



NOAA TECHNICAL MEMORANDUM NMFS-SEFSC-736

# ECONOMICS OF THE U.S. SOUTH ATLANTIC AND GULF OF MEXICO KING MACKEREL AND SPANISH MACKEREL FISHERIES - 2016

BY

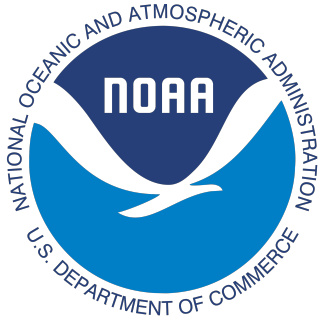
ELIZABETH OVERSTREET, LARRY PERRUSO, AND CHRISTOPHER LIESE



U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Southeast Fisheries Science Center  
Miami, Florida 33149

April 2019





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April 2019

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This report should be cited as follows:

Overstreet, E., L. Perruso, and C. Liese. 2019. Economics of the U.S. South Atlantic and Gulf Of Mexico King Mackerel and Spanish Mackerel Fisheries - 2016. NOAA Technical Memorandum NMFS-SEFSC-736. 67 p.

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## Introduction

This technical memorandum provides summary information and estimated economic information for the commercial sector of the federally-managed coastal migratory pelagic (CMP) fisheries in both the Gulf of Mexico (GOM) and the U.S. South Atlantic (SAT) in calendar year 2016, including a comparison to earlier years. King mackerel, Spanish mackerel, and cobia are the species managed in the CMP fisheries.<sup>1</sup> The fisheries are jointly managed by the GOM Fishery Management Council and the SAT Fishery Management Council through the CMP Fishery Management Plan (FMP). These fisheries have been managed by a combination of complex regional quotas, regional trip-limits, regional gear limits, and regional closures when sub-quotas are met. For detailed information about the CMP FMP, please consult the GOM Council's website at: <http://gulfcouncil.org> as well as the SAT Council's website at: <http://safmc.net/>.

This report's unique focus is on the economics of the commercial harvesting sector in the GOM and SAT CMP fisheries. The report combines trip logbook data (effort and catch at the trip-level) with two supplemental economic sample surveys—one on the logbook itself (and hence at the trip-level); the other is an annual mail survey at the vessel-level. The economic surveys elicit revenue, variable and/or fixed costs by category, and some auxiliary economic variables, such as a vessel's market value. After extensive cleaning and processing, and linking back to the logbook data, the report summarizes the logbook data by meaningful subsets of the overall data (domains in statistical context). We call these subsets Segments of Interest (SOI). In most cases, they are at the species, region, and/or at the gear-level, such as king mackerel or trolling trips. Based on the sample data, estimates of the SOI population means for the economic variables are provided, including net revenues and margins.

A major disclaimer applies to all the results reported in this technical memorandum. **The processing of data and the presentation of results are guided by the objective of presenting meaningful economic results. These numbers will differ from similar numbers generated for stock assessments and other management or research purposes. For instance, there are known reasons for why logbook totals ("near census") will deviate from official ACL/quota numbers. Further, the underlying databases are dynamic and continuously changing.** So while the numbers reported here should generally be of similar magnitude as reported elsewhere, we do not expect them to be identical.

For the CMP species it is important to note: 1. The CMP FMP manages king mackerel north of the SAT Fishery Management Council's jurisdiction. Historically, a few percent of landings are reported (to dealers) by vessels landing between Virginia and Maine. These landings, trips, and vessels are not included in this report; 2. The CMP FMP defines the boundary between the GOM and SAT king mackerel stocks along a line heading due east from the boundary between Miami-Dade and Monroe counties. In contrast, this report delineates GOM and SAT catches based on the area fished falling into GOM or SAT waters; 3. The assumption of the logbook system being a near-census of a fishery does not hold for Spanish mackerel. Dealer-reported landings of Spanish mackerel far exceed logbook-reported landings. As such, the Spanish mackerel results in this report only represent the portion of the overall

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<sup>1</sup>Note: The cobia fishery is not included in this technical memorandum due to relatively few pounds being commercially landed and a small sample size.

fishery that is federally-permitted and logbook-compliant.

The Methods section describes the sources of the data in more detail, the cleaning processes and assumptions, the statistical estimation approach, and the standardized results. The presentation of results is standardized across different SOIs to streamline the results sections. The definitions and caveats for each result variable or graph are only reported in the methods section in order to keep repetition to a minimum.

The Results section reports on 8 different SOIs. The results for any one SOI consist of six sections, corresponding to six pages. The first section, Trip-Level Summary, summarizes aggregated logbook data at the trip-level for the particular SOI. The second section, Trip-Level Economics, provides estimated SOI trip economic results based on the trip-level sample survey. The third section, Annual, Vessel-Level Summary, provides information on the vessels within the SOI at the annual, vessel-level by aggregating across all the logbook trip data for each vessel. This section also presents vessel characteristics and permit status gleaned from each vessel's permit application. The fourth section, Annual, Vessel-Level Economics, provides estimated annual economic results for SOI vessels based on the annual sample survey. The fifth section, Trip-Level Time Series, provides selected trip-level summary and economic results for previous years, side-by-side to the current year results and a three year average. The sixth section, Annual, Vessel-Level Time Series, provides the same temporal perspective for selected annual, vessel-level summary and economic results. In both time series sections, the economic results are expressed as a percent of revenue to better facilitate comparison across time. All dollar values are inflation adjusted to nominal 2016 dollars.

## Methods

### Data

Beginning in 1993, NMFS's Southeast Fisheries Science Center (SEFSC) required all fishing vessels to report on their commercial fishing activity for federally managed Gulf of Mexico Reef Fish, South Atlantic Snapper-Grouper, Coastal Migratory Pelagic (mackerels and cobia), Shark, and Atlantic Dolphin/Wahoo fisheries. To maintain compliance, fishers are responsible for submitting a trip report form (aka "logbook") for every commercial fishing trip that harvests or targets these species. Per logbook instructions, "a commercial trip is defined as a trip for profit with no paying customers onboard. Any commercial trip that targets a federally managed species listed under the aforementioned permits must be reported, even if there were no landings." This results in near-census data of all commercial trips taken by federally-permitted vessels in the fisheries for Reef Fish, Snapper and Grouper, as well as Mackerel, in the Gulf of Mexico and South Atlantic. How close the logbook's aggregate landings align with dealer reported landings—the official estimates of landings—varies by species. Across 2014 to 2016, aggregate logbook landings account for **91%** and **45%** of dealer reported landings for the GOM and SAT king and Spanish mackerel species, respectively.<sup>2</sup>

Since 2006, NMFS's SEFSC has conducted two economic surveys to collect data at both the trip-level and vessel-level in the GOM and SAT CMP FMP fishery. Each year, a subset of federally permitted vessels is randomly selected to provide additional economic data on

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<sup>2</sup>The official estimates of landings are reported annually in the Fisheries of the U.S. These estimates are based on the total pounds and value by species and time period reported to NMFS by seafood dealers (those buying from harvesters).



the logbook. Selection eligibility is based on whether a vessel has a valid federal permit of interest during late November of the previous year. In 2016, vessels were stratified into three strata based on their days at sea during the two years prior to the selection year (e.g., 2014 and 2015 in this case). The three strata are: 1. Inactive, 2. Active - Low (less than 21 days at sea per year in both years), and 3. Active - High (more than 20 days at sea in at least one year).<sup>3</sup> A vessel was considered inactive if it did not report any trips to the logbook system during the two years. Approximately 30% of active vessels were selected, while 10% of inactive vessels were selected. Beyond the initial selection, two further vessel selections were conducted throughout the first half of the year to capture vessels new to the fishery and permit renewals (vessels with invalid permits during initial selection).

For each trip, selected vessels must complete the trip expense section located at the bottom of the trip report form. Data collected in this section are for variable costs including expenses for bait, ice, groceries, and IFQ allocation; the amount of fuel used and the cost per gallon of fuel (which are used to estimate fuel costs); whether or not the vessel owner was present on the trip, and whether or not payment for the catch had been determined. If payment was determined, then gross trip revenue and payment to hired crew and hired captain are collected. Instructions and a copy of the logbook trip report form with the trip expense section can be found at this NOAA SEFSC website: [https://www.sefsc.noaa.gov/fisheries/reporting\\_archive.htm](https://www.sefsc.noaa.gov/fisheries/reporting_archive.htm).

Early in the following year, selected vessels are mailed an annual expense survey. This survey asks questions pertaining to cumulative trip-level expenses such as fuel, supplies, IFQ allocation, and hired captain and hired crew payments. In addition, the survey asks for annual, vessel-level economic costs—fixed costs—which are not documented on the trip expense section of the logbook. These expenses include the costs for maintaining and repairing the vessel and gear, insurance, loan payments, and overhead (such as mooring, utilities, office staff, professional services, etc.). The annual survey also collects an estimate of the vessel's market value as well as days at sea and revenue from commercial and for-hire fishing.<sup>4</sup>

Besides logbook and economic survey data, this technical memorandum uses vessel permit and characteristics information from NMFS's Southeast Regional Office (SERO). These data are provided by vessel owners on the application for Federal fishing permits in the Southeast. Finally, dealer landings data obtained from the states, as summarized in the ALS (Accumulated Landings System), are used to estimate the ex-vessel seafood prices. An algorithm, using trip information including the dealer, the dealer's location (state), and the month and year landed, is used to estimate a price per pound for each species at the highest resolution possible. This price per pound is used to estimate trip revenue because the logbook forms do not collect price data.

## Cleaning

As with utilizing any survey data, cleaning is necessary to ensure the data are complete, accurate, and suitable for analysis. The largest challenge in cleaning both the trip-level and annual, vessel-level economic data is dealing with variable non-response. Depending on

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<sup>3</sup>The active vessels were separated into low and high strata to ensure a sufficient response from the highly active vessels ("high liners") each year. The particular cutoff point roughly splits the active vessels into similar sized groups.

<sup>4</sup>A substantial fraction of commercially permitted vessels also are permitted for taking for-hire trips, and many vessels engage in both activities in a single year.

the variable, non-response is dealt with in different ways. If a value is missing for certain variables, the entire trip observation is dropped. This occurs when a variable is difficult to estimate accurately, such as fuel used on a trip. We replace missing values with zeros for variables where it is more than likely that the value is actually zero and the respondent left it blank. Finally, estimates of trip revenue and payments to hired crew and hired captain are imputed if payment had not been determined by the time the trip form was submitted. Missing trip revenue is replaced with the estimated trip revenue value. Gross mismatches between actual reported revenue (for observations with these data) and estimated revenue lead to these observations being dropped if no data entry error is found. An estimate for missing payments to hired crew is based on a set of regression models (equations). The variables used in the regression models include: trip revenue, crew days (number of hired crew multiplied by days at sea), and total expenses (total spent on bait, fuel, groceries, ice, IFQ allocation, and miscellaneous expenses).

### **Definition: Segment of Interest (SOI)**

Due to large trip and vessel heterogeneity within the logbook data, it is necessary to subset the commercial vessel “population” into more meaningful and tractable sub-populations, or “domains” in a statistical context. These domains could be based on any variables that are available for all trips (or vessels) within the logbook system. Examples of these variables include: Species landed, gear used, area fished, duration of trip, month landed, dealer state, and valid permit status.

This technical memorandum reports trip- and vessel-level economic estimates for a select number of domains we call Segments of Interest (SOI). A SOI is defined as all trips where at least one pound of fish, which matches the specifications of the domain, was landed. For instance, the SOI “SAT Spanish Mackerel Fishery: All gears” would include all trips that caught one or more pounds of Spanish mackerel using any gear in the U.S. South Atlantic. The following items are primarily used to create the SOIs: Area fished, gear used, and species landed.<sup>5</sup> It is important to note that not all landings on a SOI trip will match the SOI definition and not all trips by SOI vessels will be in the SOI. The naming convention of the SOIs is: Year of data, waterbody of area fished, species, and gear. It should also be noted that the different SOIs in this tech memo are not at all mutually exclusive. In fact, as the majority of trips harvest different species, most trips will be part of many different SOIs.

### **Estimation**

For the economic variables, we estimated SOI-specific population means (averages) using the economic sample data available for that particular SOI. Post-stratification of a SOI domain and its economic sample data allows the statistical estimation to take into account the realized distribution of the usable economic responses across the sampling strata. The weights used in the estimation are based on the total number of vessels in the SOI for each stratum divided by the number of vessels whose expense data are used in the estimation (as the original selection is at the vessel level before any trips are realized). In the process, we correct for trip-level and vessel-level non-response in the simplest manner. Technically, each

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<sup>5</sup>Additional segmenting can be carried out on the SOI in order to include trips which meet specific thresholds on SOI’s share of trip revenue as well as a minimum for SOI trip revenue per day. We do not report these here.

economic observation receives a weight specific to: a) the original sampling strata and b) the particular SOI domain under consideration. The trip-level and annual, vessel-level weights are calculated separately and differ due to the particular response “profile” for each survey.

## Standardized Results and Definitions

The presentation of results is standardized across different SOIs in order to streamline the results sections. The standardized results for each SOI begin with a text description of the SOI, focusing on its most pertinent aspects. The text also contains important or critical caveats that apply to particular SOIs. The definitions and caveats for each result variable or graph are only reported in this section in order to keep repetition to a minimum.

The results for any one SOI consist of six sections. The first section, Trip-Level Summary, summarizes the SOI at the trip-level—presenting the aggregate, cleaned logbook data for the particular SOI. The second section, Trip-Level Economics, provides SOI trip economic estimates based on the trip-level sample survey. The third section, Annual, Vessel-Level Summary, provides information on the vessels within the SOI at the annual-level by aggregating across all the logbook trip data (SOI and non-SOI trips). This section also presents vessel characteristics and permit status gleaned from each vessel’s permit application. The fourth section, Annual, Vessel-Level Economics, provides estimated annual economic results for SOI vessels based on the annual sample survey. The fifth section, Trip-Level Time Series, provides selected trip-level summary and economic results for previous years, side-by-side to the current year results and a three year average. The sixth section, Annual, Vessel-Level Time Series, provides the same temporal perspective for selected annual, vessel-level summary and economic results. In both time series sections, the economic results are expressed as a percent of revenue to better facilitate comparison across time. All dollar values are inflation adjusted to nominal 2016 dollars. A description of all tables and graphs that are found in these sections is provided below. Percentages may not always sum to 100% in the tables and graphs due to rounding.

### Section: Trip-Level Summary

- **Effort**: Number of SOI trips, number of vessels in SOI, and total number of days at sea and crew-days by all SOI trips in the logbook data. The days at sea variable is known to contain some imprecision.
- **Landings (gutted lbs)**: Total gutted weight of landings in pounds by SOI trips; broken down into SOI landings and non-SOI landings. "%SOI" shows the percentage share of total landings that qualify as SOI landings. The non-SOI landings occur on SOI trips. In a species-defined SOI, non-SOI landings would be non-SOI species catch. In a gear-defined SOI, non-SOI landings would be landings caught with non-SOI gear on a multi-gear SOI trip. The %SOI indicates the level of SOI criteria specialization (in terms of landings) of SOI trips. A high value indicates that the SOI trips are mostly explained by the SOI criteria. A low value indicates that the SOI landings (i.e., the landings associated with the SOI criteria) are a minor part of the trip and might just be "bycatch".
- **Percent by Gear**: Trips — Percent of trips in the SOI using a particular gear. Multi-gear trips are assigned a "top gear" based on the gear which generated the most revenue.

Vertical line gear includes hand lines, rod and reels, electrical reels and bandit gear. SOI lbs — Percent of SOI landings landed using a particular gear.

- **Price (mean)**: Average ex-vessel price per pound of all landings (gutted weight pounds), as well as the average price per pound of SOI landings and of non-SOI landings across SOI trips.
- **Revenue**: Total estimated revenue by all SOI trips; broken down into SOI revenue and non-SOI revenue. %SOI shows the percentage share of total revenue that qualifies as SOI revenue. Revenue is estimated by multiplying catch pounds from the logbook data by the ex-vessel price estimate derived from ALS (dealer) landings data. The %SOI indicates the level of SOI criteria specialization (in terms of revenue) of SOI trips. A high value indicates that the SOI trips are mostly explained by the SOI criteria. A low value indicates that the SOI revenue (i.e., the revenue associated with the SOI criteria) are a minor part of the trip and might just be "bycatch".
- **Revenue Percent by Species Group**: Distribution of estimated revenue on all SOI trips across selected species groups, in percent. Note, these species groups are independent and unrelated to the species-based SOI definitions. See Appendix 1 for the specific species included in each reported group. The first three groups contain the CMP FMP species and some other pelagic species.
- **Revenue for Top 5 Species**: Total estimated species-level revenue for the top 5 species with greatest overall revenue on all SOI trips.
- **SOI Landings by Area Fished**: A bubble map showing where SOI landings are caught in either the Gulf of Mexico, the South Atlantic, or both. Fishing areas are defined based on a 1x1 degree latitude-longitude grid.
- **Share of SOI Landings by Month**: A chart showing the seasonality of total SOI landings.
- **Cumulative SOI Landings**: A graph showing cumulative SOI landings across SOI trips ordered from lowest SOI catch to highest SOI catch. A straight line would indicate very homogeneous trips; a convex shape indicates heterogeneity (in SOI catch). The dashed horizontal line represents 20% of the total SOI landings. Where the line intersects the curve indicates the maximum number of trips which can generate (only) 20% of the SOI landings. One minus the intersects' number of trips (in percent) indicates the (smallest) percent of trips that harvest 80% of SOI landings.
- **SOI Share of Revenue Per Trip**: A graph illustrating the level of specialization (on SOI catch) by SOI trips. The graph maps the SOI share of estimated revenue for each trip in the SOI, with trips ordered from smallest to largest SOI share. Where the dashed horizontal line intersects the curve indicates the percent of trips where the percent of SOI share was 50% or less. The graph illustrates the share of SOI trips where SOI revenue is minor/bycatch (from left, line hugging the x-axis), where the trip is specialized on SOI revenue (moving toward right, line asymptotes toward 100% y-value), and those in between.
- **Trip Descriptive Statistics**: SOI trip summary statistics (mean, minimum, median, maximum) derived from the logbook data: Days at sea, number of crew, (gutted weight) pounds landed, estimated revenue, SOI estimated revenue, and the percent of total

estimated revenue attributed to the SOI. This table allows for an evaluation of the scale of variation and extremes among SOI trips.

## Section: Trip-Level Economics

- **Response Rate for SOI Trips:** While the economic survey samples at the vessel level (by design), the rates reported here are at the trip-level. Based on the SOI definition, the total number of trips and the number of trips selected for economic reporting are provided. Further, "Responded" refers to the number of trips that provided at least some economic survey data, while "Used" refers to the number of clean and complete trip observations used in the analysis.
- **Economic Results:** This table reports estimates of the population means for SOI trips based on the sample data;  $n$  equals the number of observations in the sample. The population means for the economic variables are generated using a post-stratified, weighted estimation to account for the stratification of the sample and non-response. Also reported are the standard error, the 90% confidence interval for the mean [lower bound (L.B.) and upper bound (U.B.)], and the weighted median. The variables included are:

**Owner-Operated:** Percentage of SOI trips where the vessel owner was part of the crew, usually the captain. If an owner is not on board, a captain has to be hired (presumably raising the crew expenses).

**Days at Sea:** The length of trip in days, as reported on the logbook. This variable is known to contain a substantial amount of imprecision (plus or minus one day as fishermen treat partial calendar days and 24 hour periods differently).

**Crew Size:** Total number of crew members on trip, including the captain.

**Fuel Used:** The amount of fuel used on a trip in gallons.

**Landings (gutted lbs):** Total trip landings in gutted weight pounds.

*Note, in this section, revenue, costs and net-measures are in nominal U.S. dollars, as reported on the survey (survey year dollars).*

**Total Revenue:** Reported trip revenue when available; augmented with estimated trip revenue when missing. Serious mismatches between reported and estimated trip revenue (when available) were the most frequent reason trips were dropped during data cleaning.

**Cost - Fuel:** Cost of fuel used on trip; calculated as the price paid per gallon multiplied by the gallons used. In contrast to the other trip costs below, fuel costs are counted regardless of when (or if) the expense for this fuel was incurred, as fuel is easily stored between trips (i.e., fuel purchased prior to but not used on a trip would not be included).

**Cost - Bait:** Cash expense for bait purchased for trip. The cost of self-caught bait is not included because, presumably, fuel and labor time reflect the production of self-caught bait.

**Cost - Ice:** Cash expense for ice purchased for trip. The cost of ice generated by

own ice machine(s) is not included because, presumably, fixed costs for gear and electricity reflect the own-production of ice.

**Cost - Groceries:** Cash expense for groceries purchased for this trip.

**Cost - Miscellaneous:** Cash expense for other trip-related expenses not accounted for elsewhere, including gloves, supplies for freezing product, etc.

**Cost - Hired Crew:** Payment to hired crew ("mates") and hired captain (if applicable). Reported expenses for hired crew are the most error-prone data. Substantial cleaning is necessary to make these data usable. Obvious errors and inconsistencies were blanked out, and then hired crew costs were estimated based on a complex algorithm that was developed to distinguish between small, one day trips often taking "voluntary" crew with no or in-kind payment (family, friends, etc.) and longer, professional crew positions where compensation is necessary. The resulting number is a rough estimate and should be treated as such.

**IFQ Purchase:** Cash expense for IFQ allocation purchased from third parties specifically for the trip. This primarily applies to Gulf of Mexico reef fish fisheries, where two Individual Fishing Quota (IFQ) programs exist for red snapper, groupers and tilefish. Note that many respondents have IFQ shares or long-term/annual arrangements for IFQ allocation. The use ("consumption") of annual allocation on a trip is not accounted for at a trip level in this analysis. Also, the revenue from selling annual allocation is not accounted for as it cannot, in general, be associated with a vessel and hence a trip.

**OC Owner-Captain Time:** Estimated opportunity cost (OC) of an owner's labor used on the trip. The survey does not collect this information. Instead, a value is imputed based on hired crew remuneration and the profitability of the trip because most labor is compensated based on a share system. The resulting number is a rough estimate and should be treated as such.

**Trip Net Cash Flow:** Revenue minus the costs for fuel, bait, ice, groceries, miscellaneous, hired crew, and IFQ purchase. The focus is on actual cash transactions/money flows. In-kind contribution to the production process are ignored, including the opportunity cost of owner-captain time, as well as vessel services (fixed costs and overhead) and IFQ allocation use (if not purchased from third parties specifically for the trip). Trip Net Cash Flow represents an estimate of the money (cash) generated by the typical SOI trip over and above the cash cost of taking the trip (marginal or variable costs of trip). This implies a short term perspective.

**Trip Net Revenue:** Revenue minus the costs for fuel, bait, ice, groceries, miscellaneous, hired crew, and the opportunity cost of owner's time as captain. By including opportunity cost of owner's time (an in-kind, variable factor to production) and excluding IFQ purchase payments, trip net revenue is a measure of the inherent short-term productivity (i.e., economic performance) of the commercial fishing process. For example, if a trip were not taken, with the owner avoiding to pay trip-related costs, then Trip Net Revenue represents the lost income to the owner. Because of the trip perspective, vessel services (fixed costs and overhead) and IFQ allocation use, purchase, or selling is not included. This implies a short term perspective.

