Modification of the Vessel Position Data Collection Program for the Gulf of Mexico Shrimp Fishery

Draft Framework Action
under the Fishery Management Plan for the
Shrimp Fishery in the Gulf of Mexico, U.S. Waters

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ABBREVIATIONS USED IN THIS DOCUMENT

BRD	bycatch reduction device
cELB	cellular electronic logbook
Council	Gulf of Mexico Fishery Management Council
EEZ	Exclusive Economic Zone
ELB	electronic logbook
EIS	environmental impact statement
EMTU	enhanced mobile transceiver unit
EMTU-C	enhanced mobile transceiver unit – cellular
FMP	Fishery Management Plan
GMFMC	Gulf of Mexico Fishery Management Council
Gulf	Gulf of Mexico
HMS	highly migratory species
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
RR	Gulf of Mexico reef fish commercial permit
SD	Secure Digital
Shrimp FMP	Shrimp Fishery of the Gulf of Mexico, U.S. Waters
SPGM	Gulf of Mexico shrimp moratorium
SRD	Science and Research Director
TED	turtle excluder device
VMS	vessel monitoring system

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CHAPTER 1. INTRODUCTION

1.1 Background

The Gulf of Mexico (Gulf) shrimp fishery is managed by the Gulf of Mexico Fishery Management Council (Council) through the Fishery Management Plan (FMP) for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters (Shrimp FMP). Since 2005, the National Marine Fisheries Service (NMFS) has estimated shrimp fishing effort based on vessel position data collected through an electronic logbook (ELB) program to assess the status of Gulf shrimp stocks and the fishery's impacts to red snapper and sea turtles (Amendment 13 to the Shrimp FMP; GMFMC 2005). The ELBs are passive vessel tracking devices that collect vessel positional data in 10-minute intervals. Originally, the ELB boxes stored the positional data onto Secure Digital (SD) cards, which were eventually collected in the field by NMFS port agents, with 577 vessels submitting data at some point between 2005 and 2013. The original sampling design began with shrimp vessels permitted to fish in Gulf federal waters as of December 31, 2004, that reported landings in either 2003 or 2004 (2,104 vessels). Vessels were then assigned to one of nine geographic zones across the Gulf coast based on port, with the majority of landings in the most recent year with fishing activity. Five of the nine geographic zones with large numbers of both ice and freezer boats were split into two strata, for a total of 14 strata. The number of samples within each stratum were based on the proportion of total offshore landings, and the individual vessel selection probability within stratum were based on the weighted average of 2003 and 2004 landings, with twice as much weight assigned to 2004 landings (K. Dettloff, Southeast Fisheries Science Center, pers. comm., 2024).

In 2013, NMFS upgraded the original ELB design to gain efficiency, designing a device that could transmit the positional data to NMFS over a 3G cellular signal. These upgraded vessel tracking devices were named "cellular electronic logbooks" (cELB). The vessel position information transmitted from cELBs are combined with data from submitted dealer reports to estimate effort. The Shrimp ELB Framework Action (GMFMC 2013) later established a cost-sharing system for the cELB program, under which NMFS provided the hardware, software, data storage, effort estimation analysis, and archival activities while the selected permit holders covered the costs of installing and maintaining the units, as well as the monthly cellular service required for data transmission. In 2014, approximately 500 federally permitted shrimp vessels, accounting for roughly one-third of the offshore fleet, were selected by the Science and Research Director (SRD) and required to participate in the cELB program, although the Shrimp ELB Framework Action (GMFMC 2013) estimated cost sharing for a maximum number of 1,500 vessels. The sampling design for cELB devices followed that of the original ELB program.

In 2018, to account for vessels with cELBs that were no longer operating in the fishery (J. Nance, retired Southeast Fisheries Science Center, pers. comm., 2024), the Gulf States Marine Fisheries Commission and NMFS Southeast Fisheries Science Center (SEFSC) located and installed an additional 100 cELB devices on vessels for participation in the effort monitoring program for the Gulf shrimp fleet. Since 2018, there has not been an updated stratified sampling design of the Gulf shrimp fleet.

The current regulations require participation in the cELB program if selected by the SRD and were implemented with Amendment 13 to the Shrimp FMP:

§ 622.51 Recordkeeping and reporting.
(a) Commercial vessel owners and operators--(1) General reporting requirement. The owner or operator of a vessel that fishes for shrimp in the Gulf EEZ or in adjoining state waters, or that lands shrimp in an adjoining state, must provide information for any fishing trip, as requested by the SRD, including, but not limited to, vessel identification, gear, effort, amount of shrimp caught by species, shrimp condition (heads on/heads off), fishing areas and depths, and person to whom sold.
(2) Electronic logbook reporting. The owner or operator of a vessel for which a Federal commercial vessel permit for Gulf shrimp has been issued and who is selected by the SRD must participate in the NMFS-sponsored electronic logbook reporting program as directed by the SRD. In addition, such owner or operator must provide information regarding the size and number of shrimp trawls deployed and the type of bycatch reduction device (BRD) and turtle excluder device used, as directed by the SRD. Compliance with the reporting requirements of this paragraph (a)(2) is required for permit renewal.
(3) Vessel and Gear Characterization Form. All owners or operators of vessels applying for or renewing a commercial vessel moratorium permit for Gulf shrimp must complete an annual Gulf Shrimp Vessel and Gear Characterization Form. The form will be provided by NMFS at the time of permit application and renewal. Compliance with this reporting requirement is required for permit issuance and renewal.

Vessels selected to participate must carry time-stamped global positioning system (GPS) units that record and store data regarding a vessel's location at 10-minute time intervals (LGL Ecological Research Associates, Inc. 2009).[1] From these time-stamped locations, vessel speed between points can be estimated and then evaluated with mathematical algorithms to determine if a vessel is stopped, towing, or transiting. Fishing effort has historically been measured in terms of "fishing days," where a fishing day equals 24 hours of towing time.

Trip tickets provide NMFS with shrimp catch data for each trip, which are then matched to the GPS track log data and used to estimate catch-per-unit-effort for the trip. Effort is estimated by statistical area and depth zone using the Pooling Method (Nance 2004). Shrimp fishery statistical zones in the Gulf are shown in Figure 1.1.1. Historically, GPS track logs stored on the cELBs were transmitted via a cellular signal to NMFS as soon as the vessel is within cellular range, whereas the trip ticket landings data for the year are not available to NMFS until the following year.

[1] To specify if units record data all the time, such as when a vessel is in port, it is noted within LGL's 2009 *Procedures manual for electronic logbook (ELB)* that "A second programming change extended the observation period further by not recording position data where it has not changed during a 24 hour period. It is anticipated that this change, which will stop recording while a vessel is in port…" and that "Unplugging the unit causes no problems other than lost data. If you unplug a unit for a significant amount of time during a trip, the data from that trip may not be useful to the program because information about tows may be lost. Unplugging the unit when in port is never a problem."

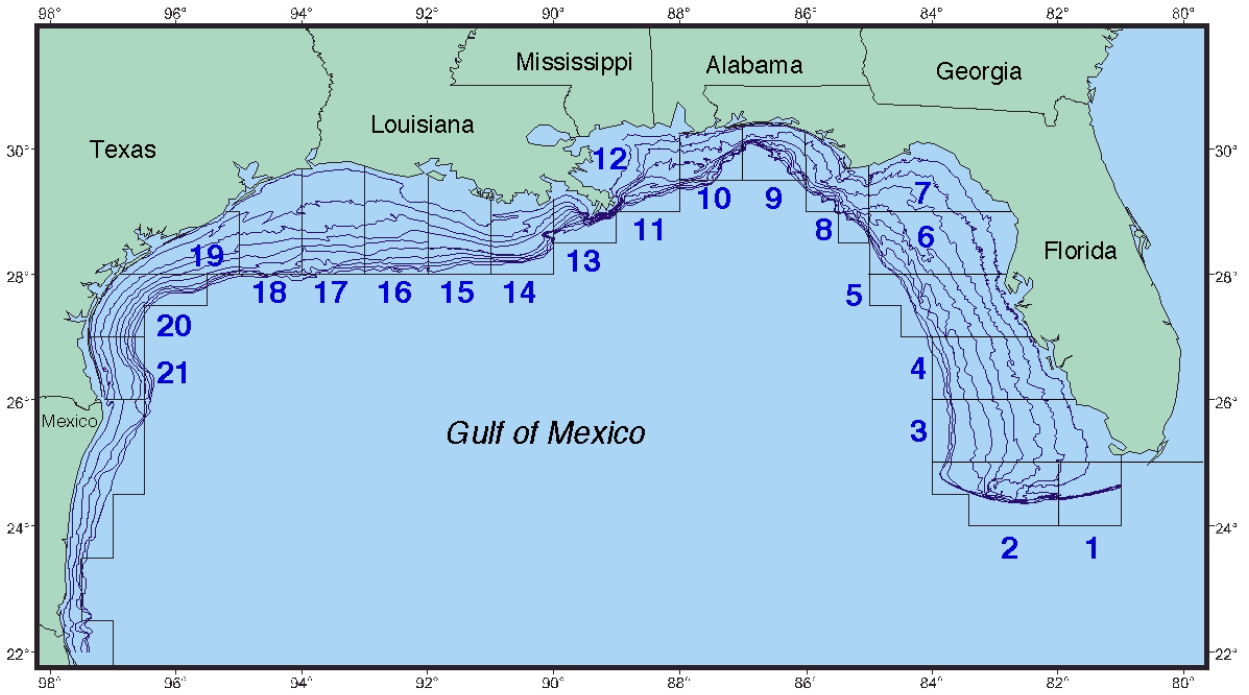

Figure 1.1.1. Statistical sub-areas and depth zones (five fathom increments) for the U.S. Gulf of Mexico.

As of December 7, 2020, the 3G cellular network which was used for transmission of data from the cELBs was discontinued and the server that securely stored the shrimp industry's vessel position data is no longer operational.[2] Even though the data can no longer be transmitted via 3G cellular networks, the hardware devices on board vessels continue to collect and store vessel position data, as long as they are still functioning.

In order to meet the requirements of Section 7 of the Endangered Species Act (ESA), specifically the "Reasonable and Prudent Measures" resulting from the recent "Reinitiation of ESA Section 7 Consultation on the Implementation of the Sea Turtle Conservation Regulations under the ESA and the Authorization of the Southeast U.S. Shrimp Fisheries in Federal Waters under the Magnuson-Stevens Fishery Management and Conservation Act" (Biological Opinion [BiOp]), NMFS must ensure that shrimp fishery effort monitoring is conducted at equivalent, or greater, levels as was conducted over the past 10 years. Currently, effort monitoring in the Gulf shrimp fishery is not being conducted at equivalent levels, and there is no clear plan for greater levels. Through this framework action, the Council is exploring alternatives to the cELB program in order to continue the estimation of effort in the shrimp fishery, which would assist in conducting annual shrimp stock assessments, estimating bycatch of other species for use in other species' assessments, and monitoring sea turtle bycatch and the juvenile red snapper effort threshold.

[2] Appendix A provides a diagram of how cELBs work and the role of cellular data transmission.

1.2 Purpose and Need

The purpose of this framework action is to transition from the expired 3G cellular electronic logbook program to a system that would maintain the Council's and NMFS' scientific ability to estimate and monitor fishing effort in the Gulf shrimp fishery while minimizing the economic burden on the industry and on the agency to the maximum extent practicable.

The need is to base conservation and management measures on the best scientific information available and to minimize bycatch to the extent practicable, as required by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), and minimize interactions with protected species as required by the ESA.

1.3 History of Management

The **Shrimp Fishery Management Plan** (1981) defined the shrimp fishery management unit to include brown shrimp, white shrimp, pink shrimp, royal red shrimp, seabobs (*Xiphopenaeus kroyeri*), and brown rock shrimp (*Sicyonia brevirostris*). The purpose of the plan was to enhance yield in volume and value by deferring harvest of small shrimp to provide for growth. The main actions included: 1) establishing a cooperative Tortugas Shrimp Sanctuary with Florida to close a shrimp trawling area where small pink shrimp comprise the majority of the population most of the time; 2) a cooperative 45-day seasonal closure with Texas to protect small brown shrimp emigrating from bay nursery areas; and 3) a seasonal closure of an area east of the Dry Tortugas to avoid gear conflicts with stone crab fishermen.

Amendment 1/Environmental Assessment (EA) (1981) provided the Regional Administrator (RA) with the authority (after conferring with the Council) to adjust by framework action the size of the Tortugas Sanctuary or the extent of the Texas closure, or to eliminate either closure for one year.

Amendment 2/EA (1981) implemented mandatory reporting of statistical data by shrimp vessel owners and operators, dealers, and processors.

Amendment 3/EA (1982) resolved a shrimp-stone crab gear conflict on the west-central coast of Florida.

A **NMFS Rule** (1987) required all shrimp trawlers 25 ft and longer in offshore waters to use qualified turtle excluder devices (TED) and all shrimp trawlers smaller than 25 ft to restrict tow times to 90 minutes or less. In inshore waters, at specified times, all shrimp trawlers were required to restrict tow times to 90 minutes or less. In both inshore and offshore waters, shrimp trawlers using TEDs are exempt from the tow time restrictions. The rule specified criteria and procedures for qualifying additional TEDs; specified vessel sizes, areas and seasons for which qualified TEDs or 90-minute tow times must be used; established reporting requirements; continued measures for resuscitation and release of captured sea turtles; and continued designated critical habitat. Initially, only four TED designs were approved: the NMFS' TED, the Cameron TED, the Matagorda TED, and the Georgia TED. The Morrison soft-TED was authorized later in the year.

Amendment 4/EA (1988) identified problems that developed in the fishery and revised the objectives of the FMP accordingly. The annual review process for the Tortugas Sanctuary was simplified, and the Council and RA review for the Texas closure was extended to February 1. A provision that white shrimp taken in the EEZ be landed in accordance with a state's size/possession regulations to provide consistency and facilitate enforcement with Louisiana was to have been implemented at such time when Louisiana provided for an incidental catch of undersized white shrimp in the fishery for seabobs. This provision was disapproved by NMFS with the recommendation that it be resubmitted after Louisiana provided for that bycatch. This resubmission was made in February of 1990 and applied to white shrimp taken in the EEZ and landed in Louisiana. It was approved and implemented in May of 1990.

Amendment 5/EA (1991) defined overfishing for Gulf brown, pink, and royal red shrimp and provided measures to restore overfished stocks if overfishing should occur. Action on the definition of overfishing for white shrimp was deferred, and seabobs and rock shrimp were removed from the management unit. The duration of the seasonal closure to shrimping off Texas was changed from June 1 through July 15 to May 15 through July 15 to conform to changes in state regulations.

Amendment 6/EA (1992) eliminated the annual reports and reviews of the Tortugas Shrimp Sanctuary in favor of monitoring and an annual stock assessment. Three seasonally opened areas within the sanctuary continue to open seasonally, without need for annual action. A proposed definition of overfishing of white shrimp was rejected by NMFS because it was not based on the best available data.

Amendment 7/EA (1994) defined overfishing for white shrimp and provided for future updating of overfishing indices for brown, white, and pink shrimp as new data became available. A total allowable level of foreign fishing for royal red shrimp was eliminated; however, a redefinition of overfishing for royal red shrimp was disapproved.

Amendment 8/EA (1995), implemented in early 1996, addressed management of royal red shrimp. It established a procedure that would allow total allowable catch for royal red shrimp to be set up to 30% above maximum sustainable yield (MSY) for no more than two consecutive years so that a better estimate of MSY could be determined. This action was subsequently negated by the 1996 Sustainable Fisheries Act amendment to the Magnuson-Stevens Act that defined overfishing as a fishing level that jeopardizes the capacity of a stock to maintain MSY and does not allow optimum yield to exceed MSY.

Amendment 9/supplemental EIS (1997) required the use of a NMFS certified bycatch reduction device (BRD) in shrimp trawls used in the EEZ from Cape San Blas, Florida to the Texas/Mexico border, and provided for the certification of BRDs and specifications for the placement and construction. The purpose of this action was to reduce the bycatch mortality of juvenile red snapper by 44% from the average mortality for the years 1984 through 1989. This amendment exempted shrimp trawls fishing for royal red shrimp seaward of the 100-fathom contour, as well as groundfish and butterfish trawls, from the BRD requirement. It also excluded small try nets and no more than two ridged frame roller trawls of limited size. Amendment 9

also provided mechanisms to change the bycatch reduction criterion and to certify additional BRDs.

Amendment 10/EA (2002) required BRDs in shrimp trawls used in the Gulf east of Cape San Blas, Florida. Certified BRDs for this area were required to demonstrate a 30% reduction by weight of finfish.

Amendment 11/EA (2001) required owners and operators of all vessels harvesting shrimp from the EEZ of the Gulf to obtain a federal commercial vessel permit. This amendment also prohibited the use of traps to harvest royal red shrimp from the Gulf and prohibited the transfer of royal red shrimp at sea.

Amendment 12/EA (2001) was included as part of the Generic Essential Fish Habitat (EFH) Amendment that established EFH for shrimp in the Gulf.

A **NMFS rule** (2003) required the use of larger TED escape openings in otter trawl nets used to harvest shrimp to improve the exclusion leatherback turtles and adult loggerheads and green turtles. Also, the double-cover escape opening was introduced, which consists of two mesh flaps covering the escape hole and provides enhanced turtle exclusion as well as improved shrimp retention.

Amendment 13/EA (2005) established an endorsement to the federal shrimp vessel permit for vessels harvesting royal red shrimp; defined the overfishing and overfished thresholds for royal red shrimp; defined MSY and OY for the penaeid shrimp stocks in the Gulf; established bycatch reporting methodologies and improved collection of shrimping effort data in the EEZ; required completion of a Gulf Shrimp Vessel and Gear Characterization Form by vessels with federal shrimp permits; established a moratorium on the issuance of federal commercial shrimp vessel permits; and required reporting and certification of annual landings during the moratorium.

August 2006 Regulatory Amendment (2006) changed the BRD certification criterion for penaeid shrimp trawling in the EEZ from being based on the expected reduction in the mortality of red snapper to the expected reduction in finfish catch. The change in the BRD certification criterion addressed shrimp trawl bycatch more comprehensively and increased flexibility, promoted innovation, and allowed for a wider variety of BRDs which allowed fishermen to choose the most effective BRD for fishing conditions and therefore reduce overall finfish bycatch. This amendment also certified the Modified Jones-Davis BRD for use in the Gulf and South Atlantic shrimp fisheries, provisionally certified the extended funnel BRD for use in the Gulf shrimp fishery, and provisionally certified the composite panel BRD to be used in the Gulf and South Atlantic shrimp fisheries. The amendment also consolidated and made modifications to the BRD Testing Manuals for the Gulf and the South Atlantic regions.

Amendment 14/EIS (2007) was a joint amendment with Reef Fish Amendment 27. It established a target red snapper bycatch mortality goal for the shrimp fishery in the western Gulf of 74% relative to the benchmark years of 2001-2003, reducing that target goal to 67% beginning in 2011 and eventually reducing the target to 60% by 2032. The amendment also defined seasonal closure restrictions that can be used to manage shrimp fishing effort in relation to the

target red snapper bycatch mortality reduction goal. If necessary, a seasonal closure of the shrimp fishery in areas (add areas) will occur at the same time as the annual closure of federal waters, which occurs in conjunction with the Texas closure. The need for a closure will be determined by the RA based on an annual assessment by the SEFSC. The assessment will use shrimp effort data for the most recent 12-month period available and will include a recommendation regarding the geographical scope and duration of the closure. The SEFSC's assessment will be provided to the RA on or about March 1 of each year. It also established a framework procedure to streamline the management of shrimp fishing effort in the western Gulf.

A **Framework Action** (2008) made revisions to BRD specifications and testing protocols, including lowering the needed bycatch reduction for BRDs in the western Gulf from 44% to 30% to be consistent with the eastern Gulf and the South Atlantic.

A **Framework Action** (2009) decertified the expanded mesh and Gulf Fisheye BRDs. This action also modified the allowable configuration for the Fisheye BRD, such that it could not be placed farther forward than 9 ft from the tie-off rings.

The Generic Annual Catch Limit (ACL)/Accountability Measures (AM) Amendment/EIS (2011) set an ACL and AM for royal red shrimp. Penaeid shrimp were exempt from the ACL/AM requirements because of their annual life cycle.

A **Framework Action** (2012) certified the two BRDs that were provisionally certified in 2010. It also lowered the effort reduction threshold established in Amendment 14 from 72% to 67%.

The Shrimp ELB Framework Action (2013) established a cost-sharing system for the ELB program and described new equipment and procedures for the program.

Amendment 15/EA (2015) redefined stock status criteria for the three penaeid species of shrimp including MSY and overfished/overfishing thresholds. The general framework procedure was also updated.

Amendment 16/SEIS (2015) eliminated duplicative AMs and the quota for royal red shrimp. The ACL was set equal to the acceptable biological catch and a post-season AM was established.

Amendment 17A/EA (2017) extended the Gulf commercial shrimp permit moratorium for 10 more years through October 26, 2026.

Amendment 17B/EA (2017) defined the aggregate MSY of 112,531,374 pounds of tails for all shrimp species and an aggregate OY of 85,761,596 pounds of tails for all shrimp species. This amendment allows for the creation of a reserve permit pool when certain conditions are met, and mandates that the Council convene a review panel to review the details of a permit pool if the number of permits reaches 1,175. This amendment also allows vessels possessing shrimp to transit through federal waters without a federal permit if their trawl doors and nets are out of the water and bag straps are removed.

