

NOAA
FISHERIES

SEFSC

**Social Science
Research Group**

Economics of the Gulf of Mexico Reef Fish and King Mackerel Fisheries - 2016

Delivering Economic Results: Using R and Markdown
to Automate the Cleaning, Analysis, and Reporting of
Coastal Logbook Data by User-Defined Subsets

January 9, 2020
Tampa, FL

New Annual Reports



Outline

- Economic surveys and their design
- Economic reporting *system*
- Reef Fish economics
- King Mackerel economics

Survey Design – Question Development

Stylized Cash Flow Statement (period of time)

Incoming/Receipts

From operations

- RF fish revenue
- Other commercial fishing revenue

Non-operating

- Other income

Outgoing/Payments

Variable cost

- Fuel
- Crew (hired)
- Other (supplies)

Fixed cost

- Vessel/gear related
- Overhead
- Loan payments

Net cash flow (+)



Stylized Income Statement (period of time)

Revenue	Expenditures
<u>From operations</u> <ul style="list-style-type: none">• RF fish revenue• Other commercial fishing revenue	<u>From operations</u> <ul style="list-style-type: none">• Fuel• Crew (hired)• Other (supplies)• Owner's labor• Vessel/gear related• Overhead• Depreciation
	Net revenue from operations
<u>Non-operating</u> <ul style="list-style-type: none">• Other income	<u>Non-operating</u> <ul style="list-style-type: none">• Interest payments
	Profit



Stylized Balance Sheet (point in time)

Assets

Vessel
and Gear
(market value)

Liabilities

Loans
(outstanding amount)

Equity



Survey Questionnaires

Trip Logbooks (since 1993)

SE Coastal Fisheries Vessels Logbook for:

- Gulf of Mexico Reef Fish
- South Atlantic Snapper-Grouper
- King and Spanish Mackerel
- Shark
- Atlantic Dolphin/Wahoo

Assume: Census

Signature: _____		Phone No.: () -		Schedule No. <i>NMFS Use Only</i>	
Vessel Name: _____		Trip Start Date: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>		County or Parish: _____ State: <input type="text"/> <input type="text"/>	
Vessel No.: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>		MM DD YY		Dealer Name: _____	
Operator Name: _____		Trip Unload Date: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>		SE Federal Dealer Number: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
Operator Number: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>		Days at Sea: <input type="text"/> <input type="text"/> No. of Crew: <input type="text"/> <input type="text"/>		State Trip Ticket No.: _____	
Check box if landings sold to multiple dealers: <input type="checkbox"/> Yes					

GEAR SECTION: See Instructions on Page 2. Check gear box and fill in all the boxes below.									
Traps (T) <input type="checkbox"/> Fish <input type="checkbox"/> Other	Longline (L) <input type="checkbox"/> Bottom <input type="checkbox"/> Other	PLL <input type="checkbox"/> Other	Gill Net (GN) <input type="checkbox"/> Strike <input type="checkbox"/> Other	Drift <input type="checkbox"/> Anchor	Hook & Line <input type="checkbox"/> Hand <input type="checkbox"/> Bandit <input type="checkbox"/> Trolling	(H) <input type="checkbox"/> (E) <input type="checkbox"/> (TR) <input type="checkbox"/> (B)	Divers <input type="checkbox"/> (S) <input type="checkbox"/> (P)	Other Gear (O)	
Total # Trap Hauls	# Sets		# Sets		# Lines		# of Divers		Type
# Traps Used	# Hooks per Line		Length (yards)		# Hooks per Line		Total Hrs Fished		Total Hrs Fished
Trap Soak Time (hrs)	Set Soak Time (hrs)		Depth (yards)		Total Hrs Fished		SE VTR #: R		
Total Soak Time (hrs)	Total Soak Time (hrs)		Set Soak Time (hrs)		Date Received: _____ NMFS use only				
Mesh: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	Length (miles)		Mesh: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>						

CATCH SECTION:													
See Instructions on Page 3.					Weight- Record POUNDS kept gutted or whole (DO NOT include fractions of pounds). Gear- Record gear used for MAJORITY of catch as T, L, GN, H, E, TR, B, S, P or O. (Do not use multiple gears). Area- Areas can be found on maps in logbook (page 6). Do not use state area codes. Depth- Record bottom depth where the MAJORITY of fish were caught in FEET.								
Species Name	Code	Gutted-lbs	Whole-lbs	Gear	Area	Depth	Species Name	Code	Gutted-lbs	Whole-lbs	Gear	Area	Depth
Amberjack-Great	1812	#	#				P Jolthead	3312	#	#			
Amberjack-Lesser	1815	#	#				O Knobbied	3308	#	#			
Almaco	1810	#	#				R Red	3302	#	#			
Banded Rudder	1817	#	#				G Whitebone	3306	#	#			

Sample Trip-level Economics (since 2002/5)

- Stratified sample of permitted **vessels** at start of year
- Supposed to report econ data for ALL logbook trips:

TRIP EXPENSE SECTION:				MANDATORY FOR SELECTED VESSELS.				See Instructions on Pages 3-4.			
Owner Operated?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Gallons of Fuel Used on This Trip	<input type="text"/>	<input type="text"/>	Price per Gallon \$	<input type="text"/>	Bait Expense \$	<input type="text"/>	Ice Expense \$	<input type="text"/>
Grocery Expense	\$	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Misc. Trip Expenses	\$	<input type="text"/>	<input type="text"/>	IFQ Allocation Purchased for This Trip	\$
Has the payment for your catch been determined?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If Yes	<input type="checkbox"/>	Total Trip Revenue	\$	<input type="text"/>	Total Payment to HIRED Crew and Captain	\$	<input type="text"/>	<input type="text"/>

Supplemental Annual Cost Survey

- Same sample vessels
- Sent after the year is over
- Fixed costs
- Many activities:
 - Logbook fisheries
 - Other seafood
 - Charter fishing
 - Other business

OMB Control No. 0648-0018

Expiration Date: 06/30/2019

2016 Survey of Annual Expenses for Snapper-Grouper, Reef Fish, Dolphin-Wahoo, Shark and Mackerel Permit Holders

Vessel Name: <VESSEL>		Vessel ID: <VESSEL_ID>	
Please report financial expenses (actual dollar payments) paid in 2016 for this vessel across all fisheries and activities. Enter "0" if you did not have any expenses in a category. PLEASE DO NOT LEAVE BLANK!			
ACTIVITY REPORT FOR THIS VESSEL IN 2016			
1. Vessel INACTIVE all year: <input type="checkbox"/> No <input type="checkbox"/> Yes (if Vessel was inactive all year, you can skip to Q9)			
Please enter the number of days spent away from port and the total gross revenues generated by this vessel for the following activities in 2016:			
2. Commercial fishing/seafood sales:	<input type="text"/> <input type="text"/> <input type="text"/> days	\$	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
3. Chartering/for-hire fishing:	<input type="text"/> <input type="text"/> <input type="text"/> days	\$	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
4. Vessel active but NOT fishing:	<input type="text"/> <input type="text"/> <input type="text"/> days	\$	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
TOTAL TRIP-RELATED EXPENSES FOR THIS VESSEL IN 2016			
5. Total paid for fuel:		\$	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
6. Total paid for other trip-related expenses: (bait, ice, groceries, oil, lubricants, tackle, etc.)		\$	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
7. Total paid for IFQ allocation transferred FROM another IFQ account:		\$	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
8. (a) Did the vessel employ HIRED crew and/or HIRED captains?	<input type="checkbox"/> Yes <input type="checkbox"/> No (go to Q9)		
(b) Total paid to HIRED crew and HIRED captain(s) of this vessel: (Not to Owner! For example: from IRS Form(s) 1099-MISC or equivalent)		\$	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
TOTAL ANNUAL EXPENSES FOR THIS VESSEL IN 2016			
9. (a) Total paid for any vessel maintenance, repair, replacement, new purchase or upgrade (include hull, engine, gear, electronics, etc.)		\$	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
(b) Does the amount in Question 10. (a) include a haul-out?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
10. (a) Vessel insurance in 2016 (please check all that apply):	<input type="checkbox"/> None <input type="checkbox"/> Hull <input type="checkbox"/> P&I		
(b) Total paid for vessel insurance in 2016 (insurance premium):		\$	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
11. Total loan payments for this vessel in 2016:		\$	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
12. Overhead applicable to this vessel such as dockage, professional services, licenses, (share of) rent, utilities, office and vehicle expenses, etc. (Please exclude: insurance and loan payments, depreciation and income taxes.)		\$	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>
13. Please estimate the current market value of this vessel and its associated gear and equipment (do NOT include IFQ quota share):		\$	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> <input type="text"/>

