SAFE Reports

11/9/2021

Prepared by SERO and SAFMC staff

Paper Topic: This paper outlines recent discussions between the Southeast Regional Office (SERO) and South Atlantic Fishery Management Council (Council) staff to produce annual SAFE (Stock Assessment and Fishery Evaluation) Reports that are useful to managers and scientists, without significantly impacting current projects.

Background: The National Standard Guidelines discuss SAFE Reports (50 CFR 600.315(d)). Staff from SERO, the Council, and the Southeast Fisheries Science Center have produced SAFE Reports for the South Atlantic region in the past. The regular production of SAFE Reports will require staff time and effort. The amount of time and effort to produce and update the reports will depend on the amount of information included in the report. In addition, the information will need to be updated to reflect changes to management and science (e.g., stock assessments). SERO and Council staff are investigating ways to produce SAFE Reports on a periodic basis that would serve the management needs of the region in an efficient manner. This paper outlines initial discussions between SERO and Council staff, and contains a description of a SAFE Report in the National Standard Guidelines, in addition to the possible contents and format of a SAFE Report.

What is a SAFE Report? A SAFE Report is a public document that provides the Secretary and the Councils with a summary of scientific information concerning the most recent biological condition of stocks, stock complexes, and marine ecosystems in the fishery management unit (FMU), essential fish habitat (EFH), and the social and economic condition of the recreational and commercial fishing interests, fishing communities, and the fish processing industries. Each SAFE report summarizes, on a periodic basis, the best scientific information available concerning the past, present, and possible future condition of the stocks, essential fish habitat (EFH), marine ecosystems, and fisheries being managed under Federal regulation.

Discussion of SAFE Reports in the National Standard Guidelines. *SAFE Report.* The term SAFE (Stock Assessment and Fishery Evaluation) report, as used in this section, refers to a public document or a set of related public documents, that provides the Secretary and the Councils with a summary of scientific information concerning the most recent biological condition of stocks, stock complexes, and marine ecosystems in the fishery management unit (FMU), essential fish habitat (EFH), and the social and economic condition of the recreational and commercial fishing interests, fishing communities, and the fish processing industries. Each SAFE report must be scientifically based with appropriate citations of data sources and information. Each SAFE report summarizes, on a periodic basis, the best scientific information

available concerning the past, present, and possible future condition of the stocks, EFH, marine ecosystems, and fisheries being managed under Federal regulation.

(1) The Secretary has the responsibility to ensure that SAFE reports are prepared and updated or supplemented as necessary whenever new information is available to inform management decisions such as status determination criteria (SDC), overfishing level (OFL), optimum yield, or ABC values (§ 600.310(c)). The SAFE report and any comments or reports from the SSC must be available to the Secretary and Council for making management decisions for each FMP to ensure that the best scientific information available is being used. The Secretary or Councils may utilize any combination of personnel from Council, State, Federal, university, or other sources to acquire and analyze data and produce the SAFE report.

(2) The SAFE report provides information to the Councils and the Secretary for determining annual catch limits (§ 600.310(f)(5)) for each stock in the fishery; documenting significant trends or changes in the resource, marine ecosystems, and fishery over time; implementing required EFH provisions (§ 600.815(a)(10)); and assessing the relative success of existing relevant state and Federal fishery management programs. The SAFE report should contain an explanation of information gaps and highlight needs for future scientific work. Information on bycatch and safety for each fishery should also be summarized. In addition, the SAFE report may be used to update or expand previous environmental and regulatory impact documents and ecosystem descriptions.

(3) Each SAFE report should contain the following scientific information when it exists:

(i) Information on which to base catch specifications and status determinations, including the most recent stock assessment documents and associated peer review reports, and recommendations and reports from the Council's SSC.

(A) A description of the SDC (e.g., maximum fishing mortality rate threshold and minimum stock size threshold for each stock or stock complex in the fishery) (§ 600.310(e)(2)).

(B) Information on OFL and ABC, preventing overfishing, and achieving rebuilding targets. Documentation of the data collection, estimation methods, and consideration of uncertainty in formulating catch specification recommendations should be included (§ 600.310(f)(2)). The best scientific information available to determine whether overfishing is occurring with respect to any stock or stock complex, whether any stock or stock complex is overfished, whether the rate or level of fishing mortality applied to any stock or stock complex is approaching the maximum fishing mortality threshold, and whether the size of any stock or stock complex is approaching the minimum stock size threshold; and

(C) The best scientific information available in support of management measures necessary to rebuild an overfished stock or stock complex (if any) in the fishery to a level consistent with producing the MSY in that fishery.

(ii) Information on sources of fishing mortality (both landed and discarded), including commercial and recreational catch and bycatch in other fisheries and a description of data collection and estimation methods used to quantify total catch mortality, as required by the National Standard 1 Guidelines (§ 600.310(i)).

(iii) Information on bycatch of non-target species for each fishery.

(iv) Information on EFH to be included in accordance with the EFH provisions (§ 600.815(a)(10)) .

(v) Pertinent economic, social, community, and ecological information for assessing the success and impacts of management measures or the achievement of objectives of each FMP.

(4) Transparency in the fishery management process is enhanced by complementing the SAFE report with the documentation of previous management actions taken by the Council or Secretary including a summary of the previous ACLs, ACTs, and accountability measures (AMs), and assessment of management uncertainty.

(5) To facilitate the use of the information in the SAFE report, and its availability to the Council, NMFS, and the public:

(i) The SAFE report should contain, or be supplemented by, a summary of the information and an index or table of contents to the components of the report. Sources of information in the SAFE report should be referenced, unless the information is proprietary.

(ii) The SAFE report or compilation of documents that comprise the SAFE report and index must be made available by the Council or NMFS on a readily accessible Web site.

What information should be in a SAFE report and is it already available?

Information in SAFE Report	**Is the information already available somewhere?**	**Are the data available to compile and bring into a SAFE Report?**
Status Determination Criteria	yes	yes
OFL	yes	yes
ABC	yes	yes
OY	yes	yes
Landings	yes	yes
Discards	yes	
EFH	yes	
Pertinent economic and social information		
Information in past reports (Appendices 1 and 2): Management history, management objectives, regulations, fishery sampling, stock status, species overview, current outlook, species information (max age, max length, age at maturity, natural mortality, peak spawning months)	yes	Some of these could be moved from another report or amendment while others would need to be developed using information from other documents.

Items to Consider in the Development of the SAFE Reports

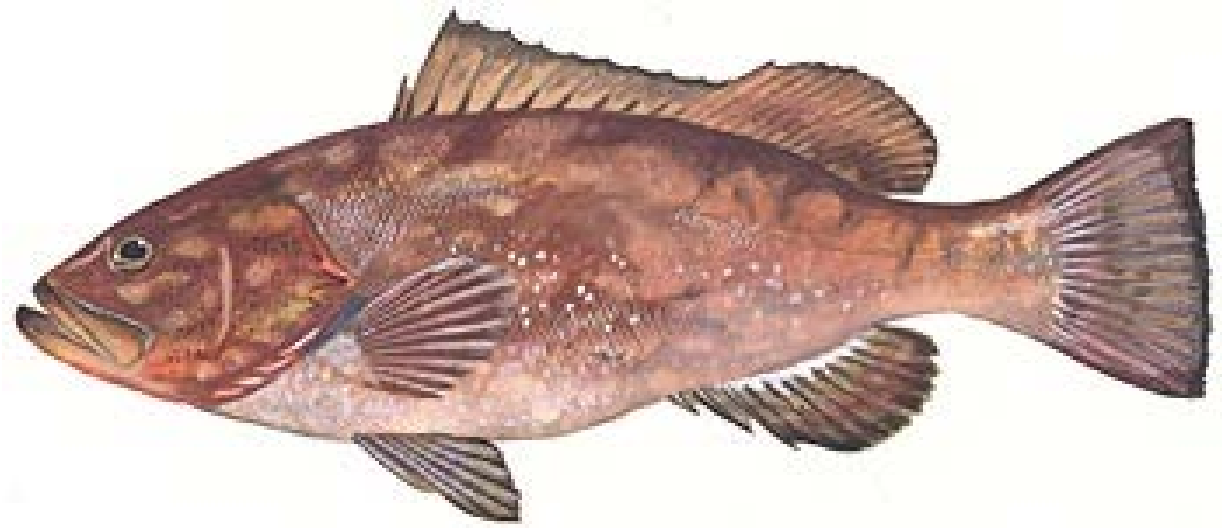
- One challenge will be to update the information for a large number of species. There will be trade-offs to the amount of information and the ability to keep the information up to date.
- In many cases, information may be found in other reports and will need to decide whether to link to the report or pull pertinent information. For example, Economics of the Snapper Grouper Fishery contains information on the commercial fishery (effort, landings, price revenue).
- Should SAFE Reports be included in the Council's work plan?
- Should there be additional information in the SAFE Report not listed in the table above?
- What report format would be most useful to the target audience? We have discussed the idea of an automated report that could be auto populated from a database with confidential data removed.
- We may need to prioritize some species over others in the beginning.
- Should there be a separate report for EFH?
- Should IPTs be developed to work on SAFE Reports?
- Should SAFE Reports be developed for each FMP?
- Most regions have SSC review.

Additional documents

1) South Atlantic Red Grouper SAFE Report (2016)
2) Recommendations on the Application of NS2 Guidelines in the Greater Atlantic Region (Report of the National Standard 2 SAFE Report Committee)
3) Economics of the U.S. of the South Atlantic Snapper-Grouper Fishery (2016)

South Atlantic Red Grouper
SAFE REPORT

2016



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1.1. Management History

Table 1 provides a summary of management actions in the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) that affect Red Grouper.

Table 1. Summary of Snapper Grouper FMP major amendments.

Document	All Actions Effective By:	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Snapper-Grouper FMP	08/31/83	-Size limits for red snapper, yellowtail snapper, red grouper, Nassau grouper, black sea bass -4" trawl mesh size -Gear limitations – poisons, explosives, fish traps, trawls -Designated modified habitats or artificial reefs as Special Management Zones
Reg A #1	03/27/87	-Prohibited fishing in SMZs except with hand-held hook-and-line and spearfishing gear. -Prohibited harvest of goliath grouper in SMZs.
A #1	01/12/89	-Prohibited trawl gear to harvest fish south of Cape Hatteras, NC and north of Cape Canaveral, FL.
Reg A #2	03/30/89	-Established 2 artificial reefs off Ft. Pierce, FL as SMZs.
Reg A #3	11/02/90	-Established artificial reef at Key Biscayne, FL as SMZ.
Reg A #5	07/31/93	-Established 8 SMZs off S. Carolina.
A #6	07/27/94	-commercial quotas and limits for snowy grouper, golden tilefish. -prohibited sale of warsaw grouper and speckled hind -100% logbook coverage upon renewal of permit -creation of the *Oculina* Experimental Closed Area
At #7	01/23/95	- size limits, hogfish and mutton snapper - Permit requirements, allowable gear specifications, allowable sale criteria, and modifed framework procedures. Required dealer, charter, and headboat federal permits. -modified management unit for scup to apply south of Cape Hatteras, NC
A #8	12/14/98	-Commercial limited entry and permit requirements
Reg A #7	01/29/99	-Established 10 SMZs at artificial reefs off South Carolina.
A #9	2/24/99	Bag and size limits and seasonal restrictions for red porgy, black sea bass, greater amberjack, vermilion snapper, black grouper, gag. Aggregate recreational limit of 20 snapper grouper per day. Longlines limited to snowy, warsaw, yellowedge, and misty grouper, and golden, blueline and sand tilefish.
Reg A #8	11/15/00	-Established 12 SMZs at artificial reefs off Georgia; revised boundaries of 7 existing SMZs off Georgia to meet CG permit specs; restricted fishing in new and revised SMZs.
A #10	07/14/00	-Identified EFH and established HAPCs for species in the SG FMU.
A #11	12/02/99	-Established SFA criteria for managed stocks (MSY, OY, MFMT, MSST).
A #13A	04/26/04	-Extended for an indefinite period the regulation prohibiting fishing for and possessing snapper grouper spp. within the *Oculina* Experimental Closed Area.
A #14	2/12/09	-Establish eight deepwater Type II marine protected areas (MPAs).
A #15B	2/15/10	- Prohibit the sale of bag-limit caught snapper grouper species. - Bycatch and ESA provisions. - Allocations for snowy grouper and red porgy.
A #16	7/29/09	- Shallow Water Grouper spawning season closure Jan-Apr. - Reduce Aggregate Grouper Bag Limit from 5 to 3.
A #17B	1/31/11	-Specify ACLs, ACTs, and AMs for 9 species undergoing overfishing. -Modify management measures as needed to limit harvest to the ACL or ACT.

Document	All Actions Effective By:	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
A #19 (Comprehensive Ecosystem-Based Amendment 1)	7/22/10	-Provide presentation of spatial information for Essential Fish Habitat (EFH) and EFH-Habitat Areas of Particular Concern (EFH-HAPC) designations under the Snapper Grouper FMP.
A #23 (Comprehensive Ecosystem-Based Amendment 2)	1/30/12	- Designate the deepwater MPAs as EFH-HAPCs. - Limit harvest of snapper grouper species in South Carolina SMZs to the bag limit. - Modify sea turtle release gear.
Amendment #25 (Comprehensive ACL Amendment)	4/16/12	- Establish ABC control rules, ABCs, ACLs, ACTs, and AMs for species not undergoing overfishing. - Remove some species from snapper grouper FMU. - Specify ecosystem component species. - Specify allocations among the commercial and recreational sectors for species not undergoing overfishing. - Limit the total mortality for federally managed species in the South Atlantic to the ACLs.
A #24	7/11/12	- Specify MSY, rebuilding plan (including ACLs, AMs, and OY), and allocations for red grouper.
Reg A #15	9/13/13	- Implement a revised ACL for yellowtail snapper based on the latest stock assessment, modify gag AM.
Generic Dealer Amendment	8/7/14	- Require weekly electronic dealer reporting for snapper grouper and other fisheries.
A #31	1/27/14	- Require weekly electronic reporting on headboats.
Reg A #21	11/6/14	- Modify definition of MSST for species with low M.
A #34	TBD	- Modify AMs for snapper grouper species to create consistency across the regulations.
A #36	TBD	- Spawning SMZs to enhance protection for snapper grouper species, including speckled hind and warsaw grouper.
Comp Allocation	TBD	- Commercial/Recreation allocations and AMs for snapper grouper and other fisheries.
For Hire Logbook Amendment	TBD	- Establish a logbook reporting requirement for all federally permitted charterboats.
Joint Commercial Logbook Amendment	TBD	- Modify timing of reporting requirements for commercial logbooks. - Allow for electronic submission of commercial logbooks.
Joint South Florida Amendment	TBD	- Establish common management regulations for species that overlap Council jurisdictions in the South FL area, including yellowtail snapper, mutton snapper, and black grouper.

Management Goal: Red grouper are currently in a rebuilding plan, with a rebuilding goal of 2020.

1.1.1. Accountability Measures

Accountability measures (AMs) are applied to prevent overfishing and maintain rebuilding progress of overfished species. The commercial AMs for Red Grouper are as follows: The commercial sector will be closed when projections indicate the commercial ACL will be met. If the ACL is exceeded in a year, the ACL will be reduced the following year by the amount of the overage if Red Grouper is overfished. Table 2 provides a summary of key commercial AM provisions.

The recreational AMs for Red Grouper include closing the sector when projections indicate the ACL will be met. If the ACL is exceeded in a year, the ACL will be reduced the following year by the amount of the overage (Table 2).

Table 2. Summary of commercial and recreational AM provisions for Red Grouper.

AM	Commercial	Recreational
In-season closure	X	X
Payback	If overfished	X
No sale	X	NA

1.2. Regulations

Regulations are subject to change at any time, and this document is not an official notification of regulations. Up-to-date information on regulations is available from the South Atlantic Council or the Southeast Regional Office (SERO).

The following tables provide a summary of regulations in place at the time this document is prepared.

Table 3. Seasonal closures for snapper grouper stocks.

Stock	Commercial	Recreational
Shallow Water Groupers (gag, black, red, coney, graysby, red hind, rock hind, yellowmouth, yellowfin)	Jan 1 - April 30	Jan 1 - April 30

Table 4. Commercial and recreational minimum size limits and possession limits.

Regulation	Commercial	Recreational	Notes
Size Limit (in TL)	20	20	
Possession Limit	-	3	Possession limit within the Aggregate Grouper Bag Limit.

1.3. Fishery Sampling

Table 5. Length and otolith sampling from TIP, as well as number of commercial trips sampled containing Red Grouper.

Year	Lengths	Otoliths	Trips
1983	79	0	11
1984	353	0	58
1985	912	0	60
1986	170	0	35
1987	455	0	57
1988	446	0	71
1989	505	0	82
1990	904	0	94
1991	1,075	0	106
1992	299	10	83
1993	676	20	127
1994	490	13	89
1995	1,171	2	145
1996	458	0	112
1997	564	20	108
1998	1,065	32	160
1999	1,888	30	236
2000	1,793	30	265
2001	996	66	200
2002	720	81	175
2003	908	44	186
2004	1,583	284	255
2005	1,419	75	280
2006	2,129	632	317
2007	2,954	1,576	453
2008	2,493	1,183	403
2009	1,655	546	320
2010	913	556	223
2011	872	382	224
2012	784	221	190
2013	486	203	135
2014	420	183	141
2015	228	77	90

Table 6. Numbers of fish and ages samples from MRIP and the headboat survey, as well as number of recreational trips sampled containing Red Grouper. Ages are from the headboat survey only.

Year	Trips	Fish	Ages
1983	230	400	39
1984	300	619	45
1985	253	592	6
1986	218	408	14
1987	181	304	13
1988	150	228	20
1989	164	263	14
1990	110	163	11
1991	60	71	18
1992	72	98	7
1993	95	138	4
1994	114	162	10
1995	122	204	1
1996	152	230	2
1997	182	277	11
1998	287	479	5
1999	222	352	0
2000	142	220	0
2001	153	207	0
2002	184	266	1
2003	121	174	9
2004	120	207	31
2005	133	199	68
2006	125	213	54
2007	113	274	59
2008	81	204	25
2009	45	80	10
2010	70	104	34
2011	74	111	63
2012	90	184	144
2013	89	150	120
2014	75	141	115
2015	61	105	85

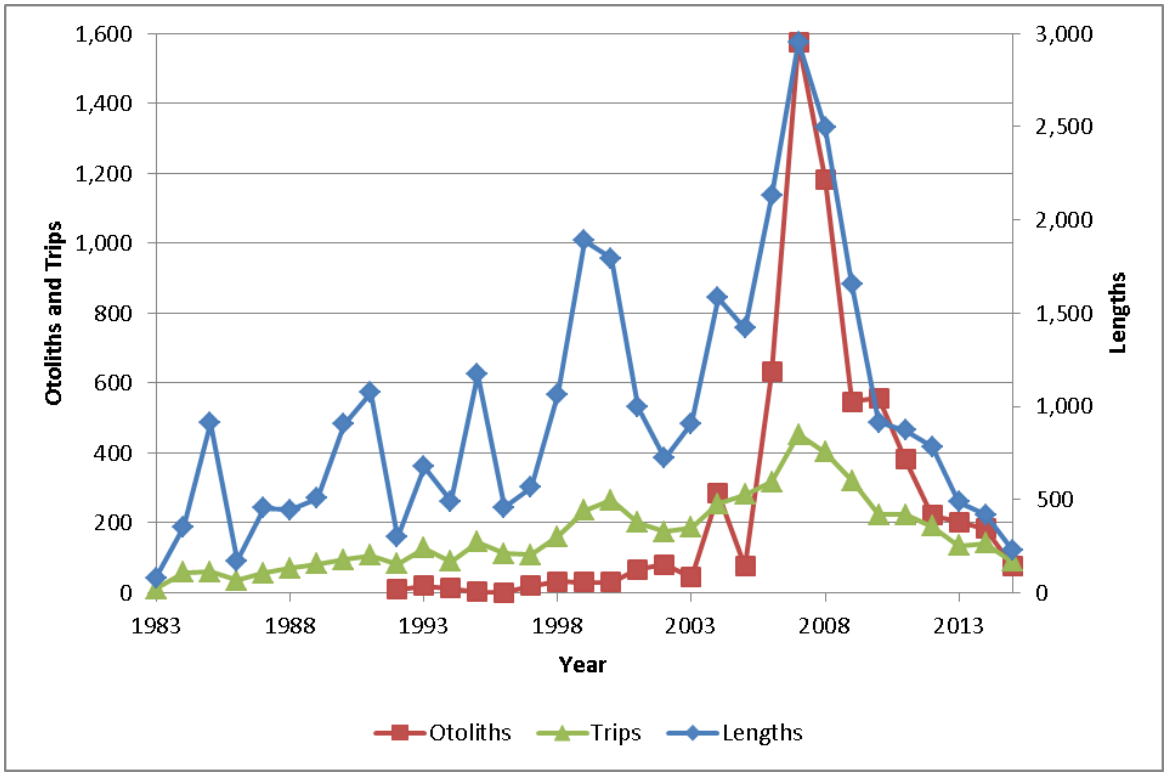

Figure 1. Summary of Red Grouper TIP sampling intensity for otoliths, lengths, and trips.

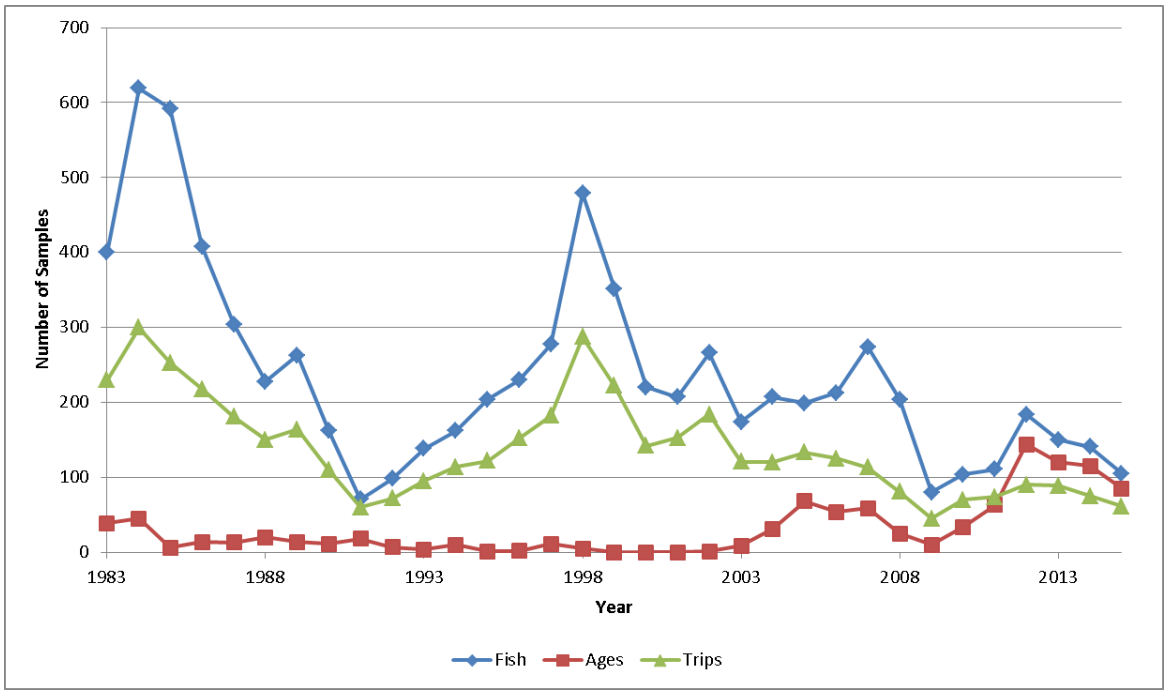

Figure 2. Summary of Red Grouper recreational sampling intensity.

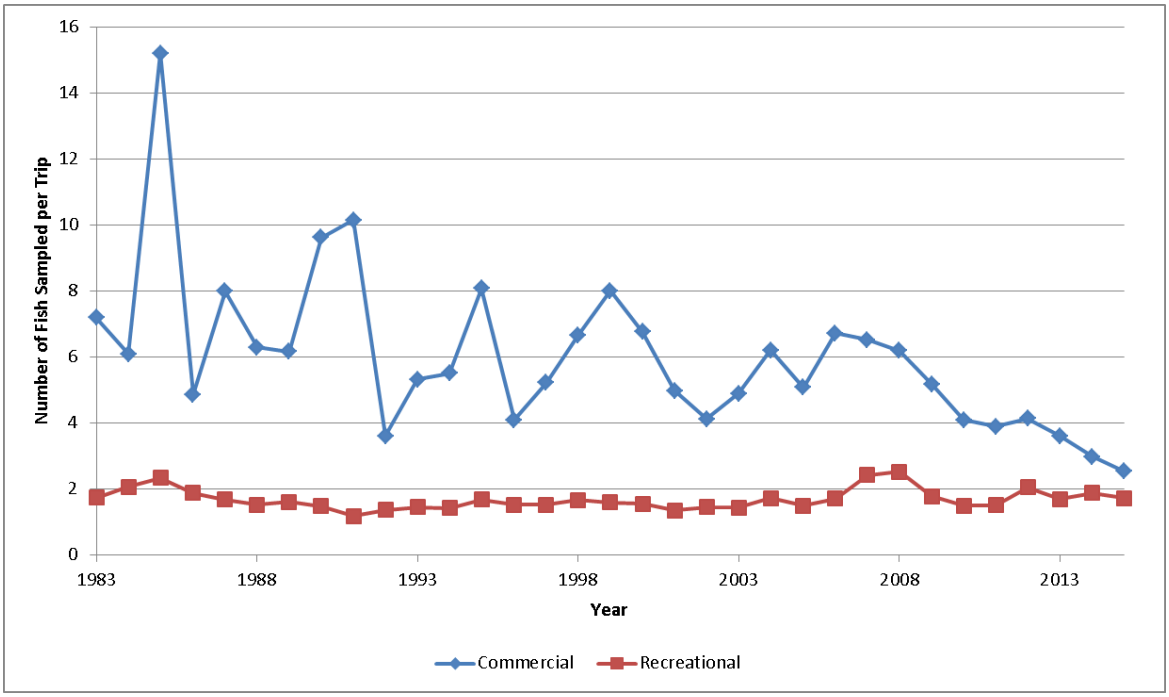

Figure 3. Numbers of Red Grouper sampled per trip for TIP samples and recreational samples.

1.4. Stock Status

SEDAR 19 concluded that red grouper are overfished and overfishing is occurring. The current fishing mortality ($F_{current}$, geometric mean of F from 2006-2008) was found to be about 35% higher than F_{MSY} (F_{2006}/F_{MSY} = 1.35, Table 7). F started above F_{MSY} at the beginning of the assessment time period and exploded in 1981. It remained at these high levels until 1989, when F crashed very quickly and then slowly decreased over time until dipping below F_{MSY} in 2005. However, F has been increasing in the last three years of the assessment to the current value above F_{MSY} (Figure 4). The spawning stock biomass (SSB) in the terminal year of the assessment was found to be just below MSST (SSB_{2008}/MSST = 0.92, Table 7). SSB has shown a steady decline since the beginning of the assessment time period until reaching a minimum value in 1987. Since that time, SSB has steadily increased until the terminal year of the assessment time period (Figure 4).

Assessment Overview

The SEDAR 19 benchmark assessment was the first peer-reviewed assessment of South Atlantic red grouper. This assessment was completed in 2010 using data through 2008. A catch curve analysis was performed by Potts and Brennan (2001) using data through 1999. This analysis was able to estimate full fishing mortality (F) and a proxy for F that yields MSY (F_{MSY}) using static spawning potential ratio (SPR). Potts and Brennan (2001) concluded that red grouper were undergoing overfishing; however the overfished status was unknown since no biomass benchmarks were estimated.

The Beaufort assessment model (BAM), which is a type of statistical catch-at-age model, was used to assess the status of red grouper and estimate management benchmarks. Uncertainty in the model was characterized utilizing several methods. A suite of sensitivity runs were used to investigate the uncertainty around model input parameters. A

mixed Monte Carlo and bootstrap approach (MCB) was used to characterize the uncertainty in the model estimates. A source of uncertainty that was of particular concern to the review panel was the estimate of discard mortality. Very little empirical data existed to base the estimate of discard mortality on. Also, sensitivity runs showed that the model was sensitive to estimates of discard mortality.

The SSC discussed several uncertainties in this assessment. Of particular note is the issue of red grouper's discontinuous distribution between North Carolina and Florida, indicating the possibility of a two-stock structure. The SSC suggested a possible two-stock scenario for the next red grouper assessment. The SSC also discussed several other issues, including: 1) constant vs. time-varying catchability, 2) release mortality estimates from all sectors, and 3) the magnitude and composition of early catches. The SSC accepted the red grouper assessment and ABC was determined by applying the ABC control rule for rebuilding stocks. P* for this stock was determined to be 0.3, so the probability of rebuilding (1-P*) of 0.7 was used to project the ABC. These projections estimated $F_{REBUILD}$ to be 0.181. However, the South Atlantic Council decided to set the ABC based on projections at 75% F_{MSY} (0.166), which is lower than $F_{REBUILD}$ and results in the stock having a 50% probability of being rebuilt by 2016 and an 81% probability of being rebuilt by the end of the rebuilding time period (2020), according to the projections.

Management Program

Table 7. Benchmarks, status parameters, catch limits, and sector allocations for red grouper. Benchmarks and status indicators are estimated from the assessment model used in SEDAR 19 for red grouper. Data are from the SEDAR 19 report for red grouper.

Parameter	Definition	Units	Value
M	Natural Mortality	per year	0.14
$F_{current}$	Geometric Mean of F from last 3 assessment years	per year	0.298
MFMT	Maximum Fishing Mortality Threshold, F_{MSY}	per year	0.221
SSB_{2008}	SSB in final assessment year	1000 lb ww	4,522
SSB_{MSY}	SSB that produces MSY	1000 lb ww	5,714
MSST	Minimum Stock Size Threshold, 75% SSB_{MSY}	1000 lb ww	4,914
B_{MSY}	Biomass at MSY	1000 lb ww	8,113
MSY	Yield at F_{MSY}	1000 lb ww	1,110
OFL	Yield at MFMT = F_{MSY}	1000 lb ww	914
ABC	Yield at 75% F_{MSY}	1000 lb ww	780
ACL	= ABC	1000 lb ww	780
Commercial ACL	44% ACL	1000 lb ww	343
Recreational ACL	56% ACL	1000 lb ww	437
$F_{current}$/ F_{MSY}	Indicates if overfishing is occurring (>1: overfishing)	-	1.35
SSB_{2008}/SSB_{MSY}	If rebuilding, indicates if stock is rebuilt (>1: rebuilt)	-	0.79
SSB_{2008}/MSST	Indicates if the stock is overfished (<1: overfished)	-	0.92

1.5. Species Overview

Red grouper, *Epinephelus morio*, is primarily a continental species, mostly found in broad shelf areas (Jory and Iversen 1989). Distributed in the Western Atlantic, from North Carolina to southeastern Brazil, including the eastern Gulf of Mexico and Bermuda, but can occasionally be found as far north as Massachusetts (Heemstra and Randall 1993). The red grouper is uncommon around coral reefs; it generally occurs over flat rock perforated with solution holes (Bullock and Smith 1991), and is commonly found in the caverns and crevices of limestone reef in the Gulf of Mexico (Moe 1969). It also occurs over rocky reef bottoms (Moe 1969).

Adult red grouper are sedentary fish that are usually found at depths of 5-300 m (16-984 ft). Fishermen off North Carolina commonly catch red grouper at depths of 27-76 m (88-249 ft) for an average of 34 m (111 ft). Fishermen off southeastern Florida also catch red grouper in depths ranging from 27-76 m (88-249 ft) with an average depth of 45 m (148 ft) (Burgos, 2001; McGovern et al., 2002a). Moe (1969) reported that juveniles live in shallow water nearshore reefs until they are 40.0 cm (16 in) and 5 years of age, when they become sexually mature and move offshore. Spawning occurs during February-June, with a peak in April (Burgos 2001). In the eastern Gulf of Mexico, ripe females are found December through June, with a peak during April and May (Moe 1969). Based on the presence of ripe adults (Moe 1996) and larval red grouper (Johnson and Keener 1984) spawning probably occurs offshore. Coleman et al. (1996) found groups of spawning red grouper at depths between 21-110 m (70-360 feet). Red grouper do not appear to form spawning aggregation or spawn at specific sites (Coleman et al. 1996). They are reported to spawn in depths of 30-90 m (98-295 ft) off the Southeast Atlantic coast (Burgos 2001; McGovern et al. 2002a).
Off North Carolina, red grouper first become males at 50.9 cm (20.1 in) TL and males dominate size classes greater than 70.0 cm (27.8 in) TL. Most females transform to males between ages 7 and 14. Burgos (2001) reported that 50% of the females caught off North Carolina are undergoing sexual transition at age 8. Maximum age reported by Heemstra and Randall (1993) was 25 years. Burgos (2001) and McGovern et al. (2002a) indicated that red grouper live for at least 20 years in the Southeast Atlantic and a maximum age of 26 years has been reported for red grouper in the Gulf of Mexico (L. Lombardi, NMFS Panama City, personal communication).

Maximum reported size is 125.0 cm (49.2 in) TL (male) and 23.0 kg (51.1 lb). For fish collected off North Carolina during the late 1990s, age at 50% maturity of females is 2.4 years and size at 50% maturity is 48.7 cm (19.3 in) TL. Off southeastern Florida, age at 50% maturity was 2.1 years and size at 50% maturity was 52.9 cm (21.0 in) TL (Burgos 2001; McGovern et al. 2002a). These fish eat a wide variety of fishes, octopuses, and crustaceans, including shrimp, lobsters, and stomatopods (Bullock and Smith 1991; Heemstra and Randall 1993).

Table 8. Overview of biological attributes for Red Grouper.

Attribute	Value
Max Age	25 years
Max Length	125 cm (49.2 in)

Max Weight	23 kg (51.1 lbs.)
Age at Maturity	2.1-2.4 years
Protogyny	50.9 cm (20.1 in)
Size at Maturity	48.7-59.2 cm (19.3-21 in)
Peak Spawning	Feb-Apr

Table 9. Ecosystem attributes of snapper grouper stocks.

Attribute	Value
Stock Genetic Diff in SA	NS
Home Range or Migration	Small
Depth Effect	Larger Offshore
Area Found	Keys to NC
Dominant Area	Keys and NC
Adult Habitat	Live, Rock, Sand, AR
Juvenile Habitat	Reef, Lesser extent Est with SAV
Female Spawning Season	Dec-Jun
Spawning Depth	30-90 m
Spawning Area	Keys and NC
Mean Depth Caught	30-45 m
Min Depth Caught	20 m
Max Depth Caught	95 m

1.6. Current Outlook

Landings of red grouper from all sectors have been reduced to a level below the ACL set by the rebuilding plan (Table 10, Figure 5). Recreational discards have been almost 5 times higher than landings in recent years, but have still been trending downward since 2000 (Table 11, Figure 6). Commercial discards also show a downward trend since 2002 (Table 11, Figure 6), however, there is a large increase in discards in the last 3 years to levels not seen since the mid-1990's. This may be indicative of a recent year class that has not yet been seen by the recreational sector or the MARMAP Chevron trap survey. Commercial TIP sampling for Red Grouper has seen a decline in the number of fish per trip sampled on trips containing Red Grouper, most sharply and steadily since 2006 (Figure 3). All of this data suggest that Red Grouper is continuing to decline despite SEDAR 19 indicating the SSB has increased in the last few years of the assessment (terminal year 2008, Figure 4). Further support for the continued decline of the Red Grouper stock is that the MARMAP Chevron trap index has been declining since 2004 and is currently at its lowest values of the entire time series (Figure 7).

Table 10. Landings of red grouper by sector in lbs ww.

Year	Commercial	For-Hire	Private	Total Recreational	Total Landings
1986	209,063	29,730	42,441	72,171	281,234
1987	239,113	34,616	135,385	170,001	409,114
1988	244,410	27,431	138,988	166,419	410,829
1989	398,029	23,310	38,057	61,368	459,397
1990	172,452	49,533	56,150	105,683	278,135
1991	145,230	19,620	10,548	30,169	175,399
1992	114,045	36,575	62,624	99,199	213,244
1993	148,680	44,908	129,681	174,588	323,268
1994	185,287	45,858	83,084	128,942	314,229
1995	342,739	50,598	31,162	81,760	424,499
1996	335,433	61,815	100,741	162,556	497,989
1997	458,729	108,139	109,518	217,657	676,386
1998	653,572	92,379	142,894	235,273	888,845
1999	570,340	97,304	78,475	175,779	746,119
2000	472,169	42,872	96,586	139,458	611,627
2001	415,990	63,680	105,203	168,883	584,873
2002	438,710	119,249	135,687	254,936	693,646
2003	393,822	83,975	98,517	182,492	576,314
2004	372,907	132,174	213,789	345,962	718,869
2005	237,007	103,000	196,117	299,116	536,123
2006	384,243	86,846	418,393	505,239	889,482
2007	655,338	135,612	498,318	633,930	1,289,268
2008	672,842	90,856	1,008,242	1,099,097	1,771,939
2009	431,604	27,669	254,812	282,481	714,085
2010	329,095	18,042	80,377	98,419	427,514
2011	314,232	19,954	91,362	111,316	425,548
2012	155,890	16,286	83,685	99,971	255,861
2013	118,055	11,229	113,476	124,705	242,760
2014	148,922	22,603	27,065	49,668	198,590
2015	66,610	13,917	114,296	128,213	194,823

Table 11. Discards of Red Grouper in numbers of fish from MRIP (Charterboats and Private anglers), Headboats (SRHS, from 2004-2015 only, HB discards average ~8,300 fish per year) and commercial vertical lines (from SEFSC).

Year	Rec	Comm
1986	12,529	
1987	45,018	
1988	15,995	
1989	4,017	
1990	8,053	
1991	60,029	
1992	52,962	
1993	18,103	15,368
1994	33,580	21,046
1995	26,540	17,800
1996	56,996	18,056
1997	106,403	21,759
1998	27,224	15,026
1999	44,347	12,410
2000	219,727	12,800
2001	104,429	11,798
2002	71,342	22,038
2003	37,106	10,953
2004	102,326	10,994
2005	159,481	10,266
2006	99,888	4,975
2007	44,411	8,619
2008	58,779	2,002
2009	100,422	1,487
2010	99,553	2,555
2011	25,414	1,781
2012	45,856	1,654
2013	72,384	17,907
2014	45,594	10,999
2015	52,361	18,750

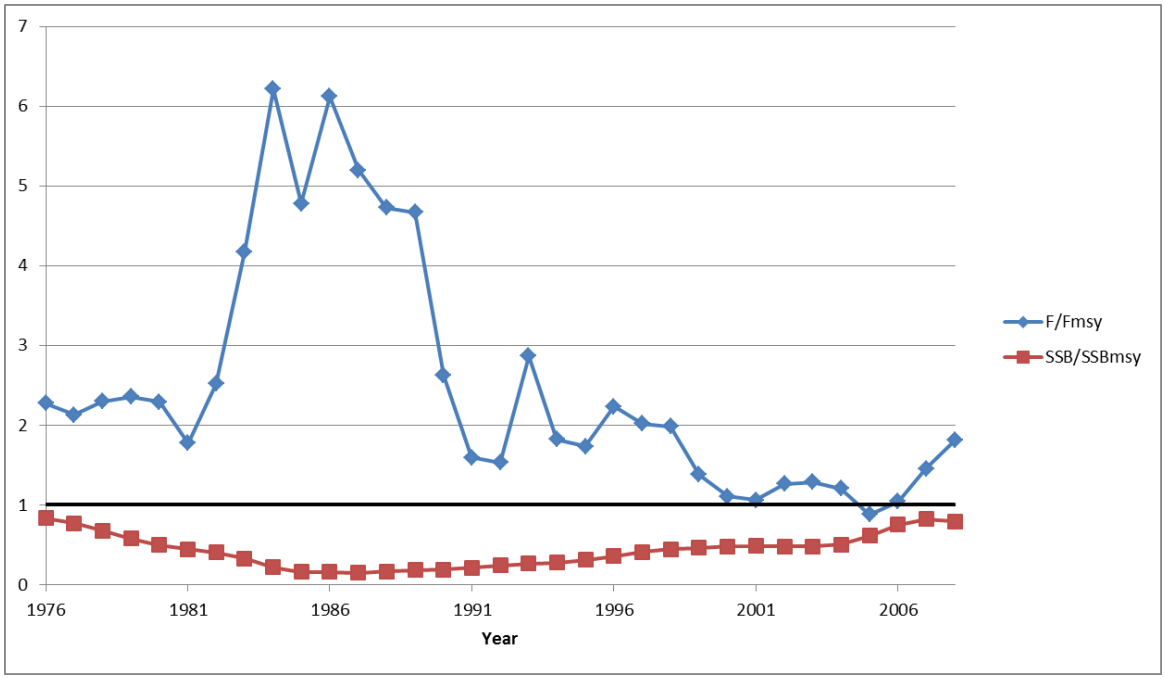

Figure 4. Spawning stock biomass (SSB) and exploitation (F) levels relative to expected conditions of the red grouper stock at MSY. Relative biomass is depicted by SSB/SSB$_{MSY}$ and exploitation by F/F$_{MSY}$. The index line at 1 represents MSY conditions. Data are from the SEDAR 19 report for red grouper.