Amendment 18/Categorical Exclusion (CE) (2019) reduced the target reduction goal for juvenile red snapper mortality in the federal Gulf penaeid shrimp trawl fishery from 67% to 60% and modified the FMP framework procedures to allow changes to the target reduction goal for juvenile red snapper mortality through the abbreviated framework documentation process.

A **NMFS Rule (EIS)** (2019, effective 2021) required skimmer trawl vessels 40 ft and greater in length that are rigged for harvesting shrimp to install and use TEDs designed to exclude small turtles in their nets. The space between the deflector bars of the new TEDs must not exceed 3 inches and escape openings must be oriented at the top of the net. There are webbing restrictions on the escape opening flap depending on the type of TED grid and escape opening configuration.

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action 1 - Modify the Method Used to Collect Vessel Position Data for the Gulf of Mexico Shrimp Fishery

Note: The types of data and amount/timing of data collection would not vary between alternatives. Consistent with current requirements, the permitted vessels selected to participate must also provide the National Marine Fisheries Service (NMFS): the size and number of shrimp trawls deployed for each set, and the type of bycatch reduction device and turtle excluder device used in the nets. As set forth in Amendment 13 to the Fishery Management Plan (FMP) for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters (Shrimp FMP; GMFMC 2005) and 50 C.F.R. § 622.51, compliance with these requirements and the requirement to submit vessel position data is required for permit renewal.

Alternative 1: No Action - Maintain the current method to collect vessel position data through the cellular electronic logbook (cELB) units supplied by NMFS. NMFS would collect the memory cards from the units via mail.

Alternative 2: Implement a vessel monitoring system (VMS) requirement for the Gulf of Mexico (Gulf) shrimp fishery that provides, at a minimum, archived position data compatible with the Southeast Fisheries Science Center's (SEFSC) shrimp effort algorithm to a NMFS server. If selected by the Science and Research Director (SRD), the owner or operator of a vessel with a Gulf shrimp moratorium (SPGM) permit would be required to install a type-approved VMS unit (50 C.F.R. § 600.1501).

Alternative 3: Implement a cellular VMS (cVMS) requirement for the Gulf shrimp fishery that provides archived position data compatible with the SEFSC's shrimp effort algorithm. If selected by the SRD, the owner or operator of a vessel with a SPGM permit would be required to install a NMFS-approved cVMS that archives vessel position when on a fishing trip in the Gulf and automatically transmits those data via cellular service to a non-OLE NMFS server. NMFS-approved cVMS would be type-approved through a process external to 50 C.F.R. § 600.1501.

Discussion:

Alternative 1 (No Action) would maintain the current method for collecting vessel position data. cELB units ceased transmitting information to NMFS on December 31, 2020, and the National Environmental Satellite Data and Information Service shut down the server receiving the data from cELB units on December 7, 2020. Because 3G cellular transmission is no longer possible, NMFS has been collecting the Secure Digital (SD) cards from the cELB units of participating vessels via mail until a new process is developed. However, NMFS is unable to determine if a cELB unit has stopped collecting data until the permit holders have returned the memory cards and NMFS has downloaded and analyzed the data. Analyses of the terminated cELB transmission method and mail-in process have shown problems with adequacy of the data collected. With the cellular system, data were automatically transmitted and so nonfunctional cELB units could be identified and replaced in real time. The mail-in process requires manual

transmission, where SD cards are only mailed to NMFS twice per year. As a result, data recovery with the mail-in process has ranged from approximately 58% to 86% for the five mailings from June 2021 to June 2023.[3] Furthermore, as cELB units break down, overall coverage will continue to lag. Cost-sharing of the ELB program was previously established (GMFMC 2013) with vessel owners paying installation, maintenance, and transmission costs; cost-sharing for cVMS units is discussed under **Alternative 2**.

In September 2023, the Gulf States Marine Fisheries Commission, using FY2023 and FY2024 Congressional funding, contracted LGL Ecological Research Associates (LGL), to coordinate an "Early Adopter Program" for the federal Gulf shrimp fleet. LGL's process for approving vendors for the Gulf shrimp fishery Early Adopter Program was based on two rounds of field testing completed by the SEFSC and is detailed in Appendix C. In November 2023, LGL completed pricing and purchasing agreements with Woods Hole Group (Nemo), Viatrax (Boat Command), and Atlantic Radio Telephone (ZenVMS) to provide cVMS units and 2 years of cellular transmission and services fees. As part of LGL's approval process, vendors were required to maintain 24/7 customer service help for their application users. Other vendors are still able to apply for consideration and participation in the Gulf shrimp Early Adopter Program. Devices approved for use in the Early Adopter Program are anticipated to meet requirements for **Alternatives 2** and **3**, which would offset some industry costs.

Alternative 2 would transition the data collection by requiring the owner or operator of a vessel with a SPGM permit, if selected by the SRD, to install a type-approved VMS, which, at a minimum, archives vessel position when on a fishing trip[4] in the Gulf and transmits that data to NMFS.[5] If a satellite VMS unit is installed, vessel position data would be automatically transmitted to a NMFS server. If a cVMS unit is installed, vessel position data would be archived when on a fishing trip in the Gulf and would be transmitted to a NMFS server when the vessel is within cellular range. As shown in Appendix B, the VMS type-approval regulations include the requirements for units that use satellite transmission as well as cellular transmission. Currently, VMS reimbursement is available nationally for the purchase cost of the units,[6] while installation, maintenance, and communication costs are covered by vessel owners, and reimbursement is currently capped at $950 for programs that allow for the use of a cVMS. The cost per unit may be increased or decreased, and any VMS reimbursement is subject to available funding. While the language of **Alternative 2** refers to data being transmitted to a NMFS server,

[3] The listed percentages represent the percent range of returned SD cards during the five mailings that have occurred prior to January 2024: 64% from Mailing 1 in June 2021; 58% from Mailing 2 in January 2022; 68% from Mailing 3 in June 2022; 76% from Mailing 4 in January 2023; and 86% from Mailing 5 in June 2023. Of note, these percentages are reflective of the number of cards returned during each 6-month period and may have been in response to an earlier mailing, not necessarily reflecting a response to a mailing in a given 6-month period. In addition, data quality from returned SD cards is not represented in these percentages.

[4] In 50 C.F.R. § 622.2, a trip is defined as "a fishing trip, regardless of number of days duration, that begins with departure from a dock, berth, beach, seawall, or ramp and that terminates with return to a dock, berth, beach, seawall, or ramp."

[5] Information on Vessel Monitoring System Type-Approval can be found at https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=40795e9b7e80ab071d63d0f076d60d11&mc=true&r=SUBPART&n=sp50.12.600.q and in Appendix B.

[6] Information on reimbursement of VMS units can be found at https://www.psmfc.org/program/vessel-monitoring-system-reimbursement-program-vms. Information on the VMS Funding Prioritization Process can be found at https://media.fisheries.noaa.gov/2022-03/06-102-Revision_Cap%20Update%20-%20Signed%20JC.pdf.

following the current national VMS regulations, NOAA Office of Law Enforcement (OLE) would maintain final storage of the collected data, to which the SEFSC would have access.

Owners or operators of vessels with more than one permit that require VMS would need to comply with all the requirements for each permit, as could be the case with Gulf shrimp vessels that possess permits in other fisheries with VMS requirements. As of September 20, 2024, there were 1,257 vessels with valid or renewable SPGM permits (NMFS SERO Sustainable Fisheries Access Permits Database, accessed 11/4/24). Of these 1,257 vessels, an estimated 104 vessels are required to comply with VMS requirements in other fisheries. Most of these 104 vessels have South Atlantic rock shrimp limited access permits (92), while others have commercial Gulf reef fish permits (12), or various Atlantic highly migratory species (HMS) permits (2). Only satellite VMS has been approved for use on vessels with these other permits. Atlantic HMS permits require VMS when various types of gear are on board (e.g., pelagic longline, bottom longline, gillnet), at certain times of year, or in certain areas. The Atlantic HMS VMS requirements would not apply when the vessel has shrimp trawl gear on board and HMS defined gear has been removed from the vessel, and thus the vessels with Atlantic HMS permits would not have to simultaneously comply with the Atlantic HMS requirements and any VMS requirements in the Gulf shrimp fishery. However, when Atlantic HMS gear is on board the vessel, the vessel must abide by both Atlantic HMS and Gulf shrimp VMS requirements. The VMS requirements for South Atlantic rock shrimp limited access permits only apply while vessels are in the South Atlantic. The commercial Gulf reef fish VMS regulations require the unit to be reporting at all times, regardless of location.

Alternative 3 would transition the data collection by requiring the owner or operator of a vessel with a SPGM permit, if selected by the SRD, to install a type-approved cVMS, which archives vessel position when on a fishing trip in the Gulf and automatically transmits that data via cellular service to NMFS. For the 104 permitted vessels described above, the vessels would be required to carry two VMS units under **Alternative 3**, as a cVMS would be mandatory. The NMFS type-approval process for cVMS devices is yet to be determined and would be a process external to 50 C.F.R. § 600.1501. It is also yet to be determined by NMFS if the devices approved in the Early Adopter Program meet these criteria, although it is anticipated that they would meet these criteria and offset costs to industry. The collected data would be transmitted to a NMFS server that is not housed by OLE. Unlike **Alternative 2**, OLE would not store these data; however, OLE would be able to access these data.

At the January 2022 Council meeting, NMFS presented an evaluation of the draft approval specifications (Appendix D) for reinstituting the historical cELB program. Under the current VMS type-approval process (**Alternative 2**), NMFS contracts with an industry expert who performs VMS testing and provides recommendations, and SEFSC would maintain additional requirements for vendors on the SEFSC program website along with a website with those approved vendors for the shrimp fishery. If the national VMS type-approval process is not followed (**Alternative 3**), the SEFSC would need to develop a separate contract for shrimp-specific testing and certification as well as maintain requirements for vendors on the SEFSC shrimp program website. In addition, NMFS may need to add the Gulf shrimp approval specifications to the regulations at 50 C.F.R. Part 622, Subpart C. A summary of the primary differences between **Alternatives 2** and **3** are shown in Table 2.1.1.

In comparing **Alternatives 2** and **3**, the types of data (i.e. HH:MM:SS; degrees, minutes, seconds), amount/timing of data collection, and minimum number of position fixes would not vary. Vessel position would be recorded every 10 minutes. The minimum number of position fixes that a unit can process would be 14,400.

Table 2.1.1. Primary differences between **Alternatives 2** and **3**.

	Alternative 2	Alternative 3
Allowed Data Transmission Type	Both cellular and satellite	Cellular only
Data Recipient	NMFS (NOAA OLE) server	Non-OLE NMFS server*
Initial VMS Device Reimbursement through Pacific States Marine Fisheries Commission and NOAA OLE	Yes (up to $950 if cellular and satellite are options)	No
Field Tests and At-sea Trials for VMS Devices	May be performed	Mandatory
Additional NMFS Costs from Not Utilizing 50 C.F.R. § 600.1501	No	Yes**

*OLE would be able to access these data.
**These are detailed in Chapter 4.

Lastly, under **Alternative 2**, as part of its review, OLE may perform field tests and at-sea trials that involve demonstrating every aspect of VMS and communications operation. These field tests and at-sea trials would not be mandatory under **Alternative 2** but would be under **Alternative 3**. As part of the suggested review process for approval of devices under **Alternative 3** specified in Appendix D, NMFS would perform at-sea trials aboard an offshore commercial shrimp vessel (i.e., in federal waters of the Gulf) that involve demonstrating functionality of every aspect of the hardware/software device, cellular mobile communications service, or bundle operation:

> At-sea testing aboard an offshore shrimp vessel includes, but is not limited to: ensuring the installed hardware/software device's GPS signal and connection is sufficient to attain and record at least 95% of the required 10-minute interval position fix data in a 24-hour period for each 24-hour day of at-sea testing, with a minimum of 7 days spent at-sea for these trials; comparing vessel speed and activity (trawling, transit, etc.), as recorded by a human observer, aboard the offshore shrimp vessel against speed and activity generated by NMFS shrimp effort algorithm programs using data from the hardware/software device, cellular mobile communications service or bundle seeking type-approval; and mounting of the hardware/software device in a location where similar/traditional marine electronics are mounted aboard working trawlers to troubleshoot any issues associated with potential mounting locations and/or wiring and battery capabilities.

Early Adopter Program

The FY2023 budget contained a Congressional appropriation that "*Within funds for Fisheries Data Collections, Surveys, and Assessments, the agreement provides $850,000 for NMFS, in consultation with the Gulf of Mexico Fishery Management Council and shrimp industry stakeholders, to continue the development and implementation of the newly approved Electronic Logbook program (ELB) that archives vessel position and automatically transmits scientific shrimp fishing effort data via cellular service to NMFS.*"[7] The Council's Shrimp Advisory Panel met with NMFS representatives in May 2023 to discuss the proposed spend plan for these funds.[8] NMFS designated $360,000 of the funds for an Early Adopter Program of cVMS units on federally permitted shrimp vessels in the Gulf. The Early Adopter Program provides cVMS units and two years of cellular service to volunteers. The FY2024 budget also contained a Congressional appropriation that "*Within the funding provided in Fisheries Data Collections, Surveys, and Assessments, the Committee provides $850,000 for NMFS, in consultation with the Gulf of Mexico Fishery Management Council and shrimp industry stakeholders, to continue the development and implementation of a newly approved ELB that archives vessel position and automatically transmits scientific shrimp fishing effort data via cellular service to NMFS.*"[9]

The Early Adopter Program is currently voluntary, and as of December 11, 2024, LGL has outfitted 116 federally permitted vessels across the Gulf with new devices as shown in Table 2.1.2. Device and installation costs supported by the Early Adopter Program are anticipated to offset industry costs under **Alternatives 2** and **3**.

Table 2.1.2. Number of vessels homeported by state that have participated in the Early Adopter Program as of December 11, 2024.

Vendor	Unit	Florida	Alabama	Mississippi	Louisiana	Texas	Total Devices to Date
Woods Hole Group	NEMO	0	0	0	0	7	7
Viatrax	Boat Command	0	3	3	19	18	43
Remote Data Sensing	ZenVMS	19	6	9	10	22	66

[7] https://www.govinfo.gov/content/pkg/CREC-2022-12-20/html/CREC-2022-12-20-pt1-PgS7819-2.htm
[8] The meeting summary is available at https://gulfcouncil.org/wp-content/uploads/02b.-Shrimp-AP-Summary-May-2023_Final_Revised.pdf
[9] https://www.congress.gov/118/crpt/srpt62/CRPT-118srpt62.pdf

CHAPTER 3. AFFECTED ENVIRONMENT

3.1 Description of the Physical Environment

General Description of the Physical Environment
The original Fishery Management Plan (FMP) for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters (Shrimp FMP) (GMFMC 1981a) and the Shrimp FMP as revised in 1981 (GMFMC 1981b) contains a description of the physical environment. The physical environment for penaeid shrimp is also detailed in the Generic Essential Fish Habitat (EFH) Amendment (GMFMC 2005). This material is incorporated by reference and is not repeated here in detail.

The Gulf of Mexico (Gulf) has a total area of approximately 600,000 square miles, including state waters (Gore 1992). It is a semi-enclosed, oceanic basin connected to the Atlantic Ocean by the Straits of Florida and to the Caribbean Sea by the Yucatan Channel (Figure 3.1.1). Oceanographic conditions are affected by the Loop Current, discharge of freshwater into the northern Gulf, and a semi-permanent, anti-cyclonic gyre in the western Gulf. The Gulf includes both temperate and tropical waters (McEachran and Fechhelm 2005). Daily mean temperatures in the Gulf ranged from approximately 70º F--88º F from 1984 – 2023, with an average annual temperature ranging from approximately 79º F--81º F with no discernable trend over the same time period (NOAA Physical Oceanography Division of the Atlantic Oceanographic and Meteorological Laboratory, data from June 13, 2023). In general, mean sea surface temperature increases from north to south with large seasonal variations in shallow waters.

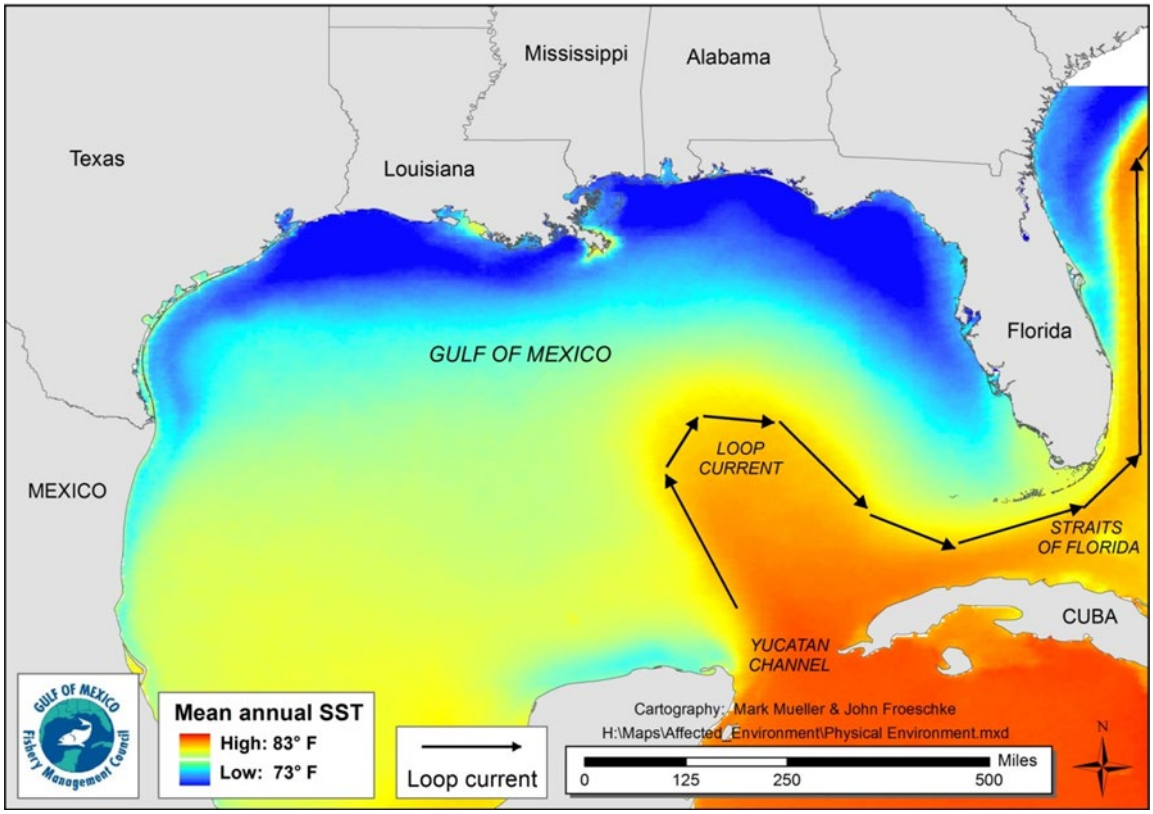

Figure 3.1.1. Physical environment of the Gulf including major feature names and mean annual sea surface temperature as derived from the Advanced Very High-Resolution Radiometer Pathfinder Version 5 sea surface temperature data set (http://accession.nodc.noaa.gov/0072888).

In the Gulf, adult penaeid shrimp are found nearshore and offshore on silt, mud, and sand bottoms; juveniles are found in estuaries. Primary fishing grounds for royal red shrimp are: the Desoto Canyon about 75 miles off Mobile, Alabama; offshore of Tampa Bay, Florida; and the Dry Tortugas northwest of the Florida Keys.

Detailed information pertaining to habitat areas of particular concern (HAPC) is provided in Generic EFH Amendment (2005) and Amendment 9 to the FMP for the Coral and Coral Reefs of the Gulf of Mexico, U.S. Waters (GMFMC 2018). These reef and bank areas in the northwestern Gulf include: East and West Flower Garden Banks, Stetson Bank, Sonnier Bank, MacNeil Bank, 29 Fathom, Rankin Bright Bank, Geyer Bank, McGrail Bank, Bouma Bank, Rezak Sidner Bank, Alderice Bank, and Jakkula Bank, Florida Middle Grounds HAPC and Pulley Ridge HAPC.

Additional area closures, some that include gear restrictions, may affect targeted and incidental harvest of penaeid shrimp species in the Gulf. The areas include:

- Cooperative Texas Shrimp Closure
- Tortugas Shrimp Sanctuary
- Southwest Florida Seasonal Closure
- Central Florida Seasonal Closure
- Longline/Buoy Gear Area Closure
- Madison-Swanson and Steamboat Lumps Marine Reserves
- The Edges Marine Reserve
- Tortugas North and South Marine Reserves
- Alabama Special Management Zone

Northern Gulf of Mexico Hypoxic Zone

Every summer in the northern Gulf, a large hypoxic zone forms. It is the result of allochthonous materials and runoff from agricultural lands resulting in increasing nutrient inputs to multiple rivers. These tributaries feed into the Mississippi River, which disperses to the Gulf, and creates a temperature and salinity dependent layering of waters. The nutrient rich fresh waters from the Mississippi create seasonal, large algal blooms at the surface that eventually die, sink to the bottom, and decompose. This creates the oxygen-poor, hypoxic, bottom water layer unless front or storm events occur, which allows for mixing of the layers (Rabalais and Turner 2019).

