UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
http://sero.nmfs.noaa.gov

Tab S, No. 2

F/SER:JBS

Mr. Doug Gregory, Executive Director
Gulf of Mexico Fishery Management Council
2203 North Lois Avenue, Suite 1100
Tampa, Florida 33607

APR 04 2018

Dear Mr. Gregory:

NOAA's National Marine Fisheries Service requests the Gulf of Mexico Fishery Management Council (Council) review the enclosed Exempted Fishing Permit (EFP) application at their April 2018 meeting. The EFP proposal was submitted by Kampachi Farms LLC (Kampachi) and reviewed by the Council at their January 2018 meeting. After that meeting, the Council sent a letter to Kamapchi requesting more information for the April meeting.

Kampachi is requesting to deploy a small-scale aquaculture demonstration cage array and rear two consecutive cohorts of almaco jack in federal waters of the Gulf of Mexico. The EFP would be for a 2 year period to evaluate: 1) the use of a SUBflex cage array system in offshore conditions, 2) environmental impacts, and 3) evaluate growth of a federally managed species in an offshore cage system. The project would also analyze public perception of offshore finfish aquaculture in the Gulf of Mexico.

The project would collect important biological, social, and economic data on the feasibility of an offshore aquaculture operation, and presents an opportunity to develop industry support for aquaculture in U.S. federal waters of the Gulf of Mexico.

Sincerely,

Roy E. Crabtree, Ph.D.
Regional Administrator

Enclosure

April 6, 2018

National Oceanic and Atmospheric Administration (NOAA) Fisheries
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701

RE: Exempted Fishing Permit Application for the Velella Epsilon Project – Pioneering Offshore Aquaculture in the Southeastern Gulf of Mexico

NOAA Fisheries

Please find the enclosed revised Exempted Fishing Permit (EFP) Application for the subject Velella Epsilon (VE) Project. The VE Project Team submits this application in support of a fisheries-related research activity that focuses on data collection related to growth of a Federally managed species in the offshore environment, information on open ocean aquaculture systems that can be used to inform other pilot- and commercial-scale operations, seafood product development, and market research.

This application was completed in compliance with the Code of Federal Regulations (CFR) 50 CFR § 600.745(b), a Magnuson-Stevens Act (MSA) - General Provision for Domestic Fisheries, and in close coordination with NOAA Fisheries, Southeast Region. The VE Project Team requests that the EFP be approved for a 2-year duration from the initial cage deployment.

If you have any questions or comments, please do not hesitate to contact me directly at petersd1@cox.net.

Sincerely,

Dennis J. Peters
Aquaculture Permitting Coordinator
Eastern Operations Manager

encl: EFP Application

cc: Neil Sims
Lisa Vollbrecht

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The Velella Epsilon Project – Exempted Fishing Permit Application

1.0 Application Submission Date and Research End Date

1.1 Application Submission Date: April 06, 2018

1.2 Research Start Date (estimated): Fall/Winter 2018

1.3 Research End Date (estimated): Fall 2020

1.4 EFP Duration: 2 years (from initial cage deployment)

2.0 Applicant Contact and Project Coordination Information

2.1 Applicant Contact Information:

Neil Anthony Sims
Kampachi Farms, LLC
PO Box 4239
Kailua-Kona, HI 96740
(808) 989-2438
neil@kampachifarm.com

2.2 Project Coordination Information:

Dennis Jay Peters
Gulf South Research Corporation (GSRC)
815 Bayshore Drive
Niceville, Florida 32579
(850) 240-3414
petersd1@cox.net

3.0 The Point of Contact Regarding Project Questions:

Dennis Jay Peters

4.0 Project Summary and Justification for the EFP Issuance:

Project Summary - Commercial-scale aquaculture systems for rearing Federally managed species in the Gulf of Mexico (GOM) are permitted through the Gulf Aquaculture Permit (GAP) application process, where permits are offered for an initial 10 year period and for up to 12.8 million pounds (whole weight) of production annually.

In contrast, the VE Project focuses on a small, demonstration, pilot-scale (two net pen array; one pen stocked with fish and one pen without fish) aquaculture system where up to 40,000 almaco jack (kampachi; *Seriola rivoliana*) fingerlings would be reared in Federal waters approximately 40 to 45 miles west southwest of Sarasota, Florida. Fish will be stocked in 2 cohorts of 20,000 fish each, reared in back-to-back cycles for approximately 9 months per cycle. We expect to yield approximately 17,000 fish/cohort (based on an estimated 85% survival rate) with a final fish size of approximately of 4.0 lbs/fish. Based on these numbers, we anticipate an estimated final maximum harvest weight of 136,000 pounds [lbs] whole weight for all fish combined. These fish will be landed in Florida, marketed and sold to state- and Federally-licensed dealers, in accordance with state and federal law.

Justification for the EFP Issuance - The VE Project will support, promote, and invigorate marine aquaculture in the GOM by directly addressing the constraints, barriers, or hurdles, and often misperceptions of, U.S. domestic aquaculture development that currently limit increased production. Issuance of this EFP will provide information on data collection related to growth of a federally managed species in the offshore environment, information on open ocean aquaculture systems that can be used to inform other pilot- and commercial-scale operations, seafood product development, and market research.

Based on the small-scale, temporary nature of the project, the VE Project Team is requesting the issuance of an EFP as the most appropriate permitting pathway for this project. While the project includes an 18 month rearing timeframe, we are requesting a total of 2 years for the EFP duration which will provide time necessary for initial cage deployment and water quality/benthic sampling, time between rearing periods and removal of gear at project conclusion.

4.1 Purpose and Goals of the Exempted Fishery Activity:

4.1.1 Purpose #1

The ***First Purpose*** of this exempted fishery activity is to validate the feasibility of deploying a temporary, small-scale, demonstration net pen array (two pens), and rearing two consecutive cohorts of the Federally managed species, almaco jack, in GOM waters approximately 40 to 45 miles off west southwest of Sarasota, Florida. Only one of the two pens will be stocked with fish for rearing during each of the consecutive cohorts. Two SUBflex net pens will be deployed in a single array, one of which will be stocked with fish for rearing during each of the consecutive cohorts, and the other which will not be stocked. ***Initially, only one net pen was envisioned for this project; however, based on subsequent engineering information from the cage manufacturer, the two-pen configuration provides the necessary structural integrity to the net pen array and the single point mooring (SPM) system.***

There are two goals of the first purpose, the ***First Goal*** is to **(a)** validate the use of a submersible surface net pen array on a SPM as an effective design for the GOM in order to reduce current and wind stress on the system; and to use the demonstration as a platform to maximize access for public outreach benefits. Structural information describing the SPM system and net pen array, along with the tethered tender vessel will be detailed in the analyses of the NEPA documentation.

The SPM was first approved and successfully deployed in Hawaii (RIN 0648-XC791) during the Velella Delta project, which lasted 41 months in duration. This particular SPM consisted of a 12,000-foot (ft) mooring line in approximately 6,000 ft of water (i.e. 2:1 scope), utilizing a deadweight anchor. The VE Project mooring will demonstrate the utility of a SPM in shallower water, approximately 130 ft deep with a longer scope (conceivably 5:1), for a mooring line length of 500 ft to 650 ft, and utilizing an embedment anchor (i.e., a flipper delta-type anchor). The SPMs have also been successfully utilized with the SubFlex system in Israel. Small-scale SPM single net pens are also used in some parts of Japan, such as Kagoshima. Kampachi Farms, LLC anticipates utilizing SPMs for future offshore macroalgae culture trials in Hawaii, as well.

The VE Project Team proposes that a successful demonstration of the two, net pen array using a SPM system will validate the structural integrity of this system as a future representative design for commercial aquaculture development in the GOM, supporting a variety of species.

Figure 1 provides a notional schematic diagram of the VE Project array. The SPM will additionally minimize the environmental footprint of the limited water quality impacts due to the unidirectional current flow and the clockwise rotation of the net pen array.

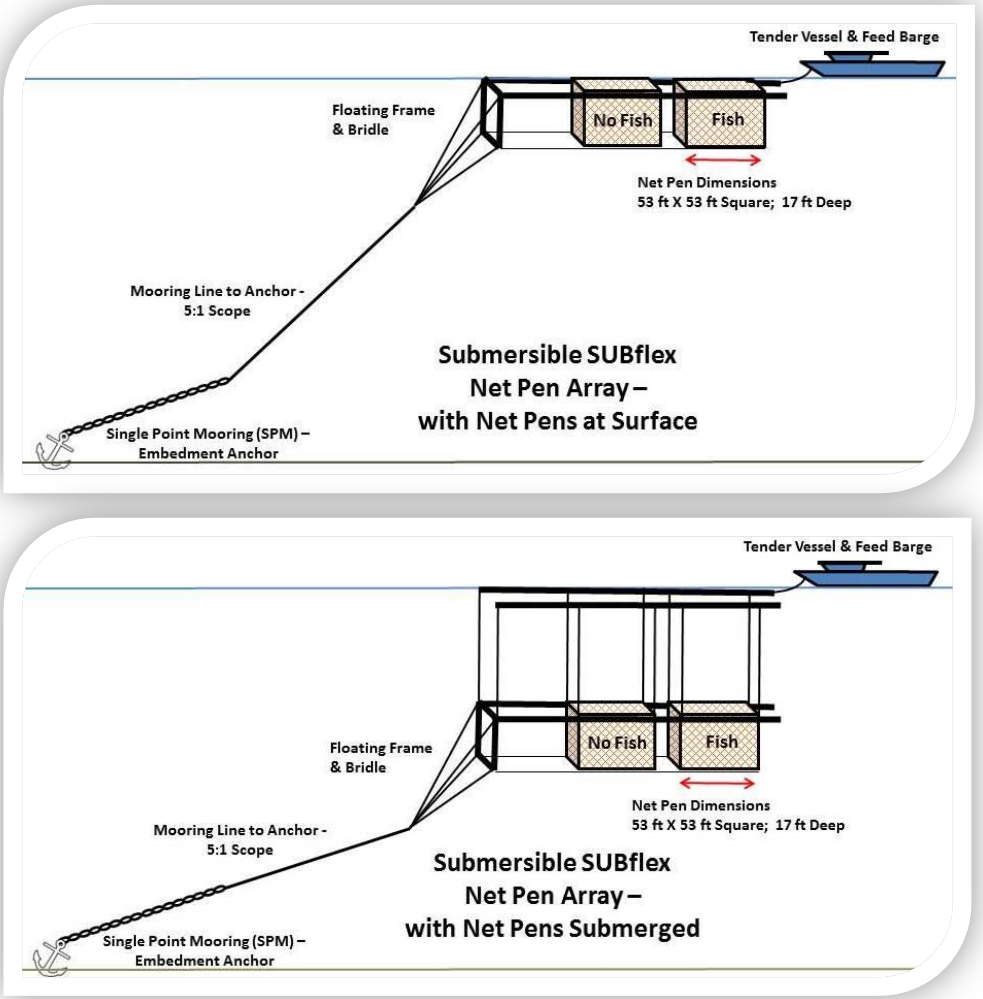


Figure 1. Notional Schematic Diagram for the VE Project Net Pen Array

The ***Second Goal*** of the first purpose is to **(b)** achieve a minimum survival rate to harvest of approximately 85% from each of the two cohorts, grown in back-to-back cycles (approximately 9 months/cycle), yielding approximately 34,000 fish harvested (17,000 fish from each cohort) from an initial 40,000 fish stocked (20,000 fish in each cohort).

The VE Project Team further proposes that successful growout survivability and size of fish at harvest will validate the system design and general site location as a future representative design to be appropriately scaled up to support commercial aquaculture development in the GOM.

4.1.2 Purpose #2

The ***Second Purpose*** of this exempted fishery activity is to conduct a thorough environmental monitoring program whose ***Goal*** is to validate previous conclusions (as shown with larger aquaculture net pen operations in Hawaii state waters) that impacts on water quality around the net pen are likely to be immeasurable, due to the low stocking biomass, the careful monitoring of feeding, and the constant, dilutive movement of water through the net pen.

Tender Vessel – The tender vessel is an 80-foot ocean going Staysail Schooner, the *SV Machias*, a U.S. Coast Guard inspected and documented (Document No. 289053) sailing vessel with a commercial fishing endorsement, outfitted and approved for open ocean, blue water cruising that includes space for 24 passengers. The vessel is

equipped with modern communications and navigation technology, e.g., two-way radio, GPS, radar, high frequency transceivers, etc. It can use both sail power and diesel power and in the event of problems, can communicate with the Coast Guard for assistance.

At least two scientific field technicians from Kampachi Farms, LLC, will be stationed on the tender vessel at all times for the duration of the project. Staff will be rotated, so that each individual is at sea for four weeks, then off for two weeks. Staff will be responsible for water quality and benthic sampling, feeding the fish, monitoring fish health, collecting data on the growing fish, and monitoring interactions with fish and protected marine species and observing fishing activities around the net pen array. Additional technicians from universities will assist with conducting environmental monitoring and monitoring of protected species interactions (see Section 6.4.2 for further details).

Water Quality and Benthic Sampling - Using a probe similar to a HYDROLAB® HL7 Multiparameter Water Quality Sonde, these technicians will measure a suite of physical, hydrographic parameters at depth; such as, temperature, salinity, pH, turbidity, dissolved oxygen (D.O.), D.O. saturation, and specific conductivity. Additionally, water samples will be taken from which measures of supplemental physical and nutrient parameters will be performed; such as dissolved nitrogen and phosphorus, and total suspended solids. These samples are anticipated to be taken at a number of sites up-current of the VE Project net pen, and at a range of distances down-current, at a range of depths (e.g., surface, 15 m, and 30 m). In addition to water column sampling, it is anticipated that benthic seafloor sampling will be conducted as well. The VE Project Team will work directly with the U.S. Environmental Protection Agency (USEPA) to define a specific monitoring plan (water quality and benthos) for the VE Project.

It is understood that the VE Project will comply with the environmental monitoring, requirements, and conditions specified in the USEPA National Pollutant Discharge Elimination System [NPDES] and all other federal permits. Additionally, a Nutrient Management Plan may be required as a condition of the USEPA, NPDES permit.

4.1.3 Purpose #3

The ***Third Purpose*** of the exempted fishing activity is to directly address the public misperception of, and resistance to, the expansion of open ocean aquaculture in the GOM. To initiate this effort, Mr. Peters will identify and select a sample of potential stakeholders (e.g., commercial and recreational fishermen) at the beginning of the project and conduct an assessment of their attitudes towards aquaculture, specifically marine fish, net pen, ocean-based aquaculture in the GOM. This assessment work will include in-person, telephone, and email interviews with established stakeholder interests and provide the baseline data for later evaluation of the effectiveness of the project.

The ***Goals*** of the third purpose are to **(a)** provide a working net pen example to Federal regulators, politicians, constituents, journalists, and other influencers of policy or public perceptions, as well as the local community as an educational platform on open ocean aquaculture; **(b)** increase public awareness of, and receptivity towards, offshore aquaculture, and the need to culture more seafood in U.S. waters, by providing public tours of the offshore operation, **(c)** serve as a demonstration platform for data collection of water quality, potential benthic impacts, and marine mammal and fish stock interactions resulting from offshore aquaculture in the GOM; and **(d)** provide local recreational, charter, and commercial fishing communities with evidence of the benefits of aquaculture, through the fish attraction device (FAD) effects of the project, and by documentation of fish aggregation and fishing boat activity around the VE project. The VE Project will capture descriptions and outcomes from the engagement with stakeholders and other community interests, and will condense these findings into summary accounts from the relevant public meetings, meetings with regional relevant officials, and other information gathered during public outreach activities.

4.1.4 Siting Analysis Process

A thorough siting analysis was performed over the course of several months to identify an appropriate Preferred Site and Alternate Site. The following section describes this process in several parts: A) Preliminary Siting, B) Secondary Siting, C) Draft-Final Siting and D) Final Siting.

Two potential site locations were identified after an extensive 5 month siting analysis with NOAA, National Ocean Service National Centers for Coastal Ocean Science (NOS NCCOS) staff and in consultation with the Southern Shrimp Alliance. The following sections go into further detail regarding the siting analysis process.

Figure 2 provides the location of the two site locations which are currently under consideration. ***Site #A is the Preferred Site of the VE Project team, with Site #B being an Alternate (or back-up) Site.*** Discussions to follow later in this section, will document the iterative evaluation process and multiple stakeholder engagements that have led to this two-site selection. A ***Baseline Environmental Survey (BES)*** will be conducted on Site A using guidance developed by NOAA Fisheries and the USEPA (**Appendix A**) prior to deployment of the net pens.

A) Preliminary Siting Analysis – The Demonstration farm site and location of the SPM considered the following criteria:

- Convenient proximity to a commercial port (Sarasota or Charlotte Harbor region)
- Short navigation time for stocking, harvesting, and public tourism activities
- Water depths (130 ft) that allow net pen submersion, but maximize mooring scope
- Avoidance of corals, coral reefs, and hardbottom habitats
- Avoidance of artificial reefs and submerged cultural resources (ship wrecks)
- Sources of open sand bottoms (unconsolidated sediments) for positioning the SPM
- Avoidance of marine protected areas (MPAs), marine reserves, and Habitats of Particular Concern (HAPCs)
- Proximity to seafood outlets for product marketing and sales trials
- Avoidance of navigational fairways, vessel traffic routes, anchoring areas, lightering zones, deepwater ports, platform safety zones, military (Air Force) zones, fisheries and tourism areas, dredging sites, mineral extraction areas, designated dredge material dumping sites, rights of way for energy transmission lines and communications cables, and scientific reference sites
- Avoidance of other industry user groups (i.e., shrimping and longline fishing)
- Avoidance of other offshore aquaculture facilities (none within 1.6 nautical miles)
- Avoidance of Ocean Dredged Material Disposal Sites (none within 1.0 nautical mile)

The VE Project Team participated in a live demonstration of the ***Gulf AquaMapper*** provided by NOS NCCOS staff during which a preliminary siting analysis was conducted. Supplemental data (e.g., wave heights, currents, temperatures, multibeam side scan sonar, and bathymetry modeling) at the proposed site location were later provided. These data were provided in the ***Screening Discussion for the Velella Project Gulf of Mexico – Exempted Fishing Project*** (**Appendix B**).

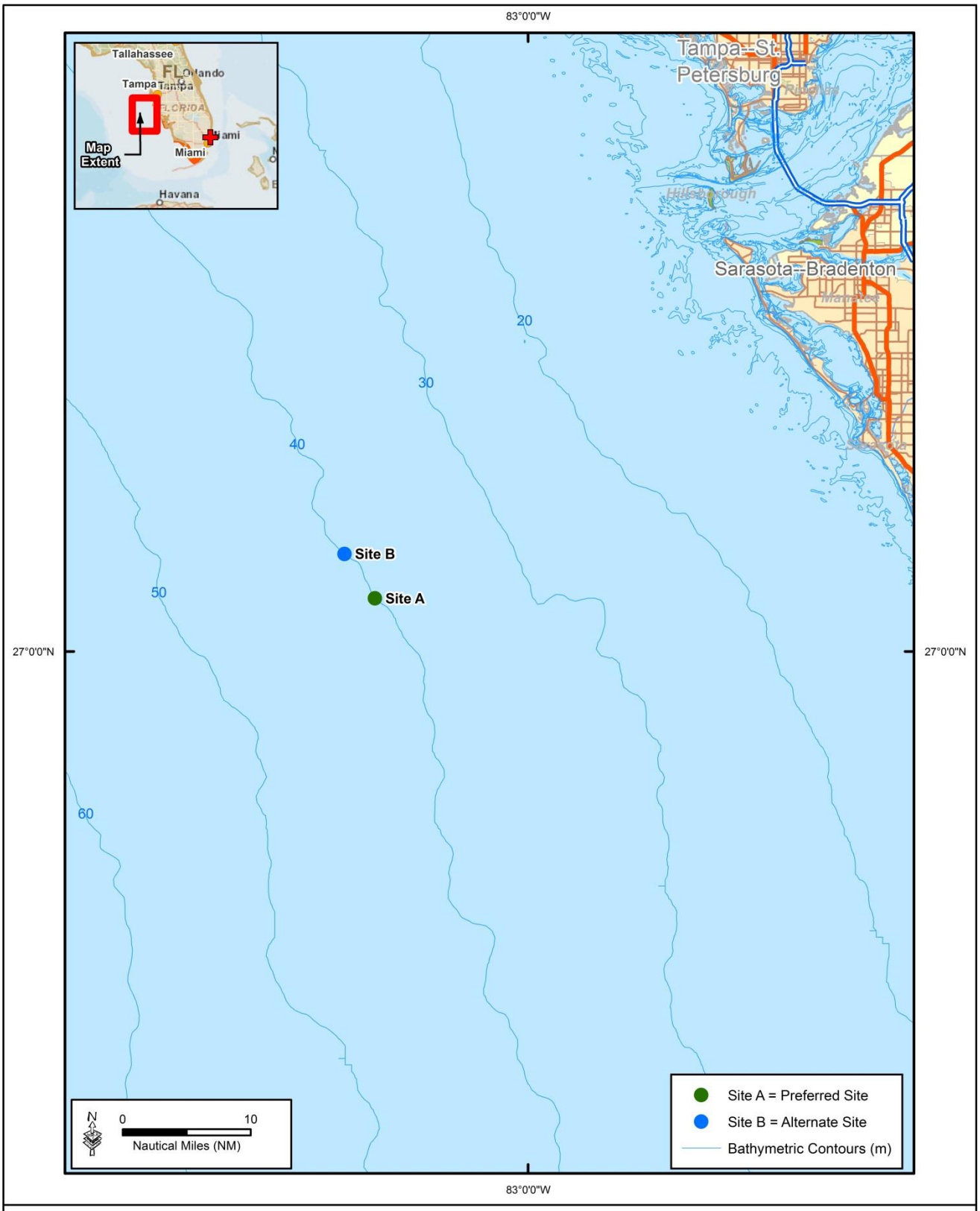


Figure 2. Proposed SPM Site for the VE Project Net Pen Array

The preliminary siting analysis for the VE Project farm site and location of the SPM additionally referenced data and information from the following Federal websites:

- Essential Fish Habitat Mapping Application for the Gulf of Mexico Fisheries: http://portal.gulfcouncil.org/EFHMap.html
- GIS Data for Gulf of Mexico EFH and HAPC http://sero.nmfs.noaa.gov/maps_gis_data/habitat_conservation/efh_gom/index.html
- NOAA Gulf of Mexico Data Atlas https://www.ncddc.noaa.gov/website/DataAtlas/atlas.htm?plate=Temperature%20-%20CMECS
- NOAA Ocean Explorer http://oceanexplorer.noaa.gov/explorations/02mexico/background/currents/currents.html
- NOAA National Data Buoy Center - Eastern Gulf of Mexico Recent Marine Data http://www.ndbc.noaa.gov/maps/Florida.shtml
- NOAA National Data Buoy Center - HF Radar National Server http://hfradar.ndbc.noaa.gov/index.php?s=42013
- NOAA Office for Coastal Management - Digital Coast https://coast.noaa.gov/digitalcoast/
- **NOAA National Centers for Coastal Ocean Science (NCCOS) – Coastal Aquaculture Planning Portal (CAPP) – Gulf AquaMapper** http://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=889b16ac2f4e4637b73e4579831b806d

NOAA navigational charts of the area were referenced and did not indicate any conflict with major shipping channels or DoD Restricted Access areas.

B) Secondary Siting Analysis – NOS NCCOS staff have offered to provide ongoing modeling and data support during the permitting process. The NOS NCCOS lab strategized further on specific siting criteria and concluded that the preliminary evaluations should identify 15 – 20 site locations, approximately 40 to 45 miles offshore of the general Sarasota and Charlotte Harbor region, to provide flexibility during the siting analyses and deconflict other potential user group industries.

Preliminary engineering analyses suggested that a minimum depth to ensure the survivability of the SPM net pen array during a potential 200-year storm is 130 feet. As such, the NOS NCCOS team identified a total of 18 alternative sites (**Figure 3**) along the 130-ft isobath offshore of Sarasota and Charlotte Harbor.

C) Draft-Final Siting Analysis – The VE Project team further reduced the number of viable alternative sites to a total of six (6) site locations that: **(a)** minimized the transit time from a major port (Sarasota or Charlotte Harbor); **(b)** avoided any military special use airspace; **(c)** minimized overlap with known commercial fishing areas; **(d)** ensured no overlap with ocean disposal sites, submarine cables, shipping lanes (and minimized intersection of major vessel traffic), anchorage areas, or artificial reefs; and **(e)** avoided sensitive coral hardbottom, coral EFH, and shrimp EFH habitat areas (**Figure 4)**.

Extensive coordination and collaboration with the Executive Director of the Southern Shrimp Alliance (SSA) over a 3-month period has resulted in identifying the three (3) sites (Sites #4, #5, and #6) that were preferred by the SSA and were not located in traditionally trawled areas by the shrimping industry or located in the military special use airspace. Of these sites, Site #6 has been identified as the VE Projects' Alternative Site A and Site #5 has been identified as the VE Projects' Preferred Site (Site B), as illustrated in **Figure 2**.

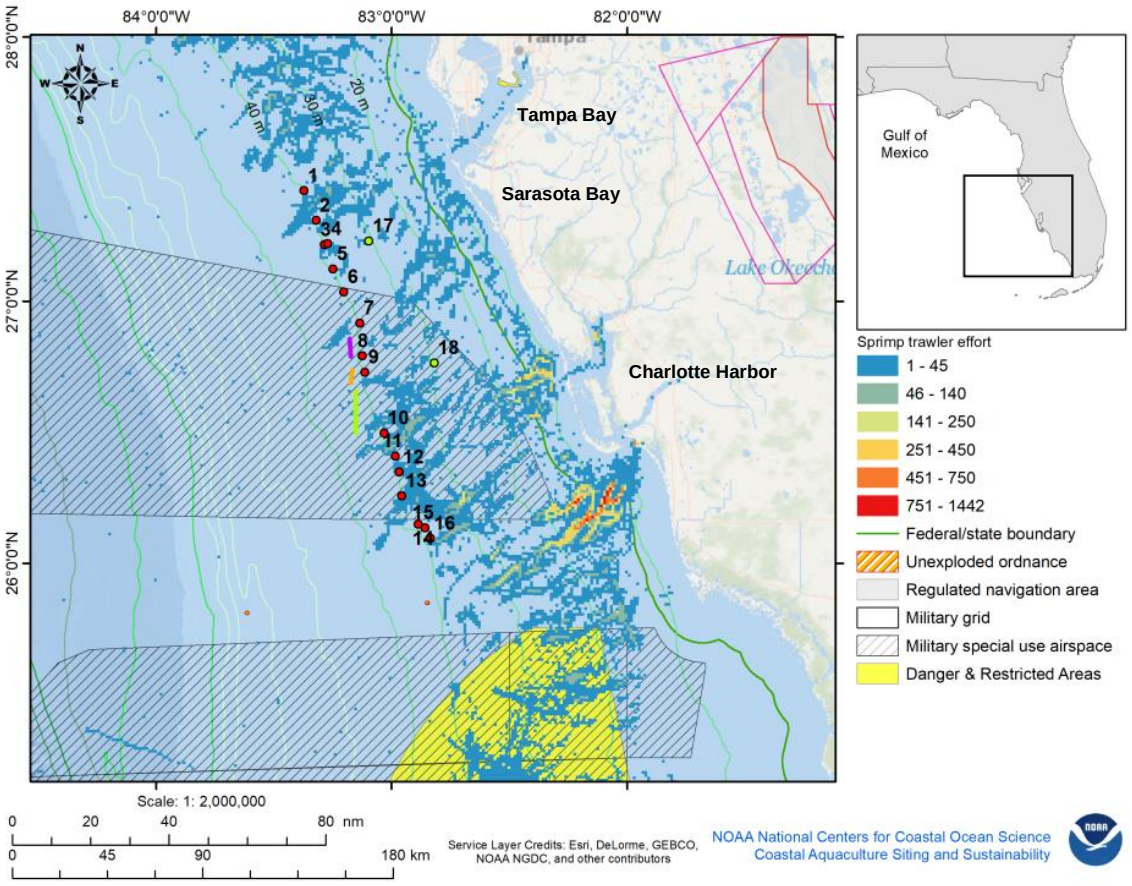


Figure 3. Alternative Site Locations (18) Resulting from the Secondary Siting Analysis

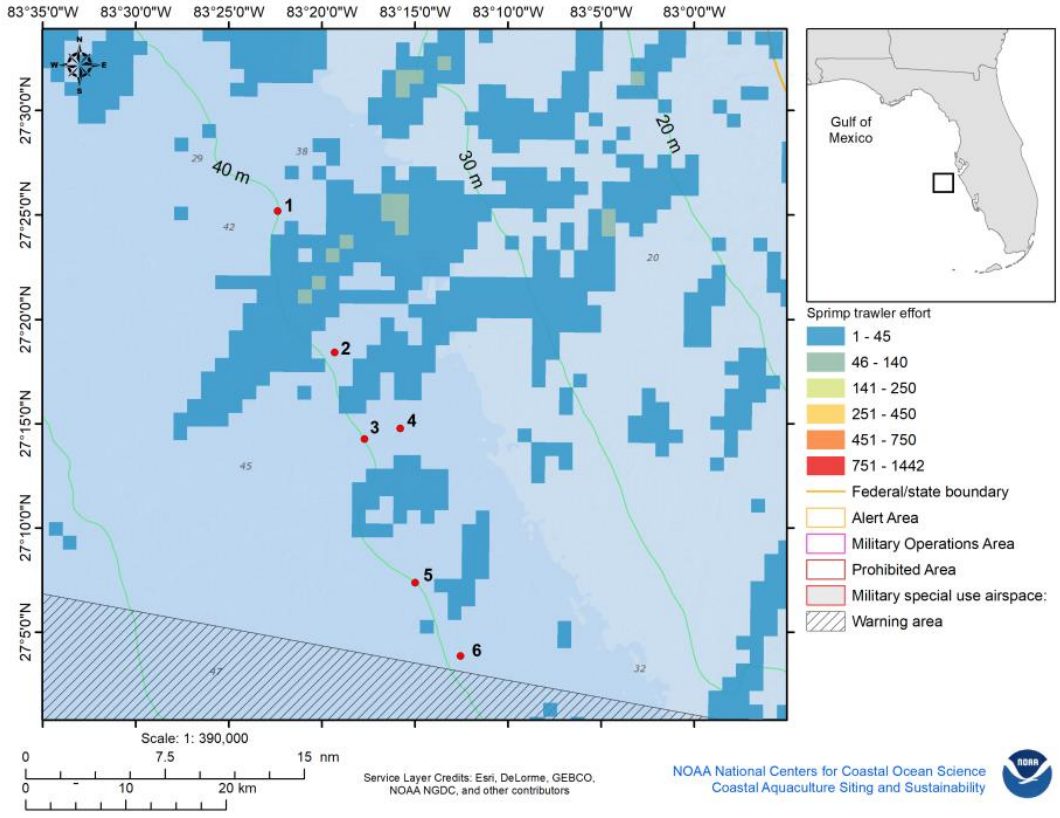


Figure 4. Alternative Site Locations (6) Resulting from the Draft-Final Siting Analysis

D) Final Siting Analysis – The VE Project Team plans to perform the Final Siting Analysis by conducting in-water site surveys. The NOAA Fisheries guidance document, ***Baseline Environmental Survey Guidance and Procedures for Marine Aquaculture Activities in U.S. Federal Waters of the Gulf of Mexico***, October 24th, 2016 (**Appendix B**), will be referenced while conducting this work. At a minimum, the BES will include a comprehensive *Seafloor Survey* and *Hydrographic Measurements* as defined in the guidance document. Information gained from the BES will be used to select the exact site location for the SPM, and demonstrate confirmation of hardbottom and coral habitat and cultural resource avoidance.