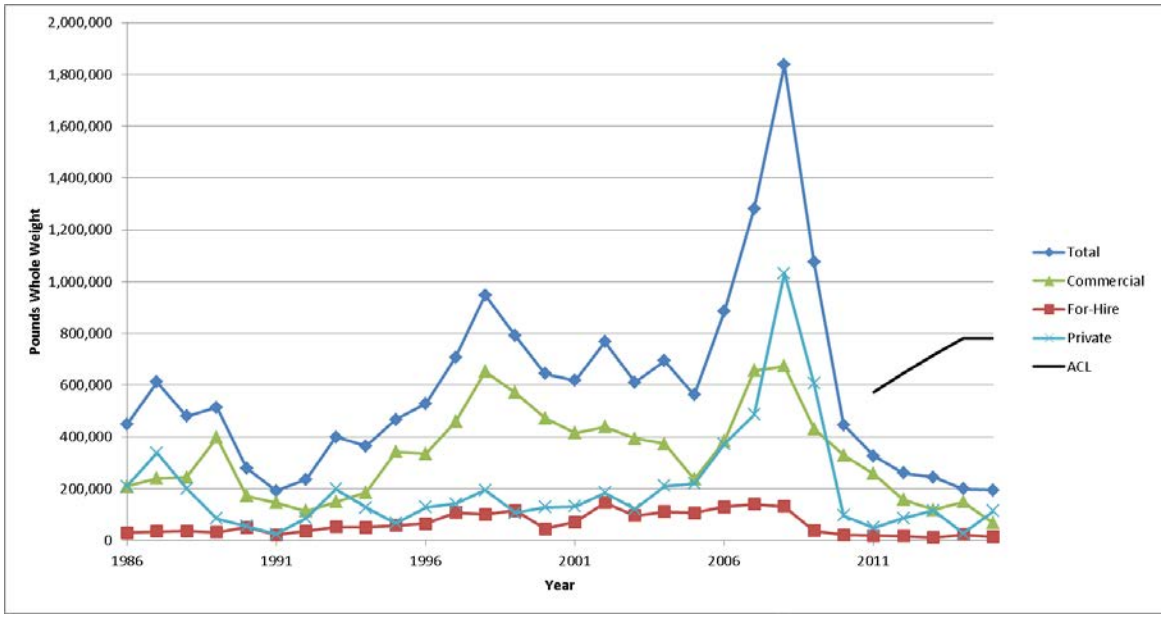

Figure 5. Landings of red grouper (lbs ww) by sector with current total commercial and recreational ACL for reference.

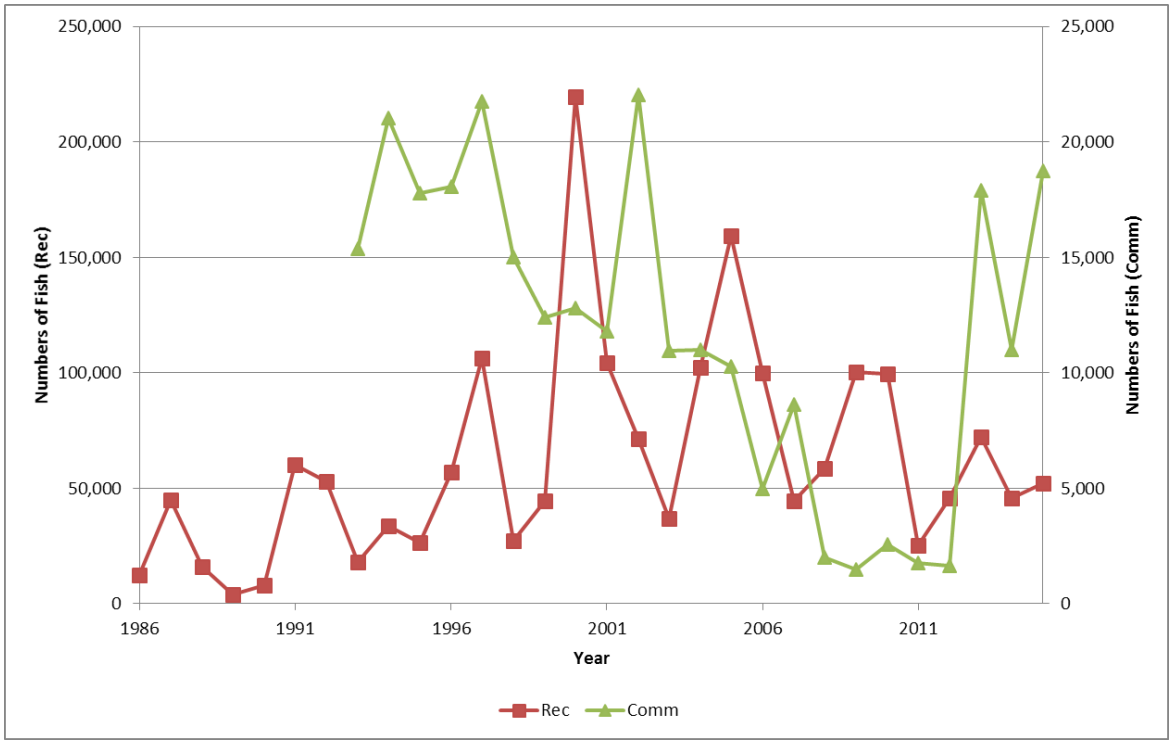

Figure 6. Discards of Red Grouper in numbers of fish from MRIP (Charterboats and Private anglers, SEFSC), Headboats (SRHS), and commercial vertical lines (SEFSC).

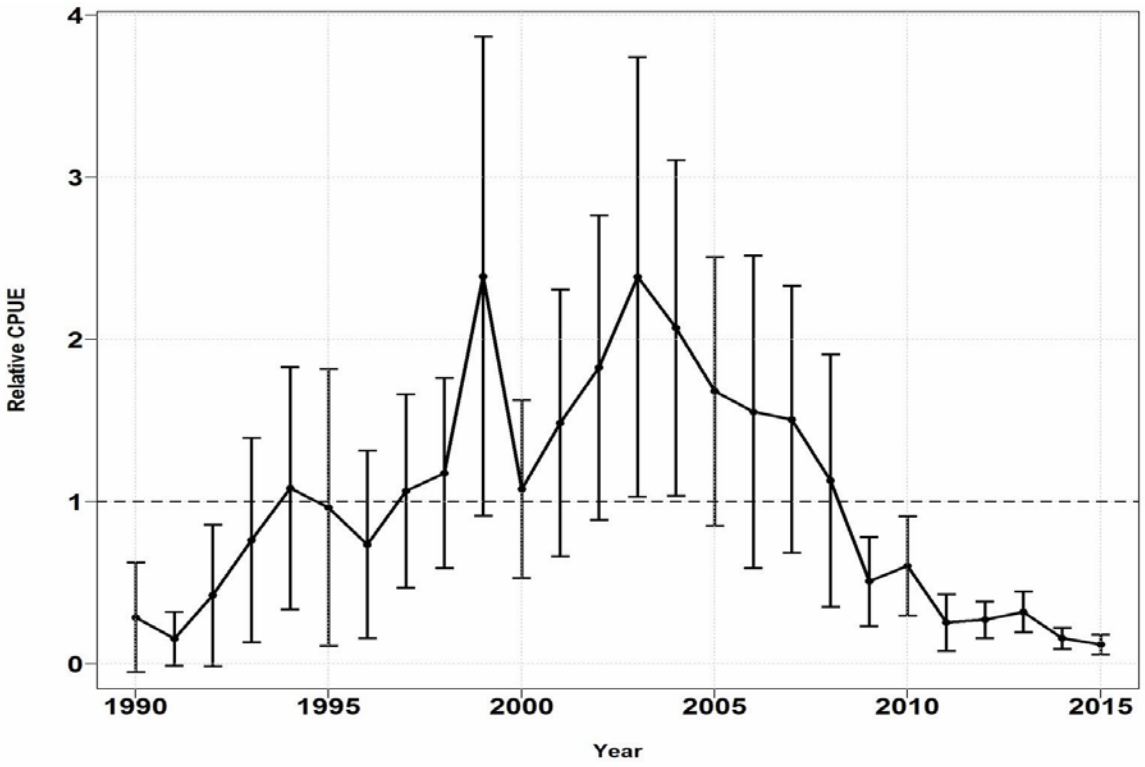

Figure 7. MARMAP Chevron trap normalized delta-GLM standardized CPUE (±SE) for red grouper.

Report of the

National Standard 2 SAFE Report Committee

RECOMMENDATIONS ON THE APPLICATION OF NS2 GUIDELINES IN THE GREATER ATLANTIC REGION

Submitted to the

Northeast Regional Coordinating Committee

October 6, 2014

Contents

Summary

Recent revisions to the National Standard 2 (NS2) guidelines[1] established new requirements for Stock Assessment and Fishery Evaluation (SAFE) reports. The revised guidelines specify the types of information that should be included in SAFE reports, and state that the reports must be made publicly available on a Council or NMFS website. In May 2014, a regional NS2 SAFE Report Committee (Committee) was formed to develop alternatives for complying with these guidelines in the Greater Atlantic Region.

The Committee developed two sets of options to address the following questions:

1. How will the SAFE Reports be produced?
2. Where and how will SAFE reports be housed?

For producing SAFE reports, the Committee recommends maintaining the current report writing process with the addition of a cohesive summary document that would be developed by a GARFO fishery analyst. For housing SAFE reports, the Committee recommends posting them to a searchable database located on the GARFO website.

This report summarizes the options developed by and recommendations of this Committee. Regardless of which options are ultimately selected, the Committee stresses that improving SAFE reports and housing them on a website will require all partner organizations (GARFO, both Councils, NEFSC) to make this effort a priority.

Introduction

The NS2 guidelines[1] call for the use of SAFE reports to help inform management decisions, including the determination of ACLs. SAFE reports summarize recent significant trends or changes in the resource, marine ecosystems, and fishery conditions. SAFE reports should also contain information on bycatch and safety concerns in each fishery, an explanation of information gaps, and the need for future scientific work (Table 1). The SAFE report may be used to update or expand previous environmental and regulatory impact documents and ecosystem descriptions. The Secretary has the responsibility to ensure that SAFE reports are prepared and made available on a Council or NMFS public website. SAFE reports should include a summary of the information they contain and an index or table of contents.

The NS2 guidelines recognize and allow for differing regional practices regarding SAFE report preparation and structure - a SAFE report can be a single document or compilation of documents. SAFE reports prepared by NMFS vary greatly among regions, and even among FMPs within the Greater Atlantic Region. Complying with the revised guidelines in a more systematic and uniform way within the Greater Atlantic Region could require substantial time and resources to change report coordination, style, content, and distribution. To address this potentially considerable task, a Committee was formed in May 2014 with staff members from the NEFSC, GARFO, and both Councils. This group was charged with compiling an inventory of SAFE reports and identifying a "single, accessible place where the public can go to find information" on the status of fish stocks and the fisheries that harvest them, consistent with the NS2 guidelines.

[1] Federal Register, Vol. 78, No. 139, July 19, 2013

Committee Members

The following individuals served on the Committee: Doug Christel (GARFO), Mary Clark (MAFMC), Rachel Feeney (NEFMC), Teri Frady (NEFSC), and Jim Weinberg (Committee lead; NEFSC).

How is the Greater Atlantic Region Currently Meeting the NS2 Guidelines?

Although only a few reports have been specifically identified as "SAFE Reports" in the Greater Atlantic Region, many of the documents produced regularly by the Councils, GARFO, and the NEFSC contain content required by the NS2 guidelines. The Committee conducted an inventory of recently prepared reports within the Greater Atlantic Region (Table 2). For each FMP, there is content that addresses each general topic (Table 1) outlined in the guidelines, though some gaps in specific content were noted. The Committee also noted that these reports have been developed by various offices in an uncoordinated manner and often without a regular or synchronized production schedule. All of these reports are publicly available on the NMFS and Council websites, but they are not posted in a centralized location.

While the Committee was not charged with conducting a thorough review of how other regions develop and publish SAFE reports, the Committee noted that in the North Pacific, stand-alone documents titled "SAFE" reports are produced on an annual basis for each FMP (Appendix 1). The Alaska Fisheries Science Center (ASFC) leads SAFE report preparation in most cases, in collaboration with the North Pacific Fishery Management Council (NPFMC), plan development teams, and the State of Alaska. Most reports are posted on a webpage of the ASFC, though reports for two fisheries (crab, scallop) are posted on the NPFMC website.

Options for Meeting NS2 Requirements in the Greater Atlantic Region

The Committee developed two sets of options for addressing the separate questions of *how* the reports will be produced and *where* the reports will be housed. Although the Committee considered various combinations of options for SAFE report production and housing, some combinations may be more appropriate than others.

Production of SAFE Reports

The Committee developed four options for producing SAFE reports, each associated with progressively greater costs (as well as potential benefits). Logistical, human resource, and funding considerations for each option are summarized in Table 3.

Option 1: Status Quo

This option would entail no changes in how reports that contain SAFE information are written. Various offices would continue to produce reports, though not necessarily in a coordinated fashion. This option would be the least complex to implement and could be done relatively quickly, but it may provide less utility to the public and to fishery managers than Options 2-4. This approach would not facilitate identification of data gaps and redundancies.

Option 2: Status Quo + Brief Description

This option would still produce the set of reports that are currently written, but with the addition of brief content descriptions (2-3 sentences) of each SAFE report component document. These short descriptions would be written by appropriate staff (e.g., a GARFO fishery analyst) and would be posted adjacent to the full reports in the central location where SAFE documents are housed. This option would be a more organized approach than Option 1. Having brief

descriptions of each report would make SAFE documents more user friendly and would make it easier to find information and identify data gaps and redundancies, which may lead to improvements indirectly.

Option 3: Status Quo + Summary Document

As with Option 2, Option 3 would still produce the set of source reports that are currently written. But in Option 3, appropriate staff (e.g., a GARFO fishery analyst) would excerpt specific summary text from the source documents and compile that into a cohesive stand-alone report that would be specifically titled the "SAFE report". The summary would reference the source documents. By excerpting source text, the risk of introducing interpretation errors by a third party would be minimized. This option would provide end users with one document that has all the essential SAFE report content briefly contained therein.

Option 4: Stand-Alone SAFE Report

Option 4 would create a comprehensive, stand-alone report that contains all information that belongs in a SAFE report, **and replace some or all original source documents**, akin to the model used in the North Pacific. An appropriate staff person (e.g., possibly the GARFO FMP coordinator) would lead report coordination, with components of the report authored by other offices (e.g., NEFSC for stock assessment information). Of the four options, this one would be the most significant departure from the Greater Atlantic Region's current process and would incur high transition costs. Although this model would require a large investment of resources and staff time, development of stand-alone SAFE reports may eventually reduce the time needed to produce some fishery reports and could eliminate the need to produce some reports that are currently written.

Several important details of Option 4 would need to be worked out. For example, given that each stock in a fishery is assessed separately, it is not clear whether SAFE reports would be developed at the stock or the FMP level. Decisions would also be required about how to treat the various types of assessments that are done in the region, synchronizing the production schedules, and whether the new SAFE reports would replace the Affected Environment section of EAs and EISs. Unless these issues are resolved, redundancies with the current set of reports would persist.

Housing of SAFE Reports

The Committee developed two options for the housing of SAFE reports on a public website. Each option includes two sub-options. Logistical, human resource, and funding considerations are summarized in Table 4. Under each option, the most recent version of the relevant documents, as well as a catalog of historic documents, would be made available.

Option 1: Post Reports on a GARFO Website

Under Option 1, the reports would be posted on a new webpage of the GARFO website dedicated to SAFE reports. This option allows for regional control of the website, with all SAFE documents residing on a local server.

- *Sub-Option 1A*: List the reports on a page on the GARFO website, perhaps in a tabular format. This option would be relatively simple to implement, but could quickly become cumbersome as more reports get posted over time.

- *Sub-Option 1B*: House the reports within a searchable database (e.g., date, FMP, key word), perhaps akin to the Northeast Consortium's Project Information Database.[2] This option would require additional resources to create the database, but the end product may be more user-friendly and require no more effort to maintain than sub-Option 1A.

Option 2: Post Reports on an Existing NMFS Website

Under Option 2, the reports would be posted to an existing national NMFS website, and an appropriate GARFO staff member would work with the HQ staff to post reports. Regional websites would need to link to the national site.

- *Sub-Option 2A:* House the reports on the Fish Watch website.
- *Sub-Option 2B:* House the reports on the Species Information System Public Portal (SIS).

Option 2 may be the best way to achieve the goal of having a single accessible place (nationally) where the public can find SAFE information, if other regions began posting SAFE reports there as well. However, this option would require close coordination with NMFS HQ and would result in the region having little control over the website. Successful implementation of this approach would require development of strong working relationships with NMFS HQ personnel who operate and maintain the national website. NMFS HQ would bear the costs of website modification and maintenance and would need to be able to post reports in a timely manner. Sub-Option 2A may be less appropriate than sub-Option 2B, because the target audience of Fish Watch is fish consumers, whereas the focus of SIS is stock status.

Committee Recommendations

Regardless of which options are ultimately selected, the Committee stresses that improving SAFE reports and housing them on a website will require all partner organizations (GARFO, both Councils, NEFSC) to make this effort a priority.

Report Production

The Committee recommends **Option 3** for the production of SAFE reports. This approach would maintain most aspects of the current reporting processes, which would keep transition costs reasonable. It would include having appropriate staff excerpt and compile content into a cohesive "SAFE" summary document with references to source documents. In the event that a stand-alone SAFE report is produced for a fishery, as is occasionally done, those could substitute for the summary document.

While Options 2 and 3 are similar, the Committee agreed that a summary document (Option 3) would provide greater utility than brief 2-3 sentence content descriptions (Option 2). Because GARFO plays a central coordinating role among the Councils, NEFSC, and NMFS, the Committee recommends that a GARFO fishery analyst should be the lead on developing the summary document.

The Committee recognizes that the production of stand-alone SAFE reports under Option 4 would offer many benefits, and that this approach should be considered as a possible long-term goal for the region. However, the Committee identified a number of significant costs and

[2] http://www.northeastconsortium.org//projects.shtml

impediments associated with Option 4. For example, the region produces a range of assessments (from benchmarks to data updates) with varying amounts of peer review. These "assessments" are produced throughout the year rather than all at once, and they support multiple FMPs, with fishing years that start on different dates, and are used by two Fishery Management Councils. In addition to the stock assessment information that is typically included in assessment reports, SAFE reports might include additional information (the role of the ecosystem, social and economic information, and EFH). Under Option 4, the Greater Atlantic Region would need to be more organized and coordinated on systematically producing SAFE reports, with commitments and understandings between GARFO, NEFSC, and the Councils about who would take the lead and contribute to the work. If the Greater Atlantic Region is not ready to adopt Option 4, Option 3 represents an improvement over the current situation, and is likely to foster greater coordination between these organizations in the future.

Report Housing

The Committee recommends **Option 1B** for the housing of SAFE reports—posting the reports within a searchable database (e.g., by date, FMP, key word) located on a new GARFO website. Since SAFE reports are not currently coordinated on a National level, the regional approaches under Option 1 would offer significantly more flexibility and would allow the region to tailor its approach over time. Given the large volume of documents that will need to be posted and regularly updated, the Committee agreed that the long-term benefits of having a searchable database would outweigh the short-term setup and implementation costs. The Committee discussed the possibility of posting reports to the websites of the NEFSC or of each Council, but does not recommend this option, as it would not achieve the goal of having a central location for all SAFE report documents. The communications team at GARFO is better equipped than that of the NEFSC or Councils to create and maintain such a website.

Table 1 - Contents of SAFE reports

Biological
Condition of the stocks, stock complexes, and marine ecosystems in the fishery management unit; past, present and possible future conditions; status determination criteria (maximum F threshold, minimum stock size threshold), OFL, OY or ABC and other information necessary to set ACLs; fishery bycatch; document significant trends; data gaps and needs for future work; bycatch; information on whether overfishing is occurring or being prevented and rebuilding targets met; methods for data collection, estimation methods, consideration for uncertainty; whether F is approaching F_{max}; whether stock size is approaching a minimum threshold; catch and bycatch in other fisheries; all sources of fishing mortality (landings and discards).
Essential Fish Habitat
Past, present and possible future conditions; document significant trends; data gaps and needs for future work; required FMP content (description and identification of EFH, including habitat info by life stage, minimizing adverse impacts, etc.).
Socioeconomics
Recreational and commercial fisheries, fishing communities, and fish processing industries; safety; past present and possible future conditions; document significant trends; data gaps and needs for future work.
Assessment and Management
Update or expand previous environmental and regulatory impact documents and ecosystem descriptions; stock assessment document and associated peer review reports, recommendations and reports from the SSC; summary of previous ACLs, ACTs, AMs and management uncertainty. Summary of all above information in a table of contents/index.

Table 2 – General list of documents produced in the Greater Atlantic Region that contain SAFE information

Document	**Contents**	**Lead**	**Notes**
Stock assessment reports from SAW/SARC and TRAC	Stock status and projections, survey and catch time series, species interactions with the ecosystem (climate, habitat).	NEFSC	
Fishery performance reports for groundfish FMP	Fishing effort, landings, price, revenue, vessels, fleet concentration and distribution of revenues.	NEFSC	Annual since FY2010
Ecosystem advisory reports	Time series of sea temperature, plankton blooms, zooplankton.	NEFSC	
Protected species reports	Population trends and status of whales, dolphins and seals.	NEFSC	
EFH source documents	Distribution and abundance of various life stages for each managed stock, in relation to water temperature, depth, and habitat type.	NEFSC or Councils	Updated approximately every 5 years
MAFMC Fishery Information Documents	Summary of catch, landings and effort, often based on unpublished information.	MAFMC	Annual since 2013
MAFMC Advisory Panel fishery performance reports	Summaries of fishermen's perspectives about fishing effort, market trends, environmental factors. Includes interpretation of MAFMC Fishery Information Documents.	MAFMC	Annual since 2013
Environmental assessments or environmental impact statements [a]	History of the FMP, physical environment and essential fish habitat, target species stock status, bycatch, interactions with protected species, descriptions of fishing communities, employment, fleet characteristics, commercial and recreational fishing effort and catch, landings and revenue, trade and processing sectors.	Councils/ GARFO	Some also titled "SAFE Report."
Reports titled "SAFE report"	Fishing effort, landings, price, revenue, vessels, fleet concentration and distribution of revenues, employment, dealers. Information to support ABC determination.	NEFMC PDTs	Sometimes produced in years when no EA/EIS is produced

Table 3 - Options for SAFE report production

Option	Logistical	Human Resources[3]	Cost
Option 1. Use existing reports.	Least complex, requiring no new coordination. Any data gaps and duplication would continue.	No additional human resources. Potentially inefficiencies would persist.	-
Option 2. Use existing reports and create brief description of contents for each FMP or species.	More user-friendly than Option 1. Source document data gaps and redundancies may be realized and mitigated.	A fishery analyst would create and update the description at least annually, if new information is available. Estimated staff time: one day per year per FMP for one fishery analyst.	$
Option 3. Create summary SAFE report for each FMP or species, with a summary document comprising excerpts from source documents.	More user-friendly and complex than Option 2 in creating a new document with excerpts existing documents. Source document data gaps and redundancies may be realized and mitigated.	A fishery analyst would create and update the summary document at least annually, if new information is available. More human effort than Options 1 and 2. Estimated staff time: five days per year per FMP for one fishery analyst.	$$
Option 4. Create new stand-alone SAFE report for each FMP or species, with an index/table of contents and a newly drafted comprehensive summary.	Most complex. Requires substantial change to report generation processes. With multiple stocks in a fishery, would combining assessment reports be feasible?	Report components would be authored by multiple offices (e.g. NEFSC for stock assessment), but a fishery analyst or other staff person (most likely from GARFO) would need to coordinate development of the report. Estimated staff time: four weeks per year per FMP for one GARFO staff, plus several weeks of Council and NEFSC staff to co-author.	$$$$

[3] These are preliminary estimates of human resource and funding requirements necessary to implement each option *relative to the status quo*. These estimates do not include the time required to maintain the current report production process. It is possible that some efficiencies would be established over time.

Table 4 - Options for SAFE report housing

Option	Logistical	Human Resources[4]	Funding
Option 1A. Create a new GARFO webpage with reports listed by FMP.	The simplest option. May get unwieldy with the number of documents to include.	Simplest option to set-up. Ongoing work to maintain. GARFO fishery analyst to give PDFs to communications staff for posting.	Set up Webmaster: 5 days Maintenance Webmaster: 5 days per year. Analyst: half day per year per FMP.
Option 1B. Create a new GARFO webpage with reports archived in a searchable database.	More user friendly product than Option 1A. Will require additional time, resources, and skill to set up.	More complicated set-up to create the database. Perhaps less work to maintain than Option 1A if the database is set up well. GARFO fishery analyst to give PDFs to communications staff for posting.	Set up Webmaster: 5 days May need new software. Maintenance Webmaster: 1 day per year. Analyst: half day per year per FMP.
Option 2A. Add to a pre-existing website: Fish Watch.	Requires coordination with NMFS HQ. Builds on pre-existing websites. FishWatch is consumer-oriented and increasingly mobile.	Requires HQ commitment to set-up and maintain. Key GARFO staff would receive PDFs and provide to HQ contact.	Set up HQ Webmaster: 5 days GARFO Analyst: 5 days Maintenance HQ Webmaster: 5 day per year. GARFO Analyst: half day per year per FMP.
Option 2B. Add to a pre-existing website: Species Information System Public Portal.	Requires coordination with NMFS HQ. Builds on pre-existing websites. Portal doesn't house reports currently.	Requires HQ commitment to set-up and maintain. Key GARFO staff would receive PDFs and provide to HQ contact.	Set up HQ Webmaster: 5 days GARFO Analyst: 5 days Maintenance HQ Webmaster: 5 day per year. GARFO Analyst: half day per year per FMP.

[4] These are preliminary estimates of human resource and funding requirements necessary to implement each option relative to the status quo. These estimates do not include the time required to maintain the current report housing process. It is possible that some efficiencies would be established over time.

Appendix: SAFE Report Production in the North Pacific

SAFE report	Approach to SAFE report production
Gulf of Alaska (GOA) groundfish	Largely authored by the Alaska Fisheries Science Center. Stock assessment authors perform their evaluation and present it to the groundfish plan team at public meetings in September and November every year. Fishermen (or their representatives) often attend to provide comments that could inform future survey plans or data interpretation. The plan team comments and writes an executive summary that ties the various assessments together into one SAFE document. The plan team is co-staffed/coordinated by one Council staff person and a lead NMFS staff. The GOA stocks are surveyed every other year. In the off years, the SAFE report is more of an updated or tweaked version of the previous GOA groundfish SAFE, with other data included (acoustic surveys, age data). The SSC also reviews the assessments that go into the report, serving as a peer review that the document represents the "best available" information.
BSAI groundfish	BSAI groundfish SAFE report is developed in a manner similar to the process used to develop the GOA groundfish SAFE reports, except that some rockfish stocks have full assessments every other year based on annual survey data.
GOA and BSAI groundfish economics	The SAFE is written by the NMFS economists at the AFSC. They receive data support from AKFIN (Alaska Fisheries Information Network) of the Pacific States Marine Fisheries Commission. AFSC staff writes the document each year and presents it to the SSC, AP and Council.
Crab	Though the fishery is primarily managed by the State of Alaska, stock assessment and SAFE report authors are divided between ADF&G and AFSC/NOAA.
Crab economics	The Crab economic report is developed in a manner similar to that of the GOA and BSAI groundfish economic SAFE report. This SAFE report has just recently started to be produced.
Scallop	This fishery is primarily managed by the State of Alaska. State staff mainly conduct the surveys and contribute to the report, but there is a plan team that is coordinated by a Council staff person. The Council staff compiles the SAFE report. It is also reviewed by the SSC, Advisory Panel, and the NPFMC. The plan teams meet approximately once a year. An economic overview is included within the scallop SAFE.
Ecosystem	The SAFE is a collaboration between all relevant agencies, but the NMFS ASFC takes the lead. Other contributors include the State of AK (ADF&G) and US Fish and Wildlife Service.
Notes: A new SAFE is produced every year (for all 6 SAFE reports). This is largely driven by the NPFMC's expectation that an update will be considered as part of the harvest specification process (ABCs, TACs) at its December meeting. All of these annual reports take a significant amount of effort to prepare and are hundreds of pages long (BSAI is >1,600p). The components of SAFEs written by plan teams (Introduction/executive summary) include OFL and ABC recommendations for every stock. *Source:* Email correspondence with NPFMC staff. A summary of the preparation and review process is at: http://www.npfmc.org/wp-content/PDFdocuments/resources/SAFE/AFSCsafeReviewProcess.pdf	

NOAA Technical Memorandum NMFS-SEFSC-730

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September 2018

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Introduction

This technical memorandum provides summary information and estimated economic information for the commercial sector of the federally-managed snapper-grouper (SG) fishery in the South Atlantic (SAT) in calendar year 2016, including a comparison to earlier years. The SAT SG fishery includes multiple species of snapper, grouper, tilefish, and jacks as well as black sea bass, triggerfish, grunts, porgies and hogfish, targeted in the U.S. EEZ off the Atlantic coast of the United States from North Carolina to Florida. The fishery is truly a multi-species fishery, with none of the 55 species being dominant. For a complete list of federally-managed snapper-grouper species, please refer to Appendix 2. The fishery is managed by the SAT Fishery Management Council (SAFMC) (in coordination with the States) through the SAT SG Fishery Management Plan (FMP). With the exception of wreckfish[1], the fishery has been managed by a combination of complex trip-limits, season closures, closed areas, and regular species-specific closures when a species's harvest is anticipated to reach the quota. For detailed information about the SG FMP, please consult the SAFMC's website at: http://safmc.net//.

This report's unique focus is on the economics of the commercial harvesting sector in the SAT SG fishery. 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 a species or species group level, such as vermilion snapper 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.

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 11 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-

[1]For data reasons, wreckfish is excluded from this report (see Appendix 1 for more information).

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 (mostly mackerels), 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 and estimated revenue align with dealer reported landings and revenue varies by species. In general, logbook landings and revenue deviate less than 10% from dealer reported landings for the SAT SG FMP's species (with the exception of yellowtail snapper); leading us to refer to the data collection as a "near census".[2]

Since 2002/03, NMFS's SEFSC has conducted two economic surveys to collect data at both the trip-level and vessel-level in the SAT SG FMP fishery.[3] Each year, a subset of federally permitted vessels is randomly selected to provide additional economic data on 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

[2]For the species perspectives other than yellowtail snapper, the deviation between logbook estimated revenue and dealer reported revenue ranged from minus 4.18% to plus 6.44%. Neither data collection is without weaknesses, and in both cases classifications and transformations can explain discrepancies. Our analysis, based on logbook data, underestimates yellowtail snapper landings by roughly a quarter. Yellowtail snapper is primarily harvested around the Florida Keys, making the assignment of fish to the Gulf of Mexico vs. the S.Atlantic a known issue.

[3]These economic data collections were started by James R. Waters. The authors would like to gratefully acknowledge that, beyond envisioning and starting these surveys, Jim also provided a thorough review of this report. Of course, all remaining issues or errors belong solely to the authors.

at sea per year in both years), and 3. Active - High (more than 20 days at sea in at least one year).[4] 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; 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.

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.[5]

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 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

[4]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.

[5]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.

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).

Definiton: 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 Vermilion Snapper Fishery: All gears" would include all trips that caught one or more pounds of vermilion snapper using any gear in the U.S. South Atlantic. The following items are primarily used to create the SOIs: Area fished and species landed.[6] 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 report are not at all mutually exclusive. In fact, as the majority of trips harvest a large number of 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 economic observation receives a weight specific to: a) the original sampling strata and b) the

[6]Segmenting by gear-use could not be reported IN FULL due to small sample sizes. Appendix 1 provides trip-level results (only) by gear type. 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.

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 3 for the specific species included in each reported group. The first 5 groups contain the SG FMP species and some other bottom fished species.
- **Revenue for Top 5 Species:** Total estimated species-level revenue for the top 5 species with greatest overall revenue on all SOI trips. Note that these numbers are by species alone, not conditioned by other factors that determine a species SOI. As a result, for a specific species—especially at the annual, vessel-level—this revenue number can exceed the SOI revenue number. For example, the SOI species might be harvested in Gulf of Mexico waters, thereby not counting toward SOI landings, which are conditioned on harvest in SA waters.
- **SOI Landings by Area Fished:** A bubble map showing where SOI landings are caught in the South Atlantic. 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, 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 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 (implicitly) in Section Four: Annual, Vessel-Level Economics and Section Six: Annual, Vessel-Level Time Series.

- **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 "bycatch".
- **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 3 for the specific species included in each reported group. The first 5 groups contain the SG FMP species and some other bottom fished 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. Note that these numbers are by species alone, not conditioned by other factors that determine a species SOI. As a result, for a specific species—especially at the annual, vessel-level—this revenue number can exceed the SOI revenue number. For example, the SOI species might be harvested in Gulf of Mexico waters, thereby not counting toward SOI landings, which are conditioned on harvest in SA waters.
- **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 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 Reef Fish, South Atlantic (SAT) Snapper & Grouper (Unlimited and Limited versions), GOM and SAT King Mackerel and Spanish Mackerel permits, Atlantic Dolphin-Wahoo (applies to SAT, not GOM), Other Commercial Fishing (including permits for sharks, swordfish, 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 ear.

  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.

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 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.[7] 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. 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 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.

[7] 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.

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 either specified on species or species group landed or permit-related. Note that the different SOIs in this tech memo are not at all mutually exclusive. In fact, as the majority of trips harvest a large number of different species, most trips will be part of many different SOIs. The SOIs featured in this report include:

The Snapper-Grouper fishery (this SOI is inclusive of all the following SOIs, as all the rest are nested within/subsets of the Snapper-Grouper SOI):
1. SAT Snapper-Grouper FMP Fishery: All Gears

SOIs based on species perspective:
2. SAT Yellowtail Snapper Fishery: All Gears
3. SAT Vermilion Snapper Fishery: All Gears
4. SAT Gag Grouper Fishery: All Gears
5. SAT Black Sea Bass Fishery: All Gears
6. SAT Triggerfish Fishery: All Gears
7. SAT Scamp Fishery: All Gears

SOIs based on species group perspective:
8. SAT FMP Deepwater Fishery: All Gears
9. SAT FMP Jacks Fishery: All Gears
10. SAT FMP SWGCS[8] Fishery: All Gears

SOI based on permit perspective:
11. SAT Snapper-Grouper FMP Fishery: All Gears, SG2 Permit

Segmenting by gear-used could not be reported in full due to small sample sizes, especially at the annual, vessel-level. Appendix 1 provides trip-level results by gear type including vertical line, longline, diving, and traps (pots).

[8]This SOI consists of mostly shallow water groupers subject to the Annual Shallow-water Grouper Spawning Season Closure, but not gag and scamp. Species included are: Black grouper, red grouper, yellowfin grouper, yellowmouth grouper, red hind, rock hind, coney, and graysby.

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[9] 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.

[9]The evaluation is facilitated by the use of a standardized 6-page "diagnostic results" product that we can quickly generate for any SOI.

Choice of Economic Results for Single Species Management

While the SG FMP has 55 species, many are harvested in very small quantities and hence it is impossible to provide species-specific economic information (with sample survey data). The following table lists total 2016 revenue, gutted-weight pounds, number of trips, and number of vessel for each SG species as reported to the coastal logbook system (near census) in order to provide an impression of the relative importance of each species to the fishery. The final column lists the available SOI that best reflects any one species. If a particular species SOI is not available but economic results are desired, the authors recommend using the SOI listed in the final column as the best approximation. Note that Appendix 1 provides trip-level results (only) for gear-based SOIs for the SG fishery. Economic results for the black sea bass pots fishery or the golden tilefish longline fishery are best approximated by the SG trap or SG longline SOIs, respectively.

Revenue, landings, trips, vessels, and most appropriate economic results for each SG species

Species	Revenue	lbs (gw)	Trips	Vessels	Use Econ Results of SOI:
Almaco Jack	$145,661	135,023	1,288	180	FMP Jacks
Atlantic Spadefish	$0	0	0	0	Snapper-Grouper FMP
Banded Rudderfish	$39,117	42,622	362	103	FMP Jacks
Bar Jack	$907	893	30	14	FMP Jacks
Blackfin Snapper	$1,803	475	31	24	FMP Deepwater
Black Grouper	$314,671	60,724	896	157	FMP SWGCS
Black Sea Bass*	$736,930	209,455	1,905	186	Black Sea Bass
Blueline Tilefish	$347,120	105,149	877	150	FMP Deepwater
Coney	$20	9	2	1	FMP SWGCS
Cubera Snapper	$12,493	3,969	72	37	Snapper-Grouper FMP
Gag Grouper	$1,174,131	199,830	1,426	201	Gag Grouper
Golden Tilefish*	$2,259,007	517,592	821	117	FMP Deepwater
Goliath Grouper	$0	0	0	0	Snapper-Grouper FMP
Graysby	$1,050	190	29	8	FMP SWGCS
Gray Snapper	$403,381	119,747	1,974	262	Snapper-Grouper FMP
Gray Triggerfish	$658,474	260,565	1,680	200	Triggerfish
Greater Amberjack	$1,193,133	750,624	1,943	254	FMP Jacks
Hogfish	$120,698	27,036	776	133	Snapper-Grouper FMP
Jolthead Porgy	$24,686	16,248	529	117	Snapper-Grouper FMP
Knobbed Porgy	$6,197	4,404	265	62	Snapper-Grouper FMP
Lane Snapper	$7,111	2,382	179	59	Snapper-Grouper FMP
Lesser Amberjack	$9,243	6,221	76	48	FMP Jacks
Margate	$3,215	3,203	225	54	Snapper-Grouper FMP
Misty Grouper	$53	16	2	2	FMP Deepwater
Mutton Snapper	$206,103	61,196	1,698	248	Snapper-Grouper FMP
Nassau Grouper	$0	0	0	0	Snapper-Grouper FMP
Queen Snapper	$6,810	1,736	19	15	FMP Deepwater

* For trip-level results with a gear perspective, i.e., black sea bass pots/traps or longline for golden tilefish, see Appendix 1.