Implementation

- Trip data: Continuous data validation and sendbacks (data entry contracted out with logbook)
- Annual data: Active January-August, with student help for mailing, validation, data entry

Toward Systematic Reporting

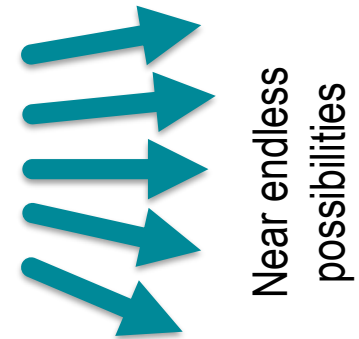
Past Use of Data

- Estimation of cost functions
 - Management support: Jim Waters' simulation model
 - Various research efforts
-
- But no systematic reporting of cost data

Census vs. Post-stratified SOI vs. Econ Sample

Overall logbooks (census) and econ sample

	Vessels	Trips
All Logbooks	1,770	36,962
Econ-Sample	373	8,312



SOI – Gulf Red Snapper

	Vessels	Trips
All Logbooks	402	3,783
Econ-Sample	92	751

SOI – SE Lionfish

	Vessels	Trips
All Logbooks	49	310
Econ-Sample	10	81

Automation:

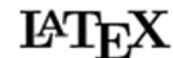
Data Processing, Cleaning, Result Generation

- Problems:
 - Heterogeneous fisheries, vessels, trips
 - Ex-ante selection, fishery participation unknown
 - Fisheries data (!)
- Built **System** with Liz Overstreet:
 - Extraction, Consolidation and Transformation
 - Cleaning, cleaning, cleaning
 - Post-Stratification: Segment of Interest (SOI)