Mapping of the hypoxic zone began in 1985. For 2022, the extent of the hypoxic area was 3,275 square miles, almost double what it was in 2020 (2,116 square miles), but still less than the extent of the 2017 hypoxic area (8,776 square miles). However, the 2022 size is the eighth smallest in 36 years of coast wide hypoxia data. The changes in hypoxic area can be attributed to changing amounts of river discharge and its associated nutrient load and storm events. The major factor for the reduced size in 2020 was the active storm season with Hurricane Hanna passing right over the zone, allowing for mixing of the waters. The 2022 hypoxia area was lower than the 5-year hypoxic area average (5,408 square miles), but larger than the 1,930 square mile

goal set by the Interagency Mississippi River and Gulf of Mexico Hypoxia Task Force to be reached by 2035. The hypoxic conditions in the northern Gulf directly impact less mobile benthic macroinvertebrates (e.g., polychaetes) by influencing density, species richness, and community composition (Baustian and Rabalais 2009; Breitburg et al. 2018). However, more mobile macroinvertebrates and demersal fishes are able to detect lower dissolved oxygen levels and move away from hypoxic conditions. Therefore, these organisms are indirectly affected by limited prey availability and constrained available habitat (Baustian and Rabalais 2009; Craig 2012).

Deepwater Horizon MC252 Oil Spill

The presence of polycyclic aromatic hydrocarbons (PAH), which are highly toxic chemicals that tend to persist in the environment for long periods of time, in marine environments can have detrimental impacts on marine finfish, especially during the more vulnerable larval stage of development (Whitehead et al. 2012). The future reproductive success of fish species may be negatively affected by episodic events resulting in high-mortality years or low recruitment. These episodic events could leave gaps in the age structure of the population, thereby affecting future reproductive output (Mendelssohn et al. 2012). Other studies have described the vulnerabilities of various marine finfish species, with morphological and/or life history characteristics similar to species found in the Gulf, to oil spills and dispersants (Hose et al. 1996; Carls et al. 1999; Heintz et al. 1999; Short 2003).

In addition to the crude oil, over a million gallons of the dispersant, Corexit 9500A®, was applied to the ocean surface and an additional hundreds of thousands of gallons of dispersant was pumped to the mile-deep wellhead (National Commission 2010). No large-scale applications of dispersants in deep water had been conducted until the Deepwater Horizon MC252 oil spill. Thus, no data exist on the environmental fate of dispersants in deep water. Twenty-first century dispersant applications are thought to be less harmful than their predecessors. However, the combination of oil and dispersants has proven to be more toxic to marine fishes than either dispersants or crude oil alone. Marine fish which are more active (e.g. a pelagic species versus a demersal species) appear to be more susceptible to negative effects from interactions with weathered oil/dispersant emulsions. These effects can include mobility impairment and inhibited respiration (Swedmark et al. 1973). The effect of oil, dispersants, and the combination of oil and dispersants on fishes of the Gulf remains an area of concern.

Greenhouse gases

The Intergovernmental Panel on Climate Change (IPCC) has indicated greenhouse gas emissions are one of the most important drivers of recent changes in climate. Wilson et al. (2019) inventoried the sources of greenhouse gases in the Gulf from sources associated with oil platforms and those associated with other activities such as fishing. A summary of the results of the inventory are shown in Table 3.2.1 with respect to total emissions and fishing. Commercial fishing and recreational vessels make up a small percentage of the total estimated greenhouse gas emissions from the Gulf (2.04% and 1.67%, respectively).

Table 3.2.1. Total Gulf greenhouse gas 2014 emissions estimates (tons per year [tpy]) from oil platform and non-oil platform sources, commercial fishing, and percent greenhouse gas emissions from commercial fishing vessels of the total emissions.*

Emission source	CO_2	Greenhouse CH_4	Gas N_2O	Total CO_{2e}**
Oil platform	5,940,330	225,667	98	11,611,272
Non-platform	14,017,962	1,999	2,646	14,856,307
Total	**19,958,292**	**227,665**	**2,743**	**26,467,578**
Commercial fishing	531,190	3	25	538,842
Recreational fishing	435,327	3	21	441,559
Percent commercial fishing	2.66%	>0.01%	0.91%	2.04%
Percent recreational fishing	2.18%	>0.01%	0.77%	1.67%

*Compiled from Tables 6-11, 6-12, and 6-13 in Wilson et al. (2014).
**The CO_2 equivalent (CO_{2e}) emission estimates represent the number of tons of CO_2 emissions with the same global warming potential as one ton of another greenhouse gas (e.g., CH_4 and N_2O). Conversion factors to CO_{2e} are 21 for CH_4 and 310 for N_2O.

3.2 Description of the Biological/Ecological Environment

The biological environment of the Gulf, including the species addressed in this amendment, is described in detail in the Generic EFH Amendment (GMFMC 2005), hereby incorporated by reference and summarized below.

Target Species
Brown, white, and pink shrimp use a variety of habitats as they grow from planktonic larvae to spawning adults (GMFMC 1981a). Brown shrimp eggs are demersal and occur offshore. Post-larvae migrate to estuaries through passes on flood tides at night mainly from February until April; there is another minor peak in the fall. Post-larvae and juveniles are common in all U.S. estuaries from Apalachicola Bay, Florida to the Mexican border. Brown shrimp post-larvae and juveniles are associated with shallow, vegetated, estuarine habitats, but may occur on silt, sand, and non-vegetated mud bottoms. Adult brown shrimp occur in marine waters extending from mean low tide to the edge of the continental shelf and are associated with silt, muddy sand, and sandy substrates. More detailed discussion on habitat associations of brown shrimp is provided in Nelson (1992) and Pattillo et al. (1997).

White shrimp eggs are demersal and larval stages are planktonic in nearshore marine waters. Post-larvae migrate through passes mainly from May until November with peaks in June and September. Juveniles are common in all Gulf estuaries from Texas to the Suwannee River in Florida. Post-larvae and juveniles commonly occur on bottoms with large quantities of decaying organic matter or vegetative cover such as mud or peat. Juvenile migration from estuaries occurs

in late August and September and is related to juvenile size and environmental conditions (e.g., sharp temperature drops in fall and winter). Adult white shrimp are demersal and inhabit nearshore Gulf waters to depths of 16 fathoms (96 feet) on soft bottoms. More detailed information on habitat associations of white shrimp is available from Nelson (1992) and Pattillo et al. (1997).

Pink shrimp eggs are demersal, early larvae are planktonic, and post-larvae are demersal in marine waters. Juveniles inhabit almost every U.S. estuary in the Gulf but are most abundant in Florida. Juveniles are commonly found in estuarine areas with seagrass where they burrow into the substrate by day and emerge at night. Adults inhabit offshore marine waters, with the highest concentrations in depths of 5 to 25 fathoms (30 to 150 feet).

Royal red shrimp occur exclusively in the exclusive economic zone (EEZ) and live longer than penaeid shrimp; however, their detailed life history is poorly known. Royal red shrimp become mature at three years, do not fully recruit to the fishery until they are 2-3 years old, and many year classes may occur in the same location (i.e., fishing grounds) (Reed and Farrington 2010). Royal red shrimp decrease in size with increasing depth; juveniles likely occur in deeper habitats (Paramo and Saint-Paul 2011), and females are larger than males (Tavares 2002; Paramo and Saint-Paul 2011).

The three species of penaeid shrimp harvested by the shrimp fishery are short-lived and provide annual crops while royal red shrimp live longer (2-5 years). The condition of each shrimp stock is monitored annually, and none has been classified as overfished or undergoing overfishing (Hart 2016a, 2016b, 2016c).

Bycatch

Most bycatch in the shrimp fishery are discards of no value to the vessel, with a limited amount being regulatory discards. Scott-Denton et al. (2020) found that about 27.4% of catch in the Gulf penaeid shrimp fishery was targeted shrimp (i.e. brown, white, pink). Between 2007 and 2010, 185 species were observed as bycatch in the shrimp fishery (Scott-Denton et al. 2012). The majority of catch and bycatch was composed of unspecified fish, Atlantic croaker, other arthropods and invertebrates, and sea trout (Table 3.2.2). The species composition is spatially and bathymetrically dependent, but overall, for the Gulf, Atlantic croaker, sea trout, and longspine porgy are the dominant finfish species taken in trawls (approximately 26% of the total catch by weight). Other commonly occurring species include: portunid crabs, mantis shrimp, spot, inshore lizardfish, sea robins, and Gulf butterfish. Although red snapper comprise a very small percentage (0.3% by weight) of overall bycatch, the mortality associated with this bycatch affects the recruitment of older fish (age-2 and above) to the directed fishery and ultimately the recovery of the red snapper stock.

Table 3.2.2. Most common catch and bycatch species from observed Gulf shrimp fisheries from 2011-2016. Values in percentage of observed catch.

Common Name	Scientific Name	Gulf Penaeid Shrimp Percentage	Gulf Rock Shrimp Percentage	Gulf Skimmer Trawl Percentage
Fish (Unspecified)	Pisces	31.8	22.0	32.7
Atlantic Croaker	*Micropogonias undulatus*	15.7	0.3	10.6
Brown Shrimp	*Farfantepenaeus aztecus*	12.6	1.3	32.5
White Shrimp	*Litopenaeus setiferus*	11.4	0.0	9.6
Arthropod Other	Crustacea	6.2	3.9	4.2
Seatrout	*Cynoscion* spp.	5.4	0.1	1.5
Invertebrates	Invertebrate	5.2	7.6	0.6
Pink Shrimp	*Farfantepenaeus duorarum*	3.4	1.7	-
Longspine Porgy	*Stenotomus caprinus*	3.1	-	-
Rock Shrimp	*Sicyonia* spp.	0.3	35.6	-
Other Important Species				
Red Snapper	*Lutjanus campechanus*	0.3	0.0	0.0
Spanish Mackerel	*Scomberomorus maculatus*	0.2	0.0	0.3
Red Drum	*Sciaenops ocellatus*	0.2	-	0.0
Lane Snapper	*Lutjanus synagris*	0.2	0.0	0.0

Scott-Denton et al., 2020

To address finfish bycatch issues, especially bycatch of red snapper, the Council initially established regulations requiring bycatch reduction devices (BRD) specifically to reduce the bycatch of juvenile red snapper. In 1998, all shrimp trawlers operating in the EEZ, inshore of the 100-fathom contour, west of Cape San Blas, Florida were required to use BRDs; later BRDs were required in the eastern Gulf (GMFMC 2002). Only three Gulf states (Florida, Louisiana, and Texas) require the use of BRDs in state waters. Shrimp trawls fishing for royal red shrimp seaward of the 100-fathom (600 feet) contour are exempt from the requirement for BRDs. Bycatch is currently considered to be reduced to the extent practicable in the Gulf shrimp fishery.

Protected Species and Protected Species Bycatch

NMFS manages marine protected species in the Southeast region under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). A brief summary of these two laws and more information is available on NMFS Office of Protected Resources website.[10] Species in the Gulf protected under the ESA include: marine mammal species (blue, sperm, sei, fin, and Rice's whales, and manatees); sea turtles (Kemp's ridley, loggerhead (North Atlantic distinct population segment (DPS)), green (North Atlantic DPSs), leatherback, and hawksbill); fish species (Gulf sturgeon, smalltooth sawfish, giant manta ray, oceanic whitetip shark, and Nassau grouper); and coral species (elkhorn coral, lobed star coral, boulder star coral, and mountainous star coral).

[10] https://www.fisheries.noaa.gov/about/office-protected-resources

The impacts of the Gulf shrimp fishery on ESA-listed species were evaluated in the most recent "Reinitiation of ESA Section 7 Consultation on the Implementation of the Sea Turtle Conservation Regulations under the ESA and the Authorization of the Southeast U.S. Shrimp Fisheries in Federal Waters under the Magnuson-Stevens Fishery Management and Conservation Act" (Biological Opinion [BiOp]; NMFS 2021). The BiOp, which was based on the best available commercial and scientific data, concluded the continued authorization of the southeast U.S. shrimp fisheries in federal waters (including the Gulf shrimp fishery) is not likely to jeopardize the continued existence of threatened or endangered species (NMFS 2021). NMFS is preparing to reinitiate ESA section 7 consultation on the fishery to address new information related to impacts to giant manta ray and smalltooth sawfish.

Sea Turtles
Five species of sea turtles (Kemp's ridley, loggerhead (Northwest Atlantic Ocean DPS), green (North Atlantic), leatherback, and hawksbill) occur in the Gulf. Green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles are all highly migratory and are known to occur in areas subject to shrimp trawling. Bycatch of the species by commercial fisheries is a major contributor to past declines and a potential threat to future recovery (NMFS and USFWS 1991, 1992a, 1992b, 2008; NMFS 2011). Historically, southeastern U.S. shrimp fisheries (both Gulf and South Atlantic) have been the largest threat to benthic sea turtles. Regulations requiring turtle excluder devices (TEDs) have reduced mortalities from trawl fisheries on sea turtles. NMFS (2021), using data from 2007-2015, estimated the combined southeastern U.S. otter trawl shrimp fisheries results in 27,509 annual estimated captures in trynets and standard nets combined, and 1,085 sea turtle mortalities in trynets and standard nets combined.

Fish
Five species of fish (Gulf sturgeon, smalltooth sawfish, Nassau grouper, oceanic whitetip shark and giant manta ray) occur in the Gulf. Otter trawls may directly affect smalltooth sawfish that are foraging within or moving through an active trawling location via direct contact with the gear. The long toothed rostrum of the smalltooth sawfish causes this species to be particularly vulnerable to entanglement in any type of netting gear, including the netting used in shrimp trawls.

Coral
Six species of coral (elkhorn, staghorn, lobed star, mountainous star, boulder star, and rough cactus) occur in the Gulf.

Marine Mammals
The five whale species that may be present in the Gulf (blue, sperm, sei, fin, and Rice's) are listed as endangered under the ESA. Rice's whales are the only resident baleen whales in the Gulf recently being listed as endangered. Manatees, listed as threatened under the ESA, also occur in the Gulf and are the only marine mammal species in this area managed by the U.S. Fish and Wildlife Service.

The shrimp fishery is classified in the proposed 2025 List of Fisheries as a Category II fishery (89 FR 77789; September 24, 2024). This classification indicates the annual mortality and serious injury of a marine mammal stock is greater than 1% but less than 50% of the stocks

potential biological removal, not including natural mortalities, which may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. The classification is based on interactions reported through observer reports, stranding data, and fisheries research data, with multiple strategic and non-strategic marine mammal stocks. NMFS observed 12 dolphin takes (of which 11 were serious injuries or mortalities) since 1993; 11 of which were taken since 2002.

3.3 Description of the Economic Environment

Descriptions of the Gulf shrimp fishery are contained in previous amendments, as well as NMFS regulatory actions, and are incorporated herein by reference [see Shrimp Amendment 17b (GMFMC 2017) and Shrimp 18 (GMFMC 2019)]. The following discusses certain key characteristics of the Gulf shrimp fishery.

The Gulf shrimp fishery consists of three major sectors: harvesting sector, dealer/wholesaler sector, and processing sector. The following discussion provides summary statistics and selected characteristics for the harvesting sector, shrimp dealers, and the processing sector.[11] Imports are also presented. All monetary values presented throughout this section have been adjusted to 2023 dollars using the annual, not seasonally-adjusted GDP implicit price deflator provided by the U.S. Bureau of Economic Analysis.

The harvesting sector is composed of two types of fleets: 1) a small vessel fleet that is predominantly active in inshore and state offshore waters and very diverse with respect to gear and other operating characteristics; and 2) a large vessel fleet predominantly active in offshore waters, particularly the EEZ, and almost always using otter trawl gear. In 2003, a federal shrimp permit (SPGM) was instituted requiring vessels to possess the permit when fishing for penaeid shrimp in the Gulf EEZ. A moratorium on the issuance of new federal shrimp permits became effective in March 2007. Currently, vessels must possess a SPGM when fishing for penaeid shrimp in the Gulf EEZ. In addition, a royal red shrimp endorsement, which is an open access permit for those holding a SPGM, is required for harvesting royal red shrimp in the Gulf.

Selected Characteristics of Participating Vessels in the Shrimp Fishery

Selected characteristics of participating vessels in the Gulf shrimp fishery during 2019 through 2023 are summarized in Table 3.3.1. Estimates of the total number of active shrimp vessels are based on the number of unique vessels landing shrimp as recorded in the state trip ticket (STT) data. The number of active permitted vessels was generated by cross referencing STT landings data with the NMFS permits database.

The number of permitted and non-permitted active vessels (i.e., vessels with reported landings in the Gulf shrimp fishery) steadily declined from 2019 through 2023 (Table 3.3.1). While shrimp landings over this period remained relatively stable, with an average of 111 million lbs, gross revenue decreased by 51%, driven by a steep reduction in average price from $3.65 to $1.91. Despite being fewer in number, federally permitted vessels accounted for 68% of shrimp

[11] The discussion on processors is to be completed, pending available data.

landings and 78% of shrimp revenue in the fishery on average from 2019 through 2023 (Table 3.3.1). The average annual price received per lb of shrimp was also significantly higher for vessels with a SPGM permit than those without one. On average (2019 through 2023), each active shrimp vessel with a SPGM permit earned approximately $301,000 in gross revenue per year. The percent of all vessels with a SPGM permit that were active decreased over time, as did the average number of months that each active vessel fished (Table 3.3.1).

Table 3.3.1. Selected characteristics of participation in the Gulf shrimp fishery, 2019-2023.*

	2019	2020	2021	2022	2023	Average
Total GOM shrimp fishery						
Number of active vessels	3,558	3,348	3,154	2,971	2,467	3,100
Landing (lbs, heads off)	115,092,015	108,521,986	114,217,843	110,844,516	107,021,123	111,139,497
Gross revenue (2023 $)	$419,971,258	$385,240,167	$471,294,385	$341,043,074	$204,439,084	$364,397,594
Average Price (2023 $)	$3.65	$3.55	$4.13	$3.08	$1.91	$3.26
GOM shrimp vessels WITH federal SPGM permit						
Number of vessels	1,416	1,399	1,377	1,356	1,332	1,376
Number of active vessels	1,020	981	950	919	790	932
Percent active	72%	70%	69%	68%	59%	68%
Average active months per vessel	6.0	6.0	5.9	4.8	4.7	5.5
Landing (lbs, heads off)	76,012,854	76,382,286	79,937,847	74,093,166	72,160,111	75,717,253
Gross revenue (2023 $)	$318,966,619	$306,505,939	$372,958,493	$259,860,103	$161,231,726	$283,904,576
Average Price (2023 $)	$4.20	$4.01	$4.67	$3.51	$2.23	$3.72
GOM shrimp vessels WITHOUT federal SPGM permit						
Number of active vessels	2,538	2,367	2,204	2,052	1,677	2,168
Average active months per vessel	4.3	4.1	4.1	3.8	3.9	4.1
Landing (lbs, heads off)	39,079,161	32,139,700	34,279,996	36,751,350	34,861,013	35,422,244
Gross revenue (2023 $)	$101,004,639	$78,734,228	$98,335,892	$81,182,971	$43,207,358	$80,493,018
Average Price (2023 $)	$2.58	$2.45	$2.87	$2.21	$1.24	$2.27

Source: C. Liese, pers. comm. 2024. STT data processed using SEDAR87 conventions. Permit data from SERO.
*These results are preliminary.
Note: Active in the context of this table means a vessel that landed at a Gulf port at least 1 lb of shrimp from offshore or inshore waters in the Gulf in a given year (or month, for active months).

Key Economic and Financial Characteristics of Federally Permitted Shrimp Vessels

The following descriptions are based on economic performance metrics of the federal Gulf shrimp fishery for the years 2019 through 2023 (C. Liese, pers. comm. 2024). These data are collected via the Annual Economic Survey of Federal Gulf Shrimp Permit Holders. The first survey, which was administered in 2007, collected data for the 2006 fishing year, and these surveys have been conducted every year since.

The type of economic data the survey collects is based on an accounting framework of money flows and values associated with the productive activity of commercial shrimping. With these data, three financial statements (the balance sheet, the cash flow statement, and the income statement) are prepared to give a comprehensive overview of the financial and economic situation of the offshore shrimp fishery. Table 3.3.2 shows a preliminary summary of these financial statements. Dollar values are averages in 2023 dollars.

From 2019 through 2023, owner's equity in the average active shrimp vessel was substantial and stable over time (Table 3.3.2). This resulted from a combination of a relatively high market value of the assets (vessel and permits being the main assets) and low liabilities (mainly loans). Net cash flows and net revenue from operations for the average active vessel were positive and increasing through 2021, but both turned negative in 2022 and remained so in 2023. This corresponds with the reduction in shrimp price seen in recent years (Table 3.3.1). Negative cash flows are troublesome and if they persist could lead to solvency issues for shrimp businesses. Approximately half of total expenses incurred by shrimp fishing businesses were non-labor costs (fuel and supplies) in 2022 and 2023, with the other half being split across labor and fixed costs (e.g., maintenance, repair, insurance, overhead, and vessel depreciation). Active shrimp vessels experienced losses, on average, in 2022 and 2023, which may affect the long-term viability of these businesses. Average government payments and non-operating revenue also shrank in 2022 and 2023, which exacerbated the overall decrease in profit before tax during those years. Individual businesses may be more or less profitable than others, depending on their operating characteristics.