Species	Revenue	lbs (gw)	Trips	Vessels	Use Econ Results of SOI:
Red Grouper	$176,444	38,129	806	209	FMP SWGCS
Red Hind	$10,076	2,333	205	66	FMP SWGCS
Red Porgy	$214,606	97,884	1,212	144	Snapper-Grouper FMP
Red Snapper	$16,177	3,887	27	22	Snapper-Grouper FMP
Rock Hind	$27,245	4,868	337	77	FMP SWGCS
Sailor's Choice Grunt	$122	89	1	1	Snapper-Grouper FMP
Sand Tilefish	$735	633	57	20	FMP Deepwater
Saucereye Porgy	$0	0	0	0	Snapper-Grouper FMP
Scamp	$632,403	104,264	909	142	Scamp
Scup	$26	22	3	3	Snapper-Grouper FMP
Silk Snapper	$78,145	19,135	330	79	FMP Deepwater
Snowy Grouper	$721,020	141,479	1,117	159	FMP Deepwater
Speckled Hind	$1,153	287	26	18	Snapper-Grouper FMP
Tomtate Grunt	$36	29	4	2	Snapper-Grouper FMP
Vermilion Snapper	$2,828,743	741,286	1,693	206	Vermilion Snapper
Warsaw Grouper	$3,033	794	3	3	Snapper-Grouper FMP
Whitebone Porgy	$1,634	1,115	116	36	Snapper-Grouper FMP
White Grunt	$57,598	43,878	877	101	Snapper-Grouper FMP
Yellowedge Grouper	$94,443	18,631	281	86	FMP Deepwater
Yellowfin Grouper	$3,938	737	15	10	FMP SWGCS
Yellowmouth Grouper	$569	124	3	3	FMP SWGCS
Yellowtail Snapper	$4,641,553	1,342,760	4,636	257	Yellowtail Snapper

SOI: 2016 SAT Snapper-Grouper FMP Fishery: All Gears

Description: This SOI consists of all logbook trips by permitted vessels where at least one pound of fish managed by the SAT Snapper-Grouper FMP was landed in 2016 using any gear type. Species managed include multiple species of snapper, grouper, tilefish, etc. For a complete list of the species, please refer to Appendix 2. For important **disclaimer**, see page 15.

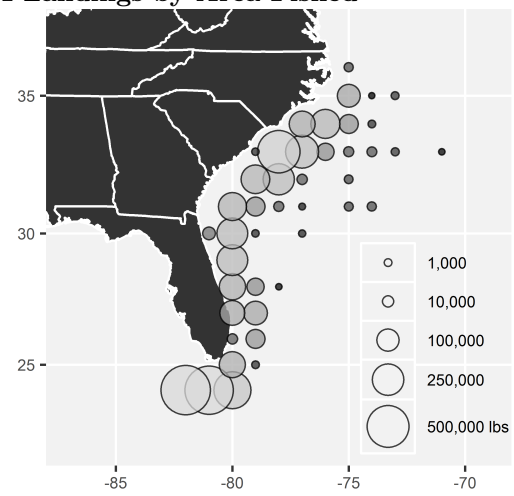
Trip-Level Summary

Effort	
Trips	11,386
Vessels	509
Days at Sea	18,878
Crew Days	40,565
Landings (gutted lbs)	
Total	5,680,861
SOI	5,101,373
Non-SOI	579,488
% SOI	90%

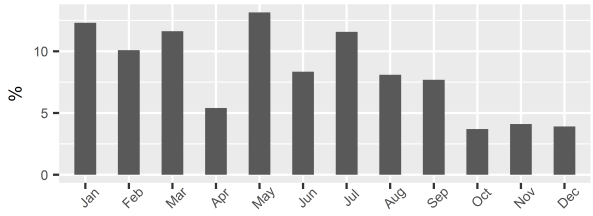
Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	85%	84%
Longline	3%	9%
Diver	7%	4%
Traps/Pots	2%	2%
Other	4%	1%

Price (mean)	
Total	$3.31
SOI	$3.37
Non-SOI	$2.75
Revenue	
Total	$18,789,938
SOI	$17,197,008
Non-SOI	$1,592,930
% SOI	92%
Percent of Revenue by Species Group	
Shallow Water Groupers	12%
Shallow Water Snappers	28%
Mid-Shelf Snappers	16%
Deep Water Groupers/Tilefish	18%
Grunt/Porgy/Sea Bass/Trigger	10%
Mackerels/Dolphinfish/Jacks	10%
Other Species	5%
Revenue for Top 5 Species	
Yellowtail Snapper	$4,649,998
Vermilion Snapper	$2,828,743
Tilefish	$2,259,007
Greater Amberjack	$1,193,133
Gag Grouper	$1,174,131

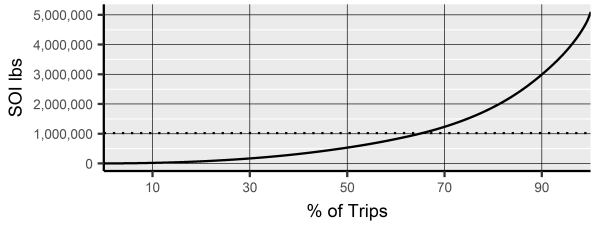
SOI Landings by Area Fished



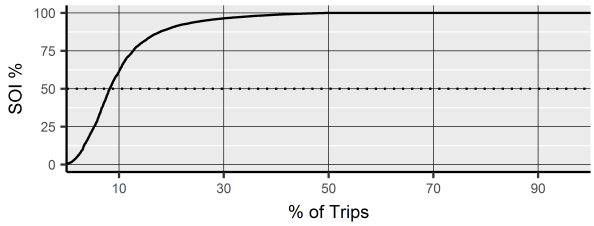
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=11,386)

	Mean	Min	Median	Max
Days at Sea	1.7	1	1	17
Crew Size	2	1	2	8
Landings	499	2	256	7,867
Revenue	$1,650	$8	$868	$28,370
SOI	$1,510	$1	$772	$26,308
% SOI	90%	0.1%	100%	100%

SOI: 2016 SAT Snapper-Grouper FMP Fishery: All Gears

Trip-Level Economics

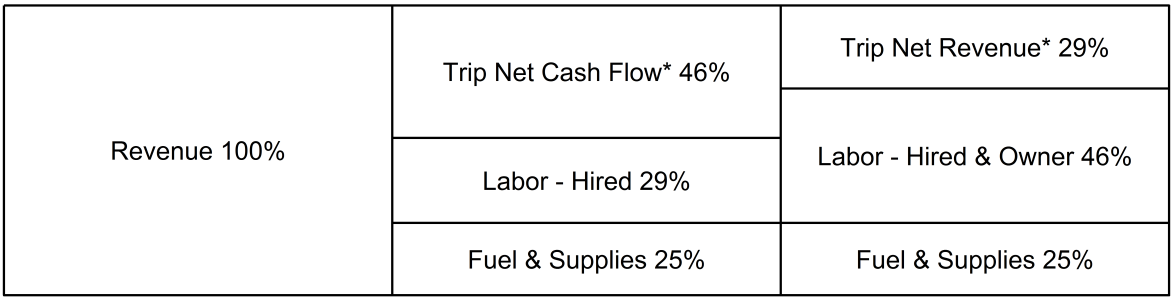
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	11,386	-	-	-
Selected	2,766	24%	-	-
Responded	2,711	24%	98%	-
Used	2,612	23%	94%	96%

Economic Results (n=2,612)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	82%	3.1	77%	87%	-
Days at Sea	1.8	0.2	1.5	2.1	1
Crew Size	2	0.1	1.9	2.1	2
Fuel Used	74	7	62	86	50
Landings (gutted lbs)	503	57	408	598	245
Total Revenue	1,761	206	1,420	2,103	938
Cost					
Fuel	165	15	140	189	110
Bait	126	23	88	165	50
Ice	38	5	29	46	16
Groceries	62	10	46	78	20
Miscellaneous	49	16	23	75	10
Hired Crew	517	84	377	657	160
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	299	35	241	358	150
Trip Net Cash Flow*	805	86	661	948	410
Trip Net Revenue*	505	74	383	628	169

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



Input Prices

Fuel Price (average): $2.22 per gallon

Hired Crew Wage (implicit): $247 per crew-day

Productivity Measures

Landings/Fuel Use: 6.8 lbs/gallon

Landings/Labor Use: 141 lbs/crew-day

* See Definitions in Methods Section or Glossary.

SOI: 2016 SAT Snapper-Grouper FMP Fishery: All Gears

Annual, Vessel-Level Summary

Effort

Vessels	509
Trips - Total	15,312
SOI Trips	11,386
Non-SOI Trips	3,926
Days at Sea	23,772
Crew Days	49,117

Landings (gutted lbs)

Total	8,197,473
SOI	5,101,373
Non-SOI	3,096,100
% SOI	62%

Percent by Gear	**Trips**	**Total lbs**
Vertical Line	73%	65%
Longline	4%	12%
Diver	5%	3%
Traps/Pots	1%	1%
Other	17%	19%

Price (mean)

Total	$2.87
SOI	$3.37
Non-SOI	$2.04

Revenue

Total	$23,514,107
SOI	$17,197,008
Non-SOI	$6,317,098
% SOI	73%

Percent of Revenue by Species Group

Shallow Water Groupers	12%
Shallow Water Snappers	24%
Mid-Shelf Snappers	13%
Deep Water Groupers/Tilefish	15%
Grunt/Porgy/Sea Bass/Trigger	8%
Mackerels/Dolphinfish/Jacks	20%
Other Species	8%

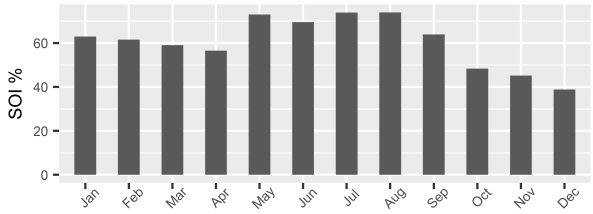
Revenue for Top 5 Species

Yellowtail Snapper	$4,940,022
Vermilion Snapper	$2,857,551
Tilefish	$2,336,490
King and Cero Mackerel	$2,335,984
Greater Amberjack	$1,247,716

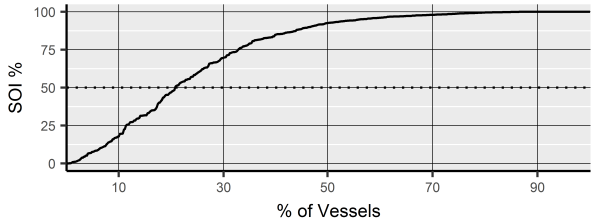
Annual, Vessel Descriptive Statistics (N=509)

	Mean	Min	Median	Max
Trips	30.1	1	19	234
Days at Sea	46.7	1	31	234
Crew Days	96.5	1	61	545
Landings	16,105	10	6,966	210,425
Revenue	$46,197	$34	$21,886	$541,023
SOI	$33,786	$3	$12,699	$239,006
% SOI	75.9%	0%	92.7%	100%

SOI Share of Monthly Landings



SOI Share of Revenue Per Vessel



Percent with Federal Permit

GOM Reef Fish	9%
SAT Snapper & Grouper - Unlimited	91%
SAT Snapper & Grouper - Limited	10%
King Mackerel	62%
Spanish Mackerel	70%
Dolphin-Wahoo	93%
Other Commercial Fishing	29%
For-Hire Fishing	28%

Vessel Characteristics (N=509)

	Mean	Min	Median	Max
Length	33	17	32	70
Year Built	1990	1954	1988	2016
Horsepower	400	50	350	1,350
Fiberglass Hull	98%	-	-	-
Diesel Engine	65%	-	-	-
Ice Refrigeration	93%	-	-	-

SOI: 2016 SAT Snapper-Grouper FMP Fishery: All Gears

Annual, Vessel-Level Economics

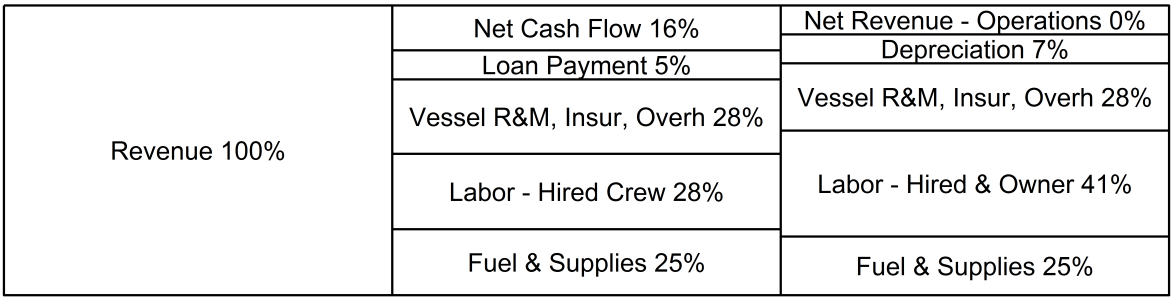
Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	509	-	-	-
Selected	132	26%	-	-
Responded	102	20%	77%	-
Used	94	18%	71%	92%

Economic Results (n=94)

	Mean	**SE**	**90% L.B.**	**90% U.B.**	**Median**
SOI Vessel					
Owner-Operated	89%	3.4	83%	94%	-
For-Hire Active	12%	3.5	6%	18%	-
Days - Commercial Fishing	80	6.3	70	91	69
Days - For-Hire Fishing	10	2.9	5	15	0
Days - Non-fishing	3	1.1	1	5	0
Vessel Value	93,685	10,395	76,410	110,960	65,000
Has Insurance	45%	5.3	36%	54%	-
Total Revenue	69,373	9,014	54,393	84,352	40,861
Commercial Fishing	57,489	7,194	45,534	69,444	35,631
For-Hire Fishing	11,883	5,442	2,840	20,926	0
Cost					
Fuel	7,037	717	5,845	8,229	4,836
Other Supplies	10,015	1,277	7,892	12,138	5,000
Hired Crew	19,274	2,853	14,534	24,014	6,152
Vessel Repair & Maintenance	10,503	1,766	7,569	13,437	5,152
Insurance	1,478	265	1,037	1,919	0
Overhead	7,100	974	5,482	8,718	3,642
Loan Payment	3,211	1,173	1,261	5,161	0
IFQ Purchase	23	14	−1	46	0
OC Owner-Captain Time	9,052	984	7,417	10,688	3,793
Depreciation	4,684	520	3,820	5,548	3,250
Net Cash Flow	10,733	4,339	3,522	17,944	6,290
Net Revenue from Operations*	230	4,328	−6,963	7,423	−2,775

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



Economic Return* (on Vessel Asset Value): 0.2%

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

SOI: 2016 SAT Snapper-Grouper FMP Fishery: All Gears

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	12,140	11,036	11,386	11,521
Vessels	527	518	509	518
Days at Sea	20,768	19,357	18,878	19,668
Landings (gutted lbs)				
Total	6,281,668	5,763,319	5,680,861	5,908,616
SOI	5,655,496	5,267,893	5,101,373	5,341,587
Non-SOI	626,172	495,426	579,488	567,029
% SOI	90%	91%	90%	90%
Price (mean)				
Total	$3.23	$3.27	$3.31	$3.27
SOI	$3.19	$3.30	$3.37	$3.29
Non-SOI	$3.46	$2.97	$2.75	$3.06
Revenue				
Total	$20,235,150	$18,886,806	$18,789,938	$19,303,965
SOI	$18,065,600	$17,415,709	$17,197,008	$17,559,439
Non-SOI	$2,169,552	$1,471,097	$1,592,930	$1,744,526
% SOI	89%	92%	92%	91%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	2,962	2,588	2,612	
Response Rate (%)	83%	83%	94%	
SOI Trip				
Owner-Operated	83%	88%	82%	84.3%
Fuel Used per Day at Sea (gallons/day)	33	38	41	37
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	13.4%	11.4%	9.3%	11.4%
Bait	6.9%	7.2%	7.2%	7.1%
Ice	1.9%	1.9%	2.1%	2%
Groceries	3.2%	2.8%	3.5%	3.2%
Miscellaneous	2.8%	2.7%	2.8%	2.8%
Hired Crew	32.6%	32.7%	29.4%	31.6%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	19.6%	17.8%	17%	18.1%
Trip Net Cash Flow*	39.1%	41.3%	45.7%	42%
Trip Net Revenue*	19.5%	23.5%	28.7%	23.9%
Labor - Hired & Owner	52.2%	50.5%	46.4%	49.7%
Fuel & Supplies	28.3%	25.9%	24.9%	26.4%
Input Prices				
Fuel Price (per gallon)	$3.68	$2.87	$2.22	$2.92
Hire Crew Wage (per crew-day)	$268	$283	$247	$266
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	8.7	7.8	6.8	8
Landings/Labor Use (lbs/crew-day)	150	150	141	147

SOI: 2016 SAT Snapper-Grouper FMP Fishery: All Gears

Annual, Vessel-Level Time Series

Annual, Vessel-Level Summary

	2014	2015	2016	Average
Effort				
Vessels	527	518	509	518
Trips - Total	16,452	14,965	15,312	15,576
SOI Trips	12,140	11,036	11,386	11,521
Non-SOI Trips	4,312	3,929	3,926	4,056
Days at Sea	26,219	24,454	23,772	24,815
Landings (gutted lbs)				
Total	9,044,887	8,262,325	8,197,473	8,501,562
SOI	5,655,496	5,267,893	5,101,373	5,341,587
Non-SOI	3,389,391	2,994,432	3,096,100	3,159,974
% SOI	63%	64%	62%	63%
Revenue				
Total	$25,363,247	$23,704,881	$23,514,107	$24,194,078
SOI	$18,065,600	$17,415,709	$17,197,008	$17,559,439
Non-SOI	$7,297,648	$6,289,173	$6,317,098	$6,634,640
% SOI	71%	73%	73%	72%
Vessel Characteristics				
Length	33	33	33	33
Year Built	1989	1989	1990	1989
For-Hire Fishing Permit	27%	26%	28%	27%

Annual, Vessel-Level Economics

	2014	2015	2016	Average
Number of Observations	75	101	94	
Response Rate (%)	50%	75%	71%	
SOI Vessel				
Owner-Operated	85%	91%	89%	88%
For-Hire Active	22%	19%	12%	18%
Vessel Value	$77,267	$77,428	$93,685	$82,793
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	15%	11.7%	10.1%	12.3%
Other Supplies	12.1%	12.9%	14.4%	13.1%
Hired Crew	28.4%	23.8%	27.8%	26.7%
Vessel Repair & Maintenance	14.7%	15.7%	15.1%	15.2%
Insurance	1.5%	1.6%	2.1%	1.7%
Overhead	6.8%	8.4%	10.2%	8.5%
Loan Payment	2.5%	3.3%	4.6%	3.5%
IFQ Purchase	0%	0.1%	0%	0%
OC Owner-Captain Time	10.6%	12.8%	13%	12.1%
Net Cash Flow	18.9%	22.4%	15.5%	18.9%
Net Revenue for Operations*	5.6%	7.7%	0.3%	4.5%
Depreciation	5.3%	5.3%	6.8%	5.8%
Vessel R&M, Insur, Overh	23%	25.7%	27.5%	25.4%
Labor - Hired & Owner	39%	36.6%	40.8%	38.8%
Fuel & Supplies	27.1%	24.6%	24.6%	25.4%
Economic Return* (on asset value)	5.4%	7.3%	0.2%	4.3%

SOI: 2016 SAT Yellowtail Snapper Fishery: All Gears

Description: This SOI consists of all logbook trips by permitted vessels where at least one pound of yellowtail snapper was landed in 2016 using any gear type. For important **disclaimer**, see page 15.

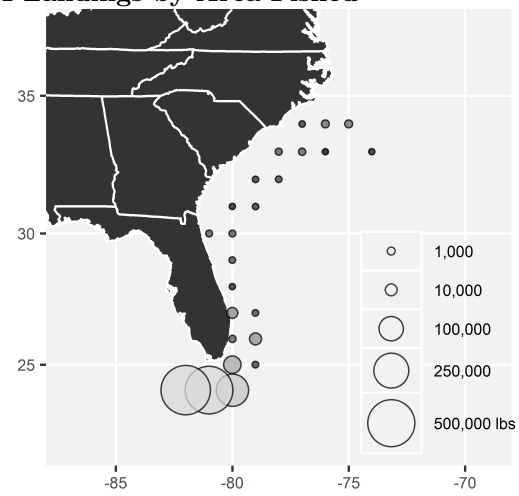
Trip-Level Summary

Effort	
Trips	4,635
Vessels	257
Days at Sea	6,571
Crew Days	13,046
Landings (gutted lbs)	
Total	1,710,473
SOI	1,342,760
Non-SOI	367,712
% SOI	79%

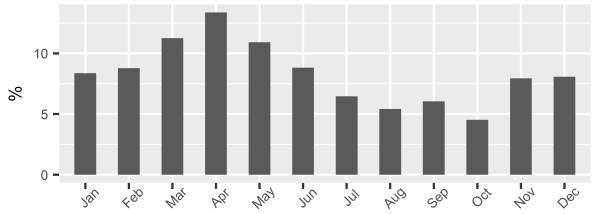
Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	98%	100%
Longline	0%	0%
Diver	0.7%	0%
Traps/Pots	0%	0%
Other	0.8%	0%

Price (mean)	
Total	$3.31
SOI	$3.46
Non-SOI	$2.77
Revenue	
Total	$5,661,547
SOI	$4,641,553
Non-SOI	$1,019,994
% SOI	82%
Percent of Revenue by Species Group	
Shallow Water Groupers	5%
Shallow Water Snappers	87%
Mid-Shelf Snappers	2%
Deep Water Groupers/Tilefish	0.9%
Grunt/Porgy/Sea Bass/Trigger	1%
Mackerels/Dolphinfish/Jacks	2%
Other Species	2%
Revenue for Top 5 Species	
Yellowtail Snapper	$4,643,191
Gray Snapper	$208,188
Vermilion Snapper	$121,562
Black Grouper	$88,875
Gag Grouper	$79,669

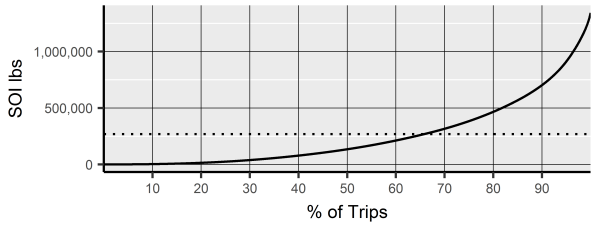
SOI Landings by Area Fished



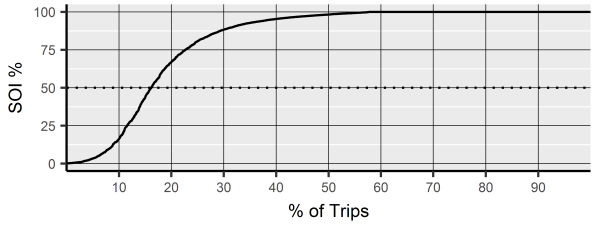
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=4,635)

	Mean	Min	Median	Max
Days at Sea	1.4	1	1	17
Crew Size	1.9	1	2	8
Landings	369	2	203	4,479
Revenue	$1,221	$8	$658	$15,435
SOI	$1,001	$3	$492	$15,435
% SOI	82%	0.2%	98.3%	100%

SOI: 2016 SAT Yellowtail Snapper Fishery: All Gears

Trip-Level Economics

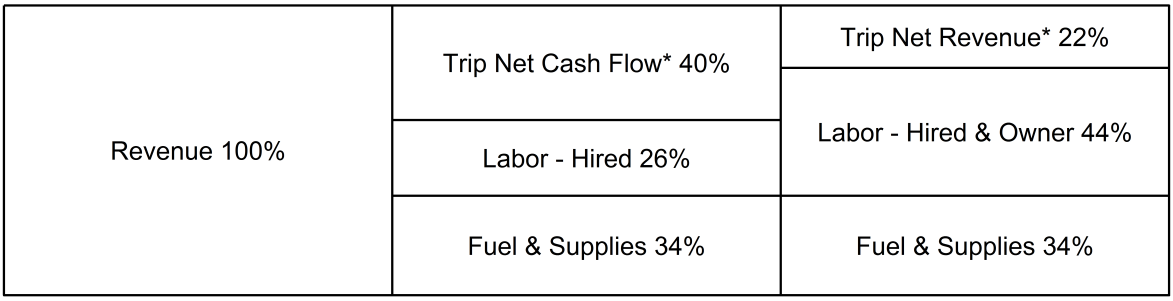
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	4,635	-	-	-
Selected	978	21%	-	-
Responded	953	21%	97%	-
Used	900	19%	92%	94%

Economic Results (n=900)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	80%	4.8	72%	88%	-
Days at Sea	1.7	0.3	1.1	2.2	1
Crew Size	2	0.1	1.8	2.1	2
Fuel Used	46	9	31	60	25
Landings (gutted lbs)	359	69	244	475	188
Total Revenue	1,237	236	842	1,631	627
Cost					
Fuel	116	17	88	144	57
Bait	198	26	154	242	120
Ice	35	8	22	49	16
Groceries	46	17	18	74	20
Miscellaneous	29	28	−17	74	10
Hired Crew	323	105	148	499	125
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	222	58	126	318	120
Trip Net Cash Flow*	489	86	345	633	241
Trip Net Revenue*	267	52	181	353	89

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



Input Prices

Fuel Price (average): $2.54 per gallon Hired Crew Wage (implicit): $167 per crew-day

Productivity Measures

Landings/Fuel Use: 7.9 lbs/gallon Landings/Labor Use: 110 lbs/crew-day

* See Definitions in Methods Section or Glossary.

SOI: 2016 SAT Yellowtail Snapper Fishery: All Gears

Annual, Vessel-Level Summary

Effort	
Vessels	257
Trips - Total	8,821
SOI Trips	4,635
Non-SOI Trips	4,186
Days at Sea	13,941
Crew Days	29,027

Landings (gutted lbs)	
Total	4,110,880
SOI	1,342,760
Non-SOI	2,768,120
% SOI	33%

Percent by Gear	**Trips**	**Total lbs**
Vertical Line	88%	88%
Longline	1%	3%
Diver	4%	3%
Traps/Pots	0%	0%
Other	7%	6%

Price (mean)	
Total	$3.16
SOI	$3.46
Non-SOI	$3.01

Revenue	
Total	$12,977,403
SOI	$4,641,553
Non-SOI	$8,335,850
% SOI	36%

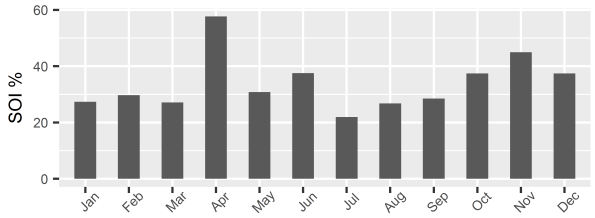
Percent of Revenue by Species Group	
Shallow Water Groupers	10%
Shallow Water Snappers	42%
Mid-Shelf Snappers	12%
Deep Water Groupers/Tilefish	9%
Grunt/Porgy/Sea Bass/Trigger	6%
Mackerels/Dolphinfish/Jacks	15%
Other Species	6%

Revenue for Top 5 Species	
Yellowtail Snapper	$4,880,190
Vermilion Snapper	$1,514,771
King and Cero Mackerel	$794,808
Greater Amberjack	$694,337
Tilefish	$656,718

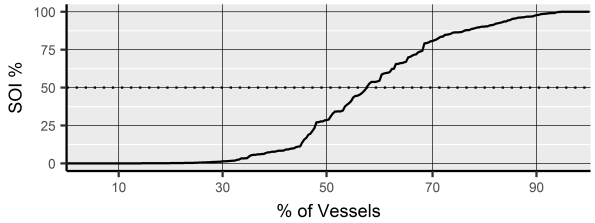
Annual, Vessel Descriptive Statistics (N=257)

	Mean	Min	Median	Max
Trips	34.3	1	21	234
Days at Sea	54.2	1	38	234
Crew Days	112.9	1	77	525
Landings	15,996	10	7,782	103,405
Revenue	$50,496	$34	$24,990	$541,023
SOI	$18,061	$3	$1,425	$233,813
% SOI	41.5%	0%	29%	100%

SOI Share of Monthly Landings



SOI Share of Revenue Per Vessel



Percent with Federal Permit	
GOM Reef Fish	15%
SAT Snapper & Grouper - Unlimited	90%
SAT Snapper & Grouper - Limited	11%
King Mackerel	60%
Spanish Mackerel	72%
Dolphin-Wahoo	93%
Other Commercial Fishing	24%
For-Hire Fishing	20%

Vessel Characteristics (N=257)

	Mean	Min	Median	Max
Length	33	21	32	70
Year Built	1988	1962	1986	2015
Horsepower	390	115	350	1,200
Fiberglass Hull	98%	-	-	-
Diesel Engine	66%	-	-	-
Ice Refrigeration	92%	-	-	-

SOI: 2016 SAT Yellowtail Snapper Fishery: All Gears

Annual, Vessel-Level Economics

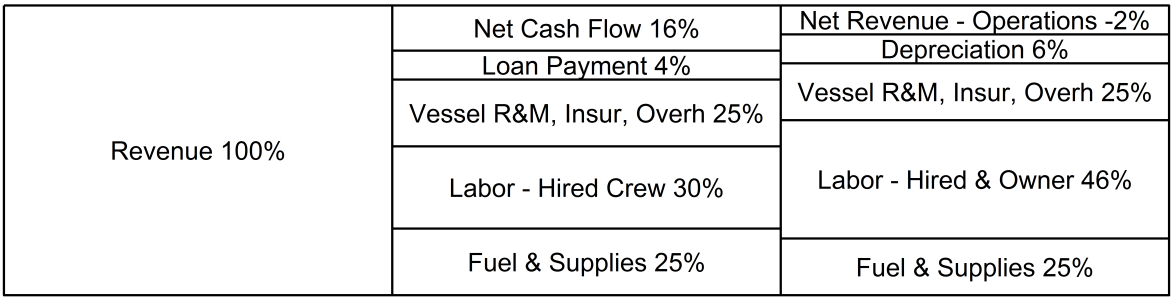
Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	257	-	-	-
Selected	71	28%	-	-
Responded	54	21%	76%	-
Used	52	20%	73%	96%

Economic Results (n=52)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Vessel					
Owner-Operated	96%	2.9	91%	101%	-
For-Hire Active	3%	2.3	−1%	6%	-
Days - Commercial Fishing	96	8.9	81	110	81
Days - For-Hire Fishing	2	0.9	0	3	0
Days - Non-fishing	5	2	2	8	0
Vessel Value	87,131	13,965	63,719	110,544	50,000
Has Insurance	40%	7	28%	51%	-
Total Revenue	70,741	12,332	50,065	91,416	40,000
Commercial Fishing	69,755	12,311	49,115	90,395	38,563
For-Hire Fishing	985	653	−109	2,080	0
Cost					
Fuel	5,931	658	4,828	7,034	4,810
Other Supplies	11,730	1,892	8,557	14,902	7,593
Hired Crew	21,443	4,492	13,911	28,975	7,500
Vessel Repair & Maintenance	9,836	2,405	5,804	13,867	4,500
Insurance	1,242	318	709	1,775	0
Overhead	6,572	1,248	4,480	8,664	3,000
Loan Payment	2,948	776	1,647	4,250	0
IFQ Purchase	40	25	−1	82	0
OC Owner-Captain Time	11,249	1,501	8,732	13,766	4,535
Depreciation	4,357	698	3,186	5,527	2,500
Net Cash Flow	10,998	6,695	−226	22,223	3,505
Net Revenue from Operations*	−1,618	5,799	−11,341	8,104	−5,142

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



Economic Return* (on Vessel Asset Value): −1.9%

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

SOI: 2016 SAT Yellowtail Snapper Fishery: All Gears

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	4,488	4,063	4,635	4,395
Vessels	263	243	257	254
Days at Sea	6,727	6,333	6,571	6,544
Landings (gutted lbs)				
Total	1,466,191	1,584,940	1,710,473	1,587,201
SOI	1,043,298	1,250,388	1,342,760	1,212,149
Non-SOI	422,893	334,552	367,712	375,052
% SOI	71%	79%	79%	76%
Price (mean)				
Total	$3.26	$3.29	$3.31	$3.29
SOI	$3.48	$3.45	$3.46	$3.46
Non-SOI	$2.71	$2.67	$2.77	$2.72
Revenue				
Total	$4,778,995	$5,218,870	$5,661,547	$5,219,804
SOI	$3,631,065	$4,323,290	$4,641,553	$4,198,636
Non-SOI	$1,147,930	$895,580	$1,019,994	$1,021,168
% SOI	76%	83%	82%	80%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	912	865	900	
Response Rate (%)	79%	80%	92%	
SOI Trip				
Owner-Operated	84%	84%	80%	82.7%
Fuel Used per Day at Sea (gallons/day)	17	22	27	22
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	10.8%	10.8%	9.4%	10.3%
Bait	18.1%	19.7%	16%	17.9%
Ice	2.3%	2%	2.9%	2.4%
Groceries	2.8%	1.7%	3.8%	2.8%
Miscellaneous	2.1%	2.4%	2.3%	2.3%
Hired Crew	24.5%	33%	26.2%	27.9%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	24.7%	16.9%	18%	19.9%
Trip Net Cash Flow*	39.4%	30.4%	39.5%	36.4%
Trip Net Cash Revenue*	14.7%	13.5%	21.6%	16.6%
Labor - Hired & Owner	49.2%	50%	44.1%	47.8%
Fuel & Supplies	36.1%	36.6%	34.3%	35.7%
Input Prices				
Fuel Price (per gallon)	$3.73	$3.62	$2.54	$3.30
Hire Crew Wage (per crew-day)	$170	$220	$167	$186
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	10.4	10.7	7.9	10
Landings/Labor Use (lbs/crew-day)	104	119	110	111

SOI: 2016 SAT Yellowtail Snapper Fishery: All Gears

Annual, Vessel-Level Time Series

Annual, Vessel-Level Summary

	2014	2015	2016	Average
Effort				
Vessels	263	243	257	254
Trips - Total	9,641	8,228	8,821	8,897
SOI Trips	4,488	4,063	4,635	4,395
Non-SOI Trips	5,153	4,165	4,186	4,501
Days at Sea	15,748	13,251	13,941	14,313
Landings (gutted lbs)				
Total	4,427,609	3,895,614	4,110,880	4,144,701
SOI	1,043,298	1,250,388	1,342,760	1,212,149
Non-SOI	3,384,311	2,645,226	2,768,120	2,932,552
% SOI	24%	32%	33%	30%
Revenue				
Total	$13,968,519	$11,963,669	$12,977,403	$12,969,864
SOI	$3,631,065	$4,323,290	$4,641,553	$4,198,636
Non-SOI	$10,337,455	$7,640,380	$8,335,850	$8,771,228
% SOI	26%	36%	36%	33%
Vessel Characteristics				
Length	32	32	33	32
Year Built	1988	1988	1988	1988
For-Hire Fishing Permit	22%	21%	20%	21%

Annual, Vessel-Level Economics

	2014	2015	2016	Average
Number of Observations	35	44	52	
Response Rate (%)	44%	68%	73%	
SOI Vessel				
Owner-Operated	79%	89%	96%	88%
For-Hire Active	7%	13%	3%	8%
Vessel Value	$81,647	$70,332	$87,131	$79,703
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	11.4%	11.6%	8.4%	10.5%
Other Supplies	11.5%	16.1%	16.6%	14.7%
Hired Crew	30.3%	22.3%	30.3%	27.6%
Vessel Repair & Maintenance	12.8%	15.2%	13.9%	14%
Insurance	1.1%	1.1%	1.8%	1.3%
Overhead	5.4%	9.1%	9.3%	7.9%
Loan Payment	1.9%	4.2%	4.2%	3.4%
IFQ Purchase	0%	0.3%	0.1%	0.1%
OC Owner-Captain Time	12.4%	15.5%	15.9%	14.6%
Net Cash Flow	25.5%	20%	15.5%	20.3%
Net Revenue for Operations*	10.4%	2.8%	−2.3%	3.6%
Depreciation	4.6%	6.2%	6.2%	5.7%
Vessel R&M, Insur, Overh	19.3%	25.4%	25%	23.2%
Labor - Hired & Owner	42.7%	37.8%	46.2%	42.2%
Fuel & Supplies	23%	27.7%	25%	25.2%
Economic Return* (on asset value)	11.2%	2.3%	−1.9%	3.9%

SOI: 2016 SAT Vermilion Snapper Fishery: All Gears

Description: This SOI consists of all logbook trips by permitted vessels where at least one pound of vermilion snapper was landed in 2016 using any gear type. For important **disclaimer**, see page 15.

