

Economic Data Collection Program  
Catcher-Processor Report (2009-2012)

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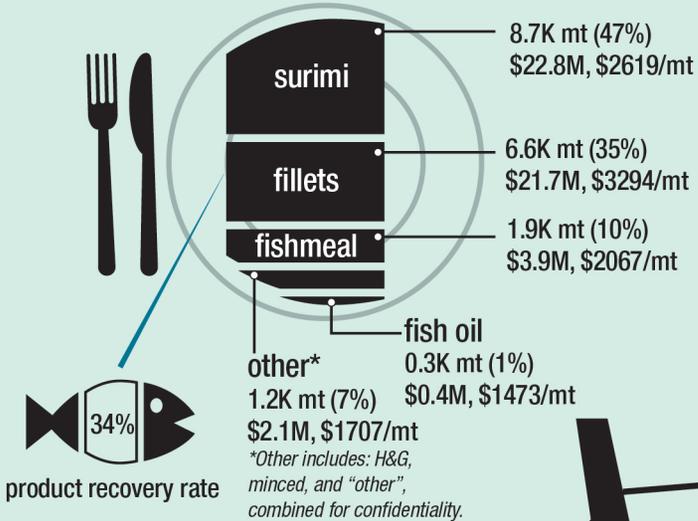
February 5, 2015

<sup>1</sup> For questions or comments, please contact the EDC Program at [nwfsc.edc@noaa.gov](mailto:nwfsc.edc@noaa.gov).

# 2012 Economic Data Collection (EDC) West Coast Groundfish Catch Share Program

## CATCHER PROCESSOR

### PACIFIC WHITING FLEET-WIDE PRODUCTION SUMMARY



### ECONOMIC SUMMARY\*

#### Vessel Average

\$5.7M revenue  
\$2.7M variable costs  
\$3M variable cost net revenue  
\$1.2M fixed cost  
\$1.8M total cost net revenue

\$91K variable cost net revenue per day

#### Fleet-wide Totals

9 vessels  
\$51M revenue  
\$27M variable cost net revenue  
\$16.3M total cost net revenue

### FISHERY PARTICIPATION

	Days at Sea
Average days fishing, processing, and steaming on the West Coast	33
Average days steaming to and from Alaska	18
Average days in Alaska	150

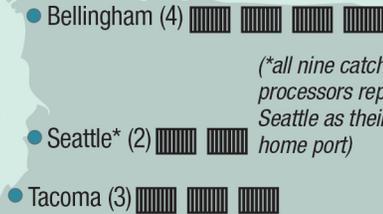
### ALASKA PARTICIPATION

9 WC vessels  
316K mt fleet-wide catch



### WC DELIVERY PORTS

# of vessels offloading in each port



2.1K mt annual production per vessel

### TOTAL US PACIFIC WHITING TAC

135,480 mt

### TOTAL CATCH

55,263 mt

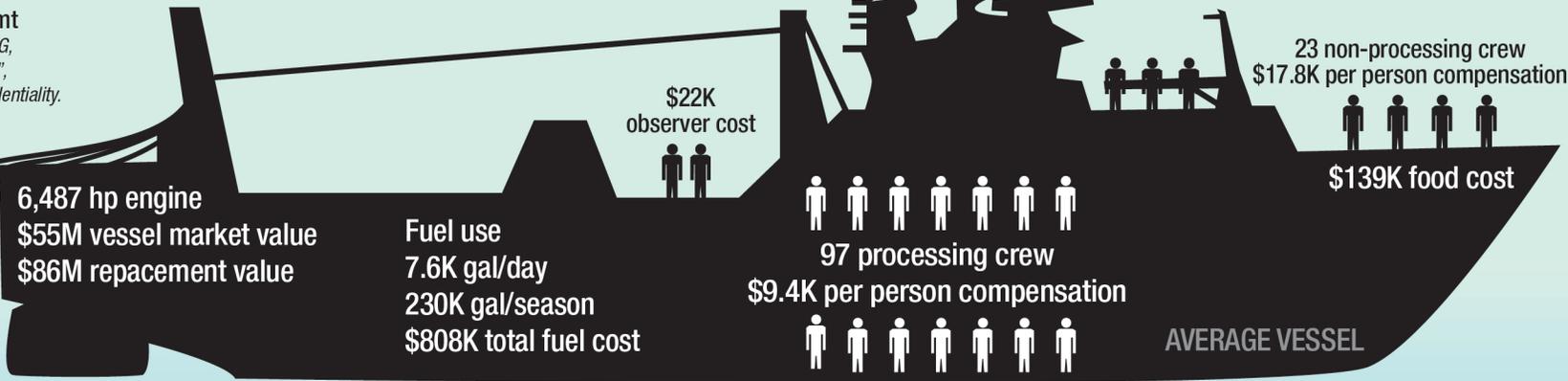
### vessel length

### TOTAL CP PACIFIC WHITING ALLOCATION

55,584 mt (34% of U.S. TAC)

### CP ALLOCATION BY COMPANY\*\*

American Seafoods	49.4%
Trident Seafoods Corp	29.6%
Glacier Fish	21.0%



### AVERAGE VESSEL

Vessel	Length (ft)	Company
American Dynasty 801	271	American Dynasty
Seattle Enterprise 2,551	272	Seattle Enterprise
Kodiak Enterprise 6,974	276	Kodiak Enterprise
Pacific Glacier 3,957	277	Pacific Glacier
American Triumph 7,932	286	American Triumph
Island Enterprise 5,266	304	Island Enterprise
Northern Eagle 3,045	341	Northern Eagle
Northern Jaeger 9,811	368	Northern Jaeger
Alaska Ocean 6,023	376	Alaska Ocean

Harvest\*\*

\*Note that some off-board costs are not collected. Therefore reported net revenue is an overestimate of actual net revenue.

\*\* PWCC Amendment 20 Catcher/Processor Cooperative Annual Report 2012.

# Catcher-Processor Sector: 2012 Highlights

In 2012, the West Coast at-sea catcher-processor fleet consisted of nine catcher-processors, owned by three companies, that harvest Pacific whiting on the West Coast.

- Catcher-processor vessels spent an average of 33 days fishing, processing, and steaming along the West Coast, primarily in June-November.
- The majority of the fleet's time (about 80%) is spent fishing Alaska pollock in the Bering Sea and Aleutian Islands off Alaska.
- West Coast catcher-processors deliver to three ports: Bellingham, Seattle, and Tacoma. All nine vessels listed Seattle as their homeport.
- The catcher-processor sector caught nearly all of their allocated 55,584 mt of Pacific whiting.
- The average first-wholesale revenue per vessel was close to \$5.65 million. Fillet and surimi production made up 87% of the total production value.
- Fillets received an average price of \$3,300 per metric ton, followed by surimi and fishmeal at \$2,600 and \$2,100 per metric ton, respectively.
- Close to an average of 100 processing and 23 non-processing crewmembers worked on each catcher-processor vessel. Average compensation for each processing and non-processing crewmember was about \$9,400 and \$17,800, respectively.
- Average variable cost net revenue (revenue minus variable costs) was \$2.98 million in 2012, which was a decrease from \$3.47 million in 2011 and \$3.84 million in 2009.<sup>1</sup>
- Average total cost net revenue (revenue minus both variable and fixed costs) per vessel was \$1.8 million in 2012 (Figure 10). Average total cost net revenue per metric ton produced was \$670 in 2012; a decrease of 7% from 2011 to 2012 (Table 10.3).

Infographic created by Su Kim, Scientific Communications Office, Northwest Fisheries Science Center.

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<sup>1</sup> Values reported in inflation adjusted 2012 dollars.

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The Economic Data Collection (EDC) Program and EDC Reports reflect collaboration and coordination of individuals across the West Coast. There are numerous individuals to thank for their contributions to this effort.

We would like to acknowledge the efforts of all the Northwest Fisheries Science Center (NWFSC) economists who provided a wide range of input into survey design, implementation, and analysis. The group worked together in an effort to provide high quality data that can be distributed in a timely and secure fashion. We thank Su Kim of the NWFSC Scientific Communications Office for producing the infographic on the second page of this report.

We appreciate the efforts of the Northwest Regional Office for support in the EDC Program development, outreach, and communication efforts. The Permit Office staff was particularly instrumental in ensuring coordination with the mandatory participation requirements.

The Northwest Division of the Office of Law Enforcement (OLE) and the National Oceanic and Atmospheric Administration (NOAA) Office of General Council helped extensively with many aspects of the EDC Program development and enforcement. They continue to cooperate with the EDC Program to ensure compliance. We thank the Northwest Fisheries Science Center Scientific Data Management staff for building an extremely useful administrative tracking system and database.

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We thank the Pacific Fishery Management Council and advisory bodies for their valuable comments on the EDC reports and data.

Finally and very importantly, we thank the members of the West Coast fishing industry who met with us to discuss the survey development and interpretation of the information collected. We appreciate the time and effort of each participant in the program.

# Report Introduction

## About the Report

The US West Coast groundfish fishery takes place off the coasts of Washington, Oregon and California, and is comprised of over 90 different species of fish. The fish are harvested both commercially and recreationally. The commercial fishery has four components: limited entry with a trawl endorsement, limited entry with a fixed gear endorsement, open access, and tribal.<sup>2</sup> In January 2011, the West Coast Limited Entry Groundfish Trawl fishery transitioned to the West Coast Groundfish Trawl Catch Share Program. The catch share program consists of cooperatives for the at-sea mothership (including catcher vessels and motherships) and catcher-processor fleets, and an individual fishing quota (IFQ) program for the shorebased trawl fleet.<sup>3</sup> The Economic Data Collection (EDC) Program is a mandatory component of the West Coast Groundfish Trawl Catch Share Program, collecting information annually from all catch share participants: catcher-processors, catcher vessels, motherships, first receivers, and shorebased processors.<sup>4</sup> The EDC information is used to monitor the economic effects of the catch share program, and collects information on operating costs, revenues, and vessel and processing facility characteristics.

This report summarizes information collected from the West Coast catcher-processor vessels. The EDC reports are also produced for the other sectors,<sup>4</sup> and currently cover the years 2009 to 2012. The 2009 and 2010 data were collected in 2011 to provide a baseline of pre-catch share information. There is a one year lag in collecting the EDC data to allow companies to close their accounting books. Thus, 2012 data were collected in September 2013. The EDC reports are updated annually to disseminate the data collected and provide background, analysis, and context to support the interpretation of the data. The reports are also expected to provide a useful catalyst for feedback on the data collected and its analysis. It is envisioned that the scope of these reports will expand, and the methods used will be refined with each annual publication.

The report is composed of two major sections. The first section, Catcher-Processor Overview (beginning on page 9), is an in-depth summary that contains descriptive analyses of the catcher-processor fleet focusing on activities during 2012. The second section, Catcher-Processor Data Summaries (beginning on page 20), provides tables of all of the data collected from 2009 to 2012, with a detailed discussion of the methods used to collect and analyze the data. The tables summarize responses for each EDC form question, as well as net revenue and economic performance rates. The data that form the basis for this report are confidential and must be aggregated so that individual responses are protected. In cases where there are not enough observations to protect confidentiality, the data are either not shown,

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<sup>2</sup> For more information about West Coast Groundfish, see [www.westcoast.fisheries.noaa.gov/fisheries/groundfish/](http://www.westcoast.fisheries.noaa.gov/fisheries/groundfish/).

<sup>3</sup> More information about the West Coast Groundfish Trawl Catch Share Program is available online at [www.westcoast.fisheries.noaa.gov/fisheries/groundfish\\_catch\\_shares/](http://www.westcoast.fisheries.noaa.gov/fisheries/groundfish_catch_shares/).

<sup>4</sup> Please see the EDC website, [www.nwfsc.noaa.gov/edc](http://www.nwfsc.noaa.gov/edc), for links to the forms used to collect the EDC data and for previous year's reports.

or are combined with broader groups of data. More information about EDC Program administration and fielding of the surveys, the EDC forms, data quality controls and quality checks, data processing, and safeguarding confidential information can be found in the EDC Administration and Operations Report.<sup>4</sup>

## **Background - Economic Data Collection and West Coast Groundfish Trawl Catch Share Program**

The economic benefits of the West Coast groundfish trawl fishery and the distribution of these benefits are expected to change under the West Coast groundfish trawl catch share program. To monitor these changes, the Pacific Fishery Management Council (PFMC) proposed the implementation of the mandatory collection of economic data. Using data collected from industry participants, the EDC Program monitors whether the goals of the catch share program have been met.<sup>5</sup>

Many of the PFMC's goals for the catch share program are economic in nature. These goals include: provide for a viable, profitable, and efficient groundfish fishery; increase operational flexibility; minimize adverse effects from an IFQ program on fishing communities and other fisheries to the extent practical; promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry; provide quality product for the consumer; and, increase safety in the fishery.

The EDC program is also intended to help meet the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 2007 requirement to determine whether a catch share program is meeting its goals, and whether there are any necessary modifications of the program to meet those goals. The MSA requires a formal review 5 years after the implementation of a catch share program to which the EDC program will make a valuable contribution.

Monitoring the economic effects of a catch share program requires a variety of economic data and analyses. The primary effects of a catch share program can be captured in two broad types of economic analysis: 1) economic performance measures, and 2) regional economic impact analysis. Both of these require information on the costs and earnings of harvesters and processors.

Economic performance measures include: costs, earnings, and profitability (net revenue); economic efficiency; capacity measures; economic stability; net benefits to society; distribution of economic net benefits; product quality; functioning of the quota market; incentives to reduce bycatch; market power; and, spillover effects in other fisheries. Some of these measures are presented in this report, while others will require more specific and involved analysis using EDC data.

