

Net Revenue Analysis for Electronic Monitoring on the West Coast

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1 Introduction

The vessels that participate on the West Coast Groundfish Trawl Catch Share Program are very diverse. Target species in the fishery range from \$0.10 per pound to upwards of \$3.00 per pound, different species are targeted by different vessels, participation ranges from Southern California to Northern Washington, and vessel length ranges from less than 60 feet to more than 100 feet. These characteristics and others result in different profit margins. It therefore follows that changing the cost structure for monitoring fisheries could have varying effects on different sectors of the fisheries.

We have divided the catch share program into five fisheries: At-sea Pacific whiting, Shoreside Pacific whiting, DTS trawl with trawl endorsement, Non-whiting, non-DTS trawl with trawl endorsement, and Groundfish fixed gear with trawl endorsement. The first section provides summaries for all fisheries, then there is a separate fishery specific section. In the fishery specific sections, we first summarize the data by home port, vessel length, and whether the vessel fished in Alaska. In many cases, some of these “breakouts” are not shown in order to prevent displaying confidential information.

After the summaries, we then calculate the variable cost net revenue and total cost net revenue at various levels of daily electronic monitoring costs and annual electronic monitoring costs. For our purposes, we consider the daily monitoring costs to include the cost of maintaining the equipment and reviewing the data collection by the equipment on-board. The annual cost would include either the cost of renting the equipment or purchasing the equipment, depending on how the final program is implemented. For all statistics shown, observer costs are not included, however, the variable cost net revenue and total cost net revenue with observer coverage can be found by looking at the variable EM costs where the fixed EM costs are zero.

1.1 Data

Estimating the net revenue earned by operating a commercial fishing vessel requires data on vessel revenues and costs. Since the same entity that owns a commercial fishing vessel may also be engaged in any number of other fishing related or non-related activities, it is important to define which revenues and costs are included in the measurement of net revenue.

The NWFSC Economic Data Collection (EDC) program focuses on collecting revenue and cost information directly related to the operation of a commercial fishing vessel. There are a variety of costs that are associated with running a catcher vessel that are not requested on the form because it is difficult to determine the share of the cost associated with the vessel. These costs include items that can be used for activities other than fishing, or are too difficult to allocate to a particular vessel in a multi-vessel company. These expenses include office space, pickup trucks, storage of equipment, professional fees, and marketing. In general, the data collection forms attempt to capture costs that are directly related to vessel maintenance and fishing operations, and not costs that are related to activities or equipment off the vessel. For these reasons, the aggregated measures of costs (variable costs, fixed costs, and total costs) underestimate the true costs of operating a business. Therefore, the measures of net revenue overstate actual net revenue.

Net revenue is calculated two ways: using only variable costs, and using variable costs plus fixed costs (total costs). The first calculation is called *variable cost net revenue*, while the second is called *total cost net revenue*. Variable cost net revenue is useful to examine changes in fishery operations that are not so great as to affect fixed costs. For example, the cost of fishing an additional day, or catching an additional metric ton of fish, is better represented by only considering variable costs. Total cost net revenue is usually a better summary measure of financial gain or loss for an entire year, season, or fishery. For these analyses, we focus on total cost net revenue.

Since most vessels operate in multiple fisheries, much of the available cost data pertain to multiple fisheries. While some of the costs, such as vessel repairs and maintenance, are joint costs, other costs, such as fuel, are not necessarily joint costs but are not reported separately by fishery in the survey. While it is not necessary to disaggregate costs in order to analyze net revenue for all vessel operations, it is necessary in order to analyze net revenue associated with operations in the West Coast groundfish fishery (or any other individual fishery). The

methods used for disaggregation can be found in the Economic Data Collection Program Catcher Vessel Report 2009-11.¹

1.2 Data Sources

For the shoreside sector, landings and ex-vessel revenue were obtained from state fish tickets. The at-sea sector deliveries to motherships were obtained from the NORPAC database and the ex-vessel revenues were obtained from the NWFSC Economic Data Collection (EDC) Program. All cost data were obtained from the EDC Program.

The costs were categorized into variable costs and fixed costs. Note that costs related to obtaining a limited entry trawl permit and quota are not included.

Variable Costs

- Bait
- Captain
- Communications
- Crew
- Fishing association dues
- Food
- Freight
- Fuel and lubrication
- Ice
- License fees
- Observer costs
- Offloading
- Supplies
- Travel
- Trucking

Fixed Costs

- Fishing gear
- Processing equipment
- Vessel and on-board equipment
- Insurance premium payments
- Moorage

¹Steiner, E., A. Harley, and T.Lee. 2014. Economic Data Collection Program Catcher Vessel Report 2009-11, Northwest Fisheries Science Center. Available at www.nwfsc.noaa.gov/research/divisions/fram/economic/economic_data.cfm.

1.3 Simulating Costs for Electronic Monitoring

In order to analyze the potential effects of the costs of electronic monitoring on the annual profitability of vessels by fishery, we first calculate the total cost net revenue including all fishing revenue and all fishing costs as described above. **Each statistic reported represents the average vessel while participating in that fishery.** The costs and earnings associated with that vessel will be apportioned to each of the fisheries in which it participates. The average total cost net revenue is first reported in the fishery summary tables, and includes the cost of observers. In the electronic monitoring cost tables, the cost of observer coverage was not included and therefore the first row in each of these tables where EM variable costs per day and EM fixed costs per year shows the total cost net revenue assuming that the vessel paid \$0 for monitoring, whether the monitoring was observer coverage or electronic monitoring. We chose a set of variable costs per day, \$0, \$200, \$400, \$600, \$800, \$1,000, and annual fixed costs \$0, \$5,000, \$10,000, \$15,000, \$20,000. This assumes that the fixed costs paid are only for the vessels' operation in that fishery.

2 West Coast Groundfish Catch Share fisheries

We use data from PacFIN and the Economic Data Collection (EDC) program to calculate 2011 revenue and 2011 variable costs. Due to the patchiness of fixed costs, an average of 2009-2011 was used.

2.1 West Coast Groundfish Catch Share fisheries summary

Table 1: Number of vessels per fishery in 2011. A vessel will be counted in all fisheries in which they participated.

	N
At-sea Pacific whiting	18
Shoreside Pacific whiting	26
DTS trawl with trawl endorsement	64
Non-whiting, non-DTS trawl with trawl endorsement	48
Groundfish fixed gear with trawl endorsement	24

Table 2: Average revenue, variable costs, fixed costs, variable cost net revenue, and total cost net revenue (\$). Revenues and variable costs are 2011 values, fixed costs are the average of 2009-2011 fixed costs.