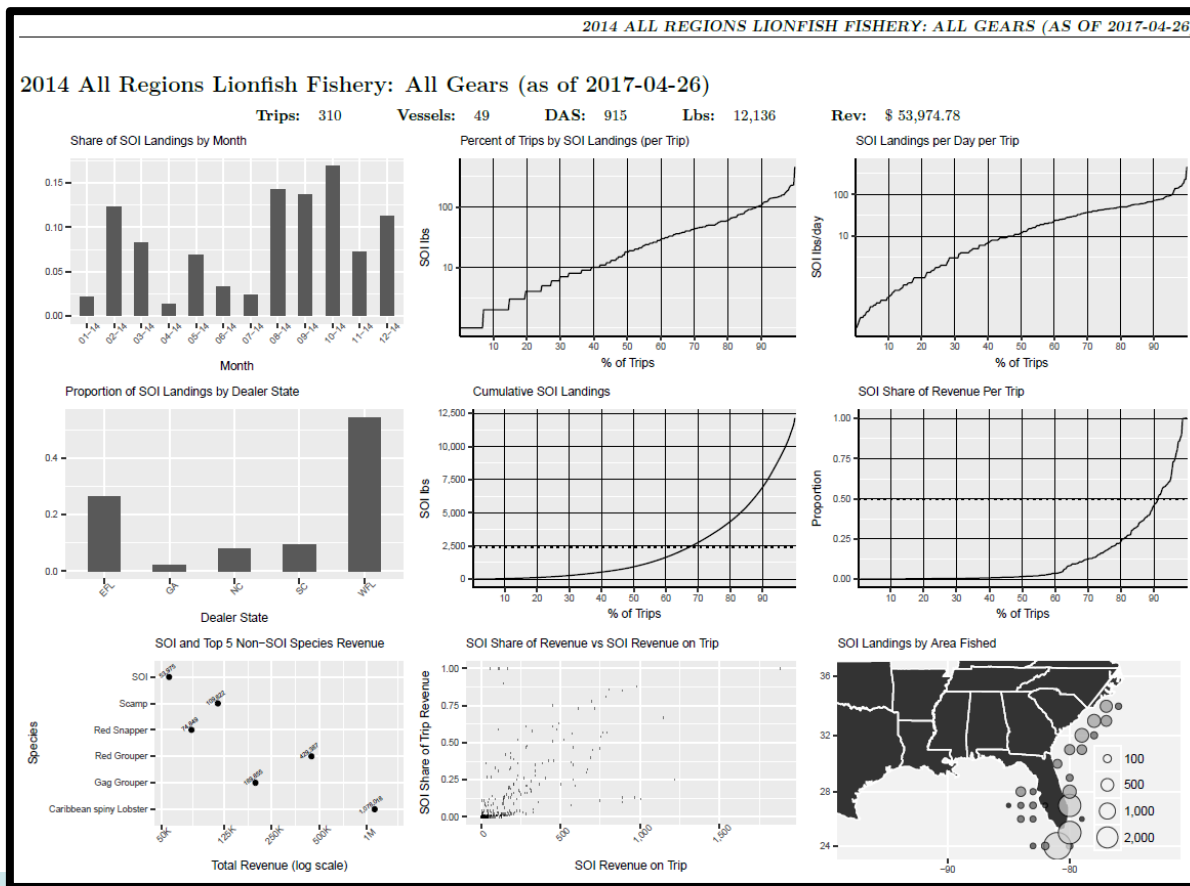


Diagnostic Report: Results for Any SOI

- 6 page standardized PDF with extensive summaries and results

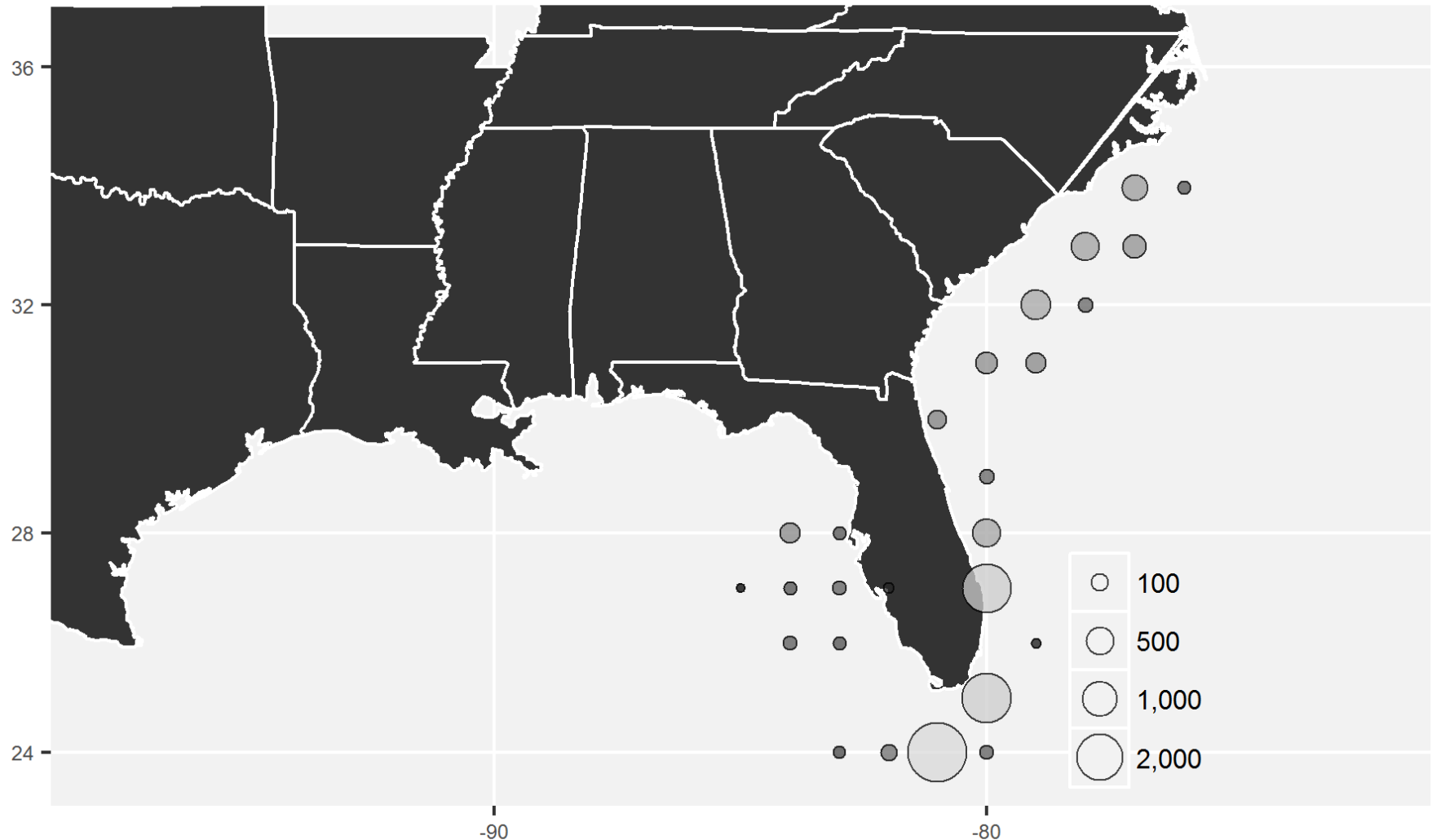


Page 1

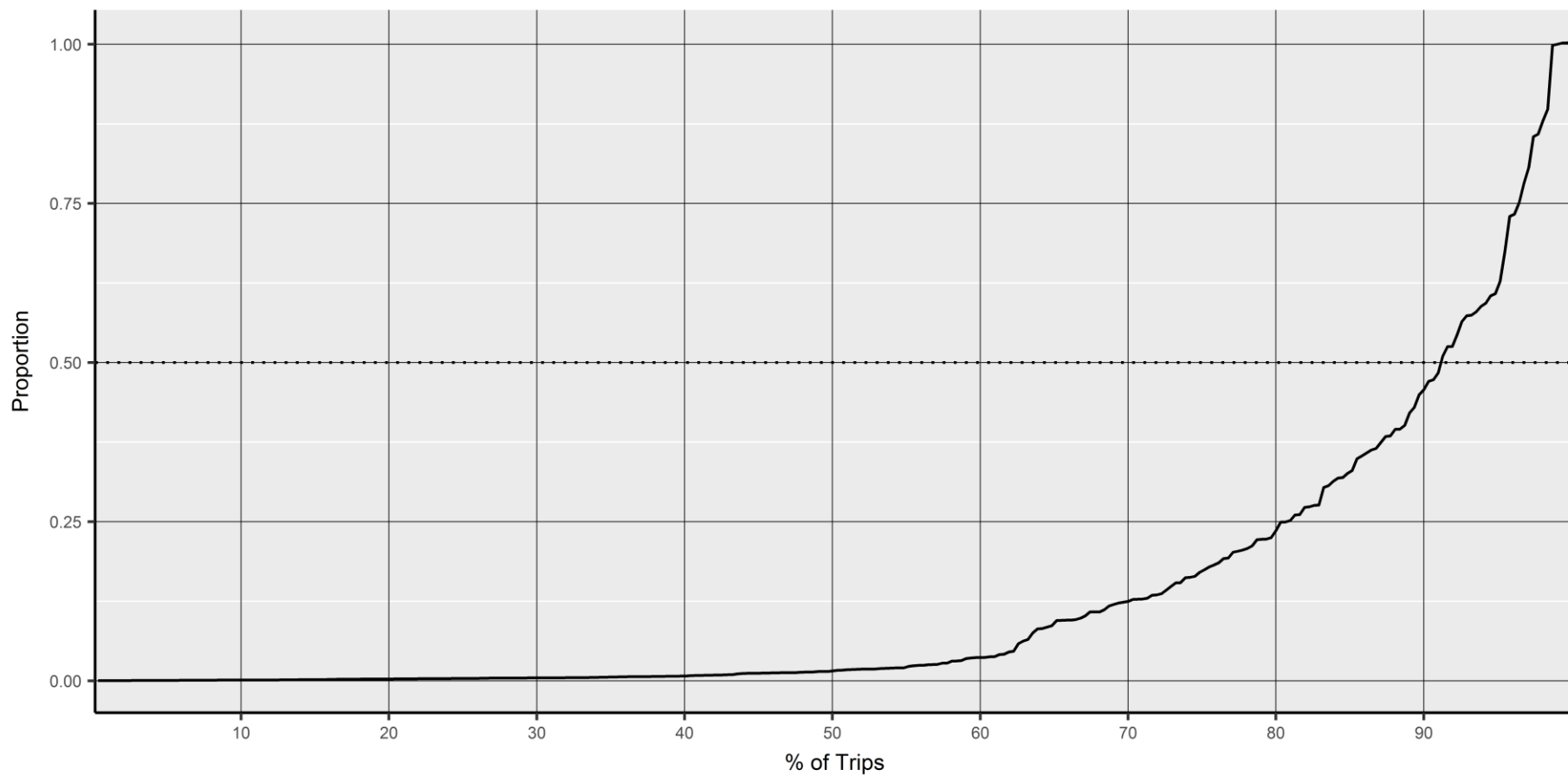


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Summarize SOI Population Level



SOI share of revenue per trip



Compare SOI Econ Sample to Population

Vessel Characteristics – SOI Population

Variable	n	Mean	Min	Med	Max
Length	49	37	22	38	53
Year	49	1990	1961	1988	2012
Power	49	404	200	350	1,200
Gr. Tons	30	25	11	23	49

Vessel Characteristics – SOI Sample with Economic Data

Variable	n	Mean	Min	Med	Max
Length	10	37	25	35	50
Year	10	1991	1979	1990.5	2008
Power	10	399	210	387.5	700
Gr. Tons	4	27	15	22	49



Trip-level Economics - Impact of Cleaning

	n	% 0	Mean	Max	Clean n	Clean Mean	Clean Min	Clean Med	Clean Max
Days at Sea	82	-	2.6	9	81	2.7	1	1	9
Crew Size	82	-	2.3	5	81	2.3	1	2	5
Landings (lbs)	82	0	788	6,045	81	795	21	406	6,045
Fuel Used	82	0	78	525	81	79	10	55	525
Fuel Unit Price	82	0	3.62	4.25	81	3.63	2.5	3.7	4.25
C Fuel	82	0	284	1,838	81	287	35	190	1,838
C Bait	82	62.2	57	787	81	58	0	0	787
C Ice	82	14.6	50	508	81	50	0	20	508
C Grocery	82	0	99	1,080	81	100	10	30	1,080
C Misc	78	7.7	129	620	81	123	0	60	620
C Hired Crew	80	5	1,747	6,766	81	1,691	0	600	6,766
OC OwnerVessTime	81	74.1	479	4,384	81	517	0	0	4,384
C IFQ	60	91.7	171	5,214	81	126	0	0	5,214
Total Revenue	81	0	3,299	14,758	81	3,391	67	1,390	19,972
Net Cash Flow	81	1.2	831	5,238	81	955	-720	493	5,238
Net Revenue	81	1.2	479	5,214	81	565	-2,506	366	10,428



Trip-level Economics (SOI Statistical Estimators)

