



Northeast Fisheries Science Center Reference Document 11-07

Interim Report for Fishing Year 2010 on the Performance of the Northeast Multispecies (Groundfish) Fishery (May 2010 – January 2011)

by Andrew Kitts, Evan Bing-Sawyer, Matthew McPherson,
Julia Olson, and John Walden

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US DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Science Center
Woods Hole, Massachusetts

May 2011

Northeast Fisheries Science Center Reference Documents

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Editorial Treatment: To distribute this report quickly, it has not undergone the normal technical and copy editing by the Northeast Fisheries Science Center's (NEFSC's) Editorial Office as have most other issues in the NOAA Technical Memorandum NMFS-NE series. Other than the four covers and first two preliminary pages, all writing and editing have been performed by the authors listed within.

Information Quality Act Compliance: In accordance with section 515 of Public Law 106-554, the Northeast Fisheries Science Center completed both technical and policy reviews for this report. These predissemination reviews are on file at the NEFSC Editorial Office.

This document may be cited as:

Kitts A, Bing-Sawyer E, McPherson M, Olson J, Walden J. 2011. Interim Report for Fishing Year 2010 on the Performance of the Northeast Multispecies (Groundfish) Fishery (May 2010 – January 2011). US Dept Commer, Northeast Fish Sci Cent Ref Doc. 11-07; 41 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at <http://www.nefsc.noaa.gov/nefsc/publications/>

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EXECUTIVE SUMMARY

This report provides an interim evaluation of the economic and social performance of active Northeast groundfish vessels for the first 9 months of the 2010 fishing year (May 2010 – January 2011). The analyses (Table 1) revealed some notable changes in the fishery between 2007 and 2010; some of these are recent, while others reflect ongoing trends.

Three clear changes were evident in 2010 compared with the 2007, 2008 and 2009 fishing years. Revenues from all species landed were higher in 2010 than in 2008 or 2009, but were \$4 million less than in 2007. Combined yearly average prices for all species were higher in 2010 than any other year in the time series. Economic performance, as indicated by revenue per unit effort, improved in 2010.

Other performance measures indicated the continuation of existing trends into 2010.

Some of these trends are downward. Since 2008, landings of both groundfish and non-groundfish species have declined by about 15%. There is increasing specialization at the trip level, with groundfish trips landing less non-groundfish, and non-groundfish trips landing less groundfish. Several measures of fishing activity and effort also continued to decline in 2010: there were 18% fewer active vessels in 2010 than in 2007, 46% fewer groundfish trips, 38% fewer days absent on groundfish trips, and fewer crew positions, days, and trips.

Other indicators showed increasing trends. The number of non-groundfish trips increased by 16% between 2007 and 2010. There has also been an increasing concentration of groundfish revenues among top earning vessels, as revenues have become consolidated on fewer vessels. About 66% of revenues from groundfish sales during 2007-2009 resulted from landings by 20% of active groundfish vessels. In 2010, 75% of the revenues from groundfish sales resulted from landings by 20% of active groundfish vessels.

Common Pool and Sector vessel performance was compared using some of the performance indicators. However, this comparison is not useful for evaluating the relative performance of DAS and Sector-based management because of fundamental differences between these groups of vessels which were not accounted for in the analyses. Nearly all measures of revenue per trip and per day absent in 2010 were higher for the average Sector vessel and lower for the average Common Pool vessel. In addition, many, but not all, of the overall averages for 2010 are higher than those in 2007-2009.

The interim evaluation conducted did not examine: (a) the costs associated with joining a sector; (b) vessel operating costs; (c) the effects of quota trading; or (d) changes in ownership patterns.

In August 2011, this interim report will be updated and expanded to evaluate the entire 2010 fishing year.

