Manna Fish Farms, Gulf of Mexico Finfish Farm Operations

Presenter: Kelly Lucas

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
- Baseline survey report information
- 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

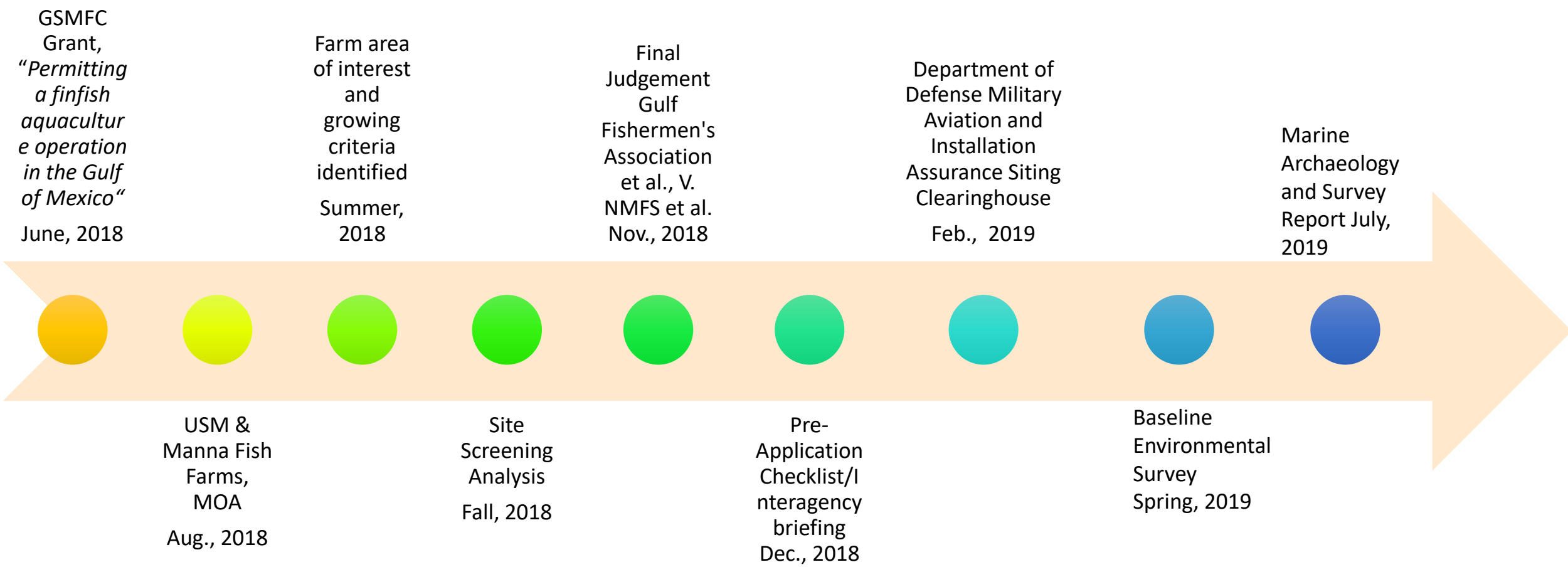
Manna Fish Farms

- 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/

MANNA FISH FARMS, INC.™

MANNA OCEAN FOUNDATION™

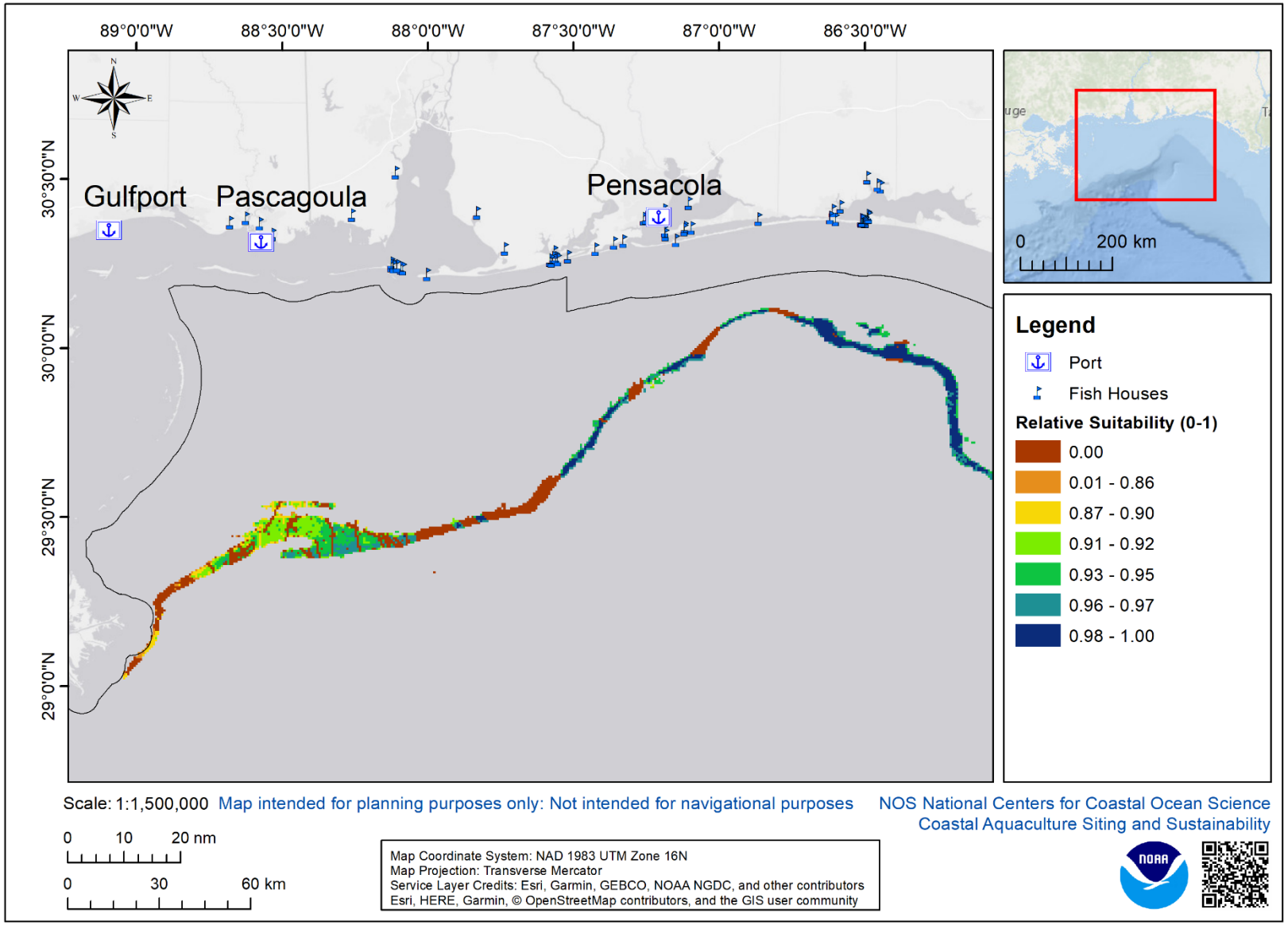
Timeline Phase 1 (June 2018 – July 2019)



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.*

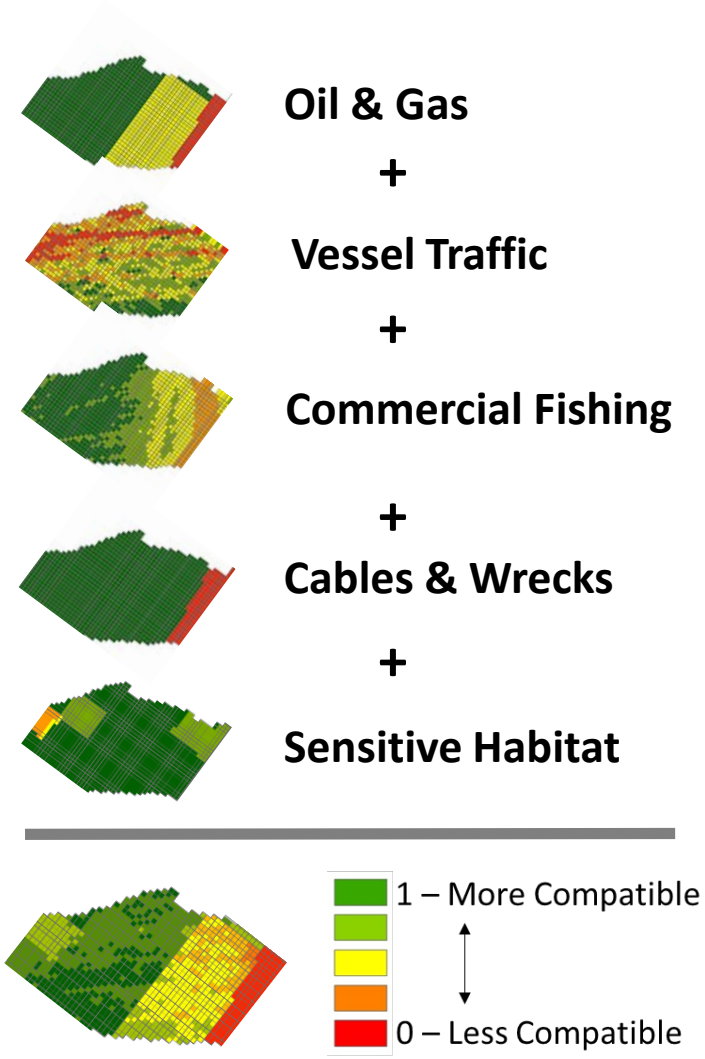
Relative Suitability within Area of Interest