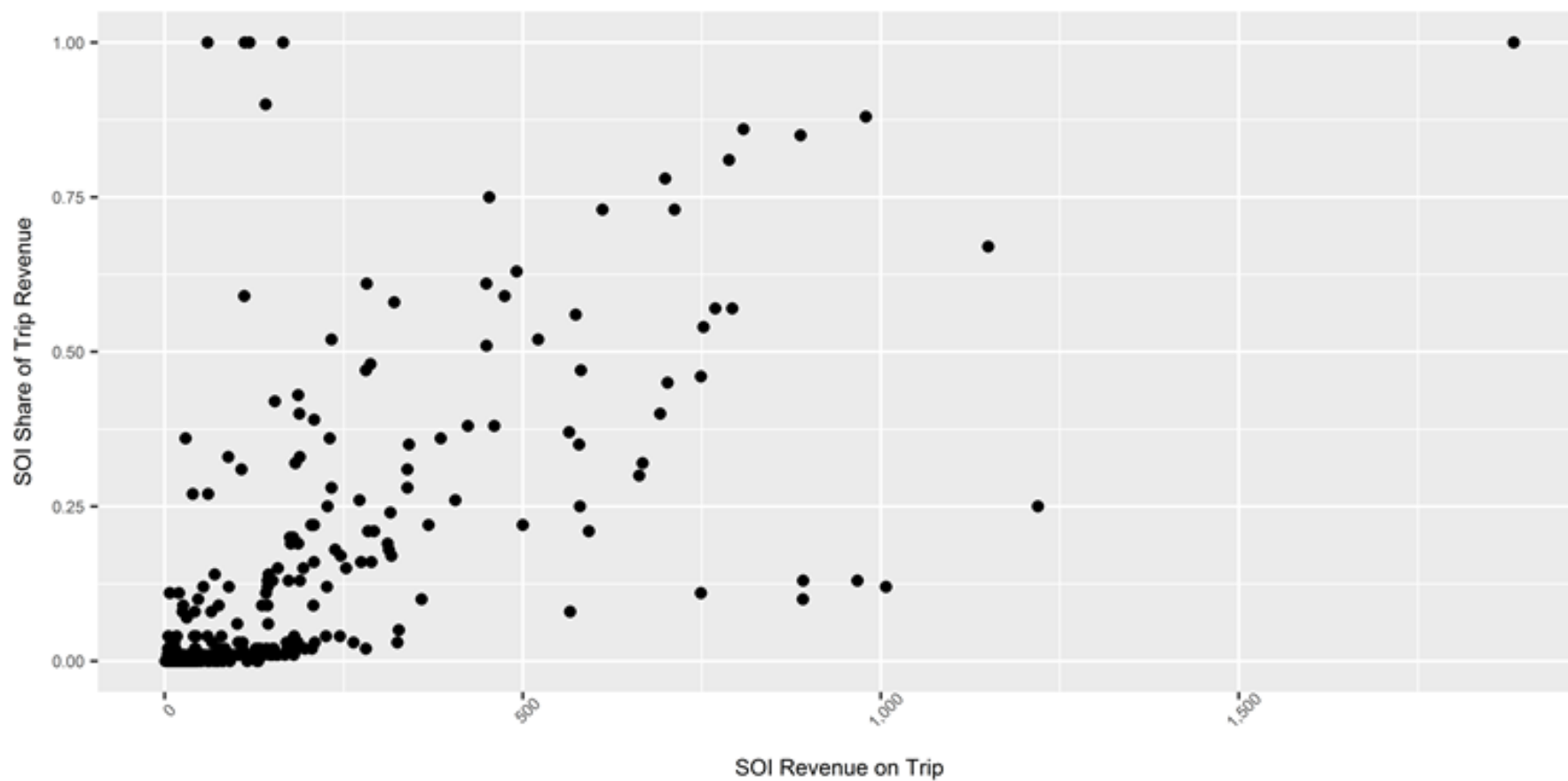
	Mean	SE	90% LB	90% UB
Days at Sea	3.92	0.7	2.62	5.22
Crew Size	2.59	0.2	2.22	2.96
Landings (lbs)	1,550	383	867	2,234
Fuel Used	159	33	99	218
Fuel Unit Price	3.59	0.05	3.5	3.67
C Fuel	568	117	359	777
C Bait	151	56	51	250
C Ice	100	26	53	146
C Grocery	187	49	101	274
C Misc	120	25	75	165
C Hired Crew	2,222	416	1,479	2,964
OC OwnerVessTime	617	211	241	992
C IFQ	498	347	-121	1,116
Total Revenue	5,579	1,255	3,342	7,815
Net Cash Flow	1,734	417	990	2,477
Net Revenue	1,615	678	407	2,823



Annual, Vessel-level Economics (SOI Statistical Estimators)

Variable	Mean	SE	90% LB	90% UB
Vessel Value	94,500	19,584	58,600	130,400
Commercial Days	88	11.1	67	108
Charter Days	3	1.7	0	6
Nonfishing Days	9	8.4	-6	25
Annual Revenue	93,836	13,416	69,243	118,429
Commercial Revenue	92,458	13,174	68,309	116,608
Charter Revenue	1,378	955	-373	3,128
Costs				
Fuel	12,346	2,563	7,647	17,045
Other Expenses	15,446	7,259	2,139	28,754
Hired Crew	33,532	9,036	16,969	50,096
Vessel Repair	10,933	3,142	5,174	16,693
Insurance	719	411	-35	1,473
Loan Payments	2,663	1,280	316	5,010
Overhead	16,555	10,339	-2,399	35,508
IFQ	4,908	2,556	223	9,593
Annual Expenses	97,102	14,442	70,629	123,576
Net Cash Flow	-3,266	12,913	-26,938	20,405

SOI share of revenue vs. SOI revenue on trip



Reef Fish Fishery



SOIs in the Report

1. GOM Reef Fish FMP Fishery: All Gears

SOIs based on gear perspective

2. GOM Reef Fish FMP Fishery: Vertical Line
3. GOM Reef Fish FMP Fishery: Longline
4. GOM Reef Fish FMP Fishery: Diver

SOIs based on management-approach perspective

5. GOM IFQ Fishery: All Gears
6. GOM Trips w/o IFQ Catch Fishery: All Gears

SOI based on species or species group perspective

7. GOM IFQ Red Snapper Fishery: All Gears
8. GOM IFQ Grouper-Tilefish Fishery: All Gears
9. GOM IFQ Red Grouper Fishery: All Gears
10. GOM IFQ Gag Grouper Fishery: All Gears
11. GOM IFQ OSWG Fishery: All Gears
12. GOM IFQ DWG Fishery: All Gears
13. GOM IFQ Tilefish Fishery: All Gears
14. GOM Vermilion Snapper Fishery: All Gears
15. GOM Yellowtail Snapper Fishery: All Gears
16. GOM FMP Jacks Fishery: All Gears

Page 1:

SOI: 2016 GOM Reef Fish 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 GOM Reef Fish FMP was landed in 2016 using any gear type. Species managed include multiple species of snapper, grouper, tilefish, and jacks as well as triggerfish and hogfish. For a complete list of the species, please refer to Appendix 1. For important **disclaimer**, see page 14.

Trip-Level Summary

Effort	
Trips	6,918
Vessels	512
Days at Sea	30,550
Crew Days	89,035

Landings (gutted lbs)	
Total	15,645,434
SOI	14,950,969
Non-SOI	694,465
% SOI	96%

Percent by Gear	Trips	SOI lbs
Vertical Line	82%	65%
Longline	12%	34%
Diver	5%	1%
Other	1%	0.7%

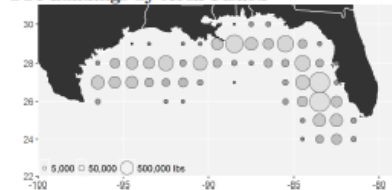
Price (mean)	
Total	\$3.96
SOI	\$4.07
Non-SOI	\$1.69

Revenue	
Total	\$62,020,750
SOI	\$60,844,287
Non-SOI	\$1,176,463
% SOI	98%

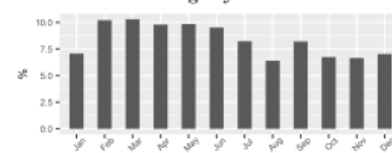
Percent of Revenue by Species Group	
Shallow Water Groupers	37%
Shallow Water Snappers	3%
Mid-Shelf Snappers	48%
Deep Water Groupers/Tilefish	8%
Grunts/Porgies/Triggerfish	1%
Mackerels/Dolphinfish/Jacks	2%
Other Species	0.4%

Revenue for Top 5 Species	
Red Snapper	\$25,617,136
Red Grouper	\$16,727,197
Gag Grouper	\$4,485,711
Vermilion Snapper	\$4,107,852
Yellowedge Grouper	\$3,270,940

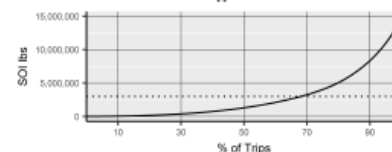
SOI Landings by Area Fished



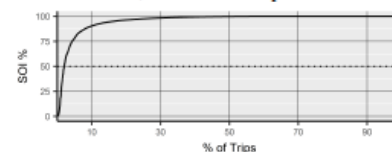
Share of Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=6,918)

	Mean	Min	Median	Max
Days at Sea	4.4	1	3	23
Crew Size	2.8	1	3	10
Landings	2,262	2	1,070	23,770
Revenue	\$8,965	\$6	\$3,630	\$97,814
SOI	\$8,795	\$3	\$3,436	\$95,972
% SOI	96%	0.1%	99.8%	100%

Page 2:

SOI: 2016 GOM Reef Fish FMP Fishery: All Gears

Trip-Level Economics

Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	6,918	-	-	-
Selected	2,065	30%	-	-
Responded	2,048	30%	99%	-
Used	1,948	28%	94%	95%