Table 1. Summary of major trends (includes all vessels with a valid multispecies permit)

	2007	2008	2009	2010		
				Total	Sector Vessels	Common Pool
Groundfish Revenue	\$66,340,671	\$68,111,880	\$59,585,006	\$62,253,513	\$60,243,035	\$2,010,478
Non-Groundfish Revenue	\$164,144,030	\$154,210,277	\$143,130,849	\$164,148,551	\$90,144,555	\$74,003,996
Total Revenue	\$230,484,701	\$222,322,157	\$202,715,855	\$226,402,064	\$150,387,590	\$76,014,474
Groundfish average price	\$1.37/lb	\$1.26/lb	\$1.20/lb	\$1.47/lb		
Non-groundfish average price	\$1.04/lb	\$0.94/lb	\$0.94/lb	\$1.13/lb		
Number of vessels with revenue from any species	1,034	966	917	847	441	406
Number of vessels with revenue from at least one groundfish trip	717	656	624	507	321	186
Number of groundfish trips	24,299	23,281	22,452	13,116	10,282	2,834
Number of non-groundfish trips	32,468	34,203	35,712	37,625	16,217	21,408
Number of days absent on groundfish trips	22,832	20,820	18,827	14,052	12,505	1,546
Number of days absent on non-groundfish trips	26,485	27,653	28,720	28,214	14,290	13,924
Total Crew Positions	2,697	2,543	2,448	2,239		
Total Crew-Trips	126,342	118,426	119,628	106,257		
Total Crew-days	154,338	144,224	142,272	129,346		

1. INTRODUCTION

On 1 May 2010, a new management program —Amendment 16 to the Northeast Multispecies Fishery Management Plan (FMP)—was implemented for the New England groundfish fishery, designed to comply with catch limit constraints and stock rebuilding deadlines required under the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSA). The new groundfish management program contained two significant changes. The first consisted of “hard quota” annual limits on the total allowable catch (TAC) for all of the 20 stocks in the groundfish complex. The second expanded the use of Fishing Sectors, a type of catch share program whereby groups of fishing vessels (i.e., Sectors) are each allotted a share (quota) of the total annual groundfish TAC. Sectors received quota for 9 of 14 groundfish species in the FMP and became exempt from many of the effort controls that were enacted prior to May 1, 2010, such as multispecies Days-at-Sea (DAS) limitations.

Seventeen Sectors were created¹. Each Sector established its own rules for using its allocations, but the allocated catch restrictions are applicable to the Sector as a unit (i.e., not to individual vessels in the Sector). Vessels that joined Sectors were allocated 98% of the total annual groundfish quotas, based on their level of historical activity in the groundfish fishery. Approximately half (46%) of the vessels with groundfish permits opted to remain in the Common Pool despite the relatively small amount of quota associated with these vessels. Common Pool vessels act independently of one another, with each vessel constrained by the number of DAS it can fish, by trip limits, and by all of the area closures. These restrictions help ensure that the groundfish catch of Common Pool vessels does not exceed the Common Pool’s allocation of the total annual groundfish quota for all stocks (about 2% for 2010) before the end of the fishing year.

This report provides an interim evaluation (1 May, 2010 - 31 January, 2011) of fishing year 2010 (1 May 2010 – 30 April 2011) of the economic and social performance of the groundfish fishery². In this report, all references to year are for the fishing year. The report presents two types of comparisons to evaluate performance: year-to-year and Sector-to-Common Pool. The first involves comparing indicators of fishing performance for the first 9 months of the 2010 fishing year with the average fishing performance during the first 9 months of fishing years 2007 through 2009. The second involves comparisons of the performance of Sector and Common Pool vessels within the 2010 fishing year.

The performance measures used in the report cover landings, revenue, number of vessels and effort, average vessel performance, distributional issues, and employment. Revenues are based on landings and ex-vessel (first sale) prices, and together with fishing effort provide an indication of vessel performance. Distribution is measured by fleet diversity (by vessel size and vessel revenue categories) and consolidation of revenues among vessels. Employment is measured by the number of crew positions and a measure that incorporates average crew sizes and the number of trips and days taken per year.

¹ It should be noted that two Sectors, the Georges Bank Cod Hook Sector (operating since 2004) and the Georges Bank Cod Fixed Gear Sector (implemented in 2006), operated in 2008 and 2009 but each only had an allocation of Georges Bank cod (*Gadus morhua*). In fishing year 2010, all members of the Georges Bank Cod Hook Sector joined the Georges Bank Cod Fixed Gear Sector.