Data Considered

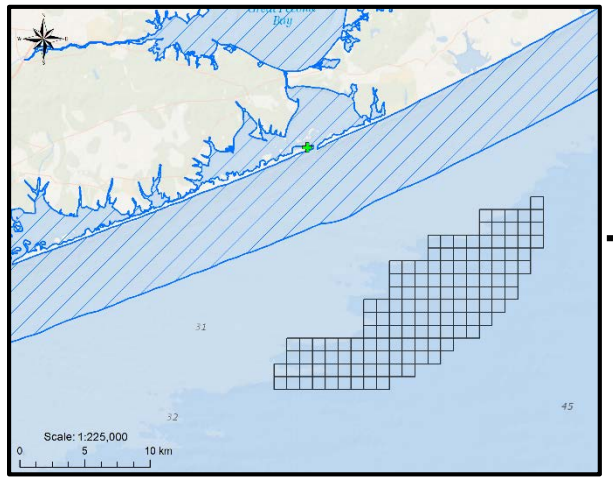
- Bathymetry
- Military
- Unexploded Ordnance
- Shipping Lanes
- AIS Vessel Traffic
- Shrimp Vessel Activity
- Submarine Cables
- Artificial Reefs
- Lightering Zones
- Oil & Gas Platforms
- Oil & Gas Well
- Oil & Gas Active Leases
- Oil & Gas Pipelines
- Shipwrecks and obstructions
- Deep Sea Coral

Siting Model

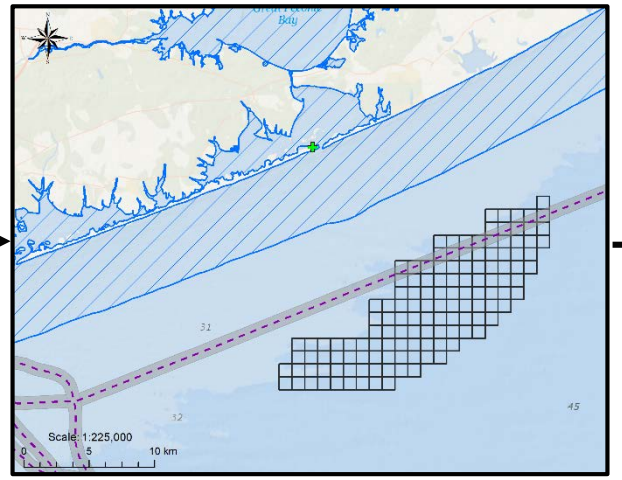


Suitability Model Methodology

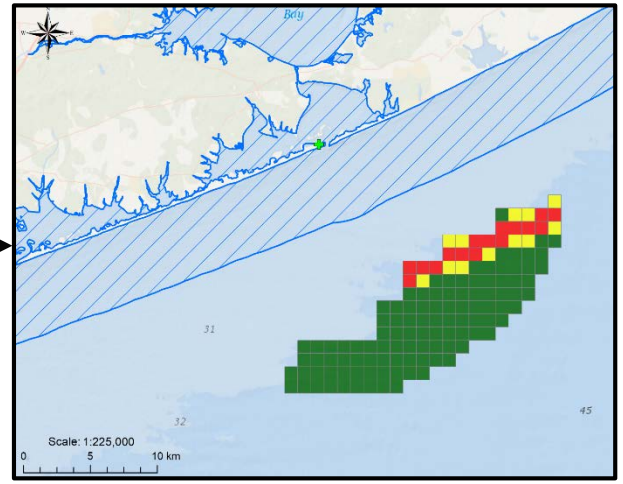
Gridded area of interest

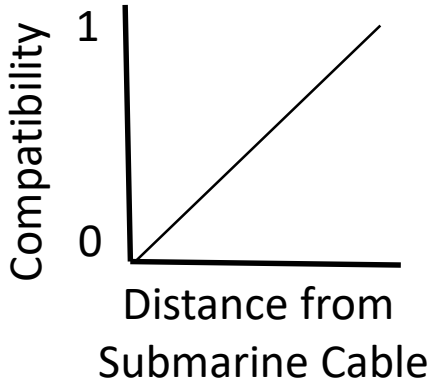


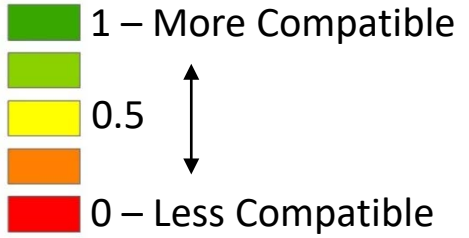
Submarine cable intersects area of interest