Table 3.3.2. Economic and financial characteristics of an average active vessel with a federal Gulf commercial shrimp permit (SPGM), 2019-2023. Parentheses indicate negative values and all dollar values are averages in 2023 dollars.*

	2019	2020	2021	2022	2023	Average
Number of observations	268	274	271	238	204	251
Balance Sheet						
Assets	$370,112	$346,222	$389,621	$364,444	$331,303	$360,341
Liabilities	$20,076	$35,215	$32,871	$32,899	$22,321	$28,676
Equity	$350,036	$311,007	$356,751	$331,545	$308,982	$331,664
Cash Flow						
Inflow	$356,777	$332,748	$447,461	$313,750	$242,796	$338,706
Outflow	$329,665	$301,212	$387,039	$321,688	$247,682	$317,457
Net cash flow	$27,112	$31,537	$60,422	($7,938)	($4,885)	$21,249
Income Statement						
Revenue (commercial fishing operations)	$342,207	$324,548	$441,829	$313,347	$241,334	$332,653
Expenses						
Variable costs – Non-labor	47.36%	40.38%	44.80%	51.71%	50.53%	46.96%
Variable costs – Labor	30.03%	33.85%	33.72%	26.35%	25.12%	29.81%
Fixed costs	22.61%	25.78%	21.48%	21.94%	24.35%	23.23%
Net revenue from operations	$918	$9,887	$43,497	($15,616)	($14,635)	$4,810
Net receipts from non-operating activities	$13,905	$7,236	$5,022	($314)	$311	$5,232
Profit or loss (before tax)	$14,824	$17,122	$48,519	($15,930)	($14,324)	$10,042
Returns						
Economic return on asset value	0.2%	2.9%	11.2%	(4.3%)	(4.4%)	1.1%
Return on equity	4.2%	5.5%	13.6%	(4.8%)	(4.6%)	2.8%

Source: C. Liese, pers. comm. 2024, as based on The Annual Economic Survey of Federal Gulf Shrimp Permit Holders, NMFS-SEFSC.
*These results are preliminary.

Dealers

The information in Table 3.3.3 illustrates the purchasing activities of seafood dealers that bought Gulf shrimp from vessels during 2019 through 2022, with preliminary data for 2023.[12] During this period, the number of shrimp dealers, as well as total shrimp purchases, trended downwards modestly. On average, from 2019 through 2022, annual shrimp purchases accounted for around 46% of all purchases made by these dealers, suggesting a fair amount of specialization. The median annual value of Gulf shrimp purchases and total seafood purchases per Gulf shrimp dealer experienced an increasing trend from 2019 through 2021 and then a dip in 2022 (Table

[12] Because 2023 is preliminary and partial year data, trends will only be discussed for 2019-2022.

3.3.3). Although the median values of Gulf shrimp and total seafood purchases per dealer appear relatively small, $18,143 and $47,292, respectively on average, Gulf shrimp dealers are a very heterogeneous group. Many if not most "dealers" are actually vessel owners and fishermen who have chosen to act as their own dealers and bypass so-called "middlemen" so they can reduce costs and retain more of their net revenue (profit). A much smaller number of these dealers are also shrimp processors, and their operations generate much larger revenues, on average. Although not shown in the table, the maximum annual value of all purchases made by a single Gulf shrimp dealer from 2019 through 2022 was approximately $39.8 million (2023 dollars), which occurred in 2021.

Table 3.3.3. Dealer statistics for dealers that purchased Gulf shrimp landings by year, 2019-2023. All dollar estimates are in 2023 dollars.

Year	Number of Dealers	Gulf Shrimp** landed lbs ww (millions)	Gulf Shrimp Purchases (millions)	Other Gulf Seafood Purchases (millions)	South Atlantic Seafood Purchases (millions)	Median Gulf Shrimp purchases value per dealer	Median total seafood purchases value per dealer
2019	743	187.9	$429.7	$476.5	$21.2	$14,851	$42,672
2020	684	175.5	$394.2	$431.3	$18.7	$17,959	$45,988
2021	601	183.4	$479.1	$525.1	$29.2	$22,133	$58,553
2022	642	178.0	$346.6	$378.7	$22.1	$17,630	$41,955
2023*	420	105.6	$157.5	$191.8	$16.6	$25,458	$66,752
Average (2019-2022)	668	181.2	$412.4	$452.9	$22.8	$18,143	$47,292

Source: SEFSC Fishing Communities Web Query Tool (Version Sep 19, 2024 Years: 2014-2023).
*The values presented for 2023 are preliminary and for a partial year only. Therefore, these values are excluded from the table averages and should be interpreted with caution.
**Only shrimp species included in the STT database are included in these estimates.
Note: Medians, as opposed to means, are reported because the data distributions are highly skewed.

Imports

Imports of seafood products compete in the domestic seafood market and have in fact dominated many segments of the seafood market. Imports affect the price for domestic seafood products and tend to set the price in the market segments in which they dominate. Seafood imports have downstream effects on local markets. At the harvest level for shrimp, imports affect the returns to fishermen through the ex-vessel prices they receive for their landings. As substitutes to the domestic production of shrimp, imports tend to cushion the adverse economic effects on consumers resulting from a reduction in domestic landings. The following describes the imports of products that directly compete with the domestic harvest of shrimp.

On average, between 2019 and 2023, the United States imported more than 1.3 billion pounds (product weight) of shrimp products annually, worth approximately $5.8 billion. There was an increasing trend in shrimp imports from 2019 through 2021 and then a modest cool down through 2023 (Table 3.3.4). Three nations, including India, Ecuador, and Indonesia, have been

responsible for the vast majority of shrimp imports in recent years. The top ports for receiving shrimp imports were New York, New York, Los Angeles, California, and Miami, Florida.

Table 3.3.4. Annual pounds and value of shrimp imports and share of imports by country, 2019-2023.

	2019	2020	2021	2022	2023
Pounds of shrimp imports (product weight, million pounds)*	1,235.1	1,268.8	1,554.3	1,401.6	1,351.7
Value of shrimp imports (millions, 2023 $)	$5,607	$5,613	$6,890	$5,989	$4,837
Share of Imports by Country					
INDIA	49%	41%	43%	40%	41%
ECUADOR	14%	21%	25%	30%	32%
INDONESIA	18%	20%	17%	17%	15%
VIETNAM	2%	4%	5%	4%	4%
MEXICO	5%	4%	3%	3%	3%
ARGENTINA	2%	3%	2%	3%	2%
THAILAND	3%	3%	2%	2%	2%
PERU	1%	1%	1%	1%	0%
GUYANA	1%	1%	0%	0%	0%
all others	3%	2%	2%	2%	1%

Source: Fisheries trade data from the Foreign Trade Division of the U.S. Census Bureau, as purchased by NOAA Fisheries (available at: https://www.fisheries.noaa.gov/national/sustainable-fisheries/foreign-fishery-trade-data).
*Excludes heavily processed shrimp products (e.g., frozen dinners).

Business Activity

The commercial harvest and subsequent sales and consumption of shrimp generate business activity as fishermen expend funds to harvest shrimp and consumers spend money on goods and services, such as shrimp purchased at a local seafood market or served during restaurant visits. These expenditures spur additional business activity in the region(s) where the harvest and purchases are made, such as jobs in local seafood markets, grocers, restaurants, and fishing supply establishments. In the absence of the availability of a given species for purchase, consumers would spend their money on substitute goods and services. As a result, the analysis presented below represents a distributional analysis only; that is, it only shows how economic effects may be distributed through regional markets and should not be interpreted to represent the impacts if these species are not available for harvest or purchase.

In addition to these types of impacts, economic impact models can be used to determine the sources of the impacts. Each impact can be broken down into direct, indirect, and induced economic impacts. "Direct" economic impacts are the results of the money initially spent in the study area (e.g., country, region, state, or community) by the fishery or industry being studied.

This includes money spent to pay for labor, supplies, raw materials, and operating expenses. The direct economic impacts from the initial spending create additional activity in the local economy, i.e., "indirect" economic impacts. Indirect economic impacts are the results of business-to-business transactions indirectly caused by the direct impacts. For example, businesses initially benefiting from the direct impacts will subsequently increase spending at other local businesses. The indirect economic impact is a measure of this increase in business-to-business activity, excluding the initial round of spending, which is included in the estimate of direct impacts. "Induced" economic impacts are the result of increased personal income caused by the direct and indirect economic impacts. For example, businesses experiencing increased revenue from the direct and indirect impacts will subsequently increase spending on labor by hiring more employees, increasing work hours, raising salaries/wage rates, etc. In turn, households will increase spending at local businesses. The induced impact is a measure of this increase in household-to-business activity.

Economic impact models are used to determine the current economic impacts of an industry or sector, as well as changes expected to occur if expenditures or gross revenues change in a particular industry or sector. Estimates of the U.S. average annual economic impacts associated with the commercial harvest of shrimp by federally permitted vessels in the Gulf of Mexico were derived using the model developed for and applied in NMFS (2024) and are provided in Table 3.3.5. [13] These economic impacts are characterized as jobs (full- and part-time), output impacts (gross business sales), income impacts (wages, salaries, and self- employed income), and value-added impacts, which represent the contribution made to the U.S. Gross Domestic Product (GDP). These impacts should not be added together because this would result in double counting. These results are based on average relationships developed through the analysis of many fishing operations that harvest many different species. Separate models to address individual species are not available. Average gross revenue from federally permitted shrimp vessels averaged about $283.9 million (2023 dollars) between 2019 and 2023. This gross revenue generated employment, income, output impacts, and value-added impacts of approximately 29,297 jobs, $1 billion, $2.7 billion, and $1.4 billion, respectively (Table 3.3.5).

[13] A detailed description of the input/output model is provided in NMFS (2011).

Table 3.3.5. Average economic impacts (2019 through 2023) associated with the commercial harvest of shrimp by federally permitted vessels in the Gulf of Mexico. All monetary estimates are in thousands of 2023 dollars.

Harvesters	Direct	Indirect	Induced	Total
Employment impacts	4,114	802	928	5,844
Income impacts	$118,069	$33,351	$58,118	$209,539
Total value-added impacts	$125,856	$119,513	$100,365	$345,733
Output Impacts	$283,905	$275,923	$192,912	$752,739
Primary dealers/processors	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	1,113	444	771	2,328
Income impacts	$50,014	$46,091	$43,594	$139,699
Total value-added impacts	$53,312	$58,811	$82,074	$194,198
Output impacts	$160,974	$121,248	$160,434	$442,656
Secondary wholesalers/distributors	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	281	62	272	615
Income impacts	$16,201	$4,818	$17,039	$38,059
Total value-added impacts	$17,270	$8,082	$29,105	$54,457
Output impacts	$43,395	$15,822	$56,602	$115,818
Grocers	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	1,731	195	382	2,308
Income impacts	$47,972	$15,832	$23,915	$87,720
Total value-added impacts	$51,136	$25,511	$40,488	$117,135
Output impacts	$81,989	$41,435	$79,489	$202,913
Restaurants	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	14,831	977	2,394	18,202
Income impacts	$264,594	$79,292	$149,756	$493,642
Total value-added impacts	$282,044	$141,735	$252,321	$676,100
Output impacts	$515,722	$221,795	$497,904	$1,235,422
Harvesters and seafood industry	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	22,070	2,480	4,748	29,297
Income impacts	$496,851	$179,385	$292,422	$968,658
Total value-added impacts	$529,618	$353,652	$504,353	$1,387,623
Output impacts	$1,085,984	$676,222	$987,341	$2,749,548

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2024).

3.4 Description of the Social Environment

This framework action affects the commercial management of shrimp in the Gulf. Shrimp permits and shrimp vessels that are dually permitted in fisheries with VMS requirements are included by state to provide information on the geographic distribution of permit holders. Descriptions of the top-ranking communities by the number of commercial shrimp permits are

included, top communities based on the number of dually permitted vessels, and commercial engagement and reliance for these top communities. Community level data are presented in order to meet the requirements of National Standard 8 of the Magnuson-Stevens Act, which requires the consideration of the importance of fishery resources to human communities when changes to fishing regulations are considered. Lastly, social vulnerability data are presented to assess the potential for environmental justice concerns.

Social Dimensions of the Shrimp Fishery

SEDAR 87 includes an overview of the social dimensions of the Gulf shrimp fishery (Griffith 2023) and this description of the state and federal shrimp fishery is included herein by reference; however, some relevant portions are summarized here. The number of vessels and boats involved in shrimping in the Gulf in 1981, when the original Shrimp FMP was developed, was estimated at 4,585 vessels (displacing > 5 tons gross weight) and 5,475 boats (displacing < 5 tons gross weight). At that time, Texas included about 40% of the vessels and Louisiana comprised about 73% of the vessels. Management and legislative efforts, such as limited entry and state buy-back programs to limit effort or added costs to shrimpers are noted as having been partially responsible for the reduction of the fleet. Most of the state and federal management efforts have been focused on protecting shrimp stocks and sustaining commercial and recreational shrimping, but additional measures to protect sea turtles and other bycatch, such as TEDs have been implemented. Problems affecting Gulf shrimping include labor, both on shrimp boats and in the processing sector, and imported shrimp, which drives down the prices of shrimp while influencing the consumer appreciation of shrimp quality. There have been recent efforts by shrimpers to influence state legislators to ban sales of or tax imported shrimp which have resulted from fears that imported shrimp will put shrimpers out of business. The destruction of coastal habitat from sources such as gentrification, coastal erosion, sea level rise, industrial development, contamination, and pollution can influence shrimp spawning populations. An influx of refugees from Vietnam who began moving into the area to take advantage of the region's fishing resources and the passing of immigration reform which authorized guest workers from Mexico, Central America, Caribbean, and other parts of the world to work in seasons processing, changed the ethnic make-up of the Gulf shrimping industry starting in the 1970s and continuing through today. It is estimated that the current proportion of Vietnamese shrimpers ranges from about 20% to 40% of the fleet.

3.4.1 Commercial Sector

Permits

A Gulf shrimp moratorium (SPGM) permit is required for vessels to harvest shrimp in federal waters. The greatest proportion of Gulf shrimp moratorium permits are issued to vessels with homeports in Texas (average of 34.6% from 2019-2024), followed by Louisiana (28.6%), Florida (13.1%), Alabama (10.2%), and Mississippi (7.8%, Table 3.4.1.1). Vessels with homeports in other states (California, Georgia, Hawaii, Massachusetts, North Carolina, New Jersey, Oregon, South Carolina, Virginia, and Washington) also hold Gulf shrimp permits, but these states represent a small percentage of the issued permits (SERO Permit Office, 2019-2024).

The number of Gulf shrimp permits has decreased over time, with a recent loss of 131 permits from 2019 to 2024 (Table 3.4.1.1). During this time period, the number of permits decreased in

the majority of Gulf states with Texas experiencing the greatest loss in the number of permits (-54); whereas there was a slight gain in the number of permitted vessels with homeports in Alabama (+4). The total number of shrimp permits in Table 3.4.1.1 varies from the number of permits presented elsewhere in the document because it includes a total for each year, rather than a total for a particular date.

Table 3.4.1.1. Gulf shrimp permits by state and year, from 2019-2024.

	AL	FL	LA	MS	TX	Other	Total
2019	135	189	398	114	500	82	1418
2020	137	186	393	111	494	79	1400
2021	141	183	401	107	473	79	1384
2022	143	176	395	107	464	75	1360
2023	142	172	387	103	457	74	1335
2024	139	165	369	99	446	69	1287

Source: SERO Permits Office. Note: includes valid and renewable SPGM permits.

Gulf shrimp permits are held by those with homeports in 184 communities (SERO Permits Office, 2024). Communities with the most Gulf shrimp permits are located in Texas, Alabama, Louisiana, Mississippi, and Florida (Table 3.4.1.2). The communities with the most shrimp permits are Brownsville, Texas (8.6% of shrimp permits); Bayou La Batre, Alabama (7.5%); and New Orleans, Louisiana (7.2%).

Table 3.4.1.2. Top homeports by number of Gulf shrimp permits.

State	Community	Permits
TX	Brownsville	111
AL	Bayou La Batre	97
LA	New Orleans	93
MS	Biloxi	69
TX	Port Lavaca	64
TX	Port Isabel	47
TX	Palacios	44
LA	Chauvin	38
TX	Galveston	36
TX	Port Arthur	31
FL	Hernando Beach	29
FL	Fort Myers Beach	26
TX	Houston	22
LA	Abbeville	20
LA	Galliano	20
LA	Venice	20

Source: SERO Permits Office, 2024.

As described in Section 2.1, there are an estimated 104 vessels with Gulf shrimp permits that are dually permitted in other fisheries (South Atlantic rock shrimp, Gulf reef fish, and HMS) with VMS requirements. Within the Gulf states, the greatest proportion of dually permitted vessels have homeports in Alabama (31.7%), followed by Florida (25%), Louisiana (8.7%), Mississippi (7.7%), and Texas (6.7%; SERO Permit Office, November 14, 2024). Outside of the Gulf, North Carolina includes a sizable proportion of dually permitted vessels (15.4%). Vessels with homeports in other states (California, Georgia, and New Jersey) also are dually permitted, but these states represent a small percentage of the vessels that are dually permitted.

Dually permitted vessels have homeports in 44 communities (SERO Permits Office, November 14, 2024). Communities with the most dually permitted vessels are located in Alabama, North Carolina, Florida, Mississippi, and New Jersey (Table 3.4.1.3). The communities with the most dually permitted vessels are Bayou La Batre, Alabama (23.1%) and Beaufort, North Carolina (8.7%).

Table 3.4.1.3. Top communities by number of dually permitted vessels with Gulf shrimp permits and South Atlantic rock shrimp, Gulf reef fish, and/or HMS permits.

State	Community	Vessels
AL	Bayou La Batre	24
NC	Beaufort	9
FL	Jacksonville	5
MS	Pascagoula	5
FL	Fort Myers Beach	3
FL	Port Canaveral	3
FL	Southport	3
MS	Biloxi	3
NC	Lowland	3
NJ	Cape May	3

Source: SERO Permits Office, November 14, 2024.

Engagement and Reliance

Figure 3.4.1.1 is an overall measure of a community's commercial fishing engagement and reliance and includes the communities with the top number of shrimp permits and top number of dually permitted vessels as depicted in Tables 3.4.1.2 and 3.4.1.3. The majority of the communities in Figure 3.4.1.1 would be considered to be highly or moderately engaged in commercial fishing, as most are at or above 1 standard deviation of the mean factor score and a few are at or above ½ standard deviation. Lowland, North Carolina shows the least amount of engagement in commercial fishing overall. Most of the included communities demonstrate low commercial reliance; however several included communities demonstrate high or moderate commercial reliance (Bayou La Batre, Alabama; Chauvin, Louisiana; Venice, Louisiana; Beaufort, North Carolina; Cape May, New Jersey; Palacios, Texas; and Port Isabel, Texas).

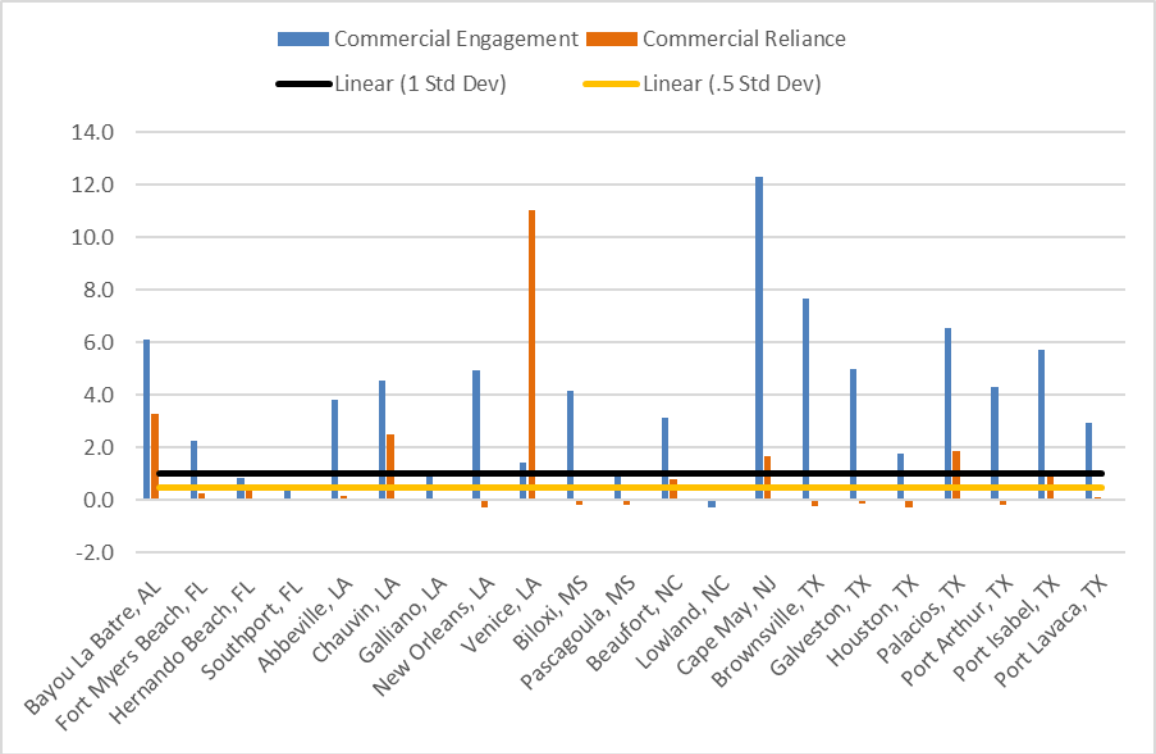

Figure 3.4.1.1. Commercial fishing engagement and reliance for top shrimp and dually permitted communities.
Source: SERO, Community Social Vulnerability Indicators Database 2019.

The description of fishing activities presented above highlights which communities may be most involved in Gulf shrimp fishing. It is expected that the impacts from the regulatory action in this framework action, whether positive or negative, will most likely affect those communities identified above.

3.4.2 Environmental Justice, Equity, and Underserved Communities

Federal agencies are required to consider the impacts and/or address the inequalities of their policies on minority populations, low-income populations, disadvantaged communities, and/or underserved communities. These requirements are outlined in the following Executive Orders (E.O.).

E.O. 12898 requires federal agencies conduct their programs, policies, and activities in a manner to ensure individuals or populations are not excluded from participation in, or denied the benefits of, or subjected to discrimination because of their race, color, or national origin. In addition, and specifically with respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. The main focus of E.O. 12898 is to consider "the disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories…" This E.O. is generally referred to as environmental justice (EJ).