	Revenue	Variable costs	Fixed costs	Variable cost net revenue	Total cost net revenue
At-sea Pacific whiting	624,685	257,634	145,517	365,813	220,297
Shoreside Pacific whiting	837,866	407,470	231,491	426,624	195,133
DTS trawl with trawl endorsement	315,167	184,363	69,556	128,802	59,245
Non-whiting, non-DTS trawl with trawl endorsement	104,676	61,762	20,664	42,178	21,514
Groundfish fixed gear with trawl endorsement	288,449	141,997	64,536	144,907	80,371

Table 3: Average variable cost and variable net revenue per day and per pound.

	Variable cost per day	Variable cost per pound	Variable net revenue per day	Variable net revenue per 1,000 lbs
At-sea Pacific whiting	8,498	43	11,456	58
Shoreside Pacific whiting	8,375	55	8,144	52
DTS trawl with trawl endorsement	4,422	451	2,884	239
Non-whiting, non-DTS trawl with trawl endorsement	4,136	414	2,958	265
Groundfish fixed gear with trawl endorsement	4,172	1,637	3,934	1,288

2.2 West Coast Groundfish Catch Share fisheries EM costs

Table 4: Average total cost net revenue for all vessels in the 5 groundfish fisheries, the EM variable costs represent the per day cost to the vessel, the EM fixed costs represent an annual cost for leasing or purchasing the EM equipment. Vessels are grouped in vessel length classes and also by whether the vessel also fished in Alaska. The costs related to observer coverage were not included, however, the daily EM variable costs can be used as a proxy for observer coverage.

EM variable costs per day	EM fixed costs per year	Small vessel (< 60 ft)	Medium vessel (> 60 ft, <= 80 ft)	Large vessel (> 80 ft)	Fished in AK	Only West Coast
0.00	0	58,385	62,623	144,969	199,797	54,903
0.00	5,000	53,385	57,623	139,969	194,797	49,903
0.00	10,000	48,385	52,623	134,969	189,797	44,903
0.00	15,000	43,385	47,623	129,969	184,797	39,903
0.00	20,000	38,385	42,623	124,969	179,797	34,903
200.00	0	51,913	54,812	137,785	192,433	47,651
200.00	5,000	46,913	49,812	132,785	187,433	42,651
200.00	10,000	41,913	44,812	127,785	182,433	37,651
200.00	15,000	36,913	39,812	122,785	177,433	32,651
200.00	20,000	31,913	34,812	117,785	172,433	27,651
400.00	0	45,441	47,000	130,602	185,070	40,399
400.00	5,000	40,441	42,000	125,602	180,070	35,399
400.00	10,000	35,441	37,000	120,602	175,070	30,399
400.00	15,000	30,441	32,000	115,602	170,070	25,399
400.00	20,000	25,441	27,000	110,602	165,070	20,399
600.00	0	38,969	39,189	123,419	177,706	33,147
600.00	5,000	33,969	34,189	118,419	172,706	28,147
600.00	10,000	28,969	29,189	113,419	167,706	23,147
600.00	15,000	23,969	24,189	108,419	162,706	18,147
600.00	20,000	18,969	19,189	103,419	157,706	13,147
800.00	0	32,497	31,377	116,236	170,343	25,895
800.00	5,000	27,497	26,377	111,236	165,343	20,895
800.00	10,000	22,497	21,377	106,236	160,343	15,895
800.00	15,000	17,497	16,377	101,236	155,343	10,895
800.00	20,000	12,497	11,377	96,236	150,343	5,895
1000.00	0	26,025	23,565	109,053	162,979	18,644
1000.00	5,000	21,025	18,565	104,053	157,979	13,644
1000.00	10,000	16,025	13,565	99,053	152,979	8,644
1000.00	15,000	11,025	8,565	94,053	147,979	3,644
1000.00	20,000	6,025	3,565	89,053	142,979	-1,356

Table 5: Average total cost net revenue for all vessels in the 5 groundfish fisheries, the EM variable costs represent the per day cost to the vessel, the EM fixed costs represent an annual cost for leasing or purchasing the EM equipment. Vessels are grouped by home port. Some ports were grouped together to protect confidential data. The costs related to observer coverage were not included, however, the daily EM variable costs can be used as a proxy for observer coverage.

EM variable costs per day	EM fixed costs per year	Washington	Astoria	Newport	Charleston or Coos Bay	Brookings	Crescent City or Eureka	Fort Bragg	Other California
0.00	0	107,857	72,622	140,174	39,254	108,378	73,058	20,124	59,705
0.00	5,000	102,857	67,622	135,174	34,254	103,378	68,058	15,124	54,705
0.00	10,000	97,857	62,622	130,174	29,254	98,378	63,058	10,124	49,705
0.00	15,000	92,857	57,622	125,174	24,254	93,378	58,058	5,124	44,705
0.00	20,000	87,857	52,622	120,174	19,254	88,378	53,058	124	39,705
200.00	0	99,454	64,053	133,645	31,477	101,369	66,758	14,961	53,332
200.00	5,000	94,454	59,053	128,645	26,477	96,369	61,758	9,961	48,332
200.00	10,000	89,454	54,053	123,645	21,477	91,369	56,758	4,961	43,332
200.00	15,000	84,454	49,053	118,645	16,477	86,369	51,758	-39	38,332
200.00	20,000	79,454	44,053	113,645	11,477	81,369	46,758	-5,039	33,332
400.00	0	91,052	55,485	127,116	23,701	94,360	60,458	9,797	46,959
400.00	5,000	86,052	50,485	122,116	18,701	89,360	55,458	4,797	41,959
400.00	10,000	81,052	45,485	117,116	13,701	84,360	50,458	-203	36,959
400.00	15,000	76,052	40,485	112,116	8,701	79,360	45,458	-5,203	31,959
400.00	20,000	71,052	35,485	107,116	3,701	74,360	40,458	-10,203	26,959
600.00	0	82,649	46,916	120,588	15,925	87,351	54,158	4,633	40,585
600.00	5,000	77,649	41,916	115,588	10,925	82,351	49,158	-367	35,585
600.00	10,000	72,649	36,916	110,588	5,925	77,351	44,158	-5,367	30,585
600.00	15,000	67,649	31,916	105,588	925	72,351	39,158	-10,367	25,585
600.00	20,000	62,649	26,916	100,588	-4,075	67,351	34,158	-15,367	20,585
800.00	0	74,247	38,348	114,059	8,148	80,342	47,858	-530	34,212
800.00	5,000	69,247	33,348	109,059	3,148	75,342	42,858	-5,530	29,212
800.00	10,000	64,247	28,348	104,059	-1,852	70,342	37,858	-10,530	24,212
800.00	15,000	59,247	23,348	99,059	-6,852	65,342	32,858	-15,530	19,212
800.00	20,000	54,247	18,348	94,059	-11,852	60,342	27,858	-20,530	14,212
1000.00	0	65,844	29,779	107,530	372	73,333	41,558	-5,694	27,839
1000.00	5,000	60,844	24,779	102,530	-4,628	68,333	36,558	-10,694	22,839
1000.00	10,000	55,844	19,779	97,530	-9,628	63,333	31,558	-15,694	17,839
1000.00	15,000	50,844	14,779	92,530	-14,628	58,333	26,558	-20,694	12,839
1000.00	20,000	45,844	9,779	87,530	-19,628	53,333	21,558	-25,694	7,839

3 At-sea whiting

In 2011, there were 18 vessels that participated in the At-sea Pacific whiting fishery. Most of those vessels also fished in Alaska and had home ports in either Newport or Seattle, other ports cannot be shown to protect confidential information.