- **Trip Net Cash Flow and Trip Net Revenue as Proportion of Trip Revenue**

**(Margins):** A chart showing Trip Net Cash Flow and Trip Net Revenue as a share of trip revenue, i.e., the gross margin of the productive activity before fixed costs are accounted for. The major cost categories that are subtracted from revenue are also displayed in percentage terms. Fuel and Supplies include the cost of fuel, bait, ice, groceries, and miscellaneous. Labor includes just Hired Crew costs for Trip Net Cash Flow and Hired Crew costs and the opportunity cost of Owner's Time for Trip Net Revenue.

- **Input Prices:** The average fuel price per gallon across all gallons used by the SOI trips is reported. This is distinct from the average fuel price across trips (not reported). The Hired Crew Wage (implicit) calculates the average amount paid (as Hired Crew costs) per hired crew-day by the SOI trips. This measure excludes an owner's crew-days in the calculation.
- **Productivity Measures:** Reports the landings (in gutted weight pounds) per gallon of fuel used as well as per crew-day of labor used. The latter measure includes an owner's crew-days in the calculation.

## **Section: Annual, Vessel-Level Summary**

For all SOI vessels, this section summarizes all logbook data. It is important to note that, during a year, some vessels will also engage in commercial fishing trips that do not require federal logbooks, such as lobster, crabs, or other state-managed species. These trips are not accounted for in this section. They ARE accounted for in Section Four: Annual, Vessel-Level Economics.

- **Effort:** Number of SOI vessels, number of total trips by SOI vessels, number of SOI trips, number of non-SOI trips and total number of days at sea and crew-days on all trips by SOI vessels in the logbook data. Non-SOI trips are trips by SOI vessels that did NOT land one pound of fish that matched the SOI definition (species, gear, etc.). The days at sea variable is known to contain some imprecision.
- **Landings (gutted lbs):** Total gutted weight of landings in pounds of all trips by SOI vessels; broken down into SOI landings and non-SOI landings. "%SOI" shows the percentage share of total landings that qualify as SOI landings. The non-SOI landings occur on all trips by SOI vessels. In a species-defined SOI, non-SOI landings would be non-SOI species catch. In a gear-defined SOI, non-SOI landings would be landings caught with non-SOI gear on a multi-gear SOI trip. The %SOI indicates the level of SOI criteria specialization (in terms of landings) of all trips by SOI vessels. A high value indicates that all trips by SOI vessels are mostly explained by the SOI criteria. A low value indicates that the SOI landings (i.e., the landings associated with the SOI criteria) are a minor part of the vessels' landings and might just be "bycatch".
- **Percent by Gear:** Trips — Percent of all trips by SOI vessels using a particular gear. Multi-gear trips are assigned a "top gear" based on which gear generated the most revenue. Vertical line gear includes hand lines, rod and reels, electrical reels and bandit gear. Total lbs — Percent of total landings by SOI vessels using particular gear.

- **Price (mean)**: Average price of all landings (gutted weight pounds), as well as the average price of SOI landings and of non-SOI landings across all trips by SOI vessels.
- **Revenue**: Total estimated revenue by all trips of SOI vessels; broken down into SOI revenue and non-SOI revenue. %SOI shows the percentage share of total revenue that qualifies as SOI revenue. Revenue is estimated by multiplying catch pounds from the logbook data by the ex-vessel price estimate derived from ALS (dealer) landings data. The %SOI indicates the level of SOI criteria specialization (in terms of revenue) of all trips by SOI vessels. A high value indicates that all trips by SOI vessels are mostly explained by the SOI criteria. A low value indicates that the SOI revenue (i.e., the revenue associated with the SOI criteria) are a minor part of the vessels' landings and might just be incidental catch.
- **Revenue Percent by Species Group**: Distribution of estimated revenue on all trips by SOI vessels across selected species groups, in percent. Note, these species groups are independent and unrelated to the species-based SOI definitions. See Appendix 1 for the specific species included in each reported group. The first three groups contain the CMP FMP species and some other pelagic species.
- **Revenue for Top 5 Species**: Total estimated species-level revenue for the top 5 species with greatest overall revenue on all trips by SOI vessels.
- **Annual, Vessel Descriptive Statistics**: Summary statistics (mean, minimum, median, maximum) for all trips by SOI vessels derived from the logbook data: Number of trips, days at sea, number of crew, (gutted weight) pounds landed, estimated revenue, SOI estimated revenue, and the percent of total estimated revenue attributed to the SOI. This table allows for an evaluation of the scale of variation and extremes among SOI vessels.
- **SOI Share of Monthly Landings**: A chart showing the seasonality of SOI landing relative to all landings.
- **SOI Share of Revenue Per Vessel**: A graph illustrating the level of specialization (on SOI catch) by SOI vessels. The graph maps the SOI share of estimated revenue for each vessel in the SOI, with vessels ordered from smallest to largest SOI share. Where the dashed horizontal line intersects the curve indicates the percent of vessels where the SOI share was 50% or less. The graph illustrates the share of SOI vessels where SOI revenue is minor/bycatch (from left, line hugging the x-axis), where the vessel is specialized on SOI revenue (moving toward right, line asymptotes toward 100% y-value), and those in between.
- **Percent with Federal Permit**: Lists the percent of SOI vessels that had a valid Federal commercial permit for at least one day during the calendar year under consideration by permit or permit category. From the permit database at SERO. Permits or permit categories listed are: GOM and SAT King Mackerel permits, GOM and SAT Spanish Mackerel permits, GOM Reef Fish, SAT Snapper & Grouper (Unlimited and Limited versions), Atlantic Dolphin-Wahoo (applies to SAT, not GOM), Other Commercial Fishing (including permits for sharks, swordfish, spiny lobster, and shrimp), and For-Hire Fishing (any GOM or SAT Federal for-hire permit). The permit status is an indicator for what other fisheries the SOI vessels have the option to participate in (and might be active in).



- **Vessel Characteristics:** Summary statistics (mean, minimum, median, maximum) for SOI vessels derived from the permit database at SERO: Vessel length (in feet), year vessel was built, horsepower of all engines, as well as the percent of vessels with fiberglass hull material, diesel engines, and lack of on-board freezing capability. This table allows for an evaluation of the scale of variation and extremes among SOI vessels.

## Section: Annual, Vessel-Level Economics

- **Response Rate for SOI Vessels:** Response rates for the annual economic survey among SOI vessels. Reported are the total number of vessels in the SOI and the number of vessels selected for additional economic reporting. Further, "Responded" refers to the number of vessels that provided (some) annual economic data, while "Used" refers to the number of clean and complete annual, vessel-level observations used in the analysis.
- **Economic Results:** This table reports estimates of the population means for SOI vessels based on the annual economic survey sample data; n equals the number of observations in the sample. The population means for the economic variables are generated using a post-stratified, weighted estimation to account for the stratification of the sample and non-response. Also reported are the standard error, the 90% confidence interval for the mean [lower bound (L.B.) and upper bound (U.B.)], and the weighted median. The variables included are:

**Owner-Operated:** Percent of SOI vessels where, on the majority of trips, an owner was part of the crew, usually the captain.

**For-Hire Active:** Percent of SOI vessels that engaged in for-hire fishing during the calendar year.

**Days - Commercial Fishing:** Number of days at sea a vessel engaged in commercial fishing during a calendar year.

**Days - For-Hire Fishing:** Number of days at sea a vessel engaged in for-hire fishing during a calendar year.

**Days - Non-fishing:** Number of days at sea a vessel engaged in non-fishing activities during a calendar year; this could include work in the oil sector, non-fishing for-hire trips, or trips for research purposes. While not the intent of the question, some individuals might be including days the vessel was used for recreational purposes.

**Vessel Value:** The estimated current market value of the vessel by respondents. Missing values are imputed. In nominal U.S. dollars, as reported on the survey.

**Has Insurance:** Percent of SOI vessels that have vessel insurance, either hull insurance, P&I insurance ("liability") or both.

*Note, in this section, revenue, costs and net-measures are in nominal U.S. dollars, as reported on the survey (survey year dollars).*

**Total Revenue:** Total revenue is sum of commercial and for-hire fishing revenues as reported on annual survey, i.e., total receipts from seafood sales and for-hire fees, respectively.

**Commercial Fishing Revenue:** Annual gross revenue from commercial fishing, i.e., total ex-vessel receipts from seafood sales. This can include amounts generated from fisheries outside the logbook reporting system, e.g., lobster or blue crab.

**For-Hire Fishing Revenue:** Annual gross revenue from for-hire fishing.

**Cost - Fuel:** Annual expenditures for fuel used by vessel.

**Cost - Other Supplies:** Annual expenditures for non-labor variable inputs other than fuel, including bait, ice, groceries, and miscellaneous.

**Cost - Hired Crew:** Annual expenditures for hired crew ("mates") and hired captain (if applicable), including fringe, bonuses, and other employment costs (if applicable).

**Cost - Vessel Repair & Maintenance:** Annual expenditures for vessel and associated gear repair and maintenance.

**Cost - Insurance:** Annual expenditures for vessel hull and P&I insurance.

**Cost - Overhead:** Annual expenditures for overhead, such as expenses for dockage, licenses, rent, utilities, vehicles, and professional services (or share thereof if the overhead is spread over multiple vessels).

**Cost - Loan Payment:** Annual payment for vessel loans, including both principal and interest.

**Cost - IFQ Purchase:** Cash expense for IFQ allocation purchased specifically for the vessel from a different IFQ shareholder ("arm's length" transactions, in principle). This primarily applies to Gulf of Mexico reef fish fisheries, where two Individual Fishing Quota (IFQ) programs exist for red snapper, groupers and tilefish. Note that many respondents own IFQ shares. The use ("consumption") of these rights is not accounted for in this analysis. Note also that the sale of IFQ allocation (or the buying or selling of IFQ shares) is not accounted for (as it cannot, in general, be associated with a vessel).

**Cost - OC Owner-Captain Time:** Estimated opportunity cost of an owner's labor as captain over the year. The survey does not collect this information, instead a value is imputed based on hired crew remuneration and the profitability of the trip (since most labor is compensated on a share system) at the logbook trip level; and then summed to the annual, vessel level. Time spent by an owner as a captain of for-hire trips or commercial fishing trips not reported to the logbook system is not accounted for (though it would be quite minor). The resulting number is a rough estimate and should be treated as such.

**Cost - Depreciation:** The estimated contribution in dollar terms of the vessel asset to the production process. The survey does not collect this information; instead a value is calculated as 5% of the vessel's current market value.<sup>6</sup> The resulting number is a rough estimate and should be treated as such.

**Net Cash Flow:** Revenue minus the costs for fuel, other supplies, hired crew, vessel repair and maintenance, insurance, overhead, loan payments, and IFQ purchase.

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<sup>6</sup>Five percent is a rough estimate. It is based on an author's experience with the Gulf shrimp fishery and the fact that the IRS requires non-fishing vessels to be depreciated over 23 years.

The focus is on actual cash transactions/money flows. In-kind contributions to the production process, i.e., the opportunity cost of owner-captain time and depreciation are ignored. The sale of IFQ allocation or shares is also not accounted for, as these transactions cannot be associated with a vessel.

**Net Revenue from Operations:** Revenue minus the costs for fuel, other supplies, hired crew, vessel repair and maintenance, insurance, overhead, and the opportunity cost of an owner's time as captain as well as the vessel's depreciation. By including in-kind contributions to the production process (opportunity cost of an owner's time and depreciation) and excluding transfer payments (loan payments and IFQ purchase), net revenue from operations is a measure of the inherent productivity, i.e., economic performance, of the commercial fishery. Note that IFQ share ownership is ignored here. See 'Economic Return' below for more discussion of the relationship between IFQ shareholders/transactions and the economics of the commercial fishery, primarily applicable to Gulf of Mexico fisheries.

- **Net Cash Flow and Net Revenue from Operations as Proportion of Vessel Revenue (Margins):** A chart showing Net Cash Flow and Net Revenue from Operations as a share of trip revenue, i.e., the margins of the productive activity after variable and fixed costs are accounted for. The major cost categories that are subtracted from revenue are also displayed in percentage terms. Fuel and Supplies include the cost of Fuel and Other Supplies. Labor includes just Hired Crew costs only for Net Cash Flow and Hired Crew costs and the opportunity cost of an owner's time for Net Revenue from Operations.
- **Economic Return (on Asset Value):** The economic return is calculated by dividing the mean Net Revenue from Operations by the mean Vessel Value. For Gulf of Mexico fisheries, it is critical to note that, practically, this return is shared between owners of vessel capital AND IFQ shares. By purposefully ignoring the IFQ shareholder distribution, the focus is on the real productive capacity of the commercial fishery. All IFQ transactions are zero-sum in that they transfer wealth. The catch share management structure of the fishery allows for the realization of resource rents that will, in all likelihood, accrue to the IFQ shareholders.

## **Section: Trip-Level Time Series**

This section provides selected trip-level summary and trip-level economic results for the years 2014, 2015, and 2016 (current) and a simple three year average. The definitions and caveats for each result variable are equivalent to and hence reported in the respective trip-level sections. All 2014 and 2015 dollar values are inflation adjusted to nominal 2016 U.S. dollars using the U.S. Bureau of Economic Analysis's Implicit Price Deflator for GDP. Most economic results are expressed as a percent of trip revenue to better facilitate comparison across time. It should be noted that the economic estimates are derived from a sample survey and exhibit significant uncertainty (large confidence intervals). As a result, fluctuating numbers from one year to the next are not necessarily statistically significant and do not necessarily imply that the fishery has changed.

## **Section: Annual, Vessel-Level Time Series**

This section provides selected annual, vessel-level summary and annual, vessel-level economic results for the years 2014, 2015, and 2016 (current) and a simple three year average. The definitions and caveats for each result variable are equivalent to and hence reported in the respective annual, vessel-level sections. All 2014 and 2015 dollar values are inflation adjusted to nominal 2016 U.S. dollars using the U.S. Bureau of Economic Analysis's Implicit Price Deflator for GDP. Most economic results are expressed as a percent of annual vessel revenue to better facilitate comparison across time. It should be noted that the economic estimates are derived from a sample survey and exhibit significant uncertainty (large confidence intervals). As a result, fluctuating numbers from one year to the next are not necessarily statistically significant and do not necessarily imply that the fishery has changed.

## Results

### Disclaimer and Overview

All vessel and logbook trip data utilized in this report were pulled from the various databases on May 4, 2018. **The processing of data and the presentation of results are guided by the objective of presenting meaningful economic results. These numbers will differ from similar numbers generated for stock assessments and other management or research purposes. For instance, there are known reasons for why logbook totals ("near census") will deviate from official ACL/quota numbers. Further, the underlying databases are dynamic and continuously changing.** All dollar values are inflation adjusted to nominal 2016 U.S. dollars using the U.S. Bureau of Economic Analysis' Implicit Price Deflator for GDP.

This technical memorandum reports trip and vessel economic estimates for a select number of domains or Segments of Interest (SOI). A SOI is defined as all trips where at least one pound of fish, which matches the specifications of the domain, was landed. The SOIs reported are specified on species landed, region and/or gear used. Note that the different SOIs in this tech memo are not at all mutually exclusive. In fact, as the majority of trips harvest different species, most trips will be part of different SOIs. The SOIs featured in this report include:

#### The King Mackerel fisheries:

SOIs based on region perspective:

1. SAT King Mackerel Fishery: All Gears
2. GOM King Mackerel Fishery: All Gears

SOIs based on region AND gear perspective:

3. SAT King Mackerel Fishery: Vertical Line
4. SAT King Mackerel Fishery: Trolling
5. GOM King Mackerel Fishery: Vertical Line
6. GOM King Mackerel Fishery: Trolling

#### The Spanish Mackerel fisheries:

SOIs based on region perspective:

7. SAT Spanish Mackerel Fishery: All Gears
8. GOM Spanish Mackerel Fishery: All Gears

Note: The cobia fishery is not included in this technical memorandum due to relatively few pounds being commercially landed and a small sample size.

The presentation of results is standardized across different SOIs to streamline the results sections. The definitions and caveats for each result variable or graph are only reported in the Methods section in order to keep repetition to a minimum. The results for any one SOI consists of six sections. The first section, Trip-Level Summary, summarizes the SOI at the trip-level- presenting the aggregate, cleaned logbook data for the particular SOI. The second section, Trip-Level Economics, provides estimated SOI trip economic results based on the trip-level sample survey. The third section, Annual, Vessel-Level Summary, provides

information on the vessels within the SOI at the annual-level by aggregating across all the logbook trip data. The section also presents vessel characteristics and permit status gleaned from each vessel's permit application. The fourth section, Annual, Vessel-Level Economics, provides estimated annual economic results for SOI vessels based on the annual sample survey. The fifth section, Trip-Level Time Series, provides selected trip-level summary and economic results for previous years, side-by-side to the current year results and a three year average. The sixth section, Annual, Vessel-Level Time Series, provides the same temporal perspective for selected annual, vessel-level summary and economic results. In both time series sections, the economic results are expressed as a percent of revenue to better facilitate comparison across time. All dollar values are inflation adjusted to nominal 2016 dollars.

A description of all tables and charts that are found in any of these sections is provided in the Methods Section - Standardized Results and Definitions. Note that percentages may not always sum to 100% in the tables and graphs due to rounding.

The reported SOIs were selected among the many possible ones after an extensive evaluation<sup>7</sup> of the validity and applicability of the economic results, including:

1. The raw data problems specific to the SOI (outliers, frequency of missing values; zeros; etc.);
2. The impact of our standardized cleaning routines (dropping records and imputing missing values);
3. The representativeness (or bias) of the SOI's economic-sample trips or vessels of the SOI population (the logbook and permit application data are a census, so there are many variables available for comparison);
4. The impact of the statistical estimation routines;
5. The economic reasonableness of the aggregate results;
6. The size of the confidence intervals; and
7. A general consistency between the trip-level and vessel-level economic results (as they are based on two different raw data streams). For the trip-level economics, an additional "separate data stream" validation is conducted that compares the economic results for selected vessels (the focus of this entire report) with the trip economics from "volunteer" vessels that fill out the economic section on the logbook report in spite of not being required to.

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<sup>7</sup>The evaluation is facilitated by the use of a standardized 6-page "diagnostic results" product that we can quickly generate for any SOI.



## SOI: 2016 SAT King Mackerel Fishery: All Gears

**Description:** This SOI consists of all logbook trips by permitted vessels where at least one pound of king mackerel from U.S. South Atlantic waters was landed in 2016 using any type of gear. For important **disclaimer**, see page 14.

### Trip-Level Summary

#### Effort

Trips	10,636
Vessels	640
Days at Sea	11,594
Crew Days	17,437

#### Landings (gutted lbs)

<u>Total</u>	3,272,336
SOI	2,327,948
Non-SOI	944,388
% SOI	71%

#### Percent by Gear

	Trips	SOI lbs
Vertical Line	45%	41%
Trolling	53%	56%
Gill Net	2%	3%
Other	0.5%	0%

#### Price (mean)

<u>Total</u>	\$2.16
SOI	\$2.23
Non-SOI	\$1.99

#### Revenue

<u>Total</u>	\$7,057,116
SOI	\$5,180,151
Non-SOI	\$1,876,964
% SOI	73%

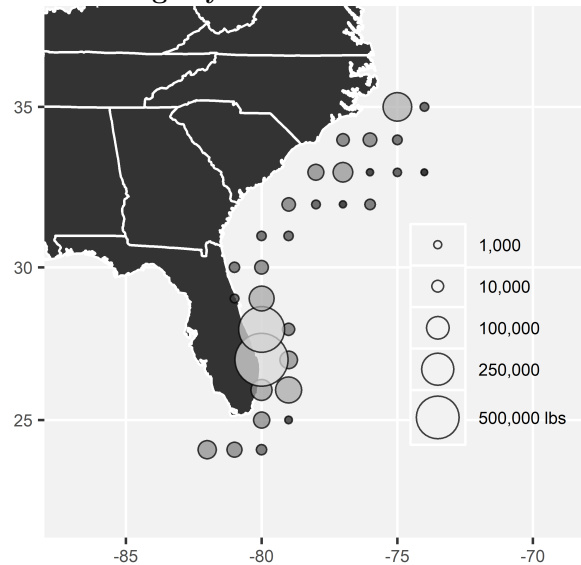
#### Percent of Revenue by Species Group

King and Cero Mackerel	73%
Spanish Mackerel	2%
Dolphinfish/Cobia/Jacks	5%
Shallow Water Snappers/Groupers	7%
Mid-Shelf Snappers	5%
Deep Water Groupers/Tilefish	2%
Grunt/Porgy/Sea Bass/Trigger	2%
Other Species	4%

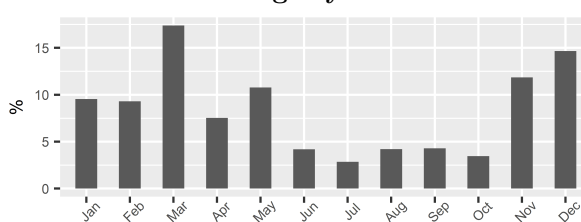
#### Revenue for Top 5 Species

King and Cero Mackerel	\$5,180,660
Vermilion Snapper	\$324,640
Yellowtail Snapper	\$182,618
Little Tunny	\$121,233
Gag Grouper	\$118,957

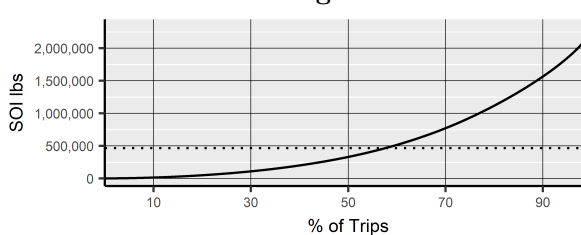
### SOI Landings by Area Fished



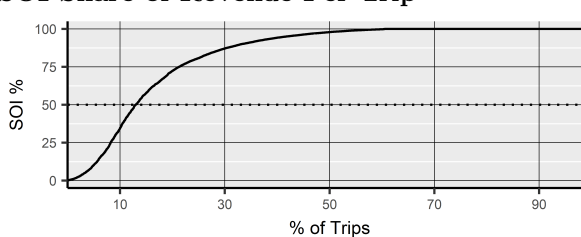
### Share of SOI Landings by Month



### Cumulative SOI Landings



### SOI Share of Revenue Per Trip



### Trip Descriptive Statistics (N=10,636)

	Mean	Min	Median	Max
Days at Sea	1.1	1	1	10
Crew Size	1.4	1	1	6
Landings	308	4	208	19,719
Revenue	\$664	\$9	\$428	\$44,648
SOI	\$487	\$2	\$325	\$44,648
% SOI	84%	0.1%	97.9%	100%



## SOI: 2016 SAT King Mackerel Fishery: All Gears

### Trip-Level Economics

#### Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	10,636	-	-	-
Selected	2,735	26%	-	-
Responded	2,669	25%	98%	-
Used	2,630	25%	96%	99%

#### Economic Results (n=2,630)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Trip</b>					
Owner-Operated	86%	2.6	82%	90%	-
Days at Sea	1.1	0.1	0.9	1.3	1
Crew Size	1.4	0.1	1.3	1.5	1
Fuel Used	32	4	24	39	25
Landings (gutted lbs)	279	29	230	328	188
<b>Total Revenue</b>	660	102	491	830	443
<b>Cost</b>					
Fuel	73	9	59	87	60
Bait	22	14	-1	45	10
Ice	11	3	6	16	0
Groceries	18	7	6	30	10
Miscellaneous	18	9	3	33	6
Hired Crew	111	47	34	188	0
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	203	20	170	236	133
<b>Trip Net Cash Flow*</b>	407	39	342	471	269
<b>Trip Net Revenue*</b>	204	27	159	249	131

#### Trip Net Cash Flow\* and Trip Net Revenue\* as Proportion of Trip Revenue (Margins)

Revenue 100%	Trip Net Cash Flow* 62%	Trip Net Revenue* 31%
		Labor - Hired & Owner 48%
	Labor - Hired 17%	Fuel & Supplies 22%
	Fuel & Supplies 22%	

#### Input Prices

Fuel Price (average): \$2.32 per gallon

Hired Crew Wage (implicit): \$198 per crew-day

#### Productivity Measures

Landings/Fuel Use: 8.8 lbs/gallon

Landings/Labor Use: 185 lbs/crew-day

\* See Definitions in Methods Section or Glossary.