Regional economic impact analysis measures the effects of the program on regional economies. In general, the catch share program will likely affect different regional economies in different ways. Regional

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<sup>5</sup> For more information about the EDC program and the West Coast Groundfish Trawl Catch Share Program, please see the Economic Data Collection Program, Administration and Operations Report available at the EDC website: [www.nwfsc.noaa.gov/edc](http://www.nwfsc.noaa.gov/edc)

economic modeling involves tracking the expenditures of all businesses, households, and institutions within a given geographic region to arrive at the effects on income and employment. On the Pacific coast, the Northwest Fishery Science Center's IO-PAC model is used to estimate regional economic impacts.<sup>6</sup>

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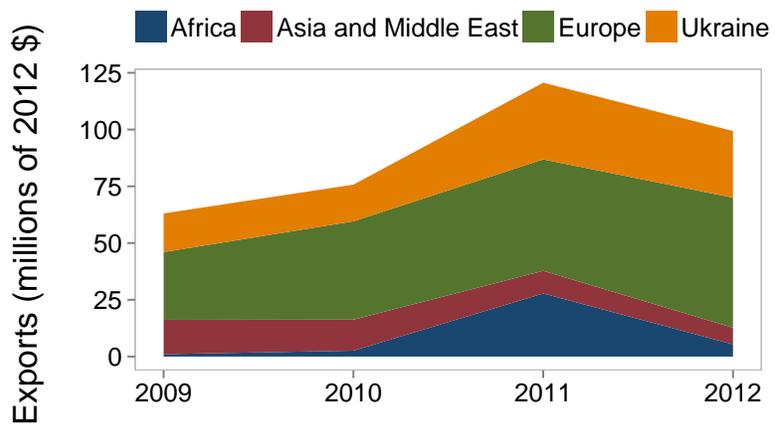
<sup>6</sup> Leonard, J., and P. Watson. 2011. Description of the input-output model for Pacific Coast fisheries. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-111, 64 p.

# CATCHER-PROCESSOR OVERVIEW

## Management Context

In January 2011, the West Coast Limited Entry Groundfish Trawl fishery transitioned to the West Coast Groundfish Trawl Catch Share Program. The catch share program consists of an individual fishing quota (IFQ) program for the shorebased trawl fleet and cooperatives for the at-sea mothership (including catcher vessels and motherships) and catcher-processor fleets. Catcher-processors are vessels that both catch fish and process them on-board. The At-sea Pacific whiting fishery also includes motherships, which are factory vessels that only process fish at sea, and catcher vessels that catch fish and then deliver to motherships.<sup>1</sup> In 2012, the catcher-processor sector generated \$75 million in income and 1,431 jobs from Pacific whiting caught in the catch share program.<sup>2</sup>

From the 1960s through 1990, foreign vessels processed most of the relatively small amount of Pacific whiting harvested off the West Coast. The U.S. outlawed the use of foreign vessels in 1990, and domestic catcher-processor and mothership vessels entered the fishery between Alaska pollock fishing seasons. The Pacific whiting sector grew rapidly in the 1990s with the development of a production process to transform Pacific whiting into surimi, a product popular in Asia, and used as an ingredient in imitation crab. The whiting fishery subsequently transformed into one of the largest fisheries by volume in the United States. In recent years the market for fillets has also grown.<sup>3</sup>



**Figure 1:** Total exports of fresh and frozen Pacific whiting (including mothership, catcher-processor, and shoreside production) from the state of Washington by recipient region (millions of 2012 \$).

The development of new international markets for smaller, unprocessed fish, and the Marine Stewardship

<sup>1</sup> 50 CFR 660.131 - Pacific whiting fishery management measures

<sup>2</sup> The values were calculated using the IO-PAC model of the NWFSC. For more information about the IO-PAC model, see Leonard, J., and P. Watson. 2011. Description of the input-output model for Pacific Coast fisheries. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-111, 64 p.

<sup>3</sup> [www.fishwatch.gov/seafood\\_profiles/species/whiting/species\\_pages/pacific\\_whiting.htm](http://www.fishwatch.gov/seafood_profiles/species/whiting/species_pages/pacific_whiting.htm)

Council (MSC) certification<sup>4</sup> in 2009 that permitted Pacific whiting products into the European Union also likely had an impact on demand for Pacific whiting, as did the development of new production technologies for fillets and surimi. In 2012, most of the U.S. Pacific whiting exports went to the European Union, followed by Ukraine, Russia, and China, among others (Figure 1).<sup>5</sup>

The catcher-processor fleet on the West Coast has operated as a cooperative since 1997, when the Pacific Whiting Conservation Cooperative (PWCC) was formed. The PWCC consists of three companies and all the catcher-processor vessels that currently participate in the Pacific whiting fishery on the West Coast. The primary function of the PWCC is to coordinate harvesting efforts of the catcher-processor vessels. While the 2011 catch share program dramatically changed the structure of the shoreside Pacific whiting and mothership fisheries, the catcher-processor sector experienced fewer changes, and has continued to operate as a single cooperative.

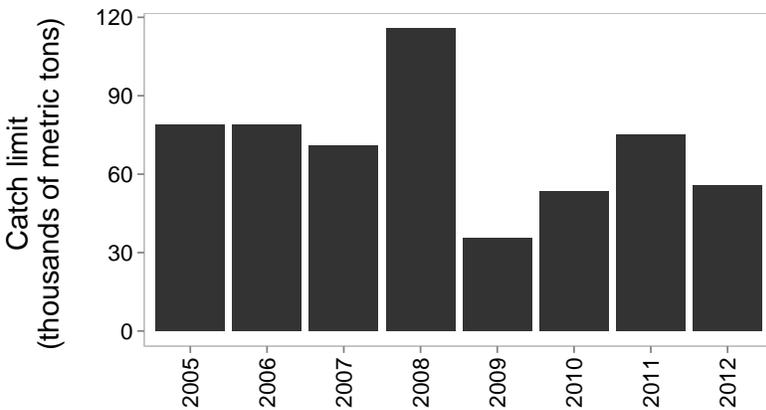
The Pacific Fishery Management Council and National Marine Fisheries Service are responsible for managing the U.S. fishery for the coastal stock of the Pacific whiting. Managers mainly use annual harvest quotas to regulate the coast-wide catch of Pacific whiting. Federal regulations prohibit at-sea processing south of the Oregon-California border. Pacific whiting is managed through a bilateral agreement between the United States and Canada, known as the Pacific Whiting Treaty. The United States and Canada signed an agreement in 2003 (which became law in 2007) that allocates a set percentage of the harvest quota to American and Canadian harvesters. The United States is allocated 73.88% and Canada the remaining 26.12%. Once the total allowable catch of Pacific whiting has been determined and the tribal sector's share has been apportioned, the remaining U.S. proportion is then allocated between the catcher-processor, mothership, and shoreside sectors. The catcher-processor sector is allocated 34%, and the mothership and shoreside sectors are allocated 24% and 42%, respectively (Figure 2). Towards the end of the season, NMFS often redistributes unfished tribal allocation amongst the three commercial sectors according to the same proportions. Commercial allocation may also be redistributed between sectors.<sup>6</sup>

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<sup>4</sup> The MSC seal of approval means that the West Coast Pacific whiting fishery has met the MSC standard for "good management practices to safeguard jobs, secure fish stocks for the future and to help to protect the marine environment". [www.msc.org/track-a-fishery/fisheries-in-the-program/certified/pacific/pacific-hake-mid-water-trawl](http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/pacific/pacific-hake-mid-water-trawl) This certification has opened new markets, largely in the European Union, for Pacific whiting. [www.st.nmfs.noaa.gov/commercial-fisheries/foreign-trade/index](http://www.st.nmfs.noaa.gov/commercial-fisheries/foreign-trade/index)

<sup>5</sup>

<sup>6</sup> For example in 2008, catcher-processors received an additional 36,724 metric tons of whiting allocation over the original catch limit from the shorebased and mothership surplus Pacific whiting. For allocation and season catch summaries going back through 2005, see [www.westcoast.fisheries.noaa.gov/fisheries/management/whiting/whiting\\_reports\\_and\\_rulemakings.html](http://www.westcoast.fisheries.noaa.gov/fisheries/management/whiting/whiting_reports_and_rulemakings.html)



**Figure 2:** Catcher-processor sector Pacific whiting catch limits, including any reapportionments among sectors that may have occurred during the season (thousands of metric tons).

The catcher processor sector had low catch during the baseline EDC years (2009 and 2010) because of relatively small catch limits. After several seasons of large Pacific whiting harvests from 2006-2008, managers lowered the catch limit substantially in 2009, with a slight increase in 2010 (Figure 2). Low harvest levels and a large recruitment class in 2010 encouraged management to increase the catch limit again

in 2011 to 2005-2007 levels. In 2012, updated projections resulted in a lower-than-usual catch limit.<sup>7</sup> Because of high variability in recruitment and other sources of uncertainty in the stock assessment, catch limits have varied substantially during the EDC collections of 2009-2012. In 2012, the at-sea catcher-processor sector was allocated 55,584 metric tons of Pacific whiting; this was about 20,000 metric tons less than the allocation in 2011, and 2,200 metric tons more than the allocation in 2010 (see Catcher-Processor Data Summaries, Table 6.1). The catcher-processor fleet has typically caught nearly all of its catch limit of Pacific whiting in recent years. The average catch per vessel was 6,140 metric tons in 2012, and the fleet as whole caught 55,263 metric tons of Pacific whiting.

In addition to coordinating harvesting efforts among the catcher-processor vessels, the PWCC engages in voluntary bycatch avoidance initiatives as part of an effort to reduce the incidental catch of species of concern, such as the Endangered Species Act listed Pacific salmon and overfished rockfish. The catcher-processor fleet also caught about four prohibited and protected species per every 100 metric tons of Pacific whiting in 2012, mostly Chinook salmon, but also chum salmon, coho salmon, pink salmon, eulachon, and Pacific Halibut.<sup>8</sup> Since 2005, NOAA Fisheries has established mandatory bycatch limits in the At-sea Pacific whiting fishery for four species of rockfish that have been designated “overfished”: Pacific ocean perch, canary rockfish, darkblotched rockfish, and widow rockfish. Levels of rockfish bycatch allowed vary by year and species. In 2012, the catcher-processor sector was allocated 10.2 metric tons of Pacific ocean perch, 86.7 metric tons of widow rockfish, 8.5 metric tons of dark blotched rockfish, and 5.0 metric tons of canary rockfish. The vessels caught less than 30% of the allocated Pacific ocean perch, 50% of the widow rockfish, less than 30% of the allocated darkblotched rockfish, and 3% of the allocated canary rockfish. The At-sea Pacific whiting fishery on the West Coast has an average bycatch rate of less than 1% of the total Pacific whiting catch.<sup>9</sup>

<sup>7</sup> <http://www.pcouncil.org/groundfish/stock-assessments/by-species/pacific-whiting-hake/>

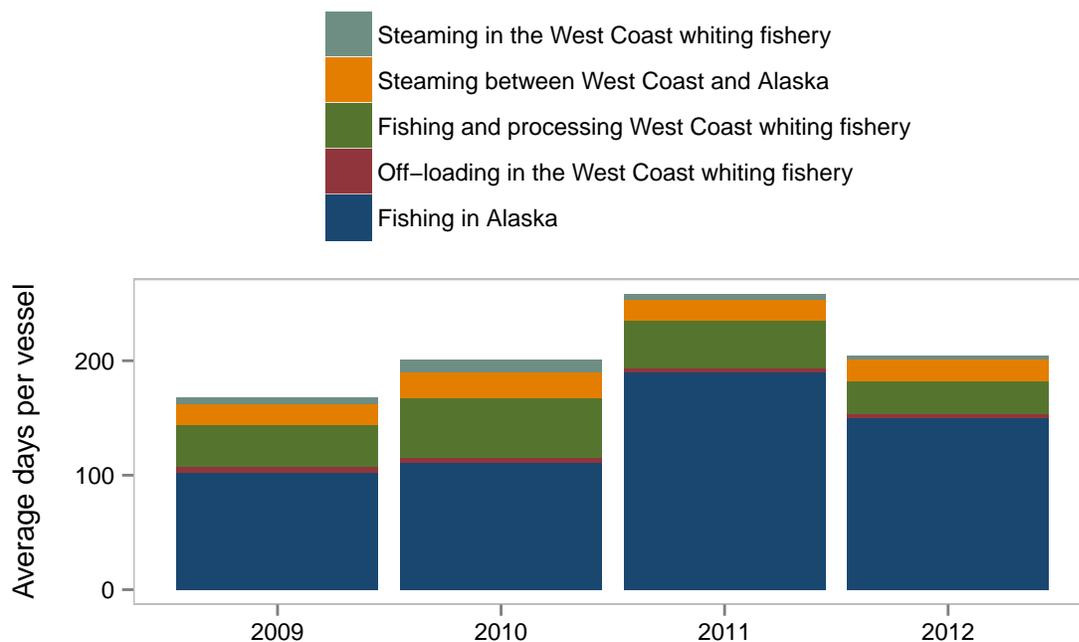
<sup>8</sup> Pacific Whiting Conservation Cooperative Amendment 20 Catcher/Processor Cooperative Final Annual Report 2012, [http://www.pcouncil.org/wp-content/uploads/D2b\\_ATT2\\_CP\\_RPT\\_APR2013BB.pdf](http://www.pcouncil.org/wp-content/uploads/D2b_ATT2_CP_RPT_APR2013BB.pdf)

<sup>9</sup> [www.pcouncil.org/wp-content/uploads/INFO\\_RPT3\\_PWCC\\_Am20\\_-NOV2012BB.pdf](http://www.pcouncil.org/wp-content/uploads/INFO_RPT3_PWCC_Am20_-NOV2012BB.pdf)

## Catcher-Processor Sector Description

In 2012, the West Coast at-sea catcher-processor fleet consisted of 9 catcher-processors owned by three companies that harvest Pacific whiting (Pacific hake) *Merluccius productus* on the West Coast. Catcher-processors are large vessels with an average length of 304 feet. The average horsepower of the main engines was 6,500 in 2012. Average fuel capacity is about 270,000 gallons. The West Coast catcher-processor fleet caught approximately 11% of all West Coast fish, 31% of all Groundfish Trawl Catch Share Program fish, and 34% of Pacific whiting. Pacific whiting is typically found off the western coast of North America, from Southern Baja California to the Gulf of Alaska, and is a migratory coastal stock that moves northward in the summer and southward in the winter.

The catcher-processors also participate in fisheries in Alaska. In fact, the catcher-processor fleet spends 80% of their total days (days fishing, processing, and steaming on the fishing grounds) fishing Alaska pollock in the Bering Sea and Aleutian Islands (Figure 3). In 2012, the average catcher-processor spent 18 days steaming between the West Coast and Alaska. A summary of catcher-processor fleet activity is available in Catcher-Processor Data Summaries, Table 2.1.



**Figure 3:** Average number of days spent in each activity per catcher-processor vessel.

The West Coast At-sea Pacific whiting season is open from May 15 through December. Fishing primarily takes place between June and November, with fishing sometimes continuing through December. Catcher-processor vessels spent an average of 33 days engaged in fishing activities on the West Coast in 2012. About 90% of the days at sea were spent catching and processing fish, while the remaining

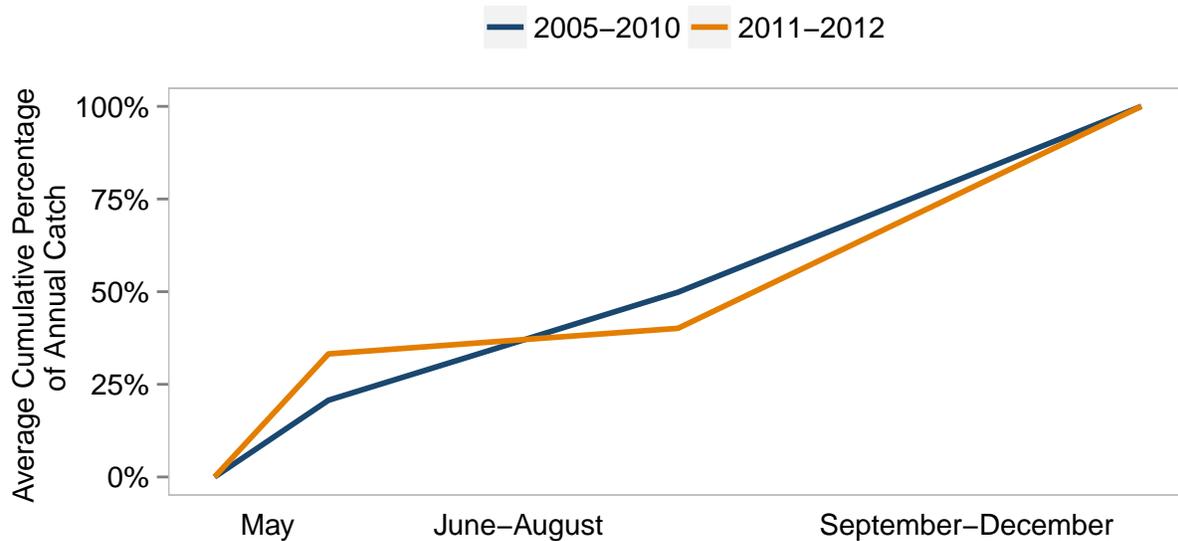


Figure 4: Cumulative catch by month.

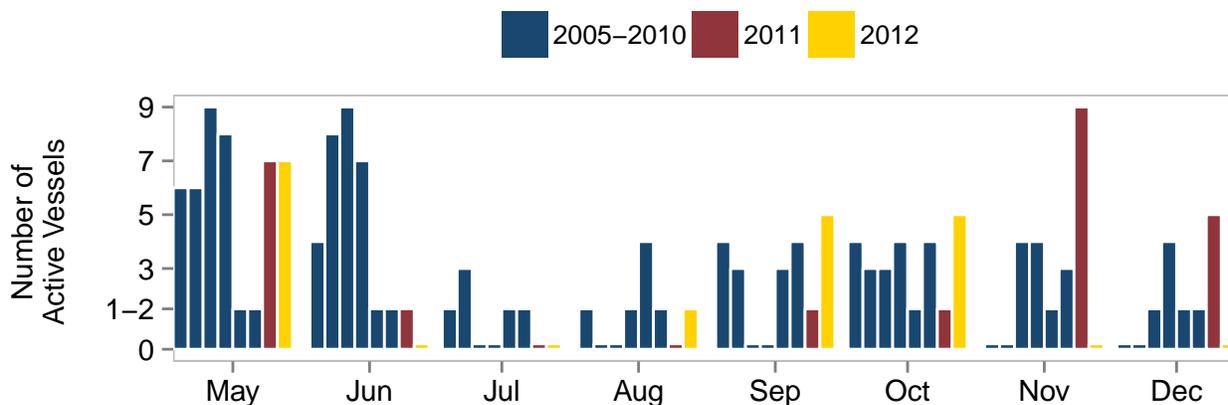


Figure 5: Number of active mothership vessels by month.

days were spent steaming. West Coast catcher-processors deliver Pacific whiting to three Washington state ports: Blaine/Bellingham, Seattle, and Tacoma.

The implementation of the 2011 catch share program does not appear to have had a clear impact on the seasonality or number of vessels participating in the catcher-processor sector (Figure 5). In 2011, nine vessels participated in the fishery

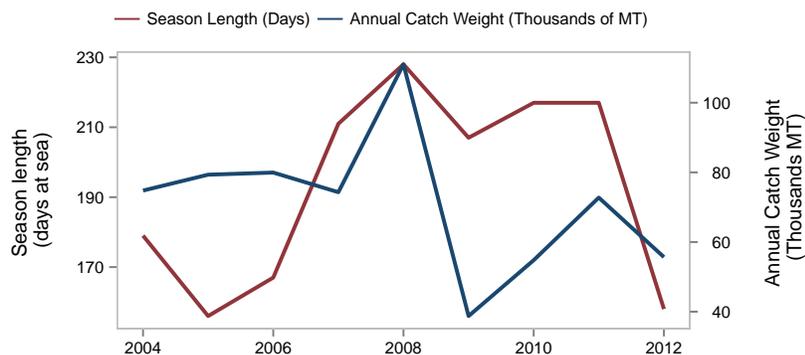
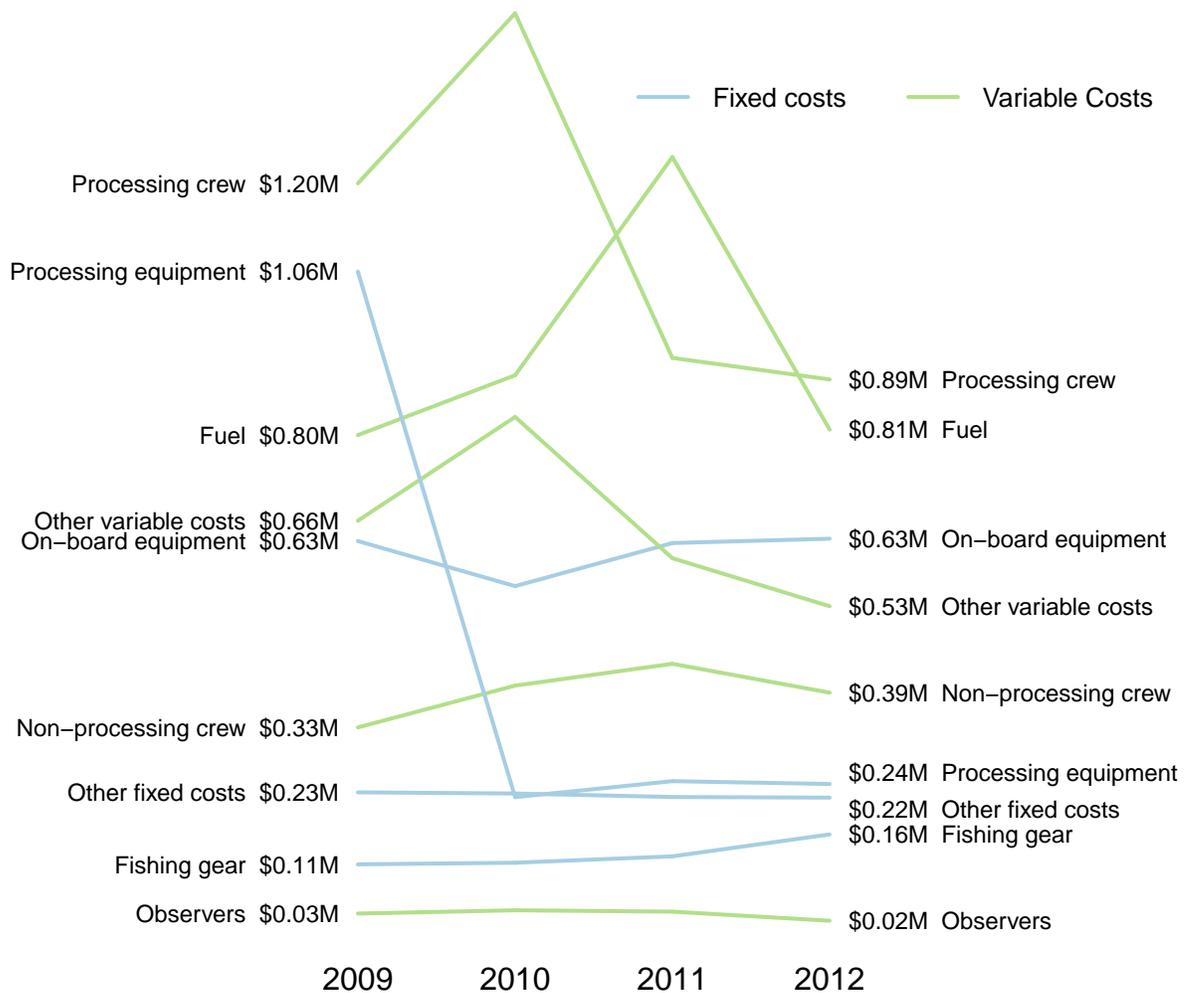


Figure 6: Season length and annual catch weight (thousands of metric tons).

during November and five in December, but in 2012 the sector concluded West Coast activities in October. The season length remained relatively constant in the 2009-2011 period, and decreased in 2012 (Figure 6).

## Economic Indicators

Catcher-processor variable costs include fuel, crew compensation, food, packaging and materials, and observer coverage among other costs, and vary with the level of fishery participation (see Catcher-Processor Data Summaries, Table 8.1). Variable costs make up the majority of a vessel's total expenditures. The average variable costs on the West Coast were approximately \$2.67 million in 2012. The three largest



**Figure 7:** Average fixed and variable costs per vessel (2012 \$).

categories of variable costs are processing crew compensation (33%), fuel and lubrication (30%), and non-processing crew compensation (14%). Observer coverage on catcher-processors dates back to the Fishery Conservation and Management Act of 1976. The PWCC has historically had two observers on board each catcher-processor vessel while operating in the at-sea West Coast Pacific whiting fishery, and continued to do so after the implementation of the catch share program. The catcher-processors spent, on average, \$21,607 on observer coverage in 2012, and elected not to receive subsidies for coverage from NMFS.

In 2012, close to an average of 100 processing crewmembers (which includes line workers, fishmeal crew, quality control, technicians, cleanup, factory managers, combis, and mechanics who work on processing equipment) worked on each catcher-processor vessel in the West Coast whiting fishery. There were also an average of 23 non-processing crewmembers (this includes captain, deckhands, wheelhouse, galley, and engineers). Average compensation per processing and non-processing crewmember was about \$9,400 and \$17,800 per position, respectively. Average processing crew compensation fell about 26%, while non-processing crew compensation increased 17% from 2009 to 2012 (see Figure 7).<sup>10</sup>

The Pacific States Marine Fisheries Commission tracks historical marine fuel prices, which in Washington State increased from \$1.92 in March 2009 to a high of \$4.10 in April 2012.<sup>11</sup> Catcher-processor's average daily fuel use, and average total fuel used for the season both declined from 2009, so that between 2009 and 2012, average fuel and lubrication expenses only increased 1.1% for the catcher-processor fleet.

Catcher-processor vessel fixed costs include capitalized expenditures and expenses on vessel and on-board equipment, fishing gear, and processing equipment. In general, these do not vary as directly as variable costs with the level of fishery participation.<sup>12</sup> The EDC form requests information for any equipment or gear used on the West Coast and for the vessel's total insurance and moorage costs (Tables 8.2-8.4). Average expenditures on vessel and on-board equipment, fishing gear, and processing equipment were \$1.03 million in 2012; this was a decrease of 43% since 2009.

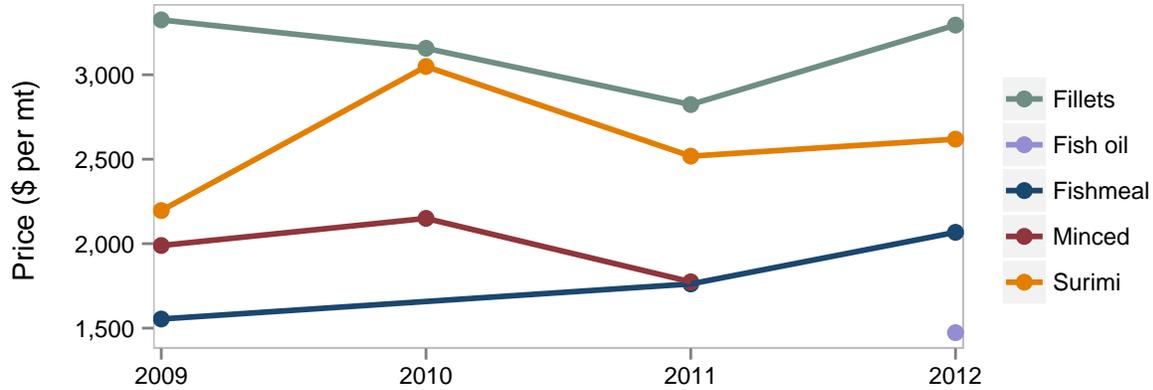
The large decline in processing equipment from 2009-2010 drove this overall fixed cost decrease, as fishing gear, on-board-equipment, and other fixed costs increased slightly over the 2009-2012 period (Figure 7). Average insurance and moorage costs were \$219,000, which was a decrease of 4% between 2009 and 2012.

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<sup>10</sup> Values reported in inflation adjusted 2012 dollars.

<sup>11</sup> [www.psmfc.org/efin/docs/2012FuelPriceReport.pdf](http://www.psmfc.org/efin/docs/2012FuelPriceReport.pdf)

<sup>12</sup> All of the average fixed costs collected, and the breakout for fixed costs on the West Coast, are reported in Catcher-Processor Data Summaries Section 8.3

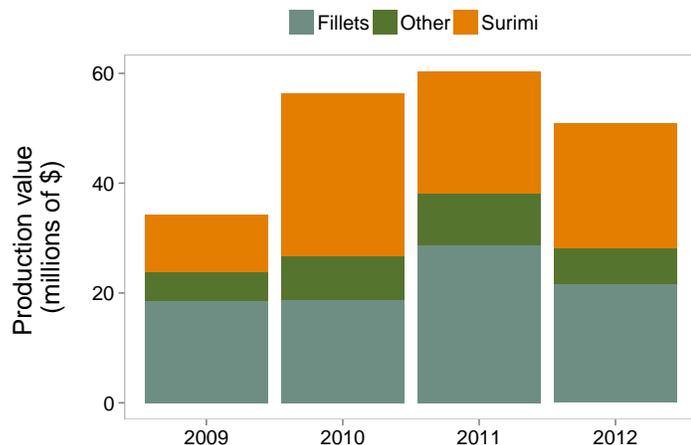


**Figure 9:** Average first-wholesale price by product type (2012 \$). Some values suppressed to protect confidential information.