3.1 At-sea whiting summary

Table 6: Number of vessels per length category in the At-sea Pacific whiting fishery

	N
Small vessel (< 90 ft)	5
Medium vessel (> 90 ft, <= 110 ft)	6
Large vessel (> 110 ft)	7

Table 7: Number of vessels per port in the At-sea Pacific whiting fishery, some ports are not shown to protect confidential data.

	N
Seattle	7
Newport	9

Table 8: Average At-sea Pacific whiting vessels by vessel length class.

	Small vessel (< 90 ft)	Medium vessel (> 90 ft, <= 110 ft)	Large vessel (> 110 ft)
Revenue (\$)	590,768	680,806	600,807
Variable costs (\$)	259,305	268,887	246,795
Fixed costs (\$)	113,498	108,015	200,532
Variable cost net revenue (\$)	328,992	411,182	353,227
Total cost net revenue (\$)	215,494	303,167	152,695
Variable cost (\$) per day	7,938	7,965	9,354
Variable cost (\$) per 1,000 lbs	47	40	43
Variable cost net revenue (\$) per day	8,421	11,931	13,216
Variable cost net revenue (\$) per 1,000 lbs	50	64	59
Landings (lbs)	6,012,428	6,597,562	5,866,860
Days at sea	33	35	28

Table 9: Average at-sea whiting vessels by home port. Some ports are not shown to protect confidential information.

	Newport	Seattle
Revenue (\$)	556,898	635,071
Variable costs (\$)	229,394	250,522
Fixed costs (\$)	116,486	172,270
Variable cost net revenue (\$)	325,921	383,403
Total cost net revenue (\$)	209,435	211,133
Variable cost (\$) per day	8,089	7,316
Variable cost (\$) per 1,000 lbs	43	40
Variable cost net revenue (\$) per day	10,509	10,963
Variable cost net revenue (\$) per 1,000 lbs	57	60
Landings (lbs)	5,522,191	6,310,637
Days at sea	30	35

3.2 At-sea whiting EM costs

Table 10: Average total cost net revenue for at-sea whiting vessels, the EM variable costs represent the per day cost to the vessel, the EM fixed costs represent an annual cost for leasing or purchasing the EM equipment. Some ports are not shown to protect confidential data. The costs related to observer coverage were not included, however, the daily EM variable costs can be used as a proxy for observer coverage.

EM variable costs per day	EM fixed costs per year	Small vessel (< 90 ft)	Medium vessel (> 90 ft, <= 110 ft)	Large vessel (> 110 ft)	Seattle	Newport
0.00	0	217,965	303,904	153,481	212,280	211,018
0.00	5,000	212,965	298,904	148,481	207,280	206,018
0.00	10,000	207,965	293,904	143,481	202,280	201,018
0.00	15,000	202,965	288,904	138,481	197,280	196,018
0.00	20,000	197,965	283,904	133,481	192,280	191,018
200.00	0	211,324	296,992	147,961	205,327	205,089
200.00	5,000	206,324	291,992	142,961	200,327	200,089
200.00	10,000	201,324	286,992	137,961	195,327	195,089
200.00	15,000	196,324	281,992	132,961	190,327	190,089
200.00	20,000	191,324	276,992	127,961	185,327	185,089
400.00	0	204,683	290,080	142,440	198,375	199,160
400.00	5,000	199,683	285,080	137,440	193,375	194,160
400.00	10,000	194,683	280,080	132,440	188,375	189,160
400.00	15,000	189,683	275,080	127,440	183,375	184,160
400.00	20,000	184,683	270,080	122,440	178,375	179,160
600.00	0	198,042	283,167	136,920	191,423	193,230
600.00	5,000	193,042	278,167	131,920	186,423	188,230
600.00	10,000	188,042	273,167	126,920	181,423	183,230
600.00	15,000	183,042	268,167	121,920	176,423	178,230
600.00	20,000	178,042	263,167	116,920	171,423	173,230
800.00	0	191,401	276,255	131,400	184,470	187,301
800.00	5,000	186,401	271,255	126,400	179,470	182,301
800.00	10,000	181,401	266,255	121,400	174,470	177,301
800.00	15,000	176,401	261,255	116,400	169,470	172,301
800.00	20,000	171,401	256,255	111,400	164,470	167,301
1000.00	0	184,761	269,343	125,880	177,518	181,372
1000.00	5,000	179,761	264,343	120,880	172,518	176,372
1000.00	10,000	174,761	259,343	115,880	167,518	171,372
1000.00	15,000	169,761	254,343	110,880	162,518	166,372
1000.00	20,000	164,761	249,343	105,880	157,518	161,372

4 Shoreside Pacific whiting

In 2011, there were 26 vessels that participated in the Shoreside Pacific whiting fishery. About half of those vessels also fished in Alaska and none had home ports in California.

4.1 Shoreside Pacific Whiting summary

Table 11: Number of vessels per length category in the Shoreside Pacific whiting fishery

	N
Small vessel (< 80 ft)	6
Medium vessel (> 80 ft, <= 90 ft)	9
Large vessel (> 90 ft)	11

Table 12: Number of vessels by state in the Shoreside Pacific whiting fishery.

	N
Oregon	20
Washington	6
California	0

Table 13: Number of vessels in the Shoreside Pacific whiting fishery who either only fished on the West Coast or also fished in Alaska.

	N
Fished in AK	15
Only West Coast	11

Table 14: Average Shoreside Pacific whiting vessels by vessel length class.

	Small vessel (< 90 ft)	Medium vessel (> 90 ft, <= 110 ft)	Large vessel (> 110 ft)
Revenue (\$)	602,289	826,602	975,579
Variable costs (\$)	308,750	414,194	455,815
Fixed costs (\$)	133,207	205,533	306,338
Variable cost net revenue (\$)	291,336	406,639	516,768
Total cost net revenue (\$)	158,129	201,106	210,431
Variable cost (\$) per day	5,396	8,389	9,987
Variable cost (\$) per 1,000 lbs	58	58	51
Variable cost net revenue (\$) per day	4,957	8,046	9,963
Variable cost net revenue (\$) per 1,000 lbs	54	53	51
Landings (lbs)	5,334,104	7,314,004	9,064,569
Days at sea	55	53	47

Table 15: Average Shoreside Pacific Whiting vessels by home port.