# SOI: 2016 SAT King Mackerel Fishery: All Gears

## Annual, Vessel-Level Summary

### Effort

Vessels	640
<u>Trips - Total</u>	<u>19,609</u>
SOI Trips	10,636
Non-SOI Trips	8,973
Days at Sea	24,310
Crew Days	42,371

### Landings (gutted lbs)

<u>Total</u>	<u>8,844,813</u>
SOI	2,327,948
Non-SOI	6,516,865
% SOI	26%

### Percent by Gear

Vertical Line	56%
Trolling	34%
Gill Net	5%
Longline	1%
Other	3%

### Price (mean)

<u>Total</u>	<u>\$2.23</u>
SOI	\$2.23
Non-SOI	\$2.23

### Revenue

<u>Total</u>	<u>\$19,731,750</u>
SOI	\$5,180,151
Non-SOI	\$14,551,599
% SOI	26%

### Percent of Revenue by Species Group

King and Cero Mackerel	36%
Spanish Mackerel	7%
Dolphinfish/Cobia/Jacks	9%
Shallow Water Snappers/Groupers	19%
Mid-Shelf Snappers	9%
Deep Water Groupers/Tilefish	8%
Grun/Porgy/Sea Bass/Trigger	5%
Other Species	6%

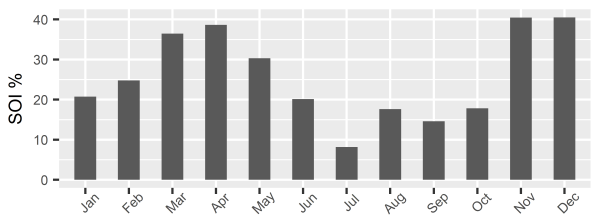
### Revenue for Top 5 Species

King and Cero Mackerel	\$7,111,001
Yellowtail Snapper	\$2,040,891
Vermilion Snapper	\$1,685,038
Spanish Mackerel	\$1,446,994
Greater Amberjack	\$908,954

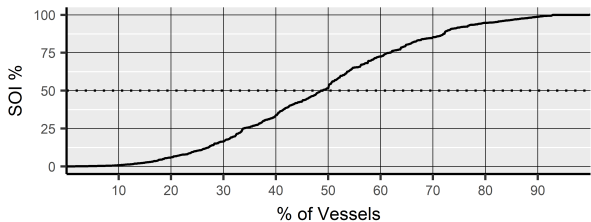
### Annual, Vessel Descriptive Statistics (N=640)

	Mean	Min	Median	Max
Trips	30.6	1	20	215
Days at Sea	38	1	23	215
Crew Days	66.2	1	37	522
Landings	13,820	10	5,079	210,425
Revenue	\$30,831	\$23	\$11,096	\$269,622
SOI	\$8,094	\$11	\$3,057	\$68,971
% SOI	51.5%	0%	52.8%	100%

### SOI Share of Monthly Landings



### SOI Share of Revenue Per Vessel



### Percent with Federal Permit

King Mackerel	100%
Spanish Mackerel	86%
Dolphin-Wahoo	95%
GOM Reef Fish	5%
SAT Snapper & Grouper - Unlimited	36%
SAT Snapper & Grouper - Limited	5%
Other Commercial Fishing	26%
For-Hire Fishing	32%

### Vessel Characteristics (N=640)

	Mean	Min	Median	Max
Length	31	17	29	64
Year Built	1989	1948	1988	2016
Horsepower	360	60	300	1,200
Fiberglass Hull	97%	-	-	-
Diesel Engine	55%	-	-	-
Ice Refrigeration	94%	-	-	-

## SOI: 2016 SAT King Mackerel Fishery: All Gears

### Annual, Vessel-Level Economics

#### Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	640	-	-	-
Selected	162	25%	-	-
Responded	126	20%	78%	-
Used	114	18%	70%	90%

#### Economic Results (n=114)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Vessel</b>					
Owner-Operated	89%	2.8	84%	94%	-
For-Hire Active	19%	3.6	13%	25%	-
Days - Commercial Fishing	66	5.6	57	76	46
Days - For-Hire Fishing	14	3.1	9	19	0
Days - Non-fishing	3	0.8	2	5	0
Vessel Value	67,382	6,880	55,971	78,793	50,000
Has Insurance	43%	4.5	36%	51%	-
<b>Total Revenue</b>	50,153	5,397	41,201	59,104	29,232
Commercial Fishing	37,169	4,116	30,342	43,997	19,420
For-Hire Fishing	12,983	3,657	6,916	19,050	0
<b>Cost</b>					
Fuel	5,846	522	4,981	6,711	3,599
Other Supplies	6,235	784	4,934	7,536	2,250
Hired Crew	11,473	2,065	8,048	14,897	0
Vessel Repair & Maintenance	7,525	874	6,075	8,975	4,825
Insurance	1,006	186	698	1,315	0
Overhead	4,767	615	3,747	5,786	2,821
Loan Payment	2,773	894	1,291	4,256	0
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	8,033	832	6,653	9,413	3,217
Depreciation	3,369	344	2,799	3,940	2,500
<b>Net Cash Flow</b>	10,528	1,875	7,417	13,638	6,522
<b>Net Revenue from Operations*</b>	1,899	1,913	-1,275	5,073	-805

#### Net Cash Flow and Net Revenue from Operations\* as Proportion of Vessel Revenue (Margins)

Revenue 100%	Net Cash Flow 21%	Net Revenue - Operations 4%
		Depreciation 7%
	Loan Payment 6%	Vessel R&M, Insur, Overh 27%
	Vessel R&M, Insur, Overh 27%	
	Labor - Hired 23%	Labor - Hired & Owner 39%
	Fuel & Supplies 24%	Fuel & Supplies 24%

#### Economic Return\* (on Vessel Asset Value): 2.8%

\* Accruing to vessel owner AND IFQ shareholder. See Definitions.

## SOI: 2016 SAT King Mackerel Fishery: All Gears

### Trip-Level Time Series

#### Trip-Level Summary

	2014	2015	2016	Average
<b>Effort</b>				
Trips	9,684	9,718	10,636	10,013
Vessels	662	647	640	650
Days at Sea	10,565	10,609	11,594	10,923
<b>Landings (gutted lbs)</b>				
<u>Total</u>	3,037,403	2,730,535	3,272,336	3,013,425
SOI	2,126,516	2,008,009	2,327,948	2,154,158
Non-SOI	910,888	722,527	944,388	859,268
% SOI	70%	74%	71%	72%
<b>Price (mean)</b>				
<u>Total</u>	\$2.29	\$2.19	\$2.16	\$2.21
SOI	\$2.39	\$2.21	\$2.23	\$2.28
Non-SOI	\$2.07	\$2.14	\$1.99	\$2.07
<b>Revenue</b>				
<u>Total</u>	\$6,961,414	\$5,985,839	\$7,057,116	\$6,668,123
SOI	\$5,074,917	\$4,440,291	\$5,180,151	\$4,898,453
Non-SOI	\$1,886,497	\$1,545,549	\$1,876,964	\$1,769,670
% SOI	73%	74%	73%	73%

#### Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	2,257	2,443	2,630	
Response Rate (%)	82%	86%	96%	
<b>SOI Trip</b>				
Owner-Operated	92%	92%	86%	90%
Fuel Used per Day at Sea (gallons/day)	29	31	29	30
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	15.6%	14.8%	11.1%	13.8%
Bait	2.7%	2.8%	3.3%	2.9%
Ice	1.1%	1%	1.7%	1.3%
Groceries	2.1%	2.4%	2.8%	2.4%
Miscellaneous	2.6%	2.9%	2.7%	2.7%
Hired Crew	18.6%	20.5%	16.8%	18.6%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	29.2%	29.1%	30.7%	29.7%
<b>Trip Net Cash Flow</b>	57.2%	55.6%	61.6%	58.1%
<b>Trip Net Revenue</b>	28%	26.5%	30.9%	28.5%
Labor - Hired & Owner	47.8%	49.7%	47.6%	48.4%
Fuel & Supplies	24.2%	23.8%	21.6%	23.2%
<b>Input Prices</b>				
Fuel Price (per gallon)	\$3.77	\$2.83	\$2.32	\$2.97
Hire Crew Wage (per crew-day)	\$267	\$219	\$198	\$228
<b>Productivity Measures</b>				
Landings/Fuel Use (lbs/gallon)	9.8	7.9	8.8	9
Landings/Labor Use (lbs/crew-day)	202	167	185	185

**SOI: 2016 SAT King Mackerel Fishery: All Gears**  
**Annual, Vessel-Level Time Series**

**Annual, Vessel-Level Summary**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>Average</b>
<b>Effort</b>				
Vessels	662	647	640	650
Trips - Total	20,344	18,743	19,609	19,565
SOI Trips	9,684	9,718	10,636	10,013
Non-SOI Trips	10,660	9,025	8,973	9,553
Days at Sea	26,120	23,861	24,310	24,764
<b>Landings (gutted lbs)</b>				
Total	9,806,156	8,319,704	8,844,813	8,990,224
SOI	2,126,516	2,008,009	2,327,948	2,154,158
Non-SOI	7,679,640	6,311,695	6,516,865	6,836,067
% SOI	22%	24%	26%	24%
<b>Revenue</b>				
Total	\$22,603,412	\$19,493,005	\$19,731,750	\$20,609,389
SOI	\$5,074,917	\$4,440,291	\$5,180,151	\$4,898,453
Non-SOI	\$17,528,495	\$15,052,714	\$14,551,599	\$15,710,936
% SOI	22%	23%	26%	24%
<b>Vessel Characteristics</b>				
Length	31	30	31	31
Year Built	1989	1990	1989	1989
For-Hire Fishing Permit	31%	28%	32%	30%

**Annual, Vessel-Level Economics**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>Average</b>
Number of Observations	102	134	114	
Response Rate (%)	58%	76%	70%	
<b>SOI Vessel</b>				
Owner-Operated	94%	92%	89%	92%
For-Hire Active	27%	12%	19%	19%
Vessel Value	\$61,226	\$59,835	\$67,382	\$62,814
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	18.8%	15.1%	11.7%	15.2%
Other Supplies	11.4%	12%	12.4%	11.9%
Hired Crew	17.2%	21.3%	22.9%	20.5%
Vessel Repair & Maintenance	14.7%	19%	15%	16.2%
Insurance	2.3%	2.1%	2%	2.1%
Overhead	9.4%	9.8%	9.5%	9.6%
Loan Payment	3.1%	2.5%	5.5%	3.7%
IFQ Purchase	0%	0.1%	0%	0%
OC Owner-Captain Time	16.8%	16.2%	16%	16.3%
<b>Net Cash Flow</b>	23%	18.1%	21%	20.7%
<b>Net Revenue for Operations*</b>	3.2%	-2.2%	3.8%	1.6%
Depreciation	6.2%	6.7%	6.7%	6.5%
Vessel R&M, Insur, Overh	26.4%	30.9%	26.5%	27.9%
Labor - Hired & Owner	34%	37.5%	38.9%	36.8%
Fuel & Supplies	30.2%	27.1%	24.1%	27.1%
<b>Economic Return* (on asset value)</b>	2.6%	-1.6%	2.8%	1.3%

## SOI: 2016 GOM King Mackerel Fishery: All Gears

**Description:** This SOI consists of all logbook trips by permitted vessels where at least one pound of king mackerel from Gulf of Mexico waters was landed in 2016 using any type of gear. For important **disclaimer**, see page 14.

### Trip-Level Summary

#### Effort

Trips	2,281
Vessels	249
Days at Sea	3,856
Crew Days	8,107

#### Landings (gutted lbs)

Total	2,839,539
SOI	2,300,536
Non-SOI	539,003
% SOI	81%

#### Percent by Gear

	Trips	SOI lbs
Vertical Line	49%	31%
Trolling	50%	51%
Gill Net	1%	18%
Other	0%	0%

#### Price (mean)

Total	\$2.43
SOI	\$2.18
Non-SOI	\$3.50

#### Revenue

Total	\$6,896,014
SOI	\$5,009,463
Non-SOI	\$1,886,551
% SOI	73%

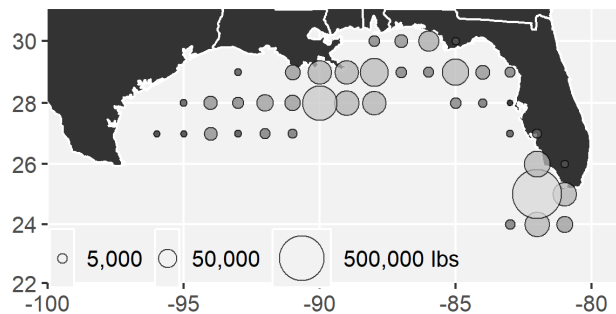
#### Percent of Revenue by Species Group

King and Cero Mackerel	73%
Spanish Mackerel	0.5%
Dolphinfish/Cobia/Jacks	1%
Shallow Water Snappers/Groupers	4%
Mid-Shelf Snappers	21%
Deep Water Groupers/Tilefish	0.4%
Grunut/Porgy/Sea Bass/Trigger	0.3%
Other Species	0.5%

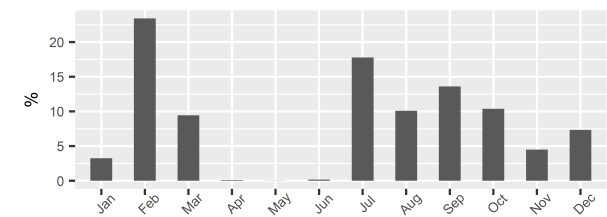
#### Revenue for Top 5 Species

King and Cero Mackerel	\$5,009,495
Red Snapper	\$1,184,470
Vermilion Snapper	\$244,053
Yellowtail Snapper	\$91,701
Gag Grouper	\$60,234

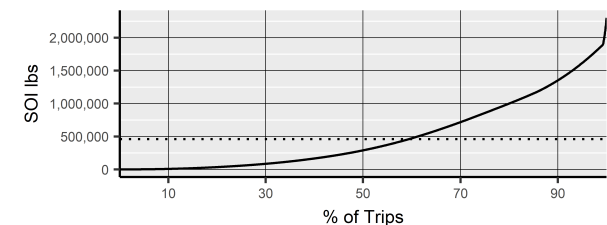
### SOI Landings by Area Fished



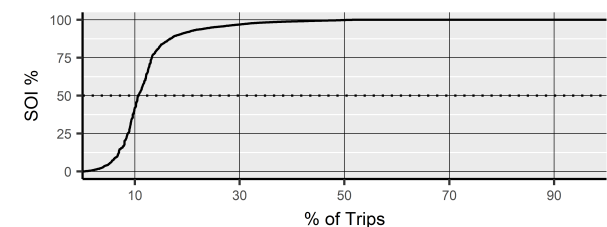
### Share of SOI Landings by Month



### Cumulative SOI Landings



### SOI Share of Revenue Per Trip



### Trip Descriptive Statistics (N=2,281)

	Mean	Min	Median	Max
Days at Sea	1.7	1	1	17
Crew Size	1.9	1	2	9
Landings	1,245	7	826	41,256
Revenue	\$3,023	\$15	\$1,816	\$93,412
SOI	\$2,196	\$2	\$1,424	\$93,412
% SOI	88%	0%	99.9%	100%

## SOI: 2016 GOM King Mackerel Fishery: All Gears

### Trip-Level Economics

#### Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	2,281	-	-	-
Selected	516	23%	-	-
Responded	516	23%	100%	-
Used	502	22%	97%	97%

#### Economic Results (n=502)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Trip</b>					
Owner-Operated	71%	5.1	63%	80%	-
Days at Sea	1.8	0.2	1.5	2.2	1
Crew Size	2	0.2	1.7	2.2	2
Fuel Used	100	15	75	125	65
Landings (gutted lbs)	1,565	434	841	2,289	760
<b>Total Revenue</b>	3,443	1,198	1,443	5,443	1,722
<b>Cost</b>					
Fuel	211	28	164	258	144
Bait	62	26	19	104	20
Ice	70	19	38	101	50
Groceries	75	18	45	105	40
Miscellaneous	89	51	4	173	20
Hired Crew	777	372	157	1,397	165
IFQ Purchase	186	308	-328	700	0
OC Owner-Captain Time	541	67	430	652	300
<b>Trip Net Cash Flow*</b>	1,975	762	703	3,247	851
<b>Trip Net Revenue*</b>	1,620	812	265	2,976	585

#### Trip Net Cash Flow\* and Trip Net Revenue\* as Proportion of Trip Revenue (Margins)

Revenue 100%	Trip Net Cash Flow* 57%	Trip Net Revenue* 47%
	IFQ Purchase 5%	Labor - Hired & Owner 38%
	Labor - Hired 23%	
	Fuel & Supplies 15%	Fuel & Supplies 15%

#### Input Prices

Fuel Price (average): \$2.11 per gallon

Hired Crew Wage (implicit): \$344 per crew-day

#### Productivity Measures

Landings/Fuel Use: 15.6 lbs/gallon

Landings/Labor Use: 440 lbs/crew-day

\* See Definitions in Methods Section or Glossary.

# SOI: 2016 GOM King Mackerel Fishery: All Gears

## Annual, Vessel-Level Summary

### Effort

Vessels	249
<u>Trips - Total</u>	<u>6,649</u>
SOI Trips	2,281
Non-SOI Trips	4,368
Days at Sea	13,444
Crew Days	34,215

### Landings (guttled lbs)

<u>Total</u>	<u>8,765,767</u>
SOI	2,300,536
Non-SOI	6,465,232
% SOI	26%

### Percent by Gear

	Trips	Total lbs
Vertical Line	67%	73%
Trolling	31%	17%
Gill Net	1%	7%
Longline	0.8%	3%
Other	0.3%	0.1%

### Price (mean)

<u>Total</u>	<u>\$3.14</u>
SOI	\$2.18
Non-SOI	\$3.48

### Revenue

<u>Total</u>	<u>\$27,516,257</u>
SOI	\$5,009,463
Non-SOI	\$22,506,794
% SOI	18%

### Percent of Revenue by Species Group

King and Cero Mackerel	22%
Spanish Mackerel	1%
Dolphinfish/Cobia/Jacks	3%
Shallow Water Snappers/Groupers	14%
Mid-Shelf Snappers	55%
Deep Water Groupers/Tilefish	3%
Grun/Porgy/Sea Bass/Trigger	0.9%
Other Species	0.6%

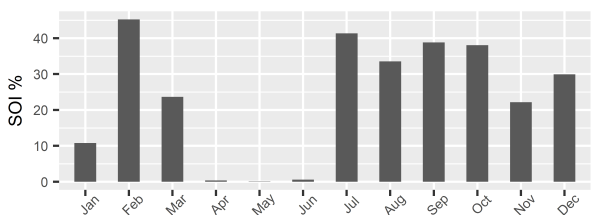
### Revenue for Top 5 Species

Red Snapper	\$12,405,667
King and Cero Mackerel	\$6,034,833
Vermilion Snapper	\$2,646,472
Yellowtail Snapper	\$1,351,295
Gag Grouper	\$909,737

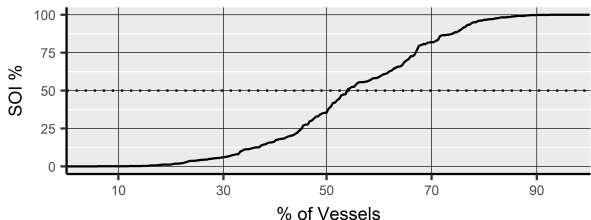
### Annual, Vessel Descriptive Statistics (N=249)

	Mean	Min	Median	Max
Trips	26.7	1	19	169
Days at Sea	54	1	39	245
Crew Days	137.4	1	68	1,470
Landings	35,204	18	19,450	448,815
Revenue	\$110,507	\$39	\$52,874	\$2,182,949
SOI	\$20,118	\$15	\$5,757	\$191,705
% SOI	45.4%	0%	38.3%	100%

### SOI Share of Monthly Landings



### SOI Share of Revenue Per Vessel



### Percent with Federal Permit

King Mackerel	100%
Spanish Mackerel	76%
Dolphin-Wahoo	56%
GOM Reef Fish	55%
SAT Snapper & Grouper - Unlimited	13%
SAT Snapper & Grouper - Limited	3%
Other Commercial Fishing	22%
For-Hire Fishing	24%

### Vessel Characteristics (N=249)

	Mean	Min	Median	Max
Length	36	21	34	69
Year Built	1987	1963	1985	2016
Horsepower	408	18	350	1,800
Fiberglass Hull	93%	-	-	-
Diesel Engine	71%	-	-	-
Ice Refrigeration	94%	-	-	-



## SOI: 2016 GOM King Mackerel Fishery: All Gears

### Annual, Vessel-Level Economics

#### Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	249	-	-	-
Selected	66	27%	-	-
Responded	55	22%	83%	-
Used	50	20%	76%	91%

#### Economic Results (n=50)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Vessel</b>					
Owner-Operated	66%	6.5	55%	77%	-
For-Hire Active	21%	5.6	12%	31%	-
Days - Commercial Fishing	81	8.5	67	95	45
Days - For-Hire Fishing	23	6.9	12	35	0
Days - Non-fishing	3	0.9	1	4	0
Vessel Value	107,437	14,134	83,732	131,143	75,000
Has Insurance	36%	6.6	25%	47%	-
<b>Total Revenue</b>	146,047	34,039	88,955	203,139	80,898
Commercial Fishing	123,060	33,669	66,589	179,530	55,000
For-Hire Fishing	22,987	7,860	9,804	36,170	0
<b>Cost</b>					
Fuel	10,400	1,573	7,761	13,039	7,500
Other Supplies	14,060	2,271	10,252	17,869	10,000
Hired Crew	33,779	7,854	20,607	46,952	11,492
Vessel Repair & Maintenance	12,578	2,273	8,765	16,391	7,000
Insurance	1,444	360	840	2,047	0
Overhead	5,945	962	4,332	7,559	4,000
Loan Payment	911	427	195	1,626	0
IFQ Purchase	9,588	2,604	5,220	13,956	0
OC Owner-Captain Time	7,579	1,346	5,321	9,836	1,900
Depreciation	5,372	707	4,187	6,557	3,750
<b>Net Cash Flow</b>	57,342	25,452	14,652	100,031	16,714
<b>Net Revenue from Operations*</b>	54,890	25,489	12,139	97,641	9,465

#### Net Cash Flow and Net Revenue from Operations\* as Proportion of Vessel Revenue (Margins)

Revenue 100%	Net Cash Flow 39%	Net Revenue - Operations 38%
	IFQ Purchase 7%	Depreciation 4%
	Loan Payment 0.6%	Vessel R&M, Insur, Overh 14%
	Vessel R&M, Insur, Overh 14%	Labor - Hired & Owner 28%
	Labor - Hired 23%	
	Fuel & Supplies 17%	Fuel & Supplies 17%

**Economic Return\* (on Vessel Asset Value): 51.1%**

\* Accruing to vessel owner AND IFQ shareholder. See Definitions.