The average vessel's first-wholesale value of Pacific whiting production was close to \$5.65 million in 2012. The product recovery rate (total weight of production divided by total weight of fish caught) ranged from 0.34 to 0.38.

Fillet and surimi production made up 87% of the total production value in 2012 (Figure 8). Other production types include fishmeal, minced fish product, and fish oil.

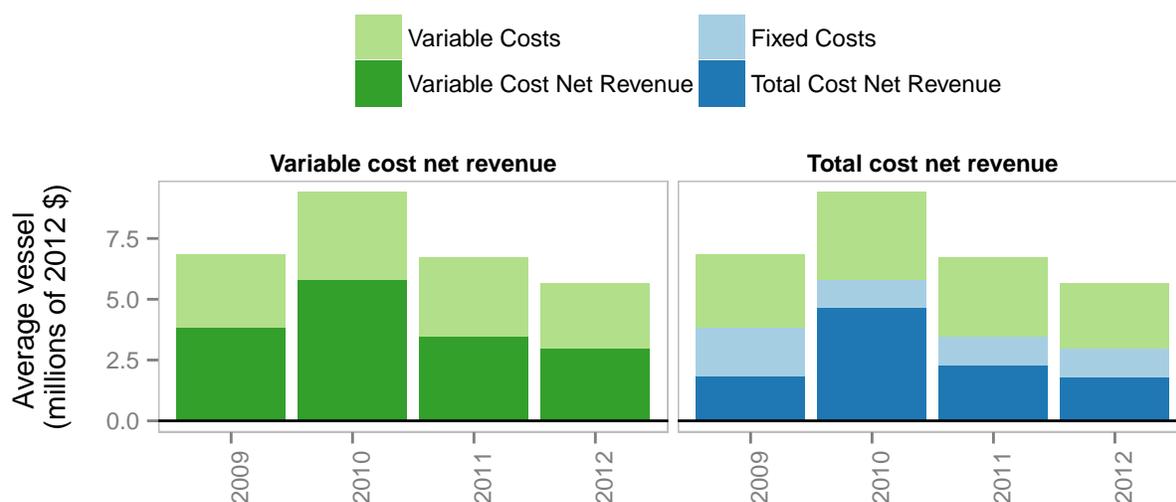
In 2012, fillets received an average first-wholesale price of \$3,300 per metric ton, followed by surimi and fishmeal at \$2,600 and \$2,100 per metric ton, respectively (Figure 9). The average first-wholesale price for all products was \$2,700 per metric ton.



**Figure 8:** Fleet-wide production value by product type (millions of 2012 \$). The Other category includes fish oil, fishmeal, headed and gutted, minced, roe, and other, these categories are combined to protect confidential data.

The EDC program measures the net economic benefits of the catch share program by reporting two types of net revenue. The first is variable cost net revenue, which is revenue minus variable costs. The second is total cost net revenue, which is revenue minus both variable and fixed costs.<sup>13</sup> To provide a complete picture of the changes that have occurred, both net revenue figures are presented at two scales. Figure 10 shows the average net revenue per vessel while Figure 11 shows the fleet-wide net revenue. Average net revenue shows the value generated by a typical vessel, while fleet-wide net revenue represents the total value generated by the fishery. Both figures only include revenues and costs associated with the

<sup>13</sup> See Figure 7 for a description of which costs are considered variable costs and which costs are considered fixed costs.



**Figure 10:** Average variable cost net revenue (revenue minus variable costs) (left), and average total cost net revenue (revenue minus variable costs and fixed costs) (right) (millions of 2012 \$).

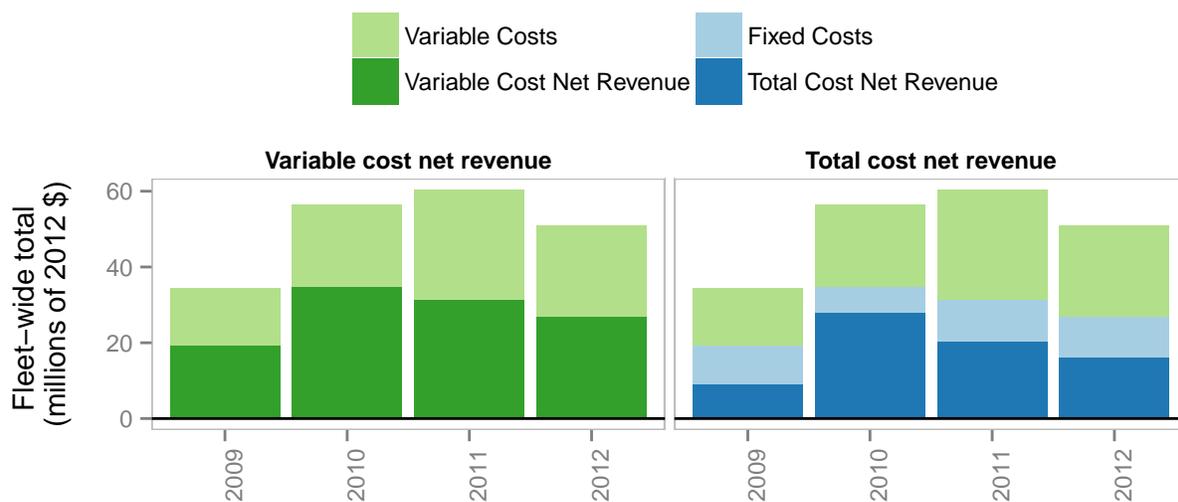
catch share program. It is important to note that the EDC forms attempt to capture only costs that are directly related to vessel fishing operations, and not costs that are related to activities or equipment off the vessel. Therefore, the net revenue reported here is an overestimate of the true net revenue.<sup>14</sup>

Average variable cost net revenue was \$2.98 million in 2012, a decrease from \$3.47 million in 2011 and \$3.84 million in 2009 (Figure 10). Average variable cost net revenue per metric ton produced was \$1,397 in 2012; nearly the same as in 2009 (\$1,411).

Average total cost net revenue per vessel was just over \$1.8 million in 2012 (Figure 10). Average total cost net revenue per metric ton produced was \$670 in 2012; an 7% decrease from 2011 to 2012 (Catcher-Processor Data Summaries, Table 10.3).

Variable costs for the catcher-processor fleet as a whole decreased over the 2010-2012 period, but still remain higher in 2012 than in 2009. (Figure 11). Fixed costs have remained fairly constant from 2009-2012, with a dip in 2010, which contributed to the relatively high total cost net revenue during 2010. Total cost net revenue has declined from 2010-2012, but remains higher than the 2009 season. The fleet-wide total cost net revenue has declined by 42% since 2010. The number of vessels increased from six to nine from 2010-2011, so even though average revenue decreased over that period, the total net revenue for the fleet increased. The catcher-processors had a fleet-wide total revenue of \$51 million in 2012, and the fleet spent about \$35 million in fixed and variable costs on the West Coast.

<sup>14</sup> See Catcher-Processor Data Summaries Section 8: Costs and Section 9: Net Revenue and Economic Profit for a more complete discussion of variable costs, fixed costs, and the calculation of net revenue



**Figure 11:** Fleet-wide variable cost net revenue (revenue minus variable costs) (left), and fleet-wide total cost net revenue (revenue minus variable costs and fixed costs) (right) (millions of 2012 \$).

# CATCHER-PROCESSOR DATA SUMMARIES

# CATCHER-PROCESSOR DATA SUMMARIES

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# 1 Introduction

## 1.1 Background

The US West Coast groundfish fishery takes place off the coasts of Washington, Oregon and California, and is comprised of over 90 different species of fish. The fish are harvested both commercially and recreationally. The commercial fishery has four components: limited entry with a trawl endorsement, limited entry with a fixed gear endorsement, open access, and tribal.<sup>1</sup> In January 2011, the West Coast Limited Entry Groundfish Trawl fishery transitioned to the West Coast Groundfish Trawl Catch Share Program. The catch share program consists of cooperatives for the at-sea mothership (including catcher vessels and motherships) and catcher-processor fleets, and an individual fishing quota (IFQ) program for the shorebased trawl fleet.<sup>2</sup>

The Economic Data Collection (EDC) program<sup>3</sup> was implemented as part of these new regulations to monitor the economic effects of the catch share program. Annual economic data submissions are required from all fishery participants: catcher vessels, motherships, catcher-processors, and first receivers and shorebased processors §50 CFR 660.114. Baseline, pre-catch share, data were submitted in 2011 for the 2009 and 2010 operating years. Data for the first year the fishery operated under the catch share program (2011) were submitted in 2012, and the 2012 data submitted for this report were collected in 2013.

EDC Program has enhanced the quantity and quality of economic information available for analysis, and for the management of the West Coast groundfish trawl fishery. While costs and earnings data are available for shorebased catcher vessels starting in 2004<sup>4</sup>, this is the first data collection from the catcher-processor fleet. This report summarizes the 2009-12 EDC catcher-processor survey data, and with its companion reports covering the other sector, is the second in what is expected to be an annual

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<sup>1</sup> For more information about West Coast Groundfish, see [www.westcoast.fisheries.noaa.gov/fisheries/groundfish/](http://www.westcoast.fisheries.noaa.gov/fisheries/groundfish/).

<sup>2</sup> More information about the West Coast Groundfish Trawl Catch Share Program is available online at [www.westcoast.fisheries.noaa.gov/fisheries/groundfish\\_catch\\_shares/](http://www.westcoast.fisheries.noaa.gov/fisheries/groundfish_catch_shares/).

<sup>3</sup> Additional information on the EDC Program, including the EDC data collection forms can be found at [www.nwfsc.noaa.gov/edc](http://www.nwfsc.noaa.gov/edc)

<sup>4</sup> Lian, C.E. 2010. West Coast limited entry groundfish trawl cost earnings survey protocols and results for 2004. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-107, 35 p.

series of reports. EDC economists will expand and refine the scope and methods used with each new annual publication.

The catcher-processor fleet on the West Coast has operated as a cooperative since 1997, when the Pacific Whiting Conservation Cooperative (PWCC) was formed. The PWCC consists of three companies and all the catcher-processor vessels that currently participate in the Pacific whiting fishery on the West Coast. The primary function of the PWCC is to coordinate harvesting efforts of the catcher-processor vessels. While the 2011 catch share program dramatically changed the structure of the Pacific whiting shoreside and mothership fisheries, the catcher-processor fishery experienced fewer changes and has continued to operate as a single cooperative.

## 1.2 Cost Disaggregation

Some categories of costs on the EDC forms are for West Coast-only operations, while others are combined for the West Coast and Alaska Fisheries. Therefore, cost disaggregation on these shared costs is required to estimate total costs and net revenues on the West Coast.

To disaggregate the West-Coast and Alaska costs, we allocate proportionally to the weight of fish harvested in each fishery. We calculate a ratio of the sum of West Coast Pacific whiting weight for all the years the vessel has supplied data, over the weight in All Fisheries for the same time span:

$$\frac{\sum_y WT_n^{WestCoast}}{\sum_y WT_n^{AllFisheries}}$$

where  $n$  is an individual vessel in a season, summed over all of the years,  $y$ , that the vessel has supplied EDC data. Thus each vessel's ratio of costs being allocated to the West Coast is the same for all years. This method provides for a constant proportion of fixed costs allocated to the West Coast over time, and this proportion is less sensitive to fluctuations in TAC for the West Coast Pacific whiting and Alaska fisheries.

## 1.3 Understanding the report

The data provided in the summary tables throughout the report are for all vessels that fished on the West Coast during the survey year, unless otherwise noted. Unlike the Overview, all numbers reported in the Data Summaries are generated from the raw responses received from participants and, therefore, are in nominal dollars.

All data submitted via the EDC Program are confidential under 402(b) of the Magnuson- Stevens Act (16 U.S.C. 1801, et seq.) and under NOAA Administrative Order 216-100<sup>5</sup>. In order to protect these

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<sup>5</sup> For more information about form administration, please see Appendix

data, a rule of three and a rule of 90-10 are implemented. The rule of three requires a response from at least three companies in order to show a summary statistic. The 90-10 rule requires that no single company's value should comprise over 90 percent of the value displayed. In the case of the West Coast whiting catcher-processor fishery, there are only three companies and therefore statistics are only shown in the tables if there was at least one vessel from each catcher-processor company reporting a positive value. The tables show a '\*\*\*' for data points where there were less than three companies reporting the information, and/or if one company's responses accounted for greater than 90 percent of the average value. Zeroes are shown if all entities reported zeroes. More information about how confidential data are protected in the EDC Program can be found in the Administration and Operations Report.

One change implemented this year is the inclusion of a measure of the variation of the data. The stacked dots included in the tables provide information about the coefficient of variation (CV) of the mean. We use the following scoring:

- represents  $CV < 0.5$ ,
- ˆ represents  $0.5 \leq CV < 1.0$ ,
- ∶ represents  $1.0 \leq CV < 2.0$ , and
- ∴ represents  $2.0 \leq CV$ . For 2009-2012, none of the CVs exceeded 2.44.

Although participants are identified on a calendar year basis, they complete the form using information based on the fiscal year of the entity. Currently data are presented for survey year, and therefore data assigned to a survey year may not overlap completely with the calendar year. Information obtained from outside of the EDC Program is adjusted to match the fiscal year provided on each form. For the four years of data collected from catcher-processors, all catcher-processors used the calendar year for the fiscal year.

The form had very few changes between the 2009-2010 data collection, and the 2011 and 2012 collections. The 2009 and 2010 EDC catcher-processor forms asked if the participant harvested or processed any fish during that calendar year, and those who answered "No" were not required to respond to any further questions. This option disappeared on the 2011 form and every participant was required to complete the form in its entirety. The only other change to the forms from 2009-2010 to 2011 pertained to offload locations, with "Tacoma" substituted for "Westport, Hoquiam" in response to input on the 2009 and 2010 surveys. In 2012, a space was added for participants to provide the total round weight harvested in the West Coast fisheries in addition to that harvested in Alaska/Other, in order to validate the external data source we will use to calculate revenue from West Coast whiting.

## 1.4 Purpose of the data summaries

This report, like the other four EDC reports<sup>6</sup>, has multiple objectives. The first is to provide basic economic data summaries that can be used for a variety of purposes associated with fishery management. Since much of the data collected are confidential under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 2007, the data are summarized as averages or totals for each question on the EDC forms. Thus summarized, the reports make the data available to the public for both research and informational purposes.