Other Required Federal Permits - The VE Project is concurrently applying for a U.S. Army Corps of Engineers (USACE) Section 10 permit (12/28/2017, Department of Army Permit Number: SAJ-2017-03488-KRD; "Velella Epsilon Project/Aquaculture"), as well as a USEPA, NPDES permit. A BES will be conducted, and the subsequent data analysis and report will be submitted in support of the USACE, Section 10 and the USEPA, NPDES permits (along with copies to NOAA FISHERIES representatives).

As part of the Federal permitting processes, the following consultations/responsibilities will be satisfied:

- Section 7 of the Endangered Species Act (ESA),
- Magnuson-Stevens Fishery Conservation and Management Act (Magnuson Stevens Act) for Essential Fish Habitat (EFH),
- Section106 of the National Historic Preservation Act (NHPA; Section 106), and
- NEPA analysis

It is also understood that a final permit authorization and issuance of the Department of the Army (DA) Section 10 permit will not be able to be made without a copy of the State of Florida's Section 404 Water Quality Certification (WQC) and Coastal Zone Management Act (CZMA) consistency determination and/or waivers.

The VE Project Team continues to work with NOAA FISHERIES, USEPA and USACE to develop and execute the milestone goals of the multiagency schedule.

An Interagency Coordination Meeting via conference call on April 3rd was conducted to review the VE project details with Federal permitting and authorizing agencies. Participants on this call included staff from the following federal agencies: NOAA Fisheries, USEPA, USACE, U.S. Coast Guard (USCG), U. S. Department of Agriculture (USDA), Bureau of Ocean Energy Management (BOEM), U.S. Air Force (USAF), and the U.S. Navy (USN). The VE Project Team feels that this multiagency coordination is the best approach for final site selection prior to expending resources on potentially conducting a *Seafloor Survey* in support of the required BES.

The VE Project Team will continue to look for any previously conducted sea floor surveys for the proposed project site location. If none are identified, it is anticipated that a *Seafloor Survey* in support of the BES for the VE Project would be initiated soon after the ***Gulf AquaMapper*** analyses and team review are completed (April 2018, timeframe).

5.0 Specific Regulations Necessitating an EFP and Necessity for Project Success:

5.1 Scientific research activity, exempted fishing, and exempted educational activity (50 CFR § 600.745[b]): Exempted Fishing – (1) General:

The VE Project qualifies for an EFP under this particular provision as a fisheries-related research activity that focuses on data collection related to growth of a Federally managed species in the offshore environment, information on open ocean aquaculture systems that can be used to inform other pilot- and commercial-scale operations, seafood product development, and market research; in particular, the aquaculture and incidental harvest of species managed under the Gulf of Mexico Fishery Management Council's (GMFMC) ***Fishery Management Plan for Regulating Offshore Marine Aquaculture in the Gulf of Mexico (Aquaculture FMP)*** .

EFPs are issued under the authority of the MSA for situations where research activities would normally be prohibited by Federal fishing regulations; the VE Project is an example of this situation.

5.2 Fisheries of the Caribbean, Gulf, and South Atlantic; Aquaculture (50 CFR Parts 600 and 622) - Final Rule:

NOAA FISHERIES has the authority to permit aquaculture operations in Federal waters of the GOM pursuant to Aquaculture FMP and its implementing regulations. For the purpose of this VE Project, we request exemption from ***50 C.F.R. Subpart F*** due to the small-scale (2 cage array), temporary (2 years from initial cage deployment) and experimental nature (data collection on a Federally managed species and open ocean aquaculture systems, seafood development, and market research) of this project. We understand that NOAA Fisheries may institute requirements similar to those required by commercial-scale operations permitted under the Gulf Aquaculture Permit (GAP) program, and that these requirements will be tailored to the small-scale experimental nature of the VE project and in line with specific purpose and objectives of the VE project (*e.g.*, in line with Purpose #3, no restricted access zone would be imposed to allow for recreational, charter and commercial fishing to occur around the cage array).

5.3 Project Needs and Milestones:

One of the various constraints to and misperceptions of, U.S. domestic offshore aquaculture development is the limitation of species with closed life-cycle technology that are suitable for production offshore. The VE Project has specifically identified and proposes to culture a species with a proven culture record and with a documented closed life-cycle technology that is suitable for offshore production in the GOM: almaco jack. Ultimately, project success is inherently determined and controlled by strict schedule management and compliance. **Table 1** provides a summary the key milestone activities, goals, and schedule of the VE Project, including the approximate start date, finish date, and the duration of each activity.

6.0 Catch (Culture) Information:

6.1 Species expected to be Harvested and/or Discarded under the EFP:

The almaco jack is the selected species that will be cultured and ultimately harvested from within a closed Demonstration net pen system under the EFP. The original source of the fish to be stocked in the net pen will likely be from either the RSMAS hatchery in Miami, Florida, or the Mote Aquaculture Research Park in Sarasota, Florida. The VE Project Team would transfer fingerlings from the hatchery's land-based rearing tanks into oxygenated holding containers. Using a crane, they would then place the holding containers onto flatbed trucks and secure them. The trucks would follow the shortest distance from RSMAS, Miami or Mote Aquaculture Research Park, Sarasota, to the Sarasota Bay, where the holding tanks would be transferred using a small crane to the deck of the tender vessel. NOAA FISHERIES, USCG, FWC and other appropriate Federal and state agencies would be notified of the anticipated transport activity.

Milestone Activity	Start Date	Finish Date	Months
Deploy Demonstration Netpen/ Tender Vessel Array			
Lease available harbor space	Aug-18	Aug-18	1
Obtain mooring and deployment equipment	Aug-18	Sep-18	2
Mobilize tender vessel to harbor	Sep-18	Oct-18	2
Mobilize staff to harbor	Sep-18	Oct-18	2
Cage delivery	Sep-18	Sep-18	1
Construct cage at port	Oct-18	Nov-18	2
Install mooring	Nov-18	Nov-18	1
Deploy research pen	Nov-18	Nov-18	
Rear Two Consecutive Cohorts of Almaco Jack			
Consult on the availability of fingerlings	Aug-18	Jan-19	6
Larval run and nursery time for fingerlings	Sep-18	Apr-19	3
Ship fingerlings to port, onboard to vessel, stock in pen	Dec-18	Sep-19	
Feeding, cleaning, monitoring	Dec-18	Apr-20	18
Water Quality Monitoring	Dec-18	Apr-20	18
Benthic monitoring (before, during, after cohorts)	Dec-18	Apr-20	18
Environmental Data and vessel reports	Dec-18	Apr-20	18
Engagement in active public outreach	Dec-18	Apr-20	18
Source a buyer(s) for the fish	Jun-19	Jan-20	2
Harvest fish and delivery to port	Aug-19	Apr-20	2
Path to Commercial Offshore Netpen Viability			
Determine if market price supports commercial model	Aug-19	Apr-20	1
Determination of business model viability	Aug-19	Apr-20	1

Table 1. Summary the Key Milestone Activities, Goals, and Schedule of the VE Project

It is estimated that three trips (approximately 6,500-7,000 fish per trip x 3 trips = 20,000 fish per grow out cycle) to stock the net pen for each grow out cycle would be required. The transport vessel would proceed to the VE Project site location where the fingerlings would be pumped via a hose directly into the net pen using a specially designed fish pump. As this is a well-rehearsed commercial activity, it is unlikely any fingerlings would escape during these operations.

6.2 Number or Weight by Species, of Harvest and/or Discard under the EFP:

The VE Project will harvest (market and sell to state- and Federally-licensed dealers) two cohorts of almaco jack, each comprising approximately 17,000 fish, grown in back-to-back cycles (9 months/cycle) for a final total harvest of approximately 34,000 fish, or a total marketable yield of approximately 136,000 lb. Due to natural mortality, it is estimated that 6,016 fish, of varying sizes over the course of a total of an 18-month growout period (9 months per cohort), will be brought onshore and properly discarded (onshore) after a necropsy has been performed on a sample of these fish to determine the cause of death. The total weight of the discarded fish is estimated to be less than 2,056 lb.

Fish would be concentrated using a seine net inside of the net pen prior to harvesting. The VE Project Team would harvest fish using a vacuum pump which will transfer fish directly from the net pen to containers onboard the vessel, thus reducing the chance for escapes. Fish may also be harvested using dip nets and transferred to a support vessel and transported to shore for processing. All appropriate state and Federal agencies would be notified of the anticipated transport activity.

6.3 Expected Disposition of Species, of such Harvest under the EFP:

The VE Project will transport the harvested fish to a shore-based operation, where extensive marketing trials will be conducted and the fish will be ultimately sold to state- and Federally-licensed seafood dealers and distributed to markets with a focus on the southeast and Florida. The VE Project Team will comply with the Best Management Practices (BMPs) identified in the "***Aquaculture Best Management Practices Manual***", Incorporated into Rule 5L-3.004, F.A.C. Further, the VE Project Team will secure the required ***Aquaculture Certificate of Registration Number***, which will be identified with each of the receipts, bills of sale, bills of lading, or other such manifest, in addition with information describing the product's origination.

Routine and Contingency Operations - The VE Project net pen will have as a minimum, one properly functioning locating device (e.g., global positioning system [GPS] device) to assist in locating the system in the event it is damaged or lost. The VE Project Team contacted the Aids to Navigation (ATON) Officer for USCG, Sector St. Petersburg, FL. It was determined that no permanent aids to navigation are required or necessary (as it is not necessary to chart the net pen array as an 'obstruction to navigation') as long as a tender vessel remains onsite. When pens are submerged during storm or other trial events, the area perimeter would be marked with buoys or high flyers (poles) per USCG and NOAA FISHERIES regulations.

The USCG is willing to broadcast safety notices to mariners to make citizens aware of the VE Project's location, as necessary. Contacts to local USCG patrols in the area re: the project location will be made as well.

The SUBflex net pen design is very flexible and self-adjusts to suit the constantly changing wave and current conditions. As a result, the system can float on the surface of the ocean most of the time at an operational position. When a storm approaches the area, the operating team simply opens a valve to flood the system (the high-density polyethylene [HDPE] float pipes) with water, causing the entire net pen array to submerge. A buoy remains on the surface, marking the net pen array's position and supporting the air hoses. When the array approaches the bottom, the system will maintain the cages several feet above the sea floor. Submerged and protected from the storm above, the system is still able to rotate around the SPM and adjust to the currents. After the storm, the operating team pumps air back into the system (the HDPE float pipes) via hoses, making the net pen array buoyant, causing the system to rise back to the surface and resume operational conditions.

During nominal storm events such as storms less than a Category 1 level or other similar tropical storms, the tender vessel would likely remain on location and the offshore-strength SUBflex net pen array would be submerged approximately 40 ft below the surface until the storm (high wind and wave height) conditions diminish.

During storm events greater than a Category 1 level, the net pen will be submerged approximately 40 ft below the surface, and the tender vessel will return to an identified safe harbor. Once the storm has passed, the tender vessel will return to the mooring position, re-connect with the mooring line, bring the net pen to the surface, and resume activities. An ***emergency contingency plan*** for containment and retrieval of the net pen array resulting from severe weather conditions may be required by NOAA Fisheries and/or the USACE.

GPS transponders aboard the net pen array would provide regular automated reporting of the array's position. This information would be available only to the VE Project Team members and not to other mariners. Video feeds from security and in-water cameras would be available for monitoring from the tender vessel 24 hours a day. VE Project staff would access the monitor the systems at least twice a day. If staff detect that the net pen is outside of the expected operating area, they would use GPS information to launch an emergency response in a timely manner.

At the conclusion of the Demonstration trials, the net pen array and all mooring equipment would be removed from the site and hauled to shore for proper cleaning and storage. The VE Project Team would comply with any requirements for a more detailed ***project closure plan*** that may be required by NOAA Fisheries and/or the USACE.

6.4 Anticipated Impacts:

6.4.1 Fisheries

The closed net pen culture and harvest of almaco jack would not result in any anticipated impacts on, nor jeopardize the sustainability of, any wild stocks of almaco jack, or of any other wild fish. The VE Project plans to use almaco broodstock that are native to the GOM (and are not genetically engineered or transgenic) for the source of eggs during the hatchery production of fingerlings. The VE Project would use first-generation offspring (***F1 juveniles***) for stocking the net pens from an existing facility (*e.g.*, RSMAS, UM or the Mote Aquaculture Research Park) that harvests fish to maintain adult broodstock.

The almaco jack broodstock at Mote Marine Lab were caught in the Gulf of Mexico off of Madeira Beach, Florida, just north of the Mote Aquaculture Research Park and only F1 progeny will be stocked into the offshore net pen array.

This sourcing of broodstock is consistent with Appendix A of the NOAA document entitled, ***Guidance and Procedures for Genetic Requirements for Gulf Aquaculture Permits***; February 12th, 2016, which states that almaco jack, may be sourced from the entire GOM (**Appendix C**). There are 26 broodstock fish at a sex ratio of approximately 1:1, and ***FWC has determined these mating ratios, as well as the cohort sizes described for the VE Project are appropriate with respect to FWC genetic-policy requirements***. Thus, the VE Project would not require any additional harvest of wild almaco jack.

The VE Project would use methods designed to prevent accidental escapes of cultured F1 almaco jack juveniles during net pen stocking and harvest activities by using closed containers to transport fingerlings to the net pen. Because stocking would be done using pumps while the net pen is at the surface and the surround net is deployed, few fingerlings if any would likely escape during stocking operations. Considering the equipment and operations that will be put in place to reduce the risk of escape, the potential for escapes during stocking and harvesting is thought to be minimal. Should any fingerlings escape, they would be expected to remain around the net pen (which, as has been the experience in Hawaii operations, would act as a fish aggregating device [FAD]). Large fish that are expected to have become attracted to the net pen such as tunas, billfish, and possibly sharks, would likely consume any escaped fingerlings that are not retrieved.

Contingency Plan for Escapes - The VE Project team of onsite technicians will attempt to recover any escapes. The risk for escapes will be *de minimus* because the net pen system consists of a stainless cage with CuNiClad coating (copper nickel alloy), which reduces the risk for catastrophic cage collapse due to predator breaches. One of the advantages of the VE Project's SUBflex system is that it will have a jump net on the surface which allows divers to enter and exit the cage from above the surface of the water, thereby further reducing potential for incidental or chronic escapes of fish.

The fish that would be stocked and maintained in the net pen would be genetically indistinguishable from the local wild population because they are first-generation (F1) offspring from wild-caught fish from the GOM and are the result of mixed broodstock parental crosses. As such, an unforeseen release of small quantities of cultured fish into the wild are not expected to substantially impact the genetic structure of wild fish stocks through genetic introgression and would therefore not reduce the health or fitness of the wild stock.

Further, the VE Project Team is aware of and will reference guidance from the "***Decision Process for the Genetic Risk Assessment of Releases Involving Marine Organisms***", Florida Fish and Wildlife Conservation Commission, September 2009.

Aquatic Animal Health - Pathogen and parasite transmission from the VE Project is unlikely due to the following protocols which will be implemented:

- Fingerlings would be from the RSMAS or Mote Aquaculture Research Park certified disease-free hatchery facility. Before every stocking event, almaco jack fingerlings would be examined by an Aquatic Animal Health Expert (AAHE) to ensure they are visibly healthy and free from pathogens of concern specific to the cultured species
- Fish are proposed to be stocked at levels that are not expected to result in stress from overcrowding, which has the potential to result in a greater likelihood for diseases.
- Technicians would routinely monitor the health of the fish in the net pen; dead or sick individual fish would be removed.
- Fish mortalities that occur during the VE Project would be removed during daily maintenance operations. Technicians would perform a necropsy on a sample of dead fish and dispose of any mortalities onshore using proper disposal methods.

As guided by any subsequent requirements issued in the EFP, the VE Project will develop an ***Aquatic Animal Health Plan*** in cooperation with NOAA Fisheries, United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service Veterinary Service (APHIS VS) and FWC that is tailored to the specific needs of the VE Project. Additionally, the VE Team will abide by the following:

- The VE Project Team will provide a contractual arrangement with an AAHE to provide services to the aquaculture facility/facilities and will provide a valid copy of the AAHE's license or certification to NOAA Fisheries. The aquatic animal health plan will involve a U.S. licensed veterinarian who can help facilitate the aquatic animal health plan, diagnosis and treat fish as needed, and certify the health of fish for movement and trade.
- Only FDA approved drugs will be used and in accordance with FDA requirements under the direction and supervision of a U.S. licensed veterinarian.
- A health certification form will be provided to NOAA Fisheries each time fingerlings are stocked into offshore cages.

6.4.2 Marine Mammals and Protected Species

The VE Project's net pen culture and harvest operations of almaco jack would not result in any anticipated impacts on marine mammals, sea turtles, or other protected species of the GOM. There are 28 different species of marine mammals that may occur in the GOM. All 28 species are protected under the MMPA; six are additionally listed as endangered under the Endangered Species Act (ESA) (sperm [*Physeter microcephalus*], sei *(Balaenoptera borealis)*, fin [*Balaenoptera physalus*], blue [*Balaenoptera musculus]*, humpback [*Megaptera novaeangliae*] and North Atlantic right [*Eubalaena glacialis*] whales).

Other ESA-protected species occurring in the GOM include two threatened sea turtle species (loggerhead [*Caretta caretta*] and green [*Chelonia mydas*]); three endangered sea turtle species (Kemp's Ridley [*Lepidochelys kempii*], leatherback [*Dermochelys coriacea*], and hawksbill [*Eretmochelys imbricata*]); two endangered fish species (Gulf

sturgeon [*Acipenser oxyrinchus desotoi*] and smalltooth sawfish [*Pristis pectinata*]); and one threatened fish species (Nassau grouper [*Epinephelus striatus*]).

Contingency Plan for Entanglements - The SPM system comprises a large diameter anchor line (rope) that will be approximately 6" to 8". The drag load and constant taught lines scenario serves to reduce to *de minimus* the typical levels of risks and concerns for marine mammal entanglement. The inherent rigidity of the anchor line would make it is extremely unlikely that the line could wrap around a fluke or tail of a marine mammal or entangle a sea turtle. Additionally, since the net pen system consists of a stainless cage, the rigid chain-link mesh pen reduces the risk for catastrophic cage collapse and further reduces to a *de minimis* level the chance for marine species entanglement. The HDPE flotation system is also very rigid, and is not anticipated to cause any entanglement or injury to protected marine species.

Further, during severe storm events when the net pen array is submerged, marine species have been documented to seek deeper waters and avoid shallower systems or infrastructure, such as the net pen array. Dolphins and whales have the ability to detect changes in salinity of waters near the surface, often caused by heavy rainfall associated with storms, such as hurricanes. Marine mammals have been reported to depart from areas experiencing the heavy rain events associated with the leading edges of hurricanes. As such, marine mammals have sufficient time to exercise precautionary measures and seek refuge away from storms, and thus the VE Project site.

Additionally, nine coral species (elkhorn [*Acropora palmata*], staghorn [*A. cervicornis*], Lamarck's sheet [*Agaricia lamarcki*], lobed star [*Orbicella annularis*] pillar coral [*Dendrogyra cylindrus*], elliptical star coral [*Dichocoenia stokesii*], mountainous star coral [*Orbicella faveolata*], boulder star coral [*Orbicella franksi*], rough cactus coral [*Mycetophyllia ferox*]) are ESA-protected as threatened.

The potential for attraction or interaction of marine mammals and sea turtles at the VE Project site is likely. Despite the potential risks; however, the potential for entanglements are unlikely if anchor lines are kept taut at all times. SPMs, as in the proposed array, are designed to remain taught. The cage (and any attached vessels) will track around in a 'watch circle' with the current, maintaining a taught mooring line. Additionally, the pen will use a rigid copper alloy mesh, which presents no marine mammal entanglement hazard. The VE Project activity is not anticipated to result in collisions between protected marine mammal, sea turtle, or fish species and the net pen or tender vessel. The vessel captain will operate at sea in a manner that would reduce the risk of collisions with marine mammals and sea turtles. No impacts are anticipated on the Gulf sturgeon, as they are not anticipated to occur at the offshore distance of the VE Project site location (40 to 45 miles offshore). No impacts are anticipated on the Nassau grouper, as they are limited to locations including the Yucatan, Tortugas, and Key West. Due to the relatively shallow water depths of the proposed VE Project site location (approximately 130 ft deep), the SPM (anchor) securing the tender vessel and supporting the floating net pen would be positioned via diver assistance and/or drop camera systems, as a habitat conservation measure for avoidance and minimization of environmental impacts, thus ensuring that the placement is in an area of unconsolidated sediments (sand bottom) and avoiding hardbottom, coral, or other sensitive habitats.

In cooperation with NOAA Fisheries Protected Resources staff, the VE Project Team has prepared and will implement a ***Marine Mammal Monitoring Plan (MMMP)***. Marine protected species are marine mammals, sea turtles, and ESA-listed seabirds. The VE Project staff would monitor marine mammals and other protected species whenever staff are at the VE Project site. A designated representative of the EFP permit would report immediately to NOAA Fisheries **(a)** any observed or reported direct physical contact by any marine mammal, sea turtle, or ESA-listed seabird with any part of the net pen array; or **(b)** any observed or reported injured or entangled marine mammal, sea turtle, or ESA-listed seabird within 330 ft of any part the net pen array. The VE Project staff would suspend all surface activities, including stocking, harvesting operations, and routine

maintenance operations when an ESA-listed seabird comes within 330 ft of the activity until the bird leaves the area. The MMMP is provided in **Appendix D**.

6.4.3 Essential Fish Habitat (EFH)

The VE Project's net pen culture and harvest activities of almaco jack may adversely affect EFH, but would have only a minimal effect on EFH. The VE Project's activities are anticipated to have no effect on EFH Habitats of Particular Concern (HAPC), as none are located in the vicinity of the project area. The Reef and Banks Coral EFH HAPC are located in the northwestern portion of the GOM, off the Texas and Louisiana coasts; and the Pulley Ridge Coral EFH HAPC is located approximately 80 nautical miles southeast of the VE Project site. The Preferred and Alternate Sites identified by the VE Project Team do not coincide with any sensitive coral hardbottom, Coral EFH, or Coral HAPC habitats, as demonstrated by the NCCOS spatial analysis team.

The VE Project activities are anticipated to result in negligible, short-term impacts on EFH, including the *Shrimp, Red Drum, Reef Fish, Coastal Migratory Pelagics, Spiny Lobster*, *Coral and Coral Reefs Stone*, and *Stone Crab* Fishery Management Units (FMUs). The VE Project is not anticipated to result in substantial impacts on EFH waters (water quality) or substrate (hardbottom components) of the GOM or coastal habitats due to the stationary (SPM) site location and diver-assisted anchor placement of the VE Project; the limited size and duration of the project; operational features that would result in minimal impacts to water quality, and that prevent adverse impacts to shallow habitats. The VE Project has GPS-tracking features to help ensure that if gear becomes detached, a notification signal would be sent and the gear could be retrieved. There would be limited vessel activity associated with the project.

7.0 Anticipated Vessel Effort Information:

7.1 For Fixed Gear:

7.1.1 Type and Size of Gear

The VE Project will include an array consisting of two (2) offshore-strength SUBflex-style net pens (53 ft x 53 ft x 17 ft, with copper alloy mesh netting) and tender vessel, on a single point mooring (SPM; flipper delta-type embedment anchor) for the duration of deployment (**Appendix E**).

7.1.2 Amount of Gear

Two (2), 53 ft x 53 ft x 17 ft, offshore-strength SUBflex-style net pens will be deployed (no gear will be deployed to sample wild fish stock). Only one (1) pen will be stocked, as the second net pen is required for proper structural configuration (see **Figure 2**).

7.1.3 Number of Gear Hauls

Two (2) stocked net pen deployments will be performed; in support of two, back-to-back cycles of fish culture (no gear hauls of wild fish stock will be conducted).

7.1.4 Average Soak Time

Each stocked net pen deployment and fish culture cycle will have approximately a 9-month duration; for a total 18-month project duration (no soak time of gear will be conducted to target wild fish stock).

7.1.5 Sampling Months/Time of Year

The net pen deployment for the first fish culture cycle will occur approximately from December 2018 through August, 2019; and the second cycle will occur approximately from August, 2019 through April, 2020 (no sampling of wild fish stock will be conducted).

7.1.6 Sampling Locations and Depth

Each of the two fish culture cycles will be located on a SPM (flipper delta-type embedment anchor). Two preliminary site locations under consideration at the time of this submittal are the Preferred Sarasota Site #A, at approximately 27.069191° N and -83.199163° W, in approximately a 130-ft water depth; and the Alternate Sarasota Site #B, at approximately 27.127108° N, -83.238919° W, in approximately a 130-ft water depth.

Although an exemption of any restricted access area around the sites is being requested, it is anticipated that the BES will typically require the establishment of a 1,640-ft (500 m) buffer area around each side of the project area. For siting analyses, the VE Project has selected to define a 1.3 mile x 1.3 mile project area about each of the two sites' coordinates, for the 1.7-square-mile area for each site; however, the VE Project Team is amenable to repositioning the proposed sites and project footprints should the final siting analyses determine an alternate location that best avoids sensitive habitats, resources, or user groups:

Preferred Sarasota Site #A:

Location	Latitude	Longitude
Top Left	27.087752° N	-83.218684° W
Top Right	27.086662° N	-83.178426° W
Bottom Left	27.051718° N	-83.219894° W
Bottom Right	27.050629° N	-83.179649° W

Alternate Sarasota Site #B:

Location	Latitude	Longitude
Top Left	27.145665° N	-83.258456° W
Top Right	27.144584° N	-83.218175° W
Bottom Left	27.109629° N	-83.259656° W
Bottom Right	27.108550° N	-83.219389° W

7.2 For Mobile Gear:

No mobile gear will be deployed.