Economic Results (n=1,948)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	68%	3.5	63%	74%	-
Days at Sea	4.4	0.2	4.1	4.8	3
Crew Size	2.7	0.1	2.6	2.8	3
Fuel Used	179	11	160	198	125
Landings (gutted lbs)	2,043	169	1,763	2,322	943
Total Revenue	8,406	757	7,153	9,660	3,180
Cost					
Fuel	365	21	330	401	258
Bait	303	31	252	353	110
Ice	143	14	120	165	84
Groceries	262	21	227	297	120
Miscellaneous	250	34	193	306	50
Hired Crew	2,277	247	1,868	2,686	750
IFQ Purchase	1,550	236	1,160	1,940	96
OC Owner-Captain Time	630	101	462	798	100
Trip Net Cash Flow	3,257	402	2,592	3,922	970
Trip Net Revenue	4,177	442	3,446	4,909	955

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

Revenue 100%	Trip Net Cash Flow 39%	Trip Net Revenue 50%
	IFQ Purchase 18%	
	Labor - Hired 27%	Labor - Hired & Owner 35%
	Fuel & Supplies 16%	Fuel & Supplies 16%

Input Prices

Fuel Price (average): \$2.04 per gallon Hired Crew Wage (implicit): \$251 per crew-day

Productivity Measures

Landings/Fuel Use: 11.4 lbs/gallon Landings/Labor Use: 169 lbs/crew-day

Page 3:

SOI: 2016 GOM Reef Fish FMP Fishery: All Gears

Annual, Vessel-Level Summary

Effort

Vessels	512
Trips - Total	8,369
SOI Trips	6,918
Non-SOI Trips	1,451
Days at Sea	32,947
Crew Days	93,956

Landings (gutted lbs)

Total	16,957,132
SOI	14,950,969
Non-SOI	2,006,163
% SOI	88%

Percent by Gear

Trips	Total lbs
Vertical Line	79%
Longline	10%
Diver	6%
Other	5%

Price (mean)

Total	\$3.84
SOI	\$4.07
Non-SOI	\$2.14

Revenue

Total	\$65,138,736
SOI	\$60,844,287
Non-SOI	\$4,294,449
% SOI	93%

Percent of Revenue by Species Group

Shallow Water Groupers	35%
Shallow Water Snappers	4%
Mid-Shelf Snappers	46%
Deep Water Groupers/Tilefish	8%
Grunts/Porgies/Triggerfish	1%
Mackerels/Dolphinfish/Jacks	4%
Other Species	0.6%

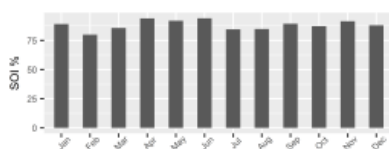
Revenue for Top 5 Species

Red Snapper	\$25,641,191
Red Grouper	\$16,767,027
Gag Grouper	\$4,509,635
Vermilion Snapper	\$4,129,328
Yellowedge Grouper	\$3,279,727

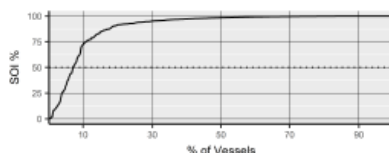
Annual, Vessel Descriptive Statistics (N=512)

	Mean	Min	Median	Max
Trips	16.3	1	13	117
Days at Sea	64.3	1	48	245
Crew Days	183.5	1	112	1,470
Landings	33,119	15	14,519	448,815
Revenue	\$127,224	\$64	\$55,152	\$2,182,950
SOI	\$118,836	\$25	\$39,598	\$2,152,496
% SOI	90.3%	0%	98.5%	100%

SOI Share of Monthly Landings



SOI Share of Revenue Per Vessel



Percent with Federal Permit

GOM Reef Fish	100%
SAT Snapper & Grouper - Unlimited	7%
SAT Snapper & Grouper - Limited	0.6%
King Mackerel	42%
Spanish Mackerel	46%
Dolphin-Wahoo	36%
Other Commercial Fishing	18%
For-Hire Fishing	23%

Vessel Characteristics (N=512)

	Mean	Min	Median	Max
Length	38	14	37	69
Year Built	1987	1961	1985	2016
Horsepower	422	12	350	2,000
Fiberglass Hull	93%	-	-	-
Diesel Engine	79%	-	-	-
Ice Refrigeration	97%	-	-	-

Page 4:

SOI: 2016 GOM Reef Fish FMP Fishery: All Gears

Annual, Vessel-Level Economics

Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	512	-	-	-
Selected	147	29%	-	-
Responded	130	25%	88%	-
Used	121	24%	82%	93%

Economic Results (n=121)

SOI Vessel	Mean	SE	90% L.B.	90% U.B.	Median
Owner-Operated	78%	3.4	73%	84%	-
For-Hire Active	16%	3.1	11%	21%	-
Days - Commercial Fishing	74	3.8	68	81	55
Days - For-Hire Fishing	10	3	5	15	0
Days - Non-fishing	2	0.4	1	3	0
Vessel Value	85,688	6,327	75,199	96,177	70,000
Has Insurance	38%	4	31%	44%	-
Total Revenue	132,167	16,043	105,572	158,762	76,255
Commercial Fishing	120,155	15,483	94,488	145,822	62,551
For-Hire Fishing	12,012	3,625	6,003	18,021	0
Cost					
Fuel	8,907	832	7,528	10,287	5,968
Other Supplies	14,263	1,152	12,354	16,172	7,410
Hired Crew	32,336	3,942	25,801	38,871	11,000
Vessel Repair & Maintenance	11,271	1,066	9,504	13,039	7,500
Insurance	1,347	200	1,015	1,679	0
Overhead	6,800	749	5,558	8,042	3,600
Loan Payment	1,689	495	869	2,509	0
IFQ Purchase	18,432	2,943	13,553	23,311	1,679
OC Owner-Captain Time	8,825	1,100	7,002	10,648	3,028
Depreciation	4,284	316	3,760	4,809	3,500
Net Cash Flow	37,121	11,023	18,849	55,394	12,292
Net Revenue from Operations*	44,133	11,340	25,333	62,932	9,197

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

Revenue 100%	Net Cash Flow 28%	Net Revenue - Operations 33%
	IFQ Purchase 14%	Depreciation 3%
	Loan Payment 1%	Fixed Costs 15%
	Fixed Costs 15%	Labor - Hired & Owner 31%
	Labor - Hired 24%	Fuel & Supplies 18%
	Fuel & Supplies 18%	Fuel & Supplies 18%

Economic Return* (on Vessel Asset Value): 51.5%

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

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SOI: 2016 GOM Reef Fish FMP Fishery: All Gears				
Trip-Level Time Series				
Trip-Level Summary				
	2014	2015	2016	Average
Effort				
Trips	6,536	6,800	6,918	6,751
Vessels	532	522	512	522
Days at Sea	30,530	30,480	30,550	30,520
Landings (gutted lbs)				
Total	16,063,839	16,125,290	15,645,434	15,944,854
SOI	15,182,555	15,396,849	14,950,969	15,176,791
Non-SOI	881,284	728,441	694,465	768,063
% SOI	95%	95%	96%	95%
Price (mean)				
Total	\$3.84	\$3.96	\$3.96	\$3.92
SOI	\$3.96	\$4.06	\$4.07	\$4.03
Non-SOI	\$1.64	\$1.73	\$1.69	\$1.69
Revenue				
Total	\$61,643,467	\$63,819,320	\$62,020,750	\$62,494,512
SOI	\$60,197,872	\$62,555,309	\$60,844,287	\$61,199,156
Non-SOI	\$1,445,596	\$1,264,012	\$1,176,463	\$1,295,357
% SOI	98%	98%	98%	98%
Trip-Level Economics				
	2014	2015	2016	Average
Number of Observations	1,237	1,787	1,948	
Response Rate (%)	78%	85%	94%	
SOI Trip				
Owner-Operated	73%	66%	68%	69%
Fuel Used per Day at Sea (gallons/day)	46	45	40	44
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	6.8%	4.9%	4.3%	5.3%
Bait	3.1%	3.4%	3.6%	3.4%
Ice	1.4%	1.5%	1.7%	1.5%
Groceries	2.4%	2.4%	3.1%	2.6%
Miscellaneous	2.5%	2.4%	3%	2.6%
Hired Crew	28.2%	25.9%	27.1%	27.1%
IFQ Purchase	14.7%	26.5%	18.4%	19.9%
OC Owner-Captain Time	6.5%	6.3%	7.5%	6.8%
Trip Net Cash Flow	41%	33%	39%	38%
Trip Net Revenue	49%	53%	50%	51%
Labor - Hired & Owner	35%	32%	35%	34%
Fuel & Supplies	16%	15%	16%	16%
Input Prices				
Fuel Price (per gallon)	\$3.53	\$2.53	\$2.04	\$2.70
Hire Crew Wage (per crew-day)	\$330	\$279	\$251	\$287
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	13.3	12.6	11.4	12
Landings/Labor Use (lbs/crew-day)	221	203	169	198