The second objective is to provide information about the performance of the catch share program. This includes information that can be used to monitor whether and to what degree the goals of the program are being met. It is expected that additional modeling will provide increased detail about program impacts. These reports will serve as the basis for the 5-year review of the catch share program that is mandated in the MSA, as well as the NOAA Fisheries National Catch Shares Performance Indicators. Currently, with just two years of catch share EDC data, it may be difficult to draw firm conclusions about the performance of the program. In addition, the catch share program may have a transitional period in the first few years as participants learn about the system and develop new business strategies.

Third, the reports serve as the basis for economic models that are used as part of the Pacific Fishery Management Council's (PFMC) biennial specification process for groundfish management. These models include the IO-PAC model<sup>7</sup>, as well as estimates of revenue, costs, and net revenue.

Lastly, and perhaps most importantly, the data reports are expected to provide a useful catalyst for feedback on the data collected and its analysis.

The Administration and Operations Report describes the EDC Program administration and fielding of the surveys, the EDC forms, data quality controls and quality checks and data processing, and safeguarding confidential information. The other EDC reports provide basic data summaries of the catcher vessel, mothership, and first receiver and shorebased processor forms.

<sup>6</sup> In addition to the catcher-processor report, there are four companion reports:

- Economic Data Collection Program, Administration and Operations Report Draft Report for PFMC Review (November 2014)
- Economic Data Collection Program, Mothership Report, 2009-2012 Draft Report for PFMC Review (November 2014)
- Economic Data Collection Program, Catcher Vessel Report, 2009-2012 Draft Report for PFMC Review (November 2014)
- Economic Data Collection Program, First Receiver and Shorebased Processor Report, 2009-2012 Draft Report for PFMC Review (November 2014)

<sup>7</sup> Leonard, J., and P. Watson. 2011. Description of the input-output model for Pacific Coast fisheries. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-111, 64 p.

## 1.5 Catcher-processor form administration

Completion of EDC forms is mandatory for participants in the catch share program. Survey participants are identified using contact information provided by the Northwest Regional Permit Office. The regulations for defining who is required to complete an EDC form differs between 2009 and 2010 data collection and all annual/ongoing data collections for 2011 onward. For the 2009-2010 period, all owners, lessees, and charterers of a catcher-processor vessel that harvested whiting in 2009 or 2010 as recorded in NOAA Fisheries' NORPAC database §660.114(b)(3)(i) are required to complete an EDC form. For 2011 and beyond, all owners, lessees, and charterers of a catcher-processor vessel registered to a C/P-endorsed limited entry trawl permit at any time are required to complete an EDC form §660.114(b)(3)(ii). For permit owners, a C/P-endorsed limited entry trawl permit application will not be considered complete until the required EDC form for the permit owner associated with that permit is submitted, as specified at §660.25(b)(4)(i). For a vessel owner, participation in the groundfish fishery (including, but not limited to, changes in vessel registration) will not be authorized until the required EDC form for that owner for that vessel is submitted, as specified, at §660.25(b)(4)(v). For a vessel lessee or charterer, participation in the groundfish fishery will not be authorized, until the required EDC form for their operation of that vessel is submitted.

A calendar year is used to determine which vessels meet the criteria. For example, in 2013 data were collected from all owners, lessees, and charters of a catcher-processor registered to a limited entry trawl permit with a C/P endorsement during 2012. The forms are fielded on this schedule in order to allow participants the time necessary to complete their taxes, which may contain some information that is required on the EDC forms.

If a form has missing information, or the information provided on the form is believed to be incorrect, EDC Program staff will attempt to contact the participant to correct the information. On occasion, the participant cannot be reached or the participant cannot provide the missing information. Missing or inaccurate data are treated on a case-by-case basis during analysis as documented in the Administration and Operations Report. Data are validated and verified with external data sources whenever possible. These data sources include the Permit Office and the At-Sea Hake Observer Program database.

## 2 Vessel Participation on the West Coast and in Alaska

The catcher-processor fleet participates in fisheries on the West Coast and Alaska. Table 2.1 provides the average days at sea by activity. Participants are instructed to count partial days as full days when recording days at sea on the forms.

**Table 2.1: Average days at sea.** Average days at sea by activity in West Coast and Alaska activities for catcher-processor vessels (N = number of vessels with non-zero, non-NA responses).

Description	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Fishing and processing West Coast whiting fishery	36 <sup>‡</sup>	5	52 <sup>‡</sup>	6	42 <sup>‡</sup>	9	29 <sup>‡</sup>	9
Steaming in the West Coast whiting fishery	6 <sup>‡</sup>	5	11 <sup>‡</sup>	6	5 <sup>‡</sup>	9	3 <sup>‡</sup>	9
Off-loading in the West Coast whiting fishery	***	***	***	***	3 <sup>‡</sup>	9	3 <sup>‡</sup>	9
Steaming between West Coast and Alaska	***	***	23 <sup>‡</sup>	6	19 <sup>‡</sup>	9	18 <sup>‡</sup>	9
Fishing in Alaska	***	***	111 <sup>‡</sup>	6	190 <sup>‡</sup>	9	150 <sup>‡</sup>	9

Table 2.2 presents the mean number of one way trips vessels made steaming between Alaska and the West Coast that year. In 2009, not all companies reported steaming trips and thus to preserve confidentiality we cannot report a value for that year.

**Table 2.2: Mean number of one-way trips steaming between West Coast and Alaska.** Mean number of one-way trips between the West Coast and Alaska (N = number of vessels with non-zero, non-NA responses).

	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
One-way trips to Alaska	***	***	3.3 <sup>*</sup>	6	4.0 <sup>*</sup>	9	3.2 <sup>*</sup>	9

**Table 2.3: Number of vessels that fished on the West Coast and Alaska.** The value for 2009 is suppressed because not all companies had vessels that fished in Alaska in 2009.

Description	2009	2010	2011	2012
Fishing and processing West Coast whiting fishery	5	6	9	9
Fishing in Alaska	***	6	9	9

### 3 Delivery Ports

Table 3.1 lists the number of vessels delivering to each port. Some vessels delivered to more than one port in a survey year. This frequency table summarizes responses to the question on the EDC that asks for the percentage of all West Coast whiting products off-loaded from the catcher-processor vessel at each major West Coast port.

**Table 3.1: Off-loading.** Total number of vessels that off-loaded in each port. Some vessels delivered to multiple ports in the same year.

Location	2009	2010	2011	2012
Astoria	0	0	0	0
At-sea	0	0	0	0
Blaine/Bellingham	0	2	4	4
Coos Bay	0	0	0	0
Port Angeles	0	0	0	0
Seattle	3	3	2	2
Tacoma	2	3	3	3
Westport	0	0	—	—

## 4 Vessel Physical Characteristics

Physical vessel characteristics are shown below in Table 4.1. Survey participants were asked to provide basic information about the vessel and its physical characteristics, including market value, replacement value, vessel length, horsepower of main engines, and fuel capacity from the most recent marine survey. Marine surveys are done on a regular basis and are often required for insurance, financing, and other purposes.

**Table 4.1: Average vessel characteristics.** Average market value, replacement value, horsepower, fuel capacity and length (N = number of EDC vessels with non-zero, non-NA responses).

Vessel characteristic	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Market value (\$)	59,706,000	5	57,583,333	6	55,181,111	9	54,847,778	9
Replacement value (\$)	92,000,000	5	86,783,333	6	85,944,444	9	85,944,444	9
Vessel length (feet)	301	5	281	6	304	9	304	9
Vessel fuel capacity (gallons)	265,884	5	212,670	6	277,936	9	270,932	9
Horsepower of main engines	6,600	5	6,433	6	6,800	9	6,487	9

The participants provide information about whether the vessel was hauled out (vessel was removed from the water for maintenance and repairs). Each year about half of all active fishing vessels are hauled out. The information shown below in Table 4.2 provides context that may be used to explain major costs associated with vessel repair and maintenance.

**Table 4.2: Haul outs.** Number of vessels (N) that hauled the vessel during their fiscal year (% percent of vessels in survey year).

Haul out	2009		2010		2011		2012	
	N	%	N	%	N	%	N	%
YES	2	40.0%	3	50.0%	4	44.4%	2	22.2%
NO	3	60.0%	3	50.0%	5	55.6%	7	77.8%

## 5 Vessel Fuel Use and Crew Size

### 5.1 Fuel use

Table 5.1 contains the vessels' average fuel use per day, for propulsion or other uses, when engaged in West Coast activities. The information in the table below represents the average of the average fuel use provided by participants. As stated for Table 2.2, not all companies had vessels that steamed between the West Coast and Alaska in 2009, and thus this value is suppressed to maintain confidentiality.

**Table 5.1: Average daily fuel use.** Average daily fuel use (gallons per day) ((N = number of vessels with non-zero, non-NA responses).

Activity	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Fishing, processing, and steaming in the West Coast whiting fishery	7,747 <sup>*</sup>	5	7,229 <sup>*</sup>	6	7,750 <sup>*</sup>	9	7,600 <sup>*</sup>	9
Steaming between West Coast and Alaska	***	***	5,503 <sup>*</sup>	6	6,242 <sup>*</sup>	9	6,284 <sup>*</sup>	9

The average total fuel used by the vessel during the survey year for propulsion or other use in the West Coast whiting fishery excludes fuel used for steaming between the West Coast and Alaska.

**Table 5.2: Total fuel use.** Average total fuel use (gallons) (N = number of vessels with non-zero, non-NA responses).

Activity	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Total bunker fuel		0		0		0		0
Total diesel	362,185 <sup>‡</sup>	5	336,837 <sup>‡</sup>	6	327,614 <sup>*</sup>	9	230,257 <sup>‡</sup>	9
Total fish oil	***	***	***	***	***	***	***	***

## 5.2 Crew

Table 5.3 presents the average number of processing and non-processing crew members when the vessel was operating in the West Coast whiting fishery during the survey year. Processing crew includes line workers, fishmeal crew, quality control, technicians, cleanup, factory managers, combis, and mechanics who work on processing equipment. Non-processing crew includes the captain, deckhands, wheelhouse, galley, and engineers.

**Table 5.3: Average crew size.** Average crew size of non-processing and processing crew (N = number of EDC vessels with non-zero, non-NA responses).

Activity	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Non-processing	24.0*	5	21.0*	6	32.0*	9	22.6*	9
Processing	87.8*	5	91.3*	6	83.2*	9	96.9*	9

## 6 Whiting Harvest

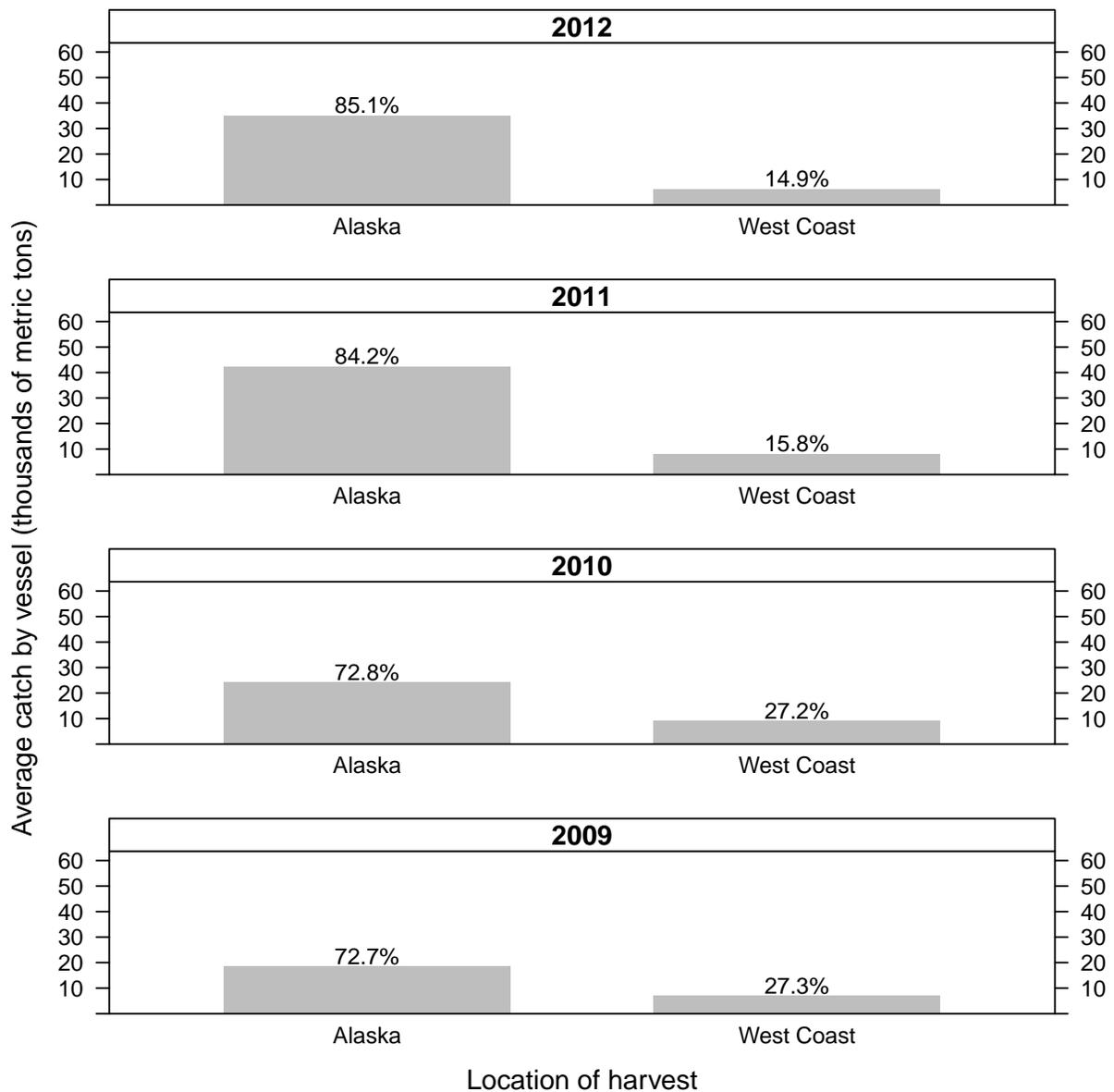
Pacific whiting is managed through a bilateral agreement between the United States and Canada, known as the Pacific Whiting Treaty. The agreement allocates a percentage of the harvest quota to the United States. Once the U.S. allocation has been determined, it is then allocated between catcher-processor, mothership, shoreside, and tribal sectors. The final annual allocations to the catcher-processor sector (Table 6.1) are taken from the annual *Pacific Whiting Fishery Summary* provided by the Northwest Regional Office<sup>1</sup>.

The West Coast data for the catcher-processor sector annual whiting fish purchases in Table 6.1 are provided by the A-SHOP through the Pacific Fisheries Information Network (PacFIN) database. The values for average vessel harvest and total fleet harvest in all fisheries (including the West Coast and Alaska) are from a question on the EDC form that asks participants to provide the total round weight of all fish harvested by the vessel in all fisheries during the survey year.

**Table 6.1: Annual catcher-processor allocation, West Coast whiting harvest, and West Coast and Alaska harvest.** Total final allocation of whiting in the West Coast catcher-processor whiting fishery, total whiting catch, and total catch including catch in Alaska (N = number of vessels with non-zero, non-NA responses).

Description	2009		2010		2011		2012	
	Total	N	Total	N	Total	N	Total	N
Catcher-processor West Coast whiting allocation	35,376		53,379		75,138		55,584	
West Coast whiting catch (A-SHOP)	34,552	5	54,285	6	71,679	9	55,263	9
West Coast and Alaska catch	126,671	5	199,475	6	453,470	9	371,686	9

<sup>1</sup> [www.westcoast.fisheries.noaa.gov/publications/fishery\\_management/groundfish/whiting/](http://www.westcoast.fisheries.noaa.gov/publications/fishery_management/groundfish/whiting/)



**Figure 6.1: Average annual harvest on the West Coast and Alaska.** Average annual harvest (thousands of metric tons) from 2009 to 2012 on the West Coast and in Alaska. Percentages above each bar indicate the portion of the total harvest caught by location.

## 7 Revenue

The EDC forms ask about four forms of revenue: revenue from production of seafood products, revenue from sale or lease of West Coast catcher-processor endorsed permits, revenue from the sale or lease of co-op shares, and revenue from lease or bareboat charter of the vessel. All vessels that fished on the West Coast reported production revenue, but there were no vessels that reported revenue from the other three categories. It is possible that vessels may have made end-of-season informal arrangements regarding leftover quota; however, this type of transfer is not captured by the EDC form.

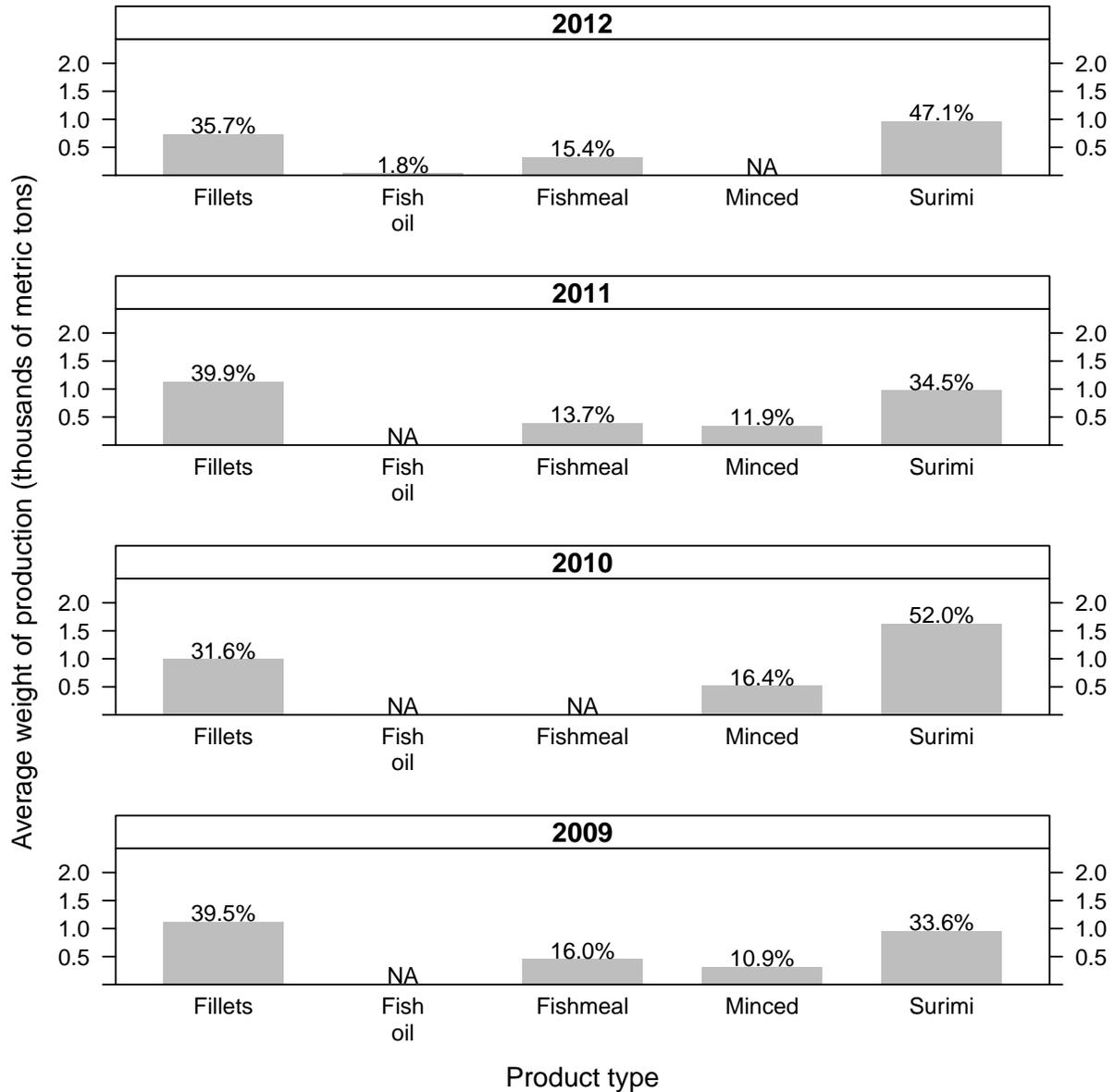
Tables 7.1 and 7.2 provide summary information on annual production in the West Coast whiting catcher-processor sector. Participants provide total weight of production and value of production by major product categories. These values include any post-season adjustments for products produced during the survey year. Not included in the value of production are any additional payments received to cover shipping, handling, or storage costs associated with the sale beyond the free-on-board (buyer assumes responsibility and liability for the product and pays shipping costs) port of discharge. The revenue only includes fish caught and processed on the West Coast.

**Table 7.1: Whiting production weight.** Average production weight (metric tons) for whiting (N = number of vessels with non-zero, non-NA responses).

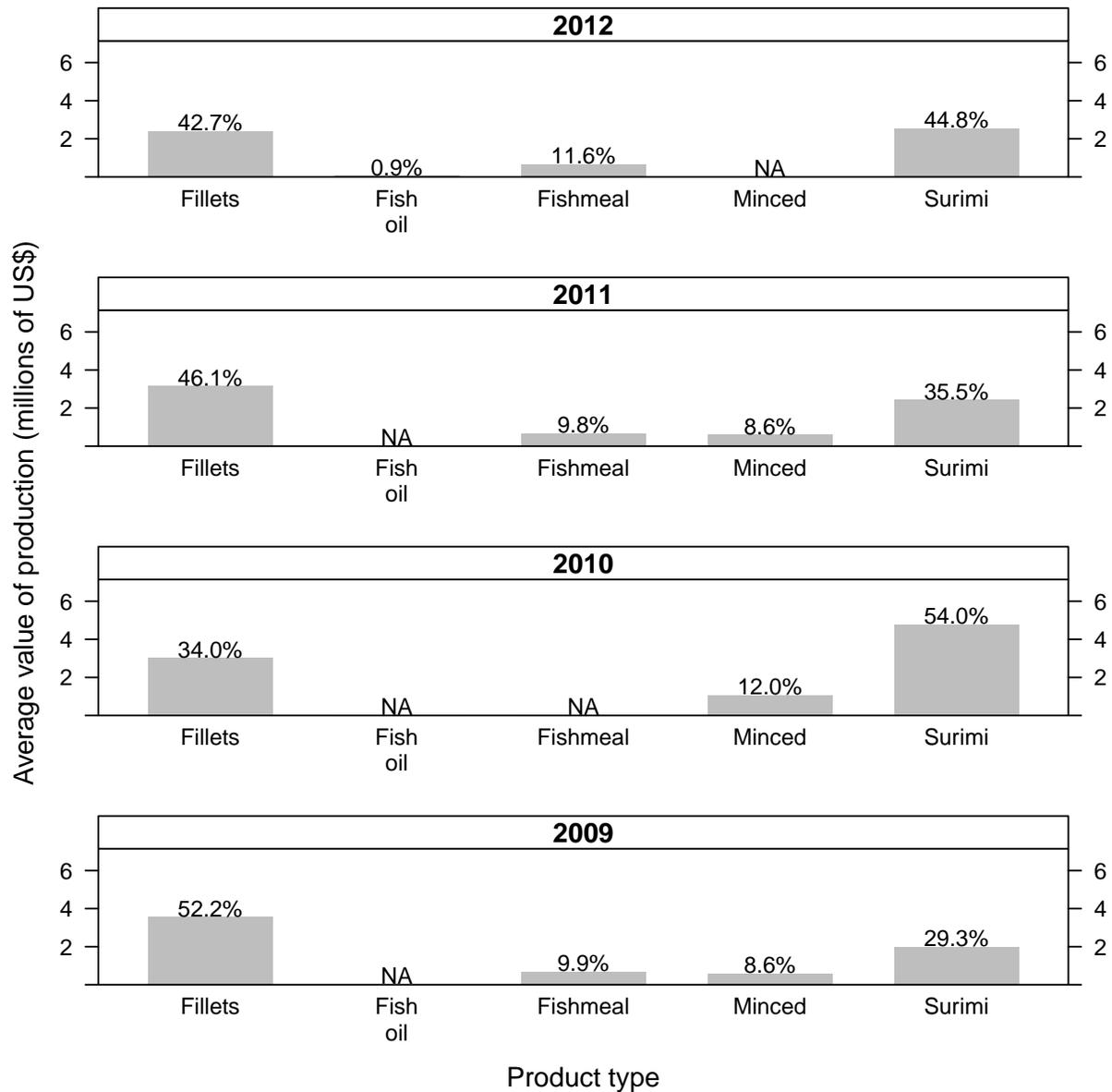
Product Category	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Fillets	1,122 <sup>‡</sup>	5	987 <sup>‡</sup>	6	1,130 <sup>‡</sup>	9	732 <sup>‡</sup>	9
Fish oil	***	***	***	***	***	***	36 <sup>‡</sup>	7
Fishmeal	454 <sup>‡</sup>	3	***	***	387 <sup>·</sup>	6	316 <sup>‡</sup>	6
Headed and gutted		0	***	***	***	***	***	***
Minced	309 <sup>‡</sup>	4	511 <sup>‡</sup>	4	338 <sup>‡</sup>	7	***	***
Roe		0	***	***		0		0
Round		0		0		0		0
Stomachs		0		0		0		0
Surimi	953 <sup>‡</sup>	5	1,621 <sup>‡</sup>	6	975 <sup>·</sup>	9	965 <sup>‡</sup>	9
Other	***	***	***	***	***	***	***	***
Average total weight	2,648 <sup>‡</sup>	5	3,310 <sup>‡</sup>	6	2,722 <sup>·</sup>	9	2,073 <sup>‡</sup>	9

**Table 7.2: Whiting production value.** Average production value (\$) for whiting (N = number of vessels with non-zero, non-NA responses).

Product Category	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Fillets	3,540,092 <sup>‡</sup>	5	3,001,928 <sup>‡</sup>	6	3,141,512 <sup>‡</sup>	9	2,411,717 <sup>‡</sup>	9
Fish oil	***	***	***	***	***	***	53,450 <sup>‡</sup>	7
Fishmeal	669,387 <sup>‡</sup>	3	***	***	670,348 <sup>·</sup>	6	653,583 <sup>‡</sup>	6
Headed and gutted		0	***	***	***	***	***	***
Minced	583,390 <sup>‡</sup>	4	1,058,464 <sup>‡</sup>	4	589,839 <sup>‡</sup>	7	***	***
Roe		0	***	***		0		0
Round (unprocessed)		0		0		0		0
Stomachs		0		0		0		0
Surimi	1,985,758 <sup>‡</sup>	5	4,761,903 <sup>‡</sup>	6	2,417,943 <sup>‡</sup>	9	2,527,992 <sup>‡</sup>	9
Other	***	***	***	***	***	***	***	***
Other species		0		0		0		0
Average total value	6,502,348 <sup>‡</sup>	5	9,059,110 <sup>‡</sup>	6	6,601,671 <sup>·</sup>	9	5,652,803 <sup>‡</sup>	9



**Figure 7.1: Production weight by product type and year.** Average whiting production value by product type and year. Confidential data have been suppressed and replaced with “NA”, product categories where production value were reported as zero for all vessels for all years are not included. The percentage of each product type of all production is listed on the top of each bar.



**Figure 7.2: Production value by product type and year.** Average whiting production value by product type and year. Confidential data have been suppressed and replaced with "NA", product categories where production value were reported as zero for all vessels for all years are not included. The percentage of each product type of all production is listed on the top of each bar.

## 8 Costs

This section of the report describes the cost data that are collected on the EDC catcher-processor form. It reports variable costs, fixed costs, and total costs, and how those costs are disaggregated to estimate the proportion of costs attributed to West Coast fisheries.

For the purposes of the EDC, costs are divided into two categories: variable costs and fixed costs. Variable costs vary with the level of fishery participation, and generally include items such as fuel and crew compensation. Fixed costs do not vary as directly with the level of fishery participation, and generally include items such as vessel capital improvements. The designation of a cost as variable or fixed depends on many factors, including the relevant time horizon and use of the data. While some costs would clearly be considered fixed (e.g., the purchase of a new engine), others are more difficult to categorize. For the purposes of this report, we consider the costs listed in Tables 8.2, 8.3 and 8.7 to be fixed, and the costs listed in Table 8.1 to be variable. The EDC Program will continue to explore, and possibly improve, the categorization of these costs.

The cost section of the EDC form collects both “capitalized expenditures” and “expenses” for vessel improvements and maintenance, fishing gear, and processing equipment. This is because for tax accounting purposes, certain costs may be treated as either capitalized or expensed. Capitalized expenditures are depreciated over a number of years. Expensed items are fully deducted as a cost for the year in which they occur. In an effort to reduce the reporting burden and errors, these data are collected as they are reported in the businesses’ accounting systems.