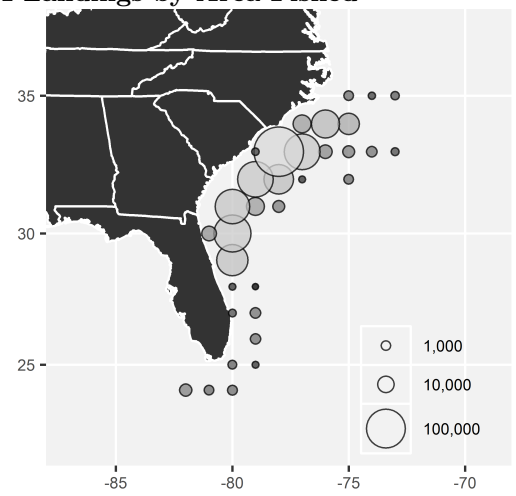
Trip-Level Summary

Effort	
Trips	1,693
Vessels	206
Days at Sea	4,872
Crew Days	12,045
Landings (gutted lbs)	
Total	1,656,926
SOI	741,286
Non-SOI	915,640
% SOI	45%

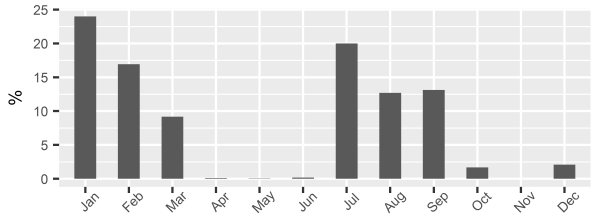
Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	96%	100%
Longline	0.1%	0%
Diver	2%	0%
Traps/Pots	0.6%	0.1%
Other	0.8%	0.2%

Price (mean)	
Total	$3.30
SOI	$3.82
Non-SOI	$2.88
Revenue	
Total	$5,463,325
SOI	$2,828,743
Non-SOI	$2,634,582
% SOI	52%
Percent of Revenue by Species Group	
Shallow Water Groupers	13%
Shallow Water Snappers	2%
Mid-Shelf Snappers	53%
Deep Water Groupers/Tilefish	7%
Grunt/Porgy/Sea Bass/Trigger	16%
Mackerels/Dolphinfish/Jacks	8%
Other Species	1%
Revenue for Top 5 Species	
Vermilion Snapper	$2,828,743
Gray Triggerfish	$468,431
Scamp	$296,532
Gag Grouper	$294,378
Greater Amberjack	$288,954

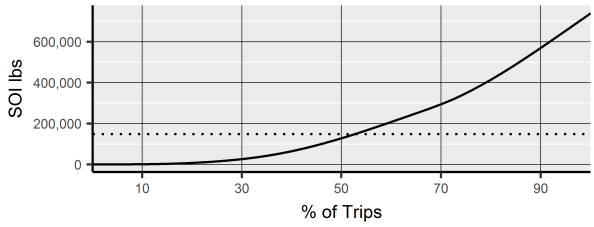
SOI Landings by Area Fished



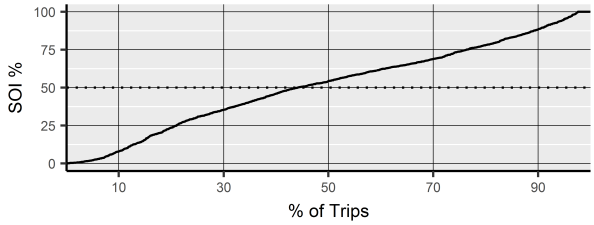
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=1,693)

	Mean	Min	Median	Max
Days at Sea	2.9	1	3	13
Crew Size	2.4	1	2	5
Landings	979	6	871	7,867
Revenue	$3,227	$19	$2,855	$24,702
SOI	$1,671	$3	$1,582	$10,365
% SOI	52%	0%	54.4%	100%

SOI: 2016 SAT Vermilion Snapper Fishery: All Gears

Trip-Level Economics

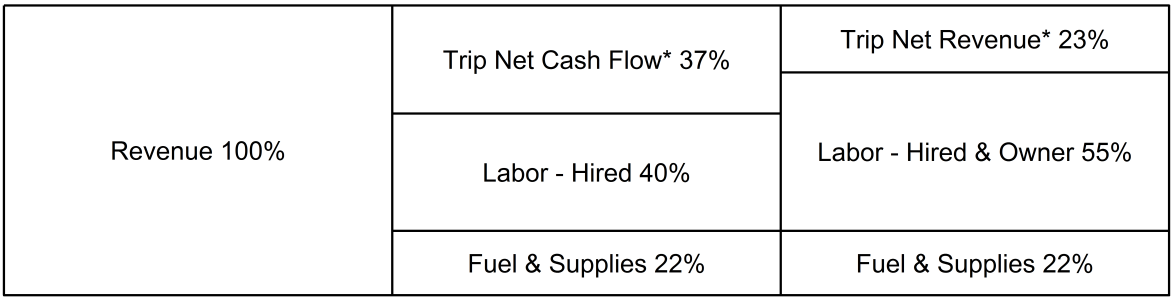
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	1,693	-	-	-
Selected	361	21%	-	-
Responded	356	21%	99%	-
Used	351	21%	97%	99%

Economic Results (n=351)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	69%	6.3	59%	80%	-
Days at Sea	3.2	0.2	2.9	3.6	3
Crew Size	2.4	0.1	2.2	2.6	2
Fuel Used	141	10	125	158	120
Landings (gutted lbs)	989	78	859	1,120	840
Total Revenue	3,263	272	2,805	3,720	2,969
Cost					
Fuel	276	20	243	309	246
Bait	123	14	101	146	85
Ice	77	7	64	89	60
Groceries	156	16	129	182	100
Miscellaneous	93	26	50	136	40
Hired Crew	1,320	122	1,115	1,525	1,050
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	463	62	360	567	85
Trip Net Cash Flow*	1,217	124	1,009	1,426	985
Trip Net Revenue*	754	87	608	900	536

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



Input Prices

Fuel Price (average): $1.95 per gallon Hired Crew Wage (implicit): $236 per crew-day

Productivity Measures

Landings/Fuel Use: 7 lbs/gallon Landings/Labor Use: 126 lbs/crew-day

* See Definitions in Methods Section or Glossary.

SOI: 2016 SAT Vermilion Snapper Fishery: All Gears

Annual, Vessel-Level Summary

Effort	
Vessels	206
Trips - Total	6,541
SOI Trips	1,693
Non-SOI Trips	4,848
Days at Sea	12,501
Crew Days	27,561

Landings (gutted lbs)	
Total	4,214,439
SOI	741,286
Non-SOI	3,473,153
% SOI	18%

Percent by Gear	**Trips**	**Total lbs**
Vertical Line	81%	77%
Longline	3%	12%
Diver	4%	3%
Traps/Pots	2%	2%
Other	10%	6%

Price (mean)	
Total	$3.06
SOI	$3.82
Non-SOI	$2.90

Revenue	
Total	$12,900,094
SOI	$2,828,743
Non-SOI	$10,071,351
% SOI	22%

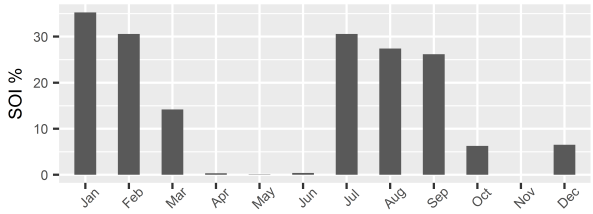
Percent of Revenue by Species Group	
Shallow Water Groupers	17%
Shallow Water Snappers	10%
Mid-Shelf Snappers	23%
Deep Water Groupers/Tilefish	15%
Grunt/Porgy/Sea Bass/Trigger	13%
Mackerels/Dolphinfish/Jacks	17%
Other Species	5%

Revenue for Top 5 Species	
Vermilion Snapper	$2,853,476
Tilefish	$1,137,825
Yellowtail Snapper	$1,067,085
Gag Grouper	$1,023,249
King and Cero Mackerel	$811,437

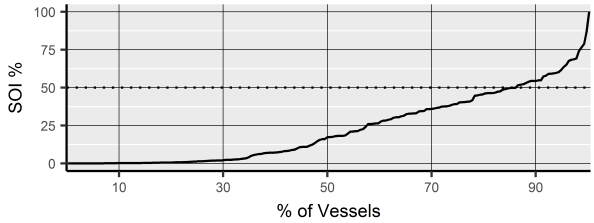
Annual, Vessel Descriptive Statistics (N=206)

	Mean	Min	Median	Max
Trips	31.8	2	22	169
Days at Sea	60.7	2	49	213
Crew Days	133.8	4	92	545
Landings	20,458	85	12,157	118,289
Revenue	$62,622	$308	$37,596	$471,162
SOI	$13,732	$4	$3,083	$117,455
% SOI	22.9%	0%	17.4%	100%

SOI Share of Monthly Landings



SOI Share of Revenue Per Vessel



Percent with Federal Permit	
GOM Reef Fish	6%
SAT Snapper & Grouper - Unlimited	96%
SAT Snapper & Grouper - Limited	4%
King Mackerel	67%
Spanish Mackerel	61%
Dolphin-Wahoo	96%
Other Commercial Fishing	34%
For-Hire Fishing	34%

Vessel Characteristics (N=206)

	Mean	Min	Median	Max
Length	34	20	32	70
Year Built	1991	1954	1988.5	2016
Horsepower	418	115	375	1,350
Fiberglass Hull	98%	-	-	-
Diesel Engine	72%	-	-	-
Ice Refrigeration	98%	-	-	-

SOI: 2016 SAT Vermilion Snapper Fishery: All Gears

Annual, Vessel-Level Economics

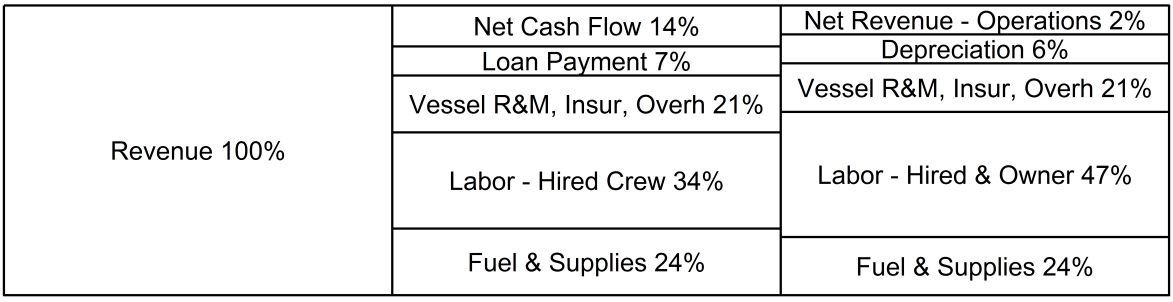
Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	206	-	-	-
Selected	49	24%	-	-
Responded	40	19%	82%	-
Used	40	19%	82%	100%

Economic Results (n=40)

	Mean	**SE**	**90% L.B.**	**90% U.B.**	**Median**
SOI Vessel					
Owner-Operated	82%	5.7	72%	91%	-
For-Hire Active	20%	5.9	10%	30%	-
Days - Commercial Fishing	82	8.3	68	96	60
Days - For-Hire Fishing	16	6	6	26	0
Days - Non-fishing	3	1.8	0	6	0
Vessel Value	98,204	11,346	79,074	117,333	75,000
Has Insurance	54%	7.4	41%	66%	-
Total Revenue	84,112	12,070	63,762	104,462	73,000
Commercial Fishing	65,030	8,982	49,888	80,173	40,861
For-Hire Fishing	19,082	7,879	5,799	32,365	0
Cost					
Fuel	9,000	1,061	7,212	10,789	6,000
Other Supplies	11,323	1,674	8,501	14,145	6,925
Hired Crew	28,887	5,375	19,825	37,948	18,941
Vessel Repair & Maintenance	9,909	1,664	7,103	12,714	6,300
Insurance	1,677	381	1,034	2,320	186
Overhead	5,920	1,569	3,275	8,565	3,000
Loan Payment	5,487	1,452	3,039	7,936	0
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	10,881	1,542	8,282	13,480	3,450
Depreciation	4,910	567	3,954	5,867	3,750
Net Cash Flow	11,909	2,782	7,218	16,600	6,900
Net Revenue from Operations*	1,605	2,842	−3,186	6,397	−125

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



Economic Return* (on Vessel Asset Value): 1.6%

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

SOI: 2016 SAT Vermilion Snapper Fishery: All Gears

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	1,768	1,724	1,693	1,728
Vessels	217	204	206	209
Days at Sea	4,803	4,988	4,872	4,888
Landings (gutted lbs)				
Total	1,758,654	1,722,248	1,656,926	1,712,609
SOI	810,598	773,951	741,286	775,278
Non-SOI	948,055	948,297	915,640	937,331
% SOI	46%	45%	45%	45%
Price (mean)				
Total	$3.26	$3.21	$3.30	$3.26
SOI	$3.87	$3.76	$3.82	$3.82
Non-SOI	$2.73	$2.77	$2.88	$2.79
Revenue				
Total	$5,728,323	$5,537,710	$5,463,325	$5,576,453
SOI	$3,139,779	$2,911,661	$2,828,743	$2,960,061
Non-SOI	$2,588,544	$2,626,049	$2,634,582	$2,616,392
% SOI	55%	53%	52%	53%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	503	380	351	
Response Rate (%)	92%	84%	97%	
SOI Trip				
Owner-Operated	74%	86%	69%	76.3%
Fuel Used per Day at Sea (gallons/day)	45	49	44	46
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	12.8%	10.6%	8.5%	10.6%
Bait	3.9%	4%	3.8%	3.9%
Ice	1.9%	2.3%	2.4%	2.2%
Groceries	3.7%	4.1%	4.8%	4.2%
Miscellaneous	2.6%	2.4%	2.9%	2.6%
Hired Crew	39.1%	34.4%	40.5%	38%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	14.8%	12.6%	14.2%	13.9%
Trip Net Cash Flow*	36%	42.2%	37.3%	38.5%
Trip Net Cash Revenue*	21.2%	29.6%	23.1%	24.6%
Labor - Hired & Owner	53.9%	47%	54.7%	51.9%
Fuel & Supplies	24.9%	23.4%	22.2%	23.5%
Input Prices				
Fuel Price (per gallon)	$3.61	$2.59	$1.95	$2.72
Hire Crew Wage (per crew-day)	$265	$250	$236	$250
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	8.4	7.6	7	8
Landings/Labor Use (lbs/crew-day)	143	149	126	139

SOI: 2016 SAT Vermilion Snapper Fishery: All Gears

Annual, Vessel-Level Time Series

Annual, Vessel-Level Summary

	2014	2015	2016	Average
Effort				
Vessels	217	204	206	209
Trips - Total	7,342	6,626	6,541	6,836
SOI Trips	1,768	1,724	1,693	1,728
Non-SOI Trips	5,574	4,902	4,848	5,108
Days at Sea	14,197	12,572	12,501	13,090
Landings (gutted lbs)				
Total	4,778,865	3,928,076	4,214,439	4,307,127
SOI	810,598	773,951	741,286	775,278
Non-SOI	3,968,266	3,154,124	3,473,153	3,531,848
% SOI	17%	20%	18%	18%
Revenue				
Total	$15,508,942	$12,712,084	$12,900,094	$13,707,040
SOI	$3,139,779	$2,911,661	$2,828,743	$2,960,061
Non-SOI	$12,369,163	$9,800,423	$10,071,351	$10,746,979
% SOI	20%	23%	22%	22%
Vessel Characteristics				
Length	34	34	34	34
Year Built	1988	1990	1991	1990
For-Hire Fishing Permit	35%	32%	34%	34%

Annual, Vessel-Level Economics

	2014	2015	2016	Average
Number of Observations	38	48	40	
Response Rate (%)	58%	89%	82%	
SOI Vessel				
Owner-Operated	81%	91%	82%	85%
For-Hire Active	30%	26%	20%	25%
Vessel Value	$75,726	$85,572	$98,204	$86,501
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	16.5%	12.1%	10.7%	13.1%
Other Supplies	12.9%	16%	13.5%	14.1%
Hired Crew	30.4%	26.4%	34.3%	30.4%
Vessel Repair & Maintenance	16.7%	19.2%	11.8%	15.9%
Insurance	1.1%	1.8%	2%	1.6%
Overhead	8.1%	8.5%	7%	7.9%
Loan Payment	3%	5.9%	6.5%	5.1%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	12.5%	13.3%	12.9%	12.9%
Net Cash Flow	11.2%	10.1%	14.2%	11.8%
Net Revenue for Operations*	−2.6%	−2%	1.9%	−0.9%
Depreciation	4.3%	4.7%	5.8%	4.9%
Vessel R&M, Insur, Overh	25.9%	29.5%	20.8%	25.4%
Labor - Hired & Owner	42.9%	39.7%	47.3%	43.3%
Fuel & Supplies	29.4%	28.1%	24.2%	27.2%
Economic Return* (on asset value)	−3%	−2.2%	1.6%	−1.2%

SOI: 2016 SAT Gag Grouper Fishery: All Gears

Description: This SOI consists of all logbook trips by permitted vessels where at least one pound of gag grouper was landed in 2016 using any gear type. For important **disclaimer**, see page 15.

Trip-Level Summary

Effort	
Trips	1,426
Vessels	201
Days at Sea	3,627
Crew Days	8,569
Landings (gutted lbs)	
Total	1,052,180
SOI	199,830
Non-SOI	852,349
% SOI	19%

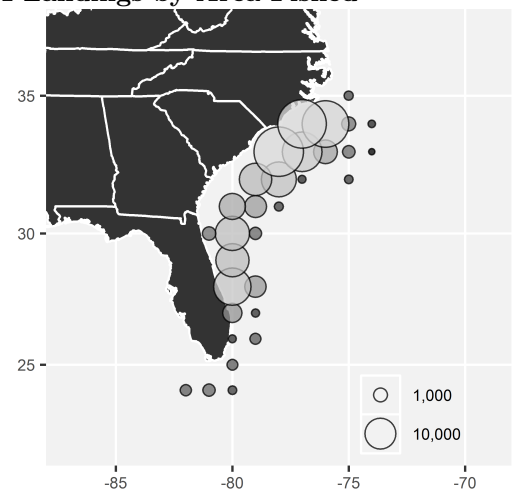
Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	77%	70%
Longline	0.1%	0.1%
Diver	20%	30%
Traps/Pots	1%	0.2%
Other	2%	0.1%

Price (mean)	
Total	$3.69
SOI	$5.88
Non-SOI	$3.18
Revenue	
Total	$3,885,881
SOI	$1,174,131
Non-SOI	$2,711,749
% SOI	30%

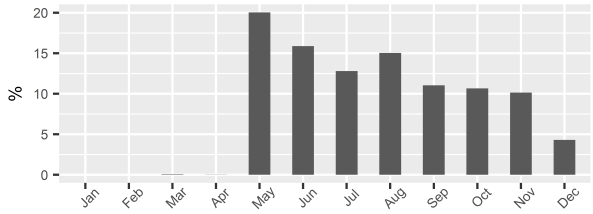
Percent of Revenue by Species Group	
Shallow Water Groupers	46%
Shallow Water Snappers	3%
Mid-Shelf Snappers	16%
Deep Water Groupers/Tilefish	5%
Grunt/Porgy/Sea Bass/Trigger	14%
Mackerels/Dolphinfish/Jacks	10%
Other Species	5%

Revenue for Top 5 Species	
Gag Grouper	$1,174,131
Vermilion Snapper	$613,284
Scamp	$483,095
Greater Amberjack	$252,048
Gray Triggerfish	$163,541

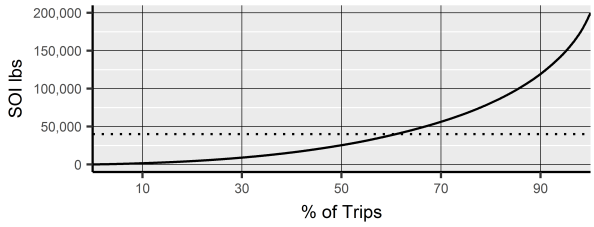
SOI Landings by Area Fished



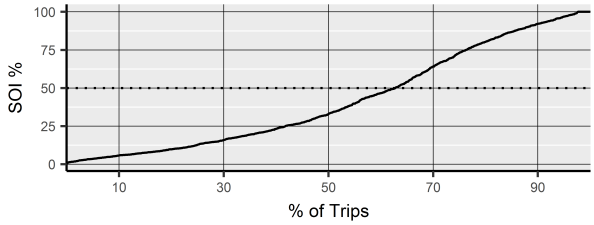
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=1,426)

	Mean	Min	Median	Max
Days at Sea	2.5	1	1	13
Crew Size	2.2	1	2	6
Landings	738	8	405	6,460
Revenue	$2,725	$47	$1,522	$24,702
SOI	$823	$15	$441	$6,646
% SOI	42%	0.5%	33.1%	100%

SOI: 2016 SAT Gag Grouper Fishery: All Gears

Trip-Level Economics

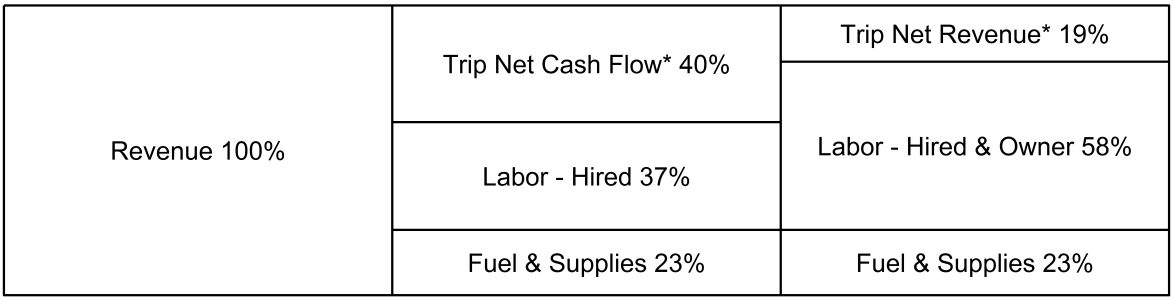
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	1,426	-	-	-
Selected	354	25%	-	-
Responded	354	25%	100%	-
Used	344	24%	97%	97%

Economic Results (n=344)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	78%	5.3	69%	87%	-
Days at Sea	2.6	0.3	2.1	3.1	1
Crew Size	2.2	0.1	2	2.3	2
Fuel Used	108	14	85	131	75
Landings (gutted lbs)	738	80	604	872	352
Total Revenue	2,801	294	2,308	3,294	1,497
Cost					
Fuel	239	28	191	287	188
Bait	110	21	74	146	30
Ice	53	8	39	67	20
Groceries	107	20	74	140	20
Miscellaneous	122	32	68	176	40
Hired Crew	1,041	126	830	1,253	600
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	584	69	469	699	273
Trip Net Cash Flow*	1,128	140	893	1,364	595
Trip Net Revenue*	544	89	396	693	230

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



Input Prices

Fuel Price (average): $2.21 per gallon

Hired Crew Wage (implicit): $287 per crew-day

Productivity Measures

Landings/Fuel Use: 6.8 lbs/gallon

Landings/Labor Use: 130 lbs/crew-day

* See Definitions in Methods Section or Glossary.

SOI: 2016 SAT Gag Grouper Fishery: All Gears

Annual, Vessel-Level Summary

Effort	
Vessels	201
Trips - Total	6,865
SOI Trips	1,426
Non-SOI Trips	5,439
Days at Sea	12,360
Crew Days	26,849

Landings (gutted lbs)	
Total	4,090,824
SOI	199,830
Non-SOI	3,890,994
% SOI	5%

Percent by Gear	**Trips**	**Total lbs**
Vertical Line	71%	72%
Longline	2%	9%
Diver	8%	5%
Traps/Pots	2%	2%
Other	17%	11%

Price (mean)	
Total	$3.15
SOI	$5.88
Non-SOI	$3.01

Revenue	
Total	$12,904,626
SOI	$1,174,131
Non-SOI	$11,730,495
% SOI	9%

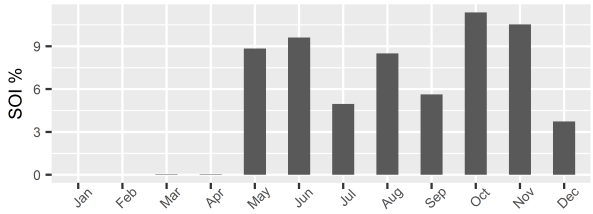
Percent of Revenue by Species Group	
Shallow Water Groupers	19%
Shallow Water Snappers	5%
Mid-Shelf Snappers	21%
Deep Water Groupers/Tilefish	14%
Grunt/Porgy/Sea Bass/Trigger	13%
Mackerels/Dolphinfish/Jacks	21%
Other Species	8%

Revenue for Top 5 Species	
Vermilion Snapper	$2,524,105
Gag Grouper	$1,210,453
King and Cero Mackerel	$1,170,494
Tilefish	$1,071,084
Greater Amberjack	$888,706

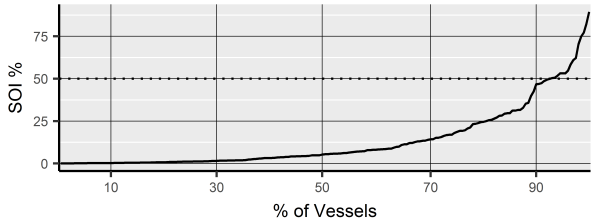
Annual, Vessel Descriptive Statistics (N=201)

	Mean	Min	Median	Max
Trips	34.2	1	26	184
Days at Sea	61.5	1	50	213
Crew Days	133.6	2	92	545
Landings	20,352	42	14,128	118,289
Revenue	$64,202	$145	$40,185	$541,023
SOI	$5,841	$31	$1,429	$58,412
% SOI	13.6%	0%	5.5%	89.4%

SOI Share of Monthly Landings



SOI Share of Revenue Per Vessel



Percent with Federal Permit	
GOM Reef Fish	5%
SAT Snapper & Grouper - Unlimited	94%
SAT Snapper & Grouper - Limited	6%
King Mackerel	64%
Spanish Mackerel	61%
Dolphin-Wahoo	94%
Other Commercial Fishing	38%
For-Hire Fishing	35%

Vessel Characteristics (N=201)

	Mean	Min	Median	Max
Length	33	20	32	53
Year Built	1992	1961	1990	2016
Horsepower	387	125	350	1,200
Fiberglass Hull	98%	-	-	-
Diesel Engine	66%	-	-	-
Ice Refrigeration	98%	-	-	-

SOI: 2016 SAT Gag Grouper Fishery: All Gears

Annual, Vessel-Level Economics

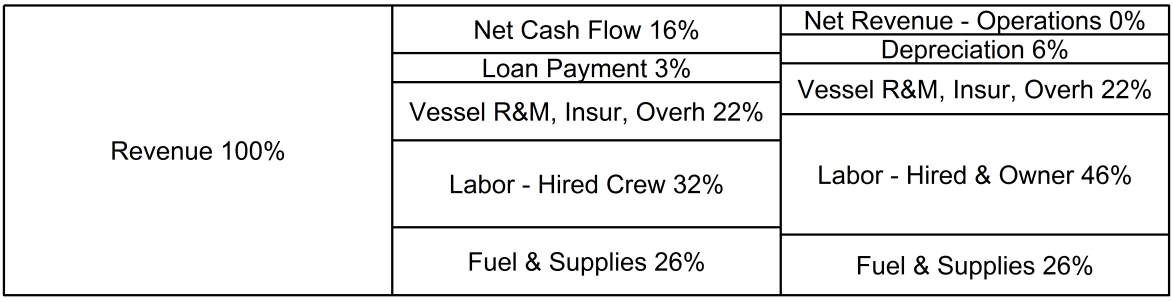
Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	201	-	-	-
Selected	50	25%	-	-
Responded	42	21%	84%	-
Used	39	19%	78%	93%

Economic Results (n=39)

	Mean	**SE**	**90% L.B.**	**90% U.B.**	**Median**
SOI Vessel					
Owner-Operated	85%	5.3	76%	94%	-
For-Hire Active	11%	4.6	3%	18%	-
Days - Commercial Fishing	86	8.2	73	100	80
Days - For-Hire Fishing	10	5	1	18	0
Days - Non-fishing	2	0.8	0	3	0
Vessel Value	98,645	13,221	76,340	120,951	70,000
Has Insurance	52%	7.4	39%	64%	-
Total Revenue	84,479	13,699	61,367	107,591	67,200
Commercial Fishing	73,999	11,945	53,847	94,150	50,719
For-Hire Fishing	10,480	6,550	−570	21,531	0
Cost					
Fuel	8,620	1,063	6,827	10,414	5,921
Other Supplies	13,076	2,312	9,176	16,976	9,451
Hired Crew	27,241	4,193	20,168	34,314	18,941
Vessel Repair & Maintenance	10,995	1,763	8,021	13,970	7,714
Insurance	1,524	360	917	2,132	162
Overhead	6,322	1,710	3,437	9,207	2,550
Loan Payment	2,787	829	1,388	4,186	0
IFQ Purchase	42	38	−22	107	0
OC Owner-Captain Time	11,854	1,690	9,004	14,705	5,343
Depreciation	4,932	661	3,817	6,048	3,500
Net Cash Flow	13,871	7,385	1,412	26,331	5,350
Net Revenue from Operations*	−87	6,275	−10,672	10,499	−6,088

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



Economic Return* (on Vessel Asset Value): −0.1%

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

SOI: 2016 SAT Gag Grouper Fishery: All Gears

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	1,907	1,588	1,426	1,640
Vessels	224	204	201	210
Days at Sea	5,034	4,009	3,627	4,223
Landings (gutted lbs)				
Total	1,470,812	1,146,628	1,052,180	1,223,207
SOI	308,669	242,802	199,830	250,434
Non-SOI	1,162,143	903,825	852,349	972,772
% SOI	21%	21%	19%	20%
Price (mean)				
Total	$3.52	$3.63	$3.69	$3.61
SOI	$5.65	$5.88	$5.88	$5.8
Non-SOI	$2.96	$3.02	$3.18	$3.05
Revenue				
Total	$5,178,121	$4,155,262	$3,885,881	$4,406,421
SOI	$1,744,668	$1,425,969	$1,174,131	$1,448,256
Non-SOI	$3,433,453	$2,729,293	$2,711,749	$2,958,165
% SOI	34%	34%	30%	33%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	584	461	344	
Response Rate (%)	93%	88%	97%	
SOI Trip				
Owner-Operated	81%	81%	78%	80%
Fuel Used per Day at Sea (gallons/day)	38	52	42	44
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	12.4%	12.7%	8.5%	11.2%
Bait	4.8%	4.7%	3.9%	4.5%
Ice	1.9%	2%	1.9%	1.9%
Groceries	3.9%	3.1%	3.8%	3.6%
Miscellaneous	3.1%	3%	4.4%	3.5%
Hired Crew	36.2%	33.2%	37.2%	35.5%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	18.4%	21.3%	20.8%	20.2%
Trip Net Cash Flow*	37.8%	41.4%	40.3%	39.8%
Trip Net Cash Revenue*	19.4%	20%	19.4%	19.6%
Labor - Hired & Owner	54.6%	54.5%	58%	55.7%
Fuel & Supplies	26%	25.5%	22.5%	24.7%
Input Prices				
Fuel Price (per gallon)	$3.60	$2.69	$2.21	$2.83
Hire Crew Wage (per crew-day)	$291	$277	$287	$285
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	7.9	5.2	6.8	7
Landings/Labor Use (lbs/crew-day)	136	127	130	131

SOI: 2016 SAT Gag Grouper Fishery: All Gears

Annual, Vessel-Level Time Series

Annual, Vessel-Level Summary

	2014	2015	2016	Average
Effort				
Vessels	224	204	201	210
Trips - Total	7,957	6,949	6,865	7,257
SOI Trips	1,907	1,588	1,426	1,640
Non-SOI Trips	6,050	5,361	5,439	5,617
Days at Sea	14,484	12,400	12,360	13,081
Landings (gutted lbs)				
Total	4,951,141	4,326,433	4,090,824	4,456,133
SOI	308,669	242,802	199,830	250,434
Non-SOI	4,642,472	4,083,631	3,890,994	4,205,699
% SOI	6%	6%	5%	6%
Revenue				
Total	$15,542,322	$13,075,047	$12,904,626	$13,840,665
SOI	$1,744,668	$1,425,969	$1,174,131	$1,448,256
Non-SOI	$13,797,654	$11,649,079	$11,730,495	$12,392,409
% SOI	11%	11%	9%	10%
Vessel Characteristics				
Length	33	33	33	33
Year Built	1990	1991	1992	1991
For-Hire Fishing Permit	31%	31%	35%	32%

Annual, Vessel-Level Economics

	2014	2015	2016	Average
Number of Observations	34	52	39	
Response Rate (%)	56%	87%	78%	
SOI Vessel				
Owner-Operated	86%	90%	85%	87%
For-Hire Active	20%	21%	11%	17%
Vessel Value	$59,921	$75,773	$98,645	$78,113
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	16.5%	11.4%	10.2%	12.7%
Other Supplies	14.2%	12.6%	15.5%	14.1%
Hired Crew	32.3%	25.7%	32.2%	30.1%
Vessel Repair & Maintenance	13.1%	15.9%	13%	14%
Insurance	1.3%	1.4%	1.8%	1.5%
Overhead	6.2%	8.9%	7.5%	7.5%
Loan Payment	1.9%	2.8%	3.3%	2.7%
IFQ Purchase	0%	0%	0.1%	0%
OC Owner-Captain Time	12.8%	14.7%	14%	13.8%
Net Cash Flow	14.4%	21.3%	16.4%	17.4%
Net Revenue for Operations*	−0.2%	4.9%	−0.1%	1.5%
Depreciation	3.8%	4.5%	5.8%	4.7%
Vessel R&M, Insur, Overh	20.6%	26.2%	22.3%	23%
Labor - Hired & Owner	45.1%	40.4%	46.3%	43.9%
Fuel & Supplies	30.8%	24%	25.7%	26.8%
Economic Return* (on asset value)	−0.3%	5.5%	−0.1%	1.7%

SOI: 2016 SAT Black Sea Bass Fishery: All Gears

Description: This SOI consists of all logbook trips by permitted vessels where at least one pound of black sea bass was landed in 2016 using any gear type. Two Ecosystem Component Species — bank sea bass and rock sea bass — are also included; landings for these species are negligible. For important **disclaimer**, see page 15.

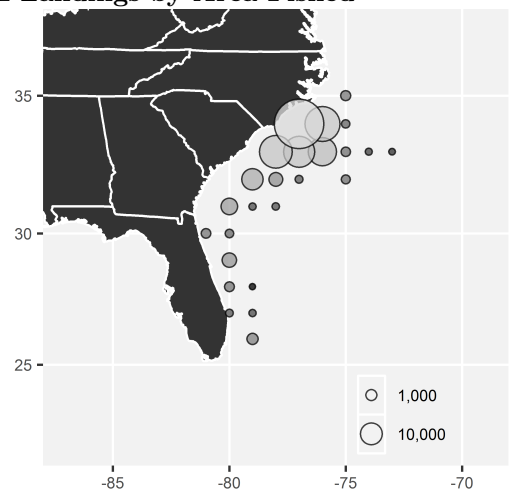
Trip-Level Summary

Effort	
Trips	1,906
Vessels	186
Days at Sea	4,047
Crew Days	9,291
Landings (gutted lbs)	
Total	1,163,375
SOI	209,462
Non-SOI	953,913
% SOI	18%

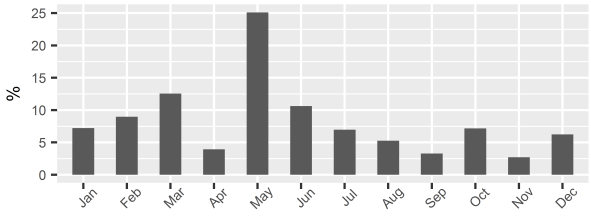
Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	80%	55%
Longline	0.2%	0%
Diver	9%	0.4%
Traps/Pots	9%	44%
Other	2%	0.2%

Price (mean)	
Total	$3.49
SOI	$3.52
Non-SOI	$3.48
Revenue	
Total	$4,060,620
SOI	$736,940
Non-SOI	$3,323,680
% SOI	18%
Percent of Revenue by Species Group	
Shallow Water Groupers	26%
Shallow Water Snappers	1%
Mid-Shelf Snappers	26%
Deep Water Groupers/Tilefish	5%
Grunt/Porgy/Sea Bass/Trigger	29%
Mackerels/Dolphinfish/Jacks	7%
Other Species	5%
Revenue for Top 5 Species	
Vermilion Snapper	$1,059,955
Black Sea bass	$736,930
Gag Grouper	$636,874
Scamp	$330,528
Gray Triggerfish	$234,947

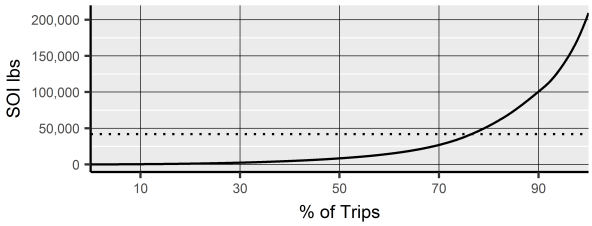
SOI Landings by Area Fished



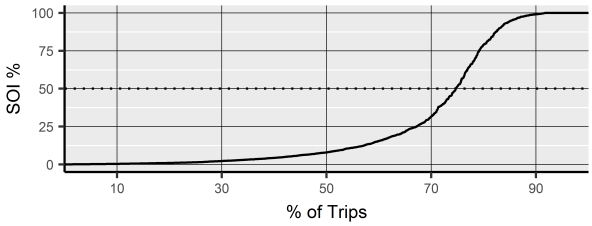
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=1,906)

	Mean	Min	Median	Max
Days at Sea	2.1	1	1	11
Crew Size	2.2	1	2	6
Landings	610	4	389	4,752
Revenue	$2,130	$18	$1,375	$15,576
SOI	$387	$1	$82	$4,217
% SOI	29%	0%	8%	100%

SOI: 2016 SAT Black Sea Bass Fishery: All Gears

Trip-Level Economics

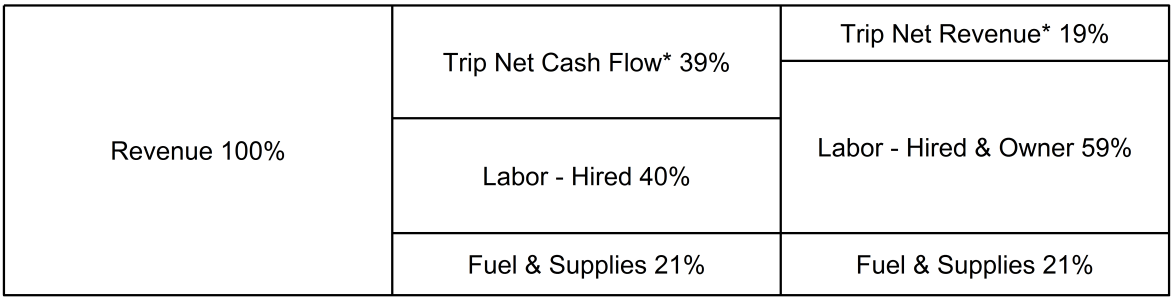
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	1,906	-	-	-
Selected	463	24%	-	-
Responded	462	24%	100%	-
Used	459	24%	99%	99%

Economic Results (n=459)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	75%	5.5	66%	85%	-
Days at Sea	2.3	0.2	1.9	2.7	1
Crew Size	2.1	0.1	2	2.2	2
Fuel Used	96	9	81	111	80
Landings (gutted lbs)	598	72	478	719	341
Total Revenue	2,205	295	1,710	2,700	1,309
Cost					
Fuel	204	17	174	233	180
Bait	83	18	53	113	40
Ice	45	7	34	57	20
Groceries	78	18	47	108	30
Miscellaneous	63	16	36	90	20
Hired Crew	873	125	664	1,083	549
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	437	74	313	561	150
Trip Net Cash Flow*	859	155	599	1,118	477
Trip Net Revenue*	422	99	256	587	199

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



Input Prices

Fuel Price (average): $2.12 per gallon

Hired Crew Wage (implicit): $285 per crew-day

Productivity Measures

Landings/Fuel Use: 6.2 lbs/gallon

Landings/Labor Use: 125 lbs/crew-day

* See Definitions in Methods Section or Glossary.