E.O. 13985 requires federal agencies to recognize and work to redress inequalities in their policies and programs that serve as barriers to equal opportunity, including pursuing a comprehensive approach to advancing equity for all, including people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality. Federal agencies must assess how programs and policies perpetuate systemic barriers to opportunities and benefits to people of color and other underserved groups in order to equip agencies to develop policies and programs that deliver resources and benefits equitably to all.

E.O. 13985 provides definitions for equity and underserved communities, which expand the definition of a community from being geographically situated, or place-based, as defined through the Magnuson-Stevens Act, to also include communities that share a particular characteristic (e.g., crew of commercial fishing vessels). Equity means the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality. The term ‘‘underserved communities’’ refers to populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life, as exemplified by the list in the preceding definition of ‘‘equity.’’

E.O. 14008 calls on agencies to make achieving EJ part of their missions “by developing programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts.” Census data are available to examine the status of communities with regard to minorities and low-income populations. These data describe geographically based communities (e.g., Panama City, Florida) and are descriptive of the total population, not limited to the fishing components of the community. Information is not available at this time to examine the status of underserved populations engaged in Gulf fisheries. To help assess whether EJ concerns may be present within regional place-based communities, a suite of indices were created using census data to examine the social vulnerability of coastal communities within the region. The three indices are poverty, population composition, and personal disruption. The variables included in each of these indices have been identified through the literature as being important components that contribute to a community’s vulnerability. Poverty includes poverty rates for different groups; population composition includes more single female-headed households, households with children under the age of five, minority populations, and those that speak English less than well; and personal disruption includes disruptions such as higher separation rates, higher crime rates, and unemployment. Increased rates in the indicators are signs of populations experiencing vulnerabilities. Again, for those communities that exceed the threshold it would be expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change.

Figure 3.4.2.1 provides social vulnerability rankings for place-based communities identified in Section 3.4. Several communities exceed the threshold of one standard deviation above the mean for at least one of the indices (Bayou La Batre, Alabama; Abbeville, Chauvin, Galliano, New Orleans, and Venice, Louisiana; Brownsville, Houston, Palacios, Port Arthur, Port Isabel, and Port Lavaca, Texas; and Pascagoula, Mississippi). Three of the communities exceed the threshold for all three of the indices (Brownsville, Port Arthur, and Port Isabel, Texas). These communities would be the most likely to exhibit vulnerabilities to social or economic disruption resulting from regulatory change.

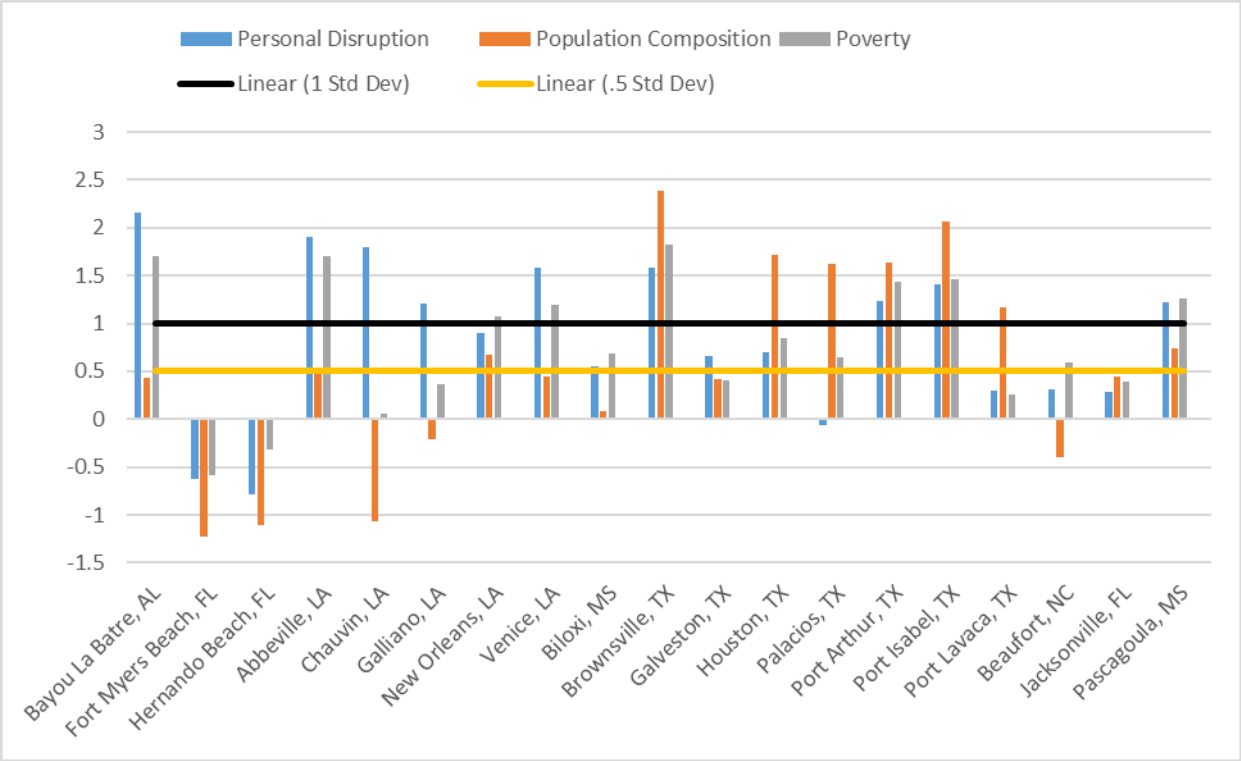

Figure 3.4.2.1. Social vulnerability indices for top shrimp and dually permitted communities.
Source: SERO, Community Social Vulnerability Indicators Database 2020.

People in these communities may be affected by fishing regulations in two ways: participation and employment. Although the place-based communities identified in Figure 3.4.2.1 may have the greatest potential for EJ concerns, complete data are not available on the race and income status for those involved in the local fishing industry (employment), or for their dependence on shrimp specifically (participation). However, a considerable portion of the shrimp fleet could be considered as part of an underserved community. A sizable proportion of the shrimp fleet is Vietnamese in ethnicity, estimated at 20% to 40% of the fleet, as described above. Some members of the Vietnamese portion of the shrimp fleet only speak Vietnamese. In addition, there have been reports that it has been difficult to make a livable income in shrimp fishing in recent years due to the impact from imports and high fuel costs. Therefore, some of the fleet could be categorized as low income or experiencing poverty. The potential effects of the actions on place based communities and non-place based communities, such as on commercial fishermen are discussed in detail in Section 4.1.3.

3.5 Description of the Administrative Environment

3.5.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; 16 U.S.C. 1801 *et seq*.), originally enacted in 1976 as the Fishery Conservation and Management Act. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within the EEZ. The EEZ is defined as an area extending 200 nautical miles from the seaward boundary of each of the coastal states. The Magnuson-Stevens Act also claims authority over U.S. anadromous species and continental shelf resources that occur beyond the EEZ.

Responsibility for federal fishery management decision-making is divided between the Secretary of Commerce (Secretary) and eight regional fishery management councils that represent the expertise and interests of constituent states. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary is responsible for promulgating regulations to implement proposed plans and amendments after ensuring management measures are consistent with the Magnuson-Stevens Act and with other applicable laws summarized in Section 10. In most cases, the Secretary has delegated this authority to NMFS.

The Council is responsible for fishery resources in federal waters of the Gulf. These waters extend to 200 nautical miles offshore from the seaward boundaries of Alabama, Florida, Louisiana, Mississippi, and Texas, as those boundaries have been defined by law. The length of the Gulf coastline is approximately 1,631 miles. Florida has the longest coastline extending 770 miles along its Gulf coast, followed by Louisiana (397 miles), Texas (361 miles), Alabama (53 miles), and Mississippi (44 miles).

The Council consists of seventeen voting members: 11 public members appointed by the Secretary; one each from the fishery agencies of Texas, Louisiana, Mississippi, Alabama, and Florida; and one from NMFS. The public is also involved in the fishery management process.

3.5.2 State Fishery Management

The purpose of state representation at the Council level is to ensure state participation in federal fishery management decision-making and to promote the development of compatible regulations in state and federal waters. The state governments of Texas, Louisiana, Mississippi, Alabama, and Florida have the authority to manage their respective state fisheries. Each of the five states exercises legislative and regulatory authority over their states' natural resources through discrete administrative units. Although each agency is the primary administrative body with respect to the states' natural resources, all states cooperate with numerous state and federal regulatory agencies when managing marine resources. A more detailed description of each state's primary regulatory agency for marine resources is provided on their respective web pages (Table 3.5.2.1).

Table 3.5.2.1. State marine resource agencies and web pages.

State Marine Resource Agency	Web Page
Alabama Marine Resources Division	http://www.outdooralabama.com/
Florida Fish and Wildlife Conservation Commission	http://myfwc.com/
Louisiana Department of Wildlife and Fisheries	http://www.wlf.louisiana.gov/
Mississippi Department of Marine Resources	http://www.dmr.ms.gov/
Texas Parks and Wildlife Department	http://tpwd.texas.gov/

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

4.1 Action: Modify the Method Used to Collect Vessel Position Data for the Gulf of Mexico Shrimp Fishery

4.1.1 Direct and Indirect Effects on the Physical Environment and Biological Environment

This action would not change how the fishery is currently prosecuted; therefore, **Alternatives 1-3** are not likely to have any direct effects on the physical or biological environments. However, the alternatives likely differ in the timeliness and accuracy of shrimp effort data reported to National Marine Fisheries Service (NMFS), which could have indirect effects on the biological environment because the data are used in assessing bycatch of juvenile red snapper and protected species, as discussed in more detail below. Under **Alternative 1** (No Action), program participants must record positional information on a memory card and then conventionally mail the cards to NMFS. Conversely, **Alternatives 2** and **3** passively monitor vessel positions and report data to NMFS without the extra step of conventionally mailing memory cards. It is likely **Alternatives 2** and **3** would result in more timely and accurate data reporting relative to **Alternative 1** (No Action) since mailing equipment would not be required. Compliance is expected to be higher for **Alternative 2** and **3** relative to **Alternative 1** (No Action) since fixed position VMS hardware would be collecting position data constantly while engaged in fishing activity, then automatically transmitted to NMFS with no additional action required by the program participant. Streamlining the data transmission process as considered in **Alternatives 2** and **3** aids in compliance and results in increased data accuracy relative to **Alternative 1** (No Action).

Juvenile red snapper bycatch

Juvenile red snapper (generally ages 0-1 years) are often captured in shrimp trawls as bycatch with assumed high mortality. Therefore, estimates of juvenile red snapper bycatch in the Gulf shrimp fleet are considered when estimating sources of mortality when assessing red snapper in the Gulf. Gulf red snapper is undergoing a new stock assessment[14] (SEDAR 98) that will consider the inclusion of discard mortality associated from shrimp bycatch. Specifically, SEDAR 98 will utilize the new estimates of shrimp fishing effort and bycatch, as appropriate, based on the peer review of such data from the SEDAR 87 stock assessment[15] of Gulf shrimp. Amendment 22 to the Fishery Management Plan (FMP) for the Reef Fish Resources of the Gulf of Mexico (GMFMC 2004b) established the current rebuilding plan for red snapper that is scheduled to end in 2032. Bycatch of red snapper by the Gulf shrimp fishery was identified as a primary factor affecting the recovery of Gulf red snapper, with the highest red snapper fishing mortality rate attributed to the western portion of the Gulf shrimp fishery, followed by the eastern portion of the Gulf recreational red snapper fishery, and the western portion of the Gulf

[14] https://sedarweb.org/assessments/sedar-98-gulf-of-mexico-red-snapper/
[15] https://sedarweb.org/assessments/sedar-87-gulf-of-mexico-white-pink-and-brown-shrimp/

commercial red snapper fishery (SEDAR 7 2005). The SEDAR 7 (2005) assessment indicated a need for a 74% reduction in the red snapper bycatch mortality attributed to shrimp trawls, compared to levels of effort and mortality experienced during the 2001-2003 period. Amendment 14 to the FMP for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters capped shrimp fishing effort in statistical zones 10-21 in 10-30 fathom water depths of the western Gulf (i.e., the area monitored for juvenile red snapper bycatch)(GMFMC 2007). Amendment 14 established a shrimp fishing effort threshold of 74% below a baseline average of the years 2001-2003. The cap was reduced to 67% in 2011 (GMFMC 2012) and further reduced to 60% in 2019 (GMFMC 2019). Research indicated that the effect of the shrimp fishery on red snapper mortality is less than previously thought (Gallaway et al. 2017). The lower effort cap provides for additional allowable effort in the shrimp fishery, while not affecting the 2032 red snapper rebuilding plan.

To date, the Gulf shrimp fishery has not exceeded the allowable threshold effort level in the area monitored for juvenile red snapper since the implementation of the threshold, though it did come within two percentage points in 2014, 2016, and 2017. The fishery has been contracting since the establishment of the federal commercial Gulf shrimp moratorium permit in 2006, which was extended until 2026 by Amendment 17A to the FMP (GMFMC 2016). **Alternatives 2** and **3** are expected to improve monitoring of the effort threshold and result in continued rebuilding of the red snapper stock.

Protected species interactions

Data timeliness and accuracy between the action alternatives discussed above are likely to have similar biological effects for assessing protected species interactions. The shrimp fishery biological opinion (NMFS 2021) includes estimates of takes of sea turtles, smalltooth sawfish, and giant manta rays. For reasons stated above, **Alternatives 2** and **3** are expected to provide more timely and accurate data for estimating protected species interactions relative to **Alternative 1** (No Action).

4.1.2 Direct and Indirect Effects on the Economic Environment

Alternative 1 (No Action) would maintain the current data collection program. Therefore, no changes in the costs incurred by the commercial sector would be expected.

As of September 20, 2024, there were 1,257 vessels with valid or renewable SPGM permits (NMFS SERO Sustainable Fisheries Access Permits Database, accessed 11/4/24). Of these 1,257 vessels, an estimated 104 vessels are required to comply with VMS requirements in other fisheries, with a satellite VMS being required. For the 104 permitted vessels described above, the vessels would be required to carry two VMS units under **Alternative 3**, as a cellular VMS (cVMS) would be mandatory, whereas under **Alternative 2**, those 104 vessels might choose to carry only a satellite VMS if that is the most cost-efficient business decision. Furthermore, as detailed in Chapter 2, vessels may be eligible for reimbursement of VMS devices, which is currently capped at $950 for programs that allow for the use of a cVMS; however, the 104 vessels described above are ineligible if they already received reimbursement for the satellite

VMS required in another fishery. As of December 11, 2024, 116 vessels have participated in the Early Adopter Program, described in Chapter 2, with funding for 204 vessels.

Analysis of **Alternatives 2** and **3** incorporates several assumptions, including that the number of SPGM permits is constant (whereas that number has decreased over time), reimbursement of VMS devices remains available, cVMS devices installed in the Early Adopter Program meet type-approval for **Alternatives 2** and **3**, and all vessels would be required to have a VMS. If the number of SPGM permits decreases over time or a subset of the industry is selected to participate[16] (instead of a census-level approach), then the industry costs are expected to be lower than in this analysis; if reimbursement of VMS devices is unavailable to cover all selected vessels, then the industry costs are expected to be higher than in this analysis. The analysis also excludes the three years of cellular transmission included for volunteers with the Early Adopter Program, as those three years may have passed by the time of implementation of this framework action.

For **Alternative 2**, 949 vessels are expected to incur installation costs ($300), annual cellular transmission costs ($99 to $179), and $0 for cVMS device costs (after reimbursement[17]) in Year 1, while the 204 vessels that participated in the Early Adopter Program are only expected to incur the annual cellular transmission costs. Following first year costs, all 1,153 vessels (excluding the 104 vessels permitted in fisheries requiring a satellite VMS) are only expected to incur annual cellular transmission costs ($99 to $179). Over a 10-year period and with a discount rate of 2%[18], the discounted net present value of industry costs is estimated to range from $1,330,542 to $2,175,667, depending on which of the three cVMS devices are utilized by vessels. For the 104 vessels permitted in fisheries requiring a satellite VMS, they are expected to incur annual satellite transmission costs ranging from $360 to $1,440 for a 10-minute ping rate. However, this does not account for the annual satellite transmission costs those 104 vessels are already paying, so the net increase in annual satellite transmission costs is expected to be less than the $360 to $1,440 range. With the assumption that the annual satellite transmission costs are incurred in full by the 104 vessels due to **Alternative 2**, over a 10-year period and with a discount rate of 2%, the discounted net present value of costs for those 104 vessels is estimated to range from $343,034 to $1,372,137, dependent on the type of satellite VMS device already installed. While these 104 vessels may choose to add a cVMS as part of a profit maximizing business strategy, they would be ineligible for the $950 reimbursement if they previously received reimbursement for their satellite VMS; however, transmission costs are expected to be lower with a cVMS than a satellite VMS. Over a 10-year period and with a discount rate of 2%, the discounted net present value of costs for those 104 vessels employing a cVMS is expected to range from $182,214 to $222,460, which includes the cVMS device cost, installation, and cellular transmission. These estimated industry costs are totaled in Table 4.1.2.1.

[16] However, if a vessel is not selected in the initial sample, it may be selected in a subsequent resampling, such that all vessels will eventually need a VMS onboard. Vessels not selected for a given time period may be able to forego transmission costs.
[17] The costs of the three devices in Appendix F and in this analysis are all less than the $950 for reimbursement.
[18] The 2% discount rate is recommended in Circular No. A-4. https://www.whitehouse.gov/wp-content/uploads/2023/11/CircularA-4.pdf

For **Alternative 3**, 1,053 vessels will incur installation costs ($300), annual cellular transmission costs ($99 to $179), and cVMS device costs ($199 to $574) in Year 1, while the 204 vessels that participated in the Early Adopter Program will only incur the annual cellular transmission costs. Following first year costs, all 1,257 vessels will incur annual expected costs from cellular transmission ($99 to $179). Over a 10-year period and with a discount rate of 2%, the discounted net present value of industry costs is estimated to range from $2,029,961 to $2,586,978, dependent on which of the three cVMS devices are utilized by vessels.

Table 4.1.2.1. Total estimated industry costs from **Alternatives 2** and **3**

	Alt 2 (949 cellular; 104 satellite)	**Alt 2 (949 cellular; 104 that have both satellite and cellular)**	**Alt 3 (1,053 cellular)**
Discounted Net Present Value of Industry Costs	$1,673,576 to $3,547,804	$1,512,756 to $2,398,127	$2,029,961 to $2,586,978

Members of the Gulf of Mexico Fishery Management Council's Shrimp Advisory Panel expressed concerns over missed fishing opportunities if VMS devices malfunction. However, analyses of these potential scenarios cannot be completed for various reasons, including lack of information on the percentage of the fleet that may be affected annually or for what length of time.

4.1.3 Direct and Indirect Effects on the Social Environment

Alternative 1 (No Action) would maintain the current method for collecting vessel position data. While no new requirements would be placed on operators, the outdated cellular ELB units and reliance on a mail-in process would likely continue to result in delays and gaps in data collection. These inefficiencies may contribute to frustration among stakeholders and diminished trust in the regulatory process.

Under **Alternative 2**, vessel operators would be required to install type-approved VMS devices, with the option of using either satellite or cellular systems. Satellite VMS would transmit position data automatically to a NMFS server, while cellular VMS would archive data during trips outside cellular range and transmit it upon returning to cellular coverage. This system would automate data collection, improving reporting efficiency and accuracy. However, the need for additional equipment and compliance requirements may create challenges for operators, particularly those already managing VMS obligations in other fisheries. The shrimp industry is already facing pressures such as competition from imports and rising fuel prices, as well as a decline in participation over time. These additional costs could further strain some operators and may contribute to difficult business decisions for those operating on the margins, potentially impacting vessel owners, operators, and crew. Concerns about system intrusiveness could persist, potentially leading to resistance among some operators.

Alternative 3 would require vessel operators to install a cVMS specific to the Gulf shrimp fishery. While potentially less costly than satellite-based systems in terms of transmission costs, the required initial and ongoing expenses may still pose challenges for smaller operators. Unlike

Alternative 2, vessel operators under **Alternative 3** would not be eligible for national VMS reimbursement for the cVMS device costs, meaning they would bear the full cost of purchasing the device in addition to installation and transmission expenses.

In summary, the social effects of these alternatives are closely tied to their operational and economic implications. **Alternative 1** avoids new costs but perpetuates inefficiencies and may erode trust in the regulatory process. **Alternative 2** could improve data collection and regulatory outcomes but imposes higher costs than **Alternative 1**, disproportionately affecting smaller operators and potentially altering community dynamics. **Alternative 3** could lead to higher financial burdens compared to **Alternative 2.** These costs may pose challenges for smaller operators and those with multi-fishery permits. Overall, **Alternatives 2** and **3** present opportunities for improved data accuracy and management outcomes, which could result in indirect social benefits through better resource sustainability. The communities expected to be most affected by these changes are described in detail in Section 3.4.

4.1.4 Direct and Indirect Effects on the Administrative Environment

Alternative 1 (No Action) is not expected to result in an additional administrative burden. However, because 3G cellular transmission is no longer possible, NMFS has been collecting the Secure Digital (SD) cards from the cELB units of participating vessels via mail until a new process is developed. This did result in additional costs through mailouts of new SD cards roughly every six months in contrast to when 3G cellular transmission for data was possible under **Alternative 1**.