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

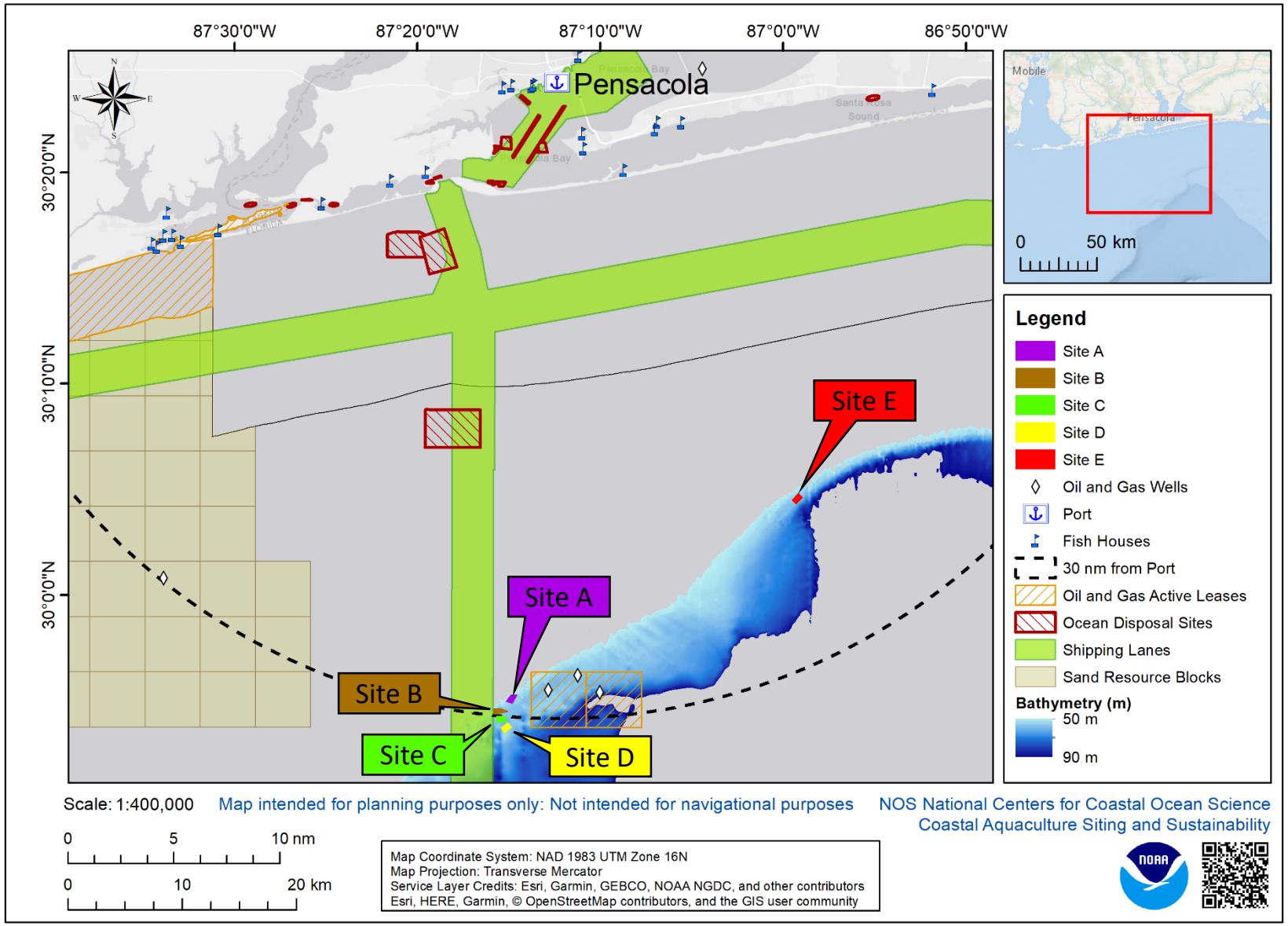




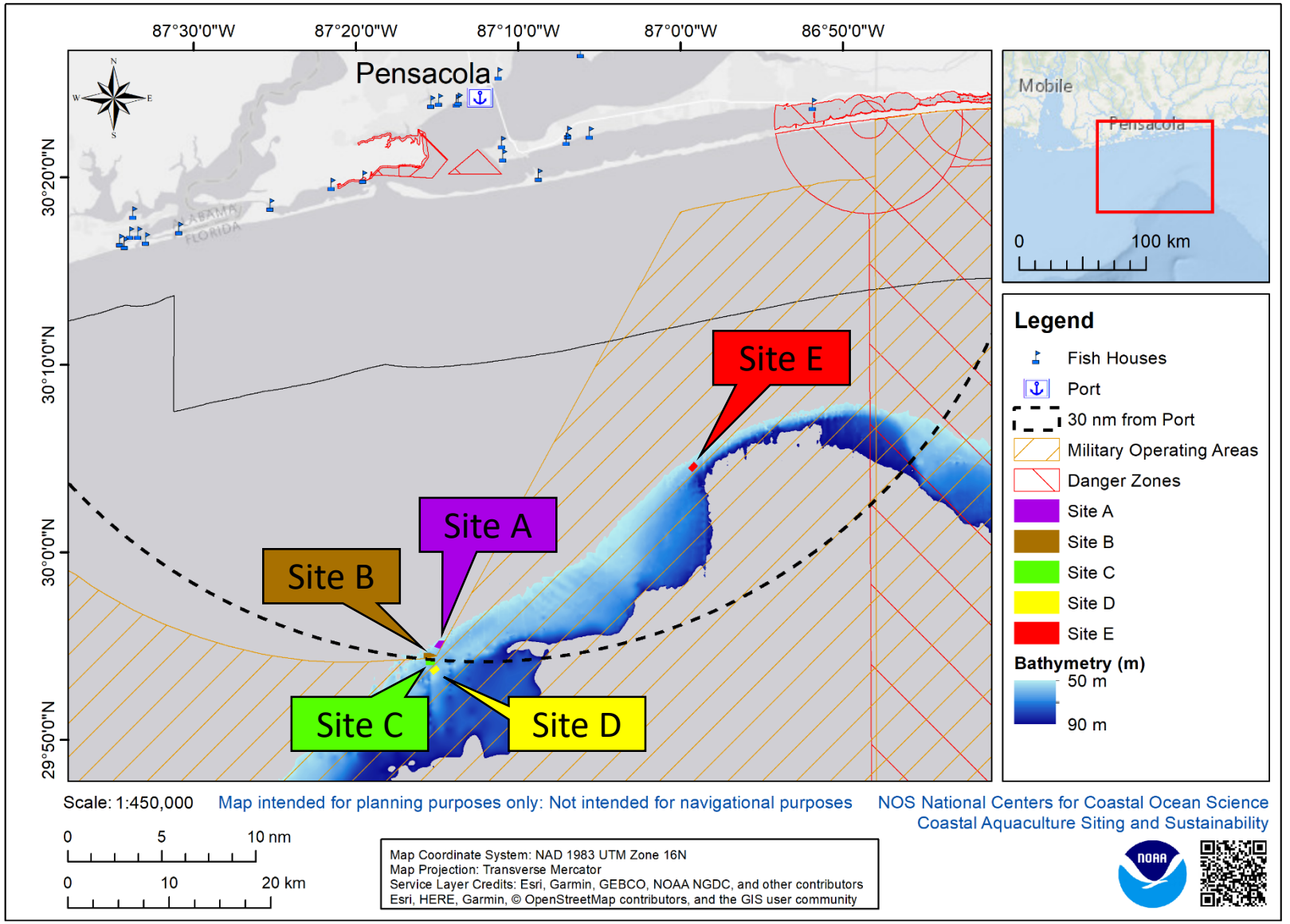


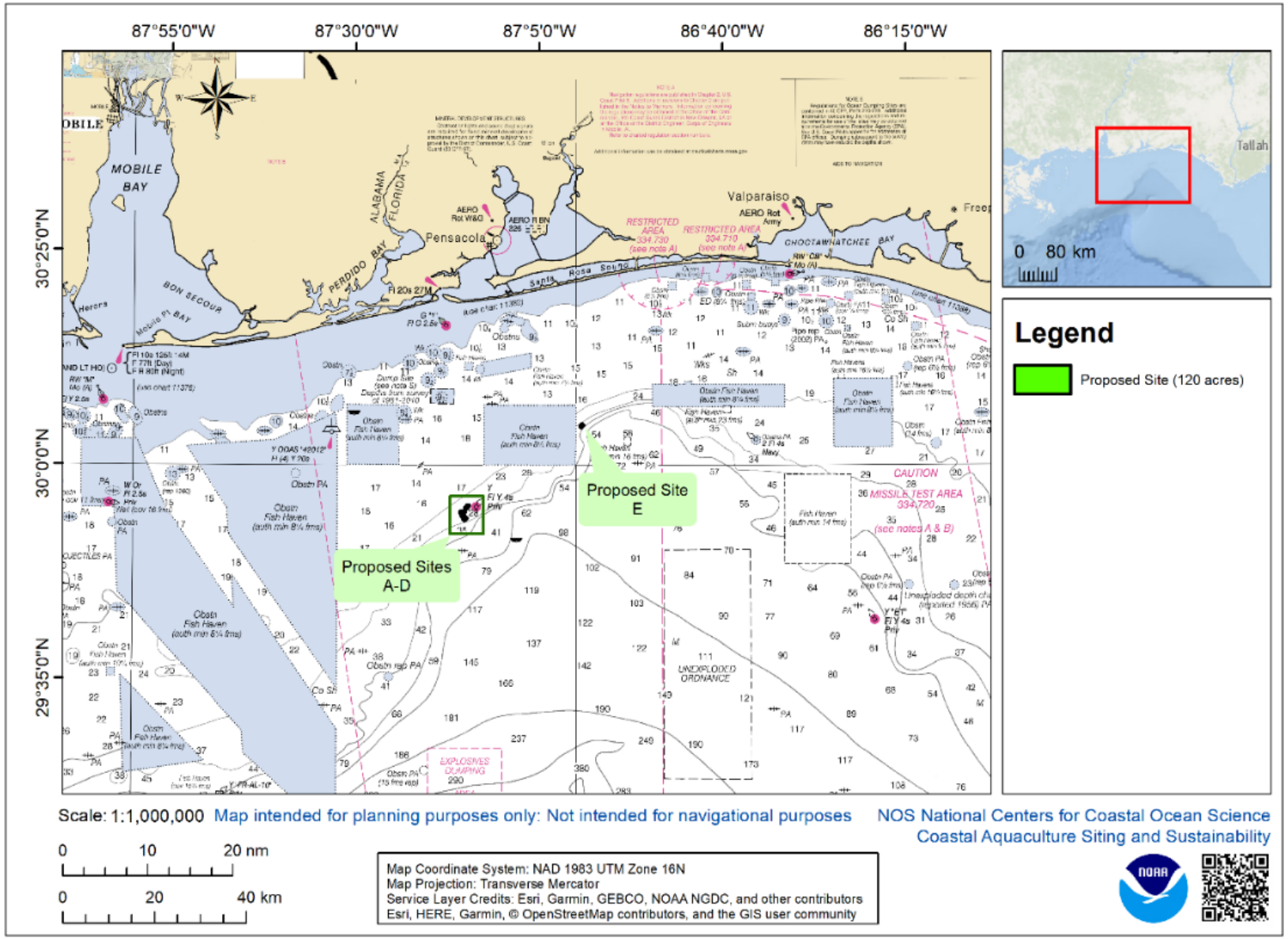
For demonstration purposes only

Navigation and Other Factors

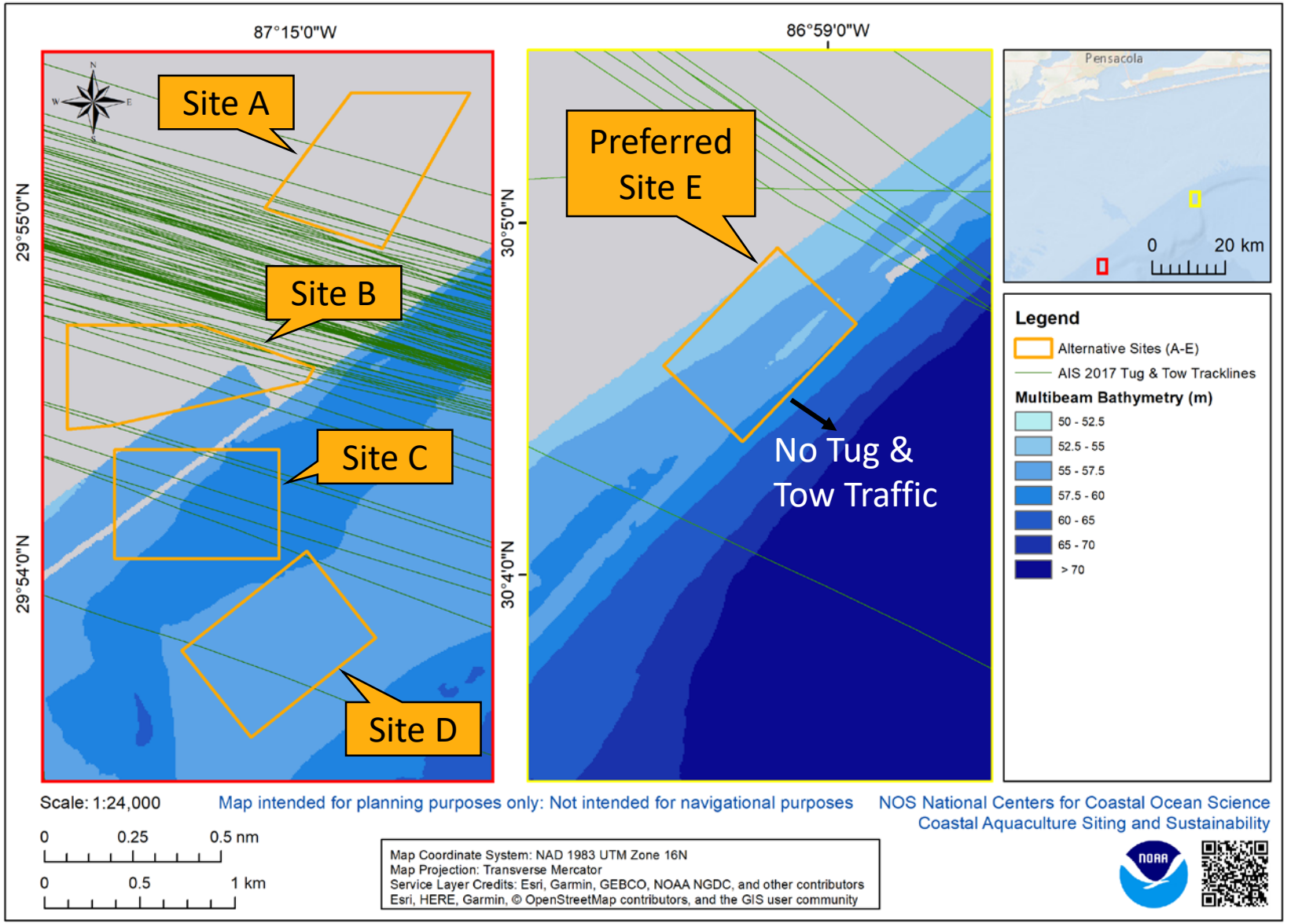


Sites (50-m depth)