In order to conduct economic analyses of specific fisheries it is important to have costs broken out by fishery. For some costs, it may be feasible for participants to break out or track costs at the fishery level. However, for most costs this is impossible. During the EDC form development process, a key issue was the determination of which costs could reasonably be broken out by fishery or groups of fisheries. Each cost item is assigned to one or more categories based on how it is commonly tracked by industry members: 1) used on West Coast fisheries only (West Coast Only); 2) used on the West Coast and in other fisheries (Shared); and 3) used in all fisheries (All) regardless of whether they are used on the West Coast.

Finally, there are a variety of costs that are associated with running a catcher-processor 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, vehicles, storage of equipment, professional fees, and marketing. In general, the EDC 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 EDC aggregated measures of costs (variable costs, fixed costs, and total costs) underestimate the true costs of operating a business.

## 8.1 Variable costs

Variable costs were collected for all West Coast activities. Variable costs are more directly related to fishing operations than fixed costs, and therefore it is possible for vessels to separate variable expenses for activities on the West Coast from other activities.

**Table 8.1: Variable expenses.** Average variable expenses on the West Coast for EDC vessels (\$) (N = number of vessels with non-zero, non-NA responses).

Expense Category	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Communication	15,896	5	21,514	6	16,765	9	7,165	9
Food	88,372	5	108,934	6	108,896	9	138,566	9
Freight	***	***	***	***	***	***	***	***
Fuel and lubrication	758,126	5	862,106	6	1,225,046	9	808,009	9
Marine Stewardship Council fees	***	***	***	***	***	***	0	0
Non-fish ingredients (additives)	217,929	5	297,747	6	142,759	9	141,779	9
Non-processing crew	314,131	5	383,442	6	426,262	9	386,814	9
Observers	31,353	5	36,923	6	35,551	9	21,607	9
Offloading	***	***	***	***	***	***	***	***
On-board cargo/product insurance	***	***	***	***	13,087	9	76,432	9
Packing materials	204,837	5	232,183	6	241,636	9	142,494	9
Processing crew	1,140,442	5	1,420,313	6	908,419	9	888,312	9
Sea State data monitoring	3,701	5	3,982	6	***	***	6,308	9
Supplies	***	***	***	***	7,899	9	***	***
Travel	***	***	***	***	***	***	15,042	8
Average total variable costs	2,859,616	5	3,483,184	6	3,184,221	9	2,672,069	9

## 8.2 Fixed costs

### 8.2.1 Costs on vessel and on-board equipment, fishing gear, and processing equipment

Table 8.2 presents average annual capitalized expenditures. Survey participants are asked to provide capitalized expenditures for the survey year associated with the following categories:

- New and used vessel and on-board equipment: excludes processing equipment and fishing gear, includes all electronics, safety equipment, and machinery not used to harvest or process fish
- Processing Equipment: excludes all equipment, machines, and buildings based primarily on shore, excludes any processing equipment that is not used at least partially in the West Coast whiting fishery, and includes on-board freezers, storage equipment, packing equipment, conveyors, and on-board cargo handling equipment
- Fishing gear: Includes nets, cables, doors, and fishing machinery used in the West Coast whiting fishery, excludes any fishing gear that is not used at least partially in the West Coast whiting fishery

Participants are asked to split out West Coast capitalized expenditures and expenses on fishing gear, and capitalized expenditures on processing equipment from shared expenses.

**Table 8.2: Capitalized expenditures on vessel and on-board equipment, fishing gear, and processing equipment.** Average capitalized expenditures (\$) on vessel and on-board equipment, fishing gear, and processing equipment (N = number of EDC vessels with non-zero, non-NA responses).

Expenditure category	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Fishing gear shared between the West Coast and other fisheries	\$96,875 <sup>*</sup>	5	***	***	***	***	\$537,424 <sup>*</sup>	9
Fishing gear used only on the West Coast	***	***	***	***	***	0		0
Processing equipment shared between the West Coast and other fisheries	***	***	***	***	***	***	***	***
Processing equipment used only on the West Coast		0	***	***	***	0		0
Vessel and on-board equipment in all fisheries	\$1,913,124 <sup>*</sup>	5	\$955,672 <sup>†</sup>	6	\$2,022,532 <sup>‡</sup>	9	\$1,380,545 <sup>§</sup>	9
Average total capitalized expenditures	\$7,229,239 <sup>‡</sup>	5	\$1,334,249 <sup>‡</sup>	6	\$2,739,627 <sup>‡</sup>	9	\$2,571,425 <sup>‡</sup>	9

**Table 8.3: Expenses on vessel and on-board equipment, fishing gear, and processing equipment.** Average expenses (\$) on vessel and on-board equipment, fishing gear, and processing equipment (N = number of vessels with non-zero, non-NA responses). Note that some expenses were requested for all fisheries the vessel participates in (West Coast, Alaska, and other) and others are for West Coast Fisheries only (Washington, Oregon, and California).

Expense category	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Fishing gear repair and maintenance shared between the West Coast and other fisheries	280,297 <sup>·</sup>	5	180,301 <sup>·</sup>	6	353,725 <sup>·</sup>	9	367,760 <sup>·</sup>	9
Fishing gear repair and maintenance used only on the West Coast	***	***	***	***	***	***		0
Processing equipment shared between the West Coast and Alaska	875,899 <sup>·</sup>	5	596,454 <sup>·</sup>	6	719,308 <sup>·</sup>	9	812,369 <sup>·</sup>	9
Vessel and on-board equipment	1,160,418 <sup>·</sup>	5	1,034,496 <sup>·</sup>	6	1,610,890 <sup>·</sup>	9	1,653,709 <sup>·</sup>	9
Average total costs on vessel and on-board equipment, fishing gear, and processing equipment	2,350,019 <sup>·</sup>	5	1,843,085 <sup>·</sup>	6	2,708,413 <sup>·</sup>	9	2,833,839 <sup>·</sup>	9

## 8.2.2 Other fixed costs

**Table 8.4: Other fixed expenses.** Average fixed expenses (\$) on all other categories (N = number of vessels with non-zero, non-NA responses).

Expense category	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Insurance premium payments (hull and machinery, protection and indemnity, and pollution insurance)	890,246	5	742,139	6	896,156	9	523,393	9
Lease of vessel	0	0	0	0	0	0	0	0
Moorage	184,240	5	192,216	6	153,244	9	260,475	9
Average total fixed costs	1,074,485	5	934,355	6	1,049,401	9	783,869	9

**Table 8.5: Depreciation.** Average depreciation taken during survey year (N = number of vessels with non-zero, non-NA responses).

	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Depreciation	2,694,639 <sup>‡</sup>	5	2,141,627 <sup>‡</sup>	6	3,029,734 <sup>‡</sup>	9	3,373,013 <sup>‡</sup>	9

### 8.3 Fixed costs on the West Coast

As described above, not all costs reported on the EDC forms are for West Coast only operations. Therefore, cost disaggregation was required both to estimate total costs and total cost net revenue on the West Coast. Estimates of West Coast only costs are calculated using a ratio of pounds caught on the West Coast to pounds caught in all fisheries, including Alaska, Tribal, and any other fisheries, which provides an estimate of the proportion of the vessel costs attributed to the West Coast for costs that are shared. This approximation for the proportion of shared spending on the West Coast is then summed with the West Coast Only spending categories to provide a total estimate for annual West Coast Only spending (Table 8.6). See Section 1.2 above for discussion of this method.

**Table 8.6: West Coast fixed costs on vessel and on-board equipment, fishing gear, and processing equipment.** Capitalized expenditures and expenses on vessel and on-board equipment, fishing gear, and processing equipment on the West Coast (N = number of vessels with non-zero, non-NA responses).

Cost category	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Fishing gear	106,141 <sup>‡</sup>	5	110,257 <sup>‡</sup>	6	122,733 <sup>‡</sup>	9	159,810 <sup>‡</sup>	9
Processing equipment	1,006,373 <sup>‡</sup>	5	211,434 <sup>‡</sup>	6	241,268 <sup>‡</sup>	9	240,551 <sup>‡</sup>	9
Vessel and on-board equipment	597,104 <sup>‡</sup>	5	536,849 <sup>‡</sup>	6	616,586 <sup>‡</sup>	9	633,266 <sup>‡</sup>	9
Average total West Coast costs on vessel and on-board equipment, fishing gear, and processing equipment	1,709,618 <sup>‡</sup>	5	858,539 <sup>‡</sup>	6	980,587 <sup>‡</sup>	9	1,033,628 <sup>‡</sup>	9

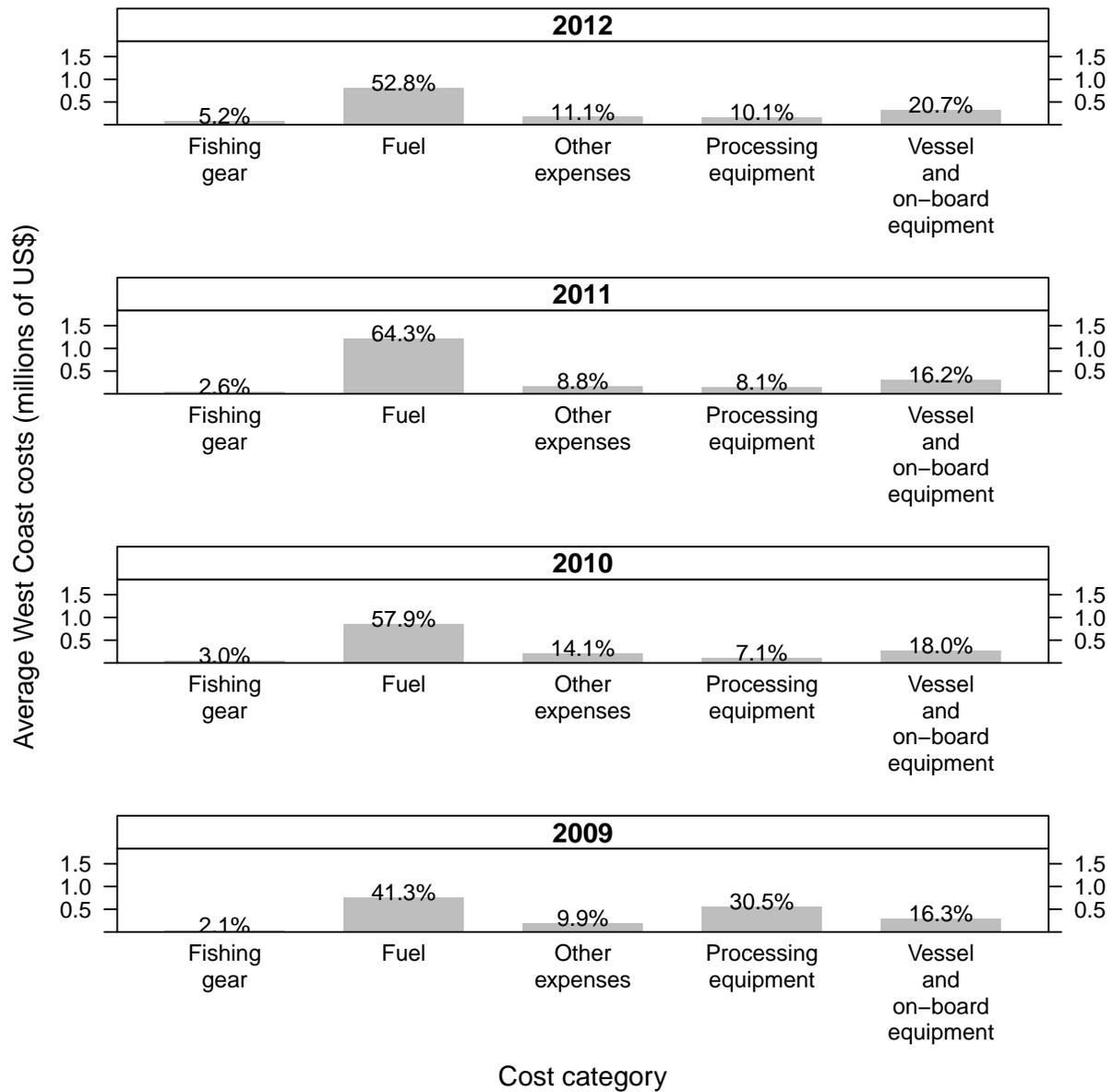
**Table 8.7: West Coast costs on insurance, moorage, and leasing.** Expenses on insurance, moorage, and leasing on the West Coast (N = number of vessels with non-zero, non-NA responses).

Cost category	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
West Coast portion of insurance expenses	171,069	5	162,650	6	170,690	9	94,133	9
West Coast portion of lease expenses		0		0		0		0
West Coast portion of moorage expenses	37,045	5	44,522	6	32,551	9	48,156	9
Average total fixed costs	208,113	5	207,172	6	203,241	9	142,289	9

## 8.4 Summary of West Coast costs

**Table 8.8: Summary of costs on the West Coast.** Average capitalized expenditures and expenses on vessel and on-board equipment, fishing gear, and processing equipment, other fixed costs, and all variable costs on the West Coast (N = number of EDC vessels with non-zero, non-NA responses).

Cost category	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Total costs on vessel and on-board equipment, fishing gear, and processing equipment	\$1,709,618	5	\$858,539	6	\$980,587	9	\$1,033,628	9
Total variable costs	\$2,859,616	5	\$3,483,184	6	\$3,184,221	9	\$2,672,069	9
Total other fixed costs	\$208,113	5	\$207,172	6	\$203,241	9	\$142,289	9
Average total costs	\$4,777,347	5	\$4,548,895	6	\$4,368,049	9	\$3,847,985	9



**Figure 8.1: Average costs by category on the West Coast.** Average costs by category on the West Coast including capitalized expenditures and annual expenses (millions of dollars). Crew includes both processing and non-processing crew expenses shown in Table 8.7. The “Other” category includes expenses on additives, communication, fees, insurance, freight, moorage, observers, offloading, supplies, packing, travel, and Sea-State monitoring. Percentages above each bar indicate the portion the category makes up of total West Coast costs.

#### 8.4.1 Quota and permit costs on the West Coast

The EDC form requests information on quota and permit expenses. No vessels reported lease or purchase of permits; however, vessels may have made end-of season informal arrangements regarding leftover

quota. This type of transfer is not captured by the EDC form.