SOI: 2016 SAT Black Sea Bass Fishery: All Gears

Annual, Vessel-Level Summary

Effort

Vessels	186
Trips - Total	5,644
SOI Trips	1,906
Non-SOI Trips	3,738
Days at Sea	10,596
Crew Days	23,397

Landings (gutted lbs)

Total	3,805,029
SOI	209,462
Non-SOI	3,595,567
% SOI	6%

Percent by Gear	**Trips**	**Total lbs**
Vertical Line	68%	63%
Longline	3%	7%
Diver	6%	5%
Traps/Pots	3%	3%
Other	19%	22%

Price (mean)

Total	$2.82
SOI	$3.52
Non-SOI	$2.78

Revenue

Total	$10,741,122
SOI	$736,940
Non-SOI	$10,004,183
% SOI	7%

Percent of Revenue by Species Group

Shallow Water Groupers	17%
Shallow Water Snappers	2%
Mid-Shelf Snappers	24%
Deep Water Groupers/Tilefish	15%
Grunt/Porgy/Sea Bass/Trigger	15%
Mackerels/Dolphinfish/Jacks	19%
Other Species	8%

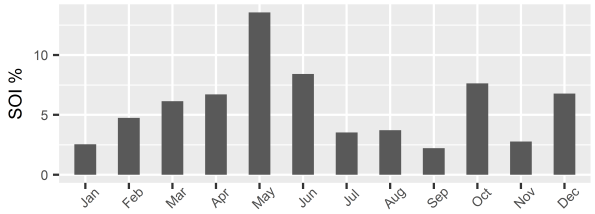
Revenue for Top 5 Species

Vermilion Snapper	$2,511,803
Gag Grouper	$1,068,308
Tilefish	$947,345
King and Cero Mackerel	$785,160
Black Sea bass	$739,745

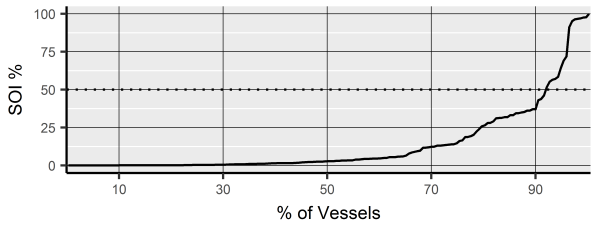
Annual, Vessel Descriptive Statistics (N=186)

	Mean	Min	Median	Max
Trips	30.3	2	23	179
Days at Sea	57	2	42	189
Crew Days	125.8	4	88	525
Landings	20,457	35	12,157	210,425
Revenue	$57,748	$122	$36,925	$269,678
SOI	$3,962	$3	$581	$79,206
% SOI	13.9%	0%	2.8%	100%

SOI Share of Monthly Landings



SOI Share of Revenue Per Vessel



Percent with Federal Permit

GOM Reef Fish	0.5%
SAT Snapper & Grouper - Unlimited	97%
SAT Snapper & Grouper - Limited	3%
King Mackerel	69%
Spanish Mackerel	61%
Dolphin-Wahoo	96%
Other Commercial Fishing	34%
For-Hire Fishing	36%

Vessel Characteristics (N=186)

	Mean	Min	Median	Max
Length	34	21	32	70
Year Built	1991	1954	1989	2015
Horsepower	392	85	360	1,200
Fiberglass Hull	97%	-	-	-
Diesel Engine	71%	-	-	-
Ice Refrigeration	98%	-	-	-

SOI: 2016 SAT Black Sea Bass Fishery: All Gears

Annual, Vessel-Level Economics

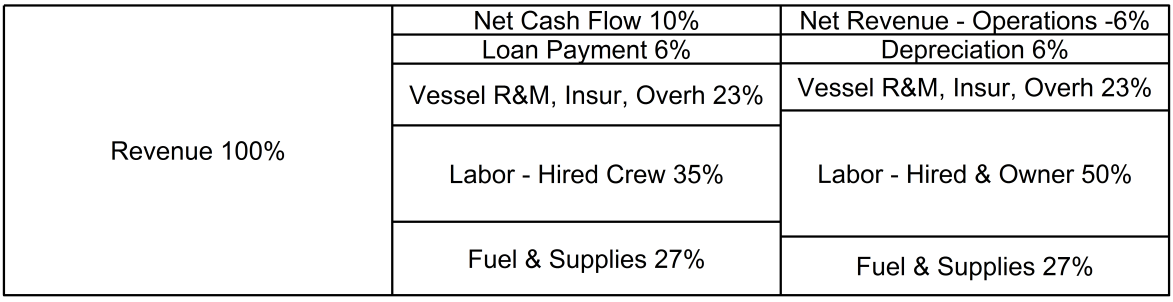
Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	186	-	-	-
Selected	48	26%	-	-
Responded	40	22%	83%	-
Used	38	20%	79%	95%

Economic Results (n=38)

	Mean	**SE**	**90% L.B.**	**90% U.B.**	**Median**
SOI Vessel					
Owner-Operated	84%	5.4	75%	93%	-
For-Hire Active	15%	5.4	6%	24%	-
Days - Commercial Fishing	69	7.4	57	82	60
Days - For-Hire Fishing	14	5.6	4	23	0
Days - Non-fishing	2	0.9	0	3	0
Vessel Value	86,849	9,455	70,887	102,811	70,000
Has Insurance	55%	7.4	42%	67%	-
Total Revenue	70,883	8,435	56,643	85,124	73,000
Commercial Fishing	58,138	5,844	48,271	68,004	42,331
For-Hire Fishing	12,746	5,986	2,639	22,853	0
Cost					
Fuel	8,281	1,009	6,577	9,985	6,000
Other Supplies	10,742	1,643	7,968	13,517	6,925
Hired Crew	24,646	3,843	18,158	31,134	15,422
Vessel Repair & Maintenance	9,715	1,671	6,895	12,536	6,300
Insurance	1,530	338	960	2,101	500
Overhead	4,933	1,251	2,820	7,045	3,000
Loan Payment	3,899	1,016	2,184	5,614	0
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	10,824	1,693	7,966	13,683	5,115
Depreciation	4,342	473	3,544	5,141	3,500
Net Cash Flow	7,137	3,070	1,953	12,320	4,258
Net Revenue from Operations*	−4,131	2,703	−8,694	432	−5,498

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



Economic Return* (on Vessel Asset Value): −4.8%

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

SOI: 2016 SAT Black Sea Bass Fishery: All Gears

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	2,533	2,005	1,906	2,148
Vessels	225	198	186	203
Days at Sea	5,914	4,825	4,047	4,929
Landings (gutted lbs)				
Total	1,739,889	1,391,868	1,163,375	1,431,711
SOI	364,936	251,945	209,462	275,448
Non-SOI	1,374,953	1,139,924	953,913	1,156,263
% SOI	21%	18%	18%	19%
Price (mean)				
Total	$3.31	$3.39	$3.49	$3.4
SOI	$3.08	$3.32	$3.52	$3.31
Non-SOI	$3.36	$3.41	$3.48	$3.42
Revenue				
Total	$5,746,936	$4,722,632	$4,060,620	$4,843,396
SOI	$1,125,597	$836,118	$736,940	$899,552
Non-SOI	$4,621,339	$3,886,514	$3,323,680	$3,943,844
% SOI	20%	18%	18%	19%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	739	584	459	
Response Rate (%)	91%	92%	99%	
SOI Trip				
Owner-Operated	74%	81%	75%	76.7%
Fuel Used per Day at Sea (gallons/day)	41	52	42	45
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	14.5%	12.6%	9.2%	12.1%
Bait	4.7%	4.8%	3.8%	4.4%
Ice	2%	2.1%	2%	2%
Groceries	3.5%	3.3%	3.5%	3.4%
Miscellaneous	2.7%	2.5%	2.9%	2.7%
Hired Crew	36.7%	32.3%	39.6%	36.2%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	19.1%	19.4%	19.8%	19.4%
Trip Net Cash Flow*	35.8%	42.4%	38.9%	39%
Trip Net Cash Revenue*	16.7%	23%	19.1%	19.6%
Labor - Hired & Owner	55.8%	51.7%	59.4%	55.6%
Fuel & Supplies	27.4%	25.3%	21.4%	24.7%
Input Prices				
Fuel Price (per gallon)	$3.60	$2.70	$2.12	$2.81
Hire Crew Wage (per crew-day)	$259	$263	$285	$269
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	7.4	5.9	6.2	6
Landings/Labor Use (lbs/crew-day)	138	140	125	134

SOI: 2016 SAT Black Sea Bass Fishery: All Gears

Annual, Vessel-Level Time Series

Annual, Vessel-Level Summary

	2014	2015	2016	Average
Effort				
Vessels	225	198	186	203
Trips - Total	6,998	5,682	5,644	6,108
SOI Trips	2,533	2,005	1,906	2,148
Non-SOI Trips	4,465	3,677	3,738	3,960
Days at Sea	13,481	11,522	10,596	11,866
Landings (gutted lbs)				
Total	5,144,952	4,002,766	3,805,029	4,317,582
SOI	364,936	251,945	209,462	275,448
Non-SOI	4,780,015	3,750,822	3,595,567	4,042,135
% SOI	7%	6%	6%	6%
Revenue				
Total	$14,110,502	$12,246,089	$10,741,122	$12,365,904
SOI	$1,125,597	$836,118	$736,940	$899,552
Non-SOI	$12,984,905	$11,409,971	$10,004,183	$11,466,353
% SOI	8%	7%	7%	7%
Vessel Characteristics				
Length	34	34	34	34
Year Built	1990	1990	1991	1990
For-Hire Fishing Permit	37%	32%	36%	35%

Annual, Vessel-Level Economics

	2014	2015	2016	Average
Number of Observations	36	48	38	
Response Rate (%)	57%	87%	79%	
SOI Vessel				
Owner-Operated	81%	88%	84%	84%
For-Hire Active	26%	19%	15%	20%
Vessel Value	$65,709	$79,797	$86,849	$77,452
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	17.4%	12.1%	11.7%	13.7%
Other Supplies	13.4%	15.5%	15.2%	14.7%
Hired Crew	33.7%	26.9%	34.8%	31.8%
Vessel Repair & Maintenance	16.3%	17.9%	13.7%	16%
Insurance	1.2%	1.7%	2.2%	1.7%
Overhead	7.5%	8.4%	7%	7.6%
Loan Payment	2.9%	5.4%	5.5%	4.6%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	12.5%	13.1%	15.3%	13.6%
Net Cash Flow	7.7%	12.2%	10.1%	10%
Net Revenue for Operations*	−6.1%	−0.3%	−5.8%	−4.1%
Depreciation	4.2%	4.7%	6.1%	5%
Vessel R&M, Insur, Overh	25%	28%	22.8%	25.3%
Labor - Hired & Owner	46.2%	40%	50%	45.4%
Fuel & Supplies	30.8%	27.6%	26.8%	28.4%
Economic Return* (on asset value)	−7.3%	−0.3%	−4.8%	−4.1%

SOI: 2016 SAT Triggerfish Fishery: All Gears

Description: This SOI consists of all logbook trips by permitted vessels where at least one pound of gray triggerfish was landed in 2016 using any gear type. An Ecosystem Component Species — ocean triggerfish — is also included; landings for this species are negligible. For important **disclaimer**, see page 15.

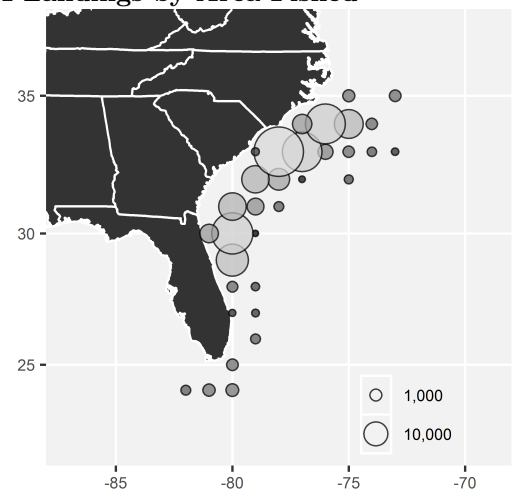
Trip-Level Summary

Effort	
Trips	1,853
Vessels	221
Days at Sea	5,347
Crew Days	13,099
Landings (gutted lbs)	
Total	1,729,870
SOI	270,260
Non-SOI	1,459,609
% SOI	16%

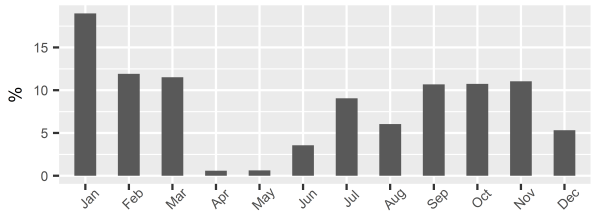
Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	86%	97%
Longline	0.1%	0.1%
Diver	9%	1%
Traps/Pots	2%	0.9%
Other	3%	0.4%

Price (mean)	
Total	$3.32
SOI	$2.49
Non-SOI	$3.47
Revenue	
Total	$5,740,382
SOI	$673,758
Non-SOI	$5,066,623
% SOI	12%
Percent of Revenue by Species Group	
Shallow Water Groupers	17%
Shallow Water Snappers	3%
Mid-Shelf Snappers	41%
Deep Water Groupers/Tilefish	7%
Grunt/Porgy/Sea Bass/Trigger	20%
Mackerels/Dolphinfish/Jacks	8%
Other Species	4%
Revenue for Top 5 Species	
Vermilion Snapper	$2,316,834
Gray Triggerfish	$658,474
Gag Grouper	$456,517
Scamp	$376,741
Greater Amberjack	$277,598

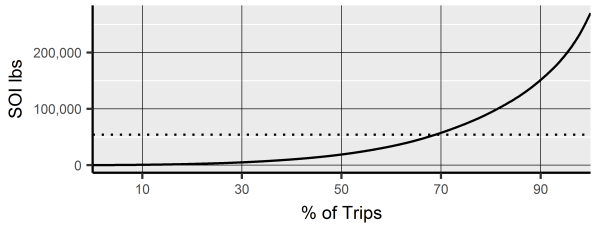
SOI Landings by Area Fished



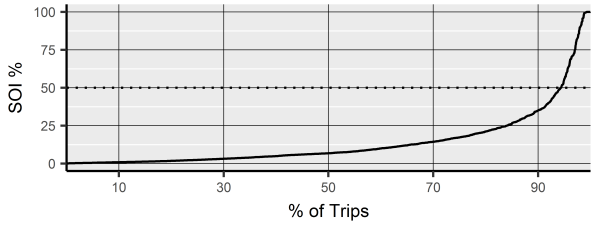
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=1,853)

	Mean	Min	Median	Max
Days at Sea	2.9	1	3	11
Crew Size	2.4	1	2	5
Landings	934	5	817	7,867
Revenue	$3,098	$12	$2,615	$24,153
SOI	$364	$2	$150	$2,773
% SOI	14%	0.1%	6.8%	100%

SOI: 2016 SAT Triggerfish Fishery: All Gears

Trip-Level Economics

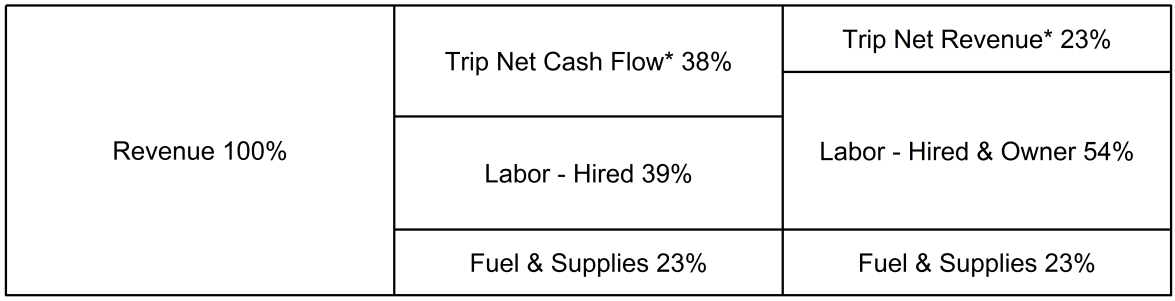
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	1,853	-	-	-
Selected	400	22%	-	-
Responded	398	21%	100%	-
Used	390	21%	98%	98%

Economic Results (n=390)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	74%	5.5	65%	83%	-
Days at Sea	3.3	0.2	2.9	3.7	3
Crew Size	2.4	0.1	2.3	2.6	2
Fuel Used	144	10	127	160	119
Landings (gutted lbs)	968	80	835	1,102	810
Total Revenue	3,307	281	2,837	3,777	2,820
Cost					
Fuel	284	18	254	315	249
Bait	128	19	95	160	90
Ice	76	7	64	88	52
Groceries	158	14	134	182	120
Miscellaneous	104	26	61	147	50
Hired Crew	1,289	121	1,086	1,493	1,066
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	509	67	397	620	100
Trip Net Cash Flow*	1,268	153	1,012	1,523	904
Trip Net Revenue*	759	108	578	939	481

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



Input Prices

Fuel Price (average): $1.98 per gallon

Hired Crew Wage (implicit): $235 per crew-day

Productivity Measures

Landings/Fuel Use: 6.7 lbs/gallon

Landings/Labor Use: 122 lbs/crew-day

* See Definitions in Methods Section or Glossary.

SOI: 2016 SAT Triggerfish Fishery: All Gears

Annual, Vessel-Level Summary

Effort	
Vessels	221
Trips - Total	7,552
SOI Trips	1,853
Non-SOI Trips	5,699
Days at Sea	13,497
Crew Days	29,618

Landings (gutted lbs)	
Total	4,483,851
SOI	270,260
Non-SOI	4,213,590
% SOI	6%

Percent by Gear	**Trips**	**Total lbs**
Vertical Line	75%	75%
Longline	2%	7%
Diver	8%	5%
Traps/Pots	1%	2%
Other	13%	11%

Price (mean)	
Total	$3.00
SOI	$2.49
Non-SOI	$3.04

Revenue	
Total	$13,471,830
SOI	$673,758
Non-SOI	$12,798,072
% SOI	5%

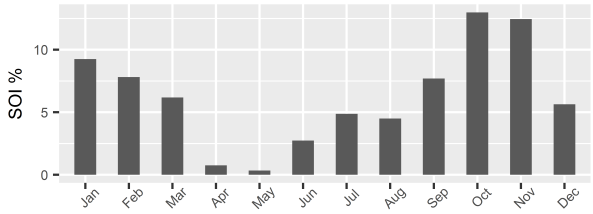
Percent of Revenue by Species Group	
Shallow Water Groupers	16%
Shallow Water Snappers	10%
Mid-Shelf Snappers	22%
Deep Water Groupers/Tilefish	13%
Grunt/Porgy/Sea Bass/Trigger	13%
Mackerels/Dolphinfish/Jacks	17%
Other Species	9%

Revenue for Top 5 Species	
Vermilion Snapper	$2,821,467
Gag Grouper	$1,091,120
Tilefish	$982,684
Yellowtail Snapper	$969,942
Greater Amberjack	$870,613

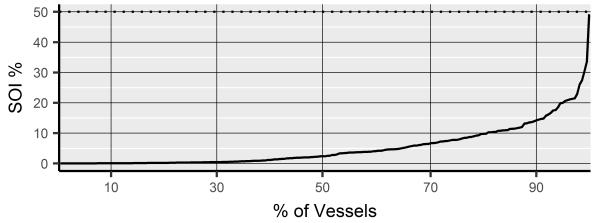
Annual, Vessel Descriptive Statistics (N=221)

	Mean	Min	Median	Max
Trips	34.2	2	25	211
Days at Sea	61.1	2	47	213
Crew Days	134	4	96	525
Landings	20,289	244	11,487	210,425
Revenue	$60,959	$767	$34,987	$541,023
SOI	$3,049	$2	$500	$29,919
% SOI	5.3%	0%	2.4%	49.2%

SOI Share of Monthly Landings



SOI Share of Revenue Per Vessel



Percent with Federal Permit	
GOM Reef Fish	6%
SAT Snapper & Grouper - Unlimited	97%
SAT Snapper & Grouper - Limited	3%
King Mackerel	67%
Spanish Mackerel	63%
Dolphin-Wahoo	94%
Other Commercial Fishing	35%
For-Hire Fishing	37%

Vessel Characteristics (N=221)

	Mean	Min	Median	Max
Length	34	20	32	70
Year Built	1992	1954	1989	2016
Horsepower	418	125	375	1,350
Fiberglass Hull	98%	-	-	-
Diesel Engine	68%	-	-	-
Ice Refrigeration	96%	-	-	-

SOI: 2016 SAT Triggerfish Fishery: All Gears

Annual, Vessel-Level Economics

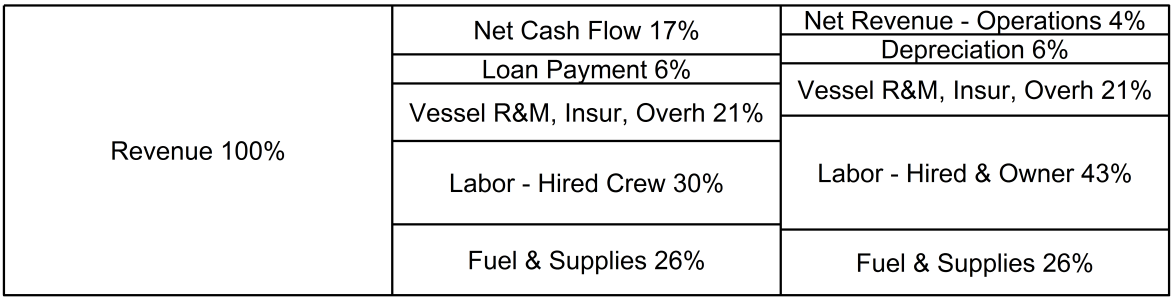
Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	221	-	-	-
Selected	55	25%	-	-
Responded	43	19%	78%	-
Used	43	19%	78%	100%

Economic Results (n=43)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Vessel					
Owner-Operated	83%	5.3	74%	92%	-
For-Hire Active	20%	5.7	10%	29%	-
Days - Commercial Fishing	77	7.5	64	90	60
Days - For-Hire Fishing	17	5.8	7	26	0
Days - Non-fishing	4	1.8	1	7	0
Vessel Value	108,484	13,463	85,826	131,141	75,000
Has Insurance	59%	6.9	48%	71%	-
Total Revenue	85,302	13,055	63,333	107,272	75,000
Commercial Fishing	66,993	10,833	48,762	85,224	42,331
For-Hire Fishing	18,309	7,187	6,214	30,405	0
Cost					
Fuel	9,514	1,037	7,770	11,259	7,655
Other Supplies	12,636	2,049	9,187	16,084	6,925
Hired Crew	25,825	3,937	19,199	32,451	18,000
Vessel Repair & Maintenance	11,208	1,832	8,125	14,291	7,341
Insurance	1,872	356	1,272	2,471	900
Overhead	5,127	1,234	3,050	7,204	3,000
Loan Payment	4,701	1,273	2,559	6,844	0
IFQ Purchase	22	20	−11	55	0
OC Owner-Captain Time	10,526	1,533	7,945	13,106	3,409
Depreciation	5,424	673	4,291	6,557	3,750
Net Cash Flow	14,397	6,742	3,051	25,744	6,522
Net Revenue from Operations*	3,171	6,002	−6,930	13,271	−5,142

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



Economic Return* (on Vessel Asset Value): 2.9%

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

SOI: 2016 SAT Triggerfish Fishery: All Gears

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	1,149	1,698	1,853	1,567
Vessels	207	233	221	220
Days at Sea	3,078	4,727	5,347	4,384
Landings (gutted lbs)				
Total	1,066,785	1,612,535	1,729,870	1,469,730
SOI	249,737	303,190	270,260	274,396
Non-SOI	817,048	1,309,345	1,459,609	1,195,334
% SOI	23%	19%	16%	19%
Price (mean)				
Total	$3.10	$3.23	$3.32	$3.22
SOI	$2.32	$2.44	$2.49	$2.42
Non-SOI	$3.34	$3.41	$3.47	$3.41
Revenue				
Total	$3,309,958	$5,209,571	$5,740,382	$4,753,304
SOI	$579,874	$740,335	$673,758	$664,656
Non-SOI	$2,730,084	$4,469,237	$5,066,623	$4,088,648
% SOI	18%	14%	12%	15%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	312	360	390	
Response Rate (%)	91%	78%	98%	
SOI Trip				
Owner-Operated	78%	83%	74%	78.3%
Fuel Used per Day at Sea (gallons/day)	42	46	44	44
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	13.8%	10.2%	8.6%	10.9%
Bait	3.6%	3.7%	3.9%	3.7%
Ice	2.1%	2.2%	2.3%	2.2%
Groceries	3.8%	4%	4.8%	4.2%
Miscellaneous	2.4%	1.9%	3.1%	2.5%
Hired Crew	39.4%	35.8%	39%	38.1%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	16.8%	12.7%	15.4%	15%
Trip Net Cash Flow*	34.8%	42.2%	38.3%	38.4%
Trip Net Cash Revenue*	18.1%	29.5%	22.9%	23.5%
Labor - Hired & Owner	56.2%	48.5%	54.4%	53%
Fuel & Supplies	25.7%	22%	22.7%	23.5%
Input Prices				
Fuel Price (per gallon)	$3.64	$2.63	$1.98	$2.75
Hire Crew Wage (per crew-day)	$263	$253	$235	$250
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	8.3	7.9	6.7	8
Landings/Labor Use (lbs/crew-day)	144	144	122	137

SOI: 2016 SAT Triggerfish Fishery: All Gears

Annual, Vessel-Level Time Series

Annual, Vessel-Level Summary

	2014	2015	2016	Average
Effort				
Vessels	207	233	221	220
Trips - Total	8,099	7,603	7,552	7,751
SOI Trips	1,149	1,698	1,853	1,567
Non-SOI Trips	6,950	5,905	5,699	6,185
Days at Sea	14,787	14,209	13,497	14,164
Landings (gutted lbs)				
Total	4,950,330	4,378,208	4,483,851	4,604,130
SOI	249,737	303,190	270,260	274,396
Non-SOI	4,700,592	4,075,018	4,213,590	4,329,733
% SOI	5%	7%	6%	6%
Revenue				
Total	$15,505,509	$14,289,823	$13,471,830	$14,422,387
SOI	$579,874	$740,335	$673,758	$664,656
Non-SOI	$14,925,635	$13,549,488	$12,798,072	$13,757,732
% SOI	4%	5%	5%	5%
Vessel Characteristics				
Length	33	33	34	33
Year Built	1989	1989	1992	1990
For-Hire Fishing Permit	35%	31%	37%	34%

Annual, Vessel-Level Economics

	2014	2015	2016	Average
Number of Observations	32	51	43	
Response Rate (%)	51%	81%	78%	
SOI Vessel				
Owner-Operated	84%	90%	83%	86%
For-Hire Active	25%	22%	20%	22%
Vessel Value	$71,563	$78,482	$108,484	$86,176
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	15.5%	11.7%	11.2%	12.8%
Other Supplies	12.4%	15.1%	14.8%	14.1%
Hired Crew	31.9%	27.5%	30.3%	29.9%
Vessel Repair & Maintenance	12.6%	17.3%	13.1%	14.3%
Insurance	1.3%	1.7%	2.2%	1.7%
Overhead	6.5%	8%	6%	6.8%
Loan Payment	2.2%	4.5%	5.5%	4.1%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	15.2%	13.1%	12.3%	13.5%
Net Cash Flow	17.5%	14.3%	16.9%	16.2%
Net Revenue for Operations*	0.1%	1.1%	3.7%	1.6%
Depreciation	4.4%	4.6%	6.4%	5.1%
Vessel R&M, Insur, Overh	20.4%	27%	21.3%	22.9%
Labor - Hired & Owner	47.1%	40.6%	42.6%	43.4%
Fuel & Supplies	28%	26.8%	26%	26.9%
Economic Return* (on asset value)	0.2%	1.2%	2.9%	1.4%

SOI: 2016 SAT Scamp Fishery: All Gears

Description: This SOI consists of all logbook trips by permitted vessels where at least one pound of scamp grouper was landed in 2016 using any gear type. For important **disclaimer**, see page 15.

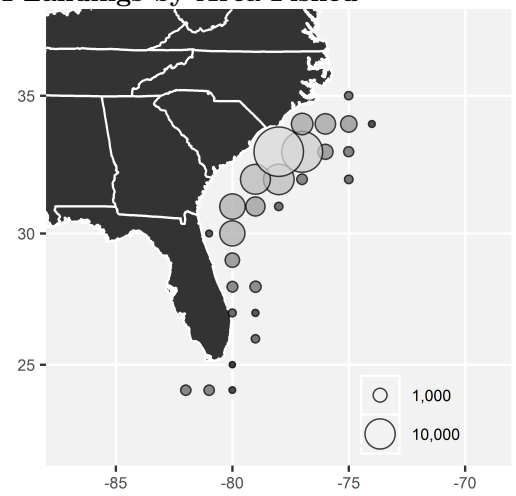
Trip-Level Summary

Effort	
Trips	909
Vessels	142
Days at Sea	3,558
Crew Days	8,610
Landings (gutted lbs)	
Total	1,088,630
SOI	104,264
Non-SOI	984,366
% SOI	10%

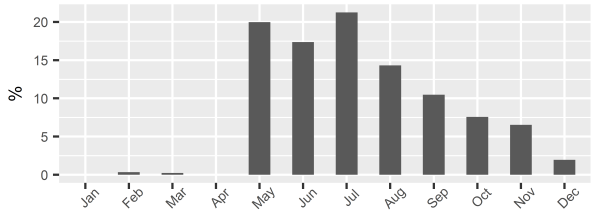
Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	89%	85%
Longline	0.1%	0.2%
Diver	9%	14%
Traps/Pots	0.4%	0.3%
Other	0.8%	0.2%

Price (mean)	
Total	$3.56
SOI	$6.07
Non-SOI	$3.30
Revenue	
Total	$3,877,332
SOI	$632,403
Non-SOI	$3,244,929
% SOI	16%
Percent of Revenue by Species Group	
Shallow Water Groupers	37%
Shallow Water Snappers	2%
Mid-Shelf Snappers	26%
Deep Water Groupers/Tilefish	8%
Grunt/Porgy/Sea Bass/Trigger	15%
Mackerels/Dolphinfish/Jacks	9%
Other Species	3%
Revenue for Top 5 Species	
Vermilion Snapper	$972,162
Scamp	$632,403
Gag Grouper	$625,434
Gray Triggerfish	$242,326
Greater Amberjack	$205,272

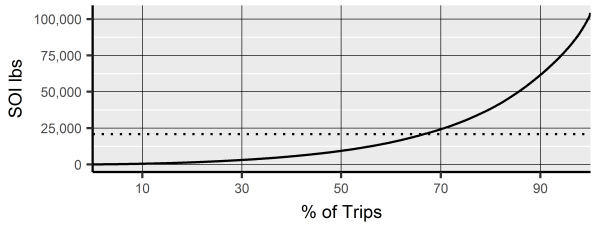
SOI Landings by Area Fished



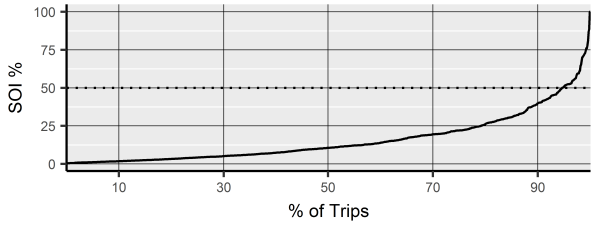
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=909)

	Mean	Min	Median	Max
Days at Sea	3.9	1	4	13
Crew Size	2.4	1	2	6
Landings	1,198	10	1,101	7,867
Revenue	$4,265	$57	$3,772	$24,702
SOI	$696	$16	$290	$7,887
% SOI	16%	0.3%	10.6%	100%

SOI: 2016 SAT Scamp Fishery: All Gears

Trip-Level Economics

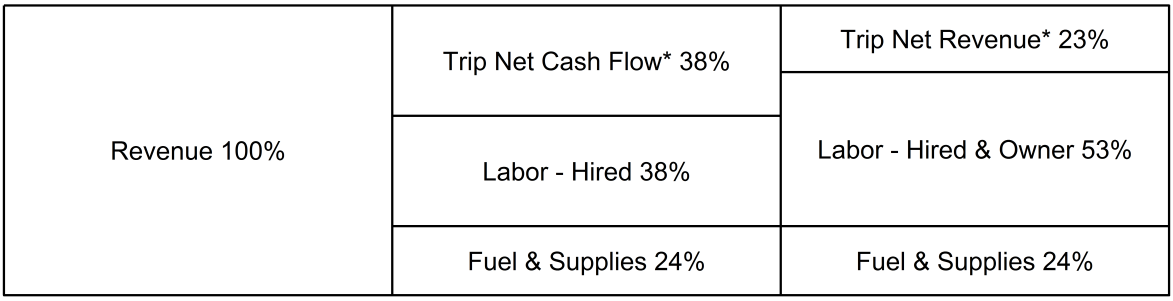
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	909	-	-	-
Selected	214	24%	-	-
Responded	214	24%	100%	-
Used	209	23%	98%	98%

Economic Results (n=209)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	68%	7.8	55%	82%	-
Days at Sea	4.2	0.4	3.5	4.8	4
Crew Size	2.4	0.1	2.2	2.6	2
Fuel Used	160	18	128	191	140
Landings (gutted lbs)	1,193	108	1,010	1,376	1,116
Total Revenue	4,380	411	3,683	5,078	4,067
Cost					
Fuel	336	39	270	402	300
Bait	196	31	144	248	151
Ice	102	11	83	120	100
Groceries	222	27	176	268	200
Miscellaneous	188	49	105	271	90
Hired Crew	1,668	168	1,383	1,952	1,365
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	661	102	488	834	139
Trip Net Cash Flow*	1,669	216	1,303	2,036	1,239
Trip Net Revenue*	1,008	145	763	1,254	675

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



Input Prices

Fuel Price (average): $2.10 per gallon

Hired Crew Wage (implicit): $233 per crew-day

Productivity Measures

Landings/Fuel Use: 7.5 lbs/gallon

Landings/Labor Use: 119 lbs/crew-day

* See Definitions in Methods Section or Glossary.

SOI: 2016 SAT Scamp Fishery: All Gears

Annual, Vessel-Level Summary

Effort	
Vessels	142
Trips - Total	4,764
SOI Trips	909
Non-SOI Trips	3,855
Days at Sea	10,582
Crew Days	24,487

Landings (gutted lbs)	
Total	3,705,492
SOI	104,264
Non-SOI	3,601,229
% SOI	3%

Percent by Gear	**Trips**	**Total lbs**
Vertical Line	80%	74%
Longline	3%	10%
Diver	6%	5%
Traps/Pots	1%	1%
Other	9%	10%

Price (mean)	
Total	$3.13
SOI	$6.07
Non-SOI	$3.05

Revenue	
Total	$11,605,484
SOI	$632,403
Non-SOI	$10,973,081
% SOI	5%

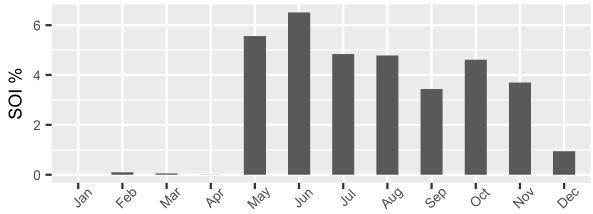
Percent of Revenue by Species Group	
Shallow Water Groupers	20%
Shallow Water Snappers	4%
Mid-Shelf Snappers	23%
Deep Water Groupers/Tilefish	18%
Grunt/Porgy/Sea Bass/Trigger	12%
Mackerels/Dolphinfish/Jacks	17%
Other Species	6%

Revenue for Top 5 Species	
Vermilion Snapper	$2,567,031
Tilefish	$1,204,434
Gag Grouper	$1,044,811
King and Cero Mackerel	$750,541
Greater Amberjack	$676,398

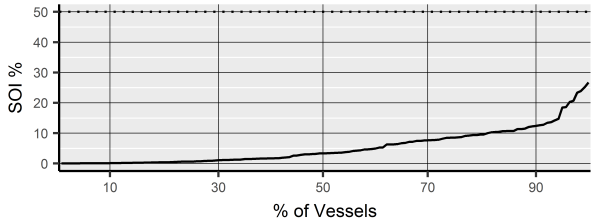
Annual, Vessel Descriptive Statistics (N=142)

	Mean	Min	Median	Max
Trips	33.5	2	26	179
Days at Sea	74.5	2	70	213
Crew Days	172.4	2	136	545
Landings	26,095	124	21,114	188,003
Revenue	$81,729	$404	$65,675	$471,162
SOI	$4,454	$19	$1,256	$36,322
% SOI	5.4%	0%	3.4%	26.7%

SOI Share of Monthly Landings



SOI Share of Revenue Per Vessel



Percent with Federal Permit	
GOM Reef Fish	5%
SAT Snapper & Grouper - Unlimited	98%
SAT Snapper & Grouper - Limited	2%
King Mackerel	65%
Spanish Mackerel	58%
Dolphin-Wahoo	96%
Other Commercial Fishing	39%
For-Hire Fishing	32%

Vessel Characteristics (N=142)

	Mean	Min	Median	Max
Length	35	23	34	54
Year Built	1990	1967	1988	2014
Horsepower	410	125	375	1,200
Fiberglass Hull	99%	-	-	-
Diesel Engine	77%	-	-	-
Ice Refrigeration	99%	-	-	-

SOI: 2016 SAT Scamp Fishery: All Gears

Annual, Vessel-Level Economics

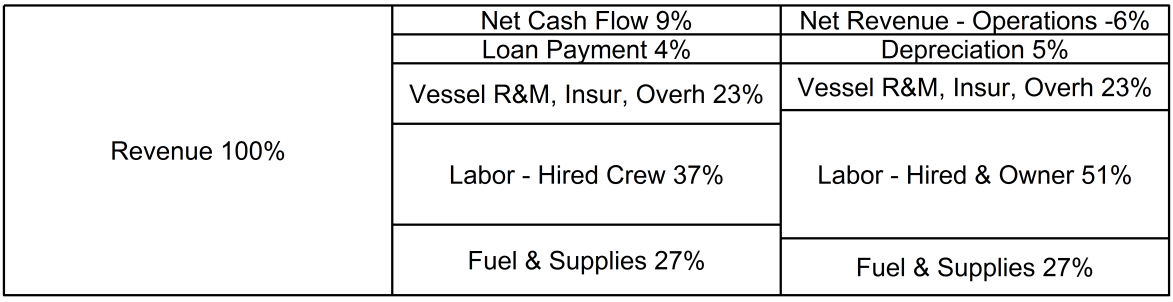
Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	142	-	-	-
Selected	32	23%	-	-
Responded	27	19%	84%	-
Used	27	19%	84%	100%

Economic Results (n=27)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Vessel					
Owner-Operated	78%	8	64%	91%	-
For-Hire Active	12%	6.3	2%	23%	-
Days - Commercial Fishing	93	9.7	77	110	81
Days - For-Hire Fishing	13	9.2	−3	29	0
Days - Non-fishing	1	0.9	0	3	0
Vessel Value	92,884	12,662	71,255	114,513	70,000
Has Insurance	60%	9.4	44%	76%	-
Total Revenue	88,430	15,044	62,733	114,128	86,000
Commercial Fishing	71,932	6,387	61,022	82,841	75,000
For-Hire Fishing	16,498	13,351	−6,306	39,303	0
Cost					
Fuel	9,994	1,603	7,256	12,732	7,540
Other Supplies	13,604	2,099	10,018	17,190	11,659
Hired Crew	32,900	6,111	22,462	43,338	36,006
Vessel Repair & Maintenance	10,835	1,971	7,468	14,203	9,500
Insurance	1,730	531	823	2,638	525
Overhead	7,948	2,983	2,853	13,043	3,000
Loan Payment	3,415	1,032	1,653	5,177	0
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	12,427	2,088	8,860	15,993	8,145
Depreciation	4,644	633	3,563	5,726	3,500
Net Cash Flow	8,004	3,658	1,755	14,252	5,350
Net Revenue from Operations*	−5,652	3,235	−11,178	−127	−6,366

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



Economic Return* (on Vessel Asset Value): −6.1%

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

SOI: 2016 SAT Scamp Fishery: All Gears

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	1,169	1,035	909	1,038
Vessels	159	151	142	151
Days at Sea	4,501	4,037	3,558	4,032
Landings (gutted lbs)				
Total	1,362,835	1,220,366	1,088,630	1,223,944
SOI	145,120	114,783	104,264	121,389
Non-SOI	1,217,715	1,105,583	984,366	1,102,555
% SOI	11%	9%	10%	10%
Price (mean)				
Total	$3.45	$3.52	$3.56	$3.51
SOI	$5.80	$5.96	$6.07	$5.94
Non-SOI	$3.17	$3.26	$3.30	$3.24
Revenue				
Total	$4,704,061	$4,290,411	$3,877,332	$4,290,601
SOI	$841,100	$683,458	$632,403	$718,987
Non-SOI	$3,862,961	$3,606,953	$3,244,929	$3,571,614
% SOI	18%	16%	16%	17%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	353	218	209	
Response Rate (%)	92%	88%	98%	
SOI Trip				
Owner-Operated	68%	73%	68%	69.7%
Fuel Used per Day at Sea (gallons/day)	39	44	38	40
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	12.4%	10%	7.7%	10%
Bait	5%	4.6%	4.5%	4.7%
Ice	2.1%	2.5%	2.3%	2.3%
Groceries	4.2%	4.5%	5.1%	4.6%
Miscellaneous	2.8%	2.6%	4.3%	3.2%
Hired Crew	37.7%	35.3%	38.1%	37%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	15.6%	10.8%	15.1%	13.8%
Trip Net Cash Flow*	36%	40.5%	38.1%	38.2%
Trip Net Cash Revenue*	20.3%	29.7%	23%	24.3%
Labor - Hired & Owner	53.3%	46.1%	53.2%	50.9%
Fuel & Supplies	26.4%	24.2%	23.8%	24.8%
Input Prices				
Fuel Price (per gallon)	$3.55	$2.61	$2.10	$2.75
Hire Crew Wage (per crew-day)	$244	$220	$233	$232
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	8	7.6	7.5	8
Landings/Labor Use (lbs/crew-day)	130	130	119	126

SOI: 2016 SAT Scamp Fishery: All Gears

Annual, Vessel-Level Time Series

Annual, Vessel-Level Summary

	2014	2015	2016	Average
Effort				
Vessels	159	151	142	151
Trips - Total	5,248	4,695	4,764	4,902
SOI Trips	1,169	1,035	909	1,038
Non-SOI Trips	4,079	3,660	3,855	3,865
Days at Sea	11,729	10,808	10,582	11,040
Landings (gutted lbs)				
Total	4,099,941	3,759,419	3,705,492	3,854,951
SOI	145,120	114,783	104,264	121,389
Non-SOI	3,954,821	3,644,636	3,601,229	3,733,562
% SOI	4%	3%	3%	3%
Revenue				
Total	$12,335,226	$11,679,071	$11,605,484	$11,873,260
SOI	$841,100	$683,458	$632,403	$718,987
Non-SOI	$11,494,126	$10,995,613	$10,973,081	$11,154,273
% SOI	7%	6%	5%	6%
Vessel Characteristics				
Length	34	34	35	34
Year Built	1990	1990	1990	1990
For-Hire Fishing Permit	36%	33%	32%	34%

Annual, Vessel-Level Economics

	2014	2015	2016	Average
Number of Observations	25	36	27	
Response Rate (%)	54%	86%	84%	
SOI Vessel				
Owner-Operated	78%	89%	78%	82%
For-Hire Active	28%	25%	12%	22%
Vessel Value	$66,769	$89,598	$92,884	$83,084
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	17.7%	10.7%	11.3%	13.2%
Other Supplies	13.1%	16.5%	15.4%	15%
Hired Crew	33.6%	28.2%	37.2%	33%
Vessel Repair & Maintenance	13.5%	16.7%	12.3%	14.2%
Insurance	1.4%	1.6%	2%	1.7%
Overhead	5.4%	7.8%	9%	7.4%
Loan Payment	1.9%	2.6%	3.9%	2.8%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	11.5%	11.5%	14.1%	12.4%
Net Cash Flow	13.4%	15.9%	9.1%	12.8%
Net Revenue for Operations*	0.6%	2.8%	−6.4%	−1%
Depreciation	3.3%	4.2%	5.3%	4.3%
Vessel R&M, Insur, Overh	20.4%	26%	23.2%	23.2%
Labor - Hired & Owner	45%	39.8%	51.3%	45.4%
Fuel & Supplies	30.8%	27.2%	26.7%	28.2%
Economic Return* (on asset value)	0.9%	3.3%	−6.1%	−0.6%

SOI: 2016 SAT FMP Deepwater Fishery: All Gears

Description: This SOI consists of all logbook trips by permitted vessels where at least one pound of deepwater fish (snapper, tilefish, and grouper species) managed by the SAT Snapper-Grouper FMP was landed in 2016 using any gear type. For a complete list of the species, please refer to Appendix 2. For important **disclaimer**, see page 15.