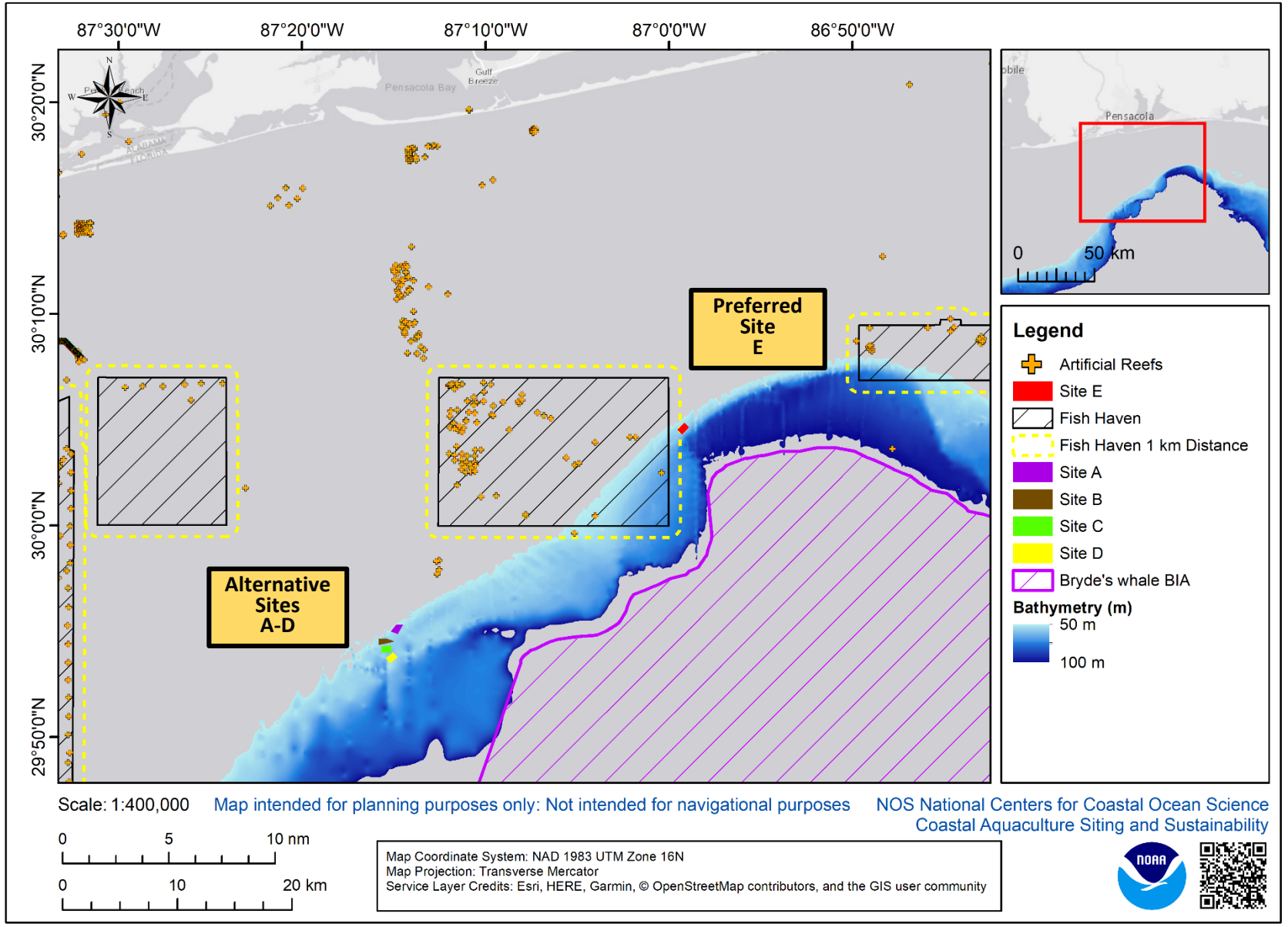



87°55'0"W
87°30'0"W
87°5'0"W
86°40'0"W
86°15'0"W
30°25'0"N
30°0'0"N
29°35'0"N
MOBILE BAY
Pensacola
Valparaiso
PERDIDO BAY
ALABAMA
FLORIDA
BON SECOUR
CHOCTAWHATCHEE BAY
Santa Rosa Sound
Proposed Site E
Proposed Sites A-D
MISSILE TEST AREA
UNDERWATER ORDNANCE
EXPLOSIVES DUMPING
0 80 km
Legend
Proposed Site (120 acres)
Scale: 1:1,000,000
Map intended for planning purposes only: Not intended for navigational purposes
0 10 20 nm
0 20 40 km
Map Coordinate System: NAD 1983 UTM Zone 16N
Map Projection: Transverse Mercator
Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
NOS National Centers for Coastal Ocean Science
Coastal Aquaculture Siting and Sustainability
NOAA