## SOI: 2016 GOM King Mackerel Fishery: All Gears

### Trip-Level Time Series

#### Trip-Level Summary

	2014	2015	2016	Average
<b>Effort</b>				
Trips	2,596	2,119	2,281	2,332
Vessels	271	256	249	259
Days at Sea	4,670	3,850	3,856	4,125
<b>Landings (gutted lbs)</b>				
<u>Total</u>	3,240,044	2,812,157	2,839,539	2,963,913
SOI	2,501,850	2,183,050	2,300,536	2,328,479
Non-SOI	738,194	629,106	539,003	635,434
% SOI	77%	78%	81%	79%
<b>Price (mean)</b>				
<u>Total</u>	\$2.51	\$2.43	\$2.43	\$2.46
SOI	\$2.27	\$2.12	\$2.18	\$2.19
Non-SOI	\$3.33	\$3.49	\$3.50	\$3.44
<b>Revenue</b>				
<u>Total</u>	\$8,128,835	\$6,826,188	\$6,896,014	\$7,283,679
SOI	\$5,673,405	\$4,633,799	\$5,009,463	\$5,105,556
Non-SOI	\$2,455,430	\$2,192,388	\$1,886,551	\$2,178,123
% SOI	70%	68%	73%	70%

#### Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	554	414	502	
Response Rate (%)	83%	84%	97%	
<b>SOI Trip</b>				
Owner-Operated	88%	81%	71%	80%
Fuel Used per Day at Sea (gallons/day)	44	51	55	50
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	9.8%	6.1%	6.1%	7.3%
Bait	1.8%	2.2%	1.8%	1.9%
Ice	1.9%	1.8%	2%	1.9%
Groceries	2.4%	2.1%	2.2%	2.2%
Miscellaneous	2.5%	2.3%	2.6%	2.5%
Hired Crew	18%	25.6%	22.6%	22.1%
IFQ Purchase	5%	2.1%	5.4%	4.2%
OC Owner-Captain Time	23.3%	15%	15.7%	18%
<b>Trip Net Cash Flow</b>	58.5%	57.9%	57.4%	57.9%
<b>Trip Net Revenue</b>	40.2%	45%	47.1%	44.1%
Labor - Hired & Owner	41.3%	40.7%	38.3%	40.1%
Fuel & Supplies	18.5%	14.4%	14.7%	15.9%
<b>Input Prices</b>				
Fuel Price (per gallon)	\$3.50	\$2.40	\$2.11	\$2.67
Hire Crew Wage (per crew-day)	\$301	\$426	\$344	\$357
<b>Productivity Measures</b>				
Landings/Fuel Use (lbs/gallon)	14.9	15.6	15.6	15
Landings/Labor Use (lbs/crew-day)	360	394	440	398

**SOI: 2016 GOM King Mackerel Fishery: All Gears**  
**Annual, Vessel-Level Time Series**

**Annual, Vessel-Level Summary**

	2014	2015	2016	Average
<b>Effort</b>				
Vessels	271	256	249	259
Trips - Total	6,213	6,419	6,649	6,427
SOI Trips	2,596	2,119	2,281	2,332
Non-SOI Trips	3,617	4,300	4,368	4,095
Days at Sea	13,956	13,500	13,444	13,633
<b>Landings (gutted lbs)</b>				
Total	8,334,437	8,286,507	8,765,767	8,462,237
SOI	2,501,850	2,183,050	2,300,536	2,328,479
Non-SOI	5,832,587	6,103,457	6,465,232	6,133,759
% SOI	30%	26%	26%	27%
<b>Revenue</b>				
Total	\$25,216,500	\$25,480,706	\$27,516,257	\$26,071,154
SOI	\$5,673,405	\$4,633,799	\$5,009,463	\$5,105,556
Non-SOI	\$19,543,095	\$20,846,906	\$22,506,794	\$20,965,598
% SOI	22%	18%	18%	19%
<b>Vessel Characteristics</b>				
Length	36	36	36	36
Year Built	1986	1987	1987	1987
For-Hire Fishing Permit	27%	25%	24%	25%

**Annual, Vessel-Level Economics**

	2014	2015	2016	Average
Number of Observations	40	49	50	
Response Rate (%)	61%	71%	76%	
<b>SOI Vessel</b>				
Owner-Operated	78%	83%	66%	76%
For-Hire Active	18%	18%	21%	19%
Vessel Value	\$98,964	\$85,542	\$107,437	\$97,314
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	11.4%	7.8%	7.1%	8.8%
Other Supplies	8.2%	11.4%	9.6%	9.7%
Hired Crew	21.8%	33.2%	23.1%	26%
Vessel Repair & Maintenance	9%	10.1%	8.6%	9.2%
Insurance	0.6%	1.2%	1%	0.9%
Overhead	5.2%	7.7%	4.1%	5.7%
Loan Payment	1.8%	1.9%	0.6%	1.4%
IFQ Purchase	3.7%	7.8%	6.6%	6%
OC Owner-Captain Time	6.7%	9.2%	5.2%	7%
<b>Net Cash Flow</b>	38.2%	18.9%	39.3%	32.1%
<b>Net Revenue for Operations*</b>	33.8%	15.8%	37.6%	29.1%
Depreciation	3.2%	3.5%	3.7%	3.5%
Vessel R&M, Insur, Overh	14.9%	19%	13.7%	15.9%
Labor - Hired & Owner	28.5%	42.4%	28.3%	33.1%
Fuel & Supplies	19.6%	19.2%	16.7%	18.5%
<b>Economic Return* (on asset value)</b>	52.2%	22.3%	51.1%	41.9%

## SOI: 2016 SAT King Mackerel Fishery: Vertical Line

**Description:** This SOI consists of all logbook trips by permitted vessels where at least one pound of king mackerel from U.S. South Atlantic waters was landed in 2016 using Vertical Line gear type. For important **disclaimer**, see page 14.

### Trip-Level Summary

#### Effort

Trips	4,712
Vessels	375
Days at Sea	5,445
Crew Days	9,255

#### Landings (gutted lbs)

<u>Total</u>	1,516,509
SOI	954,957
Non-SOI	561,553
% SOI	63%

#### Percent by Gear

	Trips	SOI lbs
Vertical Line	100%	100%
Trolling	0%	0%
Gill Net	0%	0%
Other	0.4%	0%

#### Price (mean)

<u>Total</u>	\$2.32
SOI	\$2.24
Non-SOI	\$2.45

#### Revenue

<u>Total</u>	\$3,521,182
SOI	\$2,142,854
Non-SOI	\$1,378,328
% SOI	61%

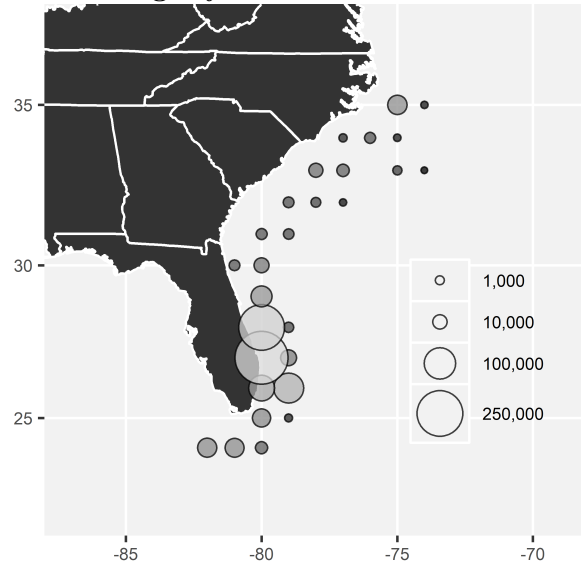
#### Percent of Revenue by Species Group

King and Cero Mackerel	61%
Spanish Mackerel	1%
Dolphinfish/Cobia/Jacks	7%
Shallow Water Snappers/Groupers	13%
Mid-Shelf Snappers	9%
Deep Water Groupers/Tilefish	2%
Grunt/Porgy/Sea Bass/Trigger	4%
Other Species	3%

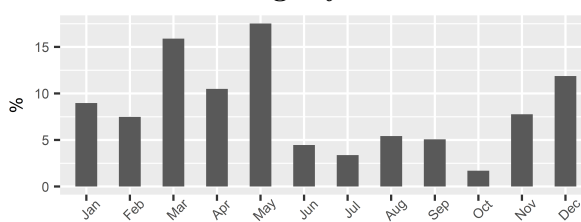
#### Revenue for Top 5 Species

King and Cero Mackerel	\$2,143,247
Vermilion Snapper	\$308,283
Yellowtail Snapper	\$181,549
Gag Grouper	\$110,256
Greater Amberjack	\$107,078

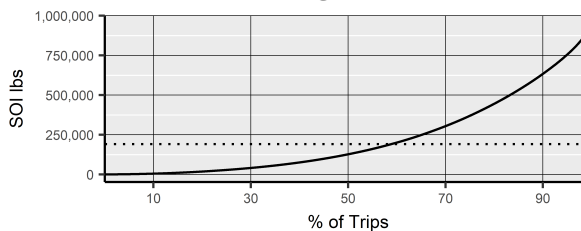
### SOI Landings by Area Fished



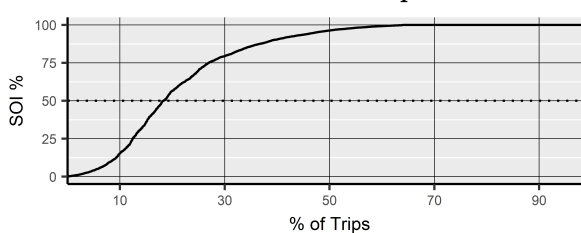
### Share of SOI Landings by Month



### Cumulative SOI Landings



### SOI Share of Revenue Per Trip



### Trip Descriptive Statistics (N=4,712)

	Mean	Min	Median	Max
Days at Sea	1.2	1	1	10
Crew Size	1.6	1	1	6
Landings	322	4	215	3,761
Revenue	\$747	\$9	\$439	\$13,435
SOI	\$455	\$6	\$295	\$4,897
% SOI	79%	0.1%	96.3%	100%

## SOI: 2016 SAT King Mackerel Fishery: Vertical Line

### Trip-Level Economics

#### Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	4,712	-	-	-
Selected	1,007	21%	-	-
Responded	958	20%	95%	-
Used	937	20%	93%	98%

#### Economic Results (n=937)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Trip</b>					
Owner-Operated	88%	3.4	82%	93%	-
Days at Sea	1.2	0.1	1	1.5	1
Crew Size	1.6	0.1	1.4	1.7	1
Fuel Used	38	8	24	51	20
Landings (gutted lbs)	316	42	246	386	196
<b>Total Revenue</b>	791	152	538	1,044	447
<b>Cost</b>					
Fuel	87	15	63	112	60
Bait	33	21	-3	68	10
Ice	15	5	6	23	0
Groceries	27	11	9	45	15
Miscellaneous	21	14	-3	45	0
Hired Crew	205	69	90	320	0
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	197	29	149	244	116
<b>Trip Net Cash Flow*</b>	404	56	310	498	238
<b>Trip Net Revenue*</b>	207	42	137	277	114

#### Trip Net Cash Flow\* and Trip Net Revenue\* as Proportion of Trip Revenue (Margins)

Revenue 100%	Trip Net Cash Flow* 51%	Trip Net Revenue* 26%
		Labor - Hired & Owner 51%
	Labor - Hired 26%	
	Fuel & Supplies 23%	Fuel & Supplies 23%

#### Input Prices

Fuel Price (average): \$2.33 per gallon

Hired Crew Wage (implicit): \$241 per crew-day

#### Productivity Measures

Landings/Fuel Use: 8.4 lbs/gallon

Landings/Labor Use: 165 lbs/crew-day

\* See Definitions in Methods Section or Glossary.

# SOI: 2016 SAT King Mackerel Fishery: Vertical Line

## Annual, Vessel-Level Summary

### Effort

Vessels	375
<u>Trips - Total</u>	<u>12,406</u>
SOI Trips	4,712
Non-SOI Trips	7,694
Days at Sea	16,274
Crew Days	30,618

### Landings (guttled lbs)

<u>Total</u>	<u>5,523,283</u>
SOI	954,957
Non-SOI	4,568,327
% SOI	17%

### Percent by Gear

Vertical Line	84%
Trolling	12%
Gill Net	0.8%
Longline	0.5%
Other	3%

### Price (mean)

<u>Total</u>	<u>\$2.43</u>
SOI	\$2.24
Non-SOI	\$2.46

### Revenue

<u>Total</u>	<u>\$13,402,702</u>
SOI	\$2,142,854
Non-SOI	\$11,259,848
% SOI	16%

### Percent of Revenue by Species Group

King and Cero Mackerel	26%
Spanish Mackerel	8%
Dolphinfish/Cobia/Jacks	11%
Shallow Water Snappers/Groupers	26%
Mid-Shelf Snappers	12%
Deep Water Groupers/Tilefish	9%
Grun/Porgy/Sea Bass/Trigger	5%
Other Species	4%

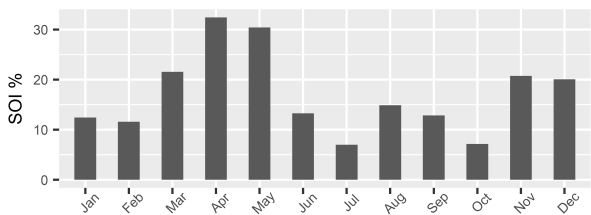
### Revenue for Top 5 Species

King and Cero Mackerel	\$3,433,542
Yellowtail Snapper	\$2,002,877
Vermilion Snapper	\$1,537,193
Spanish Mackerel	\$1,009,831
Tilefish	\$761,999

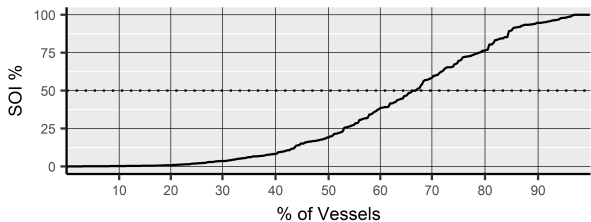
### Annual, Vessel Descriptive Statistics (N=375)

	Mean	Min	Median	Max
Trips	33.1	1	21	215
Days at Sea	43.4	1	27	215
Crew Days	81.6	1	45	496
Landings	14,729	27	6,236	210,425
Revenue	\$35,741	\$61	\$13,938	\$263,732
SOI	\$5,714	\$6	\$1,350	\$65,139
% SOI	35.5%	0%	19.3%	100%

### SOI Share of Monthly Landings



### SOI Share of Revenue Per Vessel



### Percent with Federal Permit

King Mackerel	100%
Spanish Mackerel	86%
Dolphin-Wahoo	95%
GOM Reef Fish	7%
SAT Snapper & Grouper - Unlimited	45%
SAT Snapper & Grouper - Limited	4%
Other Commercial Fishing	30%
For-Hire Fishing	31%

### Vessel Characteristics (N=375)

	Mean	Min	Median	Max
Length	31	19	28	64
Year Built	1990	1956	1988	2016
Horsepower	356	90	300	1,200
Fiberglass Hull	98%	-	-	-
Diesel Engine	50%	-	-	-
Ice Refrigeration	94%	-	-	-

## SOI: 2016 SAT King Mackerel Fishery: Vertical Line

### Annual, Vessel-Level Economics

#### Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	375	-	-	-
Selected	99	26%	-	-
Responded	77	21%	78%	-
Used	71	19%	72%	92%

#### Economic Results (n=71)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Vessel</b>					
Owner-Operated	94%	2.5	90%	99%	-
For-Hire Active	16%	4	9%	23%	-
Days - Commercial Fishing	74	7.1	62	86	45
Days - For-Hire Fishing	10	3.1	5	15	0
Days - Non-fishing	4	1.2	2	6	0
Vessel Value	73,629	6,915	62,100	85,158	50,000
Has Insurance	47%	5.4	38%	56%	-
<b>Total Revenue</b>	55,680	7,160	43,742	67,618	23,405
Commercial Fishing	45,917	6,181	35,612	56,223	20,000
For-Hire Fishing	9,762	3,610	3,743	15,782	0
<b>Cost</b>					
Fuel	6,407	704	5,234	7,580	3,402
Other Supplies	8,139	1,161	6,203	10,075	3,000
Hired Crew	14,939	3,042	9,867	20,012	600
Vessel Repair & Maintenance	7,295	923	5,757	8,834	5,000
Insurance	1,079	207	735	1,424	0
Overhead	5,371	927	3,825	6,916	2,218
Loan Payment	2,430	754	1,173	3,687	0
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	8,369	1,090	6,551	10,187	3,086
Depreciation	3,681	346	3,105	4,258	2,500
<b>Net Cash Flow</b>	10,020	2,497	5,856	14,183	4,730
<b>Net Revenue from Operations*</b>	399	2,169	-3,217	4,015	-1,693

#### Net Cash Flow and Net Revenue from Operations\* as Proportion of Vessel Revenue (Margins)

Revenue 100%	Net Cash Flow 18%	Net Revenue - Operations 0.7%
	Loan Payment 4%	Depreciation 7%
	Vessel R&M, Insur, Overh 25%	Vessel R&M, Insur, Overh 25%
	Labor - Hired 27%	Labor - Hired & Owner 42%
	Fuel & Supplies 26%	Fuel & Supplies 26%

**Economic Return\* (on Vessel Asset Value): 0.5%**

\* Accruing to vessel owner AND IFQ shareholder. See Definitions.

# SOI: 2016 SAT King Mackerel Fishery: Vertical Line

## Trip-Level Time Series

### Trip-Level Summary

	2014	2015	2016	Average
<b>Effort</b>				
Trips	4,609	4,435	4,712	4,585
Vessels	405	390	375	390
Days at Sea	5,261	5,124	5,445	5,277
<b>Landings (gutted lbs)</b>				
<u>Total</u>	<u>1,447,866</u>	<u>1,300,555</u>	<u>1,516,509</u>	<u>1,421,643</u>
SOI	924,733	829,741	954,957	903,144
Non-SOI	523,133	470,815	561,553	518,500
% SOI	64%	64%	63%	64%
<b>Price (mean)</b>				
<u>Total</u>	<u>\$2.45</u>	<u>\$2.34</u>	<u>\$2.32</u>	<u>\$2.37</u>
SOI	\$2.41	\$2.23	\$2.24	\$2.29
Non-SOI	\$2.54	\$2.52	\$2.45	\$2.5
<b>Revenue</b>				
<u>Total</u>	<u>\$3,554,569</u>	<u>\$3,039,016</u>	<u>\$3,521,182</u>	<u>\$3,371,589</u>
SOI	\$2,225,441	\$1,855,822	\$2,142,854	\$2,074,706
Non-SOI	\$1,329,127	\$1,183,195	\$1,378,328	\$1,296,883
% SOI	63%	61%	61%	62%

### Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	1,105	1,219	937	
Response Rate (%)	80%	85%	93%	
<b>SOI Trip</b>				
Owner-Operated	90%	90%	88%	89.3%
Fuel Used per Day at Sea (gallons/day)	27	32	31	30
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	15.1%	15.5%	11%	13.9%
Bait	3.2%	2.5%	4.1%	3.3%
Ice	1.1%	1.2%	1.8%	1.4%
Groceries	2.1%	2.5%	3.4%	2.7%
Miscellaneous	2.5%	2.3%	2.7%	2.5%
Hired Crew	23.4%	25%	25.9%	24.8%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	29.1%	27%	24.9%	27%
<b>Trip Net Cash Flow</b>	52.6%	51.1%	51%	51.6%
<b>Trip Net Revenue</b>	23.6%	24.1%	26.2%	24.6%
Labor - Hired & Owner	52.5%	52.1%	50.8%	51.8%
Fuel & Supplies	23.9%	23.9%	23.1%	23.6%
<b>Input Prices</b>				
Fuel Price (per gallon)	\$3.77	\$2.90	\$2.33	\$3.00
Hire Crew Wage (per crew-day)	\$249	\$238	\$241	\$243
<b>Productivity Measures</b>				
Landings/Fuel Use (lbs/gallon)	9.5	7.7	8.4	9
Landings/Labor Use (lbs/crew-day)	166	161	165	164



**SOI: 2016 SAT King Mackerel Fishery: Vertical Line**  
**Annual, Vessel-Level Time Series**

**Annual, Vessel-Level Summary**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>Average</b>
<b>Effort</b>				
Vessels	405	390	375	390
Trips - Total	13,922	12,798	12,406	13,042
SOI Trips	4,609	4,435	4,712	4,585
Non-SOI Trips	9,313	8,363	7,694	8,457
Days at Sea	18,636	17,169	16,274	17,360
<b>Landings (gutted lbs)</b>				
Total	6,508,821	5,473,242	5,523,283	5,835,115
SOI	924,733	829,741	954,957	903,144
Non-SOI	5,584,088	4,643,501	4,568,327	4,931,972
% SOI	14%	15%	17%	15%
<b>Revenue</b>				
Total	\$16,735,764	\$14,316,205	\$13,402,702	\$14,818,224
SOI	\$2,225,441	\$1,855,822	\$2,142,854	\$2,074,706
Non-SOI	\$14,510,323	\$12,460,384	\$11,259,848	\$12,743,518
% SOI	13%	13%	16%	14%
<b>Vessel Characteristics</b>				
Length	30	30	31	30
Year Built	1989	1989	1990	1989
For-Hire Fishing Permit	29%	28%	31%	29%

**Annual, Vessel-Level Economics**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>Average</b>
Number of Observations	62	86	71	
Response Rate (%)	56%	76%	72%	
<b>SOI Vessel</b>				
Owner-Operated	95%	91%	94%	93%
For-Hire Active	27%	14%	16%	19%
Vessel Value	\$58,148	\$63,640	\$73,629	\$65,139
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	17%	13.7%	11.5%	14.1%
Other Supplies	11.9%	12.6%	14.6%	13%
Hired Crew	18%	24.6%	26.8%	23.1%
Vessel Repair & Maintenance	12.9%	16.2%	13.1%	14.1%
Insurance	1.9%	1.8%	1.9%	1.9%
Overhead	9.8%	9.5%	9.6%	9.6%
Loan Payment	2.4%	3%	4.4%	3.3%
IFQ Purchase	0%	0.1%	0%	0%
OC Owner-Captain Time	16.4%	15.1%	15%	15.5%
<b>Net Cash Flow</b>	26.3%	18.4%	18%	20.9%
<b>Net Revenue for Operations*</b>	7%	1%	0.7%	2.9%
Depreciation	5.1%	5.5%	6.6%	5.7%
Vessel R&M, Insur, Overh	24.5%	27.5%	24.7%	25.6%
Labor - Hired & Owner	34.4%	39.7%	41.9%	38.7%
Fuel & Supplies	28.9%	26.3%	26.1%	27.1%
<b>Economic Return* (on asset value)</b>	6.9%	0.9%	0.5%	2.8%

## SOI: 2016 SAT King Mackerel Fishery: Trolling

**Description:** This SOI consists of all logbook trips by permitted vessels where at least one pound of king mackerel from U.S. South Atlantic waters was landed in 2016 using Trolling gear type. For important **disclaimer**, see page 14.