² This report falls under the fisheries performance measures program developed by the NEFSC Social Sciences Branch in 2009 with extensive consultation from stakeholders in the Northeast region. See www.nefsc.noaa.gov/read/socialsci/catchshares/

1.1. Data and Analytical Approach

The activities of vessels evaluated in the study are those with valid multispecies permits during fishing years 2007-2010 and with revenue from landing any species in the fishing year. For 2010, activity is summarized by both Sector and Common Pool vessels as well as all vessels combined. An active vessel is defined as having revenue from the landing of any species within the first 9 months of a fishing year. Aggregate performance was then compared for the first 9 months of fishing years 2007-2010.

All analyses were conducted at the vessel level; however, analyses at the owner level would likely give different results for some indicators since many fishermen own more than one vessel, and some vessels are owned by multiple fishermen. Detailed ownership data are not currently available, although such data are being developed and will be included in future reports.

The evaluation includes only fish landed and sold³. Weights are given in landed pounds (after heading/gutting) rather than in live pounds (whole fish) because prices are commonly calculated on a per landed pound basis. Revenues also are based on what is landed and sold. Landings data in this report should not be used to conduct comparisons with Sector annual catch limits (ACLs) or the catch monitoring reports issued for Sectors, since the ACLs are calculated and monitored in live pounds, and include both landings and discards.

A groundfish trip is defined as a trip where the vessel owner or operator declared, either through the vessel monitoring system or through the interactive voice response system, that the vessel was making a groundfish trip. This includes trips on which groundfish days-at-sea were used (including monkfish (*Lophius americanus*) trips that used groundfish DAS). Other trips were also counted as groundfish trips if the dealer or vessel reported that groundfish was landed (e.g., trips with monkfish declarations that were not also using groundfish DAS).

Some statistics are reported by both home port and port of landing. “Home port” does not necessarily identify the port where fish are landed, but rather is the “city and state where vessel is moored” provided by vessel owners on the vessel permit applications. Most often, the home port is the port where supplies are purchased and crew is hired, although this does not apply in all cases⁴. Landed port is the actual port where fish are landed. We report by home port and by landed port because the implications of each are different. For example, revenue by home port gives an indication of the benefits received by vessel owners and crew (and some fishing-related businesses such as gear suppliers) that are based in that port. Revenue by landed port gives an indication of the benefits that other fishing related business (primarily businesses that handle fish such as dealers and processors) derive from landings in their port. We identified the top six home ports and landed ports in the Northeast and also examined changes by home port and landed port at the state level.

Some indicators in the report use a measure of time called a “day absent.” A day absent is defined as the number of days (24 hours) the vessel is “absent” from port and is calculated by

³ Sectors are allocated a combined quota for landings and discards (both count against the quota). Sector vessels incur costs in trying to avoid discards and in bringing discards to shore. We are unable to calculate these costs here.

⁴ Alternative port affiliation data are available. Principal port declaration and the vessel owner’s mailing address are also entered on the permit application. However, actual landings by port may vary widely from what a vessel owner thinks his principal port of landing will be before the fishing year begins. Also, an owner’s mailing address can be different from a vessel’s base of operation. Therefore, home port is typically used in social and economic studies to establish port affiliation (as it is in this report).

subtracting the sail date/time from the land date/time as entered on vessel logbook records, called vessel trip reports (VTRs).

For comparative purposes, many measures have been calculated for both groundfish landings and all species landings. “All species” refers to the total of all species of fish or shellfish landed, including groundfish. The home port and length of a vessel are provided by the vessel owner on the vessel’s yearly permit application. Data on vessel landings, prices, and revenues come from seafood dealer reports. Information about the number of fishing trips, and crew size are from VTRs⁵.

In addition to mean values, standard deviations are provided to show the degree of variability in the data. Some standard deviations are large relative to the mean, indicating that the values are widely dispersed. Therefore, care should be used when comparing mean values that have large standard deviations.

This interim assessment is not meant to be exhaustive, and several important performance measures are not included. Four important factors not considered in this report are: (1) organizational and monitoring costs associated with joining a Sector; (2) changes in operating costs; (3) impacts from inter- and intra-Sector trading of quota⁶; and (4) vessel ownership. The 2010 year-end Sector report will update all of the measures included in this report and, to the extent that other data are available, will expand on the analyses of performance.