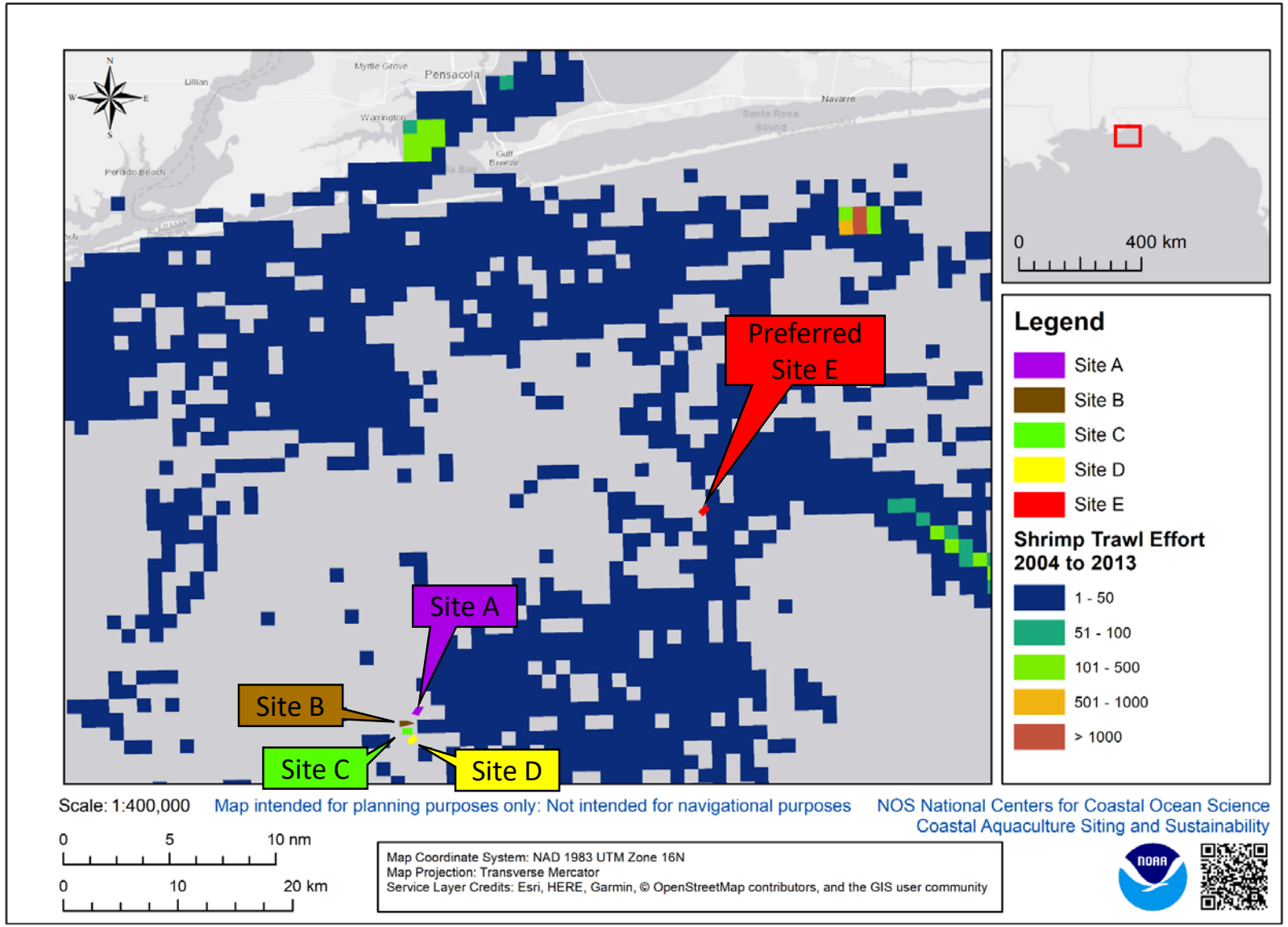
Vessel Traffic Assessment



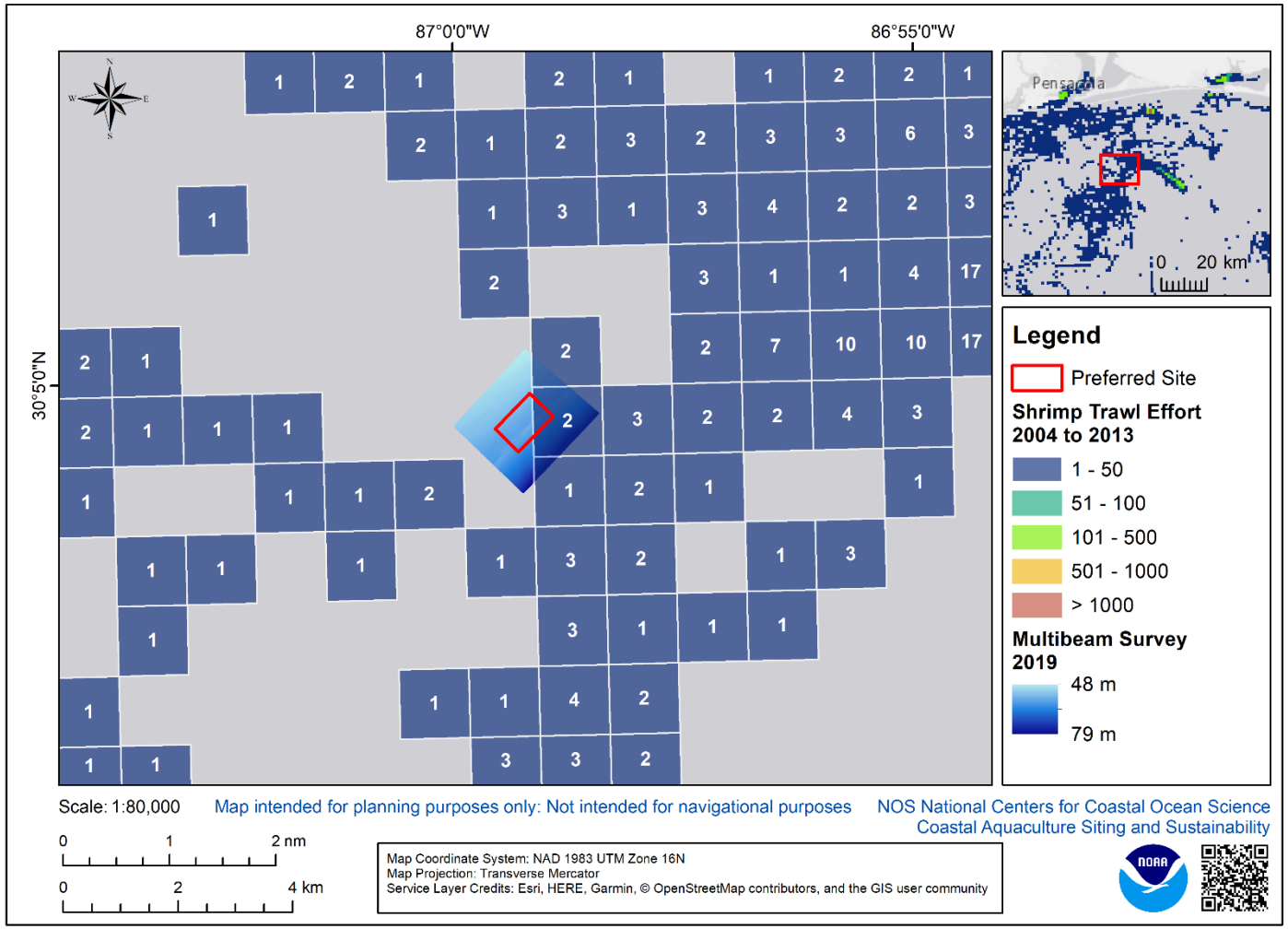
Preferred Site and Alternatives



Shrimp Trawl Effort 2004 to 2013



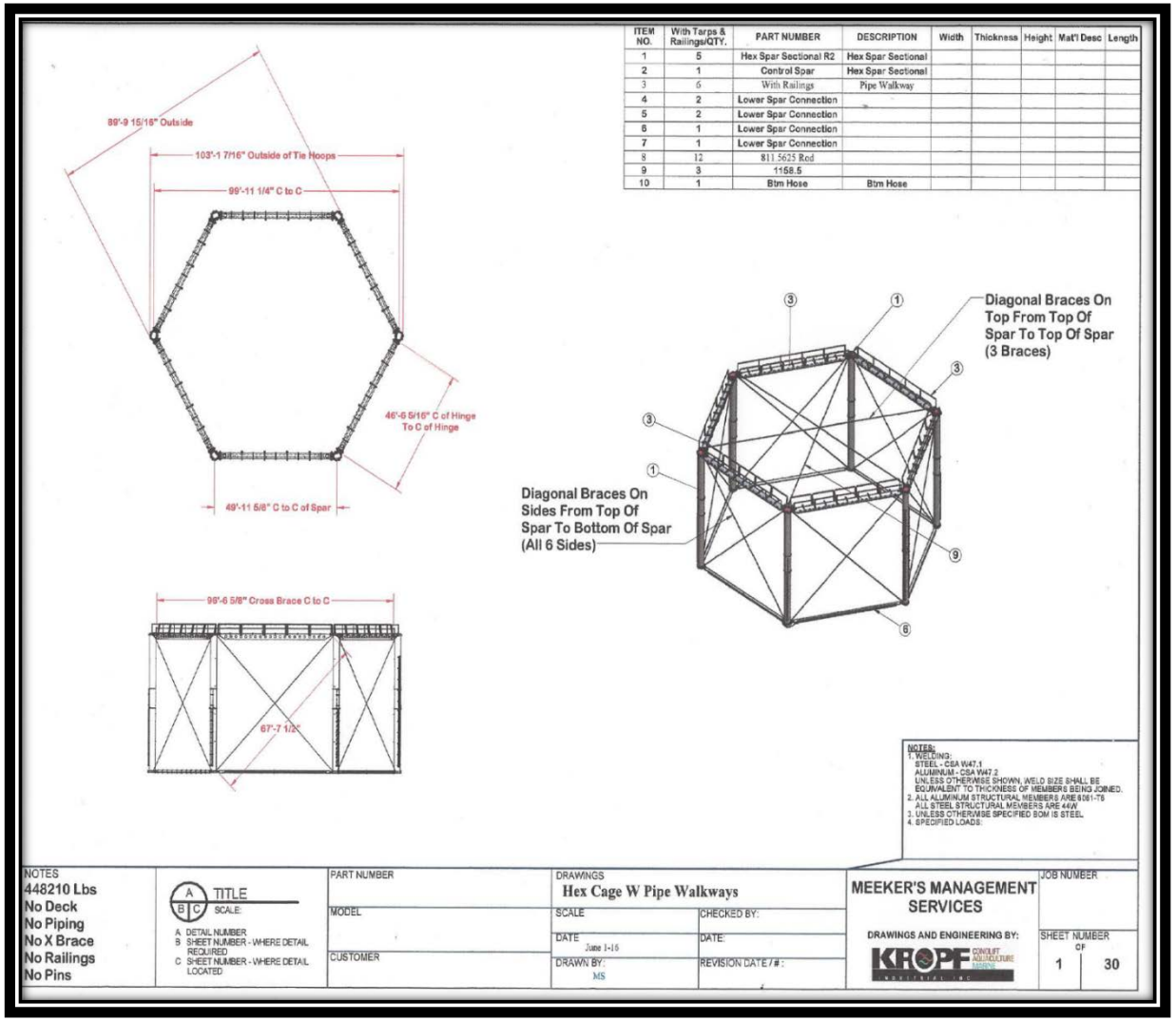
Shrimp trawl effort (sum 2004-2013) and preferred site



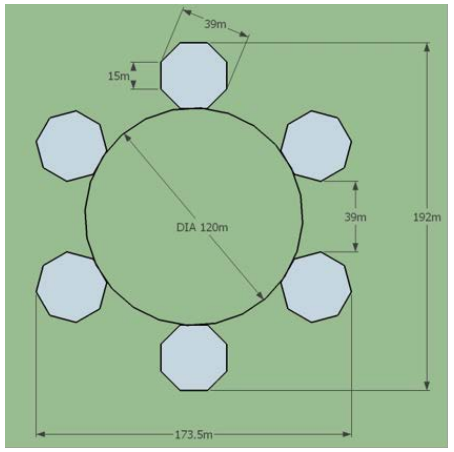
*More information on the shrimp data, which encompasses all species of shrimp important to Gulf of Mexico fisheries, can be found at: http://gulfcouncil.org/wp-content/uploads/A-7a-White-Paper-on-Artificial-Reefs.pdf (GMFMC 2015).