### Trip-Level Summary

#### Effort

Trips	5,685
Vessels	337
Days at Sea	5,901
Crew Days	7,659

#### Landings (gutted lbs)

<u>Total</u>	1,483,897
SOI	1,298,483
Non-SOI	185,414
% SOI	88%

#### Percent by Gear

	Trips	SOI lbs
Vertical Line	1%	0%
Trolling	99%	100%
Gill Net	0%	0%
Other	0.2%	0%

#### Price (mean)

<u>Total</u>	\$2.14
SOI	\$2.21
Non-SOI	\$1.61

#### Revenue

<u>Total</u>	\$3,173,676
SOI	\$2,875,391
Non-SOI	\$298,285
% SOI	91%

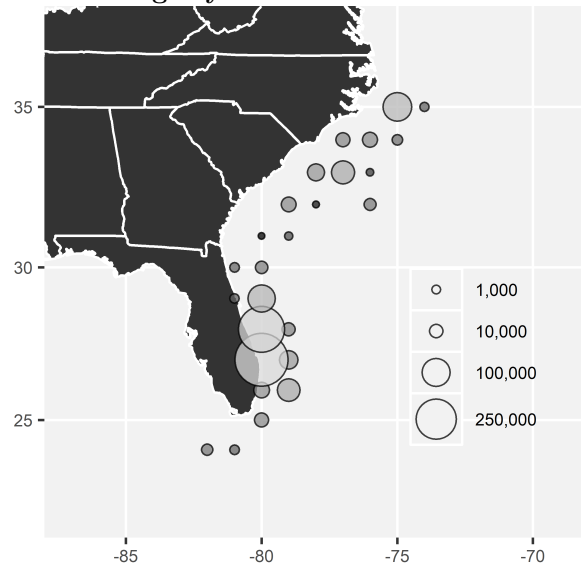
#### Percent of Revenue by Species Group

King and Cero Mackerel	91%
Spanish Mackerel	0.4%
Dolphinfish/Cobia/Jacks	3%
Shallow Water Snappers/Groupers	0.7%
Mid-Shelf Snappers	0.5%
Deep Water Groupers/Tilefish	1%
Grunt/Porgy/Sea Bass/Trigger	1%
Other Species	3%

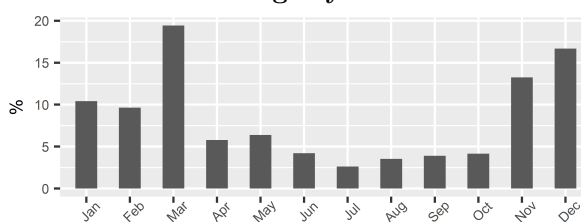
#### Revenue for Top 5 Species

King and Cero Mackerel	\$2,875,417
Little Tunny	\$44,490
Dolphinfish	\$29,442
Barracudas	\$27,534
Black Sea bass	\$24,681

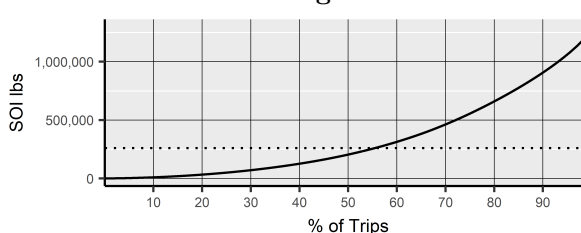
### SOI Landings by Area Fished



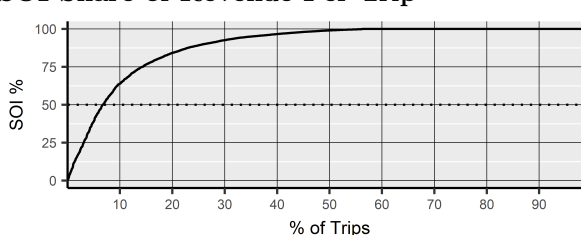
### Share of SOI Landings by Month



### Cumulative SOI Landings



### SOI Share of Revenue Per Trip



### Trip Descriptive Statistics (N=5,685)

	Mean	Min	Median	Max
Days at Sea	1	1	1	8
Crew Size	1.3	1	1	5
Landings	261	4	194	4,816
Revenue	\$558	\$9	\$405	\$20,535
SOI	\$506	\$2	\$365	\$7,265
% SOI	89%	0.1%	99%	100%

## SOI: 2016 SAT King Mackerel Fishery: Trolling

### Trip-Level Economics

#### Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	5,685	-	-	-
Selected	1,697	30%	-	-
Responded	1,680	30%	99%	-
Used	1,662	29%	98%	99%

#### Economic Results (n=1,662)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Trip</b>					
Owner-Operated	85%	3.7	78%	91%	-
Days at Sea	1	0.1	0.8	1.2	1
Crew Size	1.2	0.1	1.2	1.3	1
Fuel Used	28	4	21	34	25
Landings (gutted lbs)	245	49	163	326	175
<b>Total Revenue</b>	570	129	356	785	430
<b>Cost</b>					
Fuel	64	9	50	78	56
Bait	16	12	-4	35	10
Ice	9	3	3	15	0
Groceries	13	8	0	27	10
Miscellaneous	16	8	3	29	10
Hired Crew	53	61	-49	155	0
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	201	21	165	236	140
<b>Trip Net Cash Flow*</b>	399	44	327	471	277
<b>Trip Net Revenue*</b>	198	31	146	250	138

#### Trip Net Cash Flow\* and Trip Net Revenue\* as Proportion of Trip Revenue (Margins)

Revenue 100%	Trip Net Cash Flow* 70%	Trip Net Revenue* 35%
		Labor - Hired & Owner 44%
		Labor - Hired 9%
	Fuel & Supplies 21%	Fuel & Supplies 21%

#### Input Prices

Fuel Price (average): \$2.32 per gallon

Hired Crew Wage (implicit): \$128 per crew-day

#### Productivity Measures

Landings/Fuel Use: 8.8 lbs/gallon

Landings/Labor Use: 190 lbs/crew-day

\* See Definitions in Methods Section or Glossary.

# SOI: 2016 SAT King Mackerel Fishery: Trolling

## Annual, Vessel-Level Summary

### Effort

Vessels	337
<u>Trips - Total</u>	<u>10,095</u>
SOI Trips	5,685
Non-SOI Trips	4,410
Days at Sea	11,685
Crew Days	18,307

### Landings (gutted lbs)

<u>Total</u>	<u>4,294,015</u>
SOI	1,298,483
Non-SOI	2,995,532
% SOI	30%

### Percent by Gear

	Trips	Total lbs
Vertical Line	25%	27%
Trolling	66%	51%
Gill Net	5%	14%
Longline	2%	4%
Other	3%	3%

### Price (mean)

<u>Total</u>	<u>\$2.17</u>
SOI	\$2.21
Non-SOI	\$2.16

### Revenue

<u>Total</u>	<u>\$9,336,752</u>
SOI	\$2,875,391
Non-SOI	\$6,461,361
% SOI	31%

### Percent of Revenue by Species Group

King and Cero Mackerel	51%
Spanish Mackerel	4%
Dolphinfish/Cobia/Jacks	9%
Shallow Water Snappers/Groupers	7%
Mid-Shelf Snappers	6%
Deep Water Groupers/Tilefish	9%
Grunt/Porgy/Sea Bass/Trigger	5%
Other Species	8%

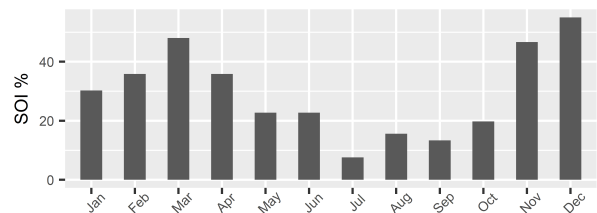
### Revenue for Top 5 Species

King and Cero Mackerel	\$4,734,029
Vermilion Snapper	\$504,348
Tilefish	\$427,648
Spanish Mackerel	\$418,107
Greater Amberjack	\$412,835

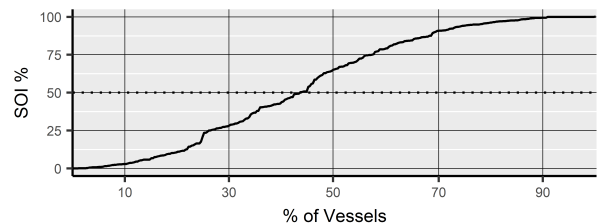
### Annual, Vessel Descriptive Statistics (N=337)

	Mean	Min	Median	Max
Trips	30	1	20	179
Days at Sea	34.7	1	23	185
Crew Days	54.3	1	33	522
Landings	12,742	10	4,566	210,425
Revenue	\$27,705	\$23	\$9,256	\$269,622
SOI	\$8,532	\$6	\$3,359	\$64,218
% SOI	56.9%	0%	65.4%	100%

### SOI Share of Monthly Landings



### SOI Share of Revenue Per Vessel



### Percent with Federal Permit

King Mackerel	100%
Spanish Mackerel	85%
Dolphin-Wahoo	96%
GOM Reef Fish	2%
SAT Snapper & Grouper - Unlimited	28%
SAT Snapper & Grouper - Limited	5%
Other Commercial Fishing	25%
For-Hire Fishing	35%

### Vessel Characteristics (N=337)

	Mean	Min	Median	Max
Length	30	17	30	54
Year Built	1989	1948	1988	2016
Horsepower	352	60	315	1,100
Fiberglass Hull	95%	-	-	-
Diesel Engine	60%	-	-	-
Ice Refrigeration	93%	-	-	-

## SOI: 2016 SAT King Mackerel Fishery: Trolling

### Annual, Vessel-Level Economics

#### Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	337	-	-	-
Selected	85	25%	-	-
Responded	69	20%	81%	-
Used	62	18%	73%	90%

#### Economic Results (n=62)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Vessel</b>					
Owner-Operated	87%	4.2	80%	94%	-
For-Hire Active	22%	5.1	13%	30%	-
Days - Commercial Fishing	64	7.1	52	76	50
Days - For-Hire Fishing	14	4.5	7	22	0
Days - Non-fishing	2	0.8	0	3	0
Vessel Value	61,993	7,070	50,178	73,808	50,000
Has Insurance	37%	5.9	27%	47%	-
<b>Total Revenue</b>	44,136	5,348	35,199	53,072	25,089
Commercial Fishing	33,087	3,962	26,466	39,709	16,207
For-Hire Fishing	11,048	3,741	4,797	17,300	0
<b>Cost</b>					
Fuel	5,093	511	4,239	5,946	3,599
Other Supplies	5,608	1,001	3,935	7,281	2,250
Hired Crew	9,199	2,115	5,664	12,734	0
Vessel Repair & Maintenance	7,013	976	5,382	8,645	4,500
Insurance	711	144	469	952	0
Overhead	4,015	469	3,232	4,799	3,000
Loan Payment	2,597	1,100	759	4,434	0
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	8,106	1,062	6,331	9,880	3,226
Depreciation	3,100	354	2,509	3,690	2,500
<b>Net Cash Flow</b>	9,900	2,412	5,869	13,931	8,446
<b>Net Revenue from Operations*</b>	1,291	2,489	-2,869	5,451	241

#### Net Cash Flow and Net Revenue from Operations\* as Proportion of Vessel Revenue (Margins)

Revenue 100%	Net Cash Flow 22%	Net Revenue - Operations 3%
		Depreciation 7%
	Loan Payment 6%	Vessel R&M, Insur, Overh 27%
	Vessel R&M, Insur, Overh 27%	
	Labor - Hired 21%	Labor - Hired & Owner 39%
	Fuel & Supplies 24%	Fuel & Supplies 24%

#### Economic Return\* (on Vessel Asset Value): 2.1%

\* Accruing to vessel owner AND IFQ shareholder. See Definitions.

## SOI: 2016 SAT King Mackerel Fishery: Trolling

### Trip-Level Time Series

#### Trip-Level Summary

	2014	2015	2016	Average
<b>Effort</b>				
Trips	4,777	5,155	5,685	5,206
Vessels	335	339	337	337
Days at Sea	4,993	5,348	5,901	5,414
<b>Landings (gutted lbs)</b>				
<u>Total</u>	<u>1,327,049</u>	<u>1,312,449</u>	<u>1,483,897</u>	<u>1,374,465</u>
SOI	1,107,619	1,132,378	1,298,483	1,179,493
Non-SOI	219,431	180,071	185,414	194,972
% SOI	83%	86%	88%	86%
<b>Price (mean)</b>				
<u>Total</u>	<u>\$2.24</u>	<u>\$2.12</u>	<u>\$2.14</u>	<u>\$2.17</u>
SOI	\$2.38	\$2.19	\$2.21	\$2.26
Non-SOI	\$1.55	\$1.65	\$1.61	\$1.6
<b>Revenue</b>				
<u>Total</u>	<u>\$2,974,104</u>	<u>\$2,780,788</u>	<u>\$3,173,676</u>	<u>\$2,976,189</u>
SOI	\$2,633,804	\$2,484,309	\$2,875,391	\$2,664,501
Non-SOI	\$340,300	\$296,479	\$298,285	\$311,688
% SOI	89%	89%	91%	90%

#### Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	1,111	1,210	1,662	
Response Rate (%)	83%	88%	98%	
<b>SOI Trip</b>				
Owner-Operated	90%	95%	85%	90%
Fuel Used per Day at Sea (gallons/day)	31	30	27	29
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	16.4%	14.4%	11.3%	14%
Bait	2.4%	3%	2.8%	2.7%
Ice	1.2%	0.8%	1.5%	1.2%
Groceries	2.2%	2.3%	2.4%	2.3%
Miscellaneous	2.7%	3.8%	2.8%	3.1%
Hired Crew	12.5%	14.6%	9.3%	12.1%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	29.9%	32%	35.2%	32.4%
<b>Trip Net Cash Flow</b>	62.7%	61.1%	70%	64.6%
<b>Trip Net Revenue</b>	32.7%	29.1%	34.8%	32.2%
Labor - Hired & Owner	42.4%	46.5%	44.5%	44.5%
Fuel & Supplies	24.9%	24.4%	20.7%	23.3%
<b>Input Prices</b>				
Fuel Price (per gallon)	\$3.76	\$2.70	\$2.32	\$2.93
Hire Crew Wage (per crew-day)	\$259	\$177	\$128	\$188
<b>Productivity Measures</b>				
Landings/Fuel Use (lbs/gallon)	9.5	7.8	8.8	9
Landings/Labor Use (lbs/crew-day)	237	165	190	197

**SOI: 2016 SAT King Mackerel Fishery: Trolling**  
**Annual, Vessel-Level Time Series**

**Annual, Vessel-Level Summary**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>Average</b>
<b>Effort</b>				
Vessels	335	339	337	337
Trips - Total	10,061	9,501	10,095	9,886
SOI Trips	4,777	5,155	5,685	5,206
Non-SOI Trips	5,284	4,346	4,410	4,680
Days at Sea	12,053	11,047	11,685	11,595
<b>Landings (gutted lbs)</b>				
Total	4,696,382	4,160,814	4,294,015	4,383,737
SOI	1,107,619	1,132,378	1,298,483	1,179,493
Non-SOI	3,588,764	3,028,436	2,995,532	3,204,244
% SOI	24%	27%	30%	27%
<b>Revenue</b>				
Total	\$9,685,080	\$8,838,920	\$9,336,752	\$9,286,917
SOI	\$2,633,804	\$2,484,309	\$2,875,391	\$2,664,501
Non-SOI	\$7,051,276	\$6,354,611	\$6,461,361	\$6,622,416
% SOI	27%	28%	31%	29%
<b>Vessel Characteristics</b>				
Length	31	30	30	30
Year Built	1988	1989	1989	1989
For-Hire Fishing Permit	33%	30%	35%	33%

**Annual, Vessel-Level Economics**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>Average</b>
Number of Observations	50	63	62	
Response Rate (%)	58%	81%	73%	
<b>SOI Vessel</b>				
Owner-Operated	93%	92%	87%	91%
For-Hire Active	30%	10%	22%	21%
Vessel Value	\$64,182	\$60,138	\$61,993	\$62,104
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	20.6%	16.6%	11.5%	16.2%
Other Supplies	10.8%	10.7%	12.7%	11.4%
Hired Crew	18.5%	19.1%	20.8%	19.5%
Vessel Repair & Maintenance	16.1%	19.8%	15.9%	17.3%
Insurance	2.7%	2.4%	1.6%	2.2%
Overhead	8.9%	9.5%	9.1%	9.2%
Loan Payment	3.3%	1.2%	5.9%	3.5%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	19.6%	19.7%	18.4%	19.2%
<b>Net Cash Flow</b>	19.1%	20.8%	22.4%	20.8%
<b>Net Revenue for Operations*</b>	-4.1%	-5.3%	2.9%	-2.2%
Depreciation	6.8%	7.6%	7%	7.1%
Vessel R&M, Insur, Overh	27.7%	31.6%	26.6%	28.6%
Labor - Hired & Owner	38.2%	38.8%	39.2%	38.7%
Fuel & Supplies	31.4%	27.3%	24.2%	27.6%
<b>Economic Return* (on asset value)</b>	-3%	-3.5%	2.1%	-1.5%

## SOI: 2016 GOM King Mackerel Fishery: Vertical Line

**Description:** This SOI consists of all logbook trips by permitted vessels where at least one pound of king mackerel from Gulf of Mexico waters was landed in 2016 using Vertical Line gear type. Due to small sample sizes, the economic results are quite variable and should be used carefully. For important **disclaimer**, see page 14.

### Trip-Level Summary

#### Effort

Trips	1,103
Vessels	159
Days at Sea	1,946
Crew Days	4,994

#### Landings (gutted lbs)

<u>Total</u>	1,187,070
SOI	709,540
Non-SOI	477,531
% SOI	60%

#### Percent by Gear

	Trips	SOI lbs
Vertical Line	100%	100%
Trolling	0.1%	0%
Gill Net	0%	0%
Other	0%	0%

#### Price (mean)

<u>Total</u>	\$2.78
SOI	\$2.16
Non-SOI	\$3.69

#### Revenue

<u>Total</u>	\$3,295,317
SOI	\$1,533,586
Non-SOI	\$1,761,731
% SOI	47%

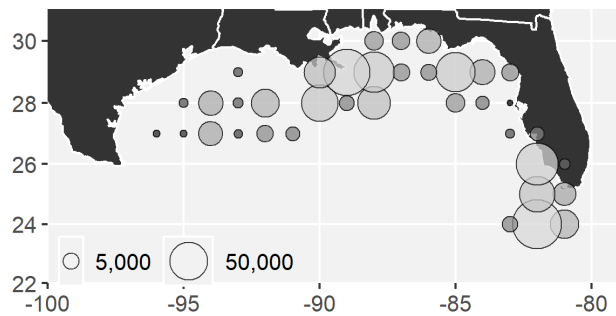
#### Percent of Revenue by Species Group

King and Cero Mackerel	47%
Spanish Mackerel	0.5%
Dolphinfish/Cobia/Jacks	2%
Shallow Water Snappers/Groupers	8%
Mid-Shelf Snappers	42%
Deep Water Groupers/Tilefish	0.2%
Grunt/Porgy/Sea Bass/Trigger	0.5%
Other Species	0.7%

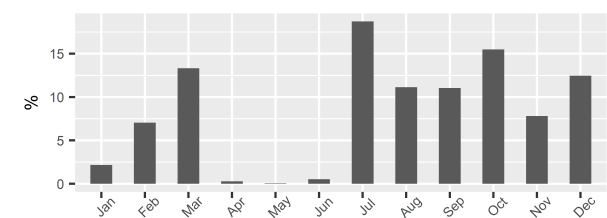
#### Revenue for Top 5 Species

King and Cero Mackerel	\$1,533,619
Red Snapper	\$1,136,197
Vermilion Snapper	\$238,869
Yellowtail Snapper	\$91,676
Gag Grouper	\$55,916

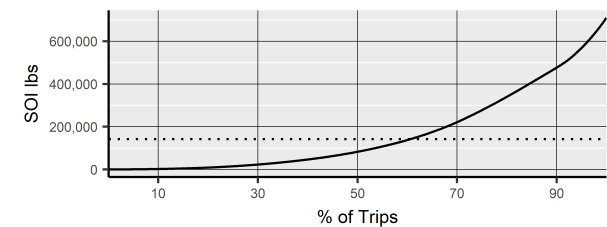
### SOI Landings by Area Fished



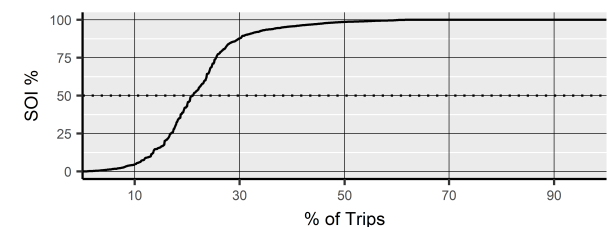
### Share of SOI Landings by Month



### Cumulative SOI Landings



### SOI Share of Revenue Per Trip



### Trip Descriptive Statistics (N=1,103)

	Mean	Min	Median	Max
Days at Sea	1.8	1	1	14
Crew Size	2.2	1	2	9
Landings	1,076	7	663	15,542
Revenue	\$2,988	\$15	\$1,521	\$68,481
SOI	\$1,390	\$2	\$869	\$6,551
% SOI	78%	0%	98.6%	100%



## SOI: 2016 GOM King Mackerel Fishery: Vertical Line

### Trip-Level Economics

#### Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	1,103	-	-	-
Selected	244	22%	-	-
Responded	244	22%	100%	-
Used	242	22%	99%	99%

#### Economic Results (n=242)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Trip</b>					
Owner-Operated	64%	7.7	51%	77%	-
Days at Sea	1.9	0.3	1.4	2.4	1
Crew Size	2.1	0.2	1.9	2.4	2
Fuel Used	111	19	79	143	95
Landings (gutted lbs)	1,133	337	565	1,701	705
<b>Total Revenue</b>	3,652	1,503	1,117	6,187	1,749
<b>Cost</b>					
Fuel	236	39	170	302	200
Bait	102	37	39	165	40
Ice	66	26	22	110	50
Groceries	78	25	36	120	40
Miscellaneous	87	74	-38	212	20
Hired Crew	854	377	218	1,490	300
IFQ Purchase	415	492	-415	1,245	0
OC Owner-Captain Time	424	90	273	575	190
<b>Trip Net Cash Flow*</b>	1,814	951	210	3,418	693
<b>Trip Net Revenue*</b>	1,805	1,054	27	3,584	557

#### Trip Net Cash Flow\* and Trip Net Revenue\* as Proportion of Trip Revenue (Margins)

Revenue 100%	Trip Net Cash Flow* 50%	Trip Net Revenue* 49%
	IFQ Purchase 11%	Labor - Hired & Owner 35%
	Labor - Hired 23%	
	Fuel & Supplies 16%	Fuel & Supplies 16%

#### Input Prices

Fuel Price (average): \$2.12 per gallon

Hired Crew Wage (implicit): \$300 per crew-day

#### Productivity Measures

Landings/Fuel Use: 10.2 lbs/gallon

Landings/Labor Use: 279 lbs/crew-day

\* See Definitions in Methods Section or Glossary.