The interim results presented in this report may not reflect Sector performance at year-end. Many factors can change over a full fishing year. For example, the pace at which Sectors reach their catch limits can affect measures, such as revenue per unit effort, through fishery behavioral changes prompted by dwindling quotas.

1.2. Sector vs. Common Pool Comparisons

Under Amendment 16 to the Groundfish FMP, quota-based management (involving TACs for all groundfish stocks) was implemented simultaneous to the expanded division of the groundfish fishery into two groups: Sector vessels and Common Pool vessels. Hence, changes in fishery performance identified in this report are not solely attributable to either “hard TACs” or “catch shares,” but reflect the concurrent implementation of both regimens.

Although some comparisons are made in this report between the performance of Common Pool and Sector vessels, it is recognized that there are fundamental differences in the characteristics of Sector and Common Pool vessels and in the TAC and DAS allocations⁷. Differences in Common Pool and Sector performance may therefore simply reflect these basic differences rather than any induced by regulatory changes. Comparisons between Common Pool and Sector vessels should not be considered as an evaluation of DAS management vs. Sector management. A large number of Common Pool vessels have little or no DAS, while some Common Pool vessels have small vessel exemption permits (Category C) or hand gear permits

⁵All data from seafood dealer reports and vessel trips reports are as of March 15, 2011

⁶Impacts from quota trading include the cost of paying for quota, access to credit and/or capital, and the effects of quota market performance.

⁷These may include differences in physical characteristics of the vessel, different fishing histories, and different attitudes about Sector management. Also, fishermen presumably opted to join a Sector or remain in the Common Pool based on their analysis of advantages and disadvantages of each regimen.

(HA and HB) excluding them from DAS constraints. Common Pool vessels are regulated not only by DAS, but also by additional measures⁸, some of which changed during the 2010 fishing year⁹. Finally, vessels opting into the Common Pool historically landed significantly less groundfish overall than those electing to operate in Sectors, which resulted in the Common Pool being allocated only 2% of the total annual groundfish quota for all stocks in 2010.

2. LANDINGS AND REVENUES

Revenues are an important indicator of the financial performance of vessel-based fishing businesses. Gross revenues are a function of the amount of fish landed and the price paid at the time of sale. Prices paid by dealers vary by species and may fluctuate as a result of short and long term market changes. Annual changes in gross revenues can result from three different factors: changes in prices paid for fish at the dock, changes in quantity of landings, and changes in the species composition of the landings. Flexibility to target specific species and/or market categories at times when market values are high can be important in maximizing gross fishing revenues. Information is provided below on landings, overall revenues, and nominal prices for 2010 in comparison with 2007-2009.

2.1. Landings

Total landings of all species on all trips were about 192 million pounds in the first 9 months of 2010. This compares to landings ranging from 207 million pounds to 226 million pounds in the first 9 months of the 2007–2009 fishing years. Total groundfish landings on all trips declined from a high of 56 million pounds in 2008 to a low of 44 million pounds in 2010. Non-groundfish landings on all trips also declined from a high of 170 million pounds in 2008 to 149 million pounds in 2010 (Table 2).

Total landings of all species on groundfish trips were about 66 million pounds in 2010. This compares to landings ranging from 79 million pounds to 94 million pounds in the first 9 months of the 2007–2009 fishing years. Groundfish landings on groundfish trips also declined from a high of 56 million pounds in 2008 to a low of 43 million pounds in 2010¹⁰. Non-groundfish landings on groundfish trips also declined from a high of 44 million pounds in 2008 to nearly half that level (23 million pounds) in 2010 (Table 3).

The trend lines of cumulative landings by month in 2010 of both all species and groundfish species are similar to those for 2007–2009 (Figures 1 and 2). This shows that in 2010

⁸ The effort controls regulating Common Pool vessels were established or modified under Amendment 16, as further modified by Framework 44, and include DAS reductions (by 27.5% for vessels with “A” DAS and by 72.5% for vessels with “B” DAS), rolling closures, trip limits, gear restricted areas, and a prohibition on the landing of windowpane flounder (*Scophthalmus aquosus*), ocean pout (*Zoarces americanus*), Atlantic wolfish (*Anarhichas lupus*), and SNE/MA winter flounder (*Pseudopleuronectes americanus*).