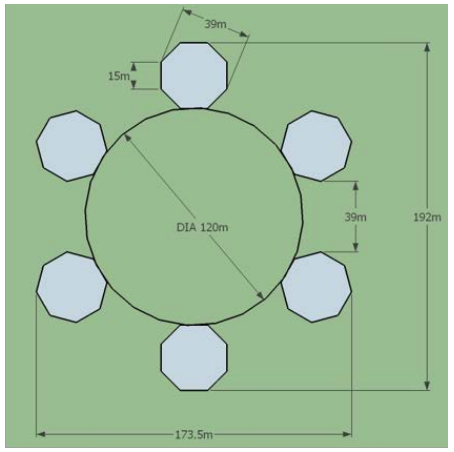
Storm Safe Submersible

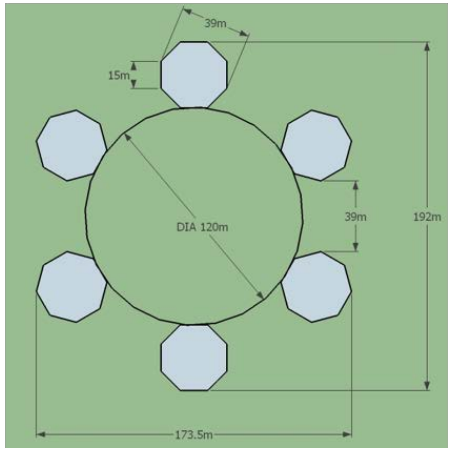
STORM SAFE
Submersible Cage System



Storm Safe Cage Site Plan







- 18 Cages
- 9000m^3/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

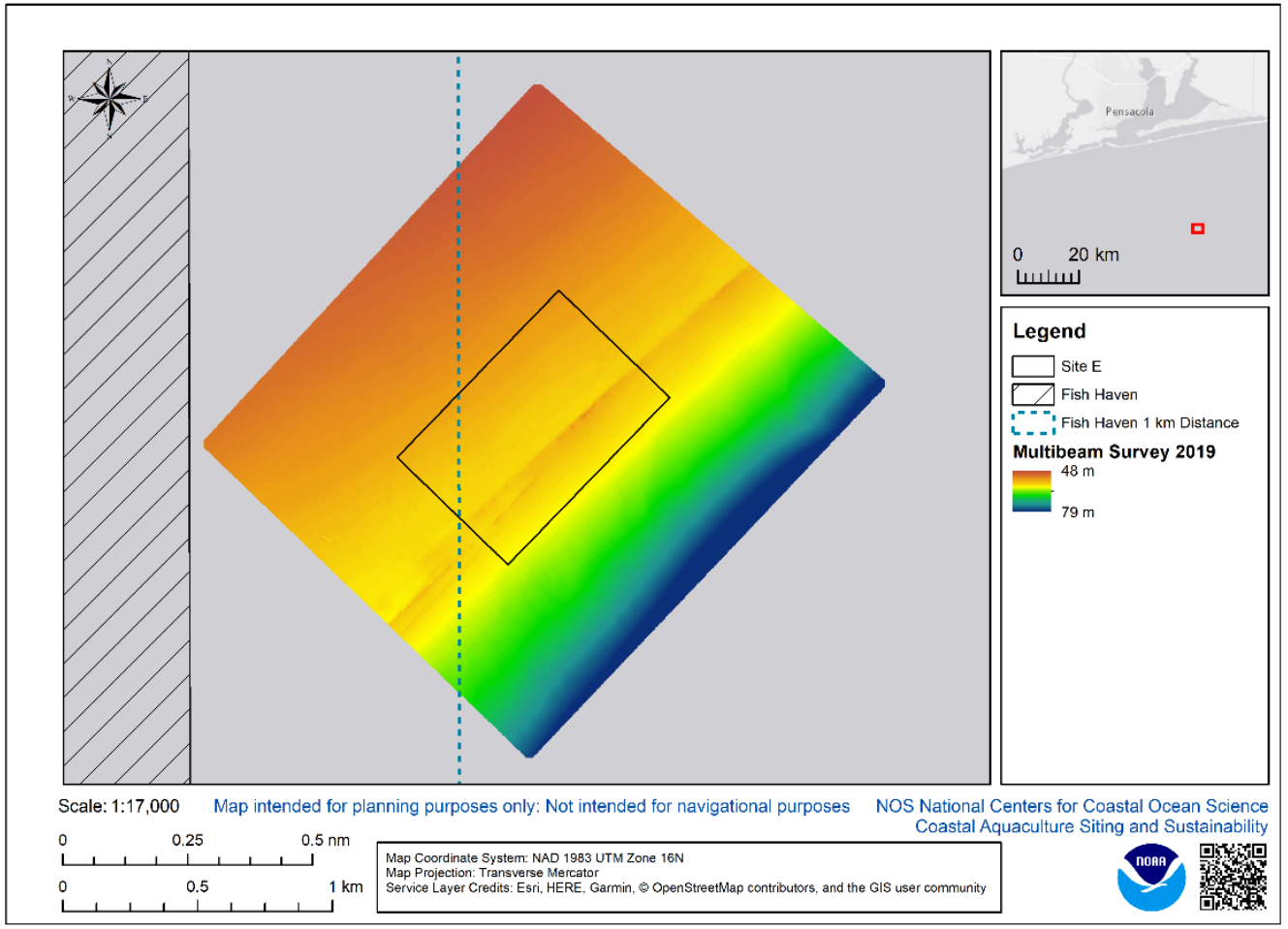
Year(s)	No. of Cages Stocked	Cages/fish production stage	Production (lbs/year)
Year 0 - 1	2	2	936,000
Years 2 - 3	4	2	1,870,000
		2	
Years 3 -4	12	4	5,620,000
		4	
		4	
Years 4-5	18	6	8,426,900
		6	
		6	

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

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

New Guidance

- Hard bottom detected on ridge
- EPA notifies team – Cages need to be 1000 m from any hard substrate (July 2019)
- EPA defers to Artificial Reef managers to determine offset distance- 500 ft.
- NOAA Protected Resources produces new Bryde's Whale map (Aug. 2019)
- Precision siting analysis determines three possible farm configurations (Sept. 2019)
- New survey plan that is twice the size of previous survey (Oct. 2019)

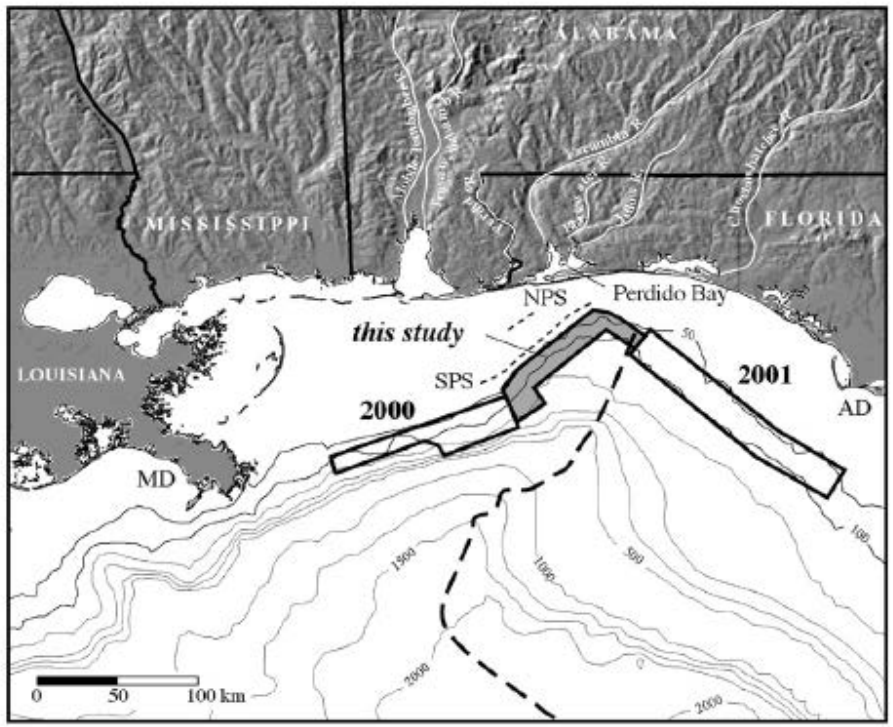


Fig. 1. Location of areas mapped. The 2000 region is the mid- and outer shelf and upper slope off Mississippi–Alabama (Gardner et al., 2001) and 2001 is the northwest Florida mid and outer shelf (Gardner et al., 2005). Heavy dashed line is axis of De Soto Canyon. Light dashed lines are approximate location of North Perdido Shoal (NPS) and South Perdido Shoal (SPS). MD is Mississippi River Delta and AD is Apalachicola River Delta. Isobaths in meters.

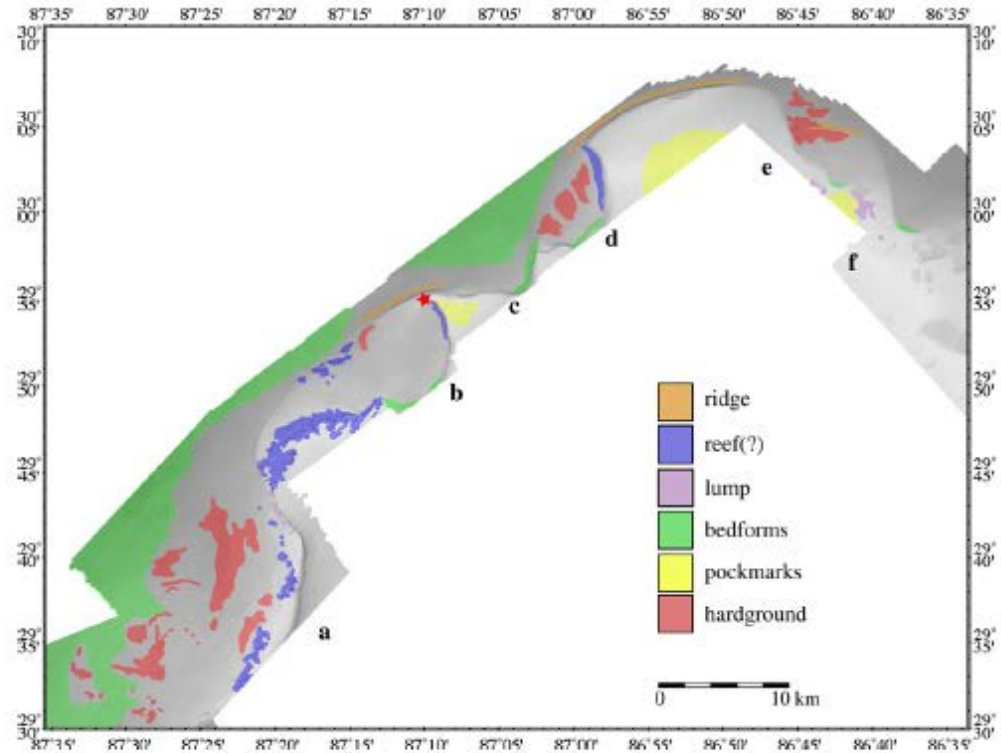
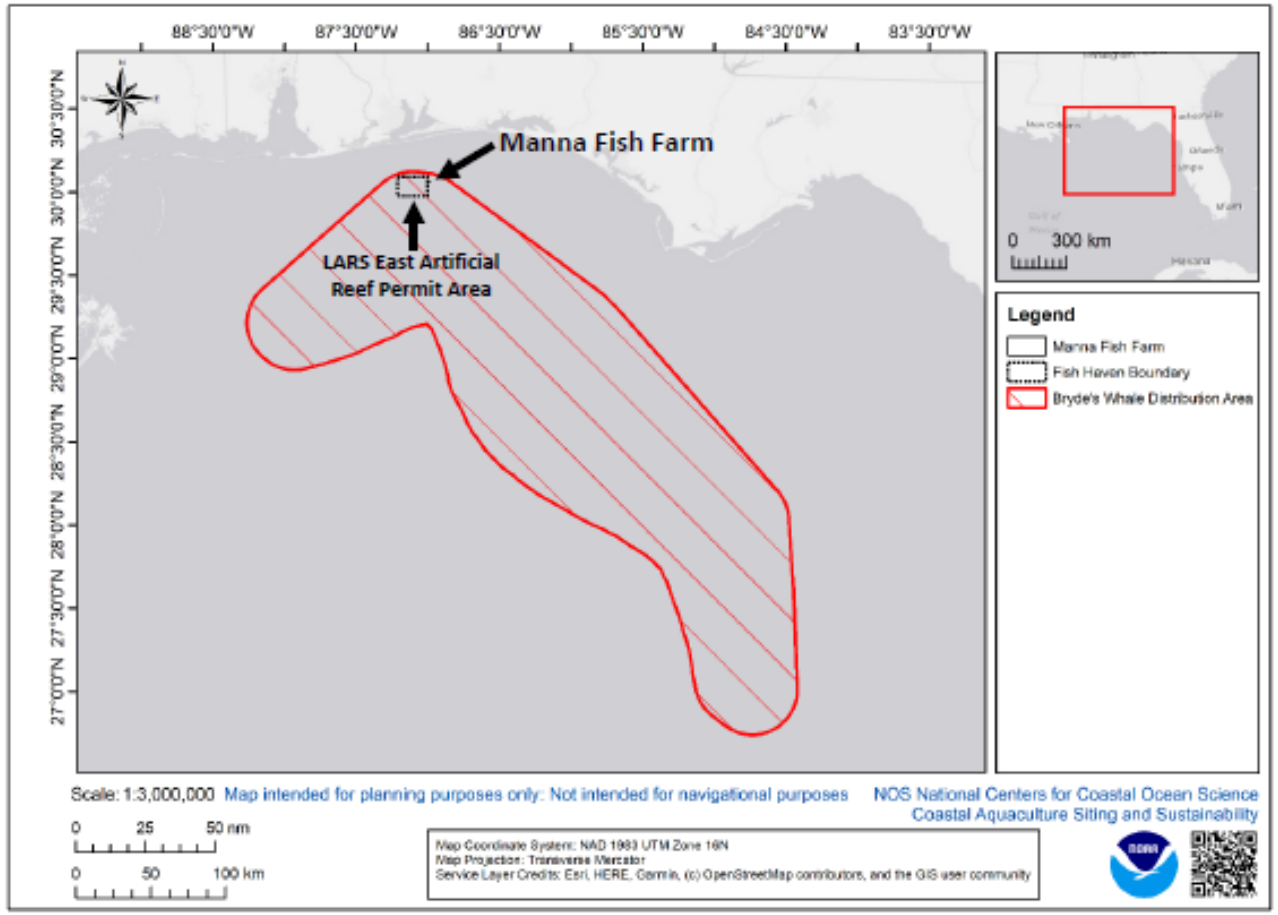