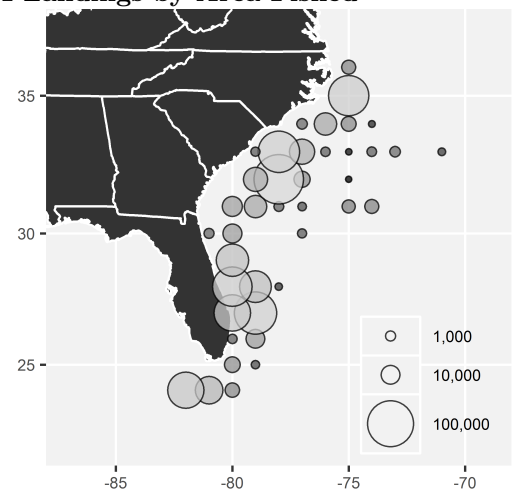
Trip-Level Summary

Effort	
Trips	2,206
Vessels	217
Days at Sea	5,435
Crew Days	12,423
Landings (gutted lbs)	
Total	1,811,815
SOI	804,845
Non-SOI	1,006,969
% SOI	44%

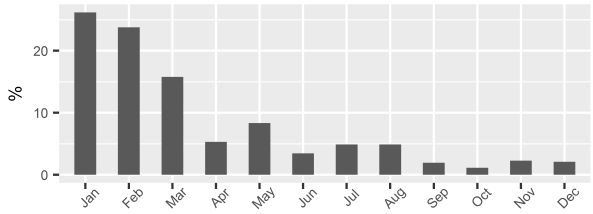
Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	81%	40%
Longline	15%	56%
Diver	0.6%	0%
Traps/Pots	0.2%	0.1%
Other	3%	3%

Price (mean)	
Total	$3.66
SOI	$4.36
Non-SOI	$3.10
Revenue	
Total	$6,630,993
SOI	$3,509,137
Non-SOI	$3,121,855
% SOI	53%
Percent of Revenue by Species Group	
Shallow Water Groupers	11%
Shallow Water Snappers	2%
Mid-Shelf Snappers	18%
Deep Water Groupers/Tilefish	52%
Grunt/Porgy/Sea Bass/Trigger	7%
Mackerels/Dolphinfish/Jacks	8%
Other Species	3%
Revenue for Top 5 Species	
Tilefish	$2,259,007
Vermilion Snapper	$1,108,885
Snowy Grouper	$721,020
Blueline Tilefish	$347,120
Gag Grouper	$288,212

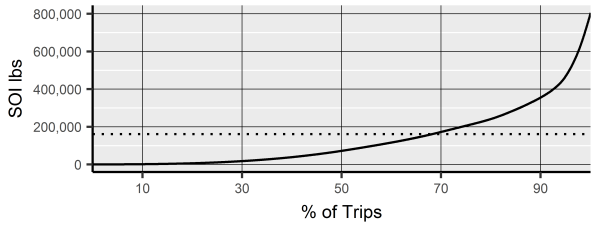
SOI Landings by Area Fished



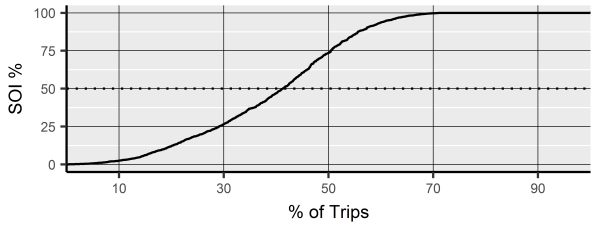
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=2,206)

	Mean	Min	Median	Max
Days at Sea	2.5	1	1	13
Crew Size	2.1	1	2	5
Landings	821	5	437	7,867
Revenue	$3,006	$24	$1,517	$28,370
SOI	$1,591	$1	$846	$26,308
% SOI	61%	0%	73.7%	100%

SOI: 2016 SAT FMP Deepwater Fishery: All Gears

Trip-Level Economics

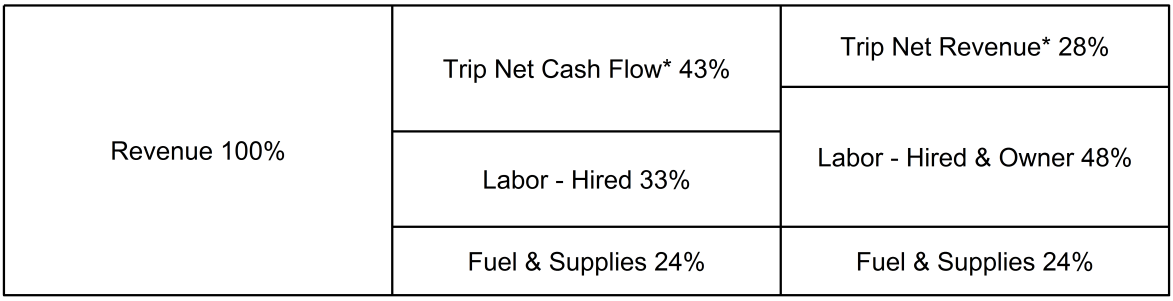
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	2,206	-	-	-
Selected	580	26%	-	-
Responded	553	25%	95%	-
Used	541	25%	93%	98%

Economic Results (n=541)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	76%	4.9	68%	85%	-
Days at Sea	2.6	0.2	2.2	3	1
Crew Size	1.9	0.1	1.7	2	2
Fuel Used	121	12	100	141	90
Landings (gutted lbs)	805	93	649	961	364
Total Revenue	2,911	342	2,339	3,483	1,435
Cost					
Fuel	258	24	218	299	171
Bait	169	34	113	225	60
Ice	57	8	44	71	30
Groceries	118	16	92	144	30
Miscellaneous	85	32	32	138	0
Hired Crew	958	140	725	1,191	361
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	447	56	354	541	251
Trip Net Cash Flow*	1,266	141	1,029	1,502	825
Trip Net Revenue*	818	128	604	1,033	419

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



Input Prices

Fuel Price (average): $2.14 per gallon

Hired Crew Wage (implicit): $331 per crew-day

Productivity Measures

Landings/Fuel Use: 6.7 lbs/gallon

Landings/Labor Use: 166 lbs/crew-day

* See Definitions in Methods Section or Glossary.

SOI: 2016 SAT FMP Deepwater Fishery: All Gears

Annual, Vessel-Level Summary

Effort

Vessels	217
Trips - Total	7,787
SOI Trips	2,206
Non-SOI Trips	5,581
Days at Sea	14,043
Crew Days	30,156

Landings (gutted lbs)

Total	5,437,781
SOI	804,845
Non-SOI	4,632,935
% SOI	15%

Percent by Gear	**Trips**	**Total lbs**
Vertical Line	70%	62%
Longline	7%	15%
Diver	4%	3%
Traps/Pots	0.7%	0.8%
Other	19%	19%

Price (mean)

Total	$2.86
SOI	$4.36
Non-SOI	$2.59

Revenue

Total	$15,527,124
SOI	$3,509,137
Non-SOI	$12,017,986
% SOI	23%

Percent of Revenue by Species Group

Shallow Water Groupers	15%
Shallow Water Snappers	5%
Mid-Shelf Snappers	18%
Deep Water Groupers/Tilefish	23%
Grunt/Porgy/Sea Bass/Trigger	9%
Mackerels/Dolphinfish/Jacks	20%
Other Species	10%

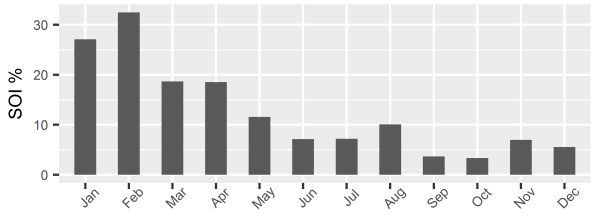
Revenue for Top 5 Species

Vermilion Snapper	$2,623,767
Tilefish	$2,336,490
King and Cero Mackerel	$1,156,341
Greater Amberjack	$1,082,995
Gag Grouper	$974,530

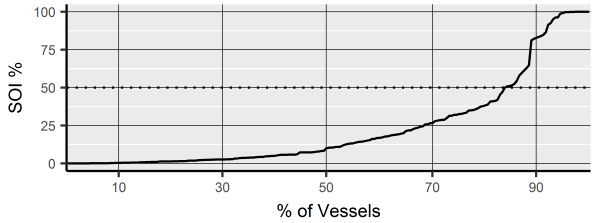
Annual, Vessel Descriptive Statistics (N=217)

	Mean	Min	Median	Max
Trips	35.9	1	27	184
Days at Sea	64.7	1	53	213
Crew Days	139	2	100	545
Landings	25,059	159	17,853	210,425
Revenue	$71,554	$735	$52,913	$541,023
SOI	$16,171	$3	$3,131	$178,622
% SOI	23.3%	0%	10.4%	100%

SOI Share of Monthly Landings



SOI Share of Revenue Per Vessel



Percent with Federal Permit

GOM Reef Fish	7%
SAT Snapper & Grouper - Unlimited	96%
SAT Snapper & Grouper - Limited	4%
King Mackerel	67%
Spanish Mackerel	68%
Dolphin-Wahoo	96%
Other Commercial Fishing	41%
For-Hire Fishing	29%

Vessel Characteristics (N=217)

	Mean	Min	Median	Max
Length	35	23	33	70
Year Built	1990	1962	1988	2015
Horsepower	399	50	375	1,200
Fiberglass Hull	97%	-	-	-
Diesel Engine	76%	-	-	-
Ice Refrigeration	97%	-	-	-

SOI: 2016 SAT FMP Deepwater Fishery: All Gears

Annual, Vessel-Level Economics

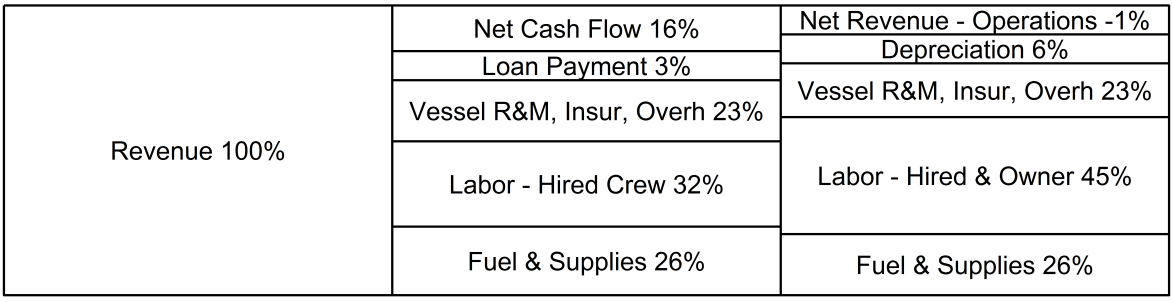
Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	217	-	-	-
Selected	58	27%	-	-
Responded	46	21%	79%	-
Used	42	19%	72%	91%

Economic Results (n=42)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Vessel					
Owner-Operated	83%	5.3	75%	92%	-
For-Hire Active	10%	4.3	3%	17%	-
Days - Commercial Fishing	99	9.4	83	115	83
Days - For-Hire Fishing	9	4.6	1	17	0
Days - Non-fishing	4	1.8	1	7	0
Vessel Value	108,781	13,143	86,650	130,912	75,000
Has Insurance	48%	7.1	36%	60%	-
Total Revenue	90,237	12,789	68,703	111,771	80,898
Commercial Fishing	80,520	11,324	61,453	99,587	76,343
For-Hire Fishing	9,717	6,069	−502	19,937	0
Cost					
Fuel	9,311	1,000	7,627	10,994	7,655
Other Supplies	14,103	2,141	10,499	17,708	10,000
Hired Crew	28,621	3,919	22,022	35,219	20,352
Vessel Repair & Maintenance	12,736	1,894	9,547	15,925	9,651
Insurance	1,761	355	1,164	2,358	0
Overhead	6,641	1,579	3,982	9,300	3,000
Loan Payment	2,823	776	1,516	4,131	0
IFQ Purchase	39	36	−21	99	0
OC Owner-Captain Time	12,184	1,687	9,343	15,025	6,359
Depreciation	5,439	657	4,332	6,546	3,750
Net Cash Flow	14,202	7,273	1,955	26,449	6,900
Net Revenue from Operations*	−559	6,258	−11,096	9,979	−6,088

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



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

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

SOI: 2016 SAT FMP Deepwater Fishery: All Gears

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	1,899	2,201	2,206	2,102
Vessels	230	233	217	227
Days at Sea	4,566	5,117	5,435	5,039
Landings (gutted lbs)				
Total	1,884,167	1,784,615	1,811,815	1,826,866
SOI	942,886	775,042	804,845	840,924
Non-SOI	941,280	1,009,573	1,006,969	985,941
% SOI	50%	43%	44%	46%
Price (mean)				
Total	$3.16	$3.51	$3.66	$3.44
SOI	$3.45	$4.09	$4.36	$3.97
Non-SOI	$2.89	$3.06	$3.10	$3.02
Revenue				
Total	$5,968,025	$6,255,607	$6,630,993	$6,284,875
SOI	$3,250,742	$3,169,571	$3,509,137	$3,309,817
Non-SOI	$2,717,283	$3,086,035	$3,121,855	$2,975,058
% SOI	54%	51%	53%	53%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	418	472	541	
Response Rate (%)	83%	86%	93%	
SOI Trip				
Owner-Operated	81%	84%	76%	80.3%
Fuel Used per Day at Sea (gallons/day)	42	44	47	44
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	12.9%	10.2%	8.9%	10.7%
Bait	5.3%	4.2%	5.8%	5.1%
Ice	1.7%	1.6%	2%	1.8%
Groceries	3.8%	2.7%	4.1%	3.5%
Miscellaneous	3%	3.2%	2.9%	3%
Hired Crew	35.7%	33.3%	32.9%	34%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	13%	13.7%	15.4%	14%
Trip Net Cash Flow*	37.6%	44.7%	43.5%	41.9%
Trip Net Cash Revenue*	24.6%	31%	28.1%	27.9%
Labor - Hired & Owner	48.8%	47.1%	48.3%	48.1%
Fuel & Supplies	26.7%	21.9%	23.6%	24.1%
Input Prices				
Fuel Price (per gallon)	$3.71	$2.84	$2.14	$2.90
Hire Crew Wage (per crew-day)	$316	$369	$331	$339
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	8.9	8.2	6.7	8
Landings/Labor Use (lbs/crew-day)	172	185	166	174

SOI: 2016 SAT FMP Deepwater Fishery: All Gears

Annual, Vessel-Level Time Series

Annual, Vessel-Level Summary

	2014	2015	2016	Average
Effort				
Vessels	230	233	217	227
Trips - Total	8,589	8,115	7,787	8,164
SOI Trips	1,899	2,201	2,206	2,102
Non-SOI Trips	6,690	5,914	5,581	6,062
Days at Sea	15,548	14,959	14,043	14,850
Landings (gutted lbs)				
Total	6,513,222	5,791,391	5,437,781	5,914,131
SOI	942,886	775,042	804,845	840,924
Non-SOI	5,570,335	5,016,349	4,632,935	5,073,206
% SOI	14%	13%	15%	14%
Revenue				
Total	$17,690,702	$16,174,125	$15,527,124	$16,463,984
SOI	$3,250,742	$3,169,571	$3,509,137	$3,309,817
Non-SOI	$14,439,960	$13,004,554	$12,017,986	$13,154,167
% SOI	18%	20%	23%	20%
Vessel Characteristics				
Length	34	34	35	34
Year Built	1988	1989	1990	1989
For-Hire Fishing Permit	26%	27%	29%	27%

Annual, Vessel-Level Economics

	2014	2015	2016	Average
Number of Observations	34	50	42	
Response Rate (%)	51%	79%	72%	
SOI Vessel				
Owner-Operated	82%	90%	83%	85%
For-Hire Active	24%	15%	10%	16%
Vessel Value	$95,062	$79,804	$108,781	$94,549
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	13.7%	11%	10.3%	11.7%
Other Supplies	13.9%	15.2%	15.6%	14.9%
Hired Crew	30.1%	25.5%	31.7%	29.1%
Vessel Repair & Maintenance	11.1%	14%	14.1%	13.1%
Insurance	1.4%	1.6%	2%	1.7%
Overhead	6.2%	8.8%	7.4%	7.5%
Loan Payment	1.5%	2.8%	3.1%	2.5%
IFQ Purchase	0%	0.2%	0%	0.1%
OC Owner-Captain Time	12.7%	12.5%	13.5%	12.9%
Net Cash Flow	22.1%	20.9%	15.7%	19.6%
Net Revenue for Operations*	6.6%	6.8%	−0.6%	4.3%
Depreciation	4.4%	4.6%	6%	5%
Vessel R&M, Insur, Overh	18.7%	24.4%	23.4%	22.2%
Labor - Hired & Owner	42.8%	38%	45.2%	42%
Fuel & Supplies	27.6%	26.2%	25.9%	26.6%
Economic Return* (on asset value)	7.5%	7.5%	−0.5%	4.8%

SOI: 2016 SAT FMP Jacks Fishery: All Gears

Description: This SOI consists of all logbook trips by permitted vessels where at least one pound of jack species managed by the South Atlantic Snapper-Grouper FMP was landed in 2016 using any gear type. For a complete list of the species, please refer to Appendix 2. For important **disclaimer**, see page 15.

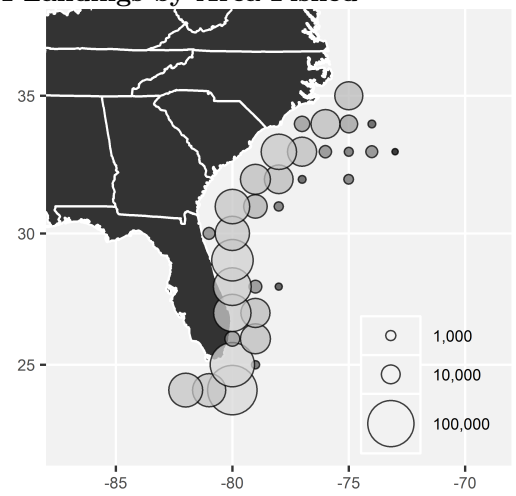
Trip-Level Summary

Effort	
Trips	2,892
Vessels	288
Days at Sea	6,465
Crew Days	14,936
Landings (gutted lbs)	
Total	2,437,211
SOI	935,383
Non-SOI	1,501,828
% SOI	38%

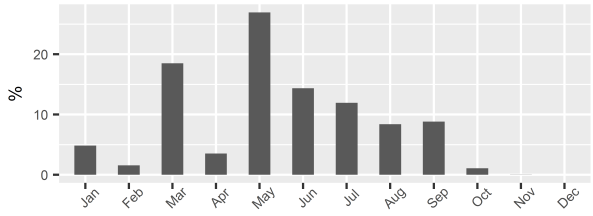
Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	89%	94%
Longline	0.1%	0%
Diver	6%	5%
Traps/Pots	0.1%	0%
Other	5%	1%

Price (mean)	
Total	$2.86
SOI	$1.48
Non-SOI	$3.72
Revenue	
Total	$6,974,941
SOI	$1,388,061
Non-SOI	$5,586,880
% SOI	20%
Percent of Revenue by Species Group	
Shallow Water Groupers	18%
Shallow Water Snappers	4%
Mid-Shelf Snappers	32%
Deep Water Groupers/Tilefish	7%
Grunt/Porgy/Sea Bass/Trigger	11%
Mackerels/Dolphinfish/Jacks	24%
Other Species	3%
Revenue for Top 5 Species	
Vermilion Snapper	$2,194,287
Greater Amberjack	$1,193,133
Gag Grouper	$620,145
Scamp	$446,640
Gray Triggerfish	$383,026

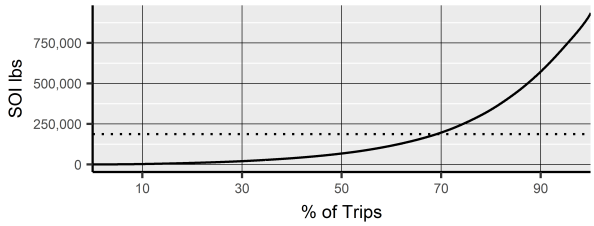
SOI Landings by Area Fished



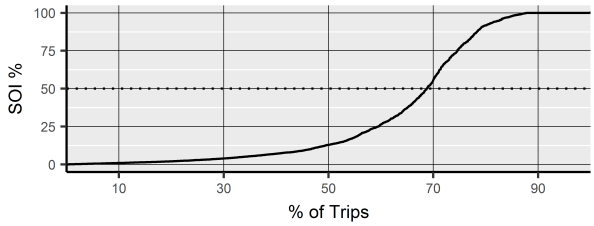
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=2,892)

	Mean	Min	Median	Max
Days at Sea	2.2	1	1	12
Crew Size	2.1	1	2	6
Landings	843	13	716	5,387
Revenue	$2,412	$11	$1,627	$19,025
SOI	$480	$1	$171	$3,262
% SOI	35%	0%	12.9%	100%

SOI: 2016 SAT FMP Jacks Fishery: All Gears

Trip-Level Economics

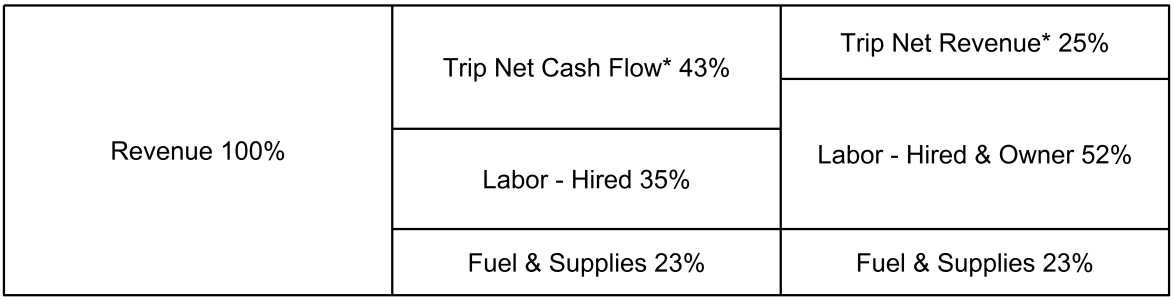
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	2,892	-	-	-
Selected	715	25%	-	-
Responded	709	25%	99%	-
Used	691	24%	97%	97%

Economic Results (n=691)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	79%	4.5	71%	86%	-
Days at Sea	2.3	0.3	1.9	2.8	1
Crew Size	2	0.1	1.9	2.1	2
Fuel Used	103	13	81	124	90
Landings (gutted lbs)	838	74	714	962	685
Total Revenue	2,335	267	1,889	2,781	1,482
Cost					
Fuel	211	26	167	254	186
Bait	95	23	57	134	40
Ice	51	6	40	62	25
Groceries	100	17	73	128	30
Miscellaneous	76	28	29	124	20
Hired Crew	808	110	625	991	250
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	401	60	301	501	177
Trip Net Cash Flow*	994	119	795	1,192	677
Trip Net Revenue*	593	89	443	742	346

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



Input Prices

Fuel Price (average): $2.05 per gallon

Hired Crew Wage (implicit): $283 per crew-day

Productivity Measures

Landings/Fuel Use: 8.2 lbs/gallon

Landings/Labor Use: 179 lbs/crew-day

* See Definitions in Methods Section or Glossary.

SOI: 2016 SAT FMP Jacks Fishery: All Gears

Annual, Vessel-Level Summary

Effort	
Vessels	288
Trips - Total	10,502
SOI Trips	2,892
Non-SOI Trips	7,610
Days at Sea	16,951
Crew Days	35,217

Landings (gutted lbs)	
Total	6,025,565
SOI	935,383
Non-SOI	5,090,182
% SOI	16%

Percent by Gear	**Trips**	**Total lbs**
Vertical Line	75%	69%
Longline	3%	9%
Diver	6%	4%
Traps/Pots	0.9%	1%
Other	16%	18%

Price (mean)	
Total	$2.78
SOI	$1.48
Non-SOI	$3.02

Revenue	
Total	$16,764,472
SOI	$1,388,061
Non-SOI	$15,376,411
% SOI	8%

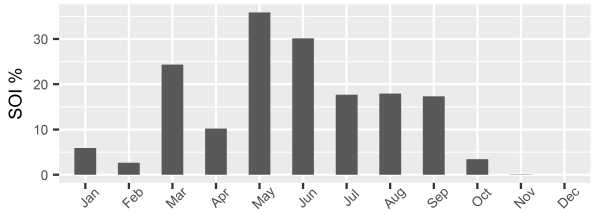
Percent of Revenue by Species Group	
Shallow Water Groupers	13%
Shallow Water Snappers	14%
Mid-Shelf Snappers	18%
Deep Water Groupers/Tilefish	14%
Grunt/Porgy/Sea Bass/Trigger	10%
Mackerels/Dolphinfish/Jacks	23%
Other Species	9%

Revenue for Top 5 Species	
Vermilion Snapper	$2,819,094
Yellowtail Snapper	$1,939,152
King and Cero Mackerel	$1,715,462
Tilefish	$1,394,866
Greater Amberjack	$1,245,249

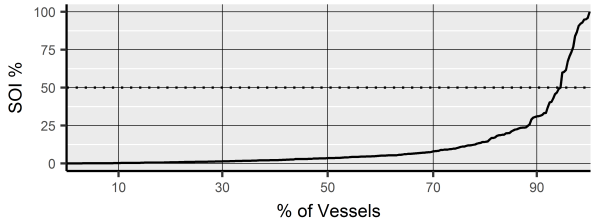
Annual, Vessel Descriptive Statistics (N=288)

	Mean	Min	Median	Max
Trips	36.5	1	26	234
Days at Sea	58.9	1	45	234
Crew Days	122.3	1	83	525
Landings	20,922	46	12,040	210,425
Revenue	$58,210	$110	$32,643	$541,023
SOI	$4,820	$3	$887	$90,930
% SOI	11.2%	0%	3.5%	100%

SOI Share of Monthly Landings



SOI Share of Revenue Per Vessel



Percent with Federal Permit	
GOM Reef Fish	9%
SAT Snapper & Grouper - Unlimited	95%
SAT Snapper & Grouper - Limited	5%
King Mackerel	70%
Spanish Mackerel	71%
Dolphin-Wahoo	95%
Other Commercial Fishing	35%
For-Hire Fishing	33%

Vessel Characteristics (N=288)

	Mean	Min	Median	Max
Length	33	17	32	70
Year Built	1990	1954	1989	2016
Horsepower	417	85	375	1,350
Fiberglass Hull	99%	-	-	-
Diesel Engine	68%	-	-	-
Ice Refrigeration	95%	-	-	-

SOI: 2016 SAT FMP Jacks Fishery: All Gears

Annual, Vessel-Level Economics

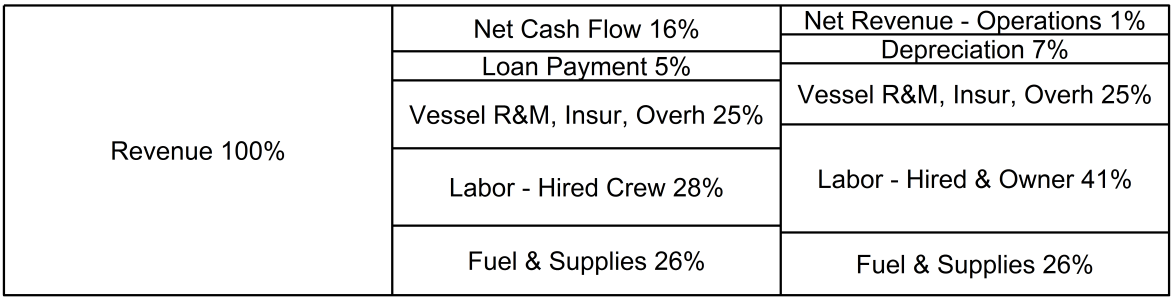
Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	288	-	-	-
Selected	70	24%	-	-
Responded	57	20%	81%	-
Used	54	19%	77%	95%

Economic Results (n=54)

	Mean	**SE**	**90% L.B.**	**90% U.B.**	**Median**
SOI Vessel					
Owner-Operated	85%	4.7	77%	93%	-
For-Hire Active	17%	4.9	9%	26%	-
Days - Commercial Fishing	87	8.1	73	100	78
Days - For-Hire Fishing	15	4.2	8	22	0
Days - Non-fishing	2	0.8	1	3	0
Vessel Value	107,899	11,739	88,233	127,565	75,000
Has Insurance	47%	6.5	36%	58%	-
Total Revenue	80,273	11,688	60,691	99,854	71,415
Commercial Fishing	64,086	9,872	47,548	80,624	40,000
For-Hire Fishing	16,187	6,079	6,002	26,371	0
Cost					
Fuel	8,534	918	6,996	10,073	6,056
Other Supplies	12,093	1,877	8,948	15,238	7,750
Hired Crew	22,818	3,321	17,255	28,381	10,000
Vessel Repair & Maintenance	11,484	1,760	8,535	14,432	6,802
Insurance	1,742	285	1,265	2,219	0
Overhead	6,954	1,252	4,856	9,052	3,100
Loan Payment	3,933	1,255	1,830	6,036	0
IFQ Purchase	22	19	−10	54	0
OC Owner-Captain Time	10,377	1,384	8,058	12,696	4,535
Depreciation	5,395	587	4,412	6,378	3,750
Net Cash Flow	12,693	6,415	1,946	23,439	5,350
Net Revenue from Operations*	875	5,883	−8,980	10,731	−6,366

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



Economic Return* (on Vessel Asset Value): 0.8%

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

SOI: 2016 SAT FMP Jacks Fishery: All Gears

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	3,327	3,083	2,892	3,101
Vessels	305	303	288	299
Days at Sea	8,100	7,358	6,465	7,308
Landings (gutted lbs)				
Total	2,982,811	2,630,351	2,437,211	2,683,458
SOI	1,148,570	975,295	935,383	1,019,749
Non-SOI	1,834,240	1,655,056	1,501,828	1,663,708
% SOI	39%	37%	38%	38%
Price (mean)				
Total	$2.84	$2.86	$2.86	$2.85
SOI	$1.41	$1.51	$1.48	$1.47
Non-SOI	$3.73	$3.66	$3.72	$3.7
Revenue				
Total	$8,454,946	$7,524,576	$6,974,941	$7,651,488
SOI	$1,627,293	$1,476,390	$1,388,061	$1,497,248
Non-SOI	$6,827,653	$6,048,186	$5,586,880	$6,154,240
% SOI	19%	20%	20%	20%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	1,000	674	691	
Response Rate (%)	90%	82%	97%	
SOI Trip				
Owner-Operated	81%	83%	79%	81%
Fuel Used per Day at Sea (gallons/day)	40	44	44	43
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	13.5%	11.2%	9%	11.2%
Bait	4%	3.8%	4.1%	4%
Ice	1.9%	1.9%	2.2%	2%
Groceries	3.8%	3.9%	4.3%	4%
Miscellaneous	3%	2.6%	3.3%	3%
Hired Crew	34.3%	33.8%	34.6%	34.2%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	16.9%	15.3%	17.2%	16.5%
Trip Net Cash Flow*	39.5%	42.7%	42.6%	41.6%
Trip Net Cash Revenue*	22.7%	27.3%	25.4%	25.1%
Labor - Hired & Owner	51.2%	49.1%	51.8%	50.7%
Fuel & Supplies	26.1%	23.5%	22.8%	24.1%
Input Prices				
Fuel Price (per gallon)	$3.62	$2.69	$2.05	$2.79
Hire Crew Wage (per crew-day)	$272	$271	$283	$275
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	9.2	8.6	8.2	9
Landings/Labor Use (lbs/crew-day)	169	175	179	174

SOI: 2016 SAT FMP Jacks Fishery: All Gears

Annual, Vessel-Level Time Series

Annual, Vessel-Level Summary

	2014	2015	2016	Average
Effort				
Vessels	305	303	288	299
Trips - Total	11,504	10,946	10,502	10,984
SOI Trips	3,327	3,083	2,892	3,101
Non-SOI Trips	8,177	7,863	7,610	7,883
Days at Sea	19,132	18,091	16,951	18,058
Landings (gutted lbs)				
Total	6,721,679	6,457,927	6,025,565	6,401,724
SOI	1,148,570	975,295	935,383	1,019,749
Non-SOI	5,573,108	5,482,632	5,090,182	5,381,974
% SOI	17%	15%	16%	16%
Revenue				
Total	$19,493,349	$18,144,860	$16,764,472	$18,134,227
SOI	$1,627,293	$1,476,390	$1,388,061	$1,497,248
Non-SOI	$17,866,056	$16,668,470	$15,376,411	$16,636,979
% SOI	8%	8%	8%	8%
Vessel Characteristics				
Length	33	33	33	33
Year Built	1989	1989	1990	1989
For-Hire Fishing Permit	34%	32%	33%	33%

Annual, Vessel-Level Economics

	2014	2015	2016	Average
Number of Observations	52	64	54	
Response Rate (%)	57%	76%	77%	
SOI Vessel				
Owner-Operated	88%	87%	85%	87%
For-Hire Active	30%	23%	17%	23%
Vessel Value	$71,859	$82,236	$107,899	$87,331
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	16.8%	12%	10.6%	13.1%
Other Supplies	13%	13.9%	15.1%	14%
Hired Crew	26.2%	24.4%	28.4%	26.3%
Vessel Repair & Maintenance	13.1%	16%	14.3%	14.5%
Insurance	1.4%	1.6%	2.2%	1.7%
Overhead	7.4%	8.3%	8.7%	8.1%
Loan Payment	2.3%	2.7%	4.9%	3.3%
IFQ Purchase	0%	0.1%	0%	0%
OC Owner-Captain Time	13.2%	12.2%	12.9%	12.8%
Net Cash Flow	19.9%	20.9%	15.8%	18.9%
Net Revenue for Operations*	4.5%	7%	1.1%	4.2%
Depreciation	4.5%	4.6%	6.7%	5.3%
Vessel R&M, Insur, Overh	21.9%	25.9%	25.1%	24.3%
Labor - Hired & Owner	39.4%	36.6%	41.4%	39.1%
Fuel & Supplies	29.7%	26%	25.7%	27.1%
Economic Return* (on asset value)	5.1%	7.6%	0.8%	4.5%

SOI: 2016 SAT FMP SWGCS Fishery: All Gears

Description: This SOI consists of all logbook trips by permitted vessels where at least one pound of shallow water grouper managed by the South Atlantic Snapper-Grouper FMP was landed in 2016 using any gear type. Note: Scamp and gag grouper are not included in this SOI. Refer to Appendix 2 for a list of species. For important **disclaimer**, see page 15.