Page 6:

SOI: 2016 GOM Reef Fish FMP Fishery: All Gears				
Annual, Vessel-Level Time Series				
Annual, Vessel-Level Summary				
	2014	2015	2016	Average
Effort				
Vessels	532	522	512	522
Trips - Total	8,015	7,954	8,369	8,113
SOI Trips	6,536	6,800	6,918	6,751
Non-SOI Trips	1,479	1,154	1,451	1,361
Days at Sea	32,899	32,570	32,947	32,805
Landings (gutted lbs)				
Total	17,206,189	17,162,505	16,957,132	17,108,609
SOI	15,182,555	15,396,849	14,950,969	15,176,791
Non-SOI	2,023,634	1,765,656	2,006,163	1,931,818
% SOI	88%	90%	88%	89%
Revenue				
Total	\$64,566,340	\$66,370,950	\$65,138,736	\$65,358,675
SOI	\$60,197,872	\$62,555,309	\$60,844,287	\$61,199,156
Non-SOI	\$4,368,468	\$3,815,641	\$4,294,449	\$4,159,519
% SOI	93%	94%	93%	93%
Vessel Characteristics				
Length	39	38	38	38
Year Built	1987	1987	1987	1987
For-Hire Fishing Permit	24%	24%	23%	24%
Annual, Vessel-Level Economics				
	2014	2015	2016	Average
Number of Observations	84	105	121	
Response Rate (%)	62%	75%	82%	
SOI Vessel				
Owner-Operated	78%	70%	78%	75%
For-Hire Active	9%	17%	16%	14%
Vessel Value	\$120,445	\$100,318	\$85,688	\$102,150
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	8.4%	6.1%	6.7%	7.1%
Other Supplies	9.7%	9.4%	10.8%	10%
Hired Crew	26.9%	25.3%	24.5%	25.6%
Vessel Repair & Maintenance	7.8%	6.9%	8.5%	7.7%
Insurance	1.1%	0.8%	1%	1%
Overhead	5.6%	5.5%	5.1%	5.4%
Loan Payment	1%	1.4%	1.3%	1.2%
IFQ Purchase	11.2%	24.2%	13.9%	16.4%
OC Owner-Captain Time	5.6%	5.5%	6.7%	5.9%
Net Cash Flow	29%	21%	28%	26%
Net Revenue for Operations*	31%	38%	33%	34%
Depreciation	3.7%	3%	3.2%	3.3%
Fixed Costs	14%	13%	15%	14%
Labor - Hired & Owner	32%	31%	31%	31%
Fuel & Supplies	18%	15%	18%	17%
Economic Return* (on asset value)	42.5%	61.7%	51.5%	51.9%

Trip-Level Summary

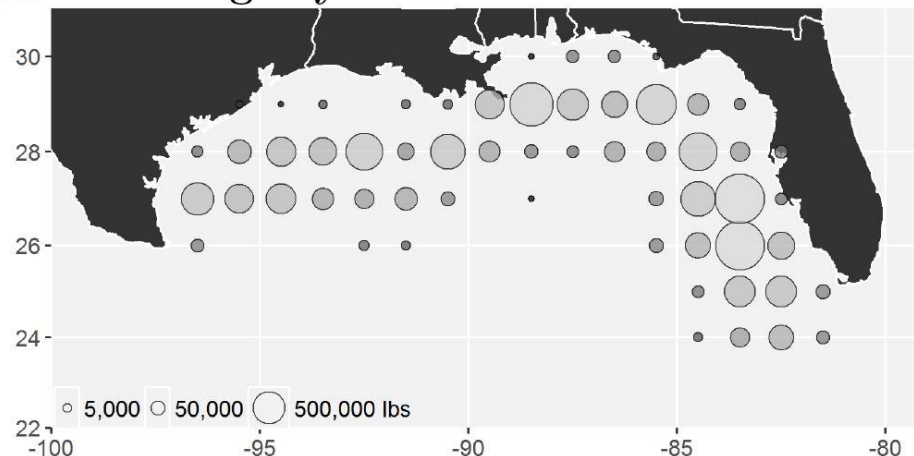
Effort

Trips	6,918
Vessels	512
Days at Sea	30,550
Crew Days	89,035

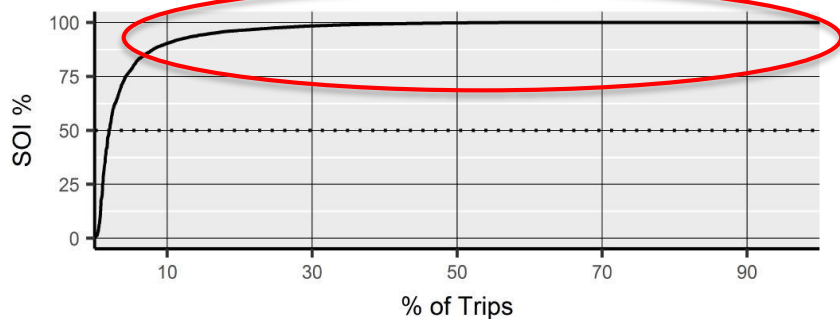
Revenue

Total	\$62,020,750
SOI	\$60,844,287
Non-SOI	\$1,176,463
% SOI	98%

SOI Landings by Area Fished



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=6,918)

	Mean	Min	Median	Max
Days at Sea	4.4	1	3	23
Crew Size	2.8	1	3	10
Landings	2,262	2	1,070	23,770
Revenue	\$8,965	\$6	\$3,630	\$97,814
SOI	\$8,795	\$3	\$3,436	\$95,972
% SOI	96%	0.1%	99.8%	100%



Trip-Level Economics

Response Rate for SOI Trips

	Trips	%SOI	%Selected	%Responded
SOI	6,918	-	-	-
Selected	2,065	30%	-	-
Responded	2,048	30%	99%	-
Used	1,948	28%	94%	95%



Trip-Level Economics, cont.

Economic Results (n=1, 948)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Trip					
Owner-Operated	68%	3.5	63%	74%	-
Days at Sea	4.4	0.2	4.1	4.8	3
Crew Size	2.7	0.1	2.6	2.8	3
Fuel Used	179	11	160	198	125
Landings (gutted lbs)	2,043	169	1,763	2,322	943
Total Revenue	8,406	757	7,153	9,660	3,180
Cost					
Fuel	365	21	330	401	258
Bait	303	31	252	353	110
Ice	143	14	120	165	84
Groceries	262	21	227	297	120
Miscellaneous	250	34	193	306	50
Hired Crew	2,277	247	1,868	2,686	750
IFQ Purchase	1,550	236	1,160	1,940	96
OC Owner-Captain Time	630	101	462	798	100
Trip Net Cash Flow	3,257	402	2,592	3,922	970
Trip Net Revenue	4,177	442	3,446	4,909	955

Trip-Level Economics, cont.

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

Revenue 100%	Trip Net Cash Flow 39%	Trip Net Revenue 50%
	IFQ Purchase 18%	Labor - Hired & Owner 35%
	Labor - Hired 27%	
	Fuel & Supplies 16%	Fuel & Supplies 16%

Input Prices

Fuel Price (average): \$2.04 per gallon

Hired Crew Wage (implicit): \$251 per crew-day

Productivity Measures

Landings/Fuel Use: 11.4 lbs/gallon

Landings/Labor Use: 169 lbs/crew-day



Time Series – Trip-Level Economics

	2014	2015	2016	Average
Number of Observations	1,237	1,787	1,948	
Response Rate (%)	78%	85%	94%	
SOI Trip				
Owner-Operated	73%	66%	68%	69%
Fuel Used per Day at Sea (gallons/day)	46	45	40	44
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	6.8%	4.9%	4.3%	5.3%
Bait	3.1%	3.4%	3.6%	3.4%
Ice	1.4%	1.5%	1.7%	1.5%
Groceries	2.4%	2.4%	3.1%	2.6%
Miscellaneous	2.5%	2.4%	3%	2.6%
Hired Crew	28.2%	25.9%	27.1%	27.1%
IFQ Purchase	14.7%	26.5%	18.4%	19.9%
OC Owner-Captain Time	6.5%	6.3%	7.5%	6.8%
Trip Net Cash Flow	41%	33%	39%	38%
Trip Net Revenue	49%	53%	50%	51%
Labor - Hired & Owner	35%	32%	35%	34%
Fuel & Supplies	16%	15%	16%	16%
Input Prices				
Fuel Price (per gallon)	\$3.53	\$2.53	\$2.04	\$2.70
Hire Crew Wage (per crew-day)	\$330	\$279	\$251	\$287
Productivity Measures				
Landings/Fuel Use (lbs/gallon)	13.3	12.6	11.4	12
Landings/Labor Use (lbs/crew-day)	221	203	169	198