8.0 Vessel Information:

8.1 Vessel Name:

Schooner Machias

8.2 Vessel USCG Documentation Number, State License or Registration:

U.S. Coast Guard (USCG) Document No. 289053

8.3 Vessel Home Port:

Honolulu, HI

8.4 Vessel Owner Information:

Ocean Charter Service, Inc.
1042 D. Ilima Drive,
Honolulu, HI 96817
(808) 595-0219
CaptBillAustin@hawaii.rr.com

8.5 Vessel Captain Information and Primary Project Participants Names:

8.5.1 Captain

Bill Austin

8.5.2 Crew

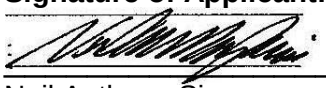
U of M graduate students, Kampachi staff, first mate, and cook (names to be provided)

Depending on the availability of Machias at the time of deployment, an alternative tender vessel of similar capability may be arranged from either Sarasota Bay or Charlotte Harbor, Florida. The exact specifications of the vessel and captain information will be provided as soon as they are confirmed for the deployment.

9.0 Principal Investigator (PI), Applicant (same as PI), and Project Coordinator's CV:

(**Appendix F**)

10.0 Signature of Applicant:



Neil Anthony Sims

APPENDIX A

Baseline Environmental Survey Guidance and Procedures for Marine Aquaculture Activities in U.S. Federal Waters of the Gulf of Mexico

Baseline Environmental Survey Guidance and Procedures for Marine Aquaculture Activities in U.S. Federal Waters of the Gulf of Mexico
October 24th, 2016

Purpose and Authorities

a) Purpose. This document provides information on the baseline environmental survey (BES) requirement for the NOAA Fisheries Gulf Aquaculture Permit (GAP) as well as requirements pertaining to the Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) permit. The information in this document is specific to marine aquaculture operations sited in federal waters of the U.S. Gulf of Mexico (Gulf).

Applicants are ***strongly encouraged*** to contact NOAA Fisheries and EPA prior to beginning survey work on a proposed aquaculture site as additional conditions may apply.

b) Authorities. NOAA Fisheries has the authority to issue GAPs under the Fishery Management Plan for Regulating Offshore Marine Aquaculture in the Gulf of Mexico (FMP) and regulations implementing the amendment codified at 50 CFR § 622, Subpart F. In accordance with the FMP and NOAA Fisheries implementing regulations, a BES of the proposed aquaculture site must be submitted as part of the GAP application package.[1]

The EPA issues NPDES permits under authority of the Clean Water Act (CWA). An NPDES permit is required for any aquaculture operation that produces 100,000 or more pounds of fish per year. The EPA requires that applicants submit baseline data on water quality and benthic systems as part of the NPDES permit application process.[2]

Guidance and Procedures

The BES consists of a ***Seafloor Survey*** and ***Hydrographic Measurements*** and shall be initiated after successful completion of the Pre-Application Meeting with the various federal permitting agencies. Potential applicants are required to conduct a BES of the proposed

[1] Once a GAP has been issued, the NOAA Fisheries requirement for permittees to monitor and report the environmental survey parameters at the site will be met by complying with EPA monitoring requirements.

[2] The EPA also administers Section 403(c) of the CWA which provides that NPDES permits for discharges to the "territorial sea, the waters of the contiguous zone, or the oceans" must be in compliance with the ocean discharge guidelines. These guidelines are used to determine whether or not a discharge will cause "unreasonable degradation" of those waters. Unreasonable degradation is defined as any significant adverse impact to water quality or the marine communities living in the water column and on the seafloor. CWA Section 403(c) requires that the EPA consider location and proximity of the discharges to sensitive marine habitat and communities in a determination of unreasonable degradation and the EPA can deny a permit if it finds that the location will result in significant adverse impacts.

area, analyze the data and submit a report to both the NOAA Fisheries (Jess.Beck@noaa.gov) and designated EPA contact (EPA Region 4 – Ferry.Rol@epal.gov; EPA Region 6 - Afghani.Jim@epa.gov). The processed data used in the analysis should be provided to NOAA and the EPA as part of the BES package.

NOAA Fisheries and the EPA will use the information submitted to determine whether or not particular features exist that could disqualify the proposed area for siting purposes. If the proposed site is disqualified, an alternate site must be chosen and another Pre-Application Meeting scheduled.

1) Seafloor Survey

The purpose of the site seafloor survey is to ensure that the site is clear of benthic and subsurface (*i.e.*, pipelines, buried debris, vessels etc.) features that would preclude the siting of an aquaculture operation. The boundaries of an aquaculture site should be a minimum of 500 meters from such features to provide a protective buffer from construction related activities and operational discharges. ***Note*** that NOAA Fisheries and EPA may modify the boundary distance on a case-by-case basis.

NOAA Fisheries and EPA may waive some or all of the seafloor survey requirements if data from prior seafloor surveys is available for the proposed site. NOAA Fisheries and EPA will make this determination on a case-by-case basis and will consider data quality and completeness. Applicants should note that even if certain requirements are waived, all data must still be analyzed and reported per Section 3.

Survey Methodology

Seafloor Surface

Acoustic (i.e., side-scan sonar) data in the 100 kHz frequency and 500 kHz frequency if available (use frequency and range settings providing best image quality) should be used to interpret for the presence of features on the seafloor surface within the boundaries of the proposed aquaculture site.[3] Survey line spacing should be set so that sonar tracks overlap sufficiently to obtain 100% coverage of the seafloor surface within the proposed site.

[3] NOAA Fisheries recommends designating an observer to scan for marine mammals in the area while conducting acoustic sonar surveys. If marine mammals are observed while conducting surveys, please halt the acoustic sonar survey until the animals have left the survey area.

Survey vessels should use an integrated GPS navigation system that can continuously determine the surface position of the vessel. In water depths greater than 91 meters (300 feet) survey vessels should use acoustic positioning of towed sensors to facilitate sufficiently accurate mapping of any recorded contacts.

A hull mounted, high-frequency, narrow beam hydrographic echo sounder must be employed to obtain bathymetric data. Bathymetry data should be logged digitally and continuously and should be corrected for vessel movement and tides.

Any significant discrete features discovered on the seafloor surface during the acoustic survey should be further resolved by adjusting range settings and frequency as appropriate. NOAA Fisheries and the EPA recognize that acoustical methods may not allow for complete and accurate identification of all seafloor features and will assume that any significant discrete features based on acoustical reflection should be avoided whether or not they are accurately identified. However, the applicant may choose to employ visual (photographic/video) methods of identification of discrete features if they believe it is warranted. In this case, applicants must provide high resolution still photos and/or video to fully and completely identify the discrete features in question.

Sub-Surface

Debris, pipelines and archeological resources may lay below the seafloor surface not detectable by sidescan sonar survey methods. Sub-surface data will be obtained with a magnetometer and a sub-bottom profiler.

> Magnetometer: For all surveys conducted in water depths less than 100 meters (328 feet), a proton precession or cesium total field magnetometer should be used to detect ferrous and other magnetically susceptible metals. Tow the magnetometer sensor as near as possible (but no more than 6 meters (20 feet) above the seafloor) and in a way that minimizes interference from the vessel hull and the other survey instruments.
>
> Attach a depth sensor to the magnetometer sensor and annotate each survey line with tow sensor height off seafloor and with start of the line (SOL) and end of the line (EOL) times. Ensure that magnetometer sensitivity is one gamma (γ) or one nanoTesla (nT) or less, and that the data sampling interval does not exceed one (1) second. Ensure also that the background noise level does not exceed a total of 3 gammas peak to peak.
>
> Record data on a digital medium in such a way that it can be linked to the positioning data. Make sure that the recording scales are set no higher than 1,000-gamma and 100-gamma full scale, respectively. Annotate shot points and recorder speed.

Sub-Bottom Profiler: Use a very high-frequency subbottom acoustic profiler operating within the 1.5- to 4.5-kHz bandwidth to provide continuous and very high resolution information of near surface geological features within the uppermost 15 meters (50 feet) of sediment. Run the subbottom profiler system to provide penetration that exceeds the depth of disturbance (i.e., the maximum expected anchor penetration).

Make sure that the subbottom profiler system is capable of achieving a resolution of vertical bed separation of at least one (1) foot in the uppermost 15 meters (50 feet) below the mudline.

Record the data digitally to allow signal processing to improve data quality further and allow export to a workstation for integrated interpretation and mapping of the data.

2) Hydrological Measurements

Hydrological information is necessary in order to model the directionality of water quality impacts and organic deposition on the seabed. The modeling results will be used to develop a directed operational monitoring plan for the facility.

A water current meter should be deployed at the approximate center of the proposed aquaculture site. The current speed and direction should be measured at a minimum of three depths: near surface, bottom of suspended cage, and one meter off the seabed. Data collection should occur for one deployment for a minimum of 20 days or 40 tidal cycles, measured hourly. If sufficient historical current data exist for the proposed site, NOAA and the EPA may waive this requirement. NOAA Fisheries and EPA will make this determination on a case-by-case basis and will consider data quality and completeness. Wave data for the site should be obtained from the Wave Information Study (WIS) station (U.S. Army Corps of Engineers) nearest the site. Wave properties to your location should be refracted using linear wave theory. Applicants should note that even if certain requirements are waived, all data must still be analyzed and reported per Section 3.

3) Data Analysis and Report

Field survey reports should be prepared using the guidelines below. Applicants should provide one hard copy and two DVD copies of the report to both NOAA Fisheries and the EPA as part of the permit application package for each agency. Note that DVD report information should be in PDF format. Applicants should also provide two digital copies of all survey maps (as DWG files) to both NOAA Fisheries and the EPA. Survey maps should be oriented to the North American Datum of 1927 (NAD 27) coordinate system. The processed data used in the analysis should be provided to NOAA and the EPA as part of the BES package.

The report should contain an evaluation and synthesis of the data gathered during the field survey. This information should be prepared, signed, and dated by a professional archaeologist who is qualified according to the standards found at 36 CFR part 61 Appendix A (http://www.gpo.gov/fdsys/pkg/CFR-1998-title36-vol1/pdf/CFR-1998-title36-vol1-part61-appA.pdf). Specialists in other fields may participate in data analysis and report preparation, as needed.

The following information should be included in the report.

A. A description of the area surveyed, including the permitted area and its minimum and maximum water depths.

B. A list of the individuals with names, titles and affiliations that were involved in survey planning, fieldwork, and report preparation, and a description of their duties.

C. A discussion of the field survey methodology, including:

1. A brief description of the navigation system, including a statement of its estimated accuracy for the area surveyed.

2. A brief description of survey instrumentation, including scale, sensitivity settings, sampling rates, and tow heights off seafloor, as appropriate for each instrument.

3. A description of the survey vessel, including its size, sensor configuration, instrument set-backs, and navigation antennae locations.

4. Vessel speed and course changes.

5. Sea state and weather conditions.

6. A copy of the ***original*** daily survey operations log. Include sensor height off seafloor for the magnetometer and acoustic survey (sidescan sonar) for the beginning and end of each survey line.

7. A description of survey procedures, including a statement of survey and record quality, a comparison of survey line crossings, and discussion of any problems that may affect the ability of the report preparers to determine the potential for the presence of hazards, debris, human activities (*i.e.*, oil/gas structure, artificial reefs), and biological and archaeological resources in the survey area.

8. An explanation of the problem(s) if unable to meet the survey line spacing or instrumentation guidelines listed above.

D. A navigation post plot map of the survey area at a scale of 1:12,000 showing survey lines, shot points at 152-meter (500-foot) intervals, line direction in the grid projection in which the lease is described (e.g., UTM, Lambert, or geographic coordinates) with tics placed every five inches thereon, and with geodetic graticules every 60 seconds. (Submit one hardcopy and two digital copies (one in PDF format and ESRI Shapefile format) of this map to both NOAA Fisheries and the EPA.) Orient this map, or separate maps at the same scale that also show survey lines, shot points, and line direction, to true north and delineate the following, as appropriate:

1. For sub-bottom profiler data, include the horizontal and vertical extent of all relict geomorphic features having potential for associated prehistoric sites.

   When relict fluvial systems are recorded, make sure that the map:

   a. differentiates between generations of channeling when more than one generation is present;

   b. shows any internal channel features such as point bar deposits and terraces;

   c. delineates any channel margin features such as natural levee ridges;

   d. indicates all depths of channel banks and channel axes (thalwegs); and

   e. delineates all areas recommended by your archaeologist for avoidance for potential archaeological resources.

   Note: An isopach map of channel fill sediments is often the most efficient means of conveying the above information, but this method alone will not allow differentiation between more than one generation of channeling.

2. All magnetic anomalies and acoustic survey (sidescan sonar) contacts of unknown source (for magnetic anomalies use map symbol: ▲; for acoustic survey contacts use map symbol: ☒).

   Identify these magnetic anomalies and acoustic survey contacts using only the aforementioned symbols and a unique number keyed to the listings in the unidentified magnetic anomaly and acoustic survey tables in the text (see paragraph F below).

   In congested areas with numerous unidentified magnetic anomalies, you may use a map(s) at a scale of 1:6,000 to depict the anomalies. If you do, tie this congested area map(s) into the 1:12,000 survey area map. ***Plot all recommended potential archaeological avoidance areas on the survey area map.***

3. Sites of oil and gas operations (e.g., well locations, platform sites, and/or pipelines), when available at the time of report preparation.

4. Sites of former oil and gas operations (e.g., abandoned well locations, platform sites, and/or pipelines).

E. An analysis of the potential for prehistoric sites within the survey area that includes:

1. A discussion of relict geomorphic features and their archaeological potential that includes the type, age, and association of the mapped features; the acoustic characteristics of channels and their fill material; evidence for preservation or erosion of channel margins; evidence for more than one generation of fluvial downcutting; and the sea level curves you used in the assessment.

2. A discussion, based on the capabilities of current technology in relation to the thickness and composition of sediments overlying the area of a potential site, of the potential for identification and evaluation of buried prehistoric sites.

F. A current review of existing records for reported shipwreck locations in the survey area and adjacent areas, and the following, as appropriate:

1. A table of the unidentified magnetic anomalies with the OCS block, shot point, and survey line location (corrected for sensor offset); gamma intensity; lateral extent (duration); whether the anomaly is characterized by a dipolar, monopolar, or complex signature; the magnetometer sensor tow height off seafloor; the NAD 27 decimal degree coordinates of the center of each unidentified anomaly; and the recommended avoidance zone. Below is an example of a suggested format for this unidentified magnetic anomaly table;

Anomaly Number	Line No.	Shot Pt.	Tow Height (feet)	Signature	Intensity (gammas)	Duration (feet)	NAD 27 Coordinates (in decimal degrees)	Minimum Avoidance Dist. (feet)
1	0020	11.4	20	Dipole	15	75		100

2. A table of sidescan sonar contacts with the lease block, shot point, and survey line location (corrected for sensor offset); size; shape; height of protrusion above the seafloor; the NAD 27 decimal degree coordinates; and recommended avoidance distance of each. A suggested format for this unidentified sidescan sonar contact table is included below;

Anomaly	Magnetometer	Dimensions	Shape	NAD 27	Minimum

Number	Association	LxWxH (ft)		Coordinates (in decimal degrees)	Avoidance Dist. (feet)
1	Mag. Anomaly 1, Line 0020, Shot Point 11.4	100 x 50 x 5	Linear		100

3. A discussion of any magnetic anomalies and acoustic survey contacts of unknown source in terms of their potential as historic shipwrecks (include an analysis of reported nearby wrecks and their potential association with these contacts/anomalies on the basis of vessel size and anomaly characterization);

4. A discussion of any correlation between magnetic anomalies or acoustic survey contacts and known or probable sources;

5. For any archaeological resources that can be positively identified from remote-sensing records, an analysis of their possible significance and recommendations for any further research or special precautions that may be necessary.

6. A discussion of the potential for shipwreck preservation in terms of bottom sediment type and thickness, and the effects of past and present marine processes in the survey area; and

7. A discussion of the potential for identification and evaluation of potential shipwrecks considering the capabilities of current technology in relation to the water depth, probable thickness and composition of sediments overlying the potential shipwreck location, and the preservation potential.

G. Representative data samples from each survey instrument to demonstrate the quality of the records. If appropriate, include the following data samples, which you may use in lieu of the representative data samples:

1. A sample of subbottom profiler data for each type of relict landform that is identified. When more than one generation of fluvial channeling is evident, include a sample that depicts each generation. Each sample should be readable and include horizontal and vertical scales. Provide any interpretive highlighting or annotation of the sample data on a separate overlay or a copy of the sample data. Do not highlight original survey data.

2. Copies of all acoustic survey data where contacts representing unidentified objects are recorded. Make sure that the copies are readable and include the scale. If you want to provide any interpretive highlighting or annotation of the sample acoustic

survey data, provide either a separate overlay or a copy of the sample data. Do not highlight original acoustic survey data. Include a digital copy of the computer-generated mosaics as a geo-referenced Tagged Image Format (TIF) file.

H. A summary of conclusions and recommendations supported by the field survey data including:

   1. A discussion of all known or potential physical, biological and archaeological resources; and

   2. Recommendations for avoidance or for further investigations.

I. A discussion of the data and results from any additional investigations that are required by NOAA Fisheries and the EPA.

J. Hydrological Measurements: Reporting of the hydrological measurements (waves and currents) should contain a thorough description of the methods employed including the instrumentation used, location and depth of deployment, deployment periods and field procedures involved in the deployment, maintenance and retrieval of equipment. Descriptions should also include the number of cells (bins) measured, and data averaging protocols for the instruments used and how the data were processed and analyzed. Any problems or issues should also be discussed in the methods section.

   The results should provide a description of maximum, minimum and average currents and tidal excursions and include a current rose plot of depth averaged currents and a rose plot for near surface, mid-water and near bottom currents. A plot of the tidal ellipse (magnitude and inclination of the major axis and magnitude of minor axis) should also be included.

   The processed wave and current data used in the analysis should be submitted to NOAA and the EPA on CD_ROM or DVD.

APPENDIX B

Screening Discussion for the Velella Project

Gulf of Mexico – Exempted Fishing Permit

SCREENING DISCUSSION FOR THE VELELLA PROJECT GULF OF MEXICO – EXEMPTED FISHING PERMIT

Ken Riley, Lisa Wickliffe, James Morris, Jr. and the NCCOS Coastal Aquaculture Spatial Team

NOAA National Ocean Service
National Centers for Coastal Ocean Science

KAMPACHI FARMS, LLC
OCEAN CULTURE, NATURALLY

Agenda:

1. Velella Epsilon Project
2. Alternative Siting Analysis
3. Environmental Modeling

Additional topics:

1. Baseline Environmental Assessment
2. Environmental Monitoring Plan
3. Best Management Practices Plan

Our Aquaculture Mission

We develop decision support tools enabling *coastal managers* to safeguard the environment while supporting aquaculture development in the coastal zone.

Our Aquaculture Priorities

Environmental Interactions
Coastal Planning and Siting
Ecosystem Services

CASS Team Members


Dr. James Morris,
Marine Ecologist


Dr. Ken Riley
Marine Ecologist


Dr. Lisa Wickliffe
Marine Spatial


Dr. Seth Theuerkauf
Marine Spatial


Dr. Jud Kenworthy
Habitat Scientist


Dr. Najat El Moutchou
Agriculture Scientist


Troy Rezek,
Aquaculture Biologist


Jennica Hawkins
Aquaculture Biologist


Amit Mahaltra
Marine Spatial


Doug Munroe
Admin Assistant


Chris Katalinas
Communications


Rodney Guajardo
Marine Spatial


Ginny Crothers
Marine Spatial


Barry King, P.E.,
Engineer/Modeler


Gary Fisher
Biological Tech


Jon Jossart
Marine Spatial

Aquaculture Coastal Planning Tools

Marine Spatial Planning

- Regional ocean mappers
- State siting atlases
- Habitat digitizer (delineate habitats from geo-referenced images)

Examples:

- NOAA Digital Coast
- Gulf AquaMapper
- North Carolina Shellfish Aquaculture Siting Tool

Environmental Models

AquaModel

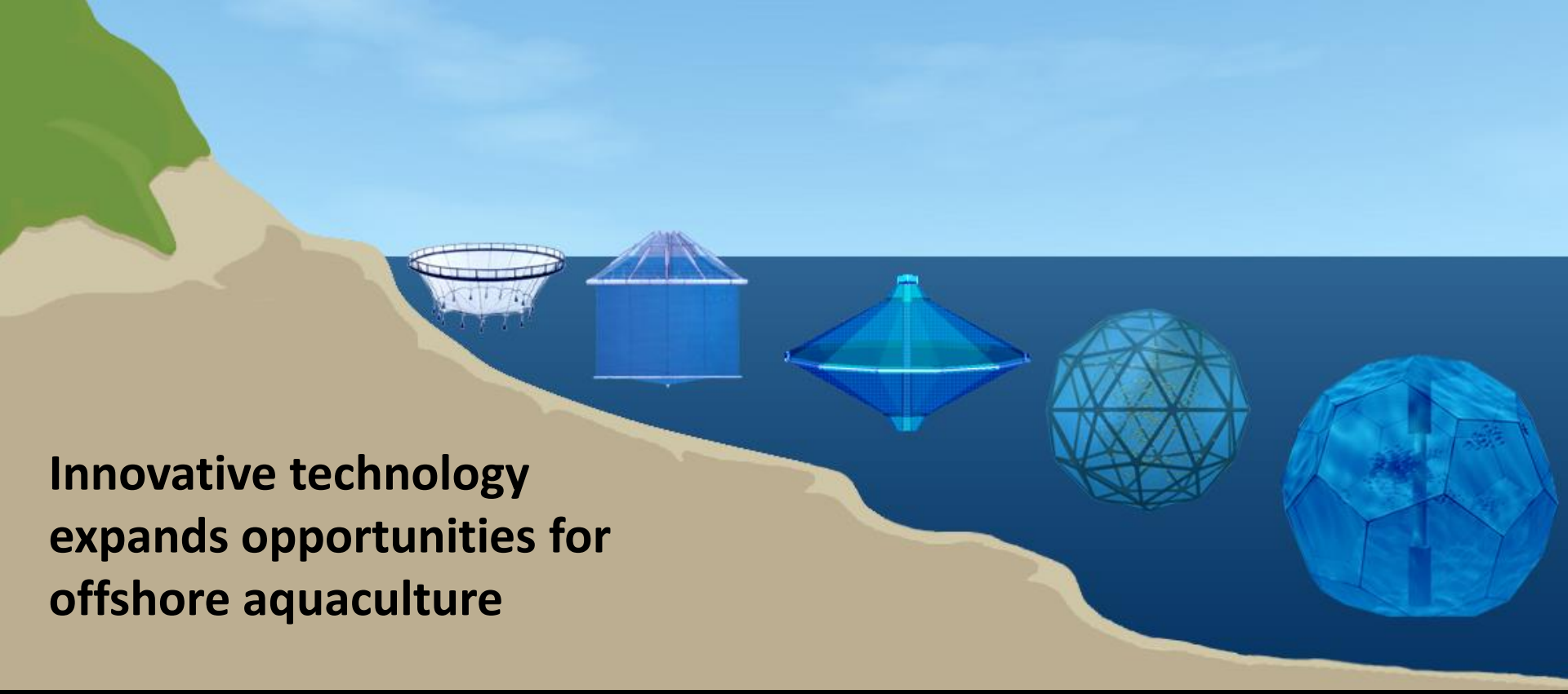
- *Hawaii*
- *California*
- *Gulf of Mexico*

Farm Aquaculture Research Model (FARM)

- *Long Island Sound*
- *Chesapeake Bay*

Tool and Data Center

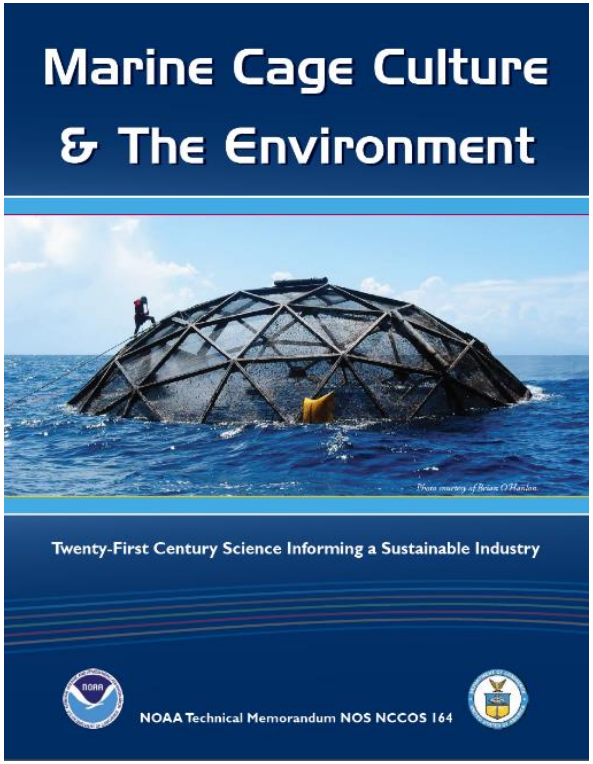
- Marine Cage Culture and the Environment
- Guidelines for Environmental Monitoring Offshore Aquaculture Operations
- Best Management Practices for Offshore Aquaculture in the US Caribbean

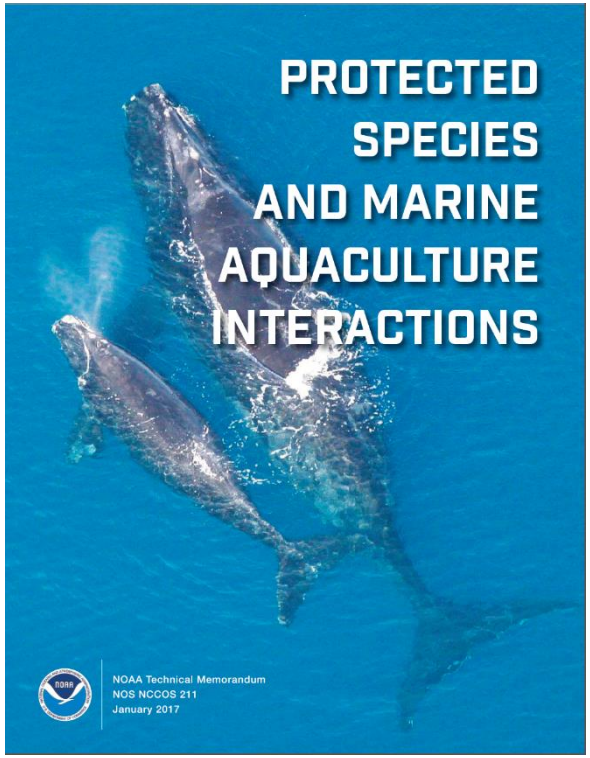


Innovative technology expands opportunities for offshore aquaculture

	Floating Flexible & Rigid	Floating Flexible	Submersible Flexible	Submersible Rigid	Emerging Technology
Deployment Distance	Nearshore	Open Ocean	Open Ocean	Open Ocean	Open Ocean
Cage Diameter (m)	10-50	40-60	40-60	15-45	> 75
Production (MT)	25-440	300-725	50-225	50-170	> 1,800

Environmental Interactions





Coastal Aquaculture Planning Portal (CAPP)

New!

A Toolbox for Sustainable Aquaculture Coastal Planning and Siting

The Coastal Aquaculture Planning Portal (CAPP) is a toolbox of coastal planning tools designed to assist managers, planners, and industry with sustainable aquaculture development. This toolbox was developed in partnership with Digital Coast, a product of the *NOAA* National Ocean Service Office of Coastal Management.

Choose one of the subportals below.

~80 aquaculture tools!

NCCOS NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE

ABOUT RESEARCH PRODUCTS NEWS

A NOAA scientific diver inspects an offshore netpen for finfish aquaculture. Credit: NOAA

New Aquamapper Tool Available for Aquaculture Siting in the Gulf of Mexico

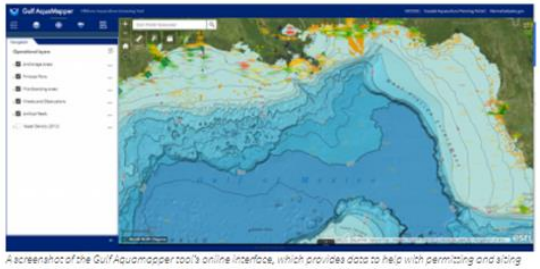
Published on: 02/14/2018

Research Area(s): Marine Spatial Ecology / Coastal Aquaculture Siting and Sustainability

Region(s) of Study: Waterbodies / Gulf of Mexico

Primary Contact(s): james.morris@noaa.gov

NCCOS is excited to release the newly created Gulf Aquamapper, a web-based tool for exploration, permitting and siting of offshore aquaculture in the Gulf of Mexico. The Gulf Aquamapper is a geodatabase featuring aquaculture-relevant GIS data for biological, navigational, military, social, economic, physical and chemical parameters. The Gulf AquaMapper can be used as a one-stop screening solution for industry and coastal managers focused on identifying suitable and unsuitable areas for aquaculture development. With over 50 data types, the Gulf Aquamapper is the first spatial planning tool designed specifically for aquaculture in the Gulf of Mexico. In particular, the tool aims to streamline the permitting process established by the Gulf Aquaculture Fishery Management Plan (PDF) in 2016, by reducing logistical and economic inefficiencies for coastal managers and aquaculture investors. Multiple data layers can be viewed simultaneously for a more comprehensive assessment of competing uses, and maps can be printed and shared to inform a more detailed site assessment to verify environmental conditions and establish site-specific designs.