## 9 Net Revenue and Economic Profit

Net returns from operating a vessel are presented in this section. The level of net returns not only indicates whether a vessel is a viable ongoing business, but also the size of net benefit that is created from society's perspective. Two different measures of net returns are examined. They differ in the types of costs that are taken into account, and therefore, in their interpretation and use. The first is a monetary, financial measure that attempts to track a vessel's net cash flow, which we call *net revenue*. It is calculated as revenue minus monetary costs. The only costs that are accounted for are those that are actually paid or associated with a financial transaction. The second measure attempts to track the broader economic performance of a vessel and includes all costs regardless of whether there is a cash or financial transaction. Costs are measured by their true resource costs, which may or may not be equal to monetary outlays. This measure is called *economic profit*<sup>1</sup>. The distinction between the two measures is probably most easily understood through a few examples relevant to fisheries.

Labor costs for the net revenue measure are the total payments to the crew and captain. If work is performed that is not paid for, then it is not included as a cost. This commonly occurs in commercial fishing when the owner of a vessel is also the captain, but does not draw a captain's wage. In this case, the net revenue is higher than it would be if the captain drew a wage or hired a captain. In the end, the vessel owner-captain is not necessarily any worse off since s/he is the residual claimant to the net revenue. However, the net revenue would be higher than a comparable vessel that hired a captain<sup>2</sup>. Economic profit, on the other hand, accounts for the cost associated with an owner's time that is used as a captain. This is called an opportunity cost in the economics literature<sup>3</sup>, and is typically approximated by the wage of a comparably productive captain<sup>4</sup>.

A second example of the difference between net revenue and economic profit is the treatment of vessel capital costs. Again, net revenue only includes costs that are actually paid, which includes items such as vessel repair, maintenance, and upgrades. Economic profit would also include the opportunity cost of owning the vessel, a capital asset. By owning a vessel, the owner foregoes other investment

<sup>1</sup> Whitmarsh D., James C., Pickering H., Neiland A. 2000. The profitability of marine commercial fisheries: a review of economic information needs with particular reference to the UK. *Marine Policy*, Vol. 24(3), pp. 257-263

<sup>2</sup> The same would also be true when a vessel owner does not receive a wage for work performed to repair or maintain a vessel or gear.

<sup>3</sup> See Boardman, Anthony, David Greenberg, and Aidan Vining. *Cost-Benefit Analysis: Concepts and Practice*, Prentice Hall, NJ. 2000. pp. 31-32.

<sup>4</sup> A more accurate measure would be the owner-captain's most valued wage off the vessel

opportunities that would provide a rate of return. This is called the opportunity cost of capital, and is typically approximated by the market rate of return associated with businesses of comparable risk, multiplied by the market value of the vessel.

Both net revenue and economic profit are useful measures for fishery management. Net revenue attempts to measure the annual financial well-being of vessel operations. It can be used to determine if there is a monetary gain or loss, or how changes in fishery management may affect the level of monetary gain or loss. Economic profit is a better indicator of the long-term viability of fishery operations since it includes all costs, and values the costs at their opportunity cost. It can be used to estimate whether there are incentives or disincentives to invest in capital, or enter and leave the fishery. It is also a better measure of the net benefit of the fishery to the nation.

Calculations of net revenue are included in this report. The cost categories used in net revenue, based on those reported in the EDC forms, are discussed below. Currently, calculations of economic profit are beyond the scope of the report. Economic profit relies on opportunity costs, which may be different from some of the costs reported on the EDC forms, so additional methods and analyses are required. The EDC Program economists will continue to work on developing measures of economic profit so that it may be included in future reports.

## 9.1 Net revenue

Net revenue is calculated two ways: using only variable costs, and using variable costs plus fixed costs (total costs)<sup>5</sup>. 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/processing an additional day, or catching/processing 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.

There are several caveats associated with the net revenue calculations in this report. As noted in Section 8, there are a variety of costs that are associated with running a vessel that are not requested by the EDC 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/processing, or are too difficult to allocate to a particular vessel in a multi-vessel company. These expenses include office space, vehicles, and transport trucks, storage of equipment, professional fees, and marketing. In general, the EDC forms attempt to capture costs that are only directly related to vessel maintenance and fishing/processing operations, and not costs that are related to activities or equipment off the vessel. Therefore, the EDC calculated net revenue is an overestimate of the true net revenue. The difference is likely much greater

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<sup>5</sup> See Section 8 for a more complete discussion of variable and fixed costs used in this report

for total cost net revenue than variable cost net revenue since most of the excluded costs are fixed costs.

Another caveat is that the EDC forms do not collect information about income taxes or financing costs. This has several implications. The first is that these costs are not included in the net revenue calculations. Therefore, net revenue is greater than it would be otherwise. The second is that in lieu of financing information (principal and interest payments), EDC total cost net revenue uses the total costs associated with vessel and gear purchases, repair, maintenance and improvements. For example, if a new engine is purchased, the total cost of the engine is used, even though the actual cash outlay, if it were financed, would only be the principal and interest payments made that year. It is likely that many larger capital costs, and perhaps some operating costs, are financed. This would mean that the actual cash outlays in a particular year for those items would be less than what is used in the EDC for the net revenue calculation. Over time, this may balance out to some degree because previously financed or purchased capital and equipment are also not included, except for the year in which they are purchased<sup>6</sup>. Moreover, total cost net revenue is expected to be representative of actual total cost net revenue only when averaged over many years and across vessels because relatively large capital costs occur periodically.

### **9.1.1 Net revenue for all West Coast fishing activities**

Average net revenue is calculated for all activities on the West Coast. West Coast revenue only includes revenue from production of fish. The variable and fixed costs do not include costs related to acquiring limited entry permits, quota shares, or quota pounds.

$$\text{Variable cost net revenue} = \text{West Coast revenue} - \text{West Coast variable costs}$$

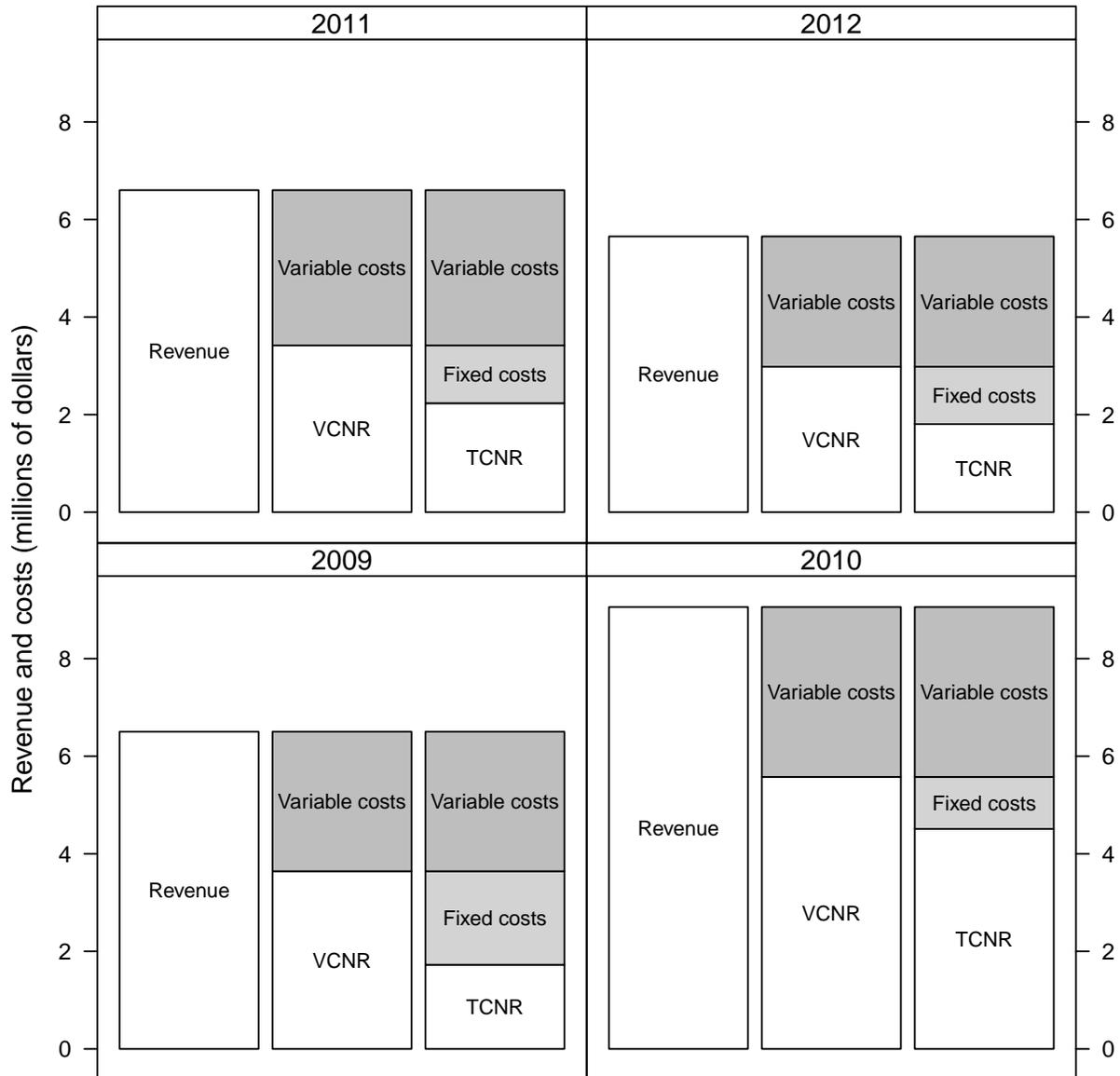
$$\text{Total cost net revenue} = \text{West Coast revenue} - (\text{West Coast variable costs} + \text{West Coast fixed costs})$$

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<sup>6</sup> At best it is just a partial balancing out because the interest payments are not accounted in the EDC data.

**Table 9.1: West Coast variable cost and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue, fixed costs, and total cost net revenue (millions of dollars) on the West Coast (N = number of vessels). Fixed costs include capitalized expenditures and expenses on vessel and on-board equipment, fishing gear, and processing equipment and other fixed costs (N = number of EDC vessels with non-zero, non-NA responses).

	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Revenue	\$6.50	5	\$9.06	6	\$6.60	9	\$5.65	9
(Variable costs)	\$2.86	5	\$3.48	6	\$3.18	9	\$2.67	9
<b>Variable cost net revenue</b>	<b>\$3.64</b>	<b>5</b>	<b>\$5.58</b>	<b>6</b>	<b>\$3.42</b>	<b>9</b>	<b>\$2.98</b>	<b>9</b>
(Fixed costs)	\$1.92	5	\$1.07	6	\$1.18	9	\$1.18	9
<b>Total cost net revenue</b>	<b>\$1.73</b>	<b>5</b>	<b>\$4.51</b>	<b>6</b>	<b>\$2.23</b>	<b>9</b>	<b>\$1.80</b>	<b>9</b>



**Figure 9.1: Catcher-processor average variable cost and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue (VCNR), fixed costs, and total cost net revenue (TCNR) on the West Coast. Fixed costs include capitalized expenditures, capital expenses, and other fixed costs.

## 10 Economic Performance: Cost, Revenue, Net Revenue, and Product Recovery Rates

As an indication of changes in efficiency and profitability, rates are calculated for the revenue, variable cost, variable cost net revenue, total cost, and total cost net revenue by days at sea (West Coast processing and steaming), metric ton of fish produced, and metric ton of fish harvested (Tables 10.1, 10.2, and 10.3).

**Table 10.1: Revenue, cost, and net revenue per day.** Mean revenue per day, variable cost per day, variable cost net revenue per day, fixed costs per day, and total cost net revenue per day.

	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Revenue per day	\$149,099	5	\$144,231	6	\$139,343	9	\$174,589	9
(Variable costs per day)	\$68,496	5	\$57,028	6	\$67,899	9	\$83,234	9
<b>Variable cost net revenue per day</b>	<b>\$80,602</b>	<b>5</b>	<b>\$87,204</b>	<b>6</b>	<b>\$71,444</b>	<b>9</b>	<b>\$91,355</b>	<b>9</b>
(Fixed costs per day)	\$80,230	5	\$19,927	6	\$27,832	9	\$48,571	9
<b>Total cost net revenue per day</b>	<b>\$373</b>	<b>5</b>	<b>\$67,277</b>	<b>6</b>	<b>\$43,612</b>	<b>9</b>	<b>\$42,784</b>	<b>9</b>

**Table 10.2: Net revenue per metric ton harvested.** Mean variable cost net revenue per metric ton harvested and total cost net revenue per metric ton harvested.

Net revenue	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Variable cost net revenue per metric ton purchased	\$491	5	\$591	6	\$416	9	\$471	9
Total cost net revenue per metric ton purchased	-\$212	5	\$458	6	\$243	9	\$227	9

**Table 10.3: Revenue, cost, and net revenue per metric ton produced.** Mean revenue per metric ton produced, variable cost per metric ton produced, variable cost net revenue per metric ton produced, fixed costs per metric ton produced, and total cost net revenue per metric ton produced.

	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Revenue per metric ton produced	\$2,500	5	\$2,743	6	\$2,423	9	\$2,702	9
(Variable costs per metric ton produced)	\$1,162	5	\$1,088	6	\$1,195	9	\$1,305	9
<b>Variable cost net revenue per metric ton produced</b>	<b>\$1,338</b>	<b>5</b>	<b>\$1,656</b>	<b>6</b>	<b>\$1,229</b>	<b>9</b>	<b>\$1,397</b>	<b>9</b>
(Fixed costs per metric ton produced)	\$2,062	5	\$371	6	\$521	9	\$727	9
<b>Total cost net revenue per metric ton produced</b>	<b>-\$723</b>	<b>5</b>	<b>\$1,284</b>	<b>6</b>	<b>\$707</b>	<b>9</b>	<b>\$670</b>	<b>9</b>

The product recovery rate for the catcher-processor whiting sector (Table 10.4) is

$$\frac{WT_n^{fishoutputs}}{WT_n^{fishinputs}}$$

where  $N$  is the number of catcher-processors that harvested fish on the West Coast,  $WT_n^{fishoutputs}$  is the weight of fish harvested and  $WT_n^{fishinputs}$  is the weight of production for each catcher-processor. The entity average product recovery rate is calculated for each survey year and shown in (Table 10.4).

**Table 10.4: Product recovery rate.** The product recovery rate (total weight of production divided by total weight of fish purchases) for catcher-processors on the West Coast ( $N$  = number of vessels with non-zero, non-NA responses).

	2009		2010		2011		2012	
	Mean	N	Mean	N	Mean	N	Mean	N
Product recovery rate	0.37 <sup>*</sup>	5	0.36 <sup>*</sup>	6	0.34 <sup>*</sup>	9	0.33 <sup>*</sup>	9