Annual, Vessel-Level Summary

Effort

Vessels	512
<u>Trips - Total</u>	<u>8,369</u>
SOI Trips	6,918
Non-SOI Trips	1,451

Revenue

<u>Total</u>	<u>\$65,138,736</u>
SOI	\$60,844,287
Non-SOI	\$4,294,449
% SOI	93%

Percent with Federal Permit

GOM Reef Fish	100%
SAT Snapper & Grouper - Unlimited	7%
SAT Snapper & Grouper - Limited	0.6%
King Mackerel	42%
Spanish Mackerel	46%
Dolphin-Wahoo	36%
Other Commercial Fishing	18%
For-Hire Fishing	23%

Annual, Vessel Descriptive Statistics (N=512)

	Mean	Min	Median	Max
Trips	16.3	1	13	117
Days at Sea	64.3	1	48	245
Crew Days	183.5	1	112	1,470
Landings	33,119	15	14,519	448,815
Revenue	\$127,224	\$64	\$55,152	\$2,182,950
SOI	\$118,836	\$25	\$39,598	\$2,152,496
% SOI	90.3%	0%	98.5%	100%

Vessel Characteristics (N=512)

	Mean	Min	Median	Max
Length	38	14	37	69
Year Built	1987	1961	1985	2016
Horsepower	422	12	350	2,000
Fiberglass Hull	93%	-	-	-
Diesel Engine	79%	-	-	-
Ice Refrigeration	97%	-	-	-

Annual, Vessel-Level Economics

Response Rate for SOI Vessels

	Vessels	%SOI	%Selected	%Responded
SOI	512	-	-	-
Selected	147	29%	-	-
Responded	130	25%	88%	-
Used	121	24%	82%	93%

Annual, Vessel-Level Economics, cont.

Economic Results (n=121)

	Mean	SE	90% L.B.	90% U.B.	Median
SOI Vessel					
Owner-Operated	78%	3.4	73%	84%	-
For-Hire Active	16%	3.1	11%	21%	-
Days - Commercial Fishing	74	3.8	68	81	55
Days - For-Hire Fishing	10	3	5	15	0
Days - Non-fishing	2	0.4	1	3	0
Vessel Value	85,688	6,327	75,199	96,177	70,000
Has Insurance	38%	4	31%	44%	-
Total Revenue	132,167	16,043	105,572	158,762	76,255
Commercial Fishing	120,155	15,483	94,488	145,822	62,551
For-Hire Fishing	12,012	3,625	6,003	18,021	0
Cost					
Fuel	8,907	832	7,528	10,287	5,968
Other Supplies	14,263	1,152	12,354	16,172	7,410
Hired Crew	32,336	3,942	25,801	38,871	11,000
Vessel Repair & Maintenance	11,271	1,066	9,504	13,039	7,500
Insurance	1,347	200	1,015	1,679	0
Overhead	6,800	749	5,558	8,042	3,600
Loan Payment	1,689	495	869	2,509	0
IFQ Purchase	18,432	2,943	13,553	23,311	1,679
OC Owner-Captain Time	8,825	1,100	7,002	10,648	3,028
Depreciation	4,284	316	3,760	4,809	3,500
Net Cash Flow	37,121	11,023	18,849	55,394	12,292
Net Revenue from Operations*	44,133	11,340	25,333	62,932	9,197

Annual, Vessel-Level Economics, cont.

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

Revenue 100%	Net Cash Flow 28%	Net Revenue - Operations 33%
	IFQ Purchase 14%	Depreciation 3%
	Loan Payment 1%	Fixed Costs 15%
	Fixed Costs 15%	Labor - Hired & Owner 31%
	Labor - Hired 24%	
	Fuel & Supplies 18%	Fuel & Supplies 18%

Economic Return* (on Vessel Asset Value): 51.5%

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

Time Series – Annual, Vessel-Level Economics

	2014	2015	2016	Average
Number of Observations	84	105	121	
Response Rate (%)	62%	75%	82%	
SOI Vessel				
Owner-Operated	78%	70%	78%	75%
For-Hire Active	9%	17%	16%	14%
Vessel Value	\$120,445	\$100,318	\$85,688	\$102,150
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	8.4%	6.1%	6.7%	7.1%
Other Supplies	9.7%	9.4%	10.8%	10%
Hired Crew	26.9%	25.3%	24.5%	25.6%
Vessel Repair & Maintenance	7.8%	6.9%	8.5%	7.7%
Insurance	1.1%	0.8%	1%	1%
Overhead	5.6%	5.5%	5.1%	5.4%
Loan Payment	1%	1.4%	1.3%	1.2%
IFQ Purchase	11.2%	24.2%	13.9%	16.4%
OC Owner-Captain Time	5.6%	5.5%	6.7%	5.9%
Net Cash Flow	29%	21%	28%	26%
Net Revenue for Operations*	31%	38%	33%	34%
Depreciation	3.7%	3%	3.2%	3.3%
Fixed Costs	14%	13%	15%	14%
Labor - Hired & Owner	32%	31%	31%	31%
Fuel & Supplies	18%	15%	18%	17%
Economic Return* (on asset value)	42.5%	61.7%	51.5%	51.9%

Mackerel/CMP Fisheries



SOIs in the Report

The King Mackerel fisheries:

SOIs based on region perspective:

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

SOIs based on region AND gear perspective:

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

The Spanish Mackerel fisheries:

SOIs based on region perspective:

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

Page 1:

SOI: 2016 GOM King Mackerel Fishery: All Gears

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

Trip-Level Summary

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

Landings (gutted lbs)	
Total	2,839,539
SOI	2,300,536
Non-SOI	539,003
% SOI	81%

Percent by Gear	Trips	SOI lbs
Vertical Line	49%	31%
Trotting	50%	51%
Gill Net	1%	18%
Other	0%	0%

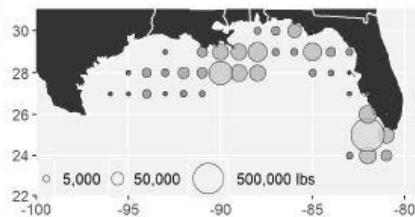
Price (mean)	
Total	\$2.43
SOI	\$2.18
Non-SOI	\$3.50

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

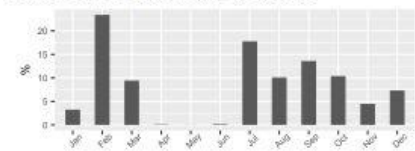
Percent of Revenue by Species Group	
King and Cero Mackerel	73%
Spanish Mackerel	0.5%
Dolphinfish/Cobia/Jacks	1%
Shallow Water Snappers/Groupers	4%
Mid-Shelf Snappers	21%
Deep Water Groupers/Tilfish	0.4%
Grunt/Porgy/Sea Bass/Trigger	0.3%
Other Species	0.5%

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

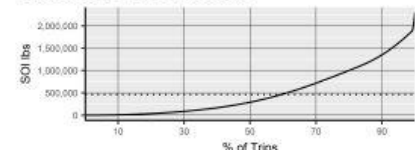
SOI Landings by Area Fished



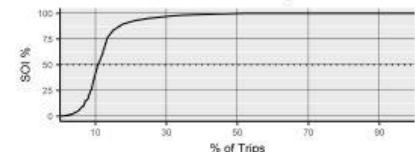
Share of SOI Landings by Month



Cumulative SOI Landings



SOI Share of Revenue Per Trip



Trip Descriptive Statistics (N=2,281)

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

Page 2:

SOI: 2016 GOM King Mackerel Fishery: All Gears

Trip-Level Economics

Response Rate for SOI Trips

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

Economic Results (n=502)

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

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

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

Input Prices

Fuel Price (average): \$2.11 per gallon Hired Crew Wage (implicit): \$344 per crew-day

Productivity Measures

Landings/Fuel Use: 15.6 lbs/gallon Landings/Labor Use: 440 lbs/crew-day

* See Definitions in Methods Section or Glossary.