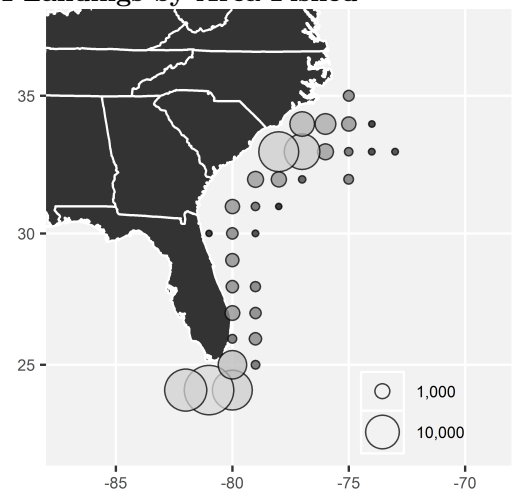
Trip-Level Summary

Effort	
Trips	1,776
Vessels	283
Days at Sea	4,225
Crew Days	9,653
Landings (gutted lbs)	
Total	1,134,896
SOI	107,114
Non-SOI	1,027,782
% SOI	9%

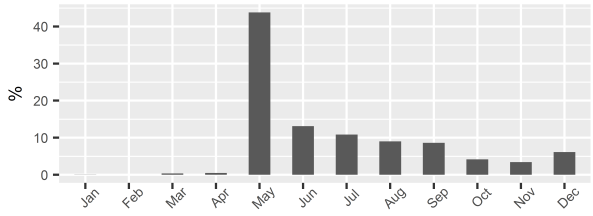
Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	75%	63%
Longline	0.1%	0.5%
Diver	21%	36%
Traps/Pots	0.2%	0.1%
Other	3%	1%

Price (mean)	
Total	$3.64
SOI	$4.99
Non-SOI	$3.50
Revenue	
Total	$4,133,889
SOI	$534,012
Non-SOI	$3,599,877
% SOI	13%
Percent of Revenue by Species Group	
Shallow Water Groupers	38%
Shallow Water Snappers	11%
Mid-Shelf Snappers	18%
Deep Water Groupers/Tilefish	6%
Grunt/Porgy/Sea Bass/Trigger	12%
Mackerels/Dolphinfish/Jacks	8%
Other Species	7%
Revenue for Top 5 Species	
Vermilion Snapper	$720,158
Gag Grouper	$555,173
Scamp	$475,332
Yellowtail Snapper	$323,362
Black Grouper	$314,671

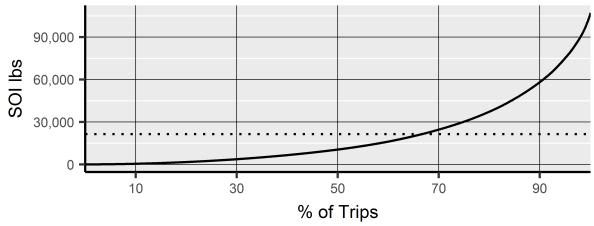
SOI Landings by Area Fished



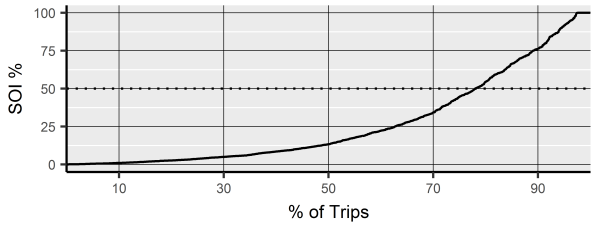
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=1,776)

	Mean	Min	Median	Max
Days at Sea	2.4	1	1	13
Crew Size	2.2	1	2	6
Landings	639	3	342	6,460
Revenue	$2,328	$12	$1,187	$24,702
SOI	$301	$2	$132	$4,019
% SOI	27%	0%	13.4%	100%

SOI: 2016 SAT FMP SWGCS Fishery: All Gears

Trip-Level Economics

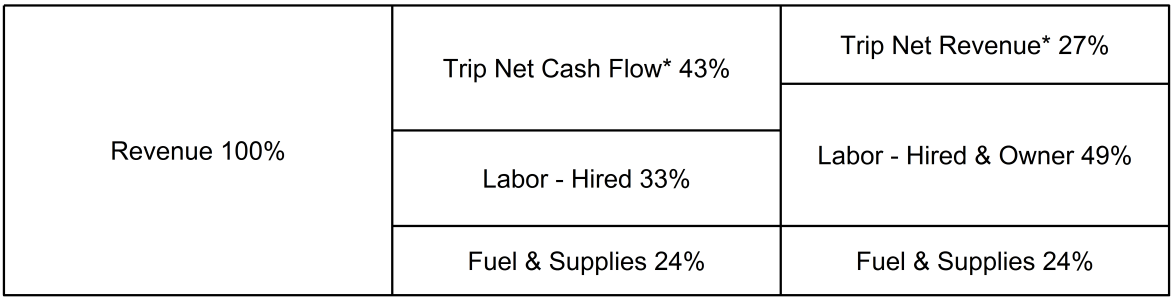
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	1,776	-	-	-
Selected	374	21%	-	-
Responded	372	21%	99%	-
Used	353	20%	94%	95%

Economic Results (n=353)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	74%	5	66%	82%	-
Days at Sea	2.9	0.3	2.3	3.4	1
Crew Size	2.3	0.1	2.1	2.4	2
Fuel Used	108	12	87	128	100
Landings (gutted lbs)	716	82	580	853	387
Total Revenue	2,868	292	2,381	3,354	1,925
Cost					
Fuel	243	25	201	286	226
Bait	145	22	108	183	81
Ice	55	8	42	69	42
Groceries	123	19	91	154	50
Miscellaneous	118	29	70	167	50
Hired Crew	946	124	740	1,152	390
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	461	70	344	578	150
Trip Net Cash Flow*	1,236	141	1,001	1,471	739
Trip Net Revenue*	775	98	611	939	342

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



Input Prices

Fuel Price (average): $2.26 per gallon

Hired Crew Wage (implicit): $215 per crew-day

Productivity Measures

Landings/Fuel Use: 6.6 lbs/gallon

Landings/Labor Use: 110 lbs/crew-day

* See Definitions in Methods Section or Glossary.

SOI: 2016 SAT FMP SWGCS Fishery: All Gears

Annual, Vessel-Level Summary

Effort	
Vessels	283
Trips - Total	10,399
SOI Trips	1,776
Non-SOI Trips	8,623
Days at Sea	17,184
Crew Days	36,621

Landings (gutted lbs)	
Total	5,362,115
SOI	107,114
Non-SOI	5,255,001
% SOI	2%

Percent by Gear	**Trips**	**Total lbs**
Vertical Line	82%	81%
Longline	0.9%	7%
Diver	7%	5%
Traps/Pots	0.5%	0.8%
Other	9%	6%

Price (mean)	
Total	$3.16
SOI	$4.99
Non-SOI	$3.13

Revenue	
Total	$16,961,790
SOI	$534,012
Non-SOI	$16,427,778
% SOI	3%

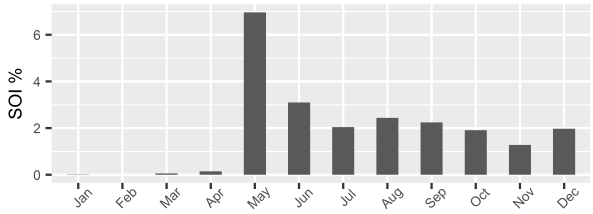
Percent of Revenue by Species Group	
Shallow Water Groupers	16%
Shallow Water Snappers	25%
Mid-Shelf Snappers	16%
Deep Water Groupers/Tilefish	11%
Grunt/Porgy/Sea Bass/Trigger	9%
Mackerels/Dolphinfish/Jacks	16%
Other Species	7%

Revenue for Top 5 Species	
Yellowtail Snapper	$3,665,475
Vermilion Snapper	$2,579,351
Gag Grouper	$1,149,179
Tilefish	$1,054,289
Greater Amberjack	$1,005,370

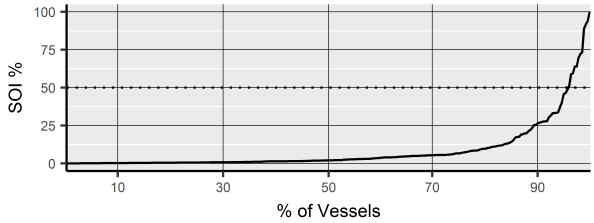
Annual, Vessel Descriptive Statistics (N=283)

	Mean	Min	Median	Max
Trips	36.7	1	26	234
Days at Sea	60.7	1	47	234
Crew Days	129.4	1	90	545
Landings	18,947	12	11,156	118,289
Revenue	$59,936	$53	$33,155	$541,023
SOI	$1,887	$3	$592	$18,604
% SOI	8.6%	0%	2%	100%

SOI Share of Monthly Landings



SOI Share of Revenue Per Vessel



Percent with Federal Permit	
GOM Reef Fish	12%
SAT Snapper & Grouper - Unlimited	92%
SAT Snapper & Grouper - Limited	8%
King Mackerel	61%
Spanish Mackerel	65%
Dolphin-Wahoo	92%
Other Commercial Fishing	31%
For-Hire Fishing	27%

Vessel Characteristics (N=283)

	Mean	Min	Median	Max
Length	33	17	31	53
Year Built	1990	1964	1989	2016
Horsepower	397	115	350	1,200
Fiberglass Hull	99%	-	-	-
Diesel Engine	63%	-	-	-
Ice Refrigeration	93%	-	-	-

SOI: 2016 SAT FMP SWGCS Fishery: All Gears

Annual, Vessel-Level Economics

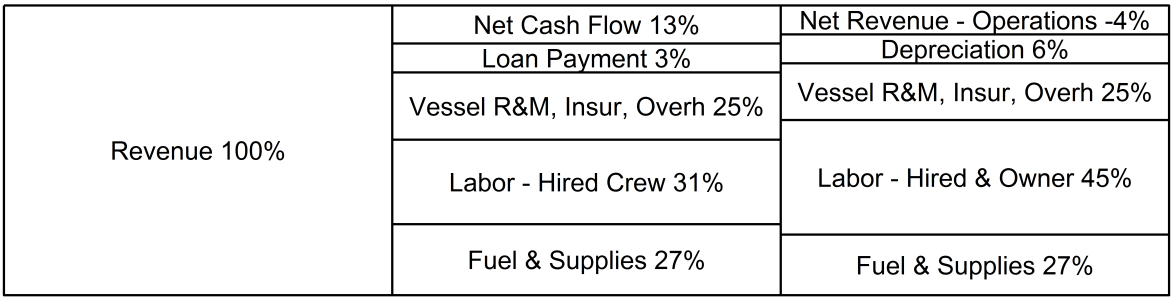
Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	283	-	-	-
Selected	71	25%	-	-
Responded	57	20%	80%	-
Used	54	19%	76%	95%

Economic Results (n=54)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Vessel					
Owner-Operated	89%	4.3	81%	96%	-
For-Hire Active	8%	3.7	2%	14%	-
Days - Commercial Fishing	96	9.1	81	112	80
Days - For-Hire Fishing	6	2.8	2	11	0
Days - Non-fishing	2	0.8	0	3	0
Vessel Value	98,482	13,496	75,873	121,092	65,000
Has Insurance	49%	6.8	38%	60%	-
Total Revenue	83,830	12,133	63,503	104,156	71,415
Commercial Fishing	77,884	11,871	57,997	97,771	47,091
For-Hire Fishing	5,946	2,907	1,075	10,816	0
Cost					
Fuel	8,475	820	7,102	9,848	6,000
Other Supplies	14,009	1,982	10,689	17,329	9,451
Hired Crew	26,357	4,429	18,937	33,776	11,492
Vessel Repair & Maintenance	12,687	2,228	8,953	16,420	8,500
Insurance	1,533	316	1,003	2,063	0
Overhead	7,126	1,404	4,774	9,478	3,100
Loan Payment	2,629	770	1,339	3,920	0
IFQ Purchase	39	24	−2	80	0
OC Owner-Captain Time	11,750	1,559	9,139	14,361	5,115
Depreciation	4,924	675	3,794	6,055	3,250
Net Cash Flow	10,975	6,538	22	21,929	4,730
Net Revenue from Operations*	−3,031	5,666	−12,523	6,462	−7,418

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



Economic Return* (on Vessel Asset Value): −3.1%

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

SOI: 2016 SAT FMP SWGCS Fishery: All Gears

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	2,145	1,929	1,776	1,950
Vessels	315	292	283	297
Days at Sea	5,433	4,799	4,225	4,819
Landings (gutted lbs)				
Total	1,409,892	1,289,344	1,134,896	1,278,044
SOI	159,117	153,745	107,114	139,992
Non-SOI	1,250,775	1,135,599	1,027,782	1,138,052
% SOI	11%	12%	9%	11%
Price (mean)				
Total	$3.66	$3.59	$3.64	$3.63
SOI	$4.77	$4.94	$4.99	$4.9
Non-SOI	$3.51	$3.40	$3.50	$3.47
Revenue				
Total	$5,149,109	$4,630,269	$4,133,889	$4,637,756
SOI	$758,534	$759,890	$534,012	$684,145
Non-SOI	$4,390,575	$3,870,379	$3,599,877	$3,953,610
% SOI	15%	16%	13%	15%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	548	389	353	
Response Rate (%)	81%	81%	94%	
SOI Trip				
Owner-Operated	84%	80%	74%	79.3%
Fuel Used per Day at Sea (gallons/day)	34	35	38	36
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	13.2%	10.5%	8.5%	10.7%
Bait	5.9%	5.6%	5.1%	5.5%
Ice	2%	1.9%	1.9%	1.9%
Groceries	4.1%	3.9%	4.3%	4.1%
Miscellaneous	2.8%	2.4%	4.1%	3.1%
Hired Crew	35.7%	34.4%	33%	34.4%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	16.8%	11.9%	16.1%	14.9%
Trip Net Cash Flow*	36.4%	41.3%	43.1%	40.3%
Trip Net Cash Revenue*	19.6%	29.4%	27%	25.3%
Labor - Hired & Owner	52.5%	46.3%	49.1%	49.3%
Fuel & Supplies	27.9%	24.3%	23.9%	25.4%
Input Prices				
Fuel Price (per gallon)	$3.66	$2.77	$2.26	$2.90
Hire Crew Wage (per crew-day)	$267	$246	$215	$243
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	7.6	7.5	6.6	7
Landings/Labor Use (lbs/crew-day)	123	126	110	120

SOI: 2016 SAT FMP SWGCS Fishery: All Gears

Annual, Vessel-Level Time Series

Annual, Vessel-Level Summary

	2014	2015	2016	Average
Effort				
Vessels	315	292	283	297
Trips - Total	11,744	10,023	10,399	10,722
SOI Trips	2,145	1,929	1,776	1,950
Non-SOI Trips	9,599	8,094	8,623	8,772
Days at Sea	19,988	17,801	17,184	18,324
Landings (gutted lbs)				
Total	6,020,123	5,717,471	5,362,115	5,699,903
SOI	159,117	153,745	107,114	139,992
Non-SOI	5,861,005	5,563,726	5,255,001	5,559,911
% SOI	3%	3%	2%	3%
Revenue				
Total	$19,177,677	$17,560,734	$16,961,790	$17,900,067
SOI	$758,534	$759,890	$534,012	$684,145
Non-SOI	$18,419,143	$16,800,844	$16,427,778	$17,215,922
% SOI	4%	4%	3%	4%
Vessel Characteristics				
Length	32	33	33	33
Year Built	1989	1990	1990	1990
For-Hire Fishing Permit	26%	25%	27%	26%

Annual, Vessel-Level Economics

	2014	2015	2016	Average
Number of Observations	48	62	54	
Response Rate (%)	54%	78%	76%	
SOI Vessel				
Owner-Operated	83%	89%	89%	87%
For-Hire Active	16%	20%	8%	15%
Vessel Value	$75,779	$84,728	$98,482	$86,330
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	13.3%	11.1%	10.1%	11.5%
Other Supplies	12%	14.9%	16.7%	14.5%
Hired Crew	32%	23.4%	31.4%	28.9%
Vessel Repair & Maintenance	13.6%	15.2%	15.1%	14.6%
Insurance	1.2%	1.5%	1.8%	1.5%
Overhead	5.4%	8.4%	8.5%	7.4%
Loan Payment	1.9%	2.3%	3.1%	2.4%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	11%	13.3%	14%	12.8%
Net Cash Flow	20.7%	23.2%	13.1%	19%
Net Revenue for Operations*	7.2%	6.4%	−3.6%	3.3%
Depreciation	4.4%	5.9%	5.9%	5.4%
Vessel R&M, Insur, Overh	20.1%	25%	25.5%	23.5%
Labor - Hired & Owner	43%	36.7%	45.5%	41.7%
Fuel & Supplies	25.3%	26%	26.8%	26%
Economic Return* (on asset value)	8.1%	5.4%	−3.1%	3.5%

SOI: 2016 SAT Snapper-Grouper FMP Fishery: All Gears, SG2 Permit

Description: This SOI consists of all logbook trips by SG2 (225 lbs trip limit) permitted vessels where at least one pound of fish managed by the SAT Snapper-Grouper FMP (refer to Appendix 2) was landed in 2016 using any gear type. The economic results are questionable and should only be used for a qualitative impression. For important **disclaimer**, see page 15.

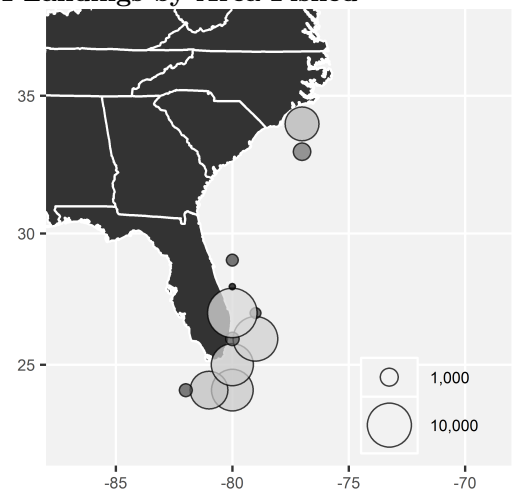
Trip-Level Summary

Effort	
Trips	722
Vessels	49
Days at Sea	726
Crew Days	1,100
Landings (gutted lbs)	
Total	82,265
SOI	55,597
Non-SOI	26,669
% SOI	68%

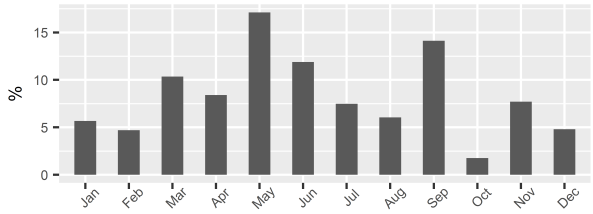
Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	84%	92%
Longline	0%	0%
Diver	4%	4%
Traps/Pots	0%	0%
Other	12%	4%

Price (mean)	
Total	$3.05
SOI	$3.54
Non-SOI	$2.01
Revenue	
Total	$250,764
SOI	$197,053
Non-SOI	$53,710
% SOI	79%
Percent of Revenue by Species Group	
Shallow Water Groupers	14%
Shallow Water Snappers	41%
Mid-Shelf Snappers	2%
Deep Water Groupers/Tilefish	10%
Grunt/Porgy/Sea Bass/Trigger	6%
Mackerels/Dolphinfish/Jacks	22%
Other Species	6%
Revenue for Top 5 Species	
Yellowtail Snapper	$63,641
Mutton Snapper	$30,340
King and Cero Mackerel	$30,235
Tilefish	$20,912
Gag Grouper	$18,747

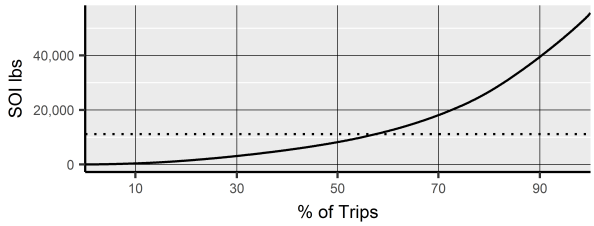
SOI Landings by Area Fished



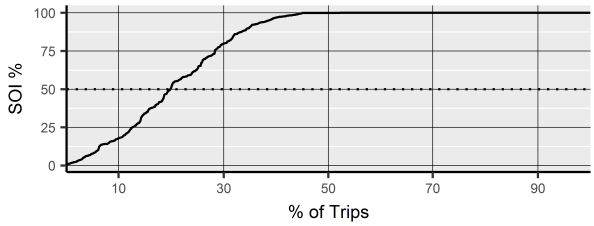
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=722)

	Mean	Min	Median	Max
Days at Sea	1	1	1	2
Crew Size	1.5	1	1	4
Landings	114	5	86	1,057
Revenue	$347	$16	$256	$2,415
SOI	$273	$1	$187	$1,725
% SOI	80%	0.7%	100%	100%

SOI: 2016 SAT Snapper-Grouper FMP Fishery: All Gears, SG2 Permit

Trip-Level Economics

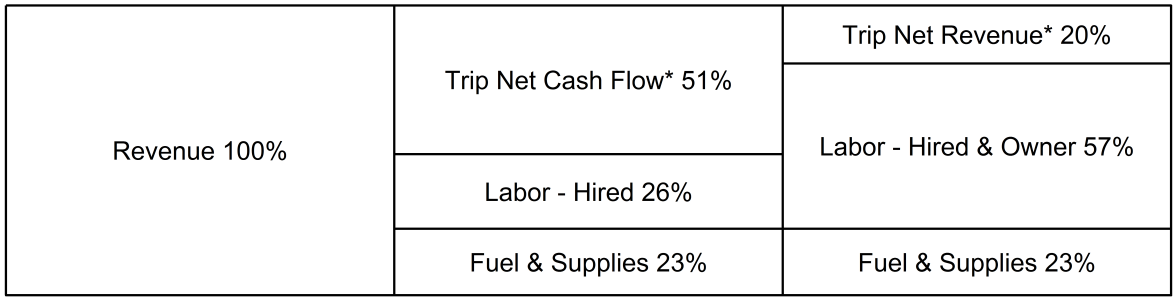
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	722	-	-	-
Selected	171	24%	-	-
Responded	171	24%	100%	-
Used	165	23%	96%	96%

Economic Results (n=165)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	100%	0	100%	100%	-
Days at Sea	1	0	1	1	1
Crew Size	1.4	0.1	1.2	1.7	1
Fuel Used	15	5	6	25	6
Landings (gutted lbs)	95	18	61	129	65
Total Revenue	416	86	255	576	275
Cost					
Fuel	36	11	15	57	14
Bait	26	5	17	35	25
Ice	15	3	10	21	16
Groceries	13	4	6	19	10
Miscellaneous	5	6	−6	16	0
Hired Crew	107	68	−20	234	0
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	130	24	86	175	80
Trip Net Cash Flow*	213	47	126	301	135
Trip Net Revenue*	83	26	34	132	59

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



Input Prices

Fuel Price (average): $2.36 per gallon

Hired Crew Wage (implicit): $249 per crew-day

Productivity Measures

Landings/Fuel Use: 6.2 lbs/gallon

Landings/Labor Use: 66 lbs/crew-day

* See Definitions in Methods Section or Glossary.

SOI: 2016 SAT Snapper-Grouper FMP Fishery: All Gears, SG2 Permit

Annual, Vessel-Level Summary

Effort	
Vessels	49
Trips - Total	1,371
SOI Trips	722
Non-SOI Trips	649
Days at Sea	1,377
Crew Days	1,964

Landings (gutted lbs)	
Total	267,674
SOI	55,597
Non-SOI	212,077
% SOI	21%

Percent by Gear	**Trips**	**Total lbs**
Vertical Line	55%	34%
Longline	0%	0%
Diver	2%	1%
Traps/Pots	0%	0%
Other	43%	65%

Price (mean)	
Total	$2.32
SOI	$3.54
Non-SOI	$2.00

Revenue	
Total	$620,421
SOI	$197,053
Non-SOI	$423,367
% SOI	32%

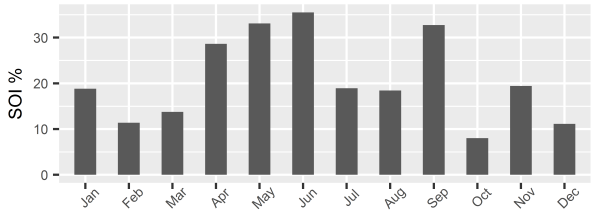
Percent of Revenue by Species Group	
Shallow Water Groupers	6%
Shallow Water Snappers	17%
Mid-Shelf Snappers	0.8%
Deep Water Groupers/Tilefish	4%
Grunt/Porgy/Sea Bass/Trigger	2%
Mackerels/Dolphinfish/Jacks	66%
Other Species	5%

Revenue for Top 5 Species	
King and Cero Mackerel	$356,846
Yellowtail Snapper	$63,641
Mutton Snapper	$30,340
Tilefish	$20,912
Gag Grouper	$18,747

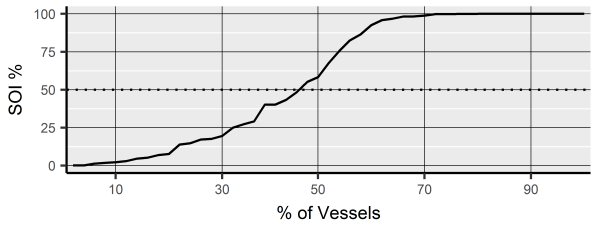
Annual, Vessel Descriptive Statistics (N=49)

	Mean	Min	Median	Max
Trips	28	1	11	144
Days at Sea	28.1	1	11	144
Crew Days	40.1	1	19	208
Landings	5,463	10	1,286	56,814
Revenue	$12,662	$34	$4,198	$122,329
SOI	$4,021	$12	$932	$30,828
% SOI	58.7%	0.1%	67.6%	100%

SOI Share of Monthly Landings



SOI Share of Revenue Per Vessel



Percent with Federal Permit	
GOM Reef Fish	0%
SAT Snapper & Grouper - Unlimited	2%
SAT Snapper & Grouper - Limited	100%
King Mackerel	57%
Spanish Mackerel	71%
Dolphin-Wahoo	92%
Other Commercial Fishing	18%
For-Hire Fishing	29%

Vessel Characteristics (N=49)

	Mean	Min	Median	Max
Length	28	21	26	40
Year Built	1989	1971	1986	2014
Horsepower	324	135	300	1,000
Fiberglass Hull	100%	-	-	-
Diesel Engine	45%	-	-	-
Ice Refrigeration	80%	-	-	-

SOI: 2016 SAT Snapper-Grouper FMP Fishery: All Gears, SG2 Permit

Annual, Vessel-Level Economics

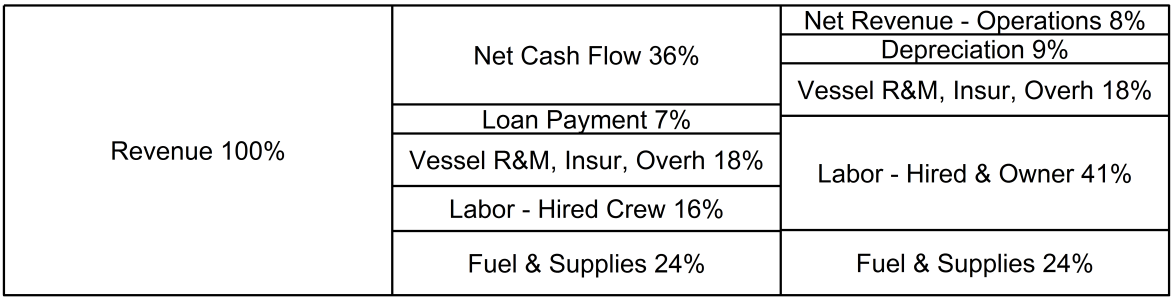
Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	49	-	-	-
Selected	9	18%	-	-
Responded	8	16%	89%	-
Used	7	14%	78%	88%

Economic Results (n=7)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Vessel					
Owner-Operated	100%	0	100%	100%	-
For-Hire Active	0%	0	0%	0%	-
Days - Commercial Fishing	71	34.2	5	138	15
Days - For-Hire Fishing	0	0	0	0	0
Days - Non-fishing	14	11.1	−8	35	0
Vessel Value	47,929	15,024	18,734	77,123	40,000
Has Insurance	0%	0	0%	0%	-
Total Revenue	25,275	9,357	7,092	43,458	13,610
Commercial Fishing	25,275	9,357	7,092	43,458	13,610
For-Hire Fishing	0	0	0	0	0
Cost					
Fuel	3,102	1,259	655	5,549	1,500
Other Supplies	2,946	1,132	747	5,145	1,500
Hired Crew	3,924	1,333	1,334	6,513	4,800
Vessel Repair & Maintenance	2,035	581	906	3,164	2,000
Insurance	0	0	0	0	0
Overhead	2,542	1,039	523	4,561	500
Loan Payment	1,646	1,524	−1,315	4,606	0
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	6,388	3,732	−863	13,639	745
Depreciation	2,396	751	937	3,856	2,000
Net Cash Flow	9,081	5,691	−1,977	20,139	591
Net Revenue from Operations*	1,942	2,199	−2,330	6,214	53

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



Economic Return* (on Vessel Asset Value): 4.1%

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

SOI: 2016 SAT Snapper-Grouper FMP Fishery: All Gears, SG2 Permit

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	776	746	722	748
Vessels	55	44	49	49
Days at Sea	780	767	726	758
Landings (gutted lbs)				
Total	104,867	91,678	82,265	92,937
SOI	64,952	67,605	55,597	62,718
Non-SOI	39,915	24,073	26,669	30,219
% SOI	62%	74%	68%	68%
Price (mean)				
Total	$2.75	$3.06	$3.05	$2.95
SOI	$3.33	$3.45	$3.54	$3.44
Non-SOI	$1.83	$1.95	$2.01	$1.93
Revenue				
Total	$289,154	$280,404	$250,764	$273,441
SOI	$215,833	$233,487	$197,053	$215,458
Non-SOI	$73,321	$46,917	$53,710	$57,983
% SOI	75%	83%	79%	79%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	196	129	165	
Response Rate (%)	88%	77%	96%	
SOI Trip				
Owner-Operated	89%	96%	100%	95%
Fuel Used per Day at Sea (gallons/day)	12	26	15	18
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	11.2%	13.8%	8.7%	11.2%
Bait	3.1%	5.9%	6.3%	5.1%
Ice	1.5%	0.9%	3.7%	2%
Groceries	2.3%	1.9%	3.1%	2.4%
Miscellaneous	1%	1.1%	1.2%	1.1%
Hired Crew	11.9%	7.2%	25.7%	14.9%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	34.8%	34%	31.3%	33.4%
Trip Net Cash Flow*	69%	69.2%	51.3%	63.2%
Trip Net Cash Revenue*	34.2%	35.2%	20%	29.8%
Labor - Hired & Owner	46.8%	41.2%	57%	48.3%
Fuel & Supplies	19%	23.6%	22.9%	21.8%
Input Prices				
Fuel Price (per gallon)	$3.76	$2.86	$2.36	$2.99
Hire Crew Wage (per crew-day)	$126	$58	$249	$144
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	10.5	6.5	6.2	8
Landings/Labor Use (lbs/crew-day)	97	104	66	89

SOI: 2016 SAT Snapper-Grouper FMP Fishery: All Gears, SG2 Permit

Annual, Vessel-Level Time Series

Annual, Vessel-Level Summary

	2014	2015	2016	Average
Effort				
Vessels	55	44	49	49
Trips - Total	1,570	1,327	1,371	1,423
SOI Trips	776	746	722	748
Non-SOI Trips	794	581	649	675
Days at Sea	1,619	1,366	1,377	1,454
Landings (gutted lbs)				
Total	348,700	240,639	267,674	285,671
SOI	64,952	67,605	55,597	62,718
Non-SOI	283,748	173,034	212,077	222,953
% SOI	19%	28%	21%	23%
Revenue				
Total	$786,367	$587,771	$620,421	$664,853
SOI	$215,833	$233,487	$197,053	$215,458
Non-SOI	$570,534	$354,284	$423,367	$449,395
% SOI	27%	40%	32%	33%
Vessel Characteristics				
Length	30	28	28	29
Year Built	1988	1989	1989	1989
For-Hire Fishing Permit	24%	23%	29%	25%

Annual, Vessel-Level Economics

	2014	2015	2016	Average
Number of Observations	8	9	7	
Response Rate (%)	62%	82%	78%	
SOI Vessel				
Owner-Operated	100%	100%	100%	100%
For-Hire Active	12%	21%	0%	11%
Vessel Value	$41,600	$52,324	$47,929	$47,284
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	17.7%	17%	12.3%	15.7%
Other Supplies	11.7%	10.5%	11.7%	11.3%
Hired Crew	21%	2.1%	15.5%	12.9%
Vessel Repair & Maintenance	10.7%	19%	8.1%	12.6%
Insurance	1.1%	1%	0%	0.7%
Overhead	6%	7.6%	10.1%	7.9%
Loan Payment	0%	1.4%	6.5%	2.6%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	22.7%	30.3%	25.3%	26.1%
Net Cash Flow	31.8%	41.4%	35.9%	36.4%
Net Revenue for Operations*	3.4%	1%	7.7%	4%
Depreciation	5.7%	11.4%	9.5%	8.9%
Vessel R&M, Insur, Overh	17.7%	27.6%	18.1%	21.1%
Labor - Hired & Owner	43.7%	32.5%	40.8%	39%
Fuel & Supplies	29.5%	27.5%	23.9%	27%
Economic Return* (on asset value)	3%	0.5%	4.1%	2.5%

Appendices

Appendix 1 - Trip-level results for gear-based Snapper-Grouper SOIs

Segmenting by gear-used could not be reported in full due to small sample sizes, especially at the annual, vessel-level. This appendix provides trip-level results (only) by the following gear-specific SOIs:

12. SAT Snapper-Grouper FMP Fishery: Vertical Line
13. SAT Snapper-Grouper FMP Fishery: Diver
14. SAT Snapper-Grouper FMP Fishery: Traps
15. SAT Snapper-Grouper FMP Fishery: Longline
16. SAT FMP Deepwater Fishery: Vertical Line

Note: the trip-level economic results for the following pairs of SOIs are materially equivalent, and only the broader perspective is reported:

- The black sea bass pots fishery is equivalent to 14. SOI (SG traps).
- The longline fishery for golden tilefish is equivalent to 15. SOI (SG longline).
- The longline fishery for deepwater species is also equivalent to 15. SOI (SG longline).

A1 - SOI: 2016 SAT Snapper-Grouper FMP Fishery: Vertical Line

Description: This SOI consists of all logbook trips by permitted vessels where at least one pound of fish managed by the SAT Snapper-Grouper FMP was landed in 2016 with vertical line gear. Species managed include multiple species of snapper, grouper, tilefish, etc. (please refer to Appendix 2). For important **disclaimer**, see page 15.

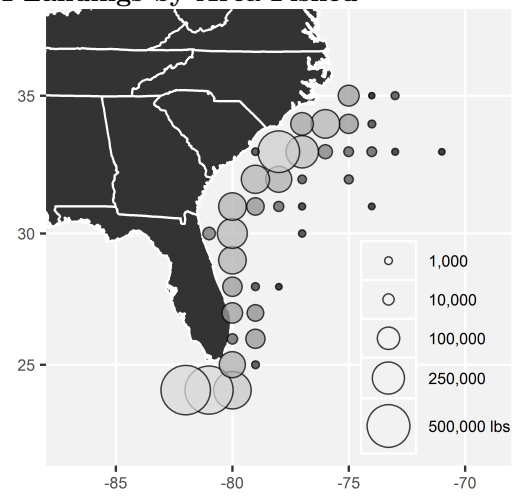
Trip-Level Summary

Effort	
Trips	9,869
Vessels	455
Days at Sea	16,591
Crew Days	35,428
Landings (gutted lbs)	
Total	4,791,393
SOI	4,281,637
Non-SOI	509,756
% SOI	89%

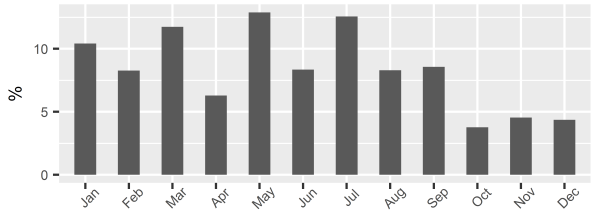
Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	98%	100%
Longline	0.1%	0%
Diver	1%	0%
Traps/Pots	0.1%	0%
Other	0.8%	0%

Price (mean)	
Total	$3.16
SOI	$3.24
Non-SOI	$2.45
Revenue	
Total	$15,121,511
SOI	$13,873,359
Non-SOI	$1,248,152
% SOI	92%
Percent of Revenue by Species Group	
Shallow Water Groupers	13%
Shallow Water Snappers	34%
Mid-Shelf Snappers	19%
Deep Water Groupers/Tilefish	10%
Grunt/Porgy/Sea Bass/Trigger	10%
Mackerels/Dolphinfish/Jacks	12%
Other Species	2%
Revenue for Top 5 Species	
Yellowtail Snapper	$4,647,958
Vermilion Snapper	$2,820,854
Greater Amberjack	$1,141,273
Gag Grouper	$946,068
Gray Triggerfish	$645,067

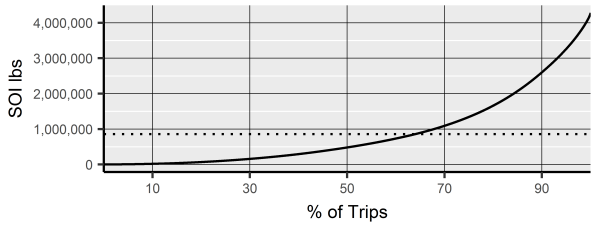
SOI Landings by Area Fished



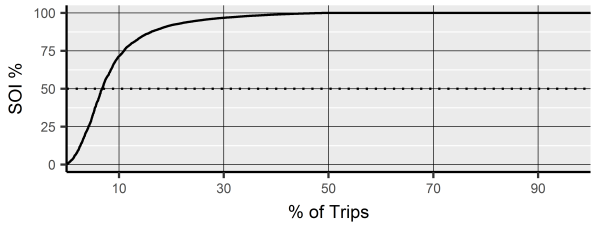
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=9,869)

	Mean	Min	Median	Max
Days at Sea	1.7	1	1	17
Crew Size	2	1	2	8
Landings	485	2	255	7,867
Revenue	$1,532	$8	$844	$24,153
SOI	$1,406	$1	$769	$21,200
% SOI	91%	0.1%	100%	100%

A1 - SOI: 2016 SAT Snapper-Grouper FMP Fishery: Vertical Line

Trip-Level Economics

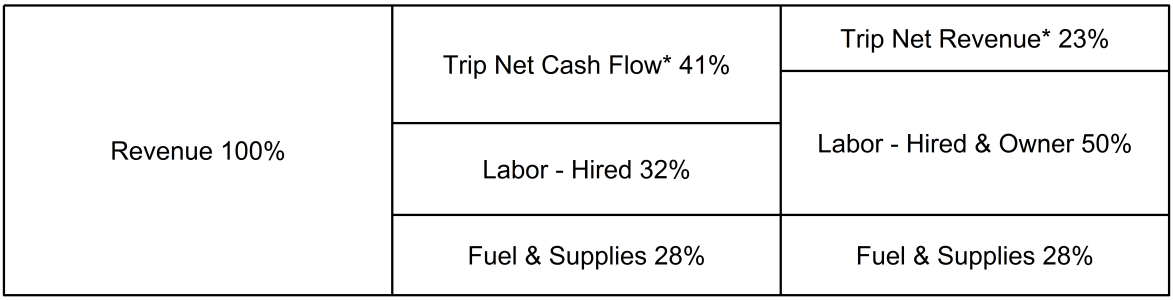
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	9,869	-	-	-
Selected	2,263	23%	-	-
Responded	2,233	23%	99%	-
Used	2,156	22%	95%	97%

Economic Results (n=2,156)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	82%	3.3	76%	87%	-
Days at Sea	1.9	0.2	1.5	2.2	1
Crew Size	2	0.1	1.9	2.1	2
Fuel Used	72	9	57	86	45
Landings (gutted lbs)	494	50	412	576	250
Total Revenue	1,568	167	1,292	1,845	879
Cost					
Fuel	160	18	130	190	100
Bait	127	21	92	163	50
Ice	38	6	29	47	15
Groceries	66	12	46	85	20
Miscellaneous	44	16	17	71	10
Hired Crew	496	73	375	617	150
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	283	36	223	342	138
Trip Net Cash Flow*	637	61	535	739	353
Trip Net Revenue*	354	44	281	428	129

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



Input Prices

Fuel Price (average): $2.23 per gallon

Hired Crew Wage (implicit): $227 per crew-day

Productivity Measures

Landings/Fuel Use: 6.9 lbs/gallon

Landings/Labor Use: 133 lbs/crew-day

* See Definitions in Methods Section or Glossary.