⁹ Framework 44 provides the Regional Administrator with the authority to adjust DAS counting and trip limits on an as-needed basis to keep the Common Pool within its sub-ACL for each stock. DAS counting rate changes and a number of trip limits adjustments have occurred. These have included a prohibition on retention of witch flounder (*Glyptocephalus cynoglossus*) and trip limits reductions on GOM cod, GOM haddock (*Melanogrammus aeglefinus*), GB yellowtail flounder (*Limanda ferruginea*), GOM winter flounder, GB winter flounder, and white hake (*Urophycis tenuis*).

¹⁰ Note that almost 100% of groundfish landings occurred on groundfish trips. For that reason, groundfish landing values for all trips and groundfish trips are nearly identical.

under Sector management, monthly aggregate landings remained the same as in the three previous years. Sector vessels were responsible for 63% of landings of all species on all trips in 2010, with Common Pool vessels accounting for the remaining 37% of the total (Figure 1 and Table 2). However, because of their large share of groundfish quota allocations, Sector vessels accounted for 97% of landings of groundfish on all trips in 2010 with Common Pool landings responsible for only 3% (Figure 2 and Table 2).

At the species level, landings of cod and pollock (*Pollachius virens*) showed marked declines in 2010. Landings of haddock increased substantially in 2010 compared to 2007–2009 (Figure 3).

2.2. Gross Revenues

Total revenues from all species on all trips for the first 9 months 2010 were \$226 million. This compares to revenue that ranged from a low of \$203 million in the first 9 months of 2009 to a high of \$230 million in the first 9 months of 2007. Groundfish revenues from all trips ranged from \$60 million in 2009 to \$68 million in 2008. Groundfish revenues from all trips in 2010 were \$62 million. Non-groundfish revenues from all trips in 2010 were about the same as in 2007 (\$164 million), and higher than in 2008 and 2009 (Table 2).

Total revenue from all species on groundfish trips in 2010 was about the same as in 2009 (\$78 million), but less than in 2007 (\$107 million) and 2008 (\$94 million). Groundfish revenue in 2010 on groundfish trips was \$3 million higher than in 2009 and lower than 2007 or 2008. Non-groundfish landings on groundfish trips declined each year from \$41 million in 2007 to \$16 million in 2010 (Table 3). This decline suggests an increase in specialization at the trip level. Vessels are increasingly utilizing groundfish trips to land groundfish and non-groundfish trips to land non-groundfish species.

As with landings, the trend lines of monthly cumulative revenues by month for all trips in 2010, for both all species and groundfish species, follow a similar pattern to those in 2007–2009 (Figures 4 and 5). Sector revenues from all species on all trips in 2010 accounted for 66% of the total revenue and Common Pool revenue accounted for 34% of the total (Figure 4 and Table 2). However, because of their large share of groundfish quota allocations, Sector vessels accounted for 97% of groundfish revenue on all trips in 2010, while Common Pool vessels accounted for the remaining 3% (Figure 5 and Table 2).

2.1.1 Revenues by Landing Port and Home Port

In Massachusetts landing ports overall, and in all major MA landing ports except Chatham, the nominal value of landings for all species was higher in 2010 than in the previous three years (Table 4). The three states that exhibited declines in revenue for all species landed in 2010 compared to 2007 were New Jersey, Rhode Island, and Maine. Two of the six major ports experienced declines in value of landings of all species: in Port Judith RI, revenues for all species landings declined from \$20.7 million in 2008 to \$16.2 million in 2010 (although 2010 revenues were higher than 2009), and in Portland ME, revenues for all species landings declined from \$11.3 million in 2008 to \$5.2 million in 2010 (Table 4).

The value of groundfish landed from all trips in Massachusetts, both overall and in all major MA ports (except Chatham), was higher in 2010 than in the previous three years. All other states experienced declines in groundfish revenues from landings during the past 3 years, as also occurred in the major landing ports of Portland, ME, and Port Judith, RI (Table 6).