	Oregon	Washington
Revenue (\$)	840,738	828,293
Variable costs (\$)	404,919	415,971
Fixed costs (\$)	197,178	345,867
Variable cost net revenue (\$)	433,044	405,225
Total cost net revenue (\$)	235,866	59,358
Variable cost (\$) per day	8,146	9,137
Variable cost (\$) per 1,000 lbs	55	54
Variable cost net revenue (\$) per day	8,222	7,887
Variable cost net revenue (\$) per 1,000 lbs	55	45
Landings (lbs)	7,542,730	7,781,053
Days at sea	52	47

4.2 Shoreside Pacific whiting EM costs

Table 16: Average total cost net revenue for Shoreside Pacific whiting vessels, the EM variable costs represent the per day cost to the vessel, the EM fixed costs represent an annual cost for leasing or purchasing the EM equipment. The costs related to observer coverage were not included, however, the daily EM variable costs can be used as a proxy for observer coverage.

EM variable costs per day	EM fixed costs per year	Small vessel (< 80 ft)	Medium vessel (> 80 ft, <= 90 ft)	Large vessel (> 90 ft)	Washington	Oregon	Fished in AK	Only West Coast
0.00	0	160,331	206,874	213,427	66,456	238,641	284,611	82,035
0.00	5,000	155,331	201,874	208,427	61,456	233,641	279,611	77,035
0.00	10,000	150,331	196,874	203,427	56,456	228,641	274,611	72,035
0.00	15,000	145,331	191,874	198,427	51,456	223,641	269,611	67,035
0.00	20,000	140,331	186,874	193,427	46,456	218,641	264,611	62,035
200.00	0	149,233	196,296	203,947	57,033	228,164	274,422	71,740
200.00	5,000	144,233	191,296	198,947	52,033	223,164	269,422	66,740
200.00	10,000	139,233	186,296	193,947	47,033	218,164	264,422	61,740
200.00	15,000	134,233	181,296	188,947	42,033	213,164	259,422	56,740
200.00	20,000	129,233	176,296	183,947	37,033	208,164	254,422	51,740
400.00	0	138,134	185,718	194,466	47,611	217,686	264,233	61,445
400.00	5,000	133,134	180,718	189,466	42,611	212,686	259,233	56,445
400.00	10,000	128,134	175,718	184,466	37,611	207,686	254,233	51,445
400.00	15,000	123,134	170,718	179,466	32,611	202,686	249,233	46,445
400.00	20,000	118,134	165,718	174,466	27,611	197,686	244,233	41,445
600.00	0	127,035	175,139	184,986	38,189	207,209	254,044	51,151
600.00	5,000	122,035	170,139	179,986	33,189	202,209	249,044	46,151
600.00	10,000	117,035	165,139	174,986	28,189	197,209	244,044	41,151
600.00	15,000	112,035	160,139	169,986	23,189	192,209	239,044	36,151
600.00	20,000	107,035	155,139	164,986	18,189	187,209	234,044	31,151
800.00	0	115,937	164,561	175,505	28,766	196,732	243,854	40,856
800.00	5,000	110,937	159,561	170,505	23,766	191,732	238,854	35,856
800.00	10,000	105,937	154,561	165,505	18,766	186,732	233,854	30,856
800.00	15,000	100,937	149,561	160,505	13,766	181,732	228,854	25,856
800.00	20,000	95,937	144,561	155,505	8,766	176,732	223,854	20,856
1000.00	0	104,838	153,983	166,025	19,344	186,254	233,665	30,561
1000.00	5,000	99,838	148,983	161,025	14,344	181,254	228,665	25,561
1000.00	10,000	94,838	143,983	156,025	9,344	176,254	223,665	20,561
1000.00	15,000	89,838	138,983	151,025	4,344	171,254	218,665	15,561
1000.00	20,000	84,838	133,983	146,025	-656	166,254	213,665	10,561

5 DTS trawl with trawl endorsement

In 2011, there were 64 vessels that participated in the DTS trawl with trawl endorsement fishery. Of those, only three fished in Alaska. Home ports were located throughout the entire West Coast. Using 2011 revenues, costs, and days at sea, the vessels that also fished in Alaska had negative total cost net revenue in 2011, and in our simulations of electronic monitoring costs, small vessels (<65 feet) started generating negative total cost net revenue when variable costs reached \$600/day. The average vessel in Newport, Charleston and Fort Bragg experience negative net revenue at relatively low levels of electronic monitoring costs. The average vessel in Washington, Astoria, Brookings, and Crescent City/Eureka never generated negative total cost net revenue in our simulations.

5.1 DTS trawl with trawl endorsement summary

Table 17: Number of vessels per length category in the DTS trawl with trawl endorsement and whether the vessels also fished in Alaska

	Fished in AK	Only West Coast
Large vessel (> 75 ft)	3	21
Medium vessel (> 65 ft, <= 75 ft)	0	21
Small vessel (< 65 ft)	0	19

Table 18: Number of vessels by port/state in the DTS trawl with trawl endorsement fishery.

	N
Washington	5
Astoria	15
Newport	9
Charleston or Coos Bay	9
Brookings	6
Crescent City or Eureka	10
Fort Bragg	6
Other California	4

Table 19: Average DTS trawl with trawl endorsement vessels split by whether the vessels fished only on the West Coast or who also fished in Alaska.

	Fished in AK	Only West Coast
Revenue (\$)	72,844	327,085
Variable costs (\$)	105,121	188,260
Fixed costs (\$)	36,051	71,204
Variable cost net revenue (\$)	-36,502	136,931
Total cost net revenue (\$)	-72,553	65,727
Variable cost (\$) per day	5,397	4,374
Variable cost (\$) per 1,000 lbs	1,126	418
Variable cost net revenue (\$) per day	-213	3,037
Variable cost net revenue (\$) per 1,000 lbs	-269	264
Landings (lbs)	111,874	511,383
Days at sea	36	47

Table 20: Average DTS trawl with trawl endorsement vessels by vessel length class.

	Small vessel (< 65 ft)	Medium vessel (> 65 ft, <= 75 ft)	Large vessel (> 75 ft)
Revenue (\$)	224,608	310,464	390,975
Variable costs (\$)	130,964	179,682	230,734
Fixed costs (\$)	64,851	81,953	62,435
Variable cost net revenue (\$)	91,916	128,909	157,910
Total cost net revenue (\$)	27,065	46,956	95,475
Variable cost (\$) per day	3,443	3,978	5,585
Variable cost (\$) per 1,000 lbs	391	380	562
Variable cost net revenue (\$) per day	2,449	2,835	3,273
Variable cost net revenue (\$) per 1,000 lbs	270	263	194
Landings (lbs)	341,986	519,892	588,105
Days at sea	40	48	50

Table 21: Average DTS trawl with trawl endorsement vessels by home port. Some ports are not shown to protect confidential information.

	WashingtonAstoria	Newport	Charleston or Coos Bay	Brookings	Crescent City or Eureka	Fort Bragg	Other California
Revenue (\$)	364,917	391,704	172,220	254,250	442,749	341,685	166,966
Variable costs (\$)	219,424	224,538	101,257	171,760	268,491	170,245	90,166
Fixed costs (\$)	52,918	65,773	59,404	76,576	80,422	74,504	36,461
Variable cost net revenue (\$)	143,984	164,328	70,010	79,839	172,186	169,583	75,291
Total cost net revenue (\$)	91,065	98,556	10,605	3,263	91,764	95,079	38,831
Variable cost (\$) per day	3,335	3,918	4,632	3,792	6,189	4,204	3,624
Variable cost (\$) per 1,000 lbs	583	334	453	566	433	421	430
Variable cost net revenue (\$) per day	1,273	2,820	2,462	2,078	4,167	4,070	3,178
Variable cost net revenue (\$) per 1,000 lbs	97	237	223	112	278	345	299
Landings (lbs)	499,720	733,296	279,656	389,867	624,116	499,474	254,202
Days at sea	69	58	26	51	45	43	36

5.2 DTS trawl with trawl endorsement EM costs

Table 22: Average total cost net revenue for DTS trawl with trawl endorsement vessels, the EM variable costs represent the per day cost to the vessel, the EM fixed costs represent an annual cost for leasing or purchasing the EM equipment. Vessels are grouped in vessel length classes and also by whether the vessel also fished in Alaska. The costs related to observer coverage were not included, however, the daily EM variable costs can be used as a proxy for observer coverage.

EM variable costs per day	EM fixed costs per year	Small vessel (< 65 ft)	Medium vessel (> 65 ft, <= 75 ft)	Large vessel (> 75 ft)	Fished in AK	Only West Coast
0.00	0	28,794	48,828	97,807	-68,328	67,620
0.00	5,000	23,794	43,828	92,807	-73,328	62,620
0.00	10,000	18,794	38,828	87,807	-78,328	57,620
0.00	15,000	13,794	33,828	82,807	-83,328	52,620
0.00	20,000	8,794	28,828	77,807	-88,328	47,620
200.00	0	20,838	39,280	87,762	-75,579	58,259
200.00	5,000	15,838	34,280	82,762	-80,579	53,259
200.00	10,000	10,838	29,280	77,762	-85,579	48,259
200.00	15,000	5,838	24,280	72,762	-90,579	43,259
200.00	20,000	838	19,280	67,762	-95,579	38,259
400.00	0	12,882	29,731	77,717	-82,829	48,899
400.00	5,000	7,882	24,731	72,717	-87,829	43,899
400.00	10,000	2,882	19,731	67,717	-92,829	38,899
400.00	15,000	-2,118	14,731	62,717	-97,829	33,899
400.00	20,000	-7,118	9,731	57,717	-102,829	28,899
600.00	0	4,926	20,183	67,673	-90,080	39,538
600.00	5,000	-74	15,183	62,673	-95,080	34,538
600.00	10,000	-5,074	10,183	57,673	-100,080	29,538
600.00	15,000	-10,074	5,183	52,673	-105,080	24,538
600.00	20,000	-15,074	183	47,673	-110,080	19,538
800.00	0	-3,030	10,634	57,628	-97,330	30,177
800.00	5,000	-8,030	5,634	52,628	-102,330	25,177
800.00	10,000	-13,030	634	47,628	-107,330	20,177
800.00	15,000	-18,030	-4,366	42,628	-112,330	15,177
800.00	20,000	-23,030	-9,366	37,628	-117,330	10,177
1000.00	0	-10,986	1,085	47,583	-104,581	20,816
1000.00	5,000	-15,986	-3,915	42,583	-109,581	15,816
1000.00	10,000	-20,986	-8,915	37,583	-114,581	10,816
1000.00	15,000	-25,986	-13,915	32,583	-119,581	5,816
1000.00	20,000	-30,986	-18,915	27,583	-124,581	816

Table 23: Average total cost net revenue for DTS trawl with trawl endorsement vessels, the EM variable costs represent the per day cost to the vessel, the EM fixed costs represent an annual cost for leasing or purchasing the EM equipment. Vessels are grouped by home port. Some ports were grouped together to protect confidential data. The costs related to observer coverage were not included, however, the daily EM variable costs can be used as a proxy for observer coverage.

EM variable costs per day	EM fixed costs per year	Washington	Astoria	Newport	Charleston or Coos Bay	Brookings	Crescent City or Eureka	Fort Bragg	Other California
0.00	0	92,575	101,394	11,558	5,914	93,835	96,935	14,184	40,339
0.00	5,000	87,575	96,394	6,558	914	88,835	91,935	9,184	35,339
0.00	10,000	82,575	91,394	1,558	-4,086	83,835	86,935	4,184	30,339
0.00	15,000	77,575	86,394	-3,442	-9,086	78,835	81,935	-816	25,339
0.00	20,000	72,575	81,394	-8,442	-14,086	73,835	76,935	-5,816	20,339
200.00	0	78,831	89,847	6,417	-4,375	84,762	88,324	7,105	33,105
200.00	5,000	73,831	84,847	1,417	-9,375	79,762	83,324	2,105	28,105
200.00	10,000	68,831	79,847	-3,583	-14,375	74,762	78,324	-2,895	23,105
200.00	15,000	63,831	74,847	-8,583	-19,375	69,762	73,324	-7,895	18,105
200.00	20,000	58,831	69,847	-13,583	-24,375	64,762	68,324	-12,895	13,105
400.00	0	65,087	78,300	1,275	-14,664	75,689	79,712	26	25,872
400.00	5,000	60,087	73,300	-3,725	-19,664	70,689	74,712	-4,974	20,872
400.00	10,000	55,087	68,300	-8,725	-24,664	65,689	69,712	-9,974	15,872
400.00	15,000	50,087	63,300	-13,725	-29,664	60,689	64,712	-14,974	10,872
400.00	20,000	45,087	58,300	-18,725	-34,664	55,689	59,712	-19,974	5,872
600.00	0	51,344	66,754	-3,866	-24,953	66,616	71,100	-7,053	18,639
600.00	5,000	46,344	61,754	-8,866	-29,953	61,616	66,100	-12,053	13,639
600.00	10,000	41,344	56,754	-13,866	-34,953	56,616	61,100	-17,053	8,639
600.00	15,000	36,344	51,754	-18,866	-39,953	51,616	56,100	-22,053	3,639
600.00	20,000	31,344	46,754	-23,866	-44,953	46,616	51,100	-27,053	-1,361
800.00	0	37,600	55,207	-9,008	-35,242	57,543	62,488	-14,133	11,406
800.00	5,000	32,600	50,207	-14,008	-40,242	52,543	57,488	-19,133	6,406
800.00	10,000	27,600	45,207	-19,008	-45,242	47,543	52,488	-24,133	1,406
800.00	15,000	22,600	40,207	-24,008	-50,242	42,543	47,488	-29,133	-3,594
800.00	20,000	17,600	35,207	-29,008	-55,242	37,543	42,488	-34,133	-8,594
1000.00	0	23,856	43,660	-14,149	-45,531	48,470	53,876	-21,212	4,172
1000.00	5,000	18,856	38,660	-19,149	-50,531	43,470	48,876	-26,212	-828
1000.00	10,000	13,856	33,660	-24,149	-55,531	38,470	43,876	-31,212	-5,828
1000.00	15,000	8,856	28,660	-29,149	-60,531	33,470	38,876	-36,212	-10,828
1000.00	20,000	3,856	23,660	-34,149	-65,531	28,470	33,876	-41,212	-15,828

6 Non-whiting, non-DTS trawl with trawl endorsement

In 2011, there were 48 vessels that participated in the Non-whiting, non-DTS trawl with trawl endorsement fishery. Of those, only four fished in Alaska. Home ports were located throughout the entire West Coast. The vessels that also fished in Alaska had negative total cost net revenue in 2011, and in our simulations of electronic monitoring costs, small vessels (<65 feet) started generating negative total cost net revenue when variable costs reached \$600/day. The average vessel in Newport, Charleston and Fort Bragg experience negative net revenue at relatively low levels of electronic monitoring costs. The average vessel in Washington, Astoria, Brookings, and Crescent City/Eureka never generated negative total cost net revenue in our simulations.

6.1 Non-whiting, non-DTS trawl with trawl endorsement summary

Table 24: Number of vessels per length category in the Non-whiting, non-DTS trawl with trawl endorsement and whether the vessels also fished in Alaska

	Fished in AK	Only West Coast
Large vessel (> 75 ft)	4	16
Medium vessel (> 65 ft, <= 75 ft)	0	11
Small vessel (< 65 ft)	0	17

Table 25: Number of vessels by port/state in the DTS trawl with trawl endorsement fishery.

	N
Washington	5
Astoria	14
Newport	8
Charleston or Coos Bay	6
Brookings	3
Crescent City or Eureka	4
Fort Bragg	4
Other California	4

Table 26: Average Non-whiting, non-DTS trawl with trawl endorsement vessels by vessel length class.

	Small vessel (< 65 ft)	Medium vessel (> 65 ft, <= 75 ft)	Large vessel (> 75 ft)
Revenue (\$)	99,368	95,449	114,262
Variable costs (\$)	52,511	52,514	74,712
Fixed costs (\$)	20,548	25,691	17,997
Variable cost net revenue (\$)	45,928	42,230	38,961
Total cost net revenue (\$)	25,380	16,539	20,965
Variable cost (\$) per day	3,180	3,615	5,235
Variable cost (\$) per 1,000 lbs	420	385	425
Variable cost net revenue (\$) per day	2,802	2,998	3,069
Variable cost net revenue (\$) per 1,000 lbs	327	320	181
Landings (lbs)	157,265	161,178	190,106
Days at sea	24	17	16

Table 27: Non-whiting, non-DTS trawl with trawl endorsement vessels by home port. Some ports are not shown to protect confidential information.

	Washington	Astoria	Newport	Charleston or Coos Bay	Brookings	Crescent City or Eureka	Fort Bragg	Other California
Revenue (\$)	172,247	165,888	68,447	63,816	20,723	31,607	118,038	62,387
Variable costs (\$)	112,632	94,033	36,889	33,376	12,325	14,170	86,269	37,716
Fixed costs (\$)	27,706	29,894	14,637	16,899	3,642	4,073	23,630	23,644
Variable cost net revenue (\$)	58,806	70,677	31,066	29,764	8,296	17,323	31,260	23,675
Total cost net revenue (\$)	31,100	40,783	16,428	12,865	4,654	13,250	7,630	31
Variable cost (\$) per day	4,073	3,573	3,137	3,486	6,859	5,515	5,938	3,937
Variable cost (\$) per 1,000 lbs	406	315	381	433	433	474	465	681
Variable cost net revenue (\$) per day	2,272	2,539	1,415	2,660	5,097	6,821	2,378	3,931
Variable cost net revenue (\$) per 1,000 lbs	232	230	135	327	307	453	231	405
Landings (lbs)	268,966	302,847	129,742	81,259	27,797	34,709	173,644	55,401
Days at sea	30	27	14	19	2	3	13	24

6.2 Non-whiting, non-DTS trawl with trawl endorsement EM costs

Table 28: Average total cost net revenue for Non-whiting, non-DTS trawl with trawl endorsement vessels, the EM variable costs represent the per day cost to the vessel, the EM fixed costs represent an annual cost for leasing or purchasing the EM equipment. Vessels are grouped in vessel length classes and also by whether the vessel also fished in Alaska. The costs related to observer coverage were not included, however, the daily EM variable costs can be used as a proxy for observer coverage.

EM variable costs per day	EM fixed costs per year	Small vessel (< 65 ft)	Medium vessel (> 65 ft, <= 75 ft)	Large vessel (> 75 ft)	Fished in AK	Only West Coast
0.00	0	26,308	17,245	21,554	2,993	24,001
0.00	5,000	21,308	12,245	16,554	-2,007	19,001
0.00	10,000	16,308	7,245	11,554	-7,007	14,001
0.00	15,000	11,308	2,245	6,554	-12,007	9,001
0.00	20,000	6,308	-2,755	1,554	-17,007	4,001
200.00	0	21,481	13,882	18,338	1,441	19,974
200.00	5,000	16,481	8,882	13,338	-3,559	14,974
200.00	10,000	11,481	3,882	8,338	-8,559	9,974
200.00	15,000	6,481	-1,118	3,338	-13,559	4,974
200.00	20,000	1,481	-6,118	-1,662	-18,559	-26
400.00	0	16,653	10,519	15,123	-110	15,948
400.00	5,000	11,653	5,519	10,123	-5,110	10,948
400.00	10,000	6,653	519	5,123	-10,110	5,948
400.00	15,000	1,653	-4,481	123	-15,110	948
400.00	20,000	-3,347	-9,481	-4,877	-20,110	-4,052
600.00	0	11,826	7,157	11,907	-1,661	11,922
600.00	5,000	6,826	2,157	6,907	-6,661	6,922
600.00	10,000	1,826	-2,843	1,907	-11,661	1,922
600.00	15,000	-3,174	-7,843	-3,093	-16,661	-3,078
600.00	20,000	-8,174	-12,843	-8,093	-21,661	-8,078
800.00	0	6,998	3,794	8,692	-3,212	7,895
800.00	5,000	1,998	-1,206	3,692	-8,212	2,895
800.00	10,000	-3,002	-6,206	-1,308	-13,212	-2,105
800.00	15,000	-8,002	-11,206	-6,308	-18,212	-7,105
800.00	20,000	-13,002	-16,206	-11,308	-23,212	-12,105
1000.00	0	2,171	431	5,476	-4,763	3,869
1000.00	5,000	-2,829	-4,569	476	-9,763	-1,131
1000.00	10,000	-7,829	-9,569	-4,524	-14,763	-6,131
1000.00	15,000	-12,829	-14,569	-9,524	-19,763	-11,131
1000.00	20,000	-17,829	-19,569	-14,524	-24,763	-16,131

Table 29: Average total cost net revenue for Non-whiting, non-DTS trawl with trawl endorsement, the EM variable costs represent the per day cost to the vessel, the EM fixed costs represent an annual cost for leasing or purchasing the EM equipment. Vessels are grouped by home port. Some ports were grouped together to protect confidential data. The costs related to observer coverage were not included, however, the daily EM variable costs can be used as a proxy for observer coverage.

EM variable costs per day	EM fixed costs per year	Washington	Astoria	Newport	Charleston or Coos Bay	Brookings	Crescent City or Eureka	Fort Bragg	Other California
0.00	0	31,909	41,962	16,920	13,541	4,756	13,364	8,140	1,027
0.00	5,000	26,909	36,962	11,920	8,541	-244	8,364	3,140	-3,973
0.00	10,000	21,909	31,962	6,920	3,541	-5,244	3,364	-1,860	-8,973
0.00	15,000	16,909	26,962	1,920	-1,459	-10,244	-1,636	-6,860	-13,973
0.00	20,000	11,909	21,962	-3,080	-6,459	-15,244	-6,636	-11,860	-18,973
200.00	0	25,888	36,615	14,057	9,782	4,387	12,844	5,508	-3,783
200.00	5,000	20,888	31,615	9,057	4,782	-613	7,844	508	-8,783
200.00	10,000	15,888	26,615	4,057	-218	-5,613	2,844	-4,492	-13,783
200.00	15,000	10,888	21,615	-943	-5,218	-10,613	-2,156	-9,492	-18,783
200.00	20,000	5,888	16,615	-5,943	-10,218	-15,613	-7,156	-14,492	-23,783
400.00	0	19,868	31,269	11,194	6,023	4,017	12,323	2,877	-8,593
400.00	5,000	14,868	26,269	6,194	1,023	-983	7,323	-2,123	-13,593
400.00	10,000	9,868	21,269	1,194	-3,977	-5,983	2,323	-7,123	-18,593
400.00	15,000	4,868	16,269	-3,806	-8,977	-10,983	-2,677	-12,123	-23,593
400.00	20,000	-132	11,269	-8,806	-13,977	-15,983	-7,677	-17,123	-28,593
600.00	0	13,847	25,922	8,331	2,265	3,648	11,803	246	-13,403
600.00	5,000	8,847	20,922	3,331	-2,735	-1,352	6,803	-4,754	-18,403
600.00	10,000	3,847	15,922	-1,669	-7,735	-6,352	1,803	-9,754	-23,403
600.00	15,000	-1,153	10,922	-6,669	-12,735	-11,352	-3,197	-14,754	-28,403
600.00	20,000	-6,153	5,922	-11,669	-17,735	-16,352	-8,197	-19,754	-33,403
800.00	0	7,827	20,575	5,467	-1,494	3,279	11,283	-2,385	-18,214
800.00	5,000	2,827	15,575	467	-6,494	-1,721	6,283	-7,385	-23,214
800.00	10,000	-2,173	10,575	-4,533	-11,494	-6,721	1,283	-12,385	-28,214
800.00	15,000	-7,173	5,575	-9,533	-16,494	-11,721	-3,717	-17,385	-33,214
800.00	20,000	-12,173	575	-14,533	-21,494	-16,721	-8,717	-22,385	-38,214
1000.00	0	1,806	15,229	2,604	-5,252	2,910	10,762	-5,017	-23,024
1000.00	5,000	-3,194	10,229	-2,396	-10,252	-2,090	5,762	-10,017	-28,024
1000.00	10,000	-8,194	5,229	-7,396	-15,252	-7,090	762	-15,017	-33,024
1000.00	15,000	-13,194	229	-12,396	-20,252	-12,090	-4,238	-20,017	-38,024
1000.00	20,000	-18,194	-4,771	-17,396	-25,252	-17,090	-9,238	-25,017	-43,024

7 Groundfish fixed gear with trawl endorsement

In 2011, there were 24 vessels that participated in the Groundfish fixed gear with trawl endorsement fishery. Of those, only four fished in Alaska. Home ports were located throughout the entire West Coast. Using 2011 revenues, costs, and days at sea, the average vessel fishing in Northern Oregon had negative net revenue, all other vessels had positive total cost net revenue, ranging, on average, from \$33 thousand to \$75 thousand. Taking into account the potential costs of electronic monitoring, small and medium sized vessels (≤ 60 feet) maintained positive total cost net revenue, while, large vessels when electronic monitoring costs reached \$800/day and annual fixed costs were at least \$15 thousand. Aside from Northern Oregon vessels which had negative total cost net revenue before electronic monitoring costs were taken into account, Southern California was the only other group by vessels that experienced negative total cost net revenue once electronic monitoring costs were taken into account.

7.1 Groundfish fixed gear with trawl endorsement summary

Table 30: Number of vessels per length category in the Groundfish fixed gear with trawl endorsement.

	N
Small vessel (< 50 ft)	8
Medium vessel (> 50 ft, <= 60 ft)	8
Large vessel (> 60 ft)	8

Table 31: Number of Groundfish fixed gear with trawl endorsement vessels that fished in Alaska or only on the West Coast.

	N
Fished in AK	4
Only West Coast	20

Table 32: Number of vessels by port/state in the DTS trawl with trawl endorsement fishery.

	N
Washington	5
Northern Oregon	5
Southern Oregon	6
Northern California	4
Southern California	4

Table 33: Average Groundfish fixed gear with trawl endorsement vessels by vessel length class.

	Small vessel (< 50 ft)	Medium vessel (> 50 ft, <= 60 ft)	Large vessel (> 60 ft)
Revenue (\$)	163,820	360,959	340,568
Variable costs (\$)	79,464	166,213	180,315
Fixed costs (\$)	27,926	46,376	119,305
Variable cost net revenue (\$)	83,175	192,188	159,359
Total cost net revenue (\$)	55,249	145,811	40,053
Variable cost (\$) per day	2,363	5,311	4,842
Variable cost (\$) per 1,000 lbs	1,635	1,595	1,680
Variable cost net revenue (\$) per day	2,046	5,992	3,764
Variable cost net revenue (\$) per 1,000 lbs	1,190	1,575	1,098
Landings (lbs)	62,029	117,743	110,257
Days at sea	33	30	33

Table 34: Groundfish fixed gear with trawl endorsement vessels by home port.