Both **Alternatives 2** and **3** share two cost categories for additional administrative burden: start-up and maintenance.[19] **Alternative 3** requires building a duplicative VMS-like system at the SEFSC[20] and, therefore, results in additional costs to operate and maintain the system (IT-oriented costs), to operate a helpdesk, and to fund contracting, the type-approval process, data sharing, the data interface, and secure transmission. **Alternative 3** would also incur costs for legal review (~$30,000 annually), for an increase in the SEFSC's Federal Information Security Modernization Act and Privacy Impact Assessment levels (~$200,000 one-time cost), for security measures, data transmission, summary reports, and graphical depictions with a Graphical User Interface (~$300,000 one-time cost, with $100,000 annual maintenance costs), and for help desk staff (~$350,000 annually, with a potential increase in costs in years that require software upgrades related to secure transmissions). Costs detailed in Table 4.1.4.1 are based on full-time employees (FTE), as hiring IT contractors are estimated to be 2 to 2.5 times the cost of an FTE. If the draft technical specifications from Appendix D are incorporated into **Alternative 3**, an additional administrative cost would be associated with the requirement that OLE must perform field tests and at-sea trials that involve demonstrating every aspect of VMS and communications operation. The administrative burden is expected to be lower under **Alternative 2** than **Alternative 3** because **Alternative 2** uses the existing VMS infrastructure.

[19] The Council's Shrimp Advisory Panel received a presentation on the estimated costs for position-recording devices in the Gulf of Mexico shrimp fleet at its December 16, 2024, meeting. This presentation may be found at this link: https://gulfcouncil.org/wp-content/uploads/07c.-Gulf-ShrimpAP-VMS-Dec-2024-v2.pdf

[20] The Department of Commerce, NOAA, and NMFS strategic plans emphasize eliminating duplicative data systems.

Table 4.1.4.1. Administrative Program Costs for **Alternatives 2** and **3**

	Alt 2 (start-up)	Alt 2 (maintenance)	Alt 3 (start-up)	Alt 3 (maintenance)
SEFSC Analysis and Maintenance Costs	$272,500	$241,000	$487,500	$341,700
Additional SEFSC VMS-like Costs	$0	$0	$1,080,000	$440,000 - $500,000
Total Administrative Program Costs	$272,500	$241,000 per year	$1,567,500	$781,700 - $841,700 per year

*Start-up costs are currently covered within the budget, and anticipated maintenance costs can also be covered with the current budget. Alternative 3 costs contain costs currently covered with the budget as well as new expected costs to maintain the new system.

4.2 Cumulative Effects Analysis

CHAPTER 5. LIST OF PREPARERS

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GMFMC = Gulf of Mexico Fishery Management Council; NOAA=National Oceanic and Atmospheric Administration, SERO = Southeast Regional Office, SF = Sustainable Fisheries Division, PR = Protected Resources Division, HC = Habitat Conservation Division, SEFSC=Southeast Fisheries Science Center, GC = General Counsel

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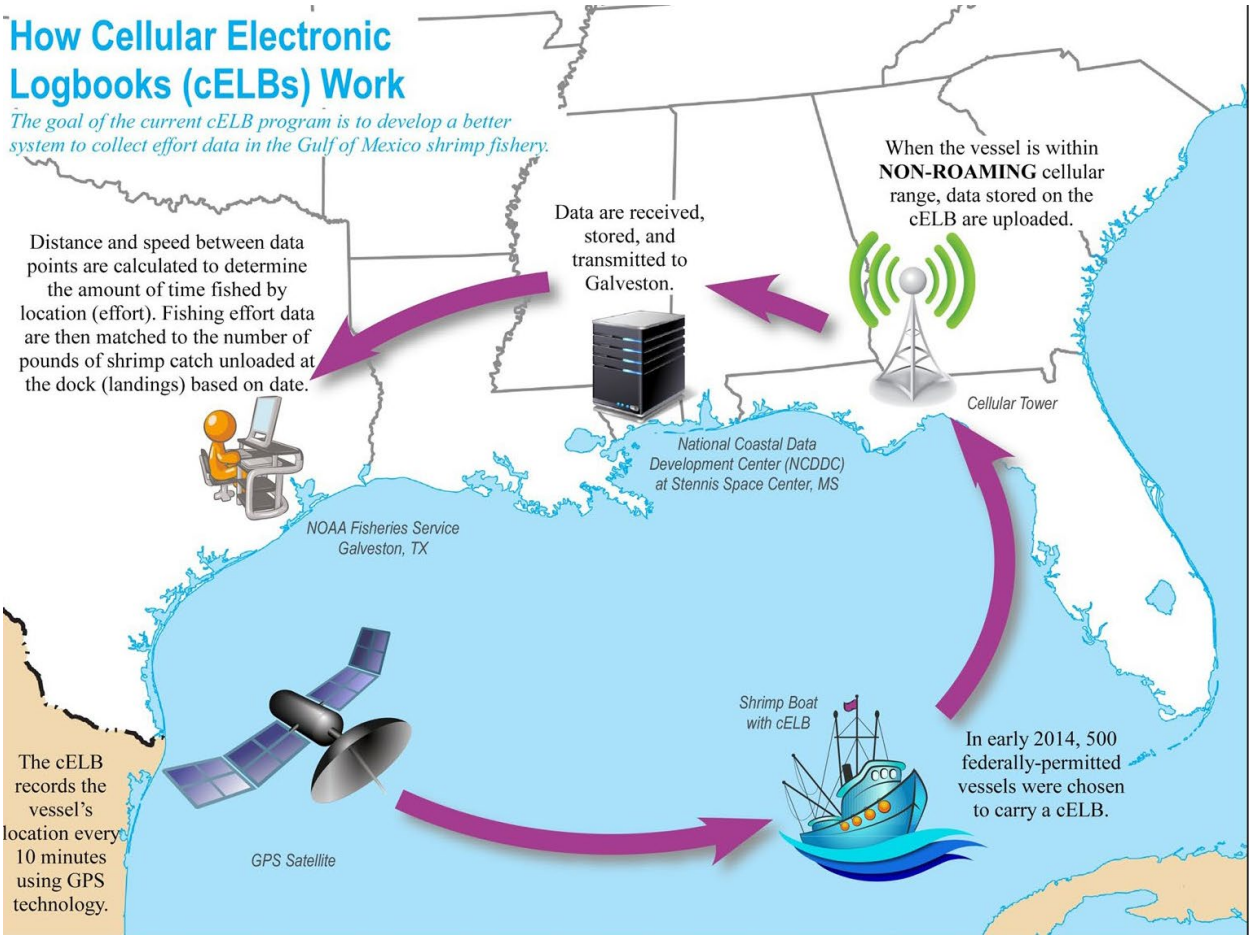
APPENDIX A. DIAGRAM OF HOW A CELLULAR ELB WORKS

The following diagram shows five steps, beginning with the GPS satellite, noting that the cELB records the vessel's location every 10 minutes using GPS technology, and ending with the National Marine Fisheries Service in Galveston, Texas, where distance and speed between data points are calculated to determine the amount of time fished by location (effort) and then matching the fishing effort data to the number of pounds of shrimp catch unloaded at the dock (landings) based on date.



APPENDIX B. VESSEL MONITORING SYSTEM TYPE-APPROVAL

e-CFR data is current as of July 19, 2021

Title 50 → Chapter VI → Part 600 → Subpart Q

Title 50: Wildlife and Fisheries
PART 600—MAGNUSON-STEVENS ACT PROVISIONS

Subpart Q—Vessel Monitoring System Type-Approval

Contents

Source: 85 FR 40921, July 8, 2020, unless otherwise noted.

§600.1500 Definitions and acronyms.

In addition to the definitions in the Magnuson-Stevens Act and in §600.10, and the acronyms in §600.15, the terms and acronyms in this subpart have the following meanings:

Authorized entity means a person, defined at 16 U.S.C. 1802(36), authorized to receive data transmitted by a VMS unit.

Bench configuration means the configuration of a VMS unit after it has been customized to meet the Federal VMS requirements.

Bundle means a mobile communications service and VMS unit sold as a package and considered one product. If a bundle is type-approved, the requestor will be the type-approval holder for the bundled MCS and VMS unit.

Cellular communication means the wireless transmission of VMS data via a cellular network.

Communication class means the satellite or cellular communications operator from which communications services originate.
Electronic form means a pre-formatted message transmitted by a VMS unit that is required for the collection of data for a specific fishery program (*e.g.,* declaration system, catch effort reporting).
Enhanced Mobile Transceiver Unit (EMTU) means a type of MTU that is capable of supporting two-way communication, messaging, and electronic forms transmission via satellite. An EMTU is a transceiver or communications device, including an antenna, and dedicated message terminal and display which can support a dedicated input device such as a tablet or keyboard, installed on fishing vessels participating in fisheries with a VMS requirement.
Enhanced Mobile Transceiver Unit, Cellular Based (EMTU-C) means an EMTU that transmits and receives data via cellular communications, except that it may not need a dedicated message terminal and display component at the time of approval as explained at §600.1502(a)(6). An EMTU-C only needs to be capable of transmission and reception when in the range of a cellular network.
Latency means the state of untimely delivery of Global Positioning System position reports and electronic forms to NMFS (*i.e.,* information is not delivered to NMFS consistent with timing requirements of this subpart).
Mobile Communications Service (MCS) means the satellite and/or cellular communications services used with particular VMS units.
Mobile Communications Service Provider (MCSP) means an entity that sells VMS satellite and/or cellular communications services to end users.
Mobile Transmitter Unit (MTU) means a VMS unit capable of transmitting Global Positioning System position reports via satellite. (MTUs are no longer approved for new installations on VMS vessels).
Notification Letter means a letter issued by NMFS to a type-approval holder identifying an alleged failure of a VMS unit, MCS, or the type-approval holder to comply with the requirements of this subpart.
Position report means the unique global positioning system (GPS) report generated by a vessel's VMS unit, which identifies the vessel's latitude/longitude position at a point in time. Position reports are sent from the VMS unit via the MCS, to authorized entities.
Requestor means a vendor seeking type-approval.
Service life means the length of time during which a VMS unit remains fully operational with reasonable repairs.
Sniffing means the unauthorized and illegitimate monitoring and capture, through use of a computer program or device, of data being transmitted over a network.
Spoofing means the reporting of a false Global Positioning System position and/or vessel identity.
Time stamp means the time, in hours, minutes, and seconds in a position report. Each position report is time stamped.
Type-approval holder means an applicant whose type-approval request has been approved pursuant to this subpart.
Vendor means a commercial provider of VMS hardware, software, and/or mobile communications services.

Vessel Monitoring System (VMS) means, for purposes of this subpart, a satellite and/or cellular based system designed to monitor the location and movement of vessels using onboard VMS units that send Global Positioning System position reports to an authorized entity.
Vessel Monitoring System (VMS) data means the data transmitted to authorized entities from a VMS unit.
Vessel Monitoring System Program means the Federal program that manages the vessel monitoring system, data, and associated program-components, nationally and in each NMFS region; it is housed in the Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service's Office of Law Enforcement.
Vessel Monitoring System (VMS) Unit means MTU, EMTU or EMTU-C, as well as the units that can operate as both an EMTU and an EMTU-C.
Vessel Monitoring System (VMS) Vessels means vessels that operate in federally managed fisheries with a requirement to carry and operate a VMS unit.

§600.1501 Vessel Monitoring System type-approval process.

(a) *Applicability.* Unless otherwise specified, this section applies to EMTUs, EMTU-Cs, units that operate as both an EMTU and EMTU-C, and MCSs. Units that can operate as both an EMTU and EMTU-C must meet the requirements for both an EMTU and an EMTU-C in order to gain type-approval as both. MTUs are no longer eligible for type-approval.
(b) *Application submission.* A requestor must submit a written type-approval request and electronic copies of supporting materials that include the information required under this section to the NMFS Office of Law Enforcement (OLE) at: U.S. Department of Commerce; National Oceanic and Atmospheric Administration; National Marine Fisheries Service; Office of Law Enforcement; Attention: Vessel Monitoring System Office; 1315 East-West Highway, SSMC3, Suite 3301, Silver Spring, Maryland 20910.
(c) *Application requirements.* (1) EMTU, EMTU-C, and MCS Identifying Information: In a type-approval request, the requestor should indicate whether the requestor is seeking approval for an EMTU, EMTU-C, MCS, or bundle and must specify identifying characteristics, as applicable: Communication class; manufacturer; brand name; model name; model number; software version and date; firmware version number and date; hardware version number and date; antenna type; antenna model number and date; tablet, monitor or terminal model number and date; MCS to be used in conjunction with the EMTU/EMTU-C; entity providing MCS to the end user; and current global and regional coverage of the MCS.
(2) Requestor-approved third-party business entities: The requestor must provide the business name, address, phone number, contact name(s), email address, specific services provided, and geographic region covered for the following third-party business entities:
(i) Entities providing bench configuration for the EMTU/EMTU-C at the warehouse or point of supply.
(ii) Entities distributing/selling the EMTU/EMTU-C to end users.
(iii) Entities currently approved by the requestor to install the EMTU/EMTU-C onboard vessels.
(iv) Entities currently approved by the requestor to offer a limited warranty.
(v) Entities approved by the requestor to offer a maintenance service agreement.
(vi) Entities approved by the requestor to repair or install new software on the EMTU/EMTU-C.
(vii) Entities approved by the requestor to train end users.
(viii) Entities approved by the requestor to advertise the EMTU/EMTU-C.
(ix) Entities approved by the requestor to provide other customer services.
(3) Regulatory Requirements and Documentation: In a type-approval request, a requestor must:

(i) Identify the NMFS region(s) and/or Federal fisheries for which the requestor seeks type-approval.
(ii) Include copies of, or citation to, applicable VMS regulations and requirements in effect for the region(s) and Federal fisheries identified under paragraph (c)(3)(i) of this section that require use of VMS.
(iii) Provide a table with the type-approval request that lists in one column each requirement set out in §§600.1502 through 600.1509 and regulations described under paragraph (c)(3)(ii) of this section. NMFS OLE will provide a template for the table upon request. The requestor must indicate in subsequent columns in the table:
(A) Whether the requirement applies to the type-approval; and
(B) Whether the EMTU, EMTU-C, MCS, or bundle meets the requirement.
(iv) Certify that the features, components, configuration and services of the requestor's EMTU/EMTU-C, MCS, or bundle comply with each requirement set out in §§600.1502 through 600.1509 and the regulations described under paragraph (c)(3)(ii) of this section.
(v) Certify that, if the request is approved, the requestor agrees to be responsible for ensuring compliance with each requirement set out in §§600.1502 through 600.1509 and the regulations described under paragraph (c)(3)(ii) of this section over the course of the type-approval period.
(vi) Provide NMFS OLE with two EMTU/EMTU-Cs loaded with forms and software, if applicable, for each NMFS region or Federal fishery, with activated MCS, for which a type-approval request is submitted for a minimum of 90 calendar days for testing and evaluation. For EMTU-Cs, the forms and software may be loaded onto a dedicated message terminal and display component to which the EMTU-C can connect. Copies of forms currently used by NMFS are available upon request. As part of its review, NMFS OLE may perform field tests and at-sea trials that involve demonstrating every aspect of EMTU/EMTU-C and communications operation. The requestor is responsible for all associated costs including paying for: Shipping of the EMTU/EMTU-C to the required NMFS regional offices and/or headquarters for testing; the MCS during the testing period; and shipping of the EMTU/EMTU-C back to the vendor.
(vii) Provide thorough documentation for the EMTU/EMTU-C and MCS, including: EMTU/EMTU-C fact sheets; installation guides; user manuals; any necessary interfacing software; MCS global and regional coverage; performance specifications; and technical support information.
(d) *Certification.* A requestor seeking type-approval of an EMTU/EMTU-C to operate with a class or type of communications, as opposed to type-approval for use with a specific MCS, shall certify that the EMTU/EMTU-C meets requirements under this subpart when using at least one MCSP within that class or type of communications.
(e) *Notification.* Unless additional time is required for EMTU/EMTU-C testing, NMFS OLE will notify the requestor within 90 days after receipt of a complete type-approval request as follows:
(1) If a request is approved or partially approved, NMFS OLE will provide notice as described under §600.1510 and the type-approval letter will serve as official documentation and notice of type-approval. OLE will publish and maintain the list of type-approved units on their Vessel Monitoring System web page.
(2) If a request is disapproved or partially disapproved:
(i) OLE will send a letter to the requestor that explains the reason for the disapproval/partial disapproval.
(ii) The requestor may respond to NMFS OLE in writing with additional information to address the reasons for disapproval identified in the NMFS OLE letter. The requestor must submit this

response within 21 calendar days of the date of the OLE letter sent under paragraph (e)(2)(i) of this section.
(iii) If any additional information is submitted under paragraph (e)(2)(ii) of this section, NMFS OLE, after reviewing such information, may either take action under paragraph (e)(1) of this section or determine that the request should continue to be disapproved or partially disapproved. In the latter case, the NMFS OLE Director will send a letter to the requestor that explains the reasons for the continued disapproval/partial disapproval. The NMFS OLE Director's decision is final upon issuance of this letter and is not appealable.

§600.1502 Communications functionality.

(a) Unless otherwise specified, this subsection applies to all VMS units. Units that can operate as both an EMTU and EMTU-C must meet the requirements for both an EMTU and an EMTU-C in order to gain type-approval as both. The VMS unit must:
(1) Be able to transmit all automatically-generated position reports.
(2) Provide visible or audible alarms onboard the vessel to indicate malfunctioning of the VMS unit.
(3) Be able to disable non-essential alarms in non-Global Maritime Distress and Safety System (GMDSS) installations.
(4) EMTU/EMTU-Cs must be able to send communications that function uniformly throughout the geographic area(s) covered by the type-approval, except an EMTU-C only needs to be capable of transmission and reception when in the range of a cellular network.
(5) EMTU/EMTU-Cs must have two-way communications between the unit and authorized entities, via MCS, or be able to connect to a device that has two-way communications.
(6) EMTU/EMTU-Cs must be able to run or to connect to a dedicated message terminal and display component that can run software and/or applications that send and receive electronic forms and internet email messages for the purpose of complying with VMS reporting requirements in Federal fisheries. Depending on the reporting requirements for the fishery(s) in which the requester is seeking type-approval, an EMTU-C type-approval may not require the inclusion of a dedicated message terminal and display component at the time of approval, but the capability to support such a component must be shown.
(7) Have messaging and communications mechanisms that are completely compatible with NMFS vessel monitoring and surveillance software.
(b) In addition, messages and communications from a VMS unit must be able to be parsed out to enable clear billing of costs to the government and to the owner of a vessel or EMTU/EMTU-C, when necessary. Also, the costs associated with position reporting and the costs associated with other communications (for example, personal email or communications/reports to non-NMFS Office of Law Enforcement entities) must be parsed out and billed to separate parties, as appropriate.

§600.1503 Position report data formats and transmission.

Unless otherwise specified, this subsection applies to all VMS units, MCSs and bundles. Units that can operate as both an EMTU and EMTU-C must meet the requirements for both an EMTU and an EMTU-C in order to gain type-approval as both. To be type-approved in any given fishery, a VMS unit must also meet any additional positioning information as required by the applicable VMS regulations and requirements in effect for each fishery or region for which the type-approval applies. The VMS unit must meet the following requirements:
(a) Transmit all automatically-generated position reports, for vessels managed individually or grouped by fleet, that meet the latency requirement under §600.1504.

(b) When powered up, must automatically re-establish its position reporting function without manual intervention.
(c) Position reports must contain all of the following:
(1) Unique identification of an EMTU/EMTU-C and clear indication if the unit is an EMTU-C.
(2) Date (year/month/day with century in the year) and time stamp (GMT) of the position fix.
(3) Date (year/month/day with century in the year) and time stamp (GMT) that the EMTU-C position report was sent from the EMTU-C.
(4) Position fixed latitude and longitude, including the hemisphere of each, which comply with the following requirements:
(i) The position fix precision must be to the decimal minute hundredths.
(ii) Accuracy of the reported position must be within 100 meters (328.1 ft).
(d) An EMTU/EMTU-C must have the ability to: (1) Store 1,000 position fixes in local, non-volatile memory.
(2) Allow for defining variable reporting intervals between 5 minutes and 24 hours.
(3) Allow for changes in reporting intervals remotely and only by authorized users.
(e) An EMTU/EMTU-C must generate specially identified position reports upon:
(1) Antenna disconnection.
(2) Loss of positioning reference signals.
(3) Security events, power-up, power down, and other status data.
(4) A request for EMTU/EMTU-C status information such as configuration of programming and reporting intervals.
(5) The EMTUs loss of the mobile communications signals.
(6) An EMTU must generate a specially identified position report upon the vessel crossing of a pre-defined geographic boundary.

§600.1504 Latency requirement.

(a) Ninety percent of all pre-programmed or requested Global Positioning System position reports during each 24-hour period must reach NMFS within 15 minutes or less of being sent from the VMS unit, for 10 out of 11 consecutive days (24-hour time periods).
(b) NMFS will continually examine latency by region and by type-approval holder.
(c) Exact dates for calculation of latency will be chosen by NMFS. Days in which isolated and documented system outages occur will not be used by NMFS to calculate a type-approval holder's latency.

§600.1505 Messaging.