From a home port and home port state perspective, 2010 revenues from all species on all trips by vessels declaring their home ports as Gloucester, MA; New Bedford, MA; and Portland, ME were the highest in the past four years, as were the 2010 all species revenues in the home port states of CT, ME, and NY (Table 5). Similarly, groundfish revenues on all trips for the home ports of Gloucester, MA; New Bedford, MA; and Portland, ME and for Maine overall were higher in 2010 than during the past 3 years. The increase in home port revenues in the state of Maine, in contrast to the decline in value of groundfish landed in this state, indicates that vessels declaring home ports in ME are landing their catch in other ports. Home ports in Rhode Island overall and in Point Judith experienced declines in groundfish revenue during 2007 through 2010, although the decline between 2009 and 2010 was much less than in the previous years (Table 7).

2.2.2. Revenues by Species

Examination of groundfish landings by species (Figure 3) in relation to groundfish revenue by species (Figure 6) revealed that changes in revenue during 2007-2010 were largely due to changes in landings. Notable differences to this generalization are: (1) landings of cod declined in 2010, but higher prices resulted in cod revenues in 2010 remaining nearly equal to those in 2009; and (2) pollock revenues were lower in 2010 compared to 2009, but higher prices mostly offset the drop in landings. Revenues for cod, winter flounder, witch flounder, yellowtail, and pollock declined slightly between 2009 and 2010, while revenues from American plaice (*Hippoglossoides platessoides*), white hake, and redfish (*Sebastes fasciatus*) slightly increased. Haddock revenues increased by 30%, from \$11.1 million in 2009 to \$16.1 million in 2010. The increase in haddock revenues accounted for most of the \$2.7 million increase in aggregate groundfish revenues between 2009 and 2010 (Table 2).

2.3. Prices

The increase in aggregate groundfish revenues between 2009 and 2010 despite lower groundfish landings resulted from the higher groundfish prices in 2010. Analysis of the average yearly prices of the 9 allocated groundfish species during fishing years 2007-2010 revealed notable increases in 2010 prices for cod, winter flounder, witch flounder, and pollock¹¹ (Figure 7). There were no price decreases in any groundfish species from 2009-2010.

Nominal yearly average prices of combined groundfish species declined from \$1.37/lb in 2007 to \$1.20/lb in 2009 (Figure 8). In 2010, the combined groundfish average price increased to \$1.47/lb. The yearly average price for combined non-groundfish species also increased in 2010 to \$1.13/lb from \$1.04/lb in 2007 and \$0.94/lb in 2008 and 2009.

Because average nominal prices of a combination of all groundfish species do not explicitly account for changes in the quantities of groundfish species in each year, a price index was constructed to more accurately display price trends of groundfish species. Price indexes more accurately reflect percentage changes in prices than results from using simple averages.

¹¹ Pollock prices were between \$1.00-1.40 per pound during May through July 2010 compared to \$0.50-1.00 per pound during the same period in 2007 and 2009. The 2010 price increase likely reflects the reduced pollock quota at the start of the 2010 fishing year, which constrained landings. The quota was subsequently increased in mid-July 2010. Prices then declined in August and September 2010 but remained at about \$0.80 per pound from October 2010 through January 2011. These prices are above 2007-2009 levels during the same time period.

The approach used is a “Fisher Ideal” index¹², which is a basket-type index constructed from several different goods, in this case fish species. The index was constructed by using quarterly data for fishing years 2007, 2008, 2009, and 2010. May-July (quarter one) of 2007 was set as the base period, with a value of 1.0.

The index values (Figure 9) show how combined prices have changed in relation to quarter one 2007 prices (throughout the entire 2007–2009 fishing years, not the first 9 months only). A value less than one means that prices are lower compared to the base time period, while a value greater than one indicates that prices have increased relative to quarter one in 2007.

The price index confirms that groundfish prices increased in 2010. The second and third quarter 2010 prices are higher than in all other quarters, except quarters 3 and 4 of 2007 (Figure 9).