	Washington	Northern Oregon	Southern Oregon	Northern California	Southern California
Revenue (\$)	293,922	353,793	364,083	182,748	192,178
Variable costs (\$)	121,891	222,909	154,817	67,689	121,071
Fixed costs (\$)	69,453	150,966	33,918	23,883	36,930
Variable cost net revenue (\$)	170,169	129,304	208,535	112,578	69,721
Total cost net revenue (\$)	100,716	-21,662	174,617	88,695	32,791
Variable cost (\$) per day	4,065	4,288	5,561	2,911	3,339
Variable cost (\$) per 1,000 lbs	1,442	1,801	1,725	1,403	1,774
Variable cost net revenue (\$) per day	4,321	2,473	6,916	3,152	1,587
Variable cost net revenue (\$) per 1,000 lbs	1,563	984	1,909	873	805
Landings (lbs)	82,170	153,163	94,455	65,107	79,103
Days at sea	31	39	27	25	40

7.2 Groundfish fixed gear with trawl endorsement EM costs

Table 35: Average total cost net revenue for Groundfish fixed gear with trawl endorsement vessels, the EM variable costs represent the per day cost to the vessel, the EM fixed costs represent an annual cost for leasing or purchasing the EM equipment. Vessels are grouped in vessel length classes and also by whether the vessel also fished in Alaska. The costs related to observer coverage were not included, however, the daily EM variable costs can be used as a proxy for observer coverage.

EM variable costs per day	EM fixed costs per year	Small vessel (< 50 ft)	Medium vessel (> 50 ft, <= 60 ft)	Large vessel (> 60 ft)	Fished in AK	Only West Coast
0.00	0	56,430	148,370	40,948	186,074	61,084
0.00	5,000	51,430	143,370	35,948	181,074	56,084
0.00	10,000	46,430	138,370	30,948	176,074	51,084
0.00	15,000	41,430	133,370	25,948	171,074	46,084
0.00	20,000	36,430	128,370	20,948	166,074	41,084
200.00	0	49,745	142,335	34,340	177,606	55,047
200.00	5,000	44,745	137,335	29,340	172,606	50,047
200.00	10,000	39,745	132,335	24,340	167,606	45,047
200.00	15,000	34,745	127,335	19,340	162,606	40,047
200.00	20,000	29,745	122,335	14,340	157,606	35,047
400.00	0	43,061	136,301	27,732	169,137	49,010
400.00	5,000	38,061	131,301	22,732	164,137	44,010
400.00	10,000	33,061	126,301	17,732	159,137	39,010
400.00	15,000	28,061	121,301	12,732	154,137	34,010
400.00	20,000	23,061	116,301	7,732	149,137	29,010
600.00	0	36,376	130,266	21,123	160,669	42,972
600.00	5,000	31,376	125,266	16,123	155,669	37,972
600.00	10,000	26,376	120,266	11,123	150,669	32,972
600.00	15,000	21,376	115,266	6,123	145,669	27,972
600.00	20,000	16,376	110,266	1,123	140,669	22,972
800.00	0	29,691	124,231	14,515	152,201	36,935
800.00	5,000	24,691	119,231	9,515	147,201	31,935
800.00	10,000	19,691	114,231	4,515	142,201	26,935
800.00	15,000	14,691	109,231	-485	137,201	21,935
800.00	20,000	9,691	104,231	-5,485	132,201	16,935
1000.00	0	23,007	118,197	7,907	143,733	30,898
1000.00	5,000	18,007	113,197	2,907	138,733	25,898
1000.00	10,000	13,007	108,197	-2,093	133,733	20,898
1000.00	15,000	8,007	103,197	-7,093	128,733	15,898
1000.00	20,000	3,007	98,197	-12,093	123,733	10,898

Table 36: Average total cost net revenue for Groundfish fixed gear with trawl endorsement, the EM variable costs represent the per day cost to the vessel, the EM fixed costs represent an annual cost for leasing or purchasing the EM equipment. Vessels are grouped by home port. Some ports were grouped together to protect confidential data. The costs related to observer coverage were not included, however, the daily EM variable costs can be used as a proxy for observer coverage.

EM variable costs per day	EM fixed costs per year	Washington	Northern Oregon	Southern Oregon	Northern California	Southern California
0.00	0	102,578	-20,082	175,348	91,176	34,177
0.00	5,000	97,578	-25,082	170,348	86,176	29,177
0.00	10,000	92,578	-30,082	165,348	81,176	24,177
0.00	15,000	87,578	-35,082	160,348	76,176	19,177
0.00	20,000	82,578	-40,082	155,348	71,176	14,177
200.00	0	96,327	-27,798	169,917	86,102	26,202
200.00	5,000	91,327	-32,798	164,917	81,102	21,202
200.00	10,000	86,327	-37,798	159,917	76,102	16,202
200.00	15,000	81,327	-42,798	154,917	71,102	11,202
200.00	20,000	76,327	-47,798	149,917	66,102	6,202
400.00	0	90,077	-35,515	164,486	81,028	18,226
400.00	5,000	85,077	-40,515	159,486	76,028	13,226
400.00	10,000	80,077	-45,515	154,486	71,028	8,226
400.00	15,000	75,077	-50,515	149,486	66,028	3,226
400.00	20,000	70,077	-55,515	144,486	61,028	-1,774
600.00	0	83,827	-43,231	159,054	75,954	10,251
600.00	5,000	78,827	-48,231	154,054	70,954	5,251
600.00	10,000	73,827	-53,231	149,054	65,954	251
600.00	15,000	68,827	-58,231	144,054	60,954	-4,749
600.00	20,000	63,827	-63,231	139,054	55,954	-9,749
800.00	0	77,577	-50,947	153,623	70,880	2,275
800.00	5,000	72,577	-55,947	148,623	65,880	-2,725
800.00	10,000	67,577	-60,947	143,623	60,880	-7,725
800.00	15,000	62,577	-65,947	138,623	55,880	-12,725
800.00	20,000	57,577	-70,947	133,623	50,880	-17,725
1000.00	0	71,326	-58,663	148,192	65,806	-5,700
1000.00	5,000	66,326	-63,663	143,192	60,806	-10,700
1000.00	10,000	61,326	-68,663	138,192	55,806	-15,700
1000.00	15,000	56,326	-73,663	133,192	50,806	-20,700
1000.00	20,000	51,326	-78,663	128,192	45,806	-25,700