A screenshot of the Gulf Aquamapper tool's online interface, which provides data to help with permitting and siting of potential offshore aquaculture ventures. Credit: NOAA

Google aquaculture portal

Alternative Siting Analysis Methods

- Determined farming parameters and area of interest
- Identified major constraints within the area of interest
- Developed alternatives that comply with farming parameters
- Rank alternatives based on number and interaction type

Velella Epsilon Farming Parameters:

Max distance from port(s): 50 miles

Depth requirements: ≥40m

Substrate requirements: coarse sand

Min and max seawater temp: 18°C to 34°C

Min and max current velocity: >0.1 m/s and <0.8 m/s

Max wave energy: not specified

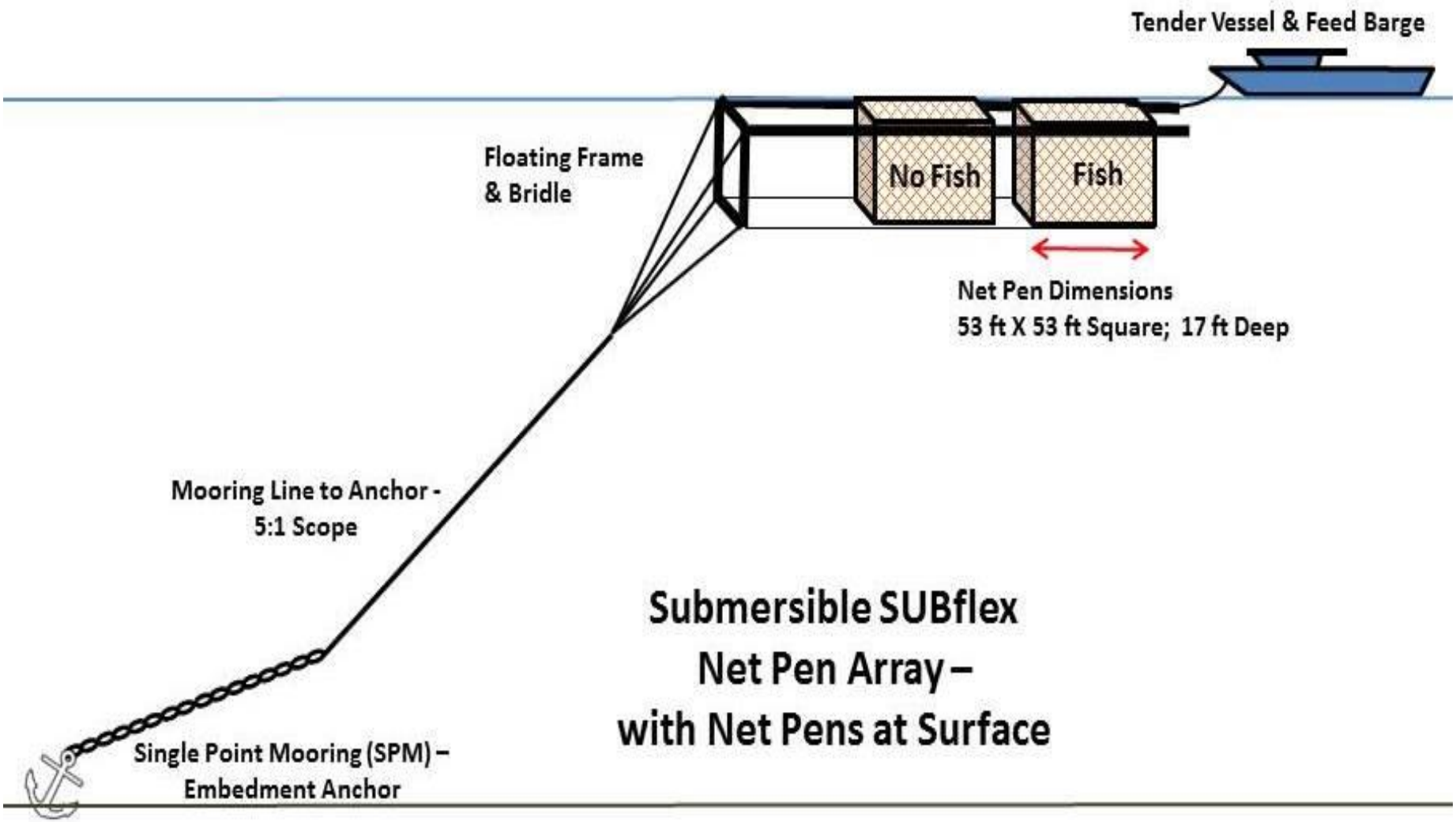
Project footprint (including anchorage): 0.3 km^2 (0.1 mi^2)

Max footprint (including navigation buffer): 2.0 km^2 (0.5 mi^2)

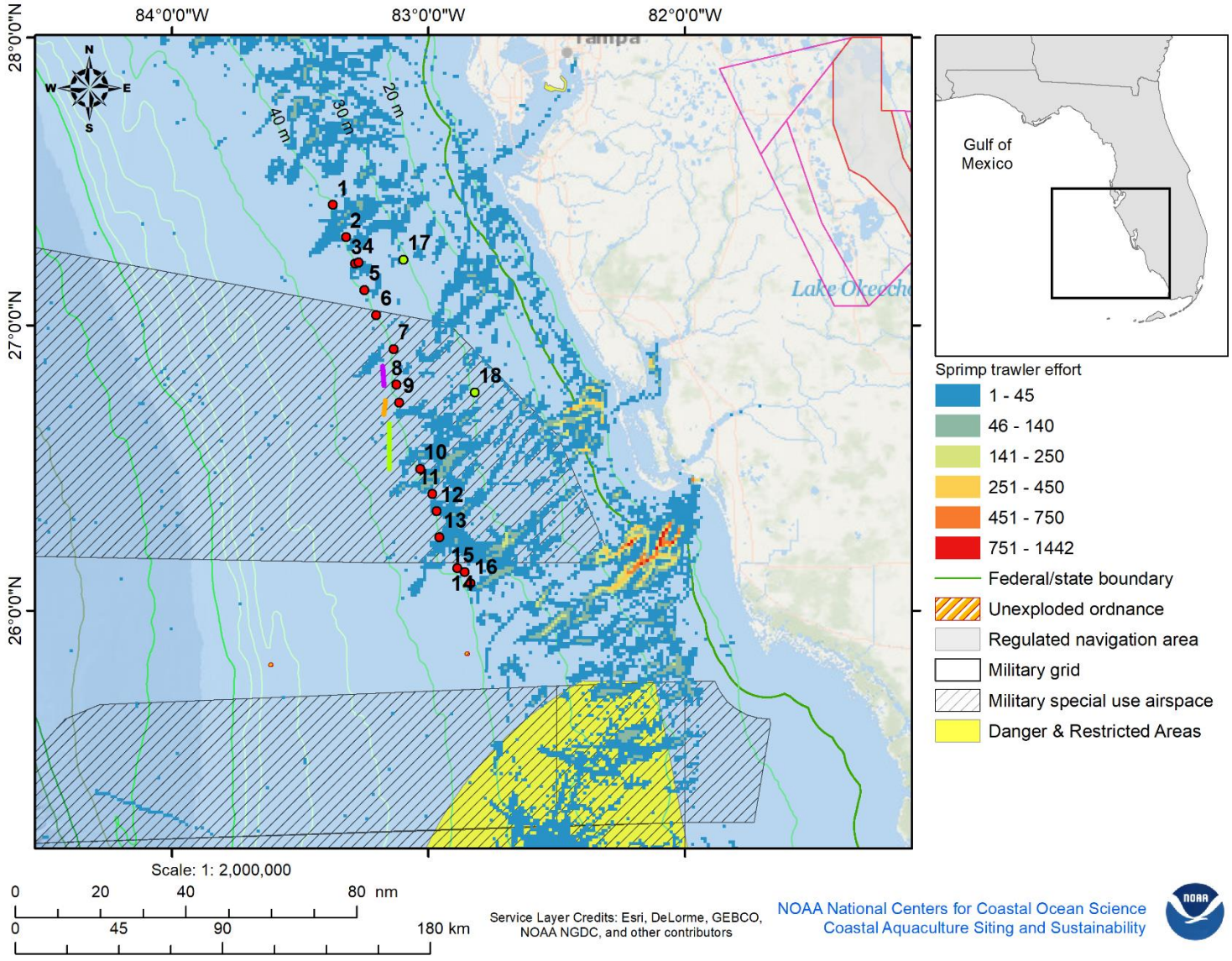
Velella Epsilon: Plan

SUBflex Open Ocean Netcages

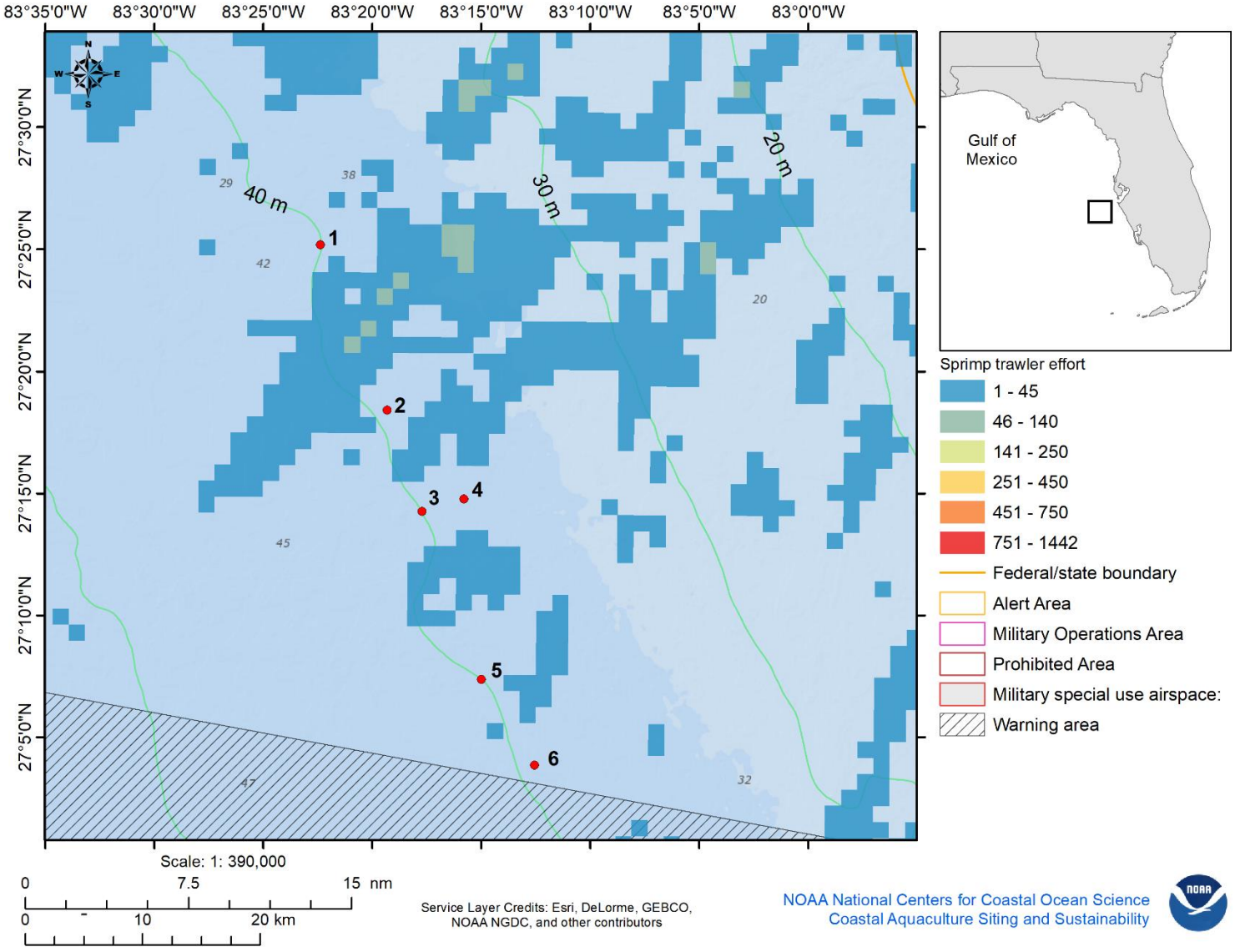
GiliOcean Technology



Alternative Sites – Military and Commercial Fishing



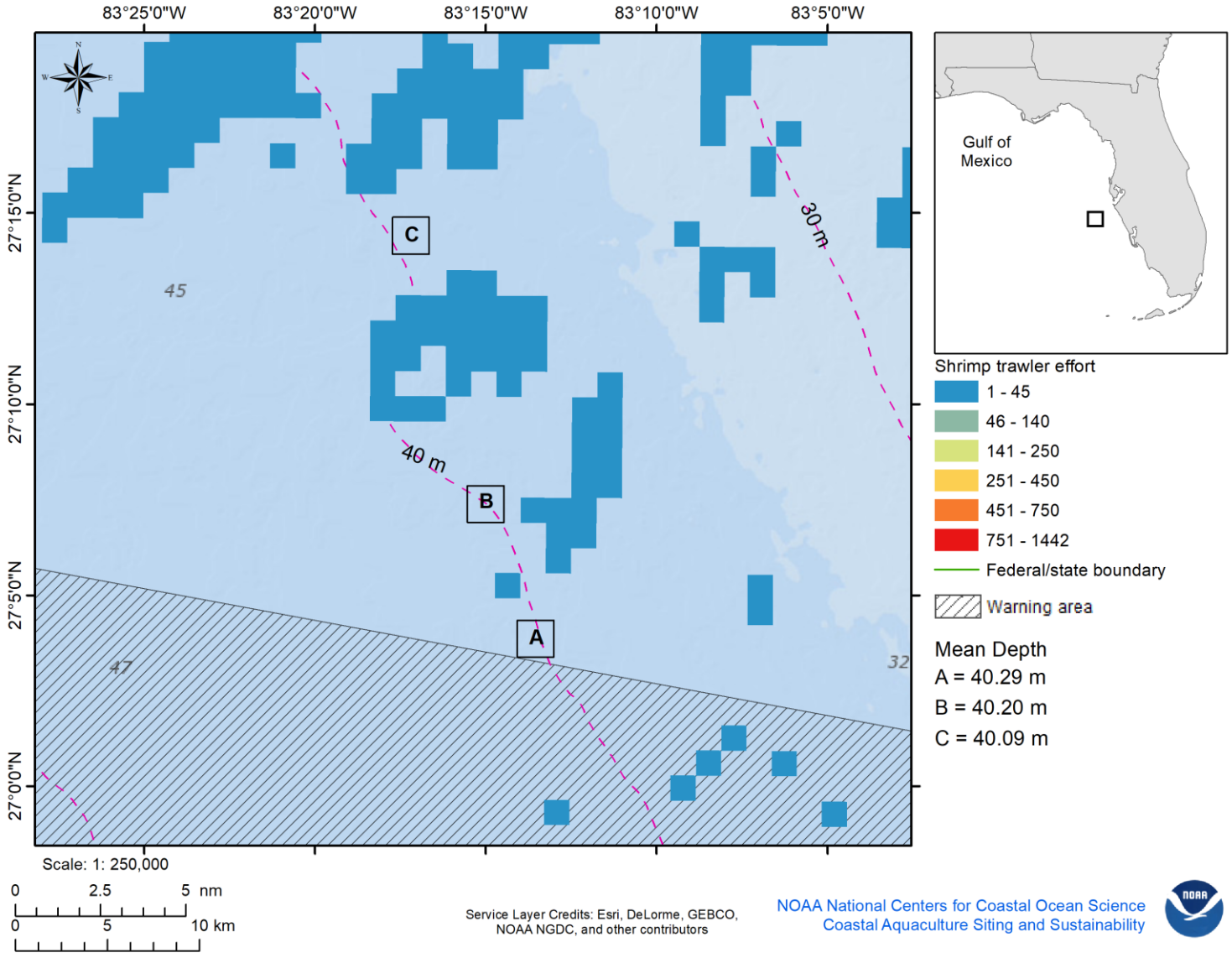
Alternative Sites – Military and Commercial Fishing



NOAA National Centers for Coastal Ocean Science
Coastal Aquaculture Siting and Sustainability

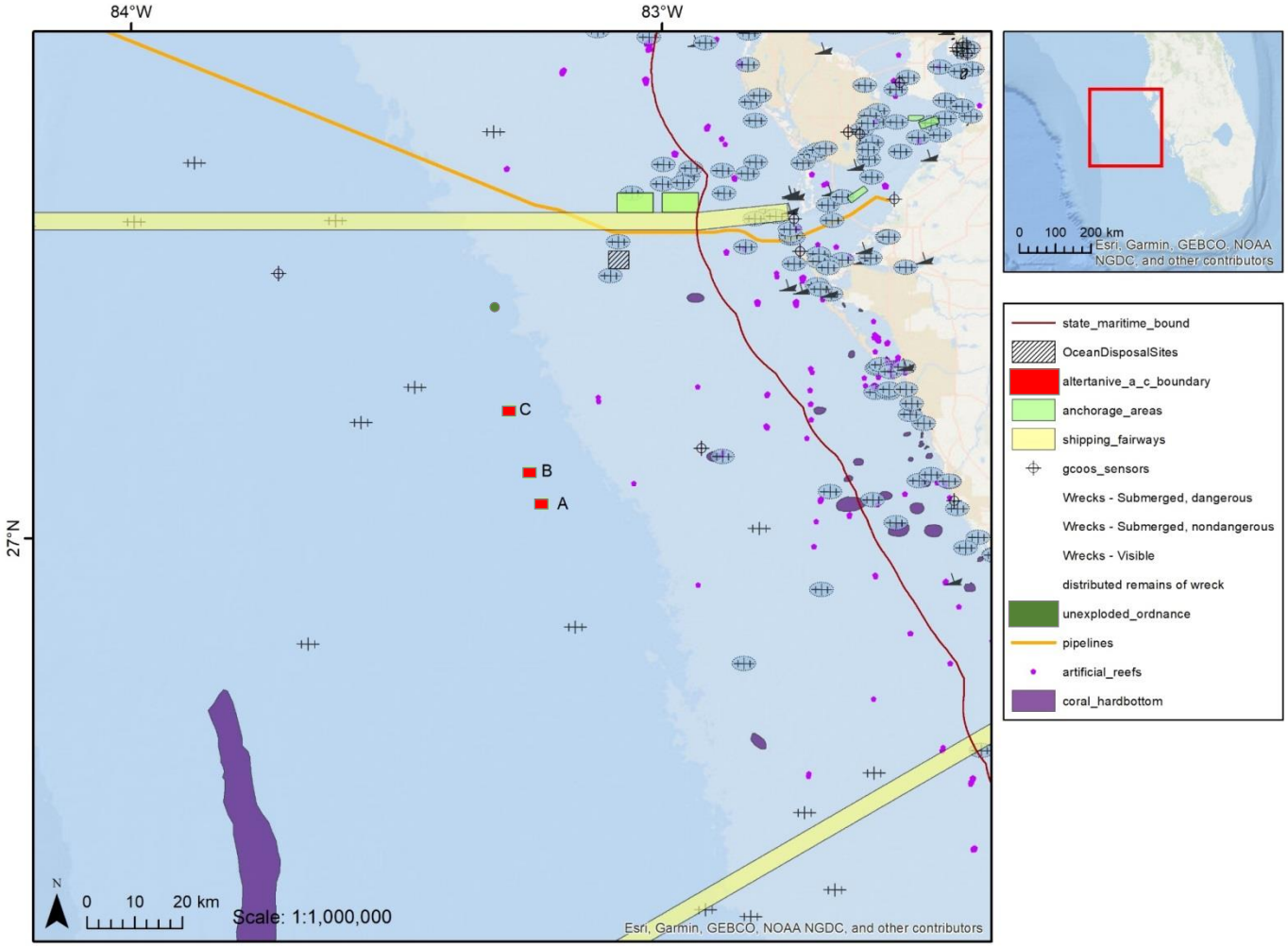
Most Desired Alternative Sites

Area of interest – 2 km²



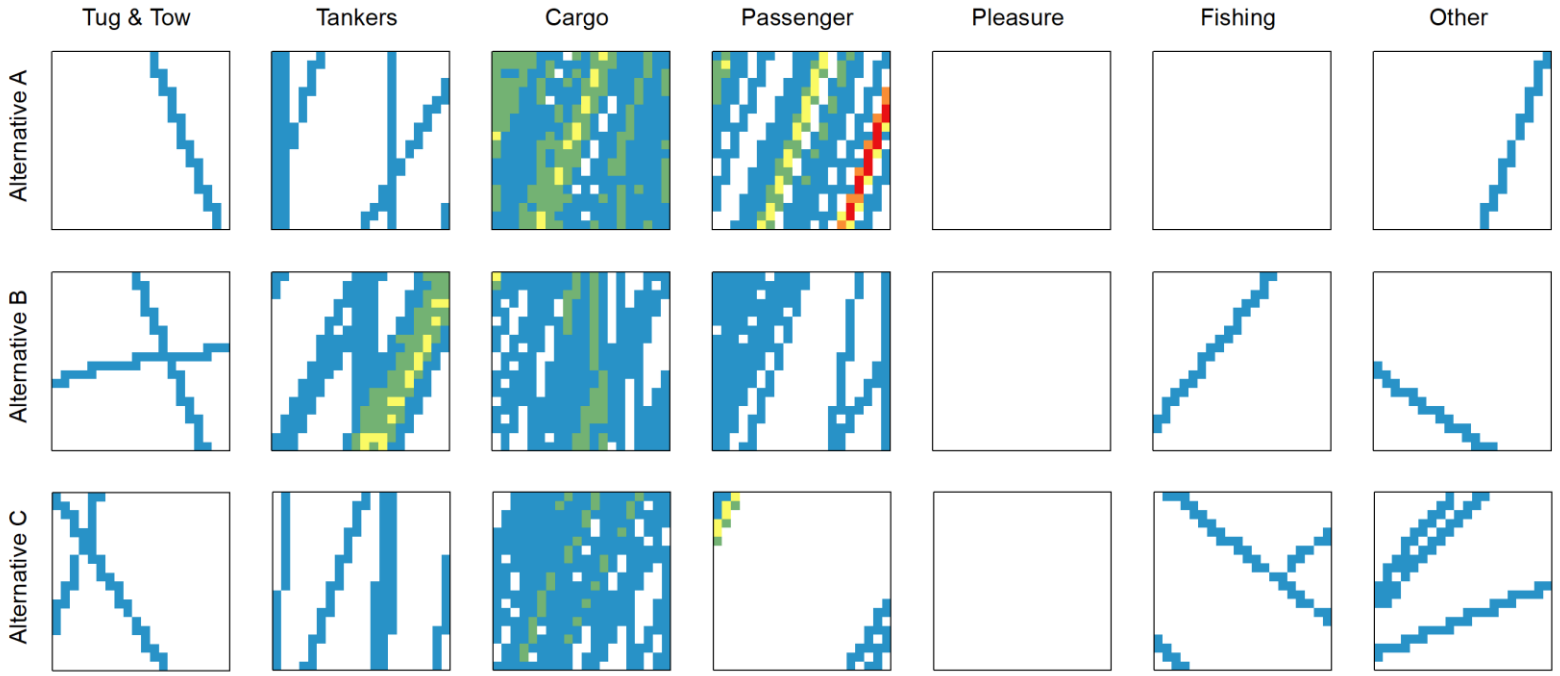
Most Desired Alternative Sites

Area of interest – 2 km^2



No overlap with ocean disposal sites, submarine cables, shipping lanes, anchorage areas, wrecks, or artificial reefs

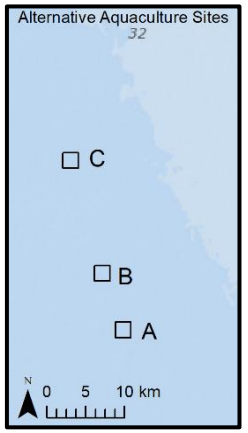
Vessel Traffic (AIS Data – 2013)



Count of Vessel Trips

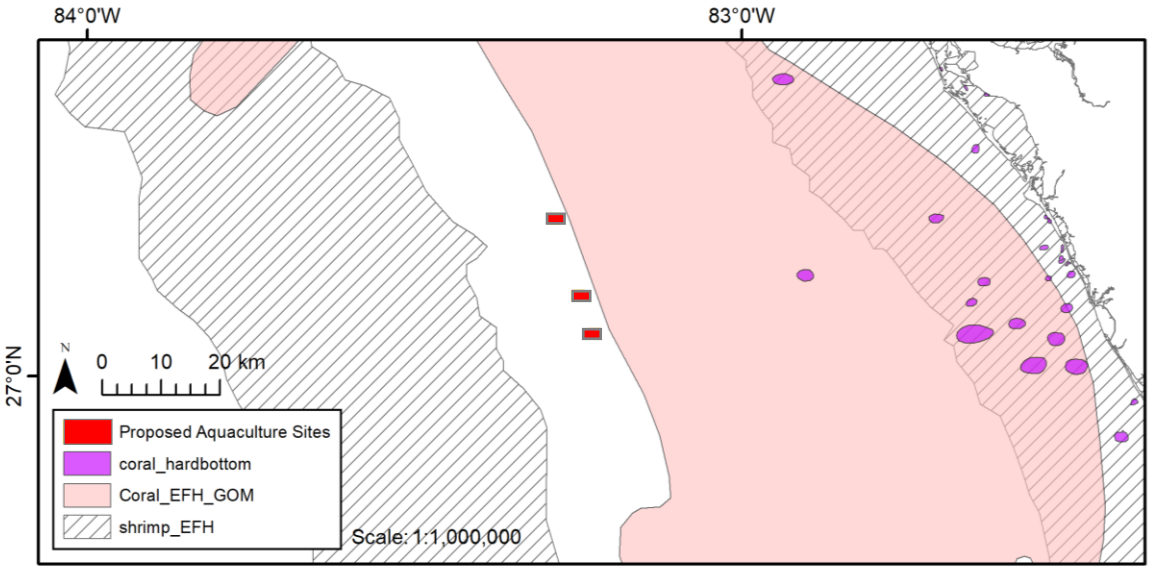
- 1 - 3
- 4 - 7
- 8 - 19
- 20 - 34
- 35 - 40

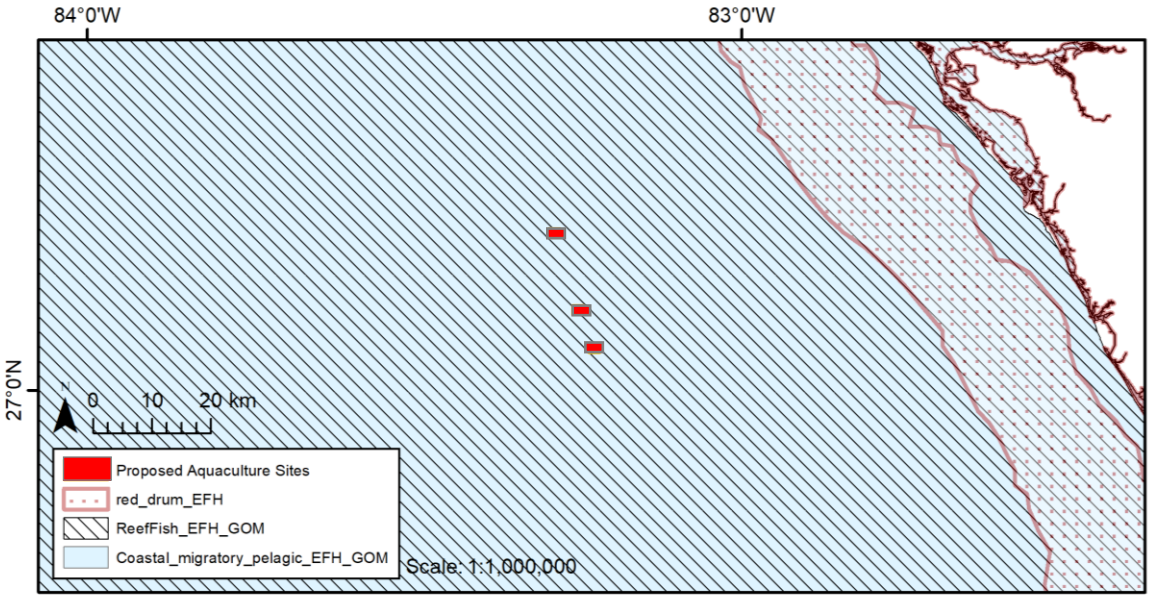
Each box is 2 km x 2 km, each cell is 100 m x 100 m
the count is of vessel trips is the sum of
all vessels that passed
through a cell during the course of a year.
Data is from MarineCadastre Zone 17 2013 AIS data.