(a) Unless otherwise specified, this section applies to all VMS units, MCSs, and bundles. Units that can operate as both an EMTU and EMTU-C must meet the requirements for both an EMTU and an EMTU-C in order to gain type-approval as both. Depending on the reporting requirements for the fishery(s) in which the requester is seeking type-approval, an EMTU-C type-approval may not require the inclusion of a dedicated message terminal and display component at the time of approval, but the capability to support such a component must be shown. To be type-approved in any given fishery, a VMS unit must meet messaging information requirements under the applicable VMS regulations and requirements in effect for each fishery or region for which the type-approval applies. The VMS unit must also meet the following requirements:
(b) An EMTU must be able to run software and/or applications that send email messages for the purpose of complying with VMS reporting requirements in Federal fisheries that require email communication capability. An EMTU-C must be able to run or connect to a device that can run

such software and/or applications. In such cases, the EMTU/EMTU-C messaging must provide for the following capabilities:
(1) Messaging from vessel to shore, and from shore to vessel by authorized entities, must have a minimum supported message length of 1 KB. For EMTU-Cs, this messaging capability need only be functional when in range of shore-based cellular communications.
(2) There must be a confirmation of delivery function that allows a user to ascertain whether a specific message was successfully transmitted to the MCS email server(s).
(3) Notification of failed delivery to the EMTU/EMTU-C must be sent to the sender of the message. The failed delivery notification must include sufficient information to identify the specific message that failed and the cause of failure (*e.g.,* invalid address, EMTU/EMTU-C switched off, *etc.*).
(4) The EMTU/EMTU-C must have an automatic retry feature in the event that a message fails to be delivered.
(5) The EMTU/EMTU-C user interface must:
(i) Support an "address book" capability and a function permitting a "reply" to a received message without re-entering the sender's address.
(ii) Provide the ability to review by date order, or by recipient, messages that were previously sent. The EMTU/EMTU-C terminal must support a minimum message history of 50 sent messages—commonly referred to as an "Outbox" or "Sent" message display.
(iii) Provide the ability to review by date order, or by sender, all messages received. The EMTU/EMTU-C terminal must support a minimum message history of at least 50 messages in an inbox.

§600.1506 Electronic forms.

Unless otherwise specified, this subsection applies to all EMTUs, EMTU-Cs, MCSs, and bundles.
(a) *Forms.* An EMTU/EMTU-C must be able to run, or to connect to and transmit data from a device that can run electronic forms software. Depending on the reporting requirements for the fishery(s) in which the requester is seeking type-approval, an EMTU-C type-approval may not require the inclusion of a dedicated message terminal and display component at the time of approval, but the capability to support such a component must be shown. The EMTU/EMTU-C must be able to support forms software that can hold a minimum of 20 electronic forms, and it must also meet any additional forms requirements in effect for each fishery or region for which the type-approval applies. The EMTU/EMTU-C must meet the following requirements:
(1) *Form Validation:* Each field on a form must be capable of being defined as Optional, Mandatory, or Logic Driven. Mandatory fields are those fields that must be entered by the user before the form is complete. Optional fields are those fields that do not require data entry. Logic-driven fields have their attributes determined by earlier form selections. Specifically, a logic-driven field must allow for selection of options in that field to change the values available as menu selections on a subsequent field within the same form.
(2) A user must be able to select forms from a menu on the EMTU/EMTU-C.
(3) A user must be able to populate a form based on the last values used and "modify" or "update" a prior submission without unnecessary re-entry of data. A user must be able to review a minimum of 20 past form submissions and ascertain for each form when the form was transmitted and whether delivery was successfully sent to the type-approval holder's VMS data processing center. In the case of a transmission failure, a user must be provided with details of the cause and have the opportunity to retry the form submission.

(4) VMS Position Report: Each form must include VMS position data, including latitude, longitude, date and time. Data to populate these fields must be automatically generated by the EMTU/EMTU-C and unable to be manually entered or altered.
(5) Delivery and Format of Forms Data: Delivery of form data to NMFS must employ the same transport security and reliability as set out in §600.1507 of this subpart. The forms data and delivery must be completely compatible with NMFS vessel monitoring software.
(b) *Updates to Forms.* (1) The EMTU/EMTU-C and MCS must be capable of providing updates to forms or adding new form requirements via wireless transmission and without manual installation.
(2) From time to time, NMFS may provide type-approved applicants with requirements for new forms or modifications to existing forms. NMFS may also provide notice of forms and form changes through the NMFS Work Order System. Type-approved applicants will be given at least 60 calendar days to complete their implementation of new or changed forms. Applicants will be capable of, and responsible for translating the requirements into their EMTU/EMTU-C-specific forms definitions and wirelessly transmitting the same to all EMTU/EMTU-C terminals supplied to fishing vessels.

§600.1507 Communications security.

Communications between an EMTU/EMTU-C and MCS must be secure from tampering or interception, including the reading of passwords and data. The EMTU/EMTU-C and MCS must have mechanisms to prevent to the extent possible:
(a) Sniffing and/or interception during transmission from the EMTU/EMTU-C to MCS.
(b) Spoofing.
(c) False position reports sent from an EMTU/EMTU-C.
(d) Modification of EMTU/EMTU-C identification.
(e) Interference with Global Maritime Distress and Safety System (GMDSS) or other safety/distress functions.
(f) Introduction of malware, spyware, keyloggers, or other software that may corrupt, disturb, or disrupt messages, transmission, and the VMS system.
(g) The EMTU/EMTU-C terminal from communicating with, influencing, or interfering with the Global Positioning System antenna or its functionality, position reports, or sending of position reports. The position reports must not be altered, corrupted, degraded, or at all affected by the operation of the terminal or any of its peripherals or installed-software.
(h) VMS data must be encrypted and sent securely through all associated cellular, satellite, and internet communication pathways and channels.

§600.1508 Field and technical services.

As a requirement of its type-approval, a type-approval holder must communicate with NMFS to resolve technical issues with a VMS Unit, MCS or bundle and ensure that field and technical services includes:
(a) Diagnostic and troubleshooting support to NMFS and fishers, which is available 24 hours a day, seven days per week, and year-round.
(b) Response times for customer service inquiries that shall not exceed 24 hours.
(c) Warranty and maintenance agreements.
(d) Escalation procedures for resolution of problems.
(e) Established facilities and procedures to assist fishers in maintaining and repairing their EMTU, EMTU-C, or MTU.
(f) Assistance to fishers in the diagnosis of the cause of communications anomalies.

(g) Assistance in resolving communications anomalies that are traced to the EMTU, EMTU-C, or MTU.
(h) Assistance to NMFS Office of Law Enforcement and its contractors, upon request, in VMS system operation, resolving technical issues, and data analyses related to the VMS Program or system.

§600.1509 General.

(a) An EMTU/EMTU-C must have the durability and reliability necessary to meet all requirements of §§600.1502 through 600.1507 regardless of weather conditions, including when placed in a marine environment where the unit may be subjected to saltwater (spray) in smaller vessels, and in larger vessels where the unit may be maintained in a wheelhouse. The unit, cabling and antenna must be resistant to salt, moisture, and shock associated with sea-going vessels in the marine environment.
(b) PII and Other Protected Information. Personally identifying information (PII) and other protected information includes Magnuson-Stevens Act confidential information as provided at 16 U.S.C. 1881a and Business Identifiable Information (BII), as defined in the Department of Commerce Information Technology Privacy Policy. A type-approval holder is responsible for ensuring that:
(1) All PII and other protected information is handled in accordance with applicable state and Federal law.
(2) All PII and other protected information provided to the type-approval holder by vessel owners or other authorized personnel for the purchase or activation of an EMTU/EMTU-C or arising from participation in any Federal fishery are protected from disclosure not authorized by NMFS or the vessel owner or other authorized personnel.
(3) Any release of PII or other protected information beyond authorized entities must be requested and approved in writing, as appropriate, by the submitter of the data in accordance with 16 U.S.C. 1881a, or by NMFS.
(4) Any PII or other protected information sent electronically by the type-approval holder to the NMFS Office of Law Enforcement must be transmitted by a secure means that prevents interception, spoofing, or viewing by unauthorized individuals.

§600.1510 Notification of type-approval.

(a) If a request made pursuant to §600.1501 (type-approval) is approved or partially approved, NMFS will issue a type-approval letter to indicate the specific EMTU/EMTU-C model, MCSP, or bundle that is approved for use, the MCS or class of MCSs permitted for use with the type-approved EMTU, and the regions or fisheries in which the EMTU/EMTU-C, MCSP, or bundle is approved for use.
(b) The NMFS Office of Law Enforcement will maintain a list of type-approved EMTUs/EMTU-C, MCSPs, and bundles on a publicly available website and provide copies of the list upon request.

§600.1511 Changes or modifications to type-approvals.

Type-approval holders must notify NMFS Office of Law Enforcement (OLE) in writing no later than 2 days following modification to or replacement of any functional component or piece of their type-approved EMTU, EMTU-C, or MTU configuration, MCS, or bundle. If the changes are substantial, NMFS OLE will notify the type-approval holder in writing within 60 calendar days that an amended type-approval is required or that NMFS will initiate the type-approval revocation process.

§600.1512 Type-approval revocation process.

(a) If at any time, a type-approved EMTU/EMTU-C, MCS, or bundle fails to meet requirements at §§600.1502 through 600.1509 or applicable VMS regulations and requirements in effect for the region(s) and Federal fisheries for which the EMTU/EMTU-C or MCS is type-approved, or if an MTU fails to meet the requirements under which it was type-approved, OLE may issue a Notification Letter to the type-approval holder that:
(1) Identifies the MTU, EMTU, EMTU-C, MCS, or bundle that allegedly fails to comply with type-approval regulations and requirements;
(2) Identifies the alleged failure to comply with type-approval regulations and requirements, and the urgency and impact of the alleged failure;
(3) Cites relevant regulations and requirements under this subpart;
(4) Describes the indications and evidence of the alleged failure;
(5) Provides documentation and data demonstrating the alleged failure;
(6) Sets a response date by which the type-approval holder must submit to NMFS OLE a written response to the Notification Letter, including, if applicable, a proposed solution; and
(7) Explains the type-approval holder's options if the type-approval holder believes the Notification Letter is in error.
(b) NMFS will establish a response date between 30 and 120 calendar days from the date of the Notification Letter. The type-approval holder's response must be received in writing by NMFS on or before the response date. If the type-approval holder fails to respond by the response date, the type-approval will be revoked. At its discretion and for good cause, NMFS may extend the response date to a maximum of 150 calendar days from the date of the Notification Letter.
(c) A type-approval holder who has submitted a timely response may meet with NMFS within 21 calendar days of the date of that response to discuss a detailed and agreed-upon procedure for resolving the alleged failure. The meeting may be in person, conference call, or webcast.
(d) If the type-approval holder disagrees with the Notification Letter and believes that there is no failure to comply with the type-approval regulations and requirements, NMFS has incorrectly defined or described the failure or its urgency and impact, or NMFS is otherwise in error, the type-approval holder may submit a written objection letter to NMFS on or before the response date. Within 21 calendar days of the date of the objection letter, the type-approval holder may meet with NMFS to discuss a resolution or redefinition of the issue. The meeting may be in person, conference call, or webcast. If modifications to any part of the Notification Letter are required, then NMFS will issue a revised Notification Letter to the type-approval holder. However, the response date or any other timeline in this process would not restart or be modified unless NMFS decides to do so, at its discretion.
(e) The total process from the date of the Notification Letter to the date of final resolution should not exceed 180 calendar days, and may require a shorter timeframe, to be determined by NMFS, depending on the urgency and impact of the alleged failure. In rare circumstances, NMFS, at its discretion, may extend the time for resolution of the alleged failure. In such a case, NMFS will provide a written notice to the type-approval holder informing him or her of the extension and the basis for the extension.
(f) If the failure to comply with type-approval regulations and requirements cannot be resolved through this process, the NMFS OLE Director will issue a Revocation Letter to the type-approval holder that:
(1) Identifies the MTU, EMTU, EMTU-C, MCS, or bundle for which type-approval is being revoked;

(2) Summarizes the failure to comply with type-approval regulations and requirements, including describing its urgency and impact;
(3) Summarizes any proposed plan, or attempts to produce such a plan, to resolve the failure;
(4) States that revocation of the MTU, EMTU, EMTU-C, MCS, or bundle's type-approval has occurred;
(5) States that no new installations of the revoked unit will be permitted in any NMFS-managed fishery requiring the use of VMS;
(6) Cites relevant regulations and requirements under this subpart;
(7) Explains why resolution was not achieved;
(8) Advises the type-approval holder that:
(i) The type-approval holder may reapply for a type-approval under the process set forth in §600.1501, and
(ii) A revocation may be appealed pursuant to the process under §600.1513.

§600.1513 Type-approval revocation appeals process.

(a) If a type-approval holder receives a Revocation Letter pursuant to §600.1512, the type-approval holder may file an appeal of the revocation to the NMFS Assistant Administrator.
(b) An appeal must be filed within 14 calendar days of the date of the Revocation Letter. A type-approval holder may not request an extension of time to file an appeal.
(c) An appeal must include a complete copy of the Revocation Letter and its attachments and a written statement detailing any facts or circumstances explaining and refuting the failures summarized in the Revocation Letter.
(d) The NMFS Assistant Administrator may, at his or her discretion, affirm, vacate, or modify the Revocation Letter and send a letter to the type-approval holder explaining his or her determination, within 21 calendar days of receipt of the appeal. The NMFS Assistant Administrator's determination constitutes the final agency decision.

§600.1514 Revocation effective date and notification to vessel owners.

(a) Following issuance of a Revocation Letter pursuant to §600.1512 and any appeal pursuant to §600.1513, NMFS will provide notice to all vessel owners impacted by the type-approval revocation via letter and Federal Register notice. NMFS will provide information to impacted vessel owners on:
(1) The next steps vessel owners should take to remain in compliance with regional and/or national VMS requirements;
(2) The date, 60-90 calendar days from the notice date, on which the type-approval revocation will become effective;
(3) Reimbursement of the cost of a new type-approved EMTU/EMTU-C, should funding for reimbursement be available pursuant to §600.1516.

§600.1515 Litigation support.

(a) All technical aspects of a type-approved EMTU, EMTU-C, MTU, MCS, or bundle are subject to being admitted as evidence in a court of law, if needed. The reliability of all technologies utilized in the EMTU, EMTU-C, MTU, MCS, or bundle may be analyzed in court for, inter alia, testing procedures, error rates, peer review, technical processes and general industry acceptance.
(b) The type-approval holder must, as a requirement of the holder's type-approval, provide technical and expert support for litigation to substantiate the EMTU/EMTU-C, MCS, or bundle capabilities to establish NMFS Office of Law Enforcement cases against violators, as needed. If the technologies have previously been subject to such scrutiny in a court of law, the type-

approval holder must provide NMFS with a brief summary of the litigation and any court findings on the reliability of the technology.
(c) The type-approval holder will be required to sign a non-disclosure agreement limiting the release of certain information that might compromise the effectiveness of the VMS operations.

§600.1516 Reimbursement opportunities for revoked Vessel Monitoring System type-approval products.

(a) Subject to the availability of funds, vessel owners may be eligible for reimbursement payments for a replacement EMTU/EMTU-C if:
(1) All eligibility and process requirements specified by NMFS are met as described in NMFS Policy Directive 06-102; and
(2) The replacement type-approved EMTU/EMTU-C is installed on the vessel, and reporting to NMFS Office of Law Enforcement; and
(3) The type-approval for the previously installed EMTU/EMTU-C has been revoked by NMFS; or
(4) NMFS requires the vessel owner to purchase a new EMTU/EMTU-C prior to the end of an existing unit's service life.
(b) The cap for individual reimbursement payments is subject to change. If this occurs, NMFS Office of Law Enforcement will publish a notice in the Federal Register announcing the change.

APPENDIX C. APPROVED CVMS UNITS FOR THE EARLY ADOPTER PROGRAM FOR THE FEDERAL GULF OF MEXICO SHRIMP FISHERY

The following information was provided by LGL Ecological Research Associates on September 23, 2024.

VMS Vendor	Unit Name	Data Transmission
Remote Data Sensing	ZenVMS	Cellular
Viatrax	Boat Command	Cellular
Woods Hole Group	NEMO	Cellular

The requirements for vendors in the Early Adopter Program were to provide devices that:

A. Record latitude and longitude at 10-minute intervals when vessel is powered
B. Store ~60 days of latitude/longitude data (at 10-minute intervals) while out of cell service range
C. Automatically transmit positional data to the Application Programming Interface (API) of NOAA Fisheries when in cell service range (not necessarily at 10-minute intervals, bulk uploads at an hour or longer latency could have been allowed)
D. Are configured so that Vessel ID and Permit Number are transmitted along with position data to the NOAA Fisheries API
E. Provide 2-years of transmission service for each vessel that volunteers to the program

APPENDIX D. DRAFT TECHNICAL SPECIFICATIONS FOR HISTORICAL CELB PROGRAM

To monitor shrimping effort in the Gulf of Mexico (Gulf) hardware/software is needed to record date, time, latitude and longitude from a GPS installed upon the vessel at 10-minute intervals, throughout the duration of each shrimping trip in the Gulf. The data should be locally stored until it can be remotely uploaded when in range of a non-roaming cellular mobile communications service to a National Marine Fisheries Service (NMFS) server. The data recorded and transmitted should be compatible with existing inputs to NMFS effort analysis algorithms for the cELB program. Any system that meets the technical specifications must first be field tested aboard an offshore shrimp vessel to ensure reliability prior to its type-approval and implementation in the shrimping fleet.

To accomplish this the following specifications are needed:

Definitions and Acronyms

This section will be completed after finalization of technical specifications.

Vessel Monitoring System Type Approval Process

Applicability. This section applies to hardware/software devices, cellular mobile communications services, and bundles installed upon vessels with a federal Gulf shrimp permit which collect time stamped vessel position fix data at 10-minute intervals when shrimping in the Gulf, and then automatically transmits recorded data to NMFS when in range of a non-roaming cellular mobile communications service for the purpose of NMFS Southeast Fishery Science Center (SEFSC) shrimp effort analysis (reference CFR number here). At no time, shall this data be transmitted automatically to the National Oceanic and Atmospheric Administration (NOAA) Office of Law Enforcement (OLE). This includes direct automatic transmission to NOAA OLE as well as secondary automatic transmission to NOAA OLE (i.e., transmission to an intermediary which is then subsequently automatically transmitted to NOAA OLE).

Application submission: A requestor must submit a written type-approval request and electronic copies of supporting materials that include the information required under this section to NMFS Southeast Regional Office at: (insert appropriate mailing address and attention line here).

Application requirements:

- Hardware/software identifying information: In a type-approval request, the requestor should indicate whether the requestor is seeking approval for a hardware/software device, cellular mobile communications service, or bundle and must specify identifying characteristics as applicable: communication class; manufacturer; brand name; model name; model number; software version and date; firmware version number and date;

hardware version number and date; antenna type; antenna model number and date; tablet, monitor or terminal number and date; cellular mobile communications service to be used in conjunction with hardware/software; entity providing cellular mobile communications service to the end user; and current global and regional coverage of the cellular mobile communications service.

- Requestor-approved third-party business entities: The requestor must provide the business name, address, phone number, contact name(s), email address, specific services provided, and geographic region covered for the following third-party business entities:
    - Entities providing bench configuration for the hardware/software at the warehouse or point of supply.
    - Entities distributing/selling the hardware/software to end users.
    - Entities currently approved by the requestor to install the hardware/software onboard vessels.
    - Entities currently approved by the requestor to offer a limited warranty.
    - Entities approved by the requestor to offer a maintenance service agreement.
    - Entities approved by the requestor to repair or install new software.
    - Entities approved by the requestor to train end users.
    - Entities approved by the requestor to advertise the hardware/software.
    - Entities approved by the requestor to provide other customer services.
- Regulatory Requirements and Documentation: In a type-approval request, a requestor must:
    - Identify the NMFS region(s) and/or federal fisheries for which the requestor seeks type approval.
    - Provide a table with the type-approval request that lists in one column each requirement set out in the regulations. NFMS will provide a template for the table upon request. The requestor must indicate in subsequent columns in the table whether the hardware/software device, cellular mobile communications service, or bundle meets the requirement.
- Certify that the features, components, configurations and services of the requestor's hardware/software device, cellular mobile communications service, or bundle comply with each requirement set out in ____ through ___ and the regulations described under paragraph ____ of this section.
- Certify that, if the request is approved, the requestor agrees to be responsible for ensuring compliance with each requirement set out in ___ through ____ and the regulations described under paragraph ___ of this section over the course of the type-approval period.
- Provide NMFS with two devices loaded with appropriate software/hardware, with activated cellular mobile communications service, for which a type-approval request is submitted for a minimum of 90 calendar days for testing and evaluation. As part of its review, NMFS will perform at-sea trials aboard an offshore commercial shrimp vessel (i.e., in federal waters of the Gulf of Mexico) that involve demonstrating functionality of every aspect of the hardware/software device, cellular mobile communications service, or bundle operation. At-sea testing aboard an offshore shrimp vessel includes, but is not limited to: ensuring the installed hardware/software device's GPS signal and connection is sufficient to attain and record at least 95% of the required 10 minute interval position fix data in a 24-hour period for each 24-hour day of at-sea testing, with a minimum of 7

days spent at-sea for these trials; comparing vessel speed and activity (trawling, transit, etc.) as recorded by human observer aboard the offshore shrimp vessel against speed and activity generated by NMFS shrimp effort algorithm programs using data from the hardware/software device, cellular mobile communications service or bundle seeking type-approval; and mounting of the hardware/software device in a location where similar/traditional marine electronics are mounted aboard working trawlers to troubleshoot any issues associated with potential mounting locations and/or wiring and battery capabilities. The requestor is responsible for all associated costs including paying for: shipping of the hardware/software device to the required NMFS office for testing; the cellular mobile communications service during the testing period; and shipping of the hardware/software device back to the vendor.

- Provide thorough documentation for the hardware/software device, cellular mobile communications service or bundle, including: hardware/software fact sheets; installation guides; user manuals; any necessary interfacing software; cellular mobile communications service global and regional coverage; performance specifications; and technical support information.