# SOI: 2016 GOM King Mackerel Fishery: Vertical Line

## Annual, Vessel-Level Summary

### Effort

Vessels	159
<u>Trips - Total</u>	<u>3,872</u>
SOI Trips	1,103
Non-SOI Trips	2,769
Days at Sea	9,168
Crew Days	26,548

### Landings (guttled lbs)

<u>Total</u>	<u>5,956,834</u>
SOI	709,540
Non-SOI	5,247,295
% SOI	12%

### Percent by Gear

Vertical Line	94%
Trolling	5%
Gill Net	0.2%
Longline	0.4%
Other	0.4%

### Price (mean)

<u>Total</u>	<u>\$3.48</u>
SOI	\$2.16
Non-SOI	\$3.65

### Revenue

<u>Total</u>	<u>\$20,710,697</u>
SOI	\$1,533,586
Non-SOI	\$19,177,111
% SOI	7%

### Percent of Revenue by Species Group

King and Cero Mackerel	11%
Spanish Mackerel	0.5%
Dolphinfish/Cobia/Jacks	3%
Shallow Water Snappers/Groupers	15%
Mid-Shelf Snappers	67%
Deep Water Groupers/Tilefish	3%
Grun/Porgy/Sea Bass/Trigger	1%
Other Species	0.6%

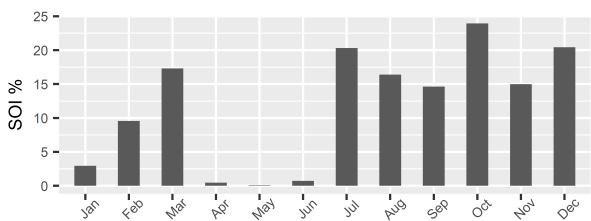
### Revenue for Top 5 Species

Red Snapper	\$11,223,781
Vermilion Snapper	\$2,536,940
King and Cero Mackerel	\$2,181,814
Yellowtail Snapper	\$1,236,879
Gag Grouper	\$812,022

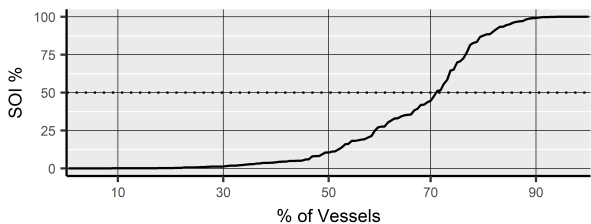
### Annual, Vessel Descriptive Statistics (N=159)

	Mean	Min	Median	Max
Trips	24.4	1	17	131
Days at Sea	57.7	1	41	245
Crew Days	167	1	78	1,470
Landings	37,464	25	17,142	448,815
Revenue	\$130,256	\$54	\$48,938	\$2,182,949
SOI	\$9,645	\$15	\$1,990	\$109,138
% SOI	32.9%	0%	10.5%	100%

### SOI Share of Monthly Landings



### SOI Share of Revenue Per Vessel



### Percent with Federal Permit

King Mackerel	100%
Spanish Mackerel	70%
Dolphin-Wahoo	51%
GOM Reef Fish	64%
SAT Snapper & Grouper - Unlimited	12%
SAT Snapper & Grouper - Limited	2%
Other Commercial Fishing	18%
For-Hire Fishing	27%

### Vessel Characteristics (N=159)

	Mean	Min	Median	Max
Length	36	21	34	69
Year Built	1988	1963	1986	2016
Horsepower	381	18	350	1,000
Fiberglass Hull	91%	-	-	-
Diesel Engine	64%	-	-	-
Ice Refrigeration	96%	-	-	-

## SOI: 2016 GOM King Mackerel Fishery: Vertical Line

### Annual, Vessel-Level Economics

#### Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	159	-	-	-
Selected	39	25%	-	-
Responded	34	21%	87%	-
Used	34	21%	87%	100%

#### Economic Results (n=34)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Vessel</b>					
Owner-Operated	56%	9.2	40%	72%	-
For-Hire Active	36%	9	21%	52%	-
Days - Commercial Fishing	75	7	63	87	40
Days - For-Hire Fishing	40	8.6	25	55	0
Days - Non-fishing	4	1.6	1	7	0
Vessel Value	107,086	20,056	73,113	141,059	75,000
Has Insurance	50%	9.3	34%	66%	-
<b>Total Revenue</b>	177,717	45,055	101,399	254,035	88,000
Commercial Fishing	137,655	43,019	64,785	210,524	40,404
For-Hire Fishing	40,062	12,007	19,723	60,402	0
<b>Cost</b>					
Fuel	11,743	2,567	7,395	16,092	8,556
Other Supplies	18,124	3,835	11,628	24,620	12,670
Hired Crew	41,534	10,185	24,281	58,787	20,320
Vessel Repair & Maintenance	14,798	3,845	8,285	21,311	8,000
Insurance	1,660	259	1,220	2,099	278
Overhead	7,305	1,566	4,652	9,957	4,800
Loan Payment	1,002	552	68	1,937	0
IFQ Purchase	12,652	3,325	7,020	18,284	0
OC Owner-Captain Time	6,447	1,475	3,949	8,945	1,232
Depreciation	5,354	1,003	3,656	7,053	3,750
<b>Net Cash Flow</b>	68,898	33,579	12,019	125,777	20,405
<b>Net Revenue from Operations*</b>	70,751	33,461	14,073	127,430	11,673

#### Net Cash Flow and Net Revenue from Operations\* as Proportion of Vessel Revenue (Margins)

Revenue 100%	Net Cash Flow 39%	Net Revenue - Operations 40%
	IFQ Purchase 7%	Depreciation 3%
	Loan Payment 0.6%	Vessel R&M, Insur, Overh 13%
	Vessel R&M, Insur, Overh 13%	Labor - Hired & Owner 27%
	Labor - Hired 23%	
	Fuel & Supplies 17%	Fuel & Supplies 17%

**Economic Return\* (on Vessel Asset Value): 66.1%**

\* Accruing to vessel owner AND IFQ shareholder. See Definitions.

## SOI: 2016 GOM King Mackerel Fishery: Vertical Line

### Trip-Level Time Series

#### Trip-Level Summary

	2014	2015	2016	Average
<b>Effort</b>				
Trips	1,370	1,019	1,103	1,164
Vessels	179	165	159	168
Days at Sea	2,706	2,088	1,946	2,247
<b>Landings (gutted lbs)</b>				
<u>Total</u>	<u>1,545,648</u>	<u>1,279,096</u>	<u>1,187,070</u>	<u>1,337,271</u>
SOI	894,976	695,029	709,540	766,515
Non-SOI	650,672	584,067	477,531	570,757
% SOI	58%	54%	60%	57%
<b>Price (mean)</b>				
<u>Total</u>	<u>\$2.73</u>	<u>\$2.76</u>	<u>\$2.78</u>	<u>\$2.76</u>
SOI	\$2.27	\$2.11	\$2.16	\$2.18
Non-SOI	\$3.35	\$3.55	\$3.69	\$3.53
<b>Revenue</b>				
<u>Total</u>	<u>\$4,215,186</u>	<u>\$3,534,780</u>	<u>\$3,295,317</u>	<u>\$3,681,761</u>
SOI	\$2,032,534	\$1,465,102	\$1,533,586	\$1,677,074
Non-SOI	\$2,182,652	\$2,069,678	\$1,761,731	\$2,004,687
% SOI	48%	41%	47%	45%

#### Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	231	286	242	
Response Rate (%)	76%	82%	99%	
<b>SOI Trip</b>				
Owner-Operated	86%	83%	64%	77.7%
Fuel Used per Day at Sea (gallons/day)	53	51	58	54
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	10.9%	8.2%	6.5%	8.5%
Bait	2.2%	3.7%	2.8%	2.9%
Ice	2.2%	2.2%	1.8%	2.1%
Groceries	2.5%	2.8%	2.1%	2.5%
Miscellaneous	2.8%	3.3%	2.4%	2.8%
Hired Crew	26.6%	27.1%	23.4%	25.7%
IFQ Purchase	9.9%	3.7%	11.4%	8.3%
OC Owner-Captain Time	19.8%	16.2%	11.6%	15.9%
<b>Trip Net Cash Flow</b>	42.8%	49%	49.7%	47.2%
<b>Trip Net Revenue</b>	33%	36.5%	49.4%	39.6%
Labor - Hired & Owner	46.3%	43.3%	35%	41.5%
Fuel & Supplies	20.7%	20.2%	15.6%	18.8%
<b>Input Prices</b>				
Fuel Price (per gallon)	\$3.51	\$2.50	\$2.12	\$2.71
Hire Crew Wage (per crew-day)	\$349	\$314	\$300	\$321
<b>Productivity Measures</b>				
Landings/Fuel Use (lbs/gallon)	12	10.5	10.2	11
Landings/Labor Use (lbs/crew-day)	296	245	279	273

**SOI: 2016 GOM King Mackerel Fishery: Vertical Line**  
**Annual, Vessel-Level Time Series**

**Annual, Vessel-Level Summary**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>Average</b>
<b>Effort</b>				
Vessels	179	165	159	168
Trips - Total	3,979	3,802	3,872	3,884
SOI Trips	1,370	1,019	1,103	1,164
Non-SOI Trips	2,609	2,783	2,769	2,720
Days at Sea	10,369	9,511	9,168	9,683
<b>Landings (gutted lbs)</b>				
Total	5,788,966	5,845,001	5,956,834	5,863,600
SOI	894,976	695,029	709,540	766,515
Non-SOI	4,893,990	5,149,972	5,247,295	5,097,086
% SOI	15%	12%	12%	13%
<b>Revenue</b>				
Total	\$18,836,010	\$19,548,973	\$20,710,697	\$19,698,560
SOI	\$2,032,534	\$1,465,102	\$1,533,586	\$1,677,074
Non-SOI	\$16,803,476	\$18,083,871	\$19,177,111	\$18,021,486
% SOI	11%	7%	7%	8%
<b>Vessel Characteristics</b>				
Length	36	36	36	36
Year Built	1987	1987	1988	1987
For-Hire Fishing Permit	30%	26%	27%	28%

**Annual, Vessel-Level Economics**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>Average</b>
Number of Observations	25	41	34	
Response Rate (%)	60%	73%	87%	
<b>SOI Vessel</b>				
Owner-Operated	73%	85%	56%	71%
For-Hire Active	26%	21%	36%	28%
Vessel Value	\$115,698	\$80,938	\$107,086	\$101,241
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	10.4%	7.8%	6.6%	8.3%
Other Supplies	7.8%	12.5%	10.2%	10.2%
Hired Crew	23.8%	32.2%	23.4%	26.5%
Vessel Repair & Maintenance	8.9%	10.5%	8.3%	9.2%
Insurance	0.5%	1%	0.9%	0.8%
Overhead	4.3%	6.2%	4.1%	4.9%
Loan Payment	1.6%	2.2%	0.6%	1.5%
IFQ Purchase	4.2%	9.4%	7.1%	6.9%
OC Owner-Captain Time	4.2%	9.2%	3.6%	5.7%
<b>Net Cash Flow</b>	38.4%	18.1%	38.8%	31.8%
<b>Net Revenue for Operations*</b>	37.3%	17.3%	39.8%	31.5%
Depreciation	2.7%	3.1%	3%	2.9%
Vessel R&M, Insur, Overh	13.8%	17.8%	13.4%	15%
Labor - Hired & Owner	27.9%	41.4%	27%	32.1%
Fuel & Supplies	18.2%	20.4%	16.8%	18.5%
<b>Economic Return* (on asset value)</b>	68%	27.6%	66.1%	53.9%

## SOI: 2016 GOM King Mackerel Fishery: Trolling

**Description:** This SOI consists of all logbook trips by permitted vessels where at least one pound of king mackerel from Gulf of Mexico waters was landed in 2016 using Trolling gear type. Due to small sample sizes, the economic results are quite variable and should be used carefully. For important **disclaimer**, see page 14.

### Trip-Level Summary

#### Effort

Trips	1,155
Vessels	94
Days at Sea	1,864
Crew Days	2,834

#### Landings (gutted lbs)

<u>Total</u>	1,209,379
SOI	1,176,548
Non-SOI	32,831
% SOI	97%

#### Percent by Gear

	Trips	SOI lbs
Vertical Line	0.7%	0%
Trolling	99%	100%
Gill Net	0%	0%
Other	0%	0%

#### Price (mean)

<u>Total</u>	\$2.17
SOI	\$2.16
Non-SOI	\$2.50

#### Revenue

<u>Total</u>	\$2,619,673
SOI	\$2,537,481
Non-SOI	\$82,192
% SOI	97%

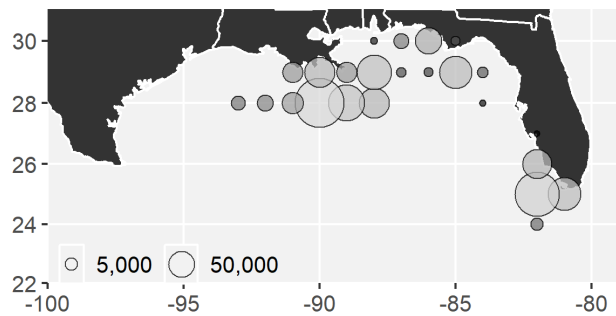
#### Percent of Revenue by Species Group

King and Cero Mackerel	97%
Spanish Mackerel	0.2%
Dolphinfish/Cobia/Jacks	0.5%
Shallow Water Snappers/Groupers	0.3%
Mid-Shelf Snappers	2%
Deep Water Groupers/Tilefish	0%
Grunt/Porgy/Sea Bass/Trigger	0%
Other Species	0.2%

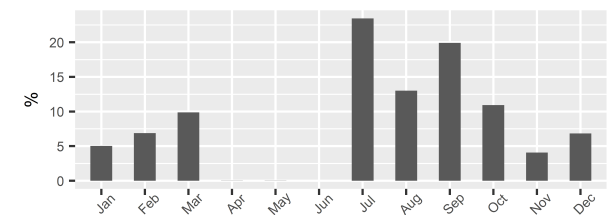
#### Revenue for Top 5 Species

King and Cero Mackerel	\$2,537,481
Red Snapper	\$42,901
Cobia	\$8,150
Spanish Mackerel	\$6,171
Vermilion Snapper	\$5,184

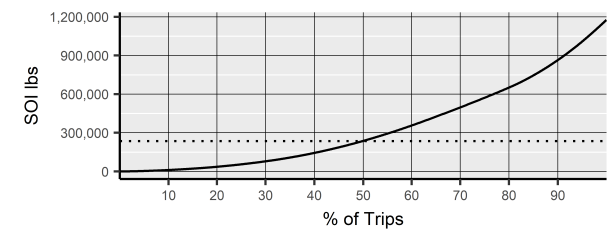
### SOI Landings by Area Fished



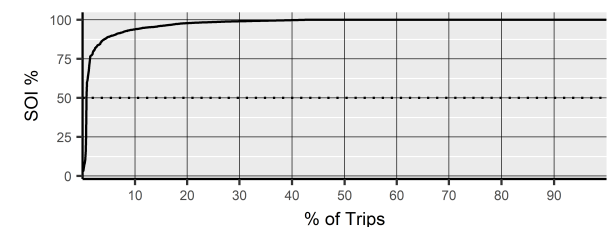
### Share of SOI Landings by Month



### Cumulative SOI Landings



### SOI Share of Revenue Per Trip



### Trip Descriptive Statistics (N=1,155)

	Mean	Min	Median	Max
Days at Sea	1.6	1	1	7
Crew Size	1.5	1	1	5
Landings	1,047	9	957	3,690
Revenue	\$2,268	\$19	\$2,089	\$16,865
SOI	\$2,197	\$19	\$2,020	\$8,331
% SOI	98%	2.9%	100%	100%

## SOI: 2016 GOM King Mackerel Fishery: Trolling

### Trip-Level Economics

#### Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	1,155	-	-	-
Selected	261	23%	-	-
Responded	261	23%	100%	-
Used	251	22%	96%	96%

#### Economic Results (n=251)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Trip</b>					
Owner-Operated	89%	5.5	80%	99%	-
Days at Sea	1.7	0.2	1.5	2	1
Crew Size	1.4	0.1	1.3	1.6	1
Fuel Used	66	8	53	79	50
Landings (gutted lbs)	962	92	804	1,120	744
<b>Total Revenue</b>	2,028	189	1,704	2,352	1,519
<b>Cost</b>					
Fuel	148	16	120	176	105
Bait	26	7	14	38	0
Ice	52	7	40	64	40
Groceries	58	9	43	72	40
Miscellaneous	74	26	30	118	20
Hired Crew	199	45	122	277	0
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	626	69	508	745	374
<b>Trip Net Cash Flow*</b>	1,470	146	1,221	1,719	998
<b>Trip Net Revenue*</b>	844	90	689	998	564

#### Trip Net Cash Flow\* and Trip Net Revenue\* as Proportion of Trip Revenue (Margins)

Revenue 100%	Trip Net Cash Flow* 72%	Trip Net Revenue* 42%
		Labor - Hired & Owner 41%
	Labor - Hired 10%	
	Fuel & Supplies 18%	Fuel & Supplies 18%

#### Input Prices

Fuel Price (average): \$2.25 per gallon

Hired Crew Wage (implicit): \$212 per crew-day

#### Productivity Measures

Landings/Fuel Use: 14.6 lbs/gallon

Landings/Labor Use: 384 lbs/crew-day

\* See Definitions in Methods Section or Glossary.

# SOI: 2016 GOM King Mackerel Fishery: Trolling

## Annual, Vessel-Level Summary

### Effort

Vessels	94
<u>Trips - Total</u>	<u>3,221</u>
SOI Trips	1,155
Non-SOI Trips	2,066
Days at Sea	4,763
Crew Days	7,909

### Landings (gutted lbs)

<u>Total</u>	<u>2,678,969</u>
SOI	1,176,548
Non-SOI	1,502,421
% SOI	44%

### Percent by Gear

	Trips	Total lbs
Vertical Line	36%	42%
Trolling	63%	56%
Gill Net	0.6%	0.5%
Longline	0.8%	1%
Other	0.1%	0%

### Price (mean)

<u>Total</u>	<u>\$2.57</u>
SOI	\$2.16
Non-SOI	\$2.90

### Revenue

<u>Total</u>	<u>\$6,887,254</u>
SOI	\$2,537,481
Non-SOI	\$4,349,773
% SOI	37%

### Percent of Revenue by Species Group

King and Cero Mackerel	50%
Spanish Mackerel	2%
Dolphinfish/Cobia/Jacks	4%
Shallow Water Snappers/Groupers	11%
Mid-Shelf Snappers	31%
Deep Water Groupers/Tilefish	1%
Grunt/Porgy/Sea Bass/Trigger	0.7%
Other Species	0.7%

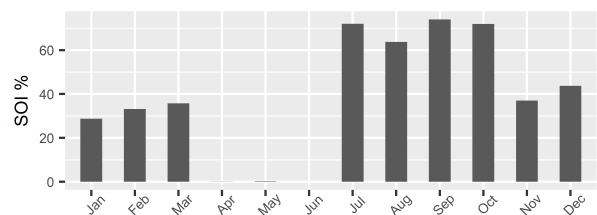
### Revenue for Top 5 Species

King and Cero Mackerel	\$3,445,243
Red Snapper	\$1,882,977
Red Grouper	\$413,128
Vermilion Snapper	\$253,549
Greater Amberjack	\$198,498

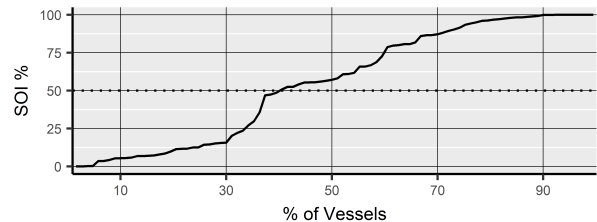
### Annual, Vessel Descriptive Statistics (N=94)

	Mean	Min	Median	Max
Trips	34.3	1	24	169
Days at Sea	50.7	1	41	169
Crew Days	84.1	2	63	453
Landings	28,500	18	22,787	199,082
Revenue	\$73,269	\$39	\$50,482	\$797,383
SOI	\$26,994	\$37	\$14,392	\$159,936
% SOI	55.3%	0%	57.7%	100%

### SOI Share of Monthly Landings



### SOI Share of Revenue Per Vessel



### Percent with Federal Permit

King Mackerel	100%
Spanish Mackerel	82%
Dolphin-Wahoo	64%
GOM Reef Fish	37%
SAT Snapper & Grouper - Unlimited	13%
SAT Snapper & Grouper - Limited	5%
Other Commercial Fishing	22%
For-Hire Fishing	18%

### Vessel Characteristics (N=94)

	Mean	Min	Median	Max
Length	33	22	32.5	57
Year Built	1985	1963	1984	2008
Horsepower	391	125	350	1,000
Fiberglass Hull	95%	-	-	-
Diesel Engine	81%	-	-	-
Ice Refrigeration	95%	-	-	-



## SOI: 2016 GOM King Mackerel Fishery: Trolling

### Annual, Vessel-Level Economics

#### Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	94	-	-	-
Selected	26	28%	-	-
Responded	21	22%	81%	-
Used	16	17%	62%	76%

#### Economic Results (n=16)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Vessel</b>					
Owner-Operated	93%	6.5	81%	104%	-
For-Hire Active	7%	6.5	-4%	19%	-
Days - Commercial Fishing	85	19.9	50	120	41
Days - For-Hire Fishing	8	7.5	-5	21	0
Days - Non-fishing	1	0.6	0	2	0
Vessel Value	87,521	27,048	39,880	135,161	35,000
Has Insurance	13%	8.5	-2%	28%	-
<b>Total Revenue</b>	44,671	8,350	29,964	59,378	35,842
Commercial Fishing	37,536	6,984	25,234	49,837	35,000
For-Hire Fishing	7,136	6,606	-4,500	18,771	0
<b>Cost</b>					
Fuel	7,082	2,085	3,410	10,753	3,383
Other Supplies	6,123	1,521	3,445	8,801	3,000
Hired Crew	2,660	985	926	4,395	0
Vessel Repair & Maintenance	6,504	1,808	3,320	9,688	3,901
Insurance	479	386	-200	1,159	0
Overhead	4,085	957	2,399	5,771	2,763
Loan Payment	957	465	138	1,776	0
IFQ Purchase	724	655	-429	1,877	0
OC Owner-Captain Time	9,848	2,509	5,429	14,268	4,436
Depreciation	4,376	1,352	1,994	6,758	1,750
<b>Net Cash Flow</b>	16,057	3,520	9,857	22,257	15,500
<b>Net Revenue from Operations*</b>	3,513	2,034	-70	7,096	2,910

#### Net Cash Flow and Net Revenue from Operations\* as Proportion of Vessel Revenue (Margins)

Revenue 100%	Net Cash Flow 36%	Net Revenue - Operations 8%
		Depreciation 10%
	IFQ Purchase 2%	Vessel R&M, Insur, Overh 25%
	Loan Payment 2%	
	Vessel R&M, Insur, Overh 25%	Labor - Hired & Owner 28%
	Labor - Hired 6%	
	Fuel & Supplies 30%	Fuel & Supplies 30%

#### Economic Return\* (on Vessel Asset Value): 4%

\* Accruing to vessel owner AND IFQ shareholder. See Definitions.