Essential Fish Habitat

- Red Drum
- Snapper-Grouper Complex
- Coastal Migratory Species





20 YEARS Habitat Protection Reaches Milestone
ESSENTIAL FISH HABITAT

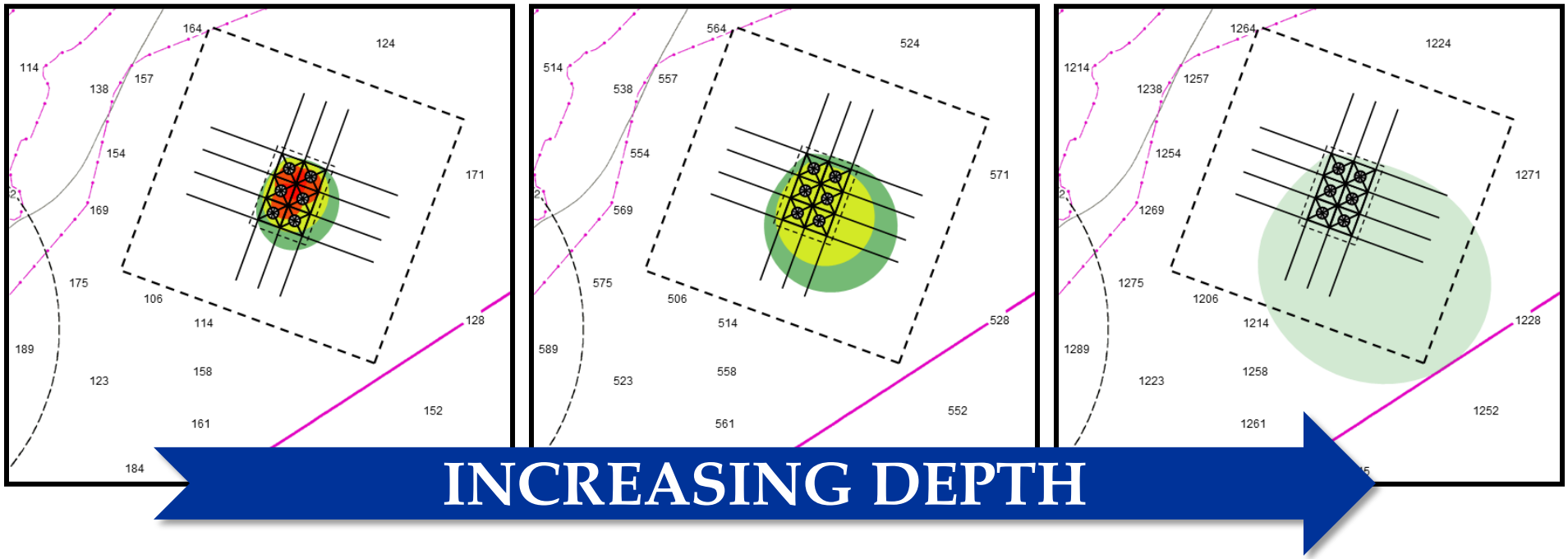
Agenda:

1. Velella Epsilon Project
2. Alternative Siting Analysis
3. Environmental Modeling

Additional topics:

1. Baseline Environmental Assessment
2. Environmental Monitoring Plan
3. Best Management Practices Plan

Environmental Modeling

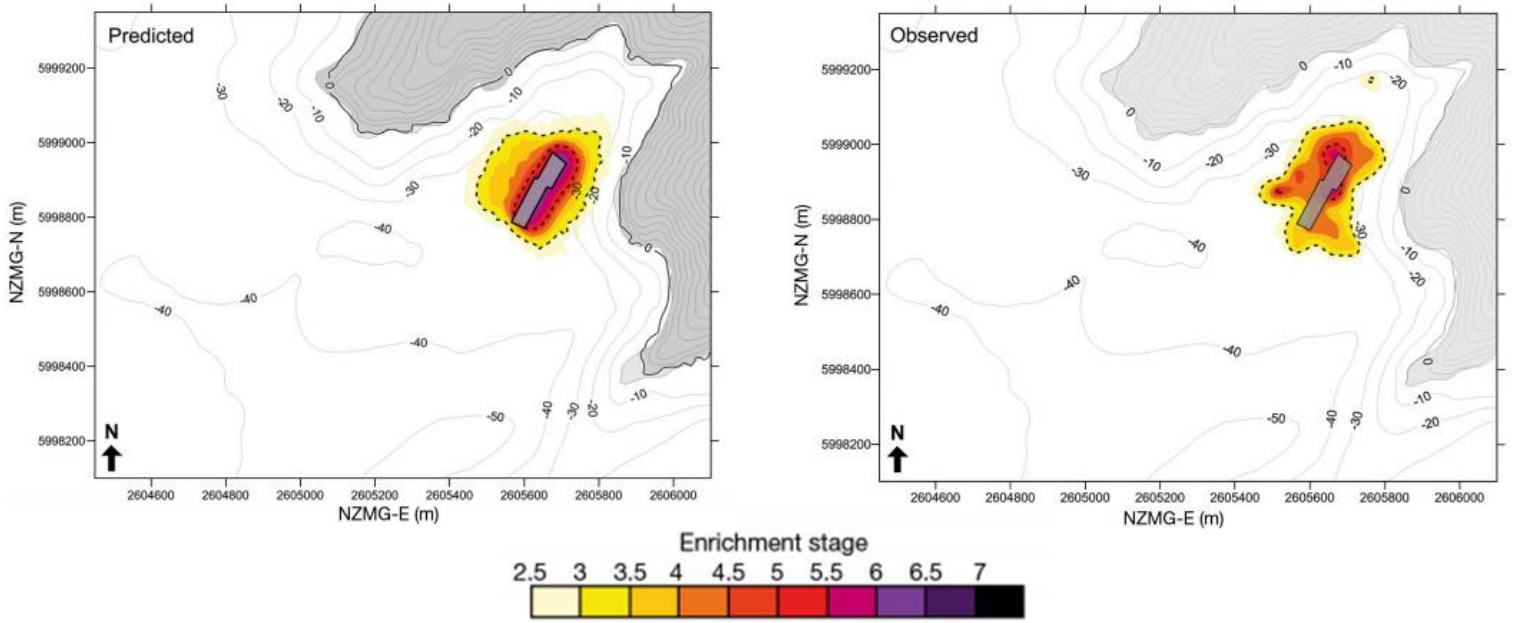


USING MODELS AS GUIDANCE FOR SITING AND ENVIRONMENTAL MONITORING

- Locations: Hawaii, California, Gulf of Mexico
- Production format: marine cage operations

DEPOMOD

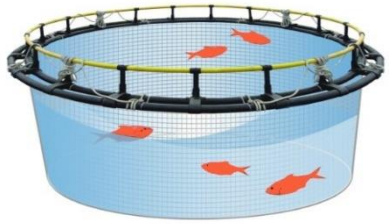
- Deposition model for feed and wastes
- Predicts benthic impacts through particle tracking and resuspension
- Temporal/spatial characteristics solids settlement
- Predicts worst-case scenario
- Validated and well published

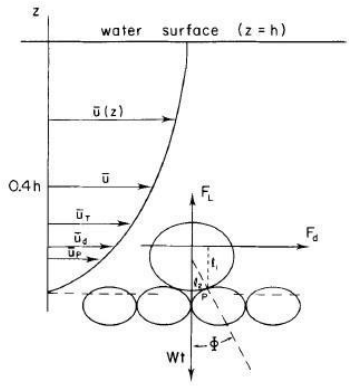


(Adapted from Keeley et al 2013)

Model Parameters

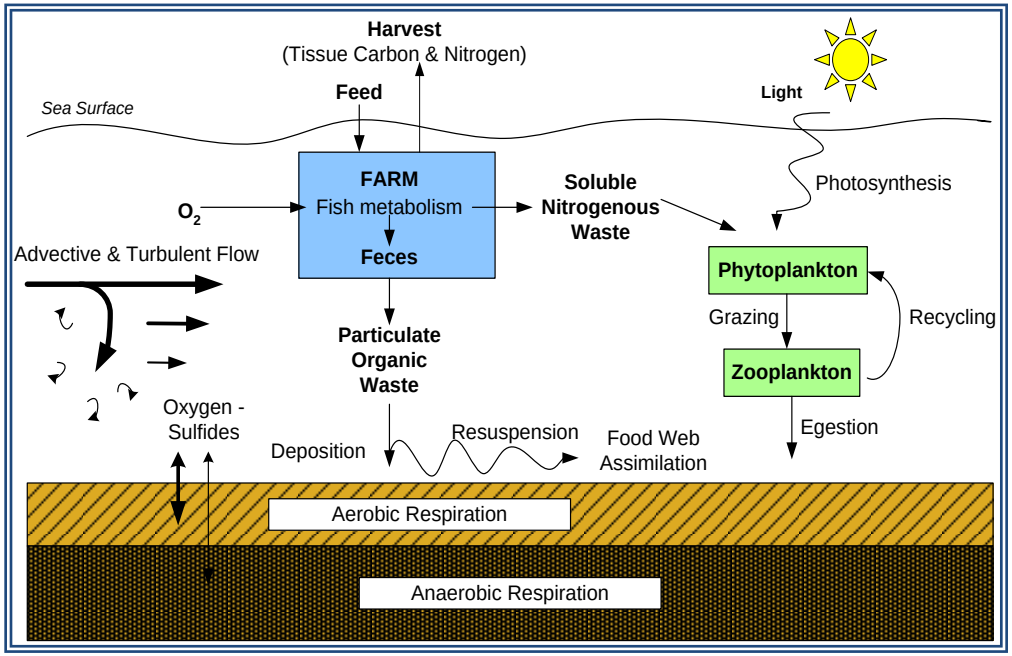
Parameter	Value
Domain	1500 X 1500 m
Grid Generation Module	
Grid Cell Dimensions	25 X 25 m
Number of Major Grid Cells	60 X 60
Specific Feed Rate SFR	1.05%
Particle Tracking Module	
Material Type	g of Carbon
Release	Continuous
Particle Parameters	
Feed Water Content	9%
Feed Digestibility	85%
Feed Wasted as % of feed fed	3%
Carbon as % of Dry Feed Pellets (dry weight)	57%
Carbon as % of fecas (dry weight)	30%
Settling Velocity of Feed Pellets (1 particle group)	9 cm/s
Settling Velocity of feces (1 particle group: +/- SD)	1.49 cm/s
Current Velocity Data	
Current Velocity Data	Recorded
Current Velocity time step	1 hour
Turbulence model	
Random Walk	Yes
Dispesion coefficient x	0.1 m^2/s
Dispesion coefficient y	0.1 m^2/s
Dispesion coefficient z	0.001 m^2/s
Particle Trajectory model	
Number of particles (for each particle type, per cage,	1
Trajectory evealuation accuracy (model time step)	High (60 s)
Resuspension module	
Number of loops to run model	1
Consolidation time of Particles	40 days





Aqua Model

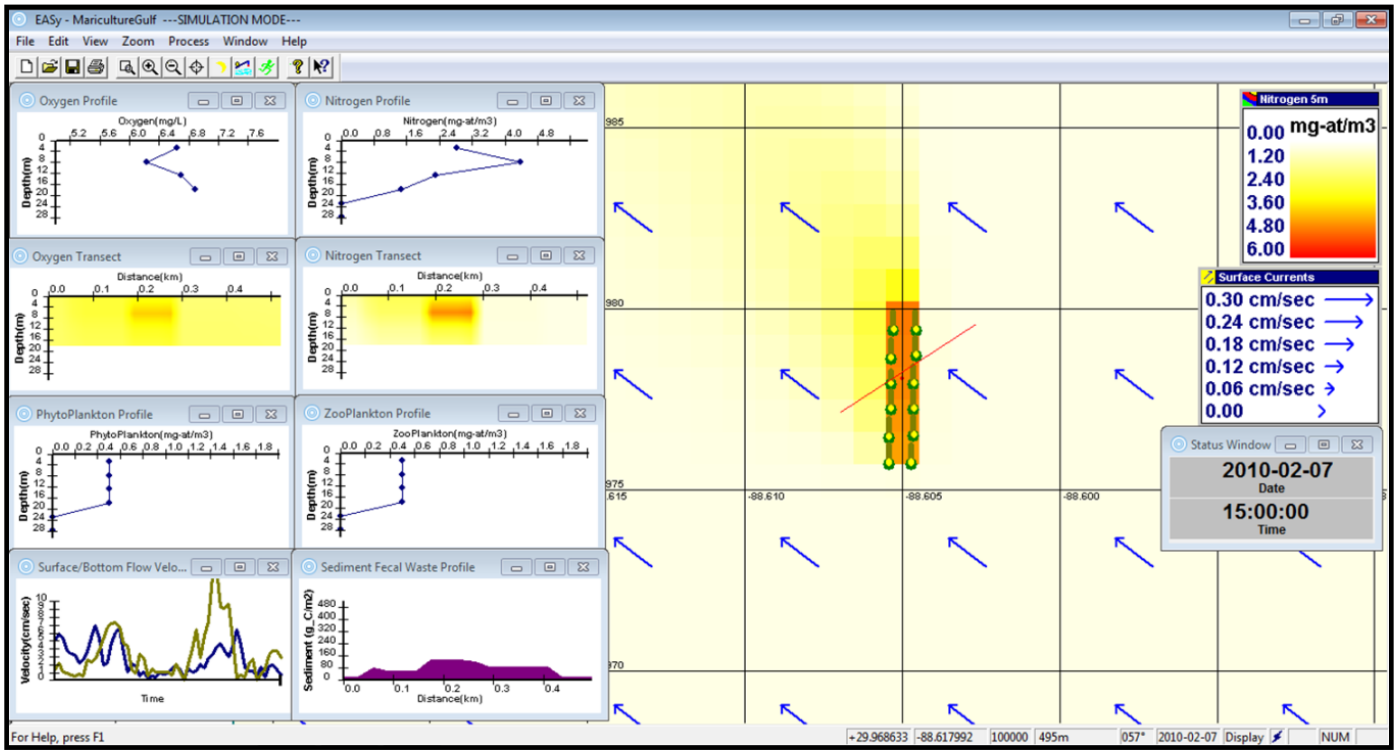
AquaModel provides a real-time, three-dimensional simulation of the growth and metabolic activity of penned fish as well as the associated flow and transformation of nutrients, oxygen, and particulate wastes in adjacent waters and sediments



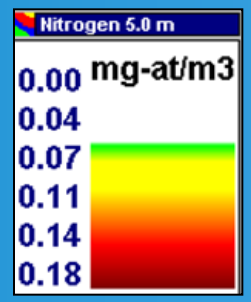
AquaModel Output

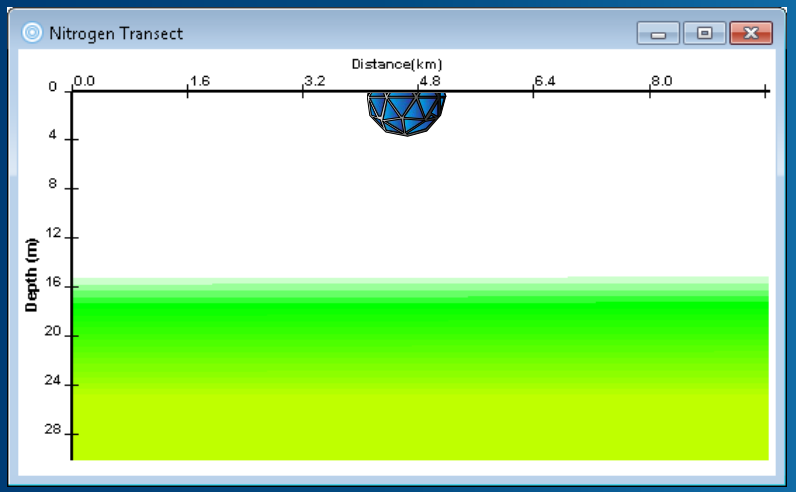
Depth profile plots →

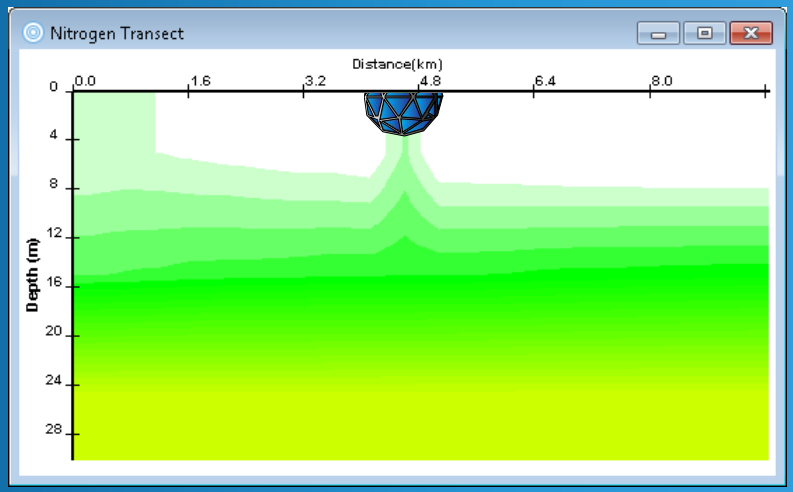
Time series plots →



Dissolved nitrogen (5-m depth)







Time: 3 months
Biomass: 2,100 kg
Feed: 45 kg/d

Time: 10 months
Biomass: 12,000 kg
Feed: 98 kg/d

Agenda:

1. Velella Epsilon Project
2. Alternative Siting Analysis
3. Environmental Modeling

Additional topics:

1. Baseline Environmental Assessment
2. Environmental Monitoring Plan
3. Best Management Practices Plan

Thanks for Partnering With Us!

Questions?

Contact: Dr. Ken Riley
NOS/NCCOS Coastal Aquaculture Siting and Sustainability
Email: ken.riley@noaa.gov
252-728-8750

Dr. James Morris
NOAA NOS

Dr. Ken Riley
NOAA NOS

Dr. Lisa Wickliffe
NOAA NOS

APPENDIX C

Guidance and Procedures for

Genetic Requirements for Gulf Aquaculture Permits

Guidance and Procedures for Genetic Requirements for Gulf Aquaculture Permits

February 12th, 2016

Purpose

To provide information on the requirements for broodstock sourcing, as well as information on genetic improvement techniques, for cultured juveniles stocked into offshore aquaculture facilities in the Gulf of Mexico (Gulf). The Fishery Management Plan for Regulating Offshore Marine Aquaculture in the Gulf of Mexico (FMP) and implementing regulations at 50 CFR § 622, Subpart F contain requirements pertaining to broodstock and cultured juveniles aimed at ensuring that escaped cultured animals present minimal genetic risk to the local wild stock from which they originated.

Background

NOAA Fisheries has the authority to issue Gulf Aquaculture Permits (GAPs) under the FMP. Final regulations for this FMP can be found at http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/aquaculture/documents/pdfs/gulf_aquaculture_fmp_fr.pdf. The FMP, which was developed by the Gulf of Mexico Fishery Management Council (Council) under the authority of the Magnuson-Stevens Fishery Conservation and Management Act, requires a GAP for aquaculture operations in federal waters of the Gulf that intend to grow species managed by the Council (with the exception of shrimp and corals, which are not allowed).

A list of species allowed for culture in the Gulf can be found in at http://gulfcouncil.org/Beta/GMFMCWeb/downloads/species%20managed.pdf. ***Note*** that shrimp and coral species ***cannot*** be cultured under the FMP and regulations.

Requirements for Gulf Aquaculture Permit Holders

A. Broodstock Sourcing

Under the regulations, applicants must certify that all broodstock or progeny of such broodstock will be or were originally harvested from U.S. waters of the Gulf, will be or were harvested from the same population or sub-population that occurs where the facility is located,

and that no genetically engineered or transgenic animals will be used or possessed at the aquaculture facility.

The terms population and subpopulation are defined in the NOAA Fisheries Glossary[1] (Glossary) as follows:

> ***Population*** is defined as a number of individuals of a particular species that live within a defined area. It is equivalent to the term stock. Stock is defined in both the Glossary and the Magnuson-Stevens Fishery Conservation and Management Act (amended 2007; §3, 104-297(42)). Therein, a ***stock*** is 1) a part of a fish population usually with a particular migration pattern, specific spawning grounds, and subject to a distinct fishery or 2) a species, subspecies, geographical grouping, or other category of fish capable of management as a unit.
>
> ***Subpopulation*** is defined as geographically or otherwise distinct groups in the population between which there is little exchange.

Other relevant fishery terms not defined here that may provide further context, if desired, include species, management (or conservation) unit (often equivalent to stock), and evolutionarily significant unit (see also distinct population segment).

Additional broodstock requirements and restrictions include:

- Permittees must submit certification to NOAA Fisheries that all original broodstock have been harvested from U.S. waters of the Gulf.
- Each individual brood animal must be marked or tagged (e.g., via a Passive Integrated Transponder (PIT), coded wire, dart, or internal anchor tag) at the hatchery to allow for identification of those individuals used in spawning.
- Permittees must submit fin clips for each individual brood animal to NOAA Fisheries. If permittees do not own or operate the hatchery, they must obtain a signed certification from the owner(s) of the hatchery indicating that this requirement has been met and furnish a copy of this certification to NOAA Fisheries. Procedures for procuring and submitting fin clips can be found in Appendix B.
- Permittees must submit certification to NOAA Fisheries that no genetically engineered or transgenic animals are used or possessed at the aquaculture facility.[2] A ***genetically***

[1] National Oceanic and Atmospheric Association (NOAA) (2006) NOAA Fisheries Glossary, Revised Edition. United States Department of Commerce, NOAA, Technical Memorandum NMFS-F/SPO-69.

[2] *Aquaculture facility* means an installation or structure, including any aquaculture system(s) (including moorings), hatcheries, equipment, and associated infrastructure used to hold, propagate, and rear allowable aquaculture species in the Gulf EEZ under authority of a GAP.

engineered animal is defined as an animal modified by recombinant DNA (rDNA) techniques, including the entire lineage of animals that contain the modification. The term genetically engineered animal can refer to both animals with heritable rDNA constructs and animals with non-heritable rDNA constructs (e.g. modifications intended for gene therapy). A ***transgenic*** animal is defined as an animal whose genome contains a nucleotide sequence that has been intentionally modified in vitro, and the progeny of such an animal. ***Note*** that an animal that has been altered such that its ploidy has been changed (e.g., a triploid animal) is not considered to be genetically engineered, provided that that animal does not contain genes that have been introduced or otherwise altered by modern biotechnology.

- F_1 individuals (i.e., first generation offspring of original wild-caught broodstock) can be used for broodstock purposes without further justification. Permittees who wish to use F_{2+} individuals (i.e., second or higher generation offspring bred in captivity) for broodstock purposes must first submit a genetics management plan to NOAA Fisheries for review and approval. This plan must include a risk assessment. Supporting information may include results from modeling (e.g., OMEGA[3]), pedigree analysis (e.g., using P-LOCI[4] to track parentage), population genetic analyses, certification of sterility in the stocked animals (e.g., via triploidy), or other applicable data.
- When using the offspring of original wild caught broodstock as broodstock, permittees must still abide by all requirements outlined above and in the regulations.

NOAA Fisheries anticipates that the following four species will be initially targeted for offshore aquaculture in the Gulf: almaco jack (*Seriola rivoliana*), cobia (*Rachycentron canadum*), red drum (*Sciaenops ocellatus*), and red snapper (*Lutjanus campechanus*). Appendix A includes guidelines for sourcing broodstock for these species in relation to the geographic location of the aquaculture facility. These guidelines are based on the best available science at this time and may be modified in the future.

[3] The Offshore Mariculture Escapes Genetics Assessment (OMEGA) model is freely available at http://www.nmfs.noaa.gov/aquaculture/science/omega_model_homepage.html.

[4] Matson S.E., M.D. Camara, W. Eichert, M.A. Banks. 2008. P-LOCI: a computer program for choosing the most efficient set of loci for parentage assignment. Molecular Ecology Resources 8:765-768.

B. Genetic Improvement Techniques

Genetic improvement is a process through which the incidence or expression of desirable traits (e.g., improved growth, higher product quality, resistance to stress or diseases) are increased in a cultured population.

Genetic improvement programs that include the use of genetic engineering or transgenics are **prohibited** (see definitions of ***genetically engineered*** and ***transgenic*** above). Allowable genetic improvement techniques may include one or more of the following: selective breeding, chromosome manipulation, hybridization, and sex control. These terms are defined and described below.

1) ***Selective breeding*** is a process by which animals are intentionally bred to produce progeny with desirable traits. Selective breeding is an often long-term process, with potentially permanent heritable genetic gains, as each generation of broodstock is selected based on desired characteristics and individuals are interbred in a controlled manner. Selective breeding programs commonly focus on traits such as growth rate, survival, stress tolerance, disease resistance, and meat quality and yield.

2) ***Chromosome manipulation*** is a modification of the number, identity, or origin of chromosomes within somatic or sex (typically egg) cells. Examples of this technique include induction of polyploidy and maintaining inbred lines.

    a. Polyploidy

    Triploidy is the most commonly produced polyploid state in aquaculture. Triploid animals contain three sets of chromosomes in their somatic cells. Triploid animals are often sterile, which can be an effective management tool for protecting wild populations by preventing reproduction with farmed conspecifics. Moreover, with triploid-induced sterility, physiological resources are used for bodily maintenance and growth rather than producing eggs and sperm, which can result in improved growth, survival, and meat quality.

    b. Inbred lines

    The making of inbred lines involves the creation of genetically identical or nearly identical populations. This technique can be used to produce large numbers of offspring with specific desirable characteristics in one generation by making multiple copies of high performance or selectively bred individuals. Maintenance of inbred lines may be coupled with hybridization (see below) to produce superior characteristics in an F_1 generation (i.e., hybrid vigor).

3) ***Hybridization*** occurs when genetically distinct individuals are crossed to produce heterozygous offspring, which contain two different alleles at a given gene or genes. Hybridization between different breeds, strains, or varieties of the same species (intraspecific) is allowed. Hybridization between species (interspecific) is prohibited. Hybridization may result in heterosis, or hybrid vigor, in which heterozygous offspring display enhanced performance (usually growth). Because heterosis requires hybridization, its effect is often restricted to the F_1 generation and not heritable. Therefore, ensuring a consistent supply of heterotic F_1 individuals requires the maintenance of multiple strains at the aquaculture operation.

4) ***Sex control*** means manipulating sex determination or sex ratio, typically with skew toward a monosex culture. Controlling sex may allow for more efficient exploitation of desirable sex-specific traits.

APPENDIX A: Species-Specific Requirements for Sourcing Wild Broodstock[5]

These guidelines are based on the best available science at this time and may be modified in the future if additional scientific data becomes available. For species that are allowed to be cultured under the regulations, but are not specified in this Appendix, permittees must provide NOAA Fisheries with information supporting the proposed collection range. NOAA Fisheries will use this information to determine whether or not the proposed collection range is suitable.

Permittees must submit a *Request to Harvest Broodstock* form to NOAA Fisheries at least 30 days prior to each time a permittee or their designee intends to harvest broodstock from the EEZ or state waters. NOAA Fisheries must approve any broodstock harvest activities before harvest can occur. This form can be found at http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/permit_apps/.

Almaco jack (*Seriola rivoliana)*

There are no studies of population genetic structure in almaco jack in the Gulf or elsewhere. Other commonly cultured seriolids include Japanese amberjack (*S. quinqueradiata*), greater amberjack (*S. dumerili*), and yellowtail amberjack (*S. lalandi*). Population genetic studies in these species show little to no divergence within water masses, similar to other pelagic finfish, such as tuna and billfish. For example, Gold and Richardson (1998a[6]) found evidence of two stocks of greater amberjack off the southeastern U.S., one in the northern Gulf and a second along the western Atlantic coast. Thus, research to date in closely related species indicates that almaco jack within the Gulf may be a single panmictic population.

Collection Range: Wild almaco jack broodstock may be collected within U.S. state or federal waters of the Gulf.

[5] Broodstock collection requirements listed for almaco jack, cobia, red drum, and red snapper only.
[6] Gold JR, Richardson LR (1998a) Population structure in greater amberjack, *Seriola dumerili*, from the Gulf of Mexico and western Atlantic Ocean. Fish Bull 96:767-778.