Page 3:

SOI: 2016 GOM King Mackerel Fishery: All Gears

Annual, Vessel-Level Summary

Effort

		Mean	Min	Median	Max
Vessels	249				
Trips - Total	6,649	26.7	1	19	169
SOI Trips	2,281	54	1	39	245
Non-SOI Trips	4,368	137.4	1	68	1,470
Days at Sea	13,444	35,204	18	19,450	448,815
Crew Days	34,215	Revenue	\$110,507	\$39	\$52,874
		SOI	\$20,118	\$15	\$5,757
		% SOI	45.4%	0%	38.3%
					100%

Landings (guttled lbs)

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

Percent by Gear

Trips	Total lbs
Vertical Line	67%
Trolling	31%
Gill Net	1%
Longline	0.8%
Other	0.3%

Price (mean)

Total	\$3.14
SOI	\$2.18
Non-SOI	\$3.48

Revenue

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

Percent of Revenue by Species Group

King and Cero Mackerel	22%	King Mackerel	100%
Spanish Mackerel	1%	Spanish Mackerel	76%
Dolphinfish/Cobia/Jacks	3%	Dolphin-Wahoo	56%
Shallow Water Snappers/Groupers	14%	GOM Reef Fish	55%
Mid-Shelf Snappers	55%	SAT Snapper & Grouper - Unlimited	13%
Deep Water Groupers/Tilefish	3%	SAT Snapper & Grouper - Limited	3%
Grunt/Porgy/Sea Bass/Trigger	0.9%	Other Commercial Fishing	22%
Other Species	0.6%	For-Hire Fishing	24%

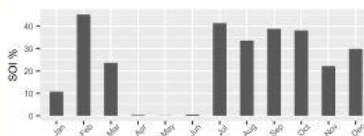
Revenue for Top 5 Species

Red Snapper	\$12,405,667	Length	36	21	34	69
King and Cero Mackerel	\$6,034,833	Year Built	1987	1963	1985	2016
Vermilion Snapper	\$2,646,472	Horsepower	408	18	350	1,800
Yellowtail Snapper	\$1,351,295	Fiberglass Hull	93%	-	-	-
Gag Grouper	\$909,737	Diesel Engine	71%	-	-	-
		Ice Refrigeration	94%	-	-	-

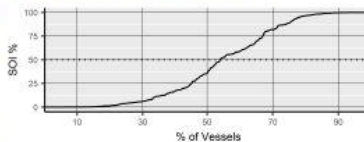
Annual, Vessel Descriptive Statistics (N=249)

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

SOI Share of Monthly Landings



SOI Share of Revenue Per Vessel



Percent with Federal Permit

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

Vessel Characteristics (N=249)

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

Page 4:

SOI: 2016 GOM King Mackerel Fishery: All Gears

Annual, Vessel-Level Economics

Response Rate for SOI Vessels

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

Economic Results (n=50)

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

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

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

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

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



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SOI: 2016 GOM King Mackerel Fishery: All Gears

Trip-Level Time Series

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

Trip-Level Economics

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

Page 6:

SOI: 2016 GOM King Mackerel Fishery: All Gears

Annual, Vessel-Level Time Series

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

Annual, Vessel-Level Economics

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

2014-16 averages by fishery

	GOM ReefFish	GOM KingM	SA S&G	SA KingM
Revenue	\$61.2 million	\$5.1 million	\$17.6 million	\$4.9 million
Landings	15.2 million	2.3 million	5.3 million	2.2 million
Trips	6,751	2,332	11,521	10,083
Vessels	522	259	518	651
% SOI	93%	19%	72%	24%
Vessel Value	\$102,150	\$97,314	\$82,793	\$62,813
OwnerOperator	75%	76%	88%	92%
Active ForHire	14%	19%	18%	19%
Revenue	100%	100%	100%	100%
Fuel and Supply	17%	19%	25%	27%
Labor - Hired	26%	26%	27%	21%
Labor - Owner	6%	7%	12%	16%
Fixed Costs	14%	16%	25%	28%
Depreciation	3%	4%	6%	7%
Net Rev from Op	34%	29%	5%	2%



Questions



Comparison with Snapper Grouper Fishery

Economics of the S&G fishery, compared

	SAT S&G	GOM RF
Landings	5,341,587	15,176,791
Revenue	17,559,439	61,199,156
Costs		
Fuel & Supplies	25.4%	17.1%
Labor - Hired & Owner	38.8%	31.5%
Vessel R&M, Insure, Overhead	25.4%	14.1%
Depreciation	5.8%	3.3%
Net Revenue from Operations	4.5%	34.0%
Opportunity Cost - Capital	4.5%	2.4%
Resource Rent (approx)	0.1%	31.6%

Lots of vessels, lots of trips, more effort

	SAT S&G	GOM RF	S&G/RF Ratio (per lb basis)
Fishery			
Landings	5,341,587	15,176,791	1.0
Price	3.29	4.03	0.8
Revenue	17,559,439	61,199,156	0.8
Effort			
Vessels	518	522	2.8
Trips	11,521	6,751	4.8
Crew days	40,565	89,035	1.3



Comparison of Trips (2016)

	SAT S&G	GOM RF
Population		
Days at sea	1.7	4.4
Crew size	2.0	2.8
Landings (lbs)	499	2,262
% of Landings in Fishery	90%	96%
Survey		
Owner operated	82%	68%
Fuel used (gallons)	74	179
Landings/gallon	6.8	11.4
Landings/crew-day	141	169

Page 1:

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%
Longline	3%
Diver	7%
Traps/Pots	2%
Other	4%

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%

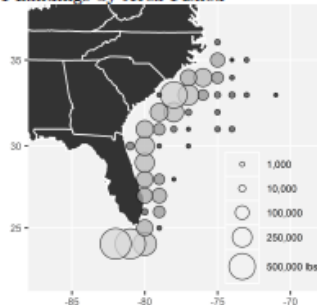
Percent of Revenue by Species Group

Shallow Water Groupers	12%
Shallow Water Snappers	28%
Mid-Shelf Snappers	16%
Deep Water Groupers/Tilefish	18%
Grouper/Porgy/Sea Bass/Trigger	10%
Mackerels/Dolphinfish/Jacks	10%
Other Species	5%

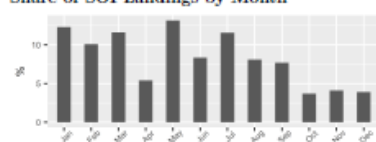
Revenue for Top 5 Species

Yellowtail Snapper	\$4,649,998
Vermilion Snapper	\$2,828,743
Tilefish	\$2,259,007
Greater Amberjack	\$1,193,133
Gag Grouper	\$1,174,131

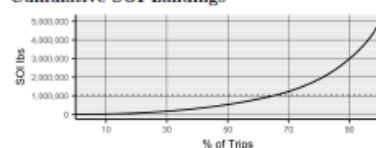
SOI Landings by Area Fished



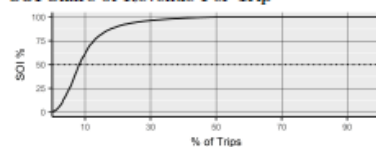
Share of SOI Landings by Month



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%

Page 2:

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)

Revenue 100%	Trip Net Cash Flow* 46%	Trip Net Revenue* 29%
	Labor - Hired 29%	Labor - Hired & Owner 46%
	Fuel & Supplies 25%	Fuel & Supplies 25%

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.

Page 3:

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%
Grun/Parrot/Sea Bass/Trigger	8%
Mackerels/Dolphinfish/Jacks	20%
Other Species	8%

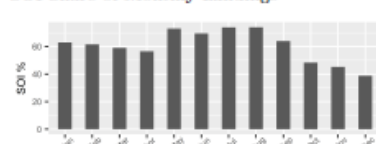
Revenue for Top 5 Species

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

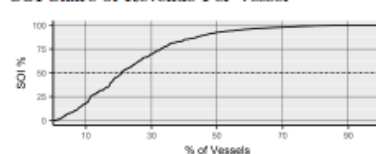
Annual, Vessel Descriptive Statistics (N=509)

	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%	-	-	-

Page 4:

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)

SOI Vessel	Mean	SE	90% L.B.	90% U.B.	Median
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)

Revenue 100%	Net Cash Flow 16%	Net Revenue - Operations 0%
	Loan Payment 5%	Depreciation 7%
	Vessel R&M, Insur, Overh 28%	Vessel R&M, Insur, Overh 28%
	Labor - Hired Crew 28%	Labor - Hired & Owner 41%
	Fuel & Supplies 25%	Fuel & Supplies 25%

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

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

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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

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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%