Certification. A requestor seeking type-approval of a hardware/software device to operate with a class or type of cellular communications, as opposed to type-approval for use with a specific cellular mobile communications service, shall certify that the hardware/software meets requirements under this subpart when using at least one cellular mobile communications service provider within that class or type of communications.

Notification. Unless additional time is required for hardware/software testing, NMFS will notify the requestor within 90 days after receipt of a complete type-approval request as follows:

- If a request is approved or partially approved, NMFS will provide notice as described under ____ (section number) and the type-approval letter will serve as official documentation and notice of type-approval. NMFS will publish and maintain the list of type-approved units on their web page.
- If a request is disapproved or partially disapproved:
    - NMFS will send a letter to the requestor that explains the reason for the disapproval/partial disapproval.
    - The requestor may respond to NMFS in writing with additional information to address the reasons for disapproval identified in the NMFS letter. The requestor must submit this response within 21 calendar days of the date of the NMFS letter sent under paragraph ___ of this section.
    - If any additional information is submitted under paragraph ___ of this section, NMFS, after reviewing such information, may either take action under paragraph ___ of this section or determine that the request should continue to be disapproved or partially disapproved. In the latter case, NMFS will send a letter to the requestor that explains the reasons for the continued disapproval/partial disapproval. NMFS's decision is final upon issuance of this letter and is not appealable.

Communications functionality

- The hardware/software device, cellular mobile communications service, or bundle must:
    - Be able to transmit automatically generated, 10-minute interval, time-stamped vessel position fix data from hardware/software when within range of a non-roaming cellular mobile communications service network/signal.
    - Have one-way communications, with transmission from the vessel to NMFS, that function uniformly throughout the geographic area covered by the type-approval when in range of a non-roaming cellular mobile communications network signal.
    - Have data and communications mechanisms that are compatible with NMFS SEFSC shrimp cELB effort analysis programs.

Position fix data formats and transmission

The hardware/software device must meet the following requirements:

- Store and then transmit all automatically-generated time-stamped vessel position fixes such that it meets the latency requirements under ____ (insert number here).
- When powered up, must automatically re-establish recording time-stamped position fixes at 10-minute intervals without manual intervention.
- Time-stamped position fix data is automatically transmitted to NMFS when within range of a non-roaming cellular mobile communications service network. At no time, are these data to be transmitted automatically to NOAA Office of Law Enforcement. This includes direct automatic transmission to NOAA OLE as well as secondary automatic transmission to NOAA OLE (i.e., transmission to an intermediary which is then subsequently automatically transmitted to NOAA OLE).
- If time-stamped position fix data fails to transmit, an automatic retry feature is enabled.
- Time-stamped position fixes are recorded every 10 minutes (600 seconds), 144 times a day, and must contain all of the following:
    - Unique identification of the hardware/software device.
    - Date (year/month/day) and time stamp (GMT) of the position fix.
    - Position fixed latitude and longitude, which comply with the following requirements:
        - The position fix precision must be to the decimal minute hundredths.
        - Accuracy of the reported position must be within 100 meters (328.1 ft).
        - Hardware/software device must have the ability to:
            - Store at least 14,400 position fixes in local, non-volatile memory.
            - Allow for interval of 10 minutes between position fixes. Have the ability to be pre-programmed for 10-minute intervals by the type-approval holder prior to sale to fishers.
    - Time-stamped position fix data and transmission must be in a format compatible with NMFS SEFSC shrimp cELB effort analysis programs.

Latency requirement

- Ninety percent of all pre-programmed time-stamped position fixes during each 24-hour period must reach NMFS within 15 minutes or less of being sent from the hardware/software device.
- NMFS will continually examine latency by type-approval holder.
- Exact dates for calculation of latency will be chosen by NMFS. Days in which isolated and documented system outages occur will not be used by NMFS to calculate a type-approval holder's latency.

Communications Security

To the extent possible, communications between a hardware/software device and the cellular mobile communications service should have mechanisms to prevent:

- Sniffing and/or interception during transmission from the hardware/software device to the cellular mobile communications service.
- Spoofing.
- False time-stamped position fix data sent from the hardware/software device.
- Modification of the hardware/software identification.
- Interference with Global Maritime Distress and Safety System (GMDSS) or other safety/distress functions.
- Introduction of malware, spyware, keyloggers, or other software that may corrupt, disturb, or disrupt transmission, and the hardware/software device.
- Position fix data should be encrypted and sent securely through associated cellular mobile communications service pathway or channel.

Field and technical services

As a requirement of type-approval, a type-approval holder must communicate with NMFS to resolve technical issues with a hardware/software device or cellular mobile communication service and ensure that field and technical services include:

- Diagnostic and troubleshooting support to NMFS and fishers.
- Established facilities and procedures to assist fishers in maintaining and repairing the hardware/software device.
- Assist fishers in the diagnosis of the cause of communications anomalies.
- Assistance in resolving communications anomalies that are traced to the hardware/software device.
- Assistance to NMFS and its contractors, upon request, in device operation, resolving technical issues, and data analysis related to the device.
- Warranty and maintenance agreements as applicable.

General

- Hardware/software device must have the durability and reliability necessary to meet all requirements regardless of weather conditions. The cabling, antenna and any portion of

the device intended to be installed outdoors must be resistant to salt, moisture and shock associated with sea-going vessels in the marine environment and have reliable functionality aboard vessels which can remain offshore for up to 60 days at a time and vessels constructed of steel, wood, fiberglass or other material, especially if a portion of the device is intended to be installed inside of a steel cabin/wheelhouse.

- PII and Other Protected Information. Personally identifying information (PII) and other protected information includes Magnuson-Stevens Act confidential information as provided at 6 U.S.C. 1881a and Business Identifiable Information (BII), as defined in the Department of Commerce Information Technology Privacy Policy. A type-approval holder is responsible for ensuring that:
    - All PII and other protected information is handled in accordance with applicable state and Federal law.
    - All PII and other protected information provided to the type-approval holder by vessel owners or other authorized personnel for the purchase or activation of a hardware/software device or arising from participation in any Federal fishery are protected from disclosure not authorized by NMFS or the vessel owner or other authorized personnel.
    - Any release of PII or other protected information beyond authorized entities must be requested and approved in writing, as appropriate, by the submitter of the data in accordance with 16 U.S.C. 1881a, or by NMFS.
    - Any PII or other protected information sent electronically by the type-approval holder to NMFS must be transmitted by secure means that prevents interception, spoofing, or viewing by unauthorized individuals to the extent possible.

Notification of type-approval

- If a request made pursuant to ____ (insert number) is approved or partially approved, NMFS will issue a type-approval letter to indicate the specific hardware/software device(s), cellular mobile communications service provider, or bundle that is approved for use, the cellular mobile communications or class of cellular mobile communications permitted for use with the type-approved device(s), and the regions or fisheries in which the hardware/software device(s), cellular mobile communications provider, or bundle is approved for use.
- NMFS will maintain a list of the type-approved devices, cellular mobile communications service providers, and bundles on a publicly available website and provide copies of the list upon request.

Changes or modifications to type-approvals

Type-approval holders must notify NMFS in writing no later than 7 days following modification to or replacement of any functional component or piece of their type-approved hardware/software device, cellular mobile communications service, or bundle. If the changes are substantial, NMFS will notify the type-approval holder in writing within 60 calendar days that an amended type-approval is required or that NMFS will initiate the type-approval revocation process.

Type-approval revocation process

- If at any time, a type-approved hardware/software device, cellular mobile communications service, or bundle fails to meet requirements at ____ (insert number) through ____ (insert number) and requirements in effect for the region(s) and Federal fisheries for which the device or cellular mobile communications service is type-approved, or if a device fails to meet the requirements under which it was type-approved, NMFS may issue a Notification Letter to the type-approval holder that:
    - Identifies the hardware/software device, cellular mobile communications service, or bundle that allegedly fails to comply with type-approval regulations and requirements;
    - Identifies the alleged failure to comply with type-approval regulations and requirements, and the urgency and impact of the alleged failure;
    - Cites relevant regulations and requirements under this subpart;
    - Describes the indications and evidence of the alleged failure;
    - Provides documentation and data demonstrating the alleged failure;
    - Sets a response date by which the type-approval holder must submit to NMFS a written response to the Notification Letter, including, if applicable, a proposed solution; and
    - Explains the type-approval holder's options if the type-approval holder believes the Notification Letter is in error.
- NMFS will establish a response date between 30 and 120 calendar days from the date of the Notification Letter. The type-approval holder's response must be received in writing by NMFS on or before the response date. If the type-approval holder fails to respond by the response date, the type-approval will be revoked. At its discretion and for good cause, NMFS may extend the response date to a maximum of 150 calendar days from the date of the Notification Letter.
- A type-approval holder who has submitted a timely response may meet with NMFS within 21 calendar days of the date of that response to discuss a detailed and agreed-upon procedure for resolving the alleged failure. The meeting may be in person, conference call, or webcast.
- If the type-approval holder disagrees with the Notification Letter and believes that there is no failure to comply with the type-approval regulations and requirements, NMFS has incorrectly defined or described the failure or its urgency and impact, or NMFS is otherwise in error, the type-approval holder may submit a written objection letter to NMFS on or before the response date. Within 21 calendar days of the date of the objection letter, the type-approval holder may meet with NMFS to discuss a resolution or redefinition of the issue. The meeting may be in person, conference call, or webcast. If modifications to any part of the Notification Letter are required, then NMFS will issue a revised Notification Letter to the type-approval holder. However, the response date or any other timeline in this process would not restart or be modified unless NMFS decides to do so, at its discretion.
- The total process from the date of the Notification Letter to the date of final resolution should not exceed 180 calendar days, and may require a shorter timeframe, to be determined by NMFS, depending on the urgency and impact of the alleged failure. In

rare circumstances, NMFS, at its discretion, may extend the time for resolution of the alleged failure. In such a case, NMFS will provide a written notice to the type-approval holder informing him or her of the extension and the basis for the extension.

- If the failure to comply with type-approval regulations and requirements cannot be resolved through this process, NMFS will issue a Revocation Letter to the type-approval holder that:
    - Identifies the hardware/software device, cellular mobile communications service, or bundle for which type-approval is being revoked;
    - Summarizes the failure to comply with type-approval regulations and requirements, including describing its urgency and impact;
    - Summarizes any proposed plan, or attempts to produce such a plan, to resolve the failure;
    - States that revocation of the hardware/software device, cellular mobile communications service, or bundle's type-approval has occurred;
    - States that no new installations of the revoked unit will be permitted in any NMFS managed fishery requiring the use of this type of device;
    - Cites relevant regulations and requirements under this subpart;
    - Explains why resolution was not achieved;
    - Advises the type-approval holder that:
        - The type-approval holder may reapply for a type-approval under the process set forth in ____ (insert number here), and
        - A revocation may be appealed pursuant to the process under ____ (insert number here)

Type-Approval revocation appeals process

- If a type-approval holder received a Revocation Letter pursuant to ___ (insert number), the type-approval holder may file an appeal of the revocation to the NMFS.
- An appeal must be filed within 14 calendar days of the date of the Revocation Letter. A type-approval holder may not request an extension of time to file an appeal.
- An appeal must include a complete copy of the Revocation Letter and its attachments and a written statement detailing any facts or circumstances explaining and refuting the failures summarized in the Revocation Letter.
- The NMFS may, at its discretion, affirm, vacate, or modify the Revocation Letter and send a letter to the type-approval holder explaining his or her determination, within 21 calendar days of receipt of the appeal. The NMFS's determination constitutes the final agency decision.

Revocation effective date and notification to vessel owners

- Following issuance of a Revocation Letter pursuant to ____ (insert number) and any appeal pursuant to ____ (insert number), NMFS will provide notice to all vessel owners impacted by the type-approval revocation via letter and Federal Register Notice. NMFS will provide information to impacted vessel owners on:

- The next steps vessel owners should take to remain in compliance with regional and/or national requirements;
- The date, 60-90 calendar days from the notice date, on which the type-approval revocation will become effective.

APPENDIX E. COMPARISON TABLE OF CELB AND OLE VMS TECHNICAL SPECIFICATIONS

Element within Type-Approval Specifications	Draft Type-Approval Specifications for Reinstituting Historical cELB Program for Shrimp Fishery	Type-Approval Specifications for Instituting NOAA OLE VMS Requirement for Shrimp Fishery
Vessel Monitoring System Type-Approval Process	This section of cELB draft specifications and the NOAA OLE VMS specifications are largely the same, with the following exceptions: • Any reference to EMTU, EMTU-C, VMS, or MTU in the VMS specifications is replaced with "hardware/software device" in the cELB specifications. • Any reference to NMFS Office of Law Enforcement in the VMS specifications is replaced with "NMFS" in the cELB specifications; NOAA OLE is specifically excluded for transmission purposes in the cELB specifications. • Applicability subsection of cELB specifications is amended to reflect devices on federally permitted shrimp vessels utilized to collect position data when shrimping for use in NMFS shrimp effort algorithms. • In the cELB specifications, at-sea testing was made a requirement rather it being optional, as it is in the VMS specifications, and several specific testing protocols were detailed to ensure they are addressed.	
Communications Functionality	Must be able to: Transmit automatically generated 10-minute interval time-stamped position fix data from a hardware/software device installed upon the vessel when in range of non-roaming cellular communications service. Have one-way communication from the vessel to NMFS. Have communication and data mechanisms that are compatible with NMFS SEFSC cELB effort analysis programs.	Must be able to: Transmit automatically generated position reports, have visible/audible alarms, have two-way communications between unit and authorized entities, run/connect to dedicated message terminal and display component capable of running software that sends and receives electronic forms and internet email messages, messaging and communications that are completely compatible with NOAA vessel monitoring surveillance software, enable billing to be parsed out to show costs for government and owner of vessel.
Position Report/Fix Data Formats & Transmission	Upon installation of the hardware/software device, position fix must be automatically recorded at 10-minute intervals to	Must transmit all automatically generated position reports & automatically re-establish position reporting function when powered.

Element within Type-Approval Specifications	Draft Type-Approval Specifications for Reinstituting Historical cELB Program for Shrimp Fishery	Type-Approval Specifications for Instituting NOAA OLE VMS Requirement for Shrimp Fishery
	a file on the device's local hard drive anytime the device is powered on. Accuracy of the reported position must be within 100 meters (328.1 ft). Must store minimum of 14,400 position fixes on local hard drive. When hardware/software device is powered up, it must automatically re-establish recording required data. Transmitted position fix data must include date, time, latitude, longitude and a unique identifying number for the device. Data transmitted automatically to NMFS (excludes NOAA OLE) when within range of a non-roaming cellular mobile communications network. If program fails to transmit data, an automatic retry feature is enabled. Time-stamped position fix data must be in a format compatible with NMFS cELB effort analysis programs.	Position reports must contain unique identification of the device, position fixed latitude and longitude with date and time stamp, position accurate to within 100 meters (328.1 ft). Must store 1,000 position fixes in local non-volatile memory. Must allow for authorized user to remotely change reporting/ping interval from the standard pre-programmed interval for the fishery. In addition to the automatically generated position reports, additional position reports must be generated when: antenna is disconnected, loss of position reference signal, power-up, power-down, loss of mobile communications signals, vessel crossing a pre-defined geographic boundary
Latency Requirement	"Position reports" (in the VMS specifications) are referred to as "time stamped position fixes" in the cELB specifications. Otherwise, these two sections are the same in both specifications.	
Messaging	Not applicable. Not required to reinstate the historical cELB program.	Must be able to run or connect to software/applications that can send email messages, must support message length of 1 KB, must have confirmation of delivery function for email messages, must be failed delivery notification for email messages, must support an "address book" and a "reply" function, must be able to review messages previously sent/received, must have minimum email message

Element within Type-Approval Specifications	Draft Type-Approval Specifications for Reinstituting Historical cELB Program for Shrimp Fishery	Type-Approval Specifications for Instituting NOAA OLE VMS Requirement for Shrimp Fishery
		history of at least 50 messages to an inbox
Electronic Forms	Not applicable. Not required to reinstate the historical cELB program.	Must be able to run and transmit electronic forms, support forms software that holds a minimum of 20 electronic forms, fields must be capable of being defined as Optional/Mandatory/Logic Driven, be able to select forms from menu, be able to populate forms based on prior submission, be able to review minimum of 20 past form submissions, reporting of forms transmission failure/success, forms data compatible with NFMS vessel monitoring software, position reports unable to be manually entered or altered, capable of providing updates to forms or adding new forms
Communications Security	Must have mechanisms to prevent to the extent possible: sniffing or interception during transmission, spoofing, false position reports, modification of hardware/software identification, or introduction of malware/spyware/etc., data shall be encrypted and sent securely. Acceptable for hardware/software device to interface with GPS antenna.	Must have mechanisms to prevent to extent possible: sniffing or interception during transmission, spoofing, false position reports, modification of identification, interference with safety functions, introduction of malware/spyware/etc., terminal from interfering with GPS antenna. Data must be encrypted and sent securely through all associated cellular, satellite and internet communication pathways and channels.
Field & Technical Services	Hardware/software developers must have established facilities and procedures to assist fishers in maintaining and repairing the device/program, provide assistance to fishers in the diagnosis of the cause of communications anomalies, and provide assistance to NMFS to	Must ensure field and technical services include: diagnostic and troubleshooting support to NMFS and fishers 24/7 and 365 days a year, response time for customer service inquiry no more than 24 hours, warranty and maintenance agreements, escalation procedures for problem resolution, established

Element within Type-Approval Specifications	Draft Type-Approval Specifications for Reinstituting Historical cELB Program for Shrimp Fishery	Type-Approval Specifications for Instituting NOAA OLE VMS Requirement for Shrimp Fishery
	resolve technical issues with the transmission or format of data, warranty and maintenance agreements.	facilities & procedures to assist fishers in maintaining and repairing equipment, assistance for diagnosis/resolution of communications anomalies, assistance to OLE
General	Device must have the durability and reliability necessary to meet all requirements regardless of weather conditions. The cabling, antenna and any portion of the device intended to be installed outdoors must be resistant to salt, moisture and shock associated with sea-going vessels in the marine environment and have functionality aboard vessels remaining offshore for up to 60 days and constructed of steel, wood, fiberglass, or other material. Remainder of this section of cELB draft specifications is largely the same as section 600.1509 of the NOAA OLE VMS specifications, with the following exceptions: • any reference to EMTU, EMTU-C, VMS, or MTU in the VMS specifications is replaced with "hardware/software" in the cELB specifications • any reference to NMFS Office of Law Enforcement in the VMS specifications is replaced with NMFS in the cELB specifications	EMTU/EMTU-C must have the durability and reliability necessary to meet all requirements regardless of weather conditions, including in a marine environment where the unit may be subject to saltwater (spray) in smaller vessels, and in larger vessels where the unit may be maintained in a wheelhouse. The unit, cabling and antenna must be resistant to salt, moisture, and shock associated with sea-going vessels in the marine environment. Remainder of this section of the NOAA OLE VMS specifications is largely the same as the cELB draft specifications, with the following exceptions: • any reference to EMTU, EMTU-C, VMS, or MTU in the VMS specifications is replaced with "hardware/software" in the cELB specifications • any reference to NMFS Office of Law Enforcement in the VMS specifications is replaced with NMFS in the cELB specifications

Element within Type-Approval Specifications	Draft Type-Approval Specifications for Reinstituting Historical cELB Program for Shrimp Fishery	Type-Approval Specifications for Instituting NOAA OLE VMS Requirement for Shrimp Fishery
5 Sections: • **Notification of Type-Approval** • **Changes or Modifications to Type-Approvals** • **Type-Approval Revocation Process** • **Type-Approval Revocation Appeals Process** • **Revocation Effective Date and Notification to Vessel Owners**	These sections of cELB draft specifications and the NOAA OLE VMS specifications are largely the same, with the following exceptions: • Any reference to EMTU, EMTU-C, VMS, or MTU in the VMS specifications is replaced with "hardware/software" in the cELB specifications. • Any reference to NMFS Office of Law Enforcement in the VMS specifications is replaced with "NMFS" in the cELB specifications.	
Litigation Support	Not applicable. Not Included in cELB specifications as cELB is a scientific data collection program and not a program designed for law enforcement purposes intended to be routinely utilized in a court of law.	All technical aspects of device subject to being admitted as evidence in court. Type approval holder must provide technical and expert support for litigation to establish NMFS OLE cases against violators. Type approval holder required to sign non-disclosure agreement limiting release of information that might compromise effectiveness of VMS operations.
Reimbursement Opportunities for Revoked Vessel Monitoring System Type-Approval Products	Not applicable. cELB's do not have a designated reimbursement fund, therefore this section does not apply.	When an EMTU/EMTU-C approval has been revoked by NMFS, vessel owners may be eligible for reimbursement.
Definitions	Not currently included in cELB draft specifications, but would be added upon finalization.	Definitions of terms included in NOAA OLE VMS specifications.

APPENDIX F. VMS DEVICE PRICING AND TRANSMISSION COSTS

Compiled by Alan Lowther, NOAA Fisheries Southeast Fisheries Science Center

Cellular devices (based on prices from the LGL/GSMFC/SEFSC Early Adopter Program with 10-minute ping intervals)

Device	Device charge	Transmission charge	Note
Zen VMS	$545	$99 per year	Price reduced due to new vendor (was $1095)
NEMO VMS	$574	$175 per year	
Boat Command VMS	$199	$179 per year	

Satellite devices (based on an informal survey)

Device	Device charge	Transmission charge	Note
MetOcean	$1750 (was $1850)	$120 per month (was $100)	Small differences from December 2025 Shrimp AP presentation
SkyMate ALON	$1000-$1500	$30-$80/month	Solar powered unit. Speculated costs

Note all prices are subject to change.