Cobia (*Rachycentron canadum)*

Gold et al. (2013)[7] found no evidence of structure among western US Atlantic and northern Gulf populations. Thus, research to date indicates that cobia within the Gulf may be a single panmictic population.

Collection Range: Wild cobia broodstock may be collected within U.S. state or federal waters of the Gulf.

Red drum (*Sciaenops ocellatus)*

Gold et al. (1993[8], 1994[9], 1999[10]) and Seyoum et al. (2000[11]) reported weak genetic divergence between Atlantic and Gulf populations. In the northern Gulf alone, Gold et al. (1999[12]) found isolation by distance (positive correlation between genetic and geographic distance), possibly attributable to sex-specific behaviors, and suggested a geographic neighborhood size relative to genetic migration of 500-600 km. Gold and Turner (2002[13]) reported similar results, with a neighborhood size of 700-900 km. Most recently, tagging studies in the Tampa Bay region indicated fairly high spawning site fidelity (~60%) and natal homing, although there was some mixing with a population 132 km to the south and another ~30-40% of tagged fish presumably spawned out of the range of monitoring.[14] Although this level of migration outside of the monitored region would homogenize allele frequencies across a broader geographic range, the known migratory radius is therefore 132 km. Thus, research to date suggests red drum display a minimum geographic neighborhood size of roughly 260 km.

Collection Range: Wild red drum broodstock may be collected within an 82 mile (~132 km radius) of the site of the permitted aquaculture operation.

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[7] Gold JR, Giresi MM, Renshaw MA,Gwo J-C (2013) Population genetic comparisons among cobia from the northern Gulf of Mexico, U.S. western Atlantic, and southeast Asia. N Am J Aquacult 75:57-63.

[8] Gold JR, Richardson LR, Furman C, King TL (1993) Mitochondrial DNA differentiation and population structure in red drum (*Sciaenops ocellatus*) from the Gulf of Mexico and Atlantic Ocean. Mar Biol 116: 175-185.

[9] Gold JR, King TL, Richardson LR, Bohlmeyer DA, Matlock GC (1994) Allozyme differentiation within and between red drum (*Sciaenops ocellatus*) from the Gulf of Mexico and Atlantic Ocean. J Fish Biol 44: 567-590.

[10] Gold JR, Richardson LR, Turner TF (1999) Temporal stability and spatial divergence of mitochondrial DNA haplotype frequencies in red drum (*Sciaenops ocellatus*) from coastal regions of the western Atlantic Ocean and Gulf of Mexico. Mar Biol 133:593-602.

[11] Seyoum S, Tringali MD, Bert TM, McElroy D, Stokes R (2000) An analysis of genetic population structure in red drum, *Sciaenops ocellatus*, based on mtDNA control region sequences. Fish Bull 98:127-138.

[12] Gold JR, Richardson LR, Turner TF (1999) Temporal stability and spatial divergence of mitochondrial DNA haplotype frequencies in red drum (*Sciaenops ocellatus*) from coastal regions of the western Atlantic Ocean and Gulf of Mexico. Mar Biol 133:593-602.

[13] Gold JR, Turner TF (2002) Population structure of red drum (*Sciaenops ocellatus*) in the northern Gulf of Mexico, as inferred from variation in nuclear-encoded microsatellites. Mar Biol 140:249-265.

[14] S Lowerre-Barbieri, Florida Fish and Wildlife Conservation Commission, personal communication.

Red snapper (*Lutjanus campechanus)*

Several studies have found no evidence of red snapper population genetic structure in the Gulf (e.g., Gold and Richardson 1998b[15], Garber et al. 2004[16], Pruett et al. 2005[17]) despite evidence of relative site fidelity of adults and homing in juveniles from tagging (e.g. Szedlmayer 1997[18], Workman et al. 2002[19]). More recent work employing genetics, tagging, and otolith microchemistry, however, suggests a metapopulation stock structure in which semi-independent, local populations are variably connected by migration, extinction, and recolonization (Pruett et al. 2005[20], Patterson 2007[21], Saillant et al. 2010[22]; see also Smedbol et al. 2002[23]). Patterson (2007), for example, found that while many adults display site fidelity, some may move hundreds of km, and larger fish moved greater distances than smaller and younger fish. These non-equilibrium conditions may homogenize allele frequencies among populations, accounting for the lack of stock structure in earlier research.

Stock assessments for red snapper treat the species as two relatively independent stocks separated by the Mississippi River[24], a conclusion putatively based on otolith elemental signatures (Patterson et al. 1998[25]; Cowan et al. 2002[26]; Patterson et al. 2008[27]). However, this is based on water mass signatures and may not reflect smaller

[15] Gold JR, Richardson LR (1998b) Genetic homogeneity among geographic samples of snappers and groupers: evidence of continuous gene flow? Proc Gulf Caribbean Res Inst 50:709-726.
[16] Garber, AF, Tringali MD, Stuck KC (2004) Population structure and variation in red snapper (*Lutjanus campechanus*) from the Gulf of Mexico and Atlantic Coast of Florida as determined from mitochondrial DNA control region sequence. Mar Biotechnol 6:175-185.
[17] Pruett CL, Saillant E, Gold JR (2005) Historical population demography of red snapper (*Lutjanus campechanus*) from the northern Gulf of Mexico based on analysis of sequences of mitochondrial DNA. Mar Biol 147:593-602.
[18] Szedlmayer ST (1997) Ultrasonic telemetry of red snapper, *Lutjanus campechanus*, at artificial reef sites in the northeast Gulf of Mexico. Copeia 1997:846-850.
[19] Workman I, Shah A, Foster D, Hataway B (2002) Habitat preferences and site fidelity of juvenile red snapper (*Lujanus campechanus*). ICES J Mar Sci S43-S50.
[20] Pruett CL, Saillant E, Gold JR (2005) Historical population demography of red snapper (*Lutjanus campechanus*) from the northern Gulf of Mexico based on analysis of sequences of mitochondrial DNA. Mar Biol 147:593-602.
[21] Patterson III WF (2007) A review of movement in Gulf of Mexico red snapper: implications for population structure. Am Fish Soc Symp 60:221-235.
[22] Saillant E, Bradfield SC, Gold JR (2010) Genetic variation and spatial autocorrelation among young-of-the-year red snapper (*Lutjanus campechanus*) in the northern Gulf of Mexico. ICES J Mar Sci 67:1240-1250.
[23] Smedbol RK, McPherson A, Hansen MM, Kenchington E (2002) Myths and moderation in marine 'metapopulations'? Fish Fisheries 3:20-35.
[24] C Porch, NOAA Fisheries Southeast Fisheries Science Center, personal communication.
[25] Patterson III WF, Cowan Jr JH, Graham EY, Lyons WB (1998) Otolith microchemical fingerprints of age-0 red snapper, *Lutjanus campechanus*, from the northern Gulf of Mexico. Gulf of Mexico Science 16:83– 91
[26] Cowan Jr JH, WoodsM, Patterson III W, Nieland D (2002) Otolith microchemistry (and reproductive biology) *In*: Stock structure of red snapper in the northern Gulf of Mexico: is their management as a single stock justified based on spatial and temporal patterns of genetic variation, otolith microchemistry, and growth rates. National Marine Fisheries Service, Marine Fisheries Initiative (MARFIN) Grant NA87FF0425.
[27] Patterson III WF, Cowan Jr JH, Wilson CA, Chen Z (2008) Temporal and spaitial variability in juvenile red snapper otolith elemental signatures in the northern Gulf of Mexico. Trans Am Fish Soc 137:521-532.

scale population heterogeneity. In terms of genetics, Saillant et al. (2010) reported significant spatial autocorrelation among young-of-the-year at ~50-100 km, with a potential isolation by distance effect at < 100 km and patchiness at > 100 km, which indicates largely local recruitment with restricted dispersal, and concluded that management should maintain local spawning populations throughout the Gulf.

Most recently, Gold and Portnoy (2014[28]) found genetic heterogeneity among northern Gulf populations, indicating that the species is not a single panmictic stock. Thus, research to date suggests red snapper display a metapopulation stock structure, although the structuring is weak and geographic stock boundaries have yet to be determined, with the most definitive genetic research suggesting greater potential for genetic similiary within a neighborhood of roughly 200 km.

Collection Range: Wild red snapper may be collected within a 62 mile (~100 km) radius of the site of the permitted aquaculture operation.

[28] Gold JR, Portnoy DS (2014) Population structure and genetic demography of red snapper (*Lutjanus campechanus*) in the U.S. south Atlantic and connectivity with red snapper in the Gulf of Mexico. Southeast Data, Assessment & Review (SEDAR) Report SEDAR41-RD32.

APPENDIX B: Procedures for Collecting Broodstock Fin Clip Samples

Purpose

Permittees are required to submit fin clip samples to NOAA Fisheries for each brood animal used in spawning. This requirement will allow for identification of source broodstock and for comparison of broodstock to offspring stocked into offshore cages. It will also allow for enforcement and monitoring in the event that the use of genetically modified or transgenic organisms is suspected.

Fin clip samples should be collected prior to, or immediately following, spawning events and should be sent to NOAA Fisheries within 30 days of collection. Fish are to be sexed and each brood animal is required to be individually marked or tagged (e.g., PIT, coded wire, dart). For additional information or questions, please contact NOAA Fisheries at 727-824-5301 or nmfs.ser.aquaculture@noaa.gov.

Procedures

Follow these steps to obtain a fin clip sample:

1) Clean all instruments used to extract samples with ethanol. Remove dirt and any visible parasites from tissues as these can affect genetic analyses. Obtain two hole punches or one dime-sized sample of the fin from each brood animal. Clean all instruments with ethanol between samples to minimize sample cross-contamination.

2) Place hole punch samples from each fish into separate clean vials (or, cut dime sized sample into half and place into separate vials). Fill each vial with enough 70-100% non-denatured ethanol[29] to cover the sample and store the sample in a freezer (-20°C to -80°C) until it is shipped to NOAA Fisheries. ***Note****:* Samples are to be sent to NOAA Fisheries within 30 days of collection.

3) Using a permanent marker, clearly label each vial with an ID# specific to the brood animal (e.g., PIT tag number, sequential number). Each ID# should be logged on the *Fin Clip Log* spreadsheet with all required information for that animal. The Fin Clip Log spreadsheet can be found at http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/aquaculture/. Permittees should store samples from each animal in a freezer (-20°C to -80°C).

[29] A license is required to purchase non-denatured ethanol as this is listed as a controlled substance.

4) Send one sample from each fish along with the *Fin Clip Log* spreadsheet to NOAA Fisheries. Include a completed chain of custody form with each shipment. Contact NOAA Fisheries at least 24 business hours prior to shipping to coordinate receipt of samples. Samples should be shipped early in the week to ensure that someone is available to receive the package during normal business hours. Pack samples in excepted quantities and ship according to hazardous materials guidelines[30]. Permittees should store the other half of the sample (or second hole punch) from each fish at their facility in a freezer (-20^{o}C to -80^{o}C) as a back-up.

[30] Federal rules have been established which govern the shipment of ethanol. Please consult with your shipping company regarding any special instructions.

APPENDIX D

Protected Marine Species Monitoring Plan

Draft-Final

Marine Mammal, Sea Turtle, and Seabird Monitoring and Data Collection Plan For the Velella Epsilon Project –

Pioneering Offshore Aquaculture in the Southeastern Gulf of Mexico

Submitted to:

Office of Protected Resources,
National Marine Fisheries Service (NMFS),
Southeast Regional Office (SERO)
National Oceanographic and Atmospheric Administration (NOAA)

Prepared by:

Gulf South Research Corporation (GSRC)
and
Kampachi Farms, LLC

April 2018

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ACRONYMS AND ABBREVIATIONS

EA	Environmental Assessment
ft.	foot / feet
m	meter
MMPA	Marine Mammal Protection Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
SERO	Southeast Regional Office
POC	point of contact
VE Project	Velella Epsilon Project
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

1.1 Purpose of the Marine Mammal, Sea Turtle, and Seabird Monitoring and Data Collection Plan

The purpose of this Marine Mammal, Sea Turtle, and Seabird Monitoring and Data Collection Plan (hereafter referred to as "Protected Species Monitoring Plan" [Plan]) is to provide monitoring protocols and data collection efforts for marine mammal, sea turtles, seabirds, and other marine protected species that may possibly be encountered (e.g., smalltooth sawfish, giant manta ray) during the proposed exempted fishery activity to validate the feasibility of deploying a temporary, small-scale, demonstration net pen and rearing two consecutive cohorts of the Federally managed species, almaco jack (kampachi; Seriola rivoliana), in Gulf of Mexico (GOM) waters off southwest Florida, generally located southwest of Sarasota, Florida. This PSM Plan was developed in cooperation with, and in support of, the Exempted Fishing Permit (EFP) application (50 CFR § 600.745[b]) by Kampachi Farms, LLC (Kampachi Farms, LLC 2018), and the National Marine Fisheries Service's (NMFS) Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] 4331 et seq.), (NMFS 2018).

Marine species monitoring and data collection will be conducted before, during, and after the single point mooring (SPM) and net pen array deployment; fish stocking, rearing, and harvesting activities; and decommissioning activities associated with the VE Project, as detailed in Section 2.3. Monitoring will represent an important minimization measure to reduce the likelihood of any unforeseen potential injury to marine mammals, sea turtles, and other protected marine species. The data collection will provide valuable insight to resource managers about potential interactions between aquaculture operations and protected species.

1.2 Scope and Timing

The scope of this Plan includes net pen deployment; fish stocking, rearing, and harvesting; and decommissioning activities that are necessary for the Velella Epsilon Project (VE Project). Marine mammals, sea turtles, sea birds, and other protected resources (as practicable) will be included in monitoring and data collection efforts. Protected species monitoring and data collection would be integrated with other marine environmental monitoring as required as a result of NMFS' NEPA review and/or as a condition of approval by NMFS and/or other regulatory agencies. The VE Project is concurrently applying for a U.S. Army Corps of Engineers (USACE) Section 10 permit (12/28/2017, Department of Army Permit Number: SAJ-2017-03488-KRD; "Velella Epsilon Project/Aquaculture"), as well as a U.S. Environmental Protection Agency (USEPA) National Pollutant Discharge and Elimination System (NPDES) permit.

This Plan will be implemented during the approximate period of November, 2018 through June, 2020, in support of the VE Project in-water activities.

1.3 Management

The Plan will be managed by Kampachi Farms, LLC. Marine mammal, sea turtle, and seabird monitoring and data collection will be carried out by their employees, volunteers, and university students supporting the VE Project. Kampachi Farms, LLC will also be responsible for the preparation of the Monitoring Report.

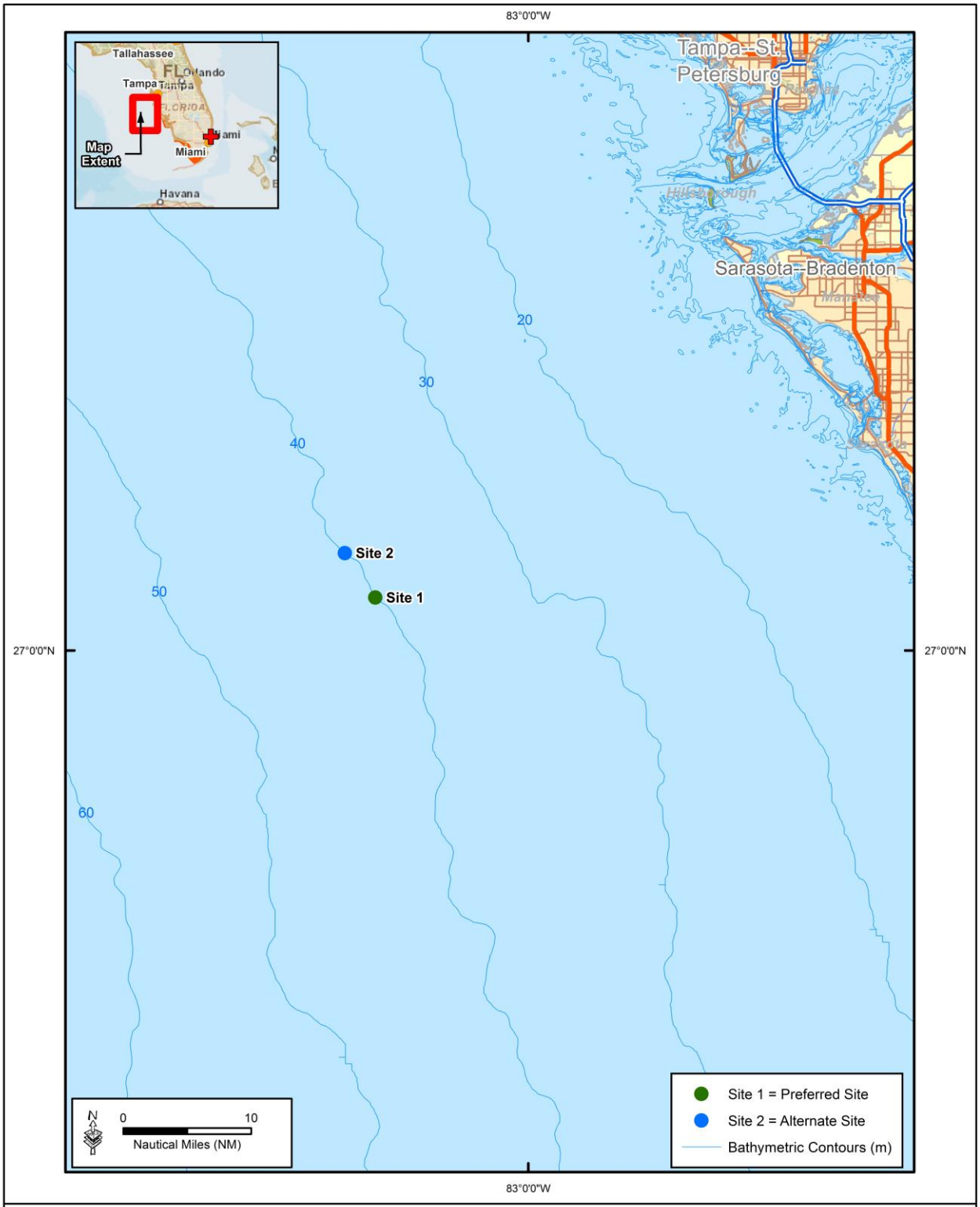


Figure 1-1. Regional Location – 45 Miles Southwest of Sarasota, Florida

2.0 VE PROJECT

Refer to the VE Project EA (NMFS, 2018) and current EFP Application (Kampachi Farms, LLC, 2018) for a full description of the VE Project.

2.1 Project Area

The project area is in the GOM in approximately 40m water depth off southwest Florida, generally located 45 miles southwest of Sarasota, Florida (see Figure 1-1). Figure 1-1 provides the location of two preliminary, yet tentative site locations, currently under consideration at the time of this PSM Plan development; however, the exact site location will be determined following an extensive siting analysis to be completed prior to the SPM and net pen array deployment.

Overlap with Protected Species

Based on the location of this project, the site will be within the range of the common bottlenose dolphin (*Tursiops truncatus truncatus*) continental shelf stock which is bounded by the 20 and 200m isobaths in the Gulf of Mexico (Hayes et al. 2017). The site will also overlap with the Northern Gulf of Mexico Stock of spotted dolphins (*Stenella frontalis*) which occupy the Florida shelf (Hayes et al. 2017). Although there are other marine mammal species in the Gulf, nearly all others are typically found in depths greater than the 100m or 1000m isobaths (Hayes et al. 2017). Sea turtles that may occur in the project area include sea turtles: the loggerhead, northwestern Atlantic (*Caretta caretta*) distinct population segment (DPS), leatherback (*Dermochelys coriacea*), green (*Chelonia mydas*) NWA DPS, and Kemp's ridley (Lepidochelys kempii). Smalltooth sawfish (*Pristis pectinata*) may possibly be present in the project area, but are a bottom-dwelling species, thus are not expected to interact with proposed activity if they are present in the area. We do anticipate some seabirds may be present in the project area; at this time we are uncertain what species. Other species protected under the ESA that occur in the Gulf of Mexico that likely have only remote chance of occurring in the project area in the recently listed Giant Manta Ray (*Manta birostris*).

2.2 Activities to be Monitored

Activities which would be subject to marine mammal monitoring and data collection include the following:

- Installation of the SPM including the anchor, chain, and line
- Deployment of the net pen array
- Stocking, rearing, and harvesting of two, back-to-back, consecutive fish trials
- Removal of the SPM and net pen array

Marine mammal monitoring will be performed to ensure that in-water activities are performed in such a manner that avoids any injury to marine mammals. Monitoring methods and data collection methods are described in Section 3 of this document.

2.3 Activity Protective Measures

2.3.1 During transit navigation to, at, and from the mission site, establish trained observers will be onboard all vessels.

- Trained observers will look for the presence of protected marine species (marine mammals and sea turtles) and advise the Captain of potential encounters in order to prevent entanglement or vessel strike. Personnel will adhere to NOAA Fisheries Service, Southeast Region's Vessel Strike Avoidance Measures and Reporting for Mariners (Appendix A).
- Trained observers will look for Sargassum mats, as well as inform the Captain, to facilitate avoiding the mats to the maximum extent practicable.

2.3.2 Vessels will operate at slow speeds when performing work within and around the VE Project area. Vessels will travel at speeds necessary for safe and efficient navigation, i.e., at speeds necessary to maintain steerage if towing equipment, but not so fast that objects in the water cannot be avoided. These considerations are expected to further reduce the potential for vessel strike of protected marine species.

2.3.3 Before discarding fish from the farm pen, personnel must ensure that no marine mammals are present. It is harmful and illegal to feed or attempt to feed wild marine mammals.

2.3.4 Activities will comply with NMFS' "Sea Turtle and Smalltooth Sawfish Construction Conditions" dated March 26, 2006.

2.3.4 If a marine mammal becomes entangled, injured, or killed by project equipment or via related operations (e.g., vessel strike), the animal must be reported within 48 hours to the Marine Mammal Authorization Program (Appendix B).

If a sea turtle becomes or is observed entangled or injured, the observer must call the Florida Wildlife Commission's 24-hour Wildlife Alert Number at 1-888-404-FWCC (1-888-404-3922).

3.0 MARINE MAMMAL, SEA TURTLE, AND SEABIRD MONITORING AND DATA COLLECTION

3.1 Observers and Procedures

A Kampachi Farms, LLC delegate shall conduct a pre-deployment briefing with the contractor, employees, technicians, graduate students, and volunteers. During the briefing, all contractor personnel working in the VE Project area will watch the Marine Species Awareness Training presentation.

Marine mammal observers ("observers") designated by Kampachi Farms, LLC, will be placed at the best vantage point(s) practicable to monitor for marine mammals and sea turtles. The observers will not have other net pen deployment-related tasks while conducting monitoring.

The contractor will adhere to all applicable requirements of the following:

- National Marine Fisheries Service 2006 Sea Turtle and Smalltooth Sawfish Construction Conditions (Appendix C).

- NOAA Fisheries, Southeast Region Vessel Strike Avoidance Measures and Reporting for Mariners (Appendix A).

3.2 Methods

The observer(s) will be placed at the best vantage point practicable (e.g. from a small boat, construction barges, or any other suitable location) to monitor for marine mammals and sea turtles. Elevated positions are preferable; it shall be the contractor's responsibility to ensure that appropriate safety measures are implemented to protect observers on elevated observation points. If a boat is used for monitoring, the boat will maintain 50-yard distances from species (should they occur).

- During all observation periods, observers would use binoculars and the naked eye to search continuously for marine mammals, sea turtles, and sea birds.

3.2.1 Deployment Monitoring and Data Collection - The VE Project site will be monitored prior to and during the in-water SPM and net pen array deployment activities. The pre-deployment monitoring and data collection will provide an initial baseline of any marine mammal and sea turtle activity within the VE Project area prior to and during the in-water activities. Protected species observations will be captured on the data forms (an example of a marine mammal sighting data form is attached; this form may change upon final design plans and expertise of observers).

3.2.2 During Activity Monitoring and Data Collection- Daily marine mammal observations and data collection will be performed in concert with and conducted by those individuals responsible for conducting routine daily operational farm activities (feeding, cleaning, environmental monitoring, etc.). Protected species observations will be captured on the marine species data forms.

3.2.3 Removal Monitoring and Data Collection - The VE Project site will be monitored prior to and during the in-water SPM and net pen array removal activities. The SPM and net pen array removal monitoring and data collection will provide information on marine species activity within the VE Project area prior to and during the in-water removal activities. Protected species observations will be captured on the marine species data forms.

3.3 Data Collection

The following information will be collected on effort logs or sighting forms used by observers:

- Date and time that deployment or removal activities begin or end
- Operational activities occurring during each day and at time of sighting
- Weather parameters identified during the monitoring (e.g., water temperature, salinity, percent cloud cover, Beaufort sea state, Secchi (*potentially*) and visibility)
- Tide state and water currents
- Number of vessels and actively fishing vessels

If a marine mammal enters the VE Project area, the following information will be recorded:

- Species, numbers, and if possible age class of marine mammals
- Behavior patterns observed and if any fishery interactions occur
- Location of the observer and distance from the animal(s) to the observer
- Environmental variables
- Number of vessels and activity fishing vessels
- Dorsal fin photographs

If one or more sea turtles enter the VE Project area, the following information will be recorded:

- Species, if known; number, and approximate size
- Behavior patterns observed, and specifically if any fishery interactions occur
- Location of the observer and distance from the animal(s) to the observer

If a seabird enters the VE Project area, the following information will be recorded:

- Species, if known; number, and approximate size
- Behavior patterns observed, and specifically if any fishery interactions occur
- Location of the observer and distance from the animal(s) to the observer

If possible, digital photographs of the animal(s) will be taken and forwarded to the Kampachi Farms, LLC point of contact; Jessica Powell, NMFS SERO; and digital copies will be provided with the Monitoring Report.

The data collection forms (Appendix D) shall be furnished to the Kampachi Farms, LLC point of contact within a mutually agreeable timeframe.

NMFS SERO is currently working with Kampachi Farms, LLC to develop a graduate level project for a master's student to assist with protected marine species data collection and analyses. This student would have access to all completed data collection forms and assist with a fine-scale data collection effort in summer of 2019.

3.4 Equipment

The observer(s) shall be equipped with the following:

- binoculars (7 x 50 power or greater) to ensure sufficient visual acuity while investigating sightings
- portable marine radios to rapidly communicate with the appropriate deployment contractor and/or operational farm personnel to initiate any precautionary actions, as needed
- a digital camera with telephoto lens for photographing any marine species sighted
- data collection forms, clipboards, and pens
- Compass/GPS
- Range finder

3.5 Observer Monitoring Locations

In order to effectively monitor the VE Project site, protected species observers will be positioned at the best practicable vantage point(s), taking into consideration the behavior of the species likely to enter the area, safety, and space limitations on the tender vessel or net pen array infrastructure, in order to properly monitor the area. Observers may be stationed in small vessels utilized for other daily environmental monitoring and data collection activities.

3.6 Interagency Notification

If observers encounter an injured, sick, or dead marine mammal, NMFS will be notified immediately. Such sightings will be called into the NMFS Stranding Hotline for the Southeast at 1 877 WHALE HELP:

The observer will provide NMFS with the species or description of the animal(s), the condition of the animal (including carcass condition if the animal is dead), location, the date and time of first discovery, observed behaviors (if alive), and photo or video (if available). The observer will be instructed by the stranding responder on specific response.

4.0 REPORTING

A draft report of any marine species observations and activity within the VE Project area will be forwarded to NMFS / USFWS no later than 30 days after project closure and the removal of the SPM and net pen array (October 2020, estimated). A final report will be prepared and submitted to NMFS within 30 days following receipt of comments on the draft report from NMFS. The VE Project will update Jessica Powell, NMFS SERO, on a 30-day basis, specifically if fishery interactions are occurring with marine mammal species.

5.0 REFERENCES

Hayes S. A., E. Josephson, K. Maze-Foley, and P. Rosel, Editors; 2017. US Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2016. NOAA Technical Memorandum NMFS-NE-241. June 2017.

National Marine Fisheries Service (NMFS), 2018. Environmental Assessment for the Implementation of the Exempt Fishing Permit for the Velella Epsilon Project – Pioneering Offshore Aquaculture in the Southeastern Gulf of Mexico; NOAA Sea Grant 2017 Aquaculture Initiative.

NMFS, 2006. Sea Turtle and Smalltooth Sawfish Construction Conditions. NMFS, Southeast Regional Office 263 13th Avenue South St. Petersburg, FL 33701.

Kampachi Farms, LLC, 2018. Exempt Fishing Permit for the Velella Epsilon Project – Pioneering Offshore Aquaculture in the Southeastern Gulf of Mexico; NOAA Sea Grant 2017 Aquaculture Initiative.

PROTECTED SPECIES MONITORING PLAN

APPENDIX A

NOAA FISHERIES, SOUTHEAST REGION VESSEL STRIKE AVOIDANCE MEASURES AND REPORTING FOR MARINERS

Vessel Strike Avoidance Measures and Reporting for Mariners NOAA Fisheries Service, Southeast Region

Background

The National Marine Fisheries Service (NMFS) has determined that collisions with vessels can injure or kill protected species (e.g., endangered and threatened species, and marine mammals). The following standard measures should be implemented to reduce the risk associated with vessel strikes or disturbance of these protected species to discountable levels. NMFS should be contacted to identify any additional conservation and recovery issues of concern, and to assist in the development of measures that may be necessary.

Protected Species Identification Training

Vessel crews should use an Atlantic and Gulf of Mexico reference guide that helps identify protected species that might be encountered in U.S. waters of the Atlantic Ocean, including the Caribbean Sea, and Gulf of Mexico. Additional training should be provided regarding information and resources available regarding federal laws and regulations for protected species, ship strike information, critical habitat, migratory routes and seasonal abundance, and recent sightings of protected species.

Vessel Strike Avoidance

In order to avoid causing injury or death to marine mammals and sea turtles the following measures should be taken when consistent with safe navigation:

1. Vessel operators and crews shall maintain a vigilant watch for marine mammals and sea turtles to avoid striking sighted protected species.

2. When whales are sighted, maintain a distance of 100 yards or greater between the whale and the vessel.

3. When sea turtles or small cetaceans are sighted, attempt to maintain a distance of 50 yards or greater between the animal and the vessel whenever possible.

4. When small cetaceans are sighted while a vessel is underway (e.g., bow-riding), attempt to remain parallel to the animal's course. Avoid excessive speed or abrupt changes in direction until the cetacean has left the area.

5. Reduce vessel speed to 10 knots or less when mother/calf pairs, groups, or large assemblages of cetaceans are observed near an underway vessel, when safety permits. A single cetacean at the surface may indicate the presence of submerged animals in the vicinity; therefore, prudent precautionary measures should always be exercised. The vessel shall attempt to route around the animals, maintaining a minimum distance of 100 yards whenever possible.

6. Whales may surface in unpredictable locations or approach slowly moving vessels. When an animal is sighted in the vessel's path or in close proximity to a moving vessel and when safety permits, reduce speed and shift the engine to neutral. Do not engage the engines until the animals are clear of the area.

Additional Requirements for the North Atlantic Right Whale

1. If a sighted whale is believed to be a North Atlantic right whale, federal regulation requires a minimum distance of 500 yards be maintained from the animal (50 CFR 224.103 (c)).

2. Vessels entering North Atlantic right whale critical habitat are required to report into the Mandatory Ship Reporting System.

3. Mariners shall check with various communication media for general information regarding avoiding ship strikes and specific information regarding North Atlantic right whale sighting locations. These include NOAA weather radio, U.S. Coast Guard NAVTEX broadcasts, and Notices to Mariners. Commercial mariners calling on United States ports should view the most recent version of the NOAA/USCG produced training CD entitled "A Prudent Mariner's Guide to Right Whale Protection" (contact the NMFS Southeast Region, Protected Resources Division for more information regarding the CD).

4. Injured, dead, or entangled right whales should be immediately reported to the U.S. Coast Guard via VHF Channel 16.

Injured or Dead Protected Species Reporting

Vessel crews shall report sightings of any injured or dead protected species immediately, regardless of whether the injury or death is caused by your vessel.

Report marine mammals to the Southeast U.S. Stranding Hotline: 877-433-8299
Report sea turtles to the NMFS Southeast Regional Office: 727-824-5312

If the injury or death of a marine mammal was caused by a collision with your vessel, responsible parties shall remain available to assist the respective salvage and stranding network as needed. NMFS' Southeast Regional Office shall be immediately notified of the strike by email (takereport.nmfsser@noaa.gov) using the attached vessel strike reporting form.

For additional information, please contact the Protected Resources Division at:

NOAA Fisheries Service
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701
Tel: (727) 824-5312
Visit us on the web at http://sero.nmfs.noaa.gov

Print Form | Submit by Email

NOAA Fisheries Service

Southeast Region Ship Strike Report

Reporter Information

Reporting Vessel/Aircraft Name or # | Reporter's Name | Reporter's phone | Date of Report

Strike Vessel Information *(complete all that apply)*

TYPE OF VESSEL: Check all that apply

- ☐ Container
- ☐ Tanker
- ☐ Freight
- ☐ Research
- ☐ Fishing
- ☐ Towing
- ☐ Government
- ☐ Whale watch
- ☐ Ferry
- ☐ Recreational
- ☐ Other

Specify _____

Draft _____ ◯ Feet ◯ Meters

Forward _____

Aft _____

Mean _____

Name of Vessel involved in Strike | Gross Tonnage | Vessel Length ◯ Feet ◯ Meters

Vessel Make | Vessel Model | Propulsion | Engine Make

Distance between shafts | Horsepower | Prop Diameter | Prop Pitch

Observed or Noted Strike Information *(strike was noted visually or impact felt)*

Date of Strike | Time of Strike ◯ Local ◯ GMT | General Location | North Latitude | West Longitude

ENVIRONMENTAL CONDITIONS AT TIME OF STRIKE

Lighting | Weather | Visibility | Distance of Visibility ◯ Kilometers ◯ Miles | Air Temperature ◯ Degrees F ◯ Degrees C

Wind Speed | Direction (degrees) | Current Speed | Direction (degrees) | Water depth

Wave Height ◯ Feet ◯ Meters | Swell Height ◯ Feet ◯ Meters | Water Depth ◯ Feet ◯ Meters

NOAA Fisheries Service

Southeast Region Ship Strike Report - Continued

NAVIGATION INFORMATION AT TIME OF STRIKE

Vessel Activity

Engine RPMs

Engine Speed (Knots)

Vessel Course (Degrees)

Autopilot ON

Autopilot OFF

Total # of watchstanders

on Navigation Bridge

on Observation Bridge

on Bow

Other

INCIDENT INFORMATION

Part of vessel struck by whale

Describe what was seen, felt, heard, etc.

Was avoidance action taken

Describe action taken, or reasons why avoidance not possible

Comments on damage to vessel

NOAA Fisheries Service

Southeast Region Ship Strike Report - Continued

ANIMAL INFORMATION

Time elapsed between sighting and collision

Distance from vessel when first sighted

Animal's orientation to the vessel

Estimated size/species of whale

Other marine mammals present?

Approximate number

Species

What direction was the whale traveling

Briefly describe whale's behavior prior to strike

Briefly describe whale's behavior after collision *(if seen)*

Portion of animal struck

Condition post-strike

Blood seen in water after strike

Description of wounds on animal. Use drawings to mark the location of wound(s). Include estimates of length and depth of wounds.

PROTECTED SPECIES MONITORING PLAN

APPENDIX B

MARINE MAMMAL AUTHORIZATION PROGRAM

MORTALITY/INJURY REPORTING FORM

MARINE MAMMAL AUTHORIZATION PROGRAM

MORTALITY/INJURY REPORTING FORM

National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910

PLEASE PRINT NEATLY AND IN CAPITAL LETTERS

1. LAST NAME OF VESSEL OWNER/OPERATOR

2. FIRST NAME OF VESSEL OWNER/OPERATOR

3. MI

4.MAILING ADDRESS

5. EMAIL ADDRESS

6. CITY

7. PHONE NUMBER

8. STATE

9. ZIP

10. VESSEL NAME

11. COAST GUARD DOC. NO. **OR** VESSEL STATE REG. NO.

12. STATE COMMERCIAL VESSEL NO.

13. FISHERY GEAR TYPE AND TARGET SPECIES

14. DATE OF MORTALITY/INJURY (MM DD YYYY)

15. APPROXIMATE TIME OF MORTALITY/INJURY **AM/PM**

16. OBSERVER PRESENT ☐ YES ☐ NO

17. LOCATION OF MORTALITY/INJURY LATITUDE ° ‘ LONGITUDE ° ‘

18. ENTER SPECIES CODE, TYPE OF MORTALITY/INJURY (SEE LIST OF CODES ON PREVIOUS PAGE), AND THE NUMBER OF EACH SPECIES INVOLVED. MAKE ONE ENTRY FOR EACH SPECIES INVOLVED IN THIS INCIDENT. YOU MAY MAKE UP TO THREE MORTALITY/INJURY CODES PER SPECIES.

SPECIES	MORTALITY/INJURY CODE	NUMBER

DESCRIPTION OF UNKNOWN SPECIES OR CIRCUMSTANCES OF MORTALITY/INJURY INCIDENT

Please provide a detailed description of the animal involved, including color patterns, length, and body shape and size (drawings are helpful). State whether the animal involved was a whale, dolphin, porpoise, seal, sea lion, walrus, manatee, or sea otter. You may also use this space for other comments regarding this incident, including length of interaction and behavior of animal after release.

NOAA/NMFS
OFFICE OF PROTECTED RESOURCES F/PR2
1315 EAST WEST HIGHWAY
SILVER SPRING MD 20910-9721

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 7411 SILVER SPRING, MD

POSTAGE WILL BE PAID BY ADDRESSEE

NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
OFFICE OF PROTECTED RESOURCES F/PR2
1315 EAST WEST HIGHWAY
SILVER SPRING MD 20910-9721

IMPORTANT!
MARINE MAMMAL REPORTING FORM

MARINE MAMMAL AUTHORIZATION

MARINE MAMMAL AUTHORIZATION PROGRAM

MORTALITY/INJURY REPORTING FORM

National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910

INSTRUCTIONS FOR COMPLETING THE MORTALITY/INJURY REPORTING FORM

This reporting form is required ONLY WHEN there is an incidental mortality or injury (M/I) to a marine mammal during commercial fishing activities. You are required to report the incidental mortality or injury within 48 hours after the end of the fishing trip (even if an observer is on board), or, for non-vessel fisheries, within 48 hours of an occurrence of an incidental mortality or injury. A separate report form is required for each fishery, for each date, and for each location.

PLEASE PRINT NEATLY AND IN CAPITAL LETTERS.

The reporting form should be detached from this instruction sheet, folded, and sealed prior to mailing. No postage is necessary for mailing. Forms may also be filled out online, emailed to nmfs.mireport@noaa.gov, or faxed to NMFS at (301) 713-0376. Questions regarding completion of this form, and requests for additional forms, may be directed to the NMFS Office of Protected Resources, 1315 East-West Hwy., Silver Spring, MD 20910-3226, (301) 427-8402.

MORTALITY/INJURY REPORT FIELD DEFINITIONS

VESSEL NAME: Enter the name of the vessel as it is identified for commercial fishing operations. For non-vessel fisheries, leave this blank.

COAST GUARD DOCUMENT NO.: Enter the vessel's Coast Guard Documentation number; OR Enter the VESSEL'S STATE REGISTRATION NO.: One of these numbers must be provided. For non-vessel fisheries, enter the state fishery permit number.

STATE COMMERCIAL VESSEL LICENSE NO.: Enter the vessel's state commercial vessel license number, if applicable.

GEAR TYPE AND TARGET SPECIES: Enter the type of fishing gear used and the target species being fished when this incident occurred.

DATE OF MORTALITY/INJURY: Enter the date the mortality/injury occurred. For example: November 1, 2009 is entered as 11/01/2009.

TIME OF MORTALITY/INJURY: Enter the approximate time of day the mortality/injury occurred. Indicate AM if the mortality/injury occurred between midnight & noon, or PM if the mortality/injury occurred between noon and midnight.

OBSERVER PRESENT: Check yes if the trip was observed, check no if the trip was not observed.

LOCATION OF MORTALITY/INJURY LATITUDE & LONGITUDE: Use standard entries in degrees and minutes.

SPECIES INCIDENTALLY KILLED OR INJURED: Enter the species code and the mortality/injury code of the animal(s) involved. (Refer to the species and mortality/injury code lists included on page 2 of these instructions.) Enter the number of animals involved in each mortality/injury. You may enter up to three (3) injury codes per species. Make as many entries as apply to the date, time, and location entered in items 14-17.

DESCRIPTION OF UNKNOWN SPECIES OR CIRCUMSTANCES OF M/I INCIDENT: If you have entered a species code for an unidentified species, please provide a detailed description of the animal involved, including color patterns, length, and body shape (drawings are helpful). State whether the animal involved was a cetacean (whale, dolphin, or porpoise), pinniped (seal or sea lion), walrus, manatee or sea otter. You may also use this space for other comments regarding this incident.

OMB Control No. 0648-0292 (expires 03/31/2019)

MARINE MAMMAL AUTHORIZATION PROGRAM

MORTALITY/INJURY REPORTING FORM

National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910

SPECIES AND STOCK CODES FOR MARINE MAMMALS

Seals and sea lions

100- Steller (northern) sea lion
101- California sea lion
105- Northern (Pribilof) fur seal
115- Harbor seal
116- Spotted seal
117- Ringed seal
121- Ribbon seal
124- Gray seal
127- Hawaiian monk seal
129- Northern elephant seal
130- Bearded seal
131- Harp seal
132- Hooded seal
203- Unidentified sea lion
204- Unidentified seal

Dolphins and porpoises

047- Atlantic white-sided dolphin
049- Pacific white-sided dolphin
053- Common dolphin
054- Bottlenose dolphin
055- Grampus (Risso's) dolphin
058- Spotted dolphin
060- Spinner dolphin
061- Striped dolphin
063- Northern right whale dolphin
068- Harbor porpoise
072- Dall's porpoise
235- Unidentified small cetacean (porpoise or dolphin)

Toothed and baleen whales

002- North Atlantic right whale
005- Gray whale
007- Fin whale
010- Minke whale
011- Humpback whale
012- Sperm whale
016- Beluga whale
038- False killer whale
039- Killer whale
221- Pilot whale
230- Beaked whale
231- Bryde's whale
232- Dwarf sperm whale
210- Unidentified baleen whale
220- Unidentified toothed whale

Other Marine Mammals

114- Walrus
135- Sea otter
139- Manatee

MORTALITY/INJURY CODES FOR MARINE MAMMALS

01- Visible blood flow
02- Loss of/damage to appendage/jaw
03- Inability to use appendage(s)
04- Asymmetry in shape of body or body position
05- Any noticeable swelling or hemorrhage (bruising)
06- Laceration (deep cut)
07- Rupture or puncture of eyeball
08- Listlessness or inability to defend
09- Inability to swim or dive
10- Equilibrium imbalance
11- Ingestion of gear
12- Released trailing gear/gear perforating body
13- Other wound or injury
14- Killed

COLLECTION MANDATE

This collection of information is mandated by the Marine Mammal Protection Act of 1972, as amended (16 U.S.C. 1361 *et. seq.*), and by implementing regulations contained at 50 CFR 229.4. The information supplied on this form will be used by the National Marine Fisheries Service to estimate levels of incidental mortalities and injuries in U.S. commercial fisheries. Certain information supplied on this form may be considered proprietary and therefore subject to data confidentiality restrictions of 50 CFR Part 229.11.

Public reporting burden for this collection of information is estimated to average 0.15 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Director, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Hwy., Silver Spring, MD 20910-3226.

The National Marine Fisheries Service may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a current and valid OMB control number. The OMB control number for this form is 0648-0292, which expires on 03/31/2019.

PROTECTED SPECIES MONITORING PLAN

APPENDIX C

NATIONAL MARINE FISHERIES SERVICE 2006

SEA TURTLE AND SMALLTOOTH SAWFISH CONSTRUCTION CONDITIONS

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

SEA TURTLE AND SMALLTOOTH SAWFISH CONSTRUCTION CONDITIONS

The permittee shall comply with the following protected species construction conditions:

a. The permittee shall instruct all personnel associated with the project of the potential presence of these species and the need to avoid collisions with sea turtles and smalltooth sawfish. All construction personnel are responsible for observing water-related activities for the presence of these species.

b. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing sea turtles or smalltooth sawfish, which are protected under the Endangered Species Act of 1973.

c. Siltation barriers shall be made of material in which a sea turtle or smalltooth sawfish cannot become entangled, be properly secured, and be regularly monitored to avoid protected species entrapment. Barriers may not block sea turtle or smalltooth sawfish entry to or exit from designated critical habitat without prior agreement from the National Marine Fisheries Service's Protected Resources Division, St. Petersburg, Florida.

d. All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will preferentially follow deep-water routes (e.g., marked channels) whenever possible.

e. If a sea turtle or smalltooth sawfish is seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a sea turtle or smalltooth sawfish. Operation of any mechanical construction equipment shall cease immediately if a sea turtle or smalltooth sawfish is seen within a 50-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.

f. Any collision with and/or injury to a sea turtle or smalltooth sawfish shall be reported immediately to the National Marine Fisheries Service's Protected Resources Division (727-824-5312) and the local authorized sea turtle stranding/rescue organization.

g. Any special construction conditions, required of your specific project, outside these general conditions, if applicable, will be addressed in the primary consultation.

Revised: March 23, 2006
O:\forms\Sea Turtle and Smalltooth Sawfish Construction Conditions.doc

PROTECTED SPECIES MONITORING PLAN

APPENDIX D

VELELLA EPSILON PROJECT SIGHTING SHEET

Date and initial when complete: Data entry_____ Photo Analysis_____ Photo Coverage

Sighting No. **Velella Epsilon Project Sighting Sheet** **Date**

Field Hours _____ to _____ **Platform_____** **Distance from ____ (m)** **Time** **to**

Observers_____

Species (*i.e.*, bottlenose dolphin, spotted dolphin, etc.)_____

Clouds % **Secchi** ft/m **Salinity** ppt **Water Temp** F/C **BSS**

Behavior State: Travel Forage Rest Social Mill Fishery-Interaction Other
(*Circle predominant for 1st 5 min & Check all see; describe fishery-interaction in section below*)

Operational activity (*i.e.*, fish feed, cleaning pens, etc.)**:**_____

FI: Beg Patrol Net Patrol Barge Attempted Depredation Depredation Other

(*Record Frame No. of interacting animals in comments when possible;*: "other activity" should be described in comments)
**Describe in specific details in Comments if injury or entanglement occurs as well as condition of the animal upon release*

No. of vessels w/in 500m:_____ **No. of actively fishing vessels w/in 500m:_____**

Field Estimates	MIN	MAX	BEST
Total Dolphins			
Total Calves			
Young of Year			

Photo Analysis	Pos IDs	Not IDed	Final Best
Total Dolphins			
Total Calves			
Young of Year			

Comments: _____

Dolphins Sighted: **ID Confirmation: P = photo V = visual**

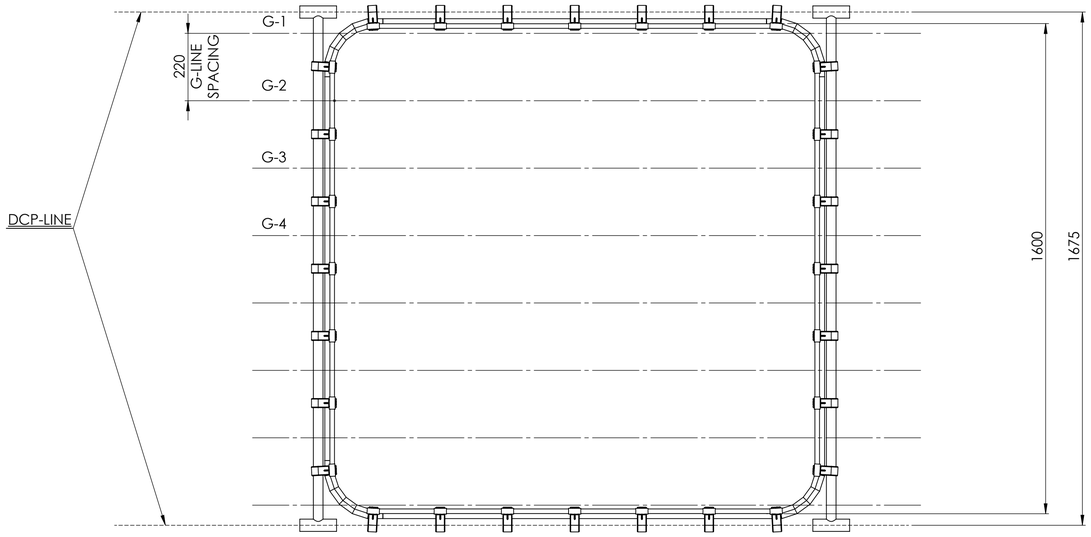
Name	Code	Cnf	Name	Code	Cnf	Name	Code	Cnf	Name	Code	Cnf

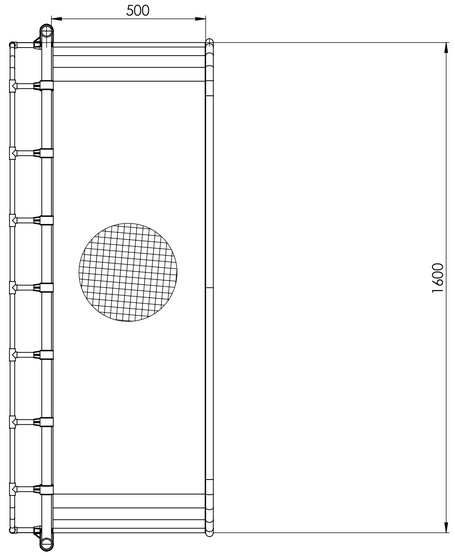
Photos: (Photographer's Initials: frame to frame) _____

Tape: (reference no.) _____

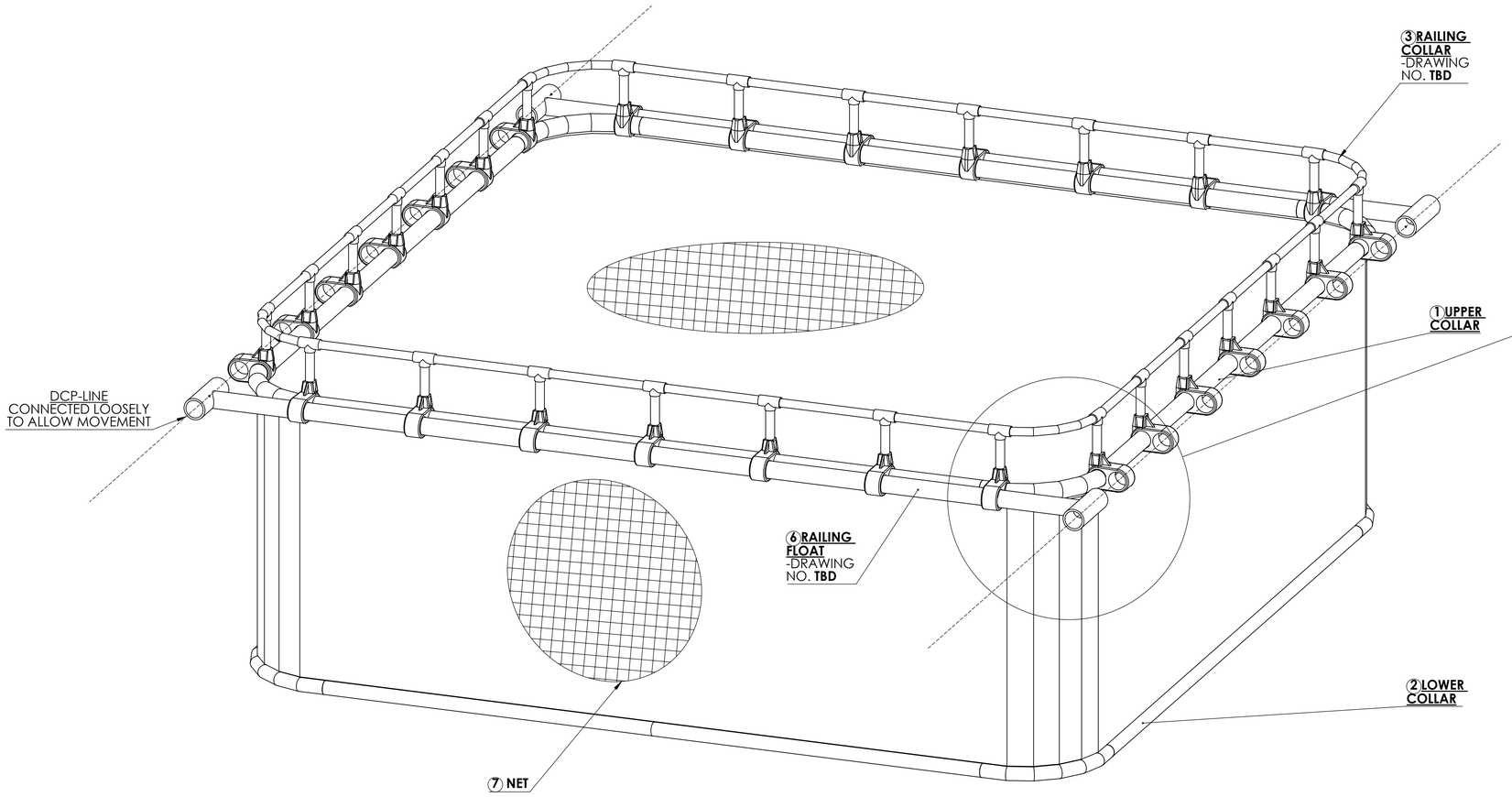
APPENDIX E

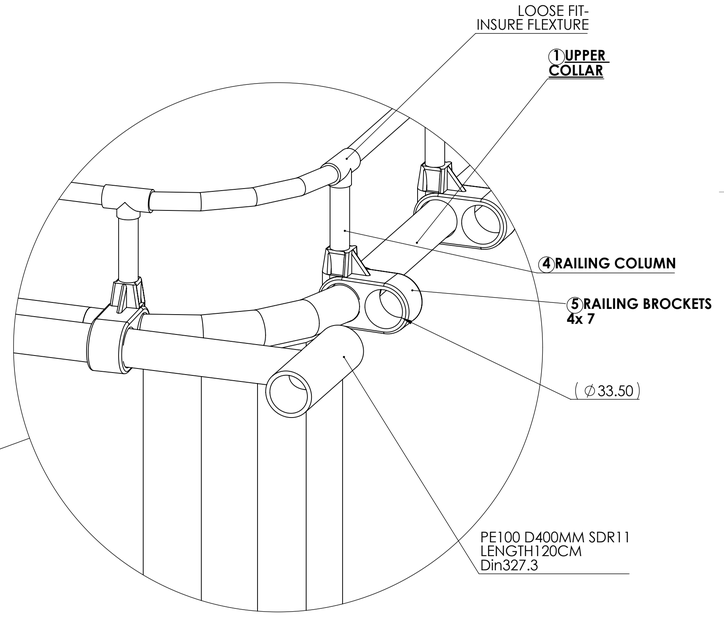
SUBflex Engineering Designs





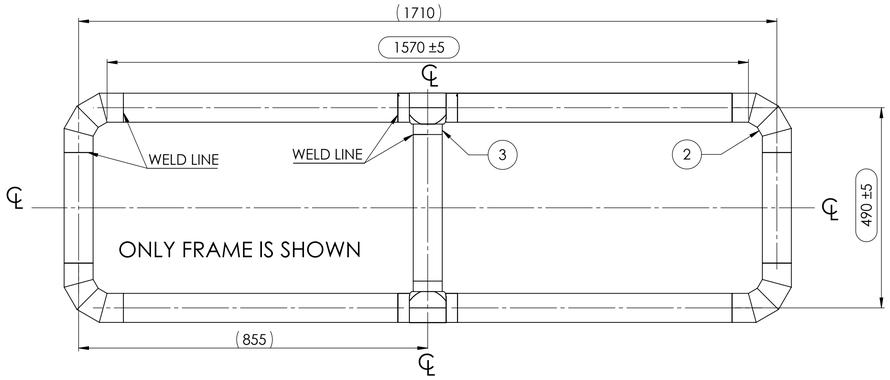
ITEM NO.	DESCRIPTION	TYPE	QTY.
1	UPPER COLLAR	PEX D315 SDR5.0 Din189	1
2	LOWER COLLAR	PEX D250 SDR7.4 Din182.4	1
3	RALING COLLAR	PEX PIPE	1
4	RAILING COLUMN	PEX PIPE	28
5	RAILING BROCKETS	HDPE	28
6	RAILING FLOAT	PE100 D315 SDR5.0	2
7	NET		1

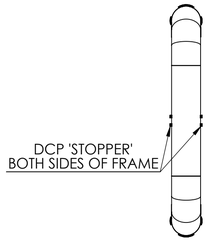


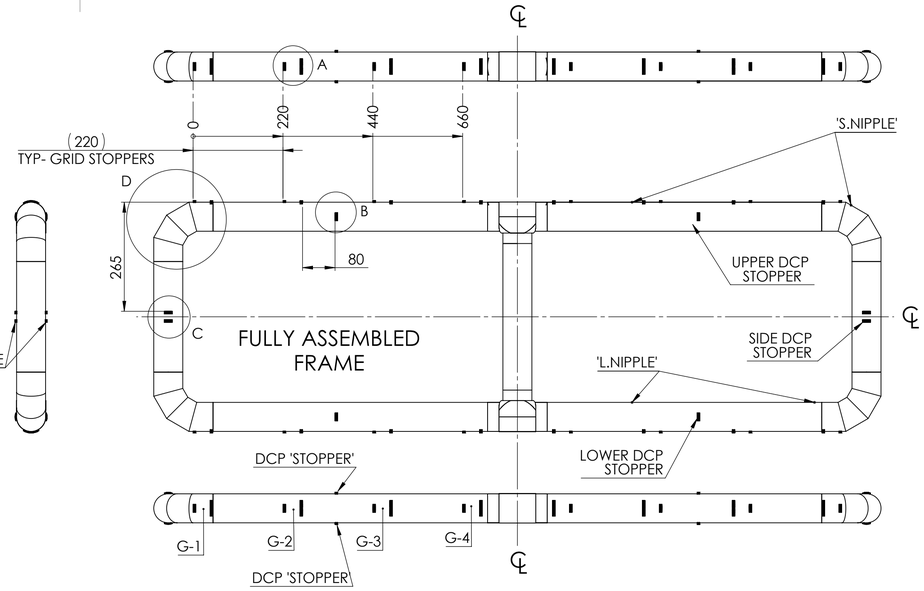


PRELIMINARY

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN CENTIMETERS SURFACE FINISH: TOLERANCES: LINEAR: +/-1 ANGULAR:1.0°		DO NOT SCALE DRAWING	REVISION V0
		GiliOcean Technology	
NAME / SIGNATURE / DATE		TITLE:	
DRAWN Alon Cohen	29/05/2018	CAGE	
CHK'D			
APPV'D			
MFG			
Q.A		DWG NO. 005-TBD	A1
	C:\Users\NADAV\Dropbox\SubFlex\SolidWorks\Structure\005\	SCALE: 1:100	SHEET 1 OF 1



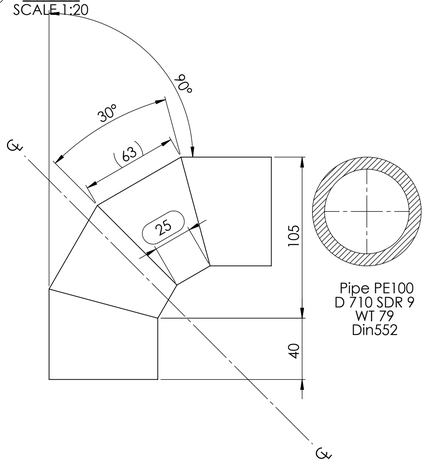




NOTES:

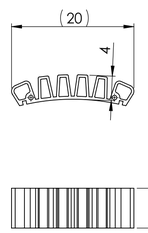
1. BUOYANCY OF WET FRAME - 680 KG
2. DRY WEIGHT - 8490 KG

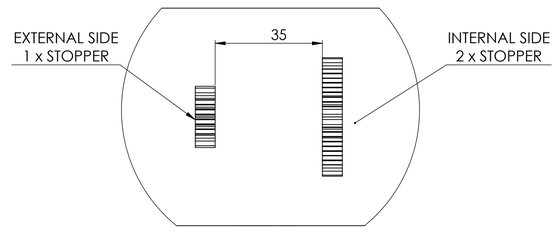
2 **'ELBOW'**
SCALE 1:20



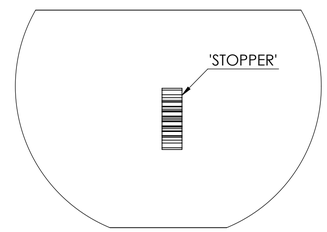
6 **"STOPPER"**
SCALE 1:5

NOTES:
-PRODUCT OF PLASSON
-SN: 49009999
-ELECTROFUSION WELDING





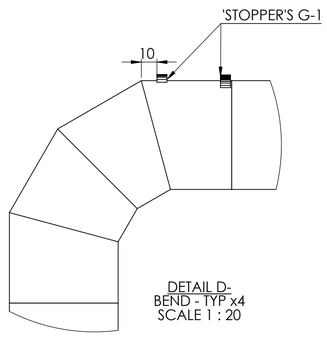
DETAIL 'A'
'GRID STOPPERS' x20
SCALE 1 : 10



DETAIL 'B'
'UPPER/LOWER DCP STOPPERS'
STOPPERS ON EACH SIDE OF FRAME

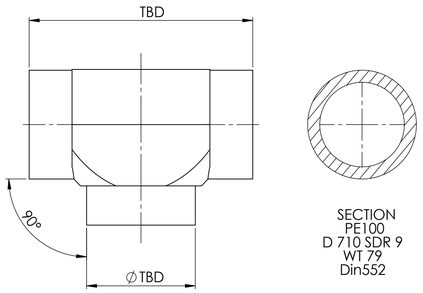
SCALE 1 : 10

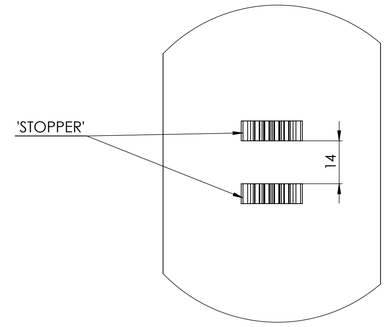
ITEM NO.	DESCRIPTION	TYPE	QYT.
1	FRAME PIPE	PE100/D710/SDR9 Din552	--
2	90 DEG ELBOW	PE100/D710/SDR9 Din552	4
3	T-JUNCTION	PE100	2
ADDITIONS			
4	K6	?mm X1"	4
5	"S.NIPPLE"	?mm X1/2"	4
6	"STOPPER"	-PRODUCT OF PLASSON -SN: 4900999	64



DETAIL D-
BEND - TYP x4
SCALE 1 : 20

3 **'T-JUNCTION'**
-SEE DRAWING NO.[TBD]
SCALE 1:20





DETAIL 'C'
'SIDE DCP STOPPERS'
2 STOPPERS ON EACH SIDE OF FRAME

SCALE 1 : 10

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN CENTIMETERS
SURFACE FINISH:
TOLERANCES:
LINEAR: -/+1
ANGULAR: 1.0°

DO NOT SCALE DRAWING — REVISION V0

	NAME	SIGNATURE	DATE
DRAWN	Alon Cohen		29/032018
CHK'D			
APPV'D			
MFG			
Q.A			

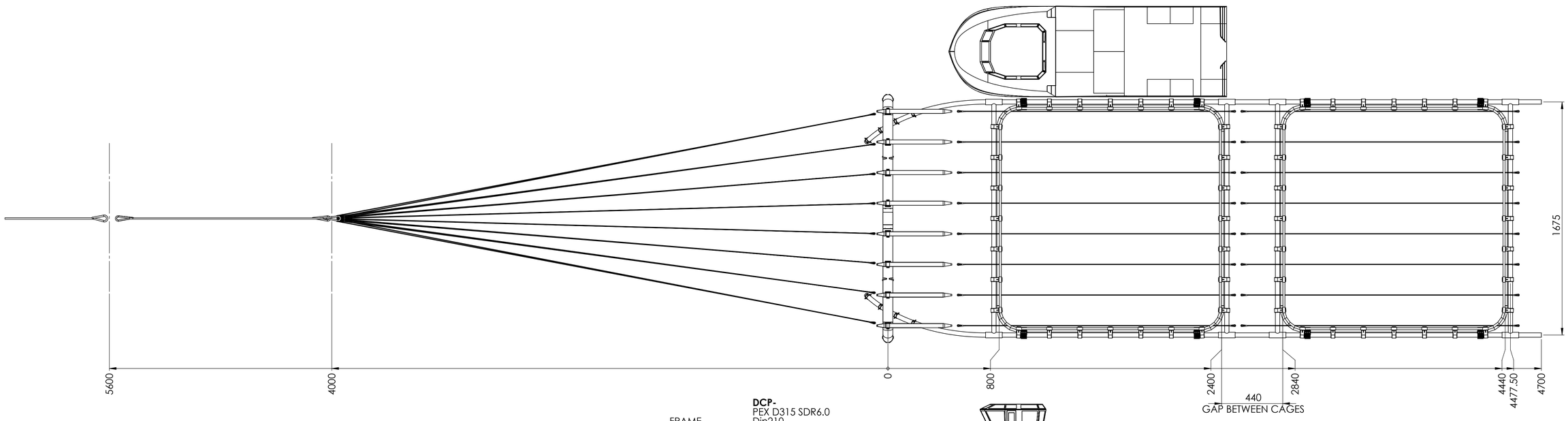
GliOcean Technology

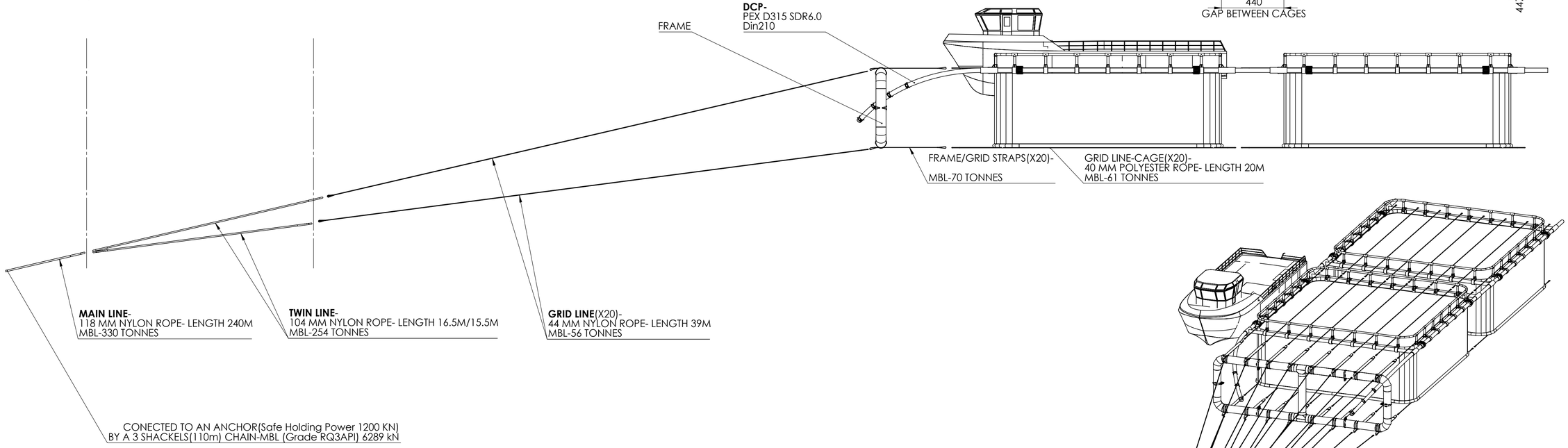
FRAME

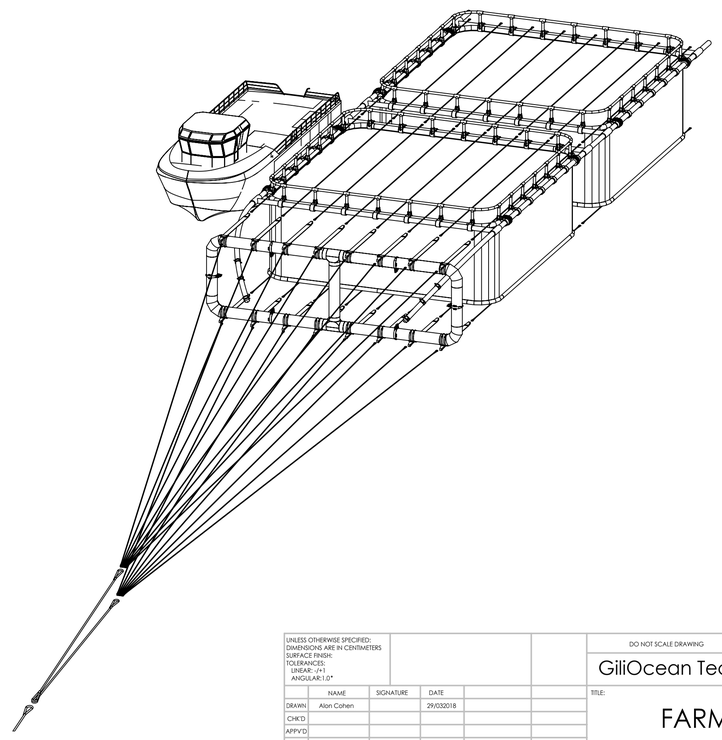
DWG NO. 005-TBD — A1

SCALE: 1:75 — SHEET 1 OF 1

PRELIMINERY







UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN CENTIMETERS SURFACE FINISH: TOLERANCES: LINEAR: -/+1 ANGULAR:1.0°				DO NOT SCALE DRAWING	REVISION V0
				GiliOcean Technology	
	NAME	SIGNATURE	DATE	TITLE:	
DRAWN	Alon Cohen		29/032018	FARM	
CHK'D					
APP'V'D					
MFG					
Q.A				DWG NO.	A1
				005-TBD	
		C:\Users\NADAV\Dropbox\SubFlex\SolidWorks\Structure\005\		SCALE: 1:150	SHEET 1 OF 1

APPENDIX F

Key Resumes

NEIL ANTHONY SIMS, M.Sc.

EDUCATION : **1989 - 1990 :** M.Sc. in Zoology University of New South Wales, Sydney.

1977-1980: B.Sc. Zoology/Marine Biology, James Cook University, North Queensland.

PROFESSIONAL EXPERIENCE : Full-time positions

2011 - Present: Co-Founder, President, Co-CEO of **Kampachi Farms, LLC.**, a private company pursuing marine fish hatchery and open ocean mariculture research and development, based in Kona, Hawaii, and La Paz, Mexico. 8 employees.

2004 - Present : Co-Founder, President of **Deep Blue Research, LLC.**, an open ocean mariculture research and development company.

2004 - 2011 : Co-Founder, President, Co-CEO of **Kona Blue Water Farms, Inc.** Established a marine fish hatchery and open ocean fish farm in Kona, Hawaii producing over 1 million lbs of sashimi-grade Kona Kampachi®, worth over $6 million annually, in an environmentally-sound manner, using sustainable diets. Up to 48 employees.

1992 - 2004 : Vice-President / Research Director and founding partner of Black Pearls, Inc., the first private company to develop South Sea pearl oyster hatchery culture techniques in the Pacific Islands. BPI applied these methods to expansion of pearl farming in Hawaii, South Pacific atolls, Australia and South East Asia. 12 full-time employees.

2000 – 2004 : Chairman of the Board and founding partner of Queensland South Sea Pearl Company, Pty, Ltd, based in Cairns. Pearl farm operations for silver-lip pearl oysters in Cape York Peninsula and Torres Strait areas of Australia. 15 employees.

1995 - 2001: Vice-President, Black Pearls of Micronesia, Inc., pearl farm in Marshall Islands. 40 employees.

PROFESSIONAL EXPERIENCE : Consulting and other positions

Vice-Chair of **Aquaculture Stewardship Council's Technical Advisory Group** (2015-present), and Member of **TAG** (2009-present).

Chair of Offshore Mariculture Session, **Aquaculture America 2015**. New Orleans, LA.

Co-Chair of Offshore Mariculture session, **Aquaculture America 2014**, Seattle, WA, USA.

Chair of **4th Offshore Mariculture Conference 2012**, Izmur, Turkey

Testified to U.S. Congress **House Sub-Committee on Insular Affairs, Oceans and Wildlife**, Oversight Hearing on offshore aquaculture (September 9, 2009).

FAO Advisor for **GESAMP** (Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection: Working Group 36) on an Ecosystem-Based approach to Offshore Aquaculture (Crete, 2008; Orbotello, 2010).

President (2008-present), and Founding Boardmember (2007-present) for the **Ocean Stewards Institute**, the international open ocean mariculture trade association.

Co-Chair, Offshore Mariculture session, **World Aquaculture Society Conf.**, Natal, Brazil, 2011.

Founding Member (2006–2007) for **Organic Seafood Committee**, National Fisheries Institute.

Co-ordinator, Pearl Oyster Res. Gp, South Pacific Commission, New Caledonia (1989 – 2005).

Chairman, Technical Sessions, for Pearls '94, the World's First International Pearl Conference.

Industry Advisory Committee Center for Tropical & Sub-Tropical Aquaculture (1999 – present)

Consultancies to : an aquaculture investment fund guiding Advisory Board establishment (2016); a public-private consortium of Chilean salmon industry partners and government agencies to recommend research strategies for offshore salmon farming (2016); Ras al Khaimah government on opportunities for open ocean mariculture in UAE waters (2015); Lockheed Martin (Oman/Saudi fish farm development, 2012); private pearl farms in Thailand (1997) and Philippines (1996 – 1999); Kuwait Institute for Scientific Research (1992); Australian International Development Assistance Bureau (1992); USAID (1991); South Pacific Commission, South Pacific Forum Secretariat (1991).

GRANTS AND AWARDS :

Fish 2.0 Business Plan pitch competition, won Strongest Market Potential, Pre-revenue companies (2015).

Since 1993, Mr Sims has been P.I. or Co-P.I. on more than 35 Federal or State research grants or contracts, worth over $8 million, including :

Principal Investigator for a U.S. National Science Foundation - Small Business Innovative Research (SBIR) grant (Phases I and II) on "Launching Velella: Testing the Commercial Potential of Mobile Offshore Fish Farming in Ocean Gyres". 2009 - 2012.

Co-Principal Investigator for a Saltonstall-Kennedy Grant (NMFS/N.O.A.A.) grant for "Fishmeal Replacement Using the Byproducts from Microalgae Based Biofuel Production and Food Processing in the Diets of High Value Marine Finfish". 2010 - 2012.

Principal Investigator for a Saltonstall-Kennedy Grant (NMFS/N.O.A.A.) grant for "Operational and economic efficiencies of surface cage technologies: The key to profitability in America's open ocean fish farming industry." 2009 – 2011.

Co-Principal Investigator for a U.S. National Science Foundation - SBIR grant (Phases I and II) on "Innovative control of ectoparasites: key to the expansion of open ocean fish". 2007 - 2010.

Co-Principal Investigator for a National Oceanographic and Atmospheric Administration SBIR Grant (Phases I and II) for "Improved Giant Grouper hatchery methods open opportunities for open ocean aquaculture and fishery enhancement". 2007 – 2011.

SELECTED PUBLICATIONS AND PAPERS : Mr Sims writes a regular column on offshore aquaculture for Aquaculture Magazine. He was previously Editor of Pearl Oyster Information Bulletin (1989–2005), and regularly contributed articles to Pearl World, The International Pearling Journal. Has authored or co-authored over 20 published papers and reports, including:

Park, H.; … **Sims, N.**; … Clemente, T.. (in press). Towards the development of a sustainable soybean-based feedstock for aquaculture. Plant Biotech. Journal: PBI-00215-2016.R1

Sims, N.A. 2013. "Kona Blue Water Farms case study: permiting, operations, marketing, environmental impacts, and impediments to expansion of global open ocean mariculture". *In* A. Lovatelli, J. Aguilar-Manjarrez & D. Soto, eds. Expanding mariculture farther offshore: Technical, environmental, spatial and governance challenges. **FAO Fisheries and Aquaculture Proc. No. 24.** Rome, FAO. pp. 263–296.

Sims, N.A. 2013. Open ocean aquaculture can fill the void. Marine Ecosystems and Management. **Vol. 7**, No. 2. October - November 2013. p. 3.

Sims, N.A. 2012. "Environmental Impacts of an Open Ocean Mariculture Operation in Kona, Hawaii". **Encyclopedia of Sustainability. Vol. 5: 3555-3582.** Springer Science+Business Media, LLC, New York. ISBN: 978-0-387-89469-0.

Key, G. & **N. A. Sims**. 2012. Velella Project Pioneers Open Ocean Cage-Farming Technology. Global Aquaculture Advocate**, September/October 2012**: pp 84 – 88.

Sims, N. A., & Key, G. 2011. Fish without footprints, pp. 1-6 in **OCEANS 2011**. IEEE.

Sims, N.A. (2010). "Fishing farming Supports Ecological Efficiency". Global Aquaculture Advocate. **May/June, 2010**: pp 54-55. (http://pdf.gaalliance.org/pdf/gaa-sims-may10.pdf)

Sims, N.A. (2008). "Net Impacts -- Net Pens Deliver More Fish With Smaller Carbon Footprint than Tank Culture". Global Aquaculture Advocate. **March/April, 2008**: pp 41-3.

Welch, A., Hoenig, R., Stieglitz, J., Benetti, D., Tacon, A., **Sims, N**., and O'Hanlon, B. 2010. From fishing to the sustainable farming of carnivorous marine finfish**.** Reviews in Fisheries Science **18**(3): 235-247.

Sims, N. A. 1994. Growth of wild and cultured black-lip pearl oysters, *Pinctada margaritifera* (L.) (Pteriidae: Bivalvia), in the Cook Islands. Aquaculture **122**: 181 – 191.

Sims, N. A. 1993. Size, age and growth of the black-lip pearl oyster, *Pinctada margaritifera* (L.). J. Shellfish Res., **12** (2): 223-8.

DENNIS JAY PETERS

603 Walton Way 850-240-3414
Miramar Beach, Florida 32550 https://www.linkedin.com/in/dennis-peters-a6048624 petersd1@cox.net

Marine Sciences Operations Management

Mr. Peters' professional experience include over 34 years of aquatic research and monitoring, fisheries/aquaculture development, and diving experience, which has focused on the protection and enhancement of marine and estuarine ecosystems of Florida, Hawaii, Belize, and the Caribbean. Dennis has worked closely with environmental issues in concert with the sensitive policy and political concerns of the local, state, and Federal stakeholders most responsible for ecosystem management and protection. This long-term working relationship with the stewards of Florida's sensitive habitats and species, particularly the Gulf of Mexico marine environment, has also afforded Mr. Peters an appreciation and knowledge of public concerns and issues.

Mr. Peters has provided direct consultation and representation support on behalf of his clients to USFWS, NMFS, and FDEP. Dennis has been responsible for preparing and securing Take Permits (Take Statements, IHA, and LOA) for the protection of T&E marine mammal and sea turtle species, as provided by the ESA and MMPA. Other areas of expertise includes marine aquaculture, environmental program management, protected species surveys, mitigation and best management plans development, permit application development, and water quality investigations and analyses.

PROFESSIONAL EXPERIENCE

GULF SOUTH RESEARCH CORPPORATION (GSRC) – Niceville, Florida
Eastern Regional Operations Manager – Southeastern United States **August, 2009 - Present**
Operations and business development for GSRC's Niceville, Florida location, directing and marketing environmental services to Federal and state agencies, as well as program and project management across multiple DOD customers; with focus on Navy, Air Force, and Army Corps of Engineers. Program manager for Naval Facilities Engineering Command (NAVFAC) Southeast, U.S. Army Corps of Engineers (USACE) Mobile District, and Air Force Civil Engineering Center (AFCEC).

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION (SAIC [LEIDOS]) – Shalimar, Florida
Business Development, Division Manager, and Vice President – Shalimar, Florida **December 1995 – June 2009**
Managed and operated the DOD Integrated Planning Division's (IPD) business (~$18M), financial performance, and staff of ~124 personnel. The IPD organization was comprised of a multi-disciplinary staff with expertise and capabilities supporting four Key Business Areas; Environmental Compliance, Range Management and Sustainment, Environmental Planning (NEPA, Natural and Cultural Resources), and Integrated Spatial Solutions.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP), DIVISION OF MARINE RESOURCES, FLORIDA MARINE RESEARCH INSTITUTE (FMRI) –
Ft. Walton Beach, Florida
Research Administrator I - Ft. Walton Beach Field Lab, Florida **January 1992 – December 1995**
Responsible for the establishment and direction of a fisheries field lab designed to conduct continuing stock assessments and estuarine monitoring for "Florida's Marine Fisheries-Independent Monitoring Program". The program utilized stratified-random and fixed monthly sampling of estuarine fishes and selected invertebrate species. Data provided trends in fishery populations and water quality so as to assess the impact of management regulations as well as fishery practices.

GULFSTREAM AQUACULTURE – Destin, Florida
Owner/Consultant – Destin, Florida **July 1991 – January 1996**
Owned and operated a private aquaculture consultancy business for marine finfish research and development operations. Performed biological assessments of the technology and feasibility required for commercial culture of new and traditional finfishes for the aquaculture industry. Developed production schedules, economic analyses, and infrastructure investigations encompassing issues of broodstock husbandry and spawning, mass larval rearing of hatchery operations, and growout maturation.

HAWAII SEAFOOD GROWERS, INC. – Kailua-Kona, Hawaii
Operations Manager | Broodstock Manager **March 1990 – July 1991**
Responsible for the construction, operation, and management of a Mahimahi (dolphin fish, *Coryphaena hippurus*) fish farm on the Big Island of Hawaii. Additionally responsible for commercial scale development, broodstock spawning, hatchery production, high density growout, cold water harvesting, and product sales and marketing. Responsible for expenditures, professional correspondences and representations, and employee supervision.

NORAQUA INC. – Vero Beach, Florida
Broodstock Manager | Hatchery Manager **May 1987 – March 1990**
Assisted with the development and construction of the first commercial aquaculture facility for Mahimahi (dolphin fish) on Grand Bahamas, Bahamas. Performed site evaluations and selections based on underwater assessments of sediments, water current, and quality parameters. Responsible for broodstock procurement (*Coryphaena hippurus* and *C. equisetis*), transport, conditioning, and spawning. Initiated genetic selection programs using third generation (F3) stock and refined live feed enrichment processes and mass larval rearing techniques for marine finfish culture.

HARBOR BRANCH OCEANOGRAPHIC INSTITUTE – Ft. Pierce, Florida
Research Assistant I – Ft. Pierce, Florida **May 1984 – May 1987**
Worked with the Marine Fisheries Population Assessment program and was responsible for the sampling design and coordination of collections of complete life stages of commercially significant marine finfishes including tarpon, snook, drum, ladyfish, and mullet. Collated and analyzed fisheries and water quality data for quarterly reports and publications, while participating in discussions concerning project design and scope with various funding agencies, mosquito control districts, and state fishery laboratories.

EDUCATION

Master of Science (M.S.); Bio-Environmental Oceanography, Florida Institute of Technology; 1984
Bachelors of Science (B.S.); Biology, Lebanon Valley College; 1980
Graduate Courses; Marine Ichthyology and Marine Ecology, Marine Science Consortium; 1977 & 1978

PROFESSIONAL / COMMUNITY AFFILIATIONS

FLORIDA FISH & WILDLIFE CONSERVATION COMMISSION (FWC) - FLORIDA MARINE FISHERIES ENHANCEMENT INITIATIVE (FMFEI); aka Marine Stock Enhancement Advisory Board [MSEAB])
Board of Directors **May 2008 - Present**
An FWC Hatchery Network Initiative promoting a network of marine fisheries/hatchery enhancement centers across the State of Florida for the enhancement and sustainability of recreational and commercial fisheries.

CHOCTAWHATCHEE BASIN ALLIANCE (CBA)
Board of Directors **January 1996 - Present**
A local nonprofit, grassroots environmental organization of community volunteers, agency representatives, and local leaders. CBA focuses on water quality monitoring, habitat restoration, education, and research initiatives of the Choctawhatchee Bay watershed; Served as Chair, Vice Chair, and Treasurer.

CHILDREN'S VOLUNTEER HEALTH NETWORK, INC. (CVHN)
Board of Directors and Board of Trustees **April 2009 - Present**
A faith-based 501(c) 3 organization providing direct medical, dental, and mental health services to schoolchildren whose family income falls below certain measures throughout Walton and Okaloosa Counties and surrounding communities; served as Vice Chair and Treasurer.

NORTHWEST FLORIDA STATE COLLEGE FOUNDATION (NWFSCF)
Board of Directors and Board of Trustees **January 2012 - Present**
A premier college foundation supporting Northwest Florida State College in improving the educational opportunities of students and enhancing the quality of life in the region through positive, value-added community and industry relationships.

PUBLICATIONS

Florida Scientist, "Seasonality, Residency, and Spatial Distribution of Juvenile Surf Zone Fishes of the Florida East Coast. March, 1987.

Gulfstream Aquaculture, "Japanese Flounder Aquaculture: Analysis of Feasibility & Profitability". August, 1991.

Gulfstream Aquaculture, "Mahimahi Aquaculture: Production & Economic Analysis Comparison at a Pre-Designed 600-Ton Japanese Flounder Facility". October, 1991.

Norsk Fiskeoppdrett, "Mahimahi-opp varmere farvann". March, 1991.