## SOI: 2016 GOM King Mackerel Fishery: Trolling

### Trip-Level Time Series

#### Trip-Level Summary

	2014	2015	2016	Average
<b>Effort</b>				
Trips	1,194	1,074	1,155	1,141
Vessels	103	99	94	99
Days at Sea	1,926	1,736	1,864	1,842
<b>Landings (gutted lbs)</b>				
<u>Total</u>	<u>1,255,158</u>	<u>1,149,074</u>	<u>1,209,379</u>	<u>1,204,537</u>
SOI	1,181,161	1,104,035	1,176,548	1,153,915
Non-SOI	73,996	45,040	32,831	50,622
% SOI	94%	96%	97%	96%
<b>Price (mean)</b>				
<u>Total</u>	<u>\$2.33</u>	<u>\$2.12</u>	<u>\$2.17</u>	<u>\$2.21</u>
SOI	\$2.26	\$2.09	\$2.16	\$2.17
Non-SOI	\$3.45	\$2.73	\$2.50	\$2.89
<b>Revenue</b>				
<u>Total</u>	<u>\$2,924,492</u>	<u>\$2,437,385</u>	<u>\$2,619,673</u>	<u>\$2,660,517</u>
SOI	\$2,669,171	\$2,314,674	\$2,537,481	\$2,507,109
Non-SOI	\$255,321	\$122,711	\$82,192	\$153,408
% SOI	91%	95%	97%	94%

#### Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	321	121	251	
Response Rate (%)	89%	92%	96%	
<b>SOI Trip</b>				
Owner-Operated	96%	79%	89%	88%
Fuel Used per Day at Sea (gallons/day)	36	39	38	38
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	9.1%	5.3%	7.3%	7.2%
Bait	1.6%	1.1%	1.3%	1.3%
Ice	1.9%	2%	2.6%	2.2%
Groceries	2.5%	1.9%	2.8%	2.4%
Miscellaneous	2.2%	1%	3.7%	2.3%
Hired Crew	7.3%	16.6%	9.8%	11.2%
IFQ Purchase	0%	1%	0%	0.3%
OC Owner-Captain Time	29.1%	29%	30.9%	29.7%
<b>Trip Net Cash Flow</b>	75.4%	71.1%	72.5%	73%
<b>Trip Net Revenue</b>	46.3%	43.1%	41.6%	43.7%
Labor - Hired & Owner	36.4%	45.6%	40.7%	40.9%
Fuel & Supplies	17.2%	11.3%	17.7%	15.4%
<b>Input Prices</b>				
Fuel Price (per gallon)	\$3.53	\$2.09	\$2.25	\$2.62
Hire Crew Wage (per crew-day)	\$240	\$406	\$212	\$286
<b>Productivity Measures</b>				
Landings/Fuel Use (lbs/gallon)	17.8	18.4	14.6	17
Landings/Labor Use (lbs/crew-day)	459	502	384	448

**SOI: 2016 GOM King Mackerel Fishery: Trolling**  
**Annual, Vessel-Level Time Series**

**Annual, Vessel-Level Summary**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>Average</b>
<b>Effort</b>				
Vessels	103	99	94	99
Trips - Total	2,850	3,144	3,221	3,072
SOI Trips	1,194	1,074	1,155	1,141
Non-SOI Trips	1,656	2,070	2,066	1,931
Days at Sea	4,676	4,936	4,763	4,792
<b>Landings (gutted lbs)</b>				
Total	2,711,126	2,611,277	2,678,969	2,667,124
SOI	1,181,161	1,104,035	1,176,548	1,153,915
Non-SOI	1,529,965	1,507,242	1,502,421	1,513,209
% SOI	44%	42%	44%	43%
<b>Revenue</b>				
Total	\$7,492,925	\$6,738,914	\$6,887,254	\$7,039,698
SOI	\$2,669,171	\$2,314,674	\$2,537,481	\$2,507,109
Non-SOI	\$4,823,754	\$4,424,240	\$4,349,773	\$4,532,589
% SOI	36%	34%	37%	36%
<b>Vessel Characteristics</b>				
Length	34	33	33	33
Year Built	1985	1986	1985	1985
For-Hire Fishing Permit	23%	22%	18%	21%

**Annual, Vessel-Level Economics**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>Average</b>
Number of Observations	17	13	16	
Response Rate (%)	63%	87%	62%	
<b>SOI Vessel</b>				
Owner-Operated	95%	85%	93%	91%
For-Hire Active	5%	8%	7%	7%
Vessel Value	\$64,728	\$84,228	\$87,521	\$78,826
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	16%	7.3%	15.9%	13.1%
Other Supplies	11.6%	8.7%	13.7%	11.3%
Hired Crew	10.5%	35.3%	6%	17.3%
Vessel Repair & Maintenance	10.5%	7.7%	14.6%	10.9%
Insurance	0.9%	1%	1.1%	1%
Overhead	11.9%	5.5%	9.1%	8.8%
Loan Payment	2.1%	0.5%	2.1%	1.6%
IFQ Purchase	1.6%	14.3%	1.6%	5.8%
OC Owner-Captain Time	21.9%	13.1%	22%	19%
<b>Net Cash Flow</b>	34.9%	19.8%	35.9%	30.2%
<b>Net Revenue for Operations*</b>	11.3%	18.6%	7.9%	12.6%
Depreciation	5.3%	2.9%	9.8%	6%
Vessel R&M, Insur, Overh	23.3%	14.1%	24.8%	20.7%
Labor - Hired & Owner	32.4%	48.4%	28%	36.3%
Fuel & Supplies	27.6%	16%	29.6%	24.4%
<b>Economic Return* (on asset value)</b>	10.6%	31.6%	4%	15.4%

## SOI: 2016 SAT Spanish Mackerel Fishery: All Gears

**Description:** This SOI consists of all logbook trips by permitted vessels where at least one pound of Spanish mackerel from U.S. South Atlantic waters was landed in 2016 using any type of gear. For important **disclaimer**, see page 14.

### Trip-Level Summary

#### Effort

Trips	3,712
Vessels	393
Days at Sea	3,883
Crew Days	6,254

#### Landings (gutted lbs)

Total	1,986,261
SOI	1,436,966
Non-SOI	549,295
% SOI	72%

#### Percent by Gear

	Trips	SOI lbs
Vertical Line	52%	55%
Trolling	17%	2%
Gill Net	26%	33%
Other	5%	10%

#### Price (mean)

Total	\$1.31
SOI	\$1.30
Non-SOI	\$1.35

#### Revenue

Total	\$2,605,868
SOI	\$1,863,537
Non-SOI	\$742,331
% SOI	72%

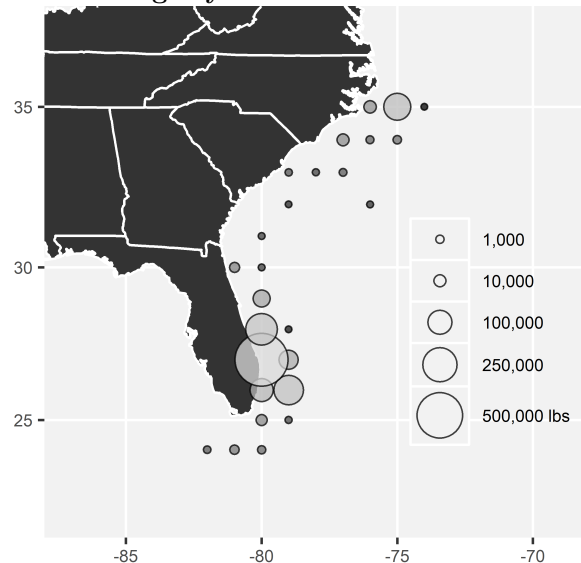
#### Percent of Revenue by Species Group

King and Cero Mackerel	14%
Spanish Mackerel	72%
Dolphinfish/Cobia/Jacks	3%
Shallow Water Snappers/Groupers	2%
Mid-Shelf Snappers	1%
Deep Water Groupers/Tilefish	0.4%
Grunt/Porgy/Sea Bass/Trigger	0.7%
Other Species	7%

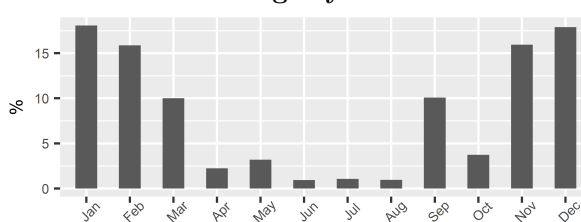
#### Revenue for Top 5 Species

Spanish Mackerel	\$1,863,537
King and Cero Mackerel	\$356,251
Bluefish	\$110,342
Blue Runner	\$30,062
Yellowtail Snapper	\$29,315

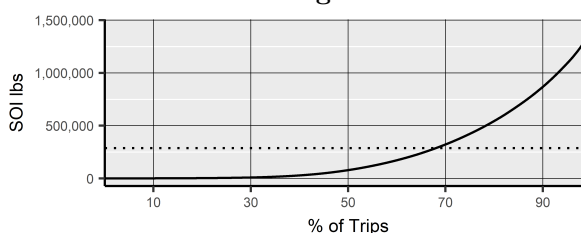
### SOI Landings by Area Fished



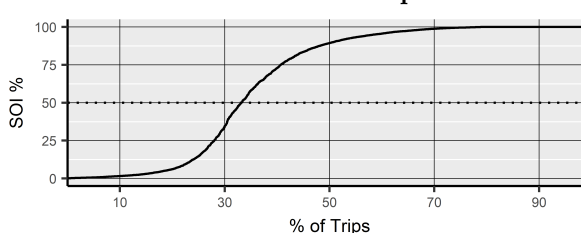
### Share of SOI Landings by Month



### Cumulative SOI Landings



### SOI Share of Revenue Per Trip



### Trip Descriptive Statistics (N=3,712)

	Mean	Min	Median	Max
Days at Sea	1	1	1	8
Crew Size	1.6	1	2	4
Landings	535	1	357	5,457
Revenue	\$702	\$1	\$512	\$8,033
SOI	\$502	\$1	\$260	\$5,778
% SOI	65%	0%	89.5%	100%

## SOI: 2016 SAT Spanish Mackerel Fishery: All Gears

### Trip-Level Economics

#### Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	3,712	-	-	-
Selected	701	19%	-	-
Responded	695	19%	99%	-
Used	648	17%	92%	93%

#### Economic Results (n=648)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Trip</b>					
Owner-Operated	91%	2.7	87%	96%	-
Days at Sea	1.1	0.1	0.9	1.2	1
Crew Size	1.6	0.1	1.5	1.7	2
Fuel Used	28	4	20	35	20
Landings (gutted lbs)	435	29	386	483	325
<b>Total Revenue</b>	653	89	505	801	514
<b>Cost</b>					
Fuel	65	9	50	79	50
Bait	22	8	8	35	0
Ice	8	2	4	12	0
Groceries	14	5	6	23	15
Miscellaneous	14	6	3	25	5
Hired Crew	136	38	73	199	31
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	208	17	180	237	164
<b>Trip Net Cash Flow*</b>	394	44	320	468	288
<b>Trip Net Revenue*</b>	186	31	134	238	121

#### Trip Net Cash Flow\* and Trip Net Revenue\* as Proportion of Trip Revenue (Margins)

Revenue 100%	Trip Net Cash Flow* 60%	Trip Net Revenue* 28%
		Labor - Hired & Owner 53%
	Labor - Hired 21%	
	Fuel & Supplies 19%	Fuel & Supplies 19%

#### Input Prices

Fuel Price (average): \$2.34 per gallon

Hired Crew Wage (implicit): \$179 per crew-day

#### Productivity Measures

Landings/Fuel Use: 15.8 lbs/gallon

Landings/Labor Use: 249 lbs/crew-day

\* See Definitions in Methods Section or Glossary.

# SOI: 2016 SAT Spanish Mackerel Fishery: All Gears

## Annual, Vessel-Level Summary

### Effort

Vessels	393
<u>Trips - Total</u>	<u>15,886</u>
SOI Trips	3,712
Non-SOI Trips	12,174
Days at Sea	17,776
Crew Days	28,859

### Landings (gutted lbs)

<u>Total</u>	<u>7,028,745</u>
SOI	1,436,966
Non-SOI	5,591,779
% SOI	20%

### Percent by Gear

Vertical Line	54%
Trolling	33%
Gill Net	9%
Longline	1%
Other	3%

### Price (mean)

<u>Total</u>	<u>\$1.94</u>
SOI	\$1.30
Non-SOI	\$2.10

### Revenue

<u>Total</u>	<u>\$13,626,995</u>
SOI	\$1,863,537
Non-SOI	\$11,763,457
% SOI	14%

### Percent of Revenue by Species Group

King and Cero Mackerel	41%
Spanish Mackerel	15%
Dolphinfish/Cobia/Jacks	8%
Shallow Water Snappers/Groupers	16%
Mid-Shelf Snappers	4%
Deep Water Groupers/Tilefish	7%
Grunt/Porgy/Sea Bass/Trigger	2%
Other Species	7%

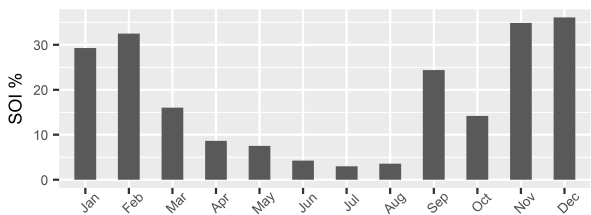
### Revenue for Top 5 Species

King and Cero Mackerel	\$5,574,883
Spanish Mackerel	\$1,990,849
Yellowtail Snapper	\$1,441,326
Vermilion Snapper	\$540,907
Greater Amberjack	\$441,258

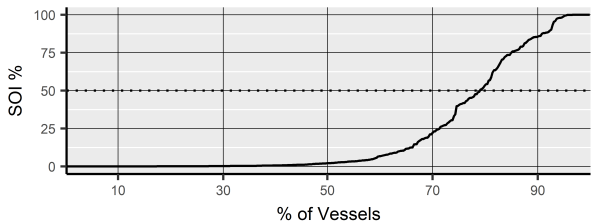
### Annual, Vessel Descriptive Statistics (N=393)

	Mean	Min	Median	Max
Trips	40.4	1	29	234
Days at Sea	45.2	1	33	234
Crew Days	73.4	1	49	522
Landings	17,885	16	8,212	210,425
Revenue	\$34,674	\$18	\$16,824	\$269,622
SOI	\$4,742	\$1	\$156	\$91,364
% SOI	22.6%	0%	2.1%	100%

### SOI Share of Monthly Landings



### SOI Share of Revenue Per Vessel



### Percent with Federal Permit

King Mackerel	86%
Spanish Mackerel	100%
Dolphin-Wahoo	92%
GOM Reef Fish	4%
SAT Snapper & Grouper - Unlimited	27%
SAT Snapper & Grouper - Limited	6%
Other Commercial Fishing	27%
For-Hire Fishing	26%

### Vessel Characteristics (N=393)

	Mean	Min	Median	Max
Length	29	17	28	48
Year Built	1989	1956	1987	2016
Horsepower	307	60	300	900
Fiberglass Hull	98%	-	-	-
Diesel Engine	49%	-	-	-
Ice Refrigeration	94%	-	-	-

## SOI: 2016 SAT Spanish Mackerel Fishery: All Gears

### Annual, Vessel-Level Economics

#### Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	393	-	-	-
Selected	94	24%	-	-
Responded	75	19%	80%	-
Used	67	17%	71%	89%

#### Economic Results (n=67)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Vessel</b>					
Owner-Operated	98%	1.7	95%	101%	-
For-Hire Active	13%	4	6%	20%	-
Days - Commercial Fishing	79	9.9	62	95	50
Days - For-Hire Fishing	7	3.1	2	12	0
Days - Non-fishing	2	0.9	1	4	0
Vessel Value	55,134	5,925	45,245	65,023	35,000
Has Insurance	29%	5.4	20%	38%	-
<b>Total Revenue</b>	35,893	3,812	29,531	42,256	22,904
Commercial Fishing	32,834	3,697	26,665	39,004	21,584
For-Hire Fishing	3,059	1,387	744	5,375	0
<b>Cost</b>					
Fuel	4,940	523	4,067	5,812	3,183
Other Supplies	5,099	690	3,948	6,250	2,142
Hired Crew	6,049	1,468	3,599	8,499	0
Vessel Repair & Maintenance	7,601	1,388	5,285	9,917	4,200
Insurance	445	111	260	630	0
Overhead	3,593	445	2,850	4,337	2,200
Loan Payment	1,257	457	494	2,020	0
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	9,473	1,055	7,713	11,233	5,455
Depreciation	2,757	296	2,262	3,251	1,750
<b>Net Cash Flow</b>	6,909	2,811	2,217	11,601	4,730
<b>Net Revenue from Operations*</b>	-4,063	2,379	-8,035	-92	-1,693

#### Net Cash Flow and Net Revenue from Operations\* as Proportion of Vessel Revenue (Margins)

Revenue 100%	Net Cash Flow 19%	Net Revenue - Operations -11.3%
	Loan Payment 4%	Depreciation 8%
	Vessel R&M, Insur, Overh 32%	Vessel R&M, Insur, Overh 32%
	Labor - Hired 17%	Labor - Hired & Owner 43%
	Fuel & Supplies 28%	Fuel & Supplies 28%

**Economic Return\* (on Vessel Asset Value): -7.4%**

\* Accruing to vessel owner AND IFQ shareholder. See Definitions.

# SOI: 2016 SAT Spanish Mackerel Fishery: All Gears

## Trip-Level Time Series

### Trip-Level Summary

	2014	2015	2016	Average
<b>Effort</b>				
Trips	4,698	3,575	3,712	3,995
Vessels	405	374	393	391
Days at Sea	4,902	3,743	3,883	4,176
<b>Landings (gutted lbs)</b>				
<u>Total</u>	2,064,158	1,570,647	1,986,261	1,873,689
SOI	1,478,115	1,141,870	1,436,966	1,352,317
Non-SOI	586,043	428,776	549,295	521,371
% SOI	72%	73%	72%	72%
<b>Price (mean)</b>				
<u>Total</u>	\$1.42	\$1.47	\$1.31	\$1.4
SOI	\$1.36	\$1.49	\$1.30	\$1.38
Non-SOI	\$1.57	\$1.42	\$1.35	\$1.45
<b>Revenue</b>				
<u>Total</u>	\$2,931,719	\$2,306,861	\$2,605,868	\$2,614,816
SOI	\$2,007,920	\$1,698,690	\$1,863,537	\$1,856,716
Non-SOI	\$923,799	\$608,170	\$742,331	\$758,100
% SOI	68%	74%	72%	71%

### Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	1,305	1,038	648	
Response Rate (%)	90%	81%	92%	
<b>SOI Trip</b>				
Owner-Operated	95%	94%	91%	93.3%
Fuel Used per Day at Sea (gallons/day)	20	21	25	22
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	12.2%	10%	9.9%	10.7%
Bait	1.9%	1%	3.3%	2.1%
Ice	1.2%	0.6%	1.3%	1%
Groceries	1.6%	1.6%	2.2%	1.8%
Miscellaneous	2.2%	1.8%	2.2%	2.1%
Hired Crew	29.1%	29.6%	20.8%	26.5%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	31%	33.9%	31.9%	32.3%
<b>Trip Net Cash Flow</b>	51.6%	55.4%	60.4%	55.8%
<b>Trip Net Revenue</b>	20.7%	21.5%	28.4%	23.5%
Labor - Hired & Owner	60.1%	63.4%	52.7%	58.7%
Fuel & Supplies	19.2%	15.1%	18.8%	17.7%
<b>Input Prices</b>				
Fuel Price (per gallon)	\$3.77	\$3.03	\$2.34	\$3.05
Hire Crew Wage (per crew-day)	\$277	\$228	\$179	\$228
<b>Productivity Measures</b>				
Landings/Fuel Use (lbs/gallon)	22.8	19.2	15.8	19
Landings/Labor Use (lbs/crew-day)	285	225	249	253



**SOI: 2016 SAT Spanish Mackerel Fishery: All Gears**  
**Annual, Vessel-Level Time Series**

**Annual, Vessel-Level Summary**

	2014	2015	2016	Average
<b>Effort</b>				
Vessels	405	374	393	391
Trips - Total	16,126	14,289	15,886	15,434
SOI Trips	4,698	3,575	3,712	3,995
Non-SOI Trips	11,428	10,714	12,174	11,439
Days at Sea	18,210	15,943	17,776	17,310
<b>Landings (gutted lbs)</b>				
Total	7,017,635	5,877,603	7,028,745	6,641,328
SOI	1,478,115	1,141,870	1,436,966	1,352,317
Non-SOI	5,539,520	4,735,732	5,591,779	5,289,010
% SOI	21%	19%	20%	20%
<b>Revenue</b>				
Total	\$13,413,294	\$11,448,553	\$13,626,995	\$12,829,614
SOI	\$2,007,920	\$1,698,690	\$1,863,537	\$1,856,716
Non-SOI	\$11,405,374	\$9,749,863	\$11,763,457	\$10,972,898
% SOI	15%	15%	14%	15%
<b>Vessel Characteristics</b>				
Length	29	29	29	29
Year Built	1988	1988	1989	1988
For-Hire Fishing Permit	22%	23%	26%	24%

**Annual, Vessel-Level Economics**

	2014	2015	2016	Average
Number of Observations	59	85	67	
Response Rate (%)	57%	73%	71%	
<b>SOI Vessel</b>				
Owner-Operated	96%	95%	98%	96%
For-Hire Active	16%	8%	13%	12%
Vessel Value	\$52,833	\$45,599	\$55,134	\$51,189
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	16.9%	14.8%	13.8%	15.2%
Other Supplies	12.6%	11.5%	14.2%	12.8%
Hired Crew	21.3%	19.3%	16.9%	19.2%
Vessel Repair & Maintenance	14.1%	17.2%	21.2%	17.5%
Insurance	1.7%	1.7%	1.2%	1.5%
Overhead	9.4%	10.4%	10%	9.9%
Loan Payment	1.9%	2.5%	3.5%	2.6%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	23.4%	24.2%	26.4%	24.7%
<b>Net Cash Flow</b>	22%	22.6%	19.2%	21.3%
<b>Net Revenue for Operations*</b>	-5%	-5.4%	-11.3%	-7.2%
Depreciation	5.5%	6.3%	7.7%	6.5%
Vessel R&M, Insur, Overh	25.3%	29.4%	32.4%	29%
Labor - Hired & Owner	44.7%	43.5%	43.2%	43.8%
Fuel & Supplies	29.5%	26.2%	28%	27.9%
<b>Economic Return* (on asset value)</b>	-4.5%	-4.3%	-7.4%	-5.4%

## SOI: 2016 GOM Spanish Mackerel Fishery: All Gears

**Description:** This SOI consists of all logbook trips by permitted vessels where at least one pound of Spanish mackerel from Gulf of Mexico waters was landed in 2016 using any gear type. Due to small sample sizes, the economic results are quite variable and should be used carefully. For important **disclaimer**, see page 14.