3. NUMBER OF VESSELS AND EFFORT

Effort indicators provide information about the amount of fishing that has occurred to produce the landings. These indicators also provide a way to gauge changes in the cost of fishing when detailed information on fishing costs and quantities of inputs is not available¹³. In this report, three indicators were used to measure fishing activity and effort: the number of active fishing vessels, the number of fishing trips, and the number of days absent from port. Detailed cost and input information, based on data obtained by at-sea observers, will be included in future reports.

3.1. Number of Vessels

The number of active vessels steadily declined during the 4 years evaluated in this report (Table 8). The number of active groundfish vessels making any fishing trips during the first 9 months of the fishing year declined by 18% between 2007 (1,034 vessels) and 2010 (847 vessels). An 8% decline (i.e., 70 vessels) occurred between 2009 and 2010. Similarly, from 2007 to 2010 there was a 29% decline in the number vessels making at least one groundfish trip (717-507), with a 19% reduction (117 vessels) between 2009 and 2010. It is not possible to reliably identify the cause for the reduction in the number of active vessels that has been occurring for a number of years, including before 2007. Amendment 16 implemented a number of measures that facilitated the consolidation of fishing effort onto fewer active fishing vessels as a means to reduce the operational expenses for owners of multiple permits. For example, that action allows owners of permits held in confirmation of fishing history and not associated with an actual fishing vessel to participate in Sectors (i.e., contribute its landing history to calculate a Sector’s yearly allocation of groundfish quotas for most stocks) and lease DAS. Amendment 13 implemented DAS leasing and transfer programs allowing vessels to fish the DAS of multiple other vessels. Further, as noted previously, it is not possible to identify the extent to which inactive vessels in Sectors may benefit if other Sector vessels harvest their allocation.

In 2010, 500 vessels (37%) were inactive (no landings) (Table 8). Of these inactive vessels, 299 were Sector vessels and 201 were Common Pool vessels. The number of inactive vessels in 2010 can be compared to the number of inactive vessels in other years: 379 vessels

¹² See Balk, B.M. 2008. Price and quantity index numbers. Cambridge University Press. New York, N.Y.

¹³ Fishing inputs are the materials and labor used to produce the fish landed at the dock. Common inputs include vessels, crew, fuel, ice, hooks, nets, and other fishing supplies and equipment.

(27%) in 2007, 444 vessels (31%) in 2008, and 464 vessels (34%) in 2009. Some vessel inactivity may be due to participation in days-at-sea (DAS) leasing or transfer programs and/or internal Sector management decisions. Data are not currently available to evaluate how inactive vessels in Sectors may have benefited from agreeing to have other vessels catch the Sector's allocation.

3.2. Number of Trips and Days Absent

Numbers of fishing trips and days absent from port by active vessels were analyzed, in the aggregate and by vessel size category (< 30'; 30' to <50'; 50' to <75'; and 75' and above), to evaluate vessel activity patterns during the past 4 years (Table 9). Vessel trip report (VTR) data were used to determine the number and length of trips taken in each fishing year.

Between 2007 and 2010, the total number of groundfish fishing trips and total days absent on groundfish trips declined by 46% and 38%, respectively (24,299 trips in 2007 vs. 13,116 trips in 2010; 22,832 days absent in 2007 vs. 14,052 days absent in 2010) (Table 9). In contrast, during this same four-year period, the number of non-groundfish trips and days absent on non-groundfish trips increased by 16% and 6.5% respectively (32,468 trips in 2007 vs. 37,625 trips in 2010; 26,485 days absent in 2007 vs. 28,214 days absent in 2010)(Table 9).

Changes in fishery effort between 2007 and 2010 were also examined by vessel size category. In percentage terms, the largest reductions in groundfish trips and days absent on groundfish trips occurred in the 50' to <75' vessel size category (56% and 51%, respectively) (Table 9). In contrast, the largest vessel class (75' and above) experienced reductions of 25% and 31%, respectively. The two smallest size classes (less than 30'; 30' to <50') had reductions of about 43% in groundfish trips and about 42% in days absent on groundfish trips. Average trip length on both groundfish and non-groundfish trips was relatively constant within all vessel size classes during the time series (Table 9).