Fig. 11. Terrain map overlain on shaded-relief bathymetry. The legend provides types of geomorphic features mapped. Bold labels are shelf-edge delta lobes. Red star is location of dated hardground reported in Benson et al. (1997).

Manna Farm Location

Proposed location for Manna Fish Farm is sited approximately 5.2 km (2.8 nm) within the Bryde's Whale Distribution Area (NMFS 2019)



Potential Farm Layout 1

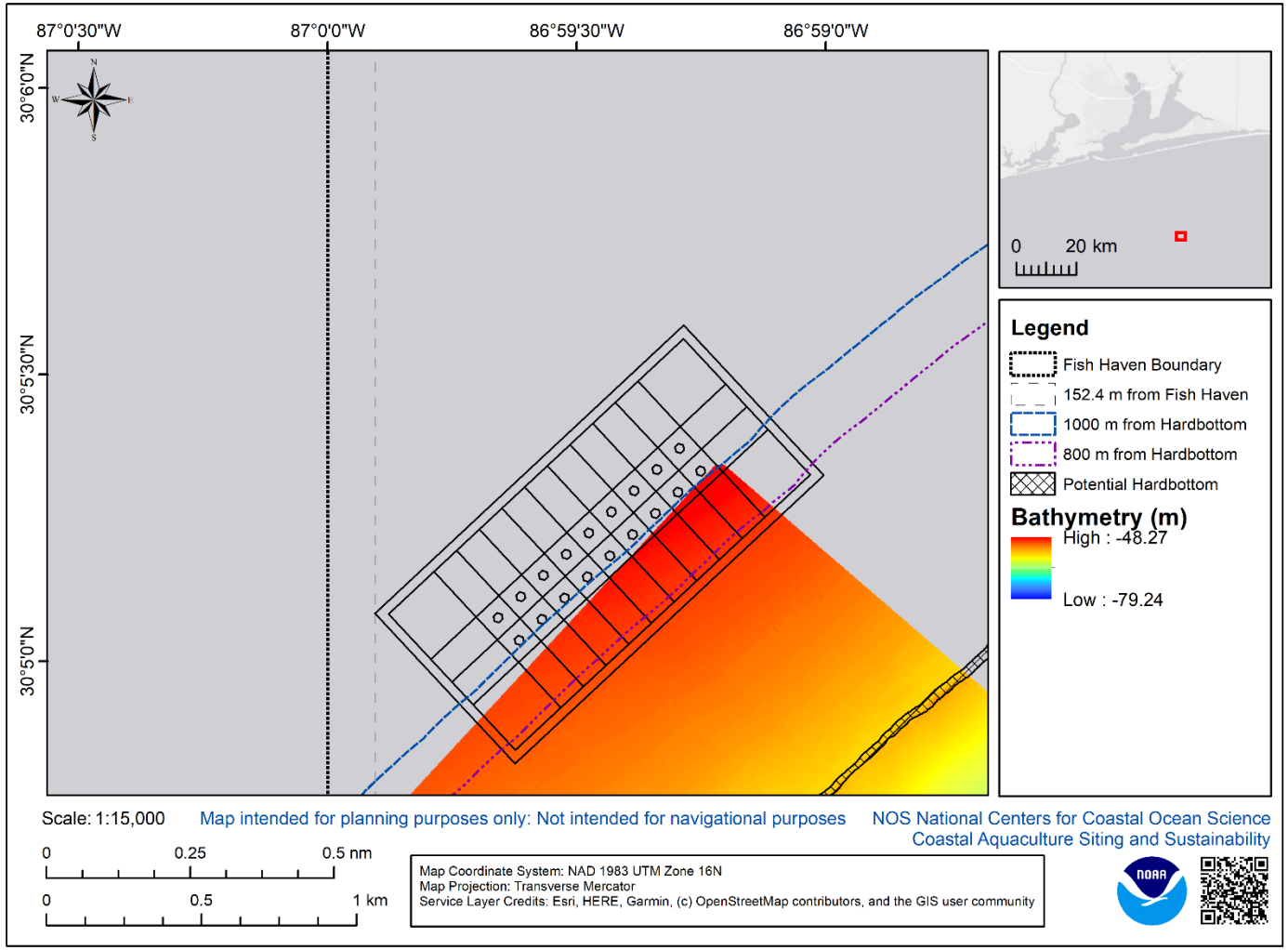
Grid based design

4:1 Slope

223 Acres

Width (1362m)

Height (662m)



Potential Farm Layout 2

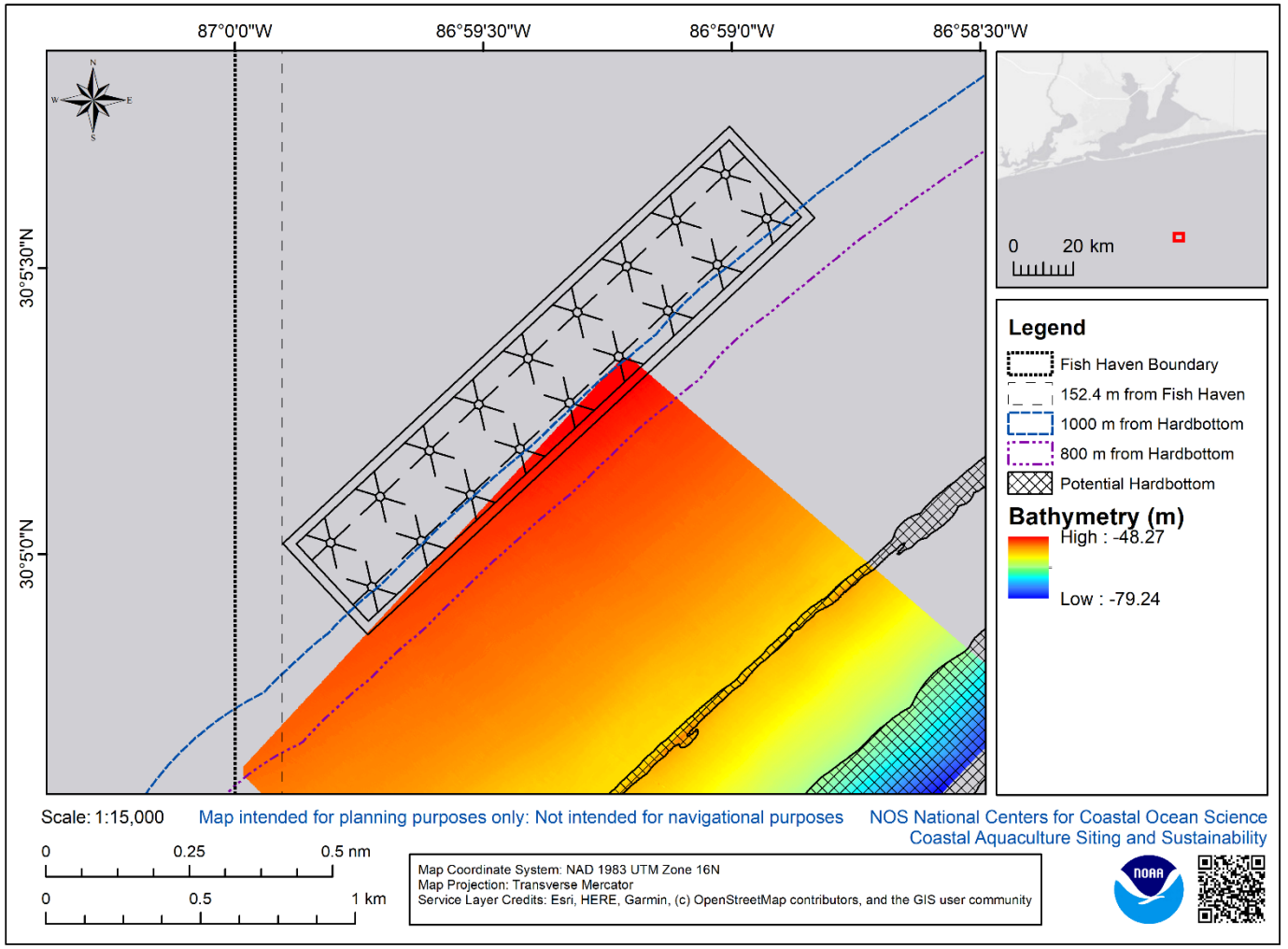
Individual moored cages

1:1 slope

197 Acres

Width (1974m)

Height (403m)