### Trip-Level Summary

#### Effort

Trips	710
Vessels	149
Days at Sea	1,113
Crew Days	2,236

#### Landings (gutted lbs)

<u>Total</u>	880,303
SOI	298,715
Non-SOI	581,589
% SOI	34%

#### Percent by Gear

	Trips	SOI lbs
Vertical Line	43%	9%
Trolling	34%	3%
Gill Net	21%	87%
Other	2%	0.9%

#### Price (mean)

<u>Total</u>	\$1.77
SOI	\$1.05
Non-SOI	\$2.14

#### Revenue

<u>Total</u>	\$1,556,556
SOI	\$312,530
Non-SOI	\$1,244,027
% SOI	20%

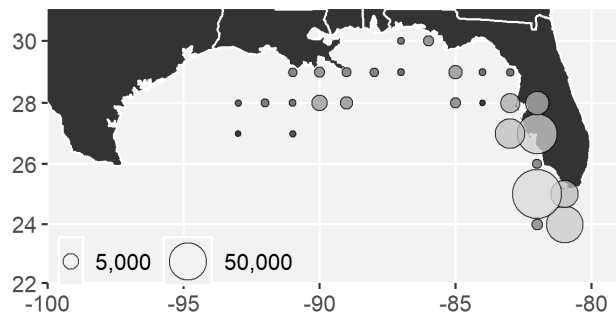
#### Percent of Revenue by Species Group

King and Cero Mackerel	58%
Spanish Mackerel	20%
Dolphinfish/Cobia/Jacks	2%
Shallow Water Snappers/Groupers	5%
Mid-Shelf Snappers	12%
Deep Water Groupers/Tilefish	0.4%
Grunt/Porgy/Sea Bass/Trigger	0.3%
Other Species	2%

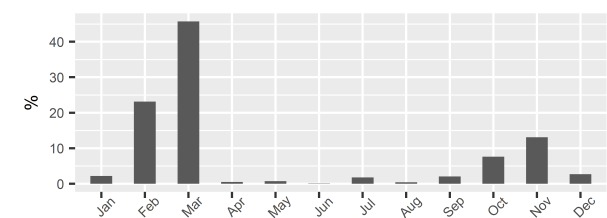
#### Revenue for Top 5 Species

King and Cero Mackerel	\$899,047
Spanish Mackerel	\$312,530
Red Snapper	\$152,431
Red Grouper	\$31,337
Bluefish	\$23,804

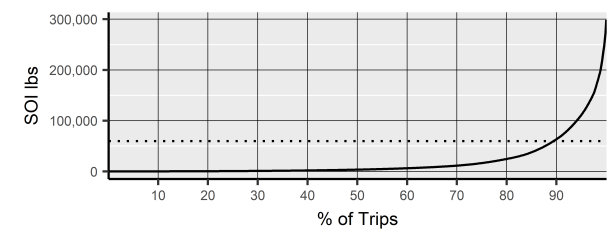
### SOI Landings by Area Fished



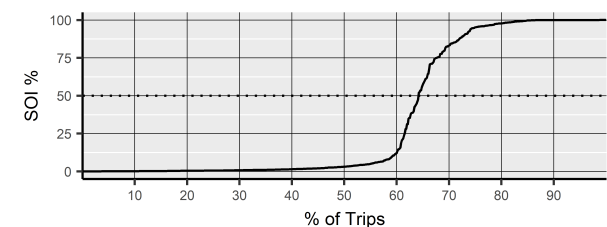
### Share of SOI Landings by Month



### Cumulative SOI Landings



### SOI Share of Revenue Per Trip



### Trip Descriptive Statistics (N=710)

	Mean	Min	Median	Max
Days at Sea	1.6	1	1	11
Crew Size	2	1	2	7
Landings	1,240	1	663	27,925
Revenue	\$2,192	\$1	\$1,135	\$35,142
SOI	\$440	\$1	\$34	\$23,913
% SOI	36%	0%	3.1%	100%

## SOI: 2016 GOM Spanish Mackerel Fishery: All Gears

### Trip-Level Economics

#### Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	710	-	-	-
Selected	135	19%	-	-
Responded	135	19%	100%	-
Used	123	17%	91%	91%

#### Economic Results (n=123)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Trip</b>					
Owner-Operated	87%	5.8	77%	97%	-
Days at Sea	1.6	0.1	1.4	1.8	1
Crew Size	2.2	0.2	1.8	2.5	2
Fuel Used	95	18	65	125	60
Landings (gutted lbs)	2,485	464	1,696	3,273	947
<b>Total Revenue</b>	2,770	378	2,127	3,412	1,638
<b>Cost</b>					
Fuel	186	34	129	244	131
Bait	32	9	16	48	0
Ice	85	17	56	113	50
Groceries	71	11	52	90	50
Miscellaneous	104	26	59	148	20
Hired Crew	725	137	492	958	185
IFQ Purchase	0	1	-2	3	0
OC Owner-Captain Time	460	87	312	609	230
<b>Trip Net Cash Flow*</b>	1,568	225	1,186	1,950	818
<b>Trip Net Revenue*</b>	1,108	186	791	1,425	465

#### Trip Net Cash Flow\* and Trip Net Revenue\* as Proportion of Trip Revenue (Margins)

Revenue 100%	Trip Net Cash Flow* 57%	Trip Net Revenue* 40%
	IFQ Purchase 0%	Labor - Hired & Owner 43%
	Labor - Hired 26%	
	Fuel & Supplies 17%	Fuel & Supplies 17%

#### Input Prices

Fuel Price (average): \$1.96 per gallon

Hired Crew Wage (implicit): \$350 per crew-day

#### Productivity Measures

Landings/Fuel Use: 26.2 lbs/gallon

Landings/Labor Use: 720 lbs/crew-day

\* See Definitions in Methods Section or Glossary.

# SOI: 2016 GOM Spanish Mackerel Fishery: All Gears

## Annual, Vessel-Level Summary

### Effort

Vessels	149
<u>Trips - Total</u>	<u>4,282</u>
SOI Trips	710
Non-SOI Trips	3,572
Days at Sea	6,583
Crew Days	12,604

### Landings (gutted lbs)

<u>Total</u>	<u>4,099,954</u>
SOI	298,715
Non-SOI	3,801,239
% SOI	7%

### Percent by Gear

Vertical Line	54%
Trolling	40%
Gill Net	4%
Longline	0.6%
Other	2%

### Price (mean)

<u>Total</u>	<u>\$2.47</u>
SOI	\$1.05
Non-SOI	\$2.58

### Revenue

<u>Total</u>	<u>\$10,131,464</u>
SOI	\$312,530
Non-SOI	\$9,818,934
% SOI	3%

### Percent of Revenue by Species Group

King and Cero Mackerel	43%
Spanish Mackerel	4%
Dolphinfish/Cobia/Jacks	5%
Shallow Water Snappers/Groupers	14%
Mid-Shelf Snappers	31%
Deep Water Groupers/Tilefish	2%
Grunt/Porgy/Sea Bass/Trigger	0.6%
Other Species	1%

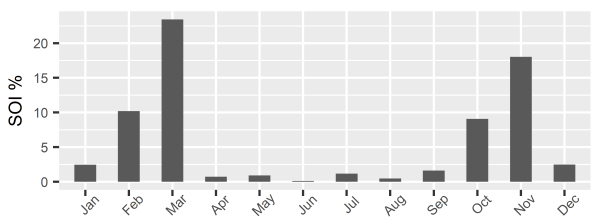
### Revenue for Top 5 Species

King and Cero Mackerel	\$4,352,224
Red Snapper	\$2,651,930
Red Grouper	\$546,605
Vermilion Snapper	\$427,558
Spanish Mackerel	\$426,329

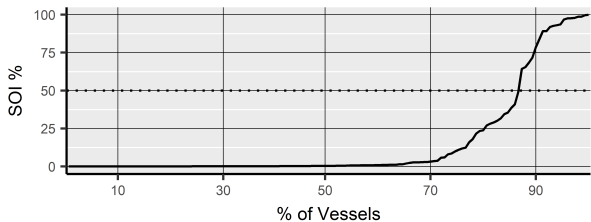
### Annual, Vessel Descriptive Statistics (N=149)

	Mean	Min	Median	Max
Trips	28.7	1	17	169
Days at Sea	44.2	1	25	169
Crew Days	84.6	1	49	654
Landings	27,516	115	15,140	130,600
Revenue	\$67,996	\$160	\$34,072	\$487,437
SOI	\$2,098	\$1	\$97	\$52,917
% SOI	15.7%	0%	0.4%	99.9%

### SOI Share of Monthly Landings



### SOI Share of Revenue Per Vessel



### Percent with Federal Permit

King Mackerel	87%
Spanish Mackerel	100%
Dolphin-Wahoo	66%
GOM Reef Fish	36%
SAT Snapper & Grouper - Unlimited	14%
SAT Snapper & Grouper - Limited	3%
Other Commercial Fishing	21%
For-Hire Fishing	21%

### Vessel Characteristics (N=149)

	Mean	Min	Median	Max
Length	34	19	32	61
Year Built	1987	1961	1986	2015
Horsepower	389	90	330	1,400
Fiberglass Hull	95%	-	-	-
Diesel Engine	63%	-	-	-
Ice Refrigeration	93%	-	-	-

## SOI: 2016 GOM Spanish Mackerel Fishery: All Gears

### Annual, Vessel-Level Economics

#### Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	149	-	-	-
Selected	31	21%	-	-
Responded	26	17%	84%	-
Used	25	17%	81%	96%

#### Economic Results (n=25)

	Mean	SE	90% L.B.	90% U.B.	Median
<b>SOI Vessel</b>					
Owner-Operated	77%	8.2	62%	91%	-
For-Hire Active	9%	5.6	0%	19%	-
Days - Commercial Fishing	94	14.8	69	119	60
Days - For-Hire Fishing	12	7.9	-2	25	0
Days - Non-fishing	1	0.5	0	1	0
Vessel Value	81,956	16,679	53,371	110,542	40,000
Has Insurance	18%	7.4	5%	30%	-
<b>Total Revenue</b>	86,917	20,881	51,130	122,704	58,713
Commercial Fishing	78,332	21,231	41,945	114,719	48,000
For-Hire Fishing	8,585	7,500	-4,268	21,438	0
<b>Cost</b>					
Fuel	10,122	2,504	5,830	14,413	7,000
Other Supplies	10,560	3,102	5,244	15,875	5,000
Hired Crew	18,100	5,477	8,714	27,486	4,400
Vessel Repair & Maintenance	9,360	2,027	5,887	12,834	5,560
Insurance	891	528	-14	1,795	0
Overhead	5,733	1,490	3,180	8,286	3,500
Loan Payment	366	233	-33	765	0
IFQ Purchase	684	421	-37	1,406	0
OC Owner-Captain Time	8,187	1,566	5,503	10,871	3,624
Depreciation	4,098	834	2,669	5,527	2,000
<b>Net Cash Flow</b>	31,102	10,997	12,255	49,948	19,815
<b>Net Revenue from Operations*</b>	19,867	10,545	1,795	37,939	6,535

#### Net Cash Flow and Net Revenue from Operations\* as Proportion of Vessel Revenue (Margins)

Revenue 100%	Net Cash Flow 36%	Net Revenue - Operations 23%
		Depreciation 5%
	IFQ Purchase 0.8%	Vessel R&M, Insur, Overh 18%
	Loan Payment 0.4%	
	Vessel R&M, Insur, Overh 18%	Labor - Hired & Owner 30%
	Labor - Hired 21%	
	Fuel & Supplies 24%	Fuel & Supplies 24%

**Economic Return\* (on Vessel Asset Value): 24.2%**

\* Accruing to vessel owner AND IFQ shareholder. See Definitions.

## SOI: 2016 GOM Spanish Mackerel Fishery: All Gears

### Trip-Level Time Series

#### Trip-Level Summary

	2014	2015	2016	Average
<b>Effort</b>				
Trips	628	669	710	669
Vessels	133	149	149	144
Days at Sea	985	1,106	1,113	1,068
<b>Landings (gutted lbs)</b>				
<u>Total</u>	713,896	844,867	880,303	813,022
SOI	242,511	294,248	298,715	278,491
Non-SOI	471,385	550,619	581,589	534,531
% SOI	34%	35%	34%	34%
<b>Price (mean)</b>				
<u>Total</u>	\$1.91	\$1.81	\$1.77	\$1.83
SOI	\$1.17	\$1.13	\$1.05	\$1.12
Non-SOI	\$2.30	\$2.17	\$2.14	\$2.2
<b>Revenue</b>				
<u>Total</u>	\$1,365,973	\$1,530,197	\$1,556,556	\$1,484,242
SOI	\$284,393	\$333,605	\$312,530	\$310,176
Non-SOI	\$1,081,580	\$1,196,592	\$1,244,027	\$1,174,066
% SOI	21%	22%	20%	21%

#### Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	114	93	123	
Response Rate (%)	78%	65%	91%	
<b>SOI Trip</b>				
Owner-Operated	82%	83%	87%	84%
Fuel Used per Day at Sea (gallons/day)	56	45	60	54
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	11.4%	9.5%	6.7%	9.2%
Bait	1.3%	2.2%	1.1%	1.5%
Ice	2.8%	2.8%	3.1%	2.9%
Groceries	3.4%	3.6%	2.6%	3.2%
Miscellaneous	4.5%	3.2%	3.7%	3.8%
Hired Crew	19.9%	28.8%	26.2%	25%
IFQ Purchase	0.2%	2%	0%	0.7%
OC Owner-Captain Time	13.9%	21.3%	16.6%	17.3%
<b>Trip Net Cash Flow</b>	56.5%	47.9%	56.6%	53.7%
<b>Trip Net Revenue</b>	42.7%	28.6%	40%	37.1%
Labor - Hired & Owner	33.9%	50%	42.8%	42.2%
Fuel & Supplies	23.4%	21.4%	17.2%	20.7%
<b>Input Prices</b>				
Fuel Price (per gallon)	\$3.65	\$2.29	\$1.96	\$2.63
Hire Crew Wage (per crew-day)	\$296	\$335	\$350	\$327
<b>Productivity Measures</b>				
Landings/Fuel Use (lbs/gallon)	24	10	26.2	20
Landings/Labor Use (lbs/crew-day)	667	253	720	547

**SOI: 2016 GOM Spanish Mackerel Fishery: All Gears**  
**Annual, Vessel-Level Time Series**

**Annual, Vessel-Level Summary**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>Average</b>
<b>Effort</b>				
Vessels	133	149	149	144
Trips - Total	3,740	3,861	4,282	3,961
SOI Trips	628	669	710	669
Non-SOI Trips	3,112	3,192	3,572	3,292
Days at Sea	6,499	6,593	6,583	6,558
<b>Landings (gutted lbs)</b>				
Total	3,900,965	3,788,709	4,099,954	3,929,876
SOI	242,511	294,248	298,715	278,491
Non-SOI	3,658,454	3,494,461	3,801,239	3,651,385
% SOI	6%	8%	7%	7%
<b>Revenue</b>				
Total	\$10,329,344	\$9,619,083	\$10,131,464	\$10,026,630
SOI	\$284,393	\$333,605	\$312,530	\$310,176
Non-SOI	\$10,044,951	\$9,285,478	\$9,818,934	\$9,716,454
% SOI	3%	3%	3%	3%
<b>Vessel Characteristics</b>				
Length	34	34	34	34
Year Built	1987	1987	1987	1987
For-Hire Fishing Permit	35%	23%	21%	26%

**Annual, Vessel-Level Economics**

	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>Average</b>
Number of Observations	25	29	25	
Response Rate (%)	62%	83%	81%	
<b>SOI Vessel</b>				
Owner-Operated	88%	84%	77%	83%
For-Hire Active	20%	20%	9%	16%
Vessel Value	\$71,432	\$64,811	\$81,956	\$72,733
<b>Total Revenue</b>	100%	100%	100%	100%
<b>Costs (% of Revenue)</b>				
Fuel	12.6%	9.9%	11.6%	11.4%
Other Supplies	10.8%	10.8%	12.1%	11.2%
Hired Crew	18.1%	28.6%	20.8%	22.5%
Vessel Repair & Maintenance	10.2%	11.2%	10.8%	10.7%
Insurance	0.7%	1.2%	1%	1%
Overhead	7.1%	5.8%	6.6%	6.5%
Loan Payment	1.3%	1.3%	0.4%	1%
IFQ Purchase	7.2%	4.3%	0.8%	4.1%
OC Owner-Captain Time	11.6%	9.5%	9.4%	10.2%
<b>Net Cash Flow</b>	32%	27%	35.8%	31.6%
<b>Net Revenue for Operations*</b>	25.5%	19.9%	22.9%	22.8%
Depreciation	3.4%	3.2%	4.7%	3.8%
Vessel R&M, Insur, Overh	18%	18.1%	18.4%	18.2%
Labor - Hired & Owner	29.7%	38.1%	30.2%	32.7%
Fuel & Supplies	23.4%	20.7%	23.8%	22.6%
<b>Economic Return* (on asset value)</b>	37.9%	31.2%	24.2%	31.1%

## Appendices

### Appendix 1 - Groups for the "Percent of Revenue by Species Group" Tables

NOTE: These groups are used in the "Percent of Revenue by Species Group" table in both the Trip-Level Summary and the Annual, Vessel-Level Summary sections.

#### King and Cero Mackerel

Cero Mackerel

King Mackerel

#### Spanish Mackerel

Spanish Mackerel

#### Dolphinfish/Cobia/Jacks

Almaco Jack

Banded Rudderfish

Bar Jack

Black Jack

Blue Runner

Cobia

Crevalle Jack

Dolphinfish

Greater Amberjack

Horse-Eye Jack

Lesser Amberjack

Wahoo

Yellow Jack

#### Shallow Water Snapper/Grouper

Black Grouper

Broomtail Grouper

Coney

Creole-Fish

Cubera Snapper

Dog Snapper

Gag Grouper

Goliath Grouper

Gray Snapper

Graysby

Lane Snapper

Mahogany Snapper

Marbled Grouper

Mutton Snapper

Nassau Grouper

Red Grouper

Red Hind

Rock Hind

Scamp

Schoolmaster Snapper

Tiger Grouper

Wenchman

Yellowfin Grouper

Yellowmouth Grouper

Yellowtail Snapper

#### Mid-Shelf Snappers

Black Snapper

Blackfin Snapper

Queen Snapper

Red Snapper

Silk Snapper

Vermilion Snapper

#### Deep Water Groupers/Tilefish

Anchor Tilefish

Blackline Tilefish

Blueline Tilefish

Golden Tilefish

Goldface Tilefish

Misty Grouper

Snowy Grouper

Speckled Hind

Warsaw Grouper

Yellowedge Grouper

#### Grunst/Porgy/Sea Bass/Triggerfish

Atlantic Spadefish

Black Margate

Black Sea Bass

Bluestriped Grunt

Cottonwick Grunt

French Grunt

Grass Porgy

Gray Triggerfish

Hogfish

Jolthead Porgy

Knobbed Porgy

Littlehead Porgy

Longspine Porgy

Margate

Ocean Triggerfish

Porkfish

Puddingwife

Queen Triggerfish

Red Porgy

Sailors Choice Grunt

Saucereye Porgy

Scup

Sheepshead

Smallmouth Grunt

Spanish Grunt

Tomtate Grunt

White Grunt

Whitebone Porgy

#### Other Species

All other species not listed above



## Appendix 2 - Glossary/Abbreviations

- **ACL** - Annual Catch Limit
- **AM** - Accountability Measures
- **CMP** - Coastal Migratory Pelagic Species including King Mackerel, Spanish Mackerel, and Cobia.
- **Deep Water Groupers/Tilefish** - See Appendix 1 for particular species included.
- **Economic Return (on Asset Value)** - The economic return is calculated by dividing the mean Net Revenue from Operations by the mean Vessel Value. For Gulf of Mexico reef fish fisheries, it is critical to note that, practically, this return is shared between owners of vessel capital AND IFQ shares. By purposefully ignoring the IFQ shareholder distribution, the focus is on the real productive capacity of the commercial fishery. All IFQ transactions are zero-sum in that they transfer wealth. The catch share management structure of the fishery allows for the realization of resource rents that will, in all likelihood, accrue to the IFQ shareholders.
- **FMP** - Fishery Management Plan
- **GOM** - Gulf of Mexico
- **Grunt/Porgy/Sea Bass/Triggerfish** - See Appendix 1 for particular species included.
- **IFQ** - Individual fishing quota
- **Dolphinfish/Cobia/Jacks** - See Appendix 1 for particular species included.
- **Mid-Shelf Snappers** - See Appendix 1 for particular species included.
- **Net Cash Flow** - Revenue minus the costs for fuel, other supplies, hired crew, vessel repair and maintenance, insurance, overhead, loan payments, and IFQ purchase. The focus is on actual cash transactions, i.e. money flows. In-kind contributions to the production process, i.e., the opportunity cost of owner-captain time and depreciation, are ignored. The sale of IFQ allocation or shares is also not accounted for, as these transactions cannot be associated with a vessel.
- **Net Revenue from Operations** - Revenue minus the costs for fuel, other supplies, hired crew, vessel repair and maintenance, insurance, overhead, and the opportunity cost of an owner's time as captain as well as the vessel's depreciation. By including in-kind contributions to the production process (opportunity cost of an owner's time and depreciation) and excluding transfer payments (loan payments and IFQ purchase), net revenue from operations is a measure of the inherent productivity, i.e., economic performance, of the commercial fishery. Note that IFQ share ownership is ignored here.
- **NMFS** - National Marine Fisheries Service
- **OC** - Opportunity Cost - An economic term referring to the value of a good or service in its next best productive use.
- **OC Owner-Captain Time** - Estimated opportunity cost (OC) of an owner's labor used on the trip.
- **RF** - Reef Fish
- **SAT** - South Atlantic
- **SEFSC** - Southeast Fisheries Science Center
- **SERO** - Southeast Regional Office
- **SG** - Snapper-Grouper
- **Shallow Water Snappers/Groupers** - See Appendix 1 for particular species included.
- **SOI** - Segment of Interest - A subset of commercial fishing trips we provide results for. A particular SOI consists of all trips where at least one pound of fish, which matches the criteria of the SOI, was landed.
- **Trip Net Cash Flow** - Revenue minus the costs for fuel, bait, ice, groceries, miscellaneous, hired crew, and IFQ purchase. Cash Flow represents an estimate of the money (cash) generated by the typical SOI trip over and above the cash cost of taking the trip (marginal or variable costs of trip). This implies a short term perspective.
- **Trip Net Revenue** - Revenue minus the costs for fuel, bait, ice, groceries, miscellaneous, hired crew, and the opportunity cost of owner's time as captain. By including opportunity cost of owner's time (an in-kind, variable factor to production) and excluding IFQ purchase payments, trip net revenue is a measure of the inherent short-term productivity of the commercial fishing process.
- **Vertical Line** - A gear type which includes hand lines, rod and reels, electrical reels and bandit gear.