A1 - SOI: 2016 SAT Snapper-Grouper FMP Fishery: Vertical Line

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	10,502	9,400	9,869	9,924
Vessels	472	455	455	461
Days at Sea	18,341	17,025	16,591	17,319
Landings (gutted lbs)				
Total	5,059,570	4,809,624	4,791,393	4,886,862
SOI	4,489,392	4,381,710	4,281,637	4,384,246
Non-SOI	570,178	427,914	509,756	502,616
% SOI	89%	91%	89%	90%
Price (mean)				
Total	$3.10	$3.14	$3.16	$3.13
SOI	$3.17	$3.22	$3.24	$3.21
Non-SOI	$2.51	$2.32	$2.45	$2.43
Revenue				
Total	$15,693,802	$15,093,863	$15,121,511	$15,303,059
SOI	$14,265,215	$14,101,818	$13,873,359	$14,080,131
Non-SOI	$1,428,588	$992,045	$1,248,152	$1,222,928
% SOI	91%	93%	92%	92%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	2,481	2,251	2,156	
Response Rate (%)	83%	84%	95%	
SOI Trip				
Owner-Operated	81%	86%	82%	83%
Fuel Used per Day at Sea (gallons/day)	33	37	38	36
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	13.8%	11.9%	10.2%	12%
Bait	7.3%	7.9%	8.1%	7.8%
Ice	1.9%	1.9%	2.4%	2.1%
Groceries	3.4%	3.1%	4.2%	3.6%
Miscellaneous	2.5%	2.4%	2.8%	2.6%
Hired Crew	32%	32.5%	31.6%	32%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	19.3%	16.2%	18%	17.8%
Trip Net Cash Flow*	39.1%	40.3%	40.6%	40%
Trip Net Cash Revenue*	19.8%	24.1%	22.6%	22.2%
Labor - Hired & Owner	51.3%	48.7%	49.7%	49.9%
Fuel & Supplies	28.9%	27.2%	27.7%	27.9%
Input Prices				
Fuel Price (per gallon)	$3.65	$2.89	$2.23	$2.92
Hire Crew Wage (per crew-day)	$247	$263	$227	$246
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	8.5	7.8	6.9	8
Landings/Labor Use (lbs/crew-day)	143	146	133	141

A1 - SOI: 2016 SAT Snapper-Grouper FMP Fishery: Diver

Description: This SOI consists of all logbook trips by permitted vessels where at least one pound of fish managed by the SAT Snapper-Grouper FMP was landed in 2016 using diving gear. The economic results are based on small sample size and fluctuate from year to year. Focus on qualitative results. For important **disclaimer**, see page 15.

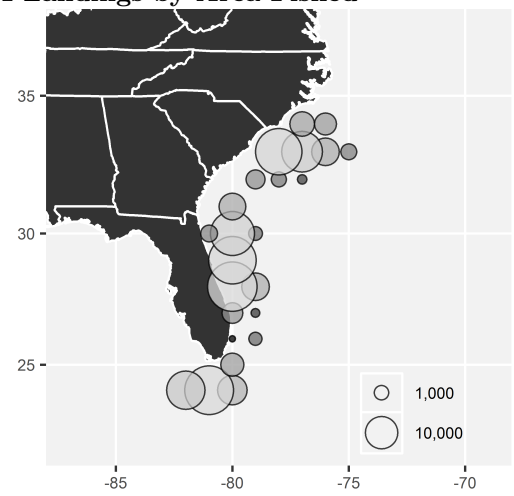
Trip-Level Summary

Effort	
Trips	763
Vessels	77
Days at Sea	1,097
Crew Days	2,591
Landings (gutted lbs)	
Total	290,017
SOI	206,211
Non-SOI	83,806
% SOI	71%

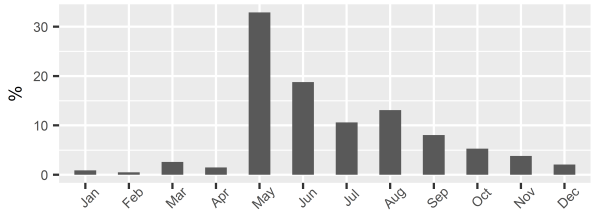
Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	3%	0%
Longline	0%	0%
Diver	97%	100%
Traps/Pots	0%	0%
Other	0.1%	0%

Price (mean)	
Total	$4.11
SOI	$4.21
Non-SOI	$3.87
Revenue	
Total	$1,192,842
SOI	$868,457
Non-SOI	$324,385
% SOI	73%
Percent of Revenue by Species Group	
Shallow Water Groupers	53%
Shallow Water Snappers	9%
Mid-Shelf Snappers	2%
Deep Water Groupers/Tilefish	0.7%
Grunt/Porgy/Sea Bass/Trigger	10%
Mackerels/Dolphinfish/Jacks	8%
Other Species	19%
Revenue for Top 5 Species	
Gag Grouper	$345,440
Lionfishes	$155,608
Black Grouper	$149,287
Scamp	$91,190
Hogfish	$74,624

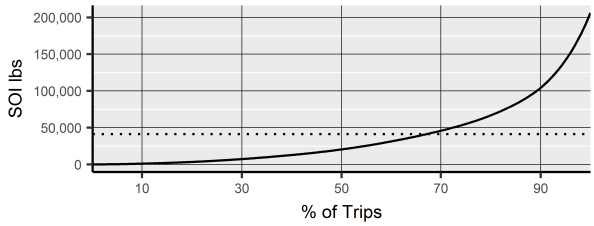
SOI Landings by Area Fished



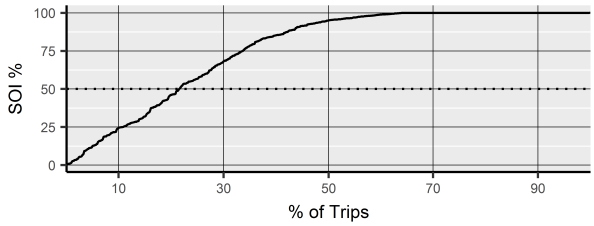
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=763)

	Mean	Min	Median	Max
Days at Sea	1.4	1	1	7
Crew Size	2.3	1	2	6
Landings	380	5	177	3,558
Revenue	$1,563	$12	$740	$14,143
SOI	$1,138	$3	$480	$10,901
% SOI	77%	0.4%	95.2%	100%

A1 - SOI: 2016 SAT Snapper-Grouper FMP Fishery: Diver

Trip-Level Economics

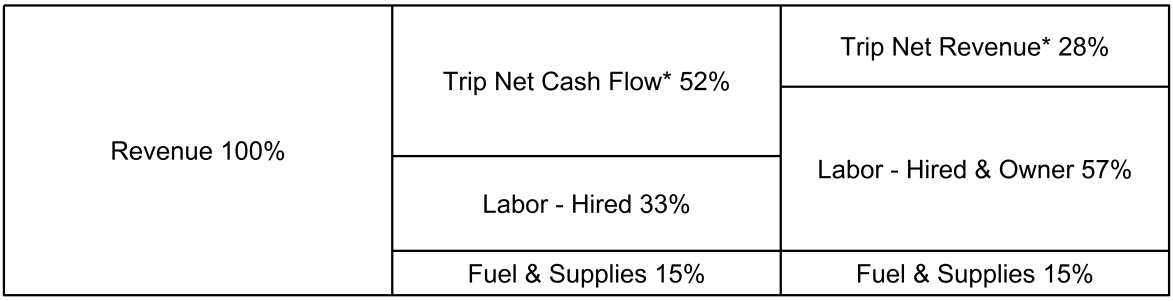
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	763	-	-	-
Selected	196	26%	-	-
Responded	196	26%	100%	-
Used	175	23%	89%	89%

Economic Results (n=175)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	90%	6.3	79%	100%	-
Days at Sea	1.7	0.2	1.3	2.1	1
Crew Size	2.3	0.1	2.1	2.5	2
Fuel Used	61	11	43	79	40
Landings (gutted lbs)	467	115	268	666	161
Total Revenue	2,116	468	1,306	2,925	662
Cost					
Fuel	135	19	103	168	108
Bait	30	13	7	52	0
Ice	24	7	11	36	0
Groceries	54	16	27	82	20
Miscellaneous	81	19	48	115	20
Hired Crew	692	194	356	1,028	100
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	506	117	303	708	119
Trip Net Cash Flow*	1,099	246	674	1,525	313
Trip Net Revenue*	593	136	358	829	152

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



Input Prices

Fuel Price (average): $2.22 per gallon

Hired Crew Wage (implicit): $283 per crew-day

Productivity Measures

Landings/Fuel Use: 7.7 lbs/gallon

Landings/Labor Use: 117 lbs/crew-day

* See Definitions in Methods Section or Glossary.

A1 - SOI: 2016 SAT Snapper-Grouper FMP Fishery: Diver

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	911	988	763	887
Vessels	92	83	77	84
Days at Sea	1,469	1,384	1,097	1,317
Landings (gutted lbs)				
Total	390,054	350,138	290,017	343,403
SOI	281,616	244,858	206,211	244,228
Non-SOI	108,438	105,280	83,806	99,175
% SOI	72%	70%	71%	71%
Price (mean)				
Total	$3.62	$3.79	$4.11	$3.84
SOI	$3.68	$3.88	$4.21	$3.92
Non-SOI	$3.48	$3.58	$3.87	$3.64
Revenue				
Total	$1,412,507	$1,327,739	$1,192,842	$1,311,029
SOI	$1,034,685	$950,776	$868,457	$951,306
Non-SOI	$377,822	$376,963	$324,385	$359,723
% SOI	73%	72%	73%	73%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	346	245	175	
Response Rate (%)	84%	79%	89%	
SOI Trip				
Owner-Operated	82%	76%	90%	82.7%
Fuel Used per Day at Sea (gallons/day)	29	40	35	35
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	12.2%	13.1%	6.4%	10.6%
Bait	1.5%	0.8%	1.4%	1.2%
Ice	2.1%	1.8%	1.1%	1.7%
Groceries	2.6%	1.5%	2.6%	2.2%
Miscellaneous	5%	2.2%	3.8%	3.7%
Hired Crew	41.1%	36.9%	32.7%	36.9%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	28.1%	23.2%	23.9%	25.1%
Trip Net Cash Flow*	35.5%	43.9%	52%	43.8%
Trip Net Cash Revenue*	7.4%	20.7%	28.1%	18.7%
Labor - Hired & Owner	69.2%	60.1%	56.6%	62%
Fuel & Supplies	23.4%	19.2%	15.3%	19.3%
Input Prices				
Fuel Price (per gallon)	$3.81	$2.95	$2.22	$2.99
Hire Crew Wage (per crew-day)	$280	$223	$283	$262
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	8.1	4.9	7.7	7
Landings/Labor Use (lbs/crew-day)	110	86	117	104

A1 - SOI: 2016 SAT Snapper-Grouper FMP Fishery: Traps

Description: This SOI consists of all logbook trips by permitted vessels where at least one pound of fish managed by the SAT Snapper-Grouper FMP was landed in 2016 using traps. The economic results are based on small sample size and fluctuate from year to year. Focus on qualitative results. For important **disclaimer**, see page 15.

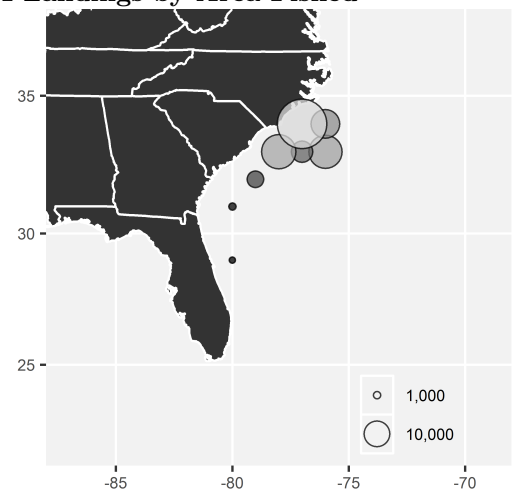
Trip-Level Summary

Effort	
Trips	180
Vessels	20
Days at Sea	247
Crew Days	527
Landings (gutted lbs)	
Total	119,285
SOI	108,902
Non-SOI	10,384
% SOI	91%

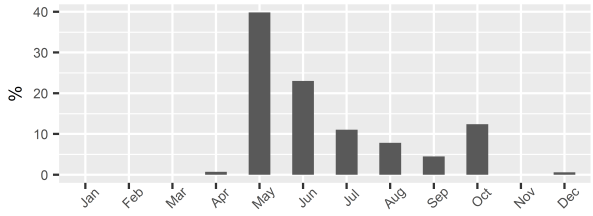
Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	3%	0%
Longline	0%	0%
Diver	0%	0%
Traps/Pots	96%	100%
Other	0.6%	0%

Price (mean)	
Total	$3.05
SOI	$3.15
Non-SOI	$2.00
Revenue	
Total	$363,726
SOI	$342,966
Non-SOI	$20,760
% SOI	94%
Percent of Revenue by Species Group	
Shallow Water Groupers	3%
Shallow Water Snappers	0.1%
Mid-Shelf Snappers	1%
Deep Water Groupers/Tilefish	0.5%
Grunt/Porgy/Sea Bass/Trigger	94%
Mackerels/Dolphinfish/Jacks	2%
Other Species	0.2%
Revenue for Top 5 Species	
Black Sea bass	$311,014
White Grunt	$15,362
Gray Triggerfish	$6,697
Red Porgy	$4,466
Scamp	$4,338

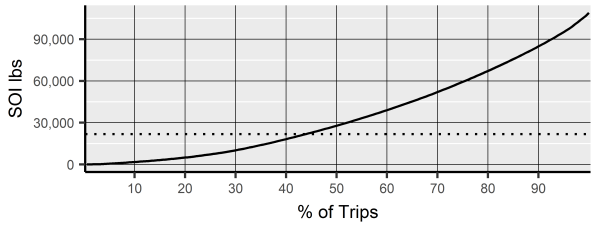
SOI Landings by Area Fished



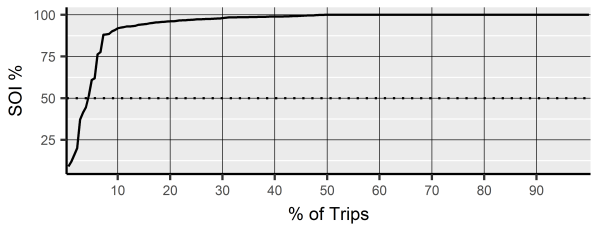
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=180)

	Mean	Min	Median	Max
Days at Sea	1.4	1	1	6
Crew Size	2	1	2	3
Landings	663	53	615	2,214
Revenue	$2,021	$133	$1,896	$6,370
SOI	$1,905	$28	$1,785	$6,370
% SOI	95%	9%	100%	100%

A1 - SOI: 2016 SAT Snapper-Grouper FMP Fishery: Traps

Trip-Level Economics

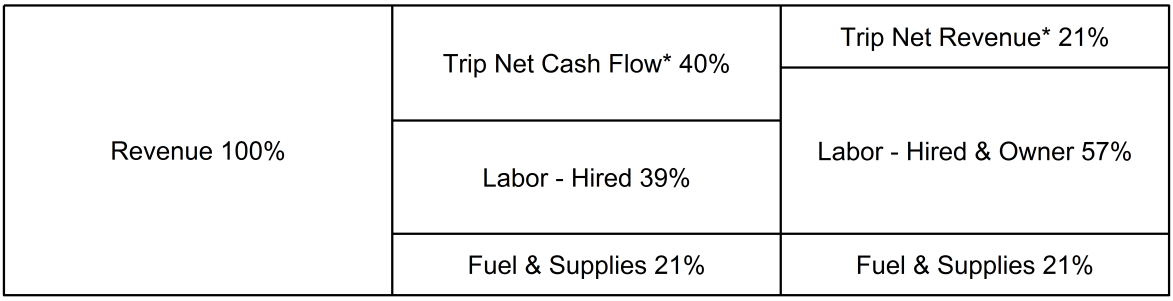
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	180	-	-	-
Selected	56	31%	-	-
Responded	56	31%	100%	-
Used	56	31%	100%	100%

Economic Results (n=56)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	65%	15.7	34%	95%	-
Days at Sea	1.5	0.5	0.6	2.4	1
Crew Size	1.9	0.2	1.5	2.2	2
Fuel Used	65	21	24	106	48
Landings (gutted lbs)	514	125	271	756	336
Total Revenue	1,517	263	1,005	2,029	960
Cost					
Fuel	141	41	60	221	91
Bait	105	37	33	177	44
Ice	27	23	−18	72	12
Groceries	28	31	−33	88	0
Miscellaneous	21	14	−5	48	0
Hired Crew	593	101	397	789	355
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	277	100	83	471	0
Trip Net Cash Flow*	602	164	284	920	358
Trip Net Revenue*	325	110	111	539	320

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



Input Prices

Fuel Price (average): $2.17 per gallon

Hired Crew Wage (implicit): $314 per crew-day

Productivity Measures

Landings/Fuel Use: 7.9 lbs/gallon

Landings/Labor Use: 179 lbs/crew-day

* See Definitions in Methods Section or Glossary.

A1 - SOI: 2016 SAT Snapper-Grouper FMP Fishery: Traps

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	302	230	180	237
Vessels	26	21	20	22
Days at Sea	420	332	247	333
Landings (gutted lbs)				
Total	175,759	153,396	119,285	149,480
SOI	155,452	146,271	108,902	136,875
Non-SOI	20,306	7,125	10,384	12,605
% SOI	88%	95%	91%	91%
Price (mean)				
Total	$2.84	$3.10	$3.05	$3
SOI	$2.89	$3.17	$3.15	$3.07
Non-SOI	$2.42	$1.72	$2.00	$2.05
Revenue				
Total	$498,205	$476,246	$363,726	$446,059
SOI	$449,156	$463,952	$342,966	$418,691
Non-SOI	$49,049	$12,294	$20,760	$27,368
% SOI	90%	97%	94%	94%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	67	63	56	
Response Rate (%)	93%	93%	100%	
SOI Trip				
Owner-Operated	71%	100%	65%	78.7%
Fuel Used per Day at Sea (gallons/day)	66	68	43	59
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	18.1%	12.7%	9.3%	13.4%
Bait	8.3%	6.8%	6.9%	7.3%
Ice	2.7%	2.8%	1.8%	2.4%
Groceries	1.9%	1.4%	1.8%	1.7%
Miscellaneous	3.6%	3.1%	1.4%	2.7%
Hired Crew	33.1%	38%	39.1%	36.7%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	23.8%	34.2%	18.2%	25.4%
Trip Net Cash Flow*	32.2%	35.2%	39.7%	35.7%
Trip Net Cash Revenue*	8.3%	1%	21.5%	10.3%
Labor - Hired & Owner	57%	72.2%	57.4%	62.2%
Fuel & Supplies	34.7%	26.8%	21.2%	27.6%
Input Prices				
Fuel Price (per gallon)	$3.44	$2.61	$2.17	$2.74
Hire Crew Wage (per crew-day)	$288	$458	$314	$353
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	6.1	6.6	7.9	7
Landings/Labor Use (lbs/crew-day)	187	208	179	191

A1 - SOI: 2016 SAT Snapper-Grouper FMP Fishery: Longline

Description: This SOI consists of all logbook trips by permitted vessels where at least one pound of fish managed by the SAT Snapper-Grouper FMP was landed in 2016 using longline. The economic results are based on small sample size and fluctuate from year to year. Focus on qualitative results. For important **disclaimer**, see page 15.

Trip-Level Summary

Effort	
Trips	327
Vessels	28
Days at Sea	793
Crew Days	1,996

Landings (gutted lbs)	
Total	484,751
SOI	455,386
Non-SOI	29,365
% SOI	94%

Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	0%	0%
Longline	100%	100%
Diver	0%	0%
Traps/Pots	0%	0%
Other	0%	0%

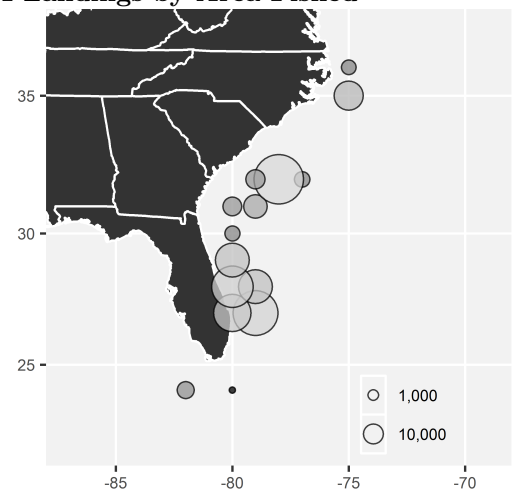
Price (mean)	
Total	$4.14
SOI	$4.28
Non-SOI	$2.04

Revenue	
Total	$2,008,435
SOI	$1,948,413
Non-SOI	$60,022
% SOI	97%

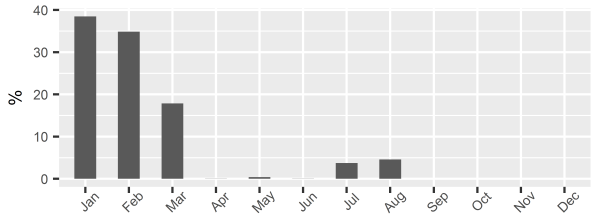
Percent of Revenue by Species Group	
Shallow Water Groupers	0.2%
Shallow Water Snappers	0%
Mid-Shelf Snappers	0.3%
Deep Water Groupers/Tilefish	97%
Grunt/Porgy/Sea Bass/Trigger	0%
Mackerels/Dolphinfish/Jacks	0.4%
Other Species	3%

Revenue for Top 5 Species	
Tilefish	$1,687,162
Blueline Tilefish	$136,417
Snowy Grouper	$75,280
Black bellied rosefish	$44,393
Yellowedge Grouper	$40,094

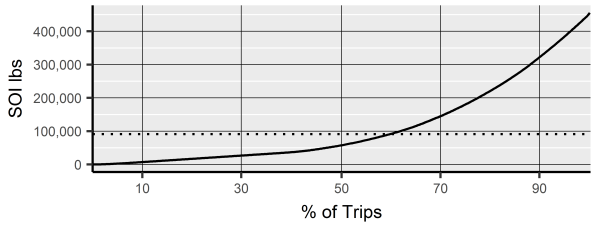
SOI Landings by Area Fished



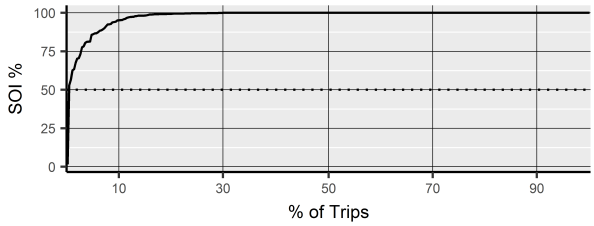
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=327)

	Mean	Min	Median	Max
Days at Sea	2.4	1	1	13
Crew Size	2.2	1	2	4
Landings	1,482	28	849	6,460
Revenue	$6,142	$110	$3,353	$28,370
SOI	$5,958	$43	$3,353	$26,308
% SOI	98%	1.5%	100%	100%

A1 - SOI: 2016 SAT Snapper-Grouper FMP Fishery: Longline

Trip-Level Economics

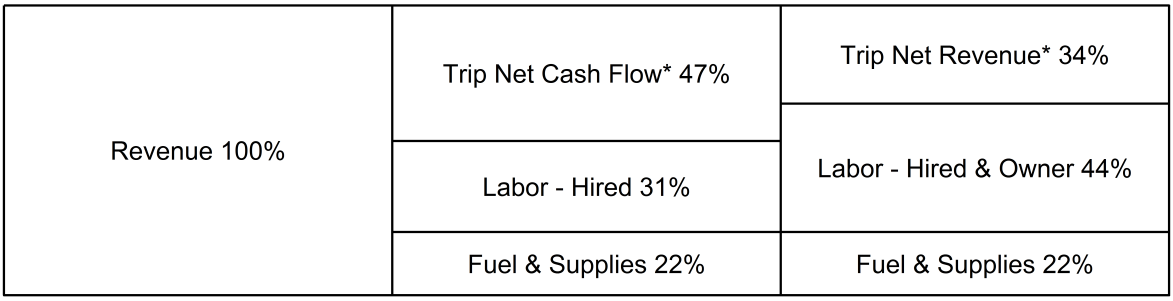
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	327	-	-	-
Selected	124	38%	-	-
Responded	99	30%	80%	-
Used	98	30%	79%	99%

Economic Results (n=98)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	65%	13.9	39%	91%	-
Days at Sea	2.1	0.5	1.2	3.1	1
Crew Size	2	0.2	1.6	2.4	2
Fuel Used	153	62	37	269	75
Landings (gutted lbs)	1,237	391	509	1,965	459
Total Revenue	4,766	1,452	2,066	7,465	2,256
Cost					
Fuel	329	117	111	547	136
Bait	392	149	114	669	196
Ice	86	37	18	154	50
Groceries	96	43	16	176	35
Miscellaneous	138	63	21	255	25
Hired Crew	1,497	592	397	2,598	748
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	615	196	251	979	416
Trip Net Cash Flow*	2,229	578	1,154	3,304	1,028
Trip Net Revenue*	1,614	549	592	2,635	514

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



Input Prices

Fuel Price (average): $2.15 per gallon Hired Crew Wage (implicit): $517 per crew-day

Productivity Measures

Landings/Fuel Use: 8.1 lbs/gallon Landings/Labor Use: 290 lbs/crew-day

* See Definitions in Methods Section or Glossary.

A1 - SOI: 2016 SAT Snapper-Grouper FMP Fishery: Longline

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	291	180	327	266
Vessels	29	24	28	27
Days at Sea	759	556	793	703
Landings (gutted lbs)				
Total	693,399	487,139	484,751	555,096
SOI	660,221	456,571	455,386	524,059
Non-SOI	33,178	30,568	29,365	31,037
% SOI	95%	94%	94%	94%
Price (mean)				
Total	$3.26	$3.84	$4.14	$3.75
SOI	$3.29	$3.90	$4.28	$3.82
Non-SOI	$2.67	$2.81	$2.04	$2.51
Revenue				
Total	$2,255,868	$1,868,167	$2,008,435	$2,044,157
SOI	$2,167,198	$1,782,274	$1,948,413	$1,965,962
Non-SOI	$88,670	$85,893	$60,022	$78,195
% SOI	96%	95%	97%	96%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	64	22	98	
Response Rate (%)	97%	63%	79%	
SOI Trip				
Owner-Operated	68%	100%	65%	77.7%
Fuel Used per Day at Sea (gallons/day)	56	55	72	61
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	8.8%	4.2%	6.9%	6.6%
Bait	7.8%	5.6%	8.2%	7.2%
Ice	1.5%	1.1%	1.8%	1.5%
Groceries	2.7%	1.1%	2%	1.9%
Miscellaneous	3%	6.4%	2.9%	4.1%
Hired Crew	36.9%	34.8%	31.4%	34.4%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	9.1%	18%	12.9%	13.3%
Trip Net Cash Flow*	39.2%	46.8%	46.8%	44.3%
Trip Net Cash Revenue*	30.1%	28.7%	33.9%	30.9%
Labor - Hired & Owner	46%	52.8%	44.3%	47.7%
Fuel & Supplies	23.9%	18.4%	21.8%	21.4%
Input Prices				
Fuel Price (per gallon)	$3.78	$2.58	$2.15	$2.84
Hire Crew Wage (per crew-day)	$480	$607	$517	$535
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	13.5	16.5	8.1	13
Landings/Labor Use (lbs/crew-day)	299	306	290	298

A1 - SOI: 2016 SAT FMP Deepwater Fishery: Vertical Line

Description: This SOI consists of all logbook trips by permitted vessels where at least one pound of deepwater fish (see Appendix 2) managed by the SAT SG FMP was landed in 2016 with vertical line gear. Species managed include multiple species of snapper, grouper, tilefish, etc. (please refer to Appendix 2). For important **disclaimer**, see page 15.

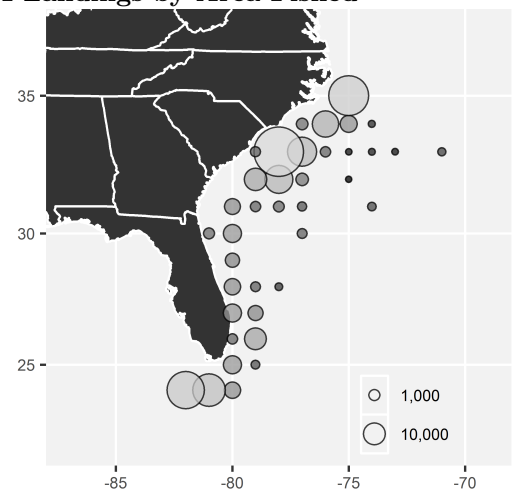
Trip-Level Summary

Effort	
Trips	1,810
Vessels	194
Days at Sea	4,472
Crew Days	10,067
Landings (gutted lbs)	
Total	1,282,021
SOI	325,258
Non-SOI	956,763
% SOI	25%

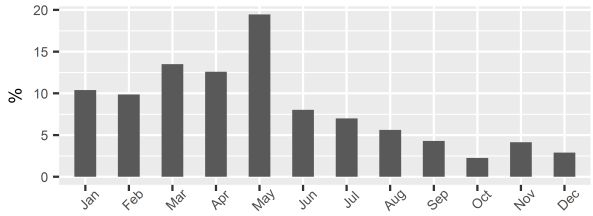
Percent by Gear	**Trips**	**SOI lbs**
Vertical Line	98%	100%
Longline	0.3%	0%
Diver	0.4%	0%
Traps/Pots	0%	0%
Other	1%	0%

Price (mean)	
Total	$3.50
SOI	$4.48
Non-SOI	$3.17
Revenue	
Total	$4,486,560
SOI	$1,458,077
Non-SOI	$3,028,483
% SOI	32%
Percent of Revenue by Species Group	
Shallow Water Groupers	15%
Shallow Water Snappers	2%
Mid-Shelf Snappers	26%
Deep Water Groupers/Tilefish	31%
Grunt/Porgy/Sea Bass/Trigger	11%
Mackerels/Dolphinfish/Jacks	11%
Other Species	3%
Revenue for Top 5 Species	
Vermilion Snapper	$1,099,318
Snowy Grouper	$632,913
Tilefish	$518,351
Scamp	$282,247
Gag Grouper	$281,932

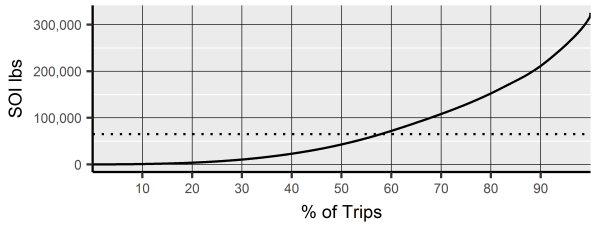
SOI Landings by Area Fished



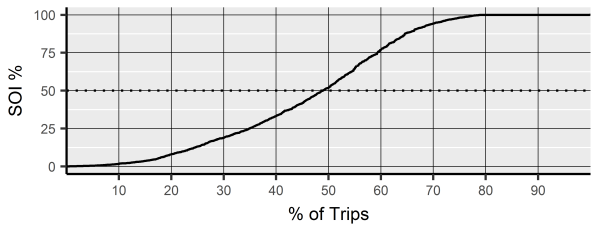
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=1,810)

	Mean	Min	Median	Max
Days at Sea	2.5	1	1	12
Crew Size	2	1	2	5
Landings	708	5	391	7,867
Revenue	$2,479	$24	$1,392	$24,153
SOI	$806	$1	$617	$14,256
% SOI	54%	0%	52%	100%

A1 - SOI: 2016 SAT FMP Deepwater Fishery: Vertical Line

Trip-Level Economics

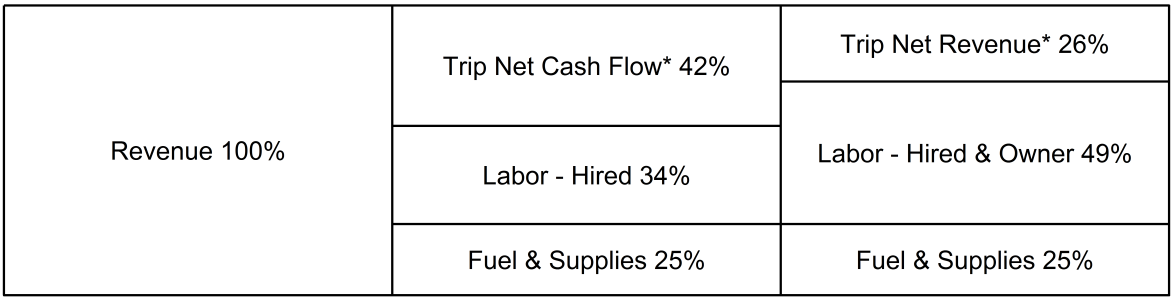
Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	1,810	-	-	-
Selected	427	24%	-	-
Responded	425	23%	100%	-
Used	415	23%	97%	98%

Economic Results (n=415)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	75%	5.3	66%	84%	-
Days at Sea	2.7	0.3	2.2	3.2	1
Crew Size	1.9	0.1	1.7	2	2
Fuel Used	110	14	87	134	100
Landings (gutted lbs)	695	75	570	821	361
Total Revenue	2,428	262	1,989	2,867	1,420
Cost					
Fuel	237	29	188	285	194
Bait	110	26	68	153	40
Ice	51	8	39	64	20
Groceries	126	19	94	158	25
Miscellaneous	72	34	15	130	0
Hired Crew	822	115	629	1,015	341
IFQ Purchase	0	0	0	0	0
OC Owner-Captain Time	372	57	276	467	200
Trip Net Cash Flow*	1,009	92	856	1,163	718
Trip Net Revenue*	638	75	512	764	358

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



Input Prices

Fuel Price (average): $2.14 per gallon

Hired Crew Wage (implicit): $277 per crew-day

Productivity Measures

Landings/Fuel Use: 6.3 lbs/gallon

Landings/Labor Use: 140 lbs/crew-day

* See Definitions in Methods Section or Glossary.

A1 - SOI: 2016 SAT FMP Deepwater Fishery: Vertical Line

Trip-Level Time Series

Trip-Level Summary

	2014	2015	2016	Average
Effort				
Trips	1,577	1,982	1,810	1,790
Vessels	213	209	194	205
Days at Sea	3,722	4,516	4,472	4,237
Landings (gutted lbs)				
Total	1,131,973	1,286,320	1,282,021	1,233,438
SOI	282,758	320,097	325,258	309,371
Non-SOI	849,215	966,222	956,763	924,067
% SOI	25%	25%	25%	25%
Price (mean)				
Total	$3.22	$3.38	$3.50	$3.37
SOI	$3.84	$4.35	$4.48	$4.22
Non-SOI	$3.01	$3.07	$3.17	$3.08
Revenue				
Total	$3,637,813	$4,353,175	$4,486,560	$4,159,183
SOI	$1,085,074	$1,390,137	$1,458,077	$1,311,096
Non-SOI	$2,552,739	$2,963,037	$3,028,483	$2,848,086
% SOI	30%	32%	32%	31%

Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	344	442	415	
Response Rate (%)	81%	87%	97%	
SOI Trip				
Owner-Operated	80%	80%	75%	78.3%
Fuel Used per Day at Sea (gallons/day)	39	42	41	41
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	14.3%	11.9%	9.7%	12%
Bait	4.3%	3.8%	4.5%	4.2%
Ice	1.8%	1.8%	2.1%	1.9%
Groceries	4.2%	3.2%	5.2%	4.2%
Miscellaneous	2.9%	2.4%	3%	2.8%
Hired Crew	35.1%	32.9%	33.9%	34%
IFQ Purchase	0%	0%	0%	0%
OC Owner-Captain Time	14.1%	12.2%	15.3%	13.9%
Trip Net Cash Flow*	37.3%	43.9%	41.6%	40.9%
Trip Net Cash Revenue*	23.2%	31.7%	26.3%	27.1%
Labor - Hired & Owner	49.2%	45.1%	49.2%	47.8%
Fuel & Supplies	27.6%	23.2%	24.6%	25.1%
Input Prices				
Fuel Price (per gallon)	$3.68	$2.87	$2.14	$2.90
Hire Crew Wage (per crew-day)	$273	$308	$277	$286
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	7.7	7.3	6.3	7
Landings/Labor Use (lbs/crew-day)	144	163	140	149

Appendix 2 - List of Species in the SAT Snapper-Grouper FMP and Species Group SOIs

Species	FMP Deepwater Fishery	FMP Jacks Fishery	FMP SWGCS Fishery	Species	FMP Deepwater Fishery	FMP Jacks Fishery	FMP SWGCS Fishery
Almaco Jack		X		Mutton Snapper			
Atlantic Spadefish				Nassau Grouper			
Banded Rudderfish		X		Ocean Triggerfish*			
Bank Sea Bass*				Queen Snapper	X		
Bar Jack		X		Red Grouper			X
Blackfin Snapper	X			Red Hind			X
Black Grouper			X	Red Porgy			
Black Sea Bass				Red Snapper			
Blueline Tilefish	X			Rock Hind			X
Coney			X	Rock Sea Bass*			
Cottonwick Grunt*				Sailor's Choice Grunt			
Cubera Snapper				Sand Tilefish	X		
Gag Grouper				Saucereye Porgy			
Golden Tilefish	X			Scamp			
Goliath Grouper				Scup			
Graysby			X	Silk Snapper	X		
Gray Snapper				Snowy Grouper	X		
Gray Triggerfish				Speckled Hind			
Greater Amberjack		X		Tomtate Grunt			
Hogfish				Vermilion Snapper			
Jolthead Porgy				Warsaw Grouper			
Knobbed Porgy				Whitebone Porgy			
Lane Snapper				White Grunt			
Lesser Amberjack		X		Yellowedge Grouper	X		
Longspine Porgy*				Yellowfin Grouper			X
Margate				Yellowmouth Grouper			X
Misty Grouper	X			Yellowtail Snapper			

* Indicates Ecosystem Components Species which do not have specific annual catch limits (ACLs), accountability measures (AMs), or management measures in place.

NOTE: Wreckfish are also managed under the SAT Snapper-Grouper FMP. However, landings are not reported to the Southeast Coastal Fisheries Trip Logbook program. Only 6 vessels participated in the wreckfish fishery in 2016.

Appendix 3 - Species Groups for the Tables: "Percent of Revenue by Species Group"

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.

Shallow Water Groupers
- Black Grouper
- Broomtail Grouper
- Coney
- Creole-Fish
- Gag Grouper
- Goliath Grouper
- Graysby
- Marbled Grouper
- Nassau Grouper
- Red Grouper
- Red Hind
- Rock Hind
- Scamp
- Tiger Grouper
- Yellowfin Grouper
- Yellowmouth Grouper

Shallow Water Snappers
- Cubera Snapper
- Dog Snapper
- Gray Snapper
- Lane Snapper
- Mahogany Snapper
- Mutton Snapper
- Schoolmaster
- Wenchman
- 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

Grunt/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

Mackerels/Dolphinfish/Jacks
- Almaco Jack
- Banded Rudderfish
- Bar Jack
- Black Jack
- Blue Runner
- Cero Mackerel
- Crevalle Jack
- Dolphinfish
- Greater Amberjack
- Horse-Eye Jack
- King Mackerel
- Lesser Amberjack
- Spanish Mackerel
- Yellow Jack

Other Species
- All other species not listed above

Appendix 4 - Glossary/Abbreviations

- **ACL** - Annual Catch Limit
- **AM** - Accountability Measures
- **Deep Water Groupers/Tilefish** - See Appendix 3 for particular species included.
- **Diver** - A gear type which includes spear guns.
- **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.
- **FMP** - Fishery Management Plan
- **GOM** - Gulf of Mexico
- **Grunt/Porgy/Sea Bass/Triggerfish** - See Appendix 3 for particular species included.
- **IFQ** - Individual fishing quota
- **Mackerels/Dolphinfish/Jacks** - See Appendix 3 for particular species included.
- **Mid-Shelf Snappers** - See Appendix 3 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 Groupers** - See Appendix 3 for particular species included.
- **Shallow Water Snappers** - See Appendix 3 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.
- **SWGCS** - Shallow Water Groupers Closure Species. See Appendix 2 for particular species included.
- **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.