Potential Farm Layout 3

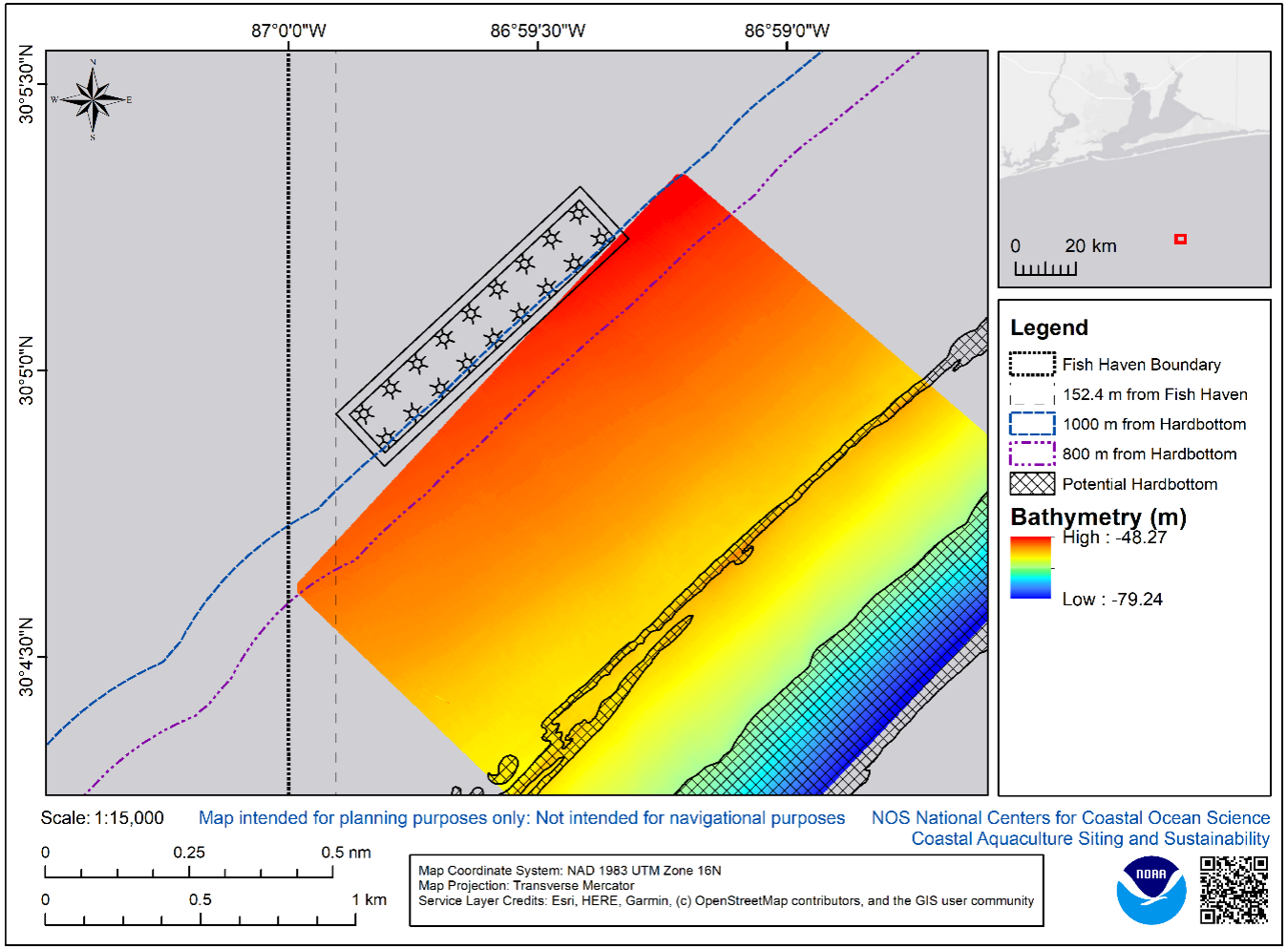
Individual moored cages

No slope

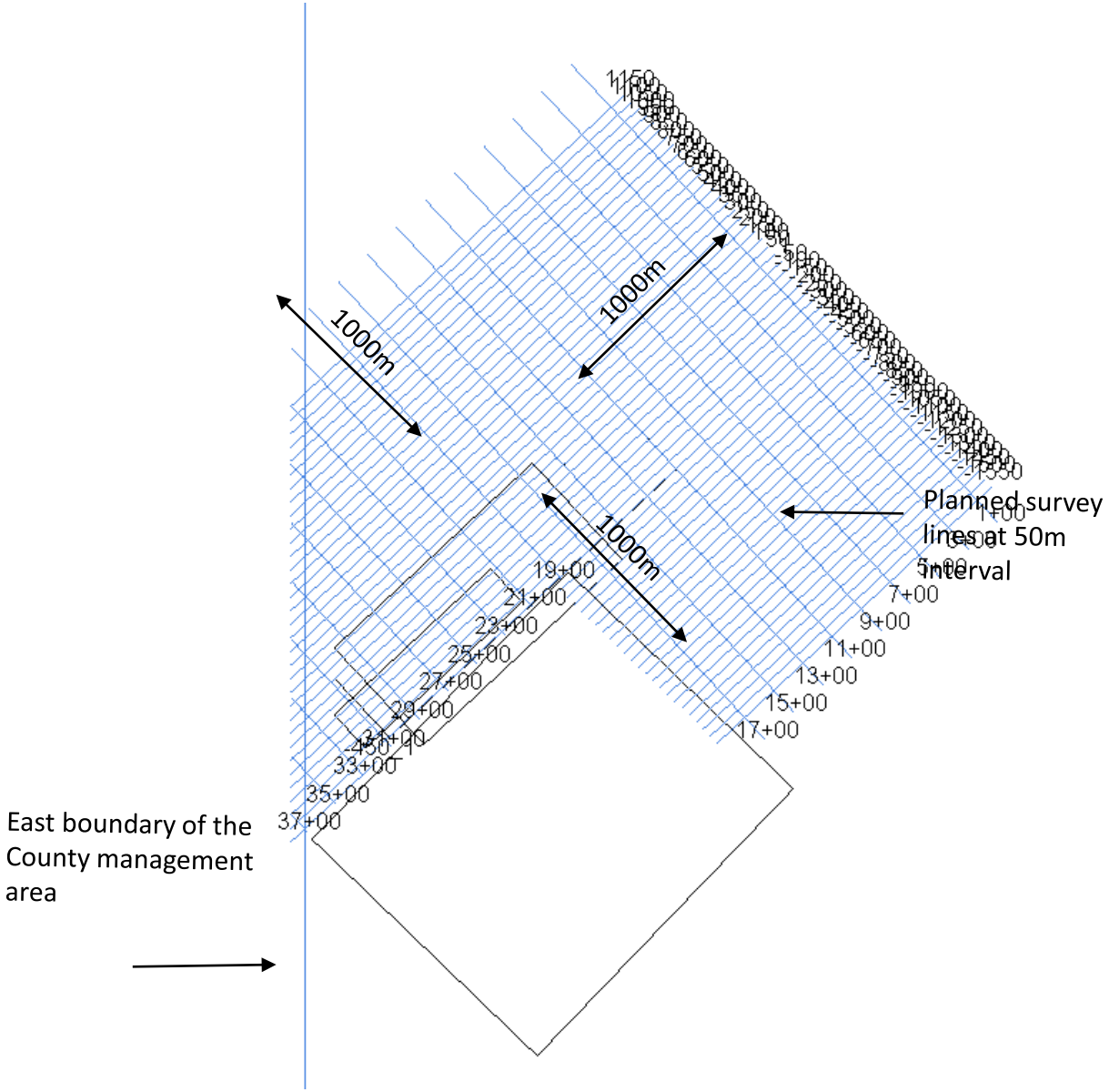
61 Acres

Width (1076m)

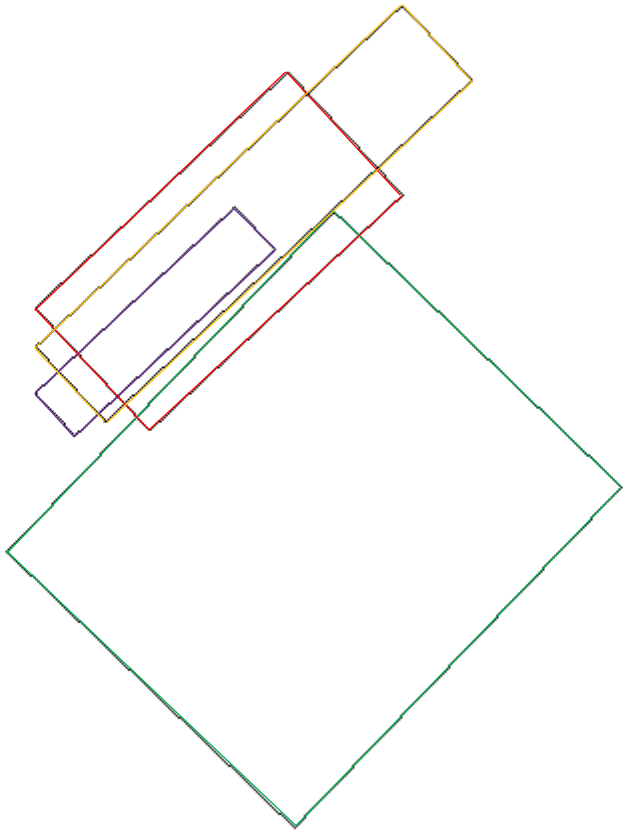
Height (230m)



Survey area coverage



3 proposed sitting sites (shown in read, blue and orange)



Previously surveyed site E (shown in Green)

Next Steps

- Submit Baseline Environmental Survey #2
  - Structural modeling
  - Discuss mooring, materials and structure with NOAA Protected Resources
- 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

Timeline (Milestones Pending)

- Effluent Modeling (Winter, 2020)
- Structural Modeling (Winter, 2020)
- EPA, National Pollutants Discharge Elimination System Permit Application (Spring, 2020)
- USACE, Section 10 Permit Application (Spring, 2020)
- USCG, CG-2554 Authorization, Private Aids to Navigation Application (Spring, 2020)

Concluding Remarks

- The process is working
- The agency staff have been responsive
- We need to refine the survey requirements
  - What is needed to make decisions without being overly prescriptive
- We need to refine the siting guidelines
  - No surprise distance requirements after the fact
  - What is the foundation for the distance requirement? Is it needed?
- Is there a way to consolidate plan documents that meet the needs of multiple agencies?

Contact information

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