4. AVERAGE VESSEL PERFORMANCE

Average revenue per vessel, per trip, and per day absent were evaluated to assess changes in economic performance. A rigorous assessment of fishery economic performance would require actual cost information to estimate profits. However, measures of profit would need to consider both input costs (fuel, fishing supplies, ice, vessels, etc.) and revenues from fish sales. Although data on input costs are currently being collected by fishery observers, analysis of this information is not yet complete¹⁴. Therefore, for this interim report, revenue per unit of effort was used as a proxy measure for profit. Changes in revenue per unit of effort serve as a good proxy for changes in profit because an increase in the ratio of revenue to effort implies that revenues are increasing more than inputs. This is based on the assumption that inputs change as effort changes.

The revenue per effort metrics used in this report characterize the performance of an average vessel within each vessel size category. However, individual vessel performance may vary substantially, in either direction, from the average. Changes in revenue per unit effort can

¹⁴ Both the Northeast Fishery Observer Program and the At-Sea Monitors Program implemented to monitor Sector trips collect trip cost data that can be used to evaluate fishery activity. However, these programs do not collect information about sector organizational and membership costs.

also be accompanied by changes in the use (and therefore the cost) of inputs¹⁵. These caveats should be considered when evaluating the vessel performance results.

Average all-species revenue per vessel during the first 9 months of fishing year 2010 was greater than that in any of the three prior fishing years across all vessel size categories (Table 10). However, there are some differences by vessel size category.

Vessels in the two smallest size categories are relying more on non-groundfish trips and landings for their revenues. For these length categories, both the 2010 average groundfish revenue per vessel and the 2010 revenue from all species on groundfish trips were among the lowest in the past 4 years. In contrast, the larger vessels have higher averages of groundfish revenue per vessel and revenues from all species on groundfish trips in 2010 than in the previous 3 years. Furthermore, in all measures of revenue per vessel examined, the average for Sector vessels was higher than the overall 2010 average (and the average for Common Pool vessels lower) (Table 10).

Nine of the twelve revenue per trip and revenue per day absent measures for the largest three vessel size categories were higher in 2010 than in 2007-2009 (Table 11). This reinforces the observation that these vessels are currently relying less on groundfish revenue than in previous years. With one exception, all measures of revenue per trip and per day absent were higher for the average Sector vessel and lower for the average Common Pool vessel. The one exception is that the average all species revenue per day absent on non-groundfish trips in the 75' and greater vessel size category was lower for Sector vessels and higher for Common Pool vessels (Table 11). This indicates that Sector vessels may be more profitable, on average, than Common Pool vessels.

5. DISTRIBUTIONAL ISSUES

Management and regulatory changes may induce changes in the relative distribution of types and locations of vessels operating in a fishery. The measures provided thus far have provided information about aggregate activity and average vessel performance by port of landing, home port, and by vessel size class. Of equal importance is the number of vessels that underlie this information, how the distribution of vessels has changed geographically, and how the mix of vessel “types,” in terms of vessel size class and revenue class, has changed.

5.1. Number of Active Vessels by Home Port

As noted previously (Section 3.1 and Table 8), the total number of active vessels with revenue from any species on all trips during the first 9 months of the fishing year declined 18% between 2007 and 2010 (1,034 to 847 vessels). By home port, the largest percentage declines occurred in Boston (32%), Portland (27%), and New Bedford (24%) (Table 12). By state, the largest percentage decline (33%: 18-12 vessels) occurred in Connecticut. Between 2009 and 2010, the largest percentage reduction in active vessels, by state, occurred in New Jersey (14%: 65-56 vessels) and, by home port, in New Bedford (19%: 85-69 vessels) and Boston (15%: 65-55 vessels) (Table 12). Overall, the number of vessels decreased by 68 between 2007 and 2008, by 49 between 2008 and 2009, and by 70 between 2009 and 2010.

Between 2007 and 2010, the total number of vessels with revenue from at least one groundfish trip declined by 29% (717-507 vessels) (Table 13). By state, the largest percentage

¹⁵ For example, the amount of fuel used could increase due to a change in fishing behavior that may generate an increase in revenue per day absent.

declines occurred in Maine (46%: 79-43 vessels) and in Rhode Island (34%: 82-54 vessels). By homeport, the greