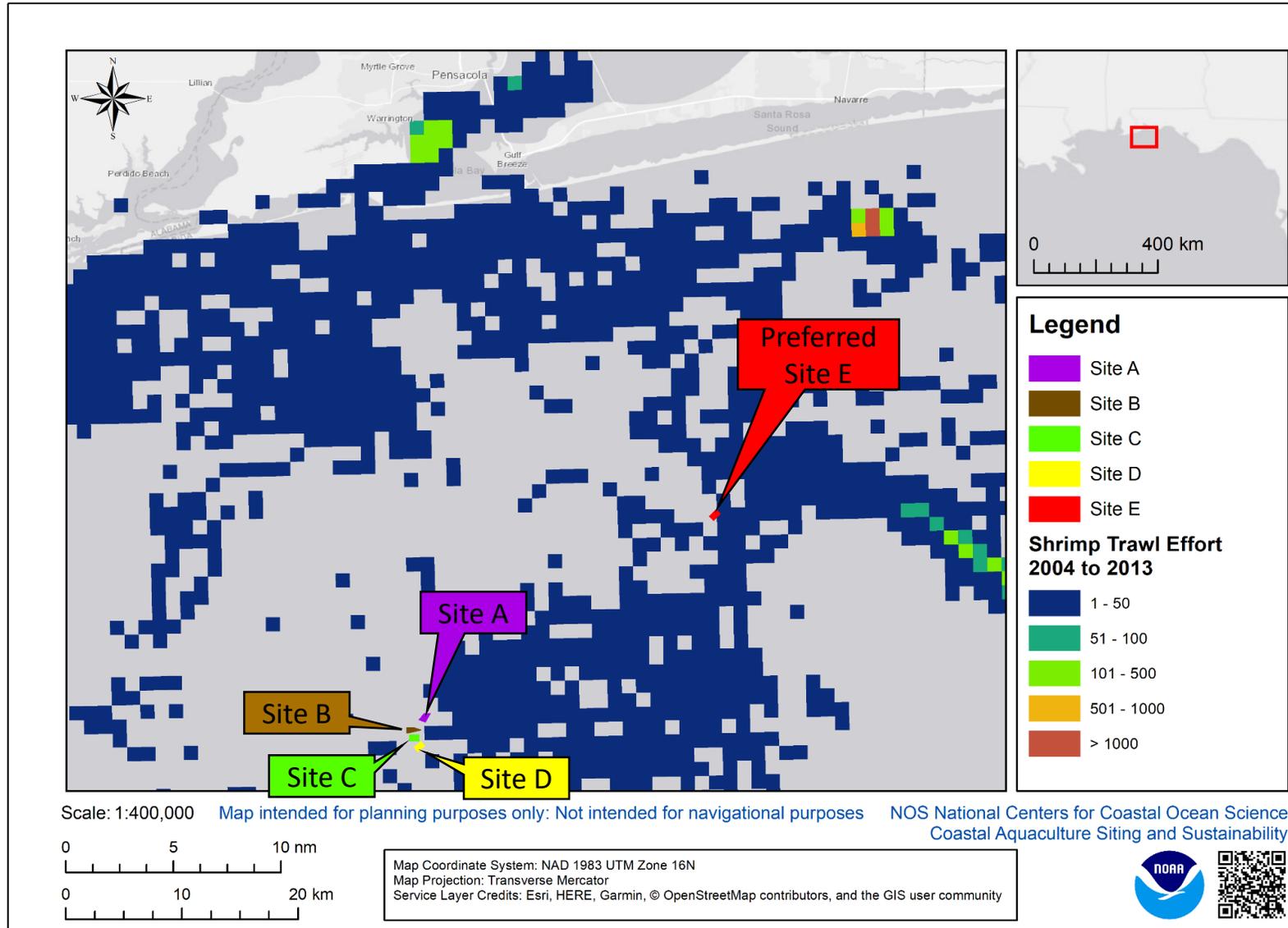
Vessel Traffic Assessment



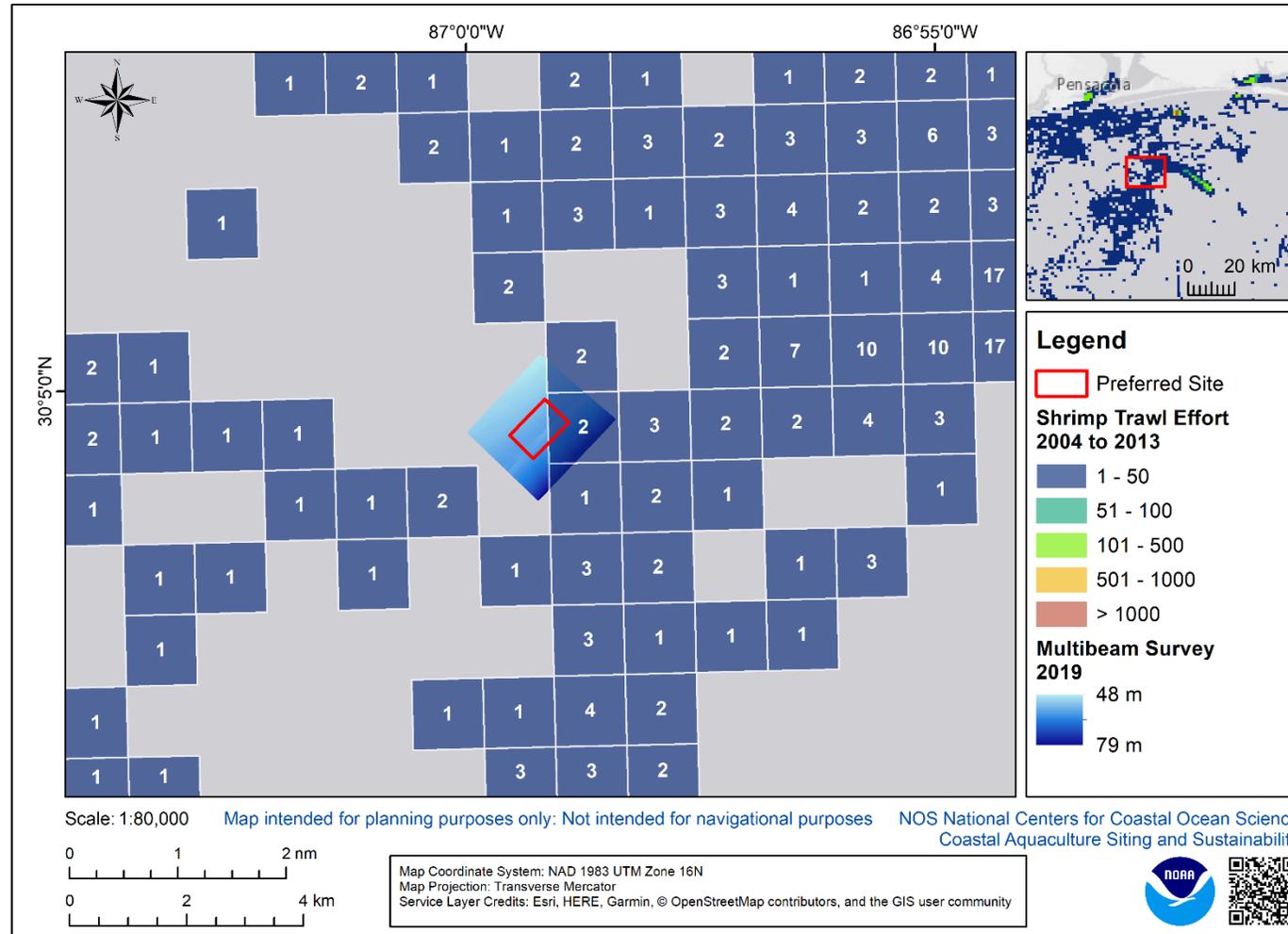
Preferred Site and Alternatives



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

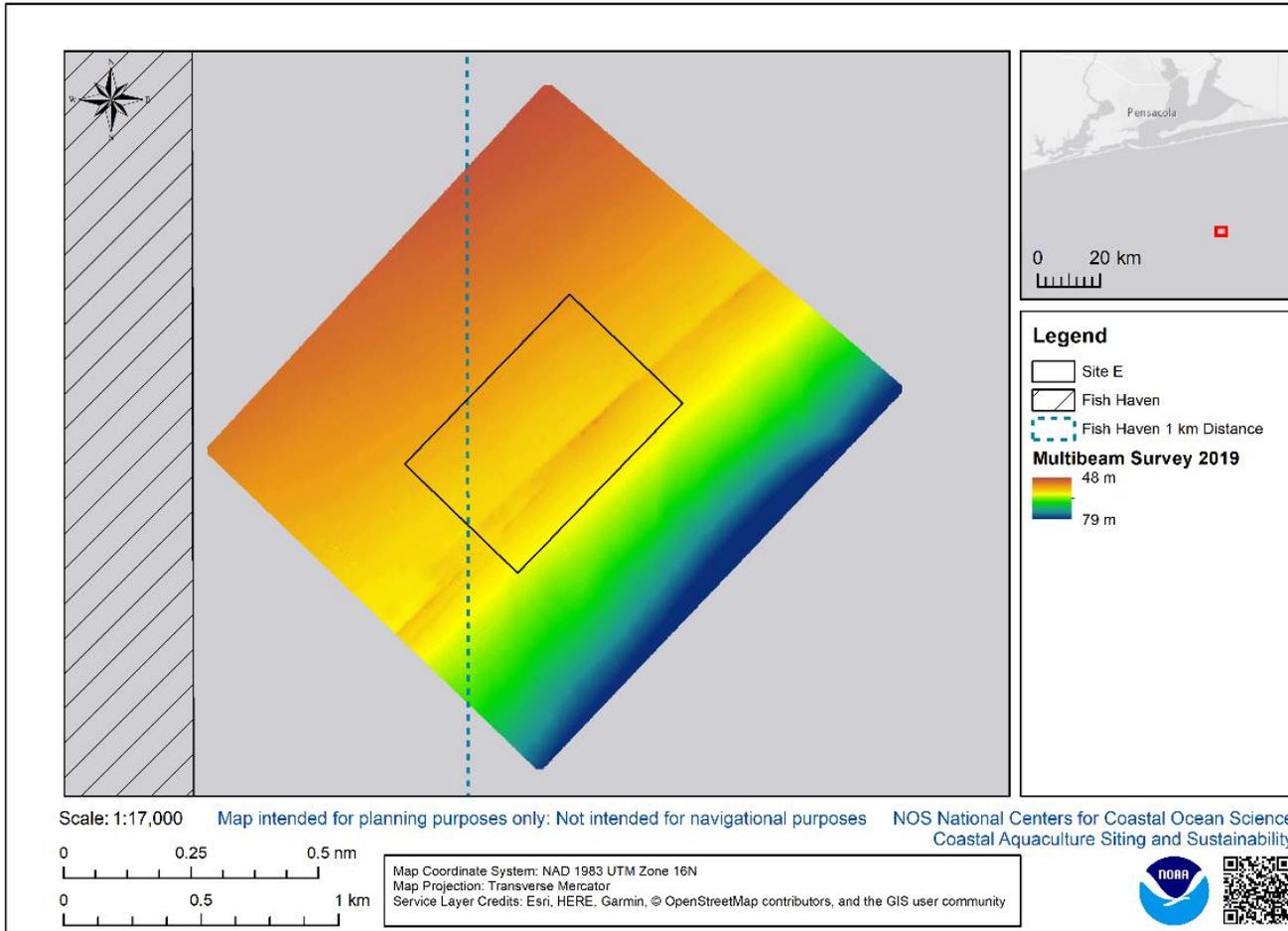
Baseline Environmental Survey



Results of multibeam survey
completed April 2019

- Surveyed 0.5 km beyond area of interest
- 2-m resolution
- Depths confirmed 48-70m
- Minimal slope across site
- Small ridge detected
- Sand substrate

Side-scan and sub-bottom
survey May 2019



Storm Safe Submersible



ITEM NO.	With Tergs & Railings/QTY.	PART NUMBER	DESCRIPTION	Width	Thickness	Height	Mat Desc	Length
1	5	Hex Spar Sectional R2	Hex Spar Sectional					
2	1	Control Spar	Hex Spar Sectional					
3	6	With Railings	Pipe Walkway					
4	2	Lower Spar Connection						
5	2	Lower Spar Connection						
6	1	Lower Spar Connection						
7	1	Lower Spar Connection						
8	12	811 5625 Rod						
9	3	1158.5						
10	1	Btm Hose	Btm Hose					

99'-9 15/16" Outside
 103'-1 7/16" Outside of Tie Hoops
 99'-11 1/4" C to C
 46'-6 5/16" C of Hinge To C of Hinge
 49'-11 5/8" C to C of Spar
 99'-6 5/8" Cross Brace C to C
 67'-7 1/2"

Diagonal Braces On Top From Top Of Spar To Top Of Spar (3 Braces)
 Diagonal Braces On Sides From Top Of Spar To Bottom Of Spar (All 6 Sides)

NOTES:
 1. WELDING:
 STEEL - CSA W47.1
 ALUMINUM - CSA W47.2
 UNLESS OTHERWISE SHOWN, WELD SIZE SHALL BE EQUIVALENT TO THICKNESS OF MEMBERS BEING JOINED.
 2. ALL ALUMINUM STRUCTURAL MEMBERS ARE 6061-T5
 ALL STEEL STRUCTURAL MEMBERS ARE A490
 3. UNLESS OTHERWISE SPECIFIED BOM IS STEEL.
 4. SPECIFIED LOADS.

NOTES:
 448210 Lbs
 No Deck
 No Piping
 No X Brace
 No Railings
 No Pins

A TITLE
B SCALE
C SHEET NUMBER - WHERE DETAIL REQUIRED
 A DETAIL NUMBER
 B SHEET NUMBER - WHERE DETAIL REQUIRED
 C SHEET NUMBER - WHERE DETAIL LOCATED

PART NUMBER
 MODEL
 CUSTOMER

DRAWINGS
Hex Cage W Pipe Walkways
 SCALE
 DATE: June 1-15
 DRAWN BY: MS

CHECKED BY:
 DATE:
 REVISION DATE / #:

MEEKER'S MANAGEMENT SERVICES
 DRAWINGS AND ENGINEERING BY:
KROFF CONSULTING

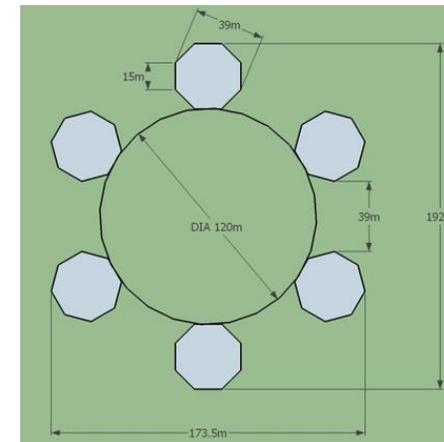
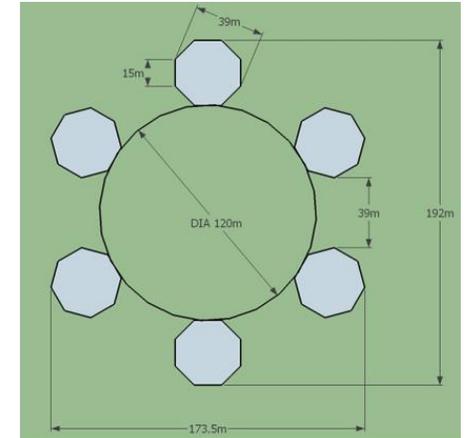
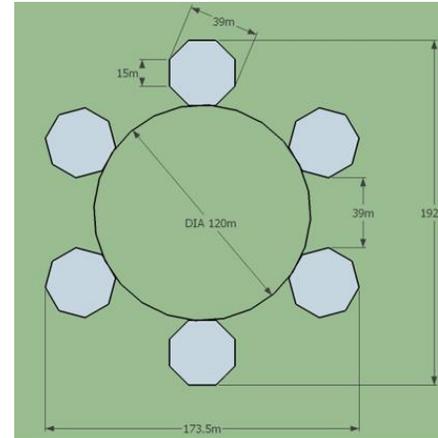
JOB NUMBER
 SHEET NUMBER OF 1 30



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

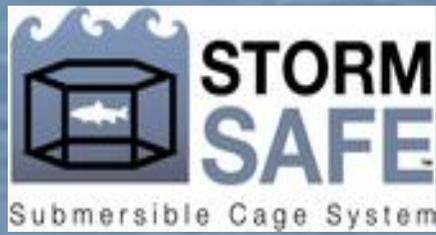
Year(s)	No. of Cages Stocked	Cages/fish production stage	Production (lbs/year)
Year 0 - 1	2	2	936,000
Years 2 - 3	4	2	1,870,000
		2	
Years 3 -4	12	4	5,620,000
		4	
		4	
Years 4-5	18	6	8,426,900
		6	
		6	

Feed Information

Type	Slow sinking pellet with estimated 44% protein and 13% lipid
Mechanism	Feeding by vessel in the beginning moving to feed buoy or barge
Feed Frequency	Will vary by species and biomass. Feed calculations were calculated at a feed conversion rate (FCR) 1.7.
Stock (9000m ³ cage)	Weight of fingerlings at stocking = 50g Total weight at initial stocking cage = 10,045kg Target harvest density = 25kg/m ³
Amount (9000m ³ cage)	Daily feeding amount at initial biomass = 503 kg Daily feeding amount at max biomass = 4,500 kg

Next Steps

- Submit Baseline environmental survey data
 - Finalize 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

Kelly Lucas, PhD.

Director

Thad Cochran Marine Aquaculture Center

School of Ocean Science and Technology

The University of Southern Mississippi

228-818-8026

Kelly.lucas@usm.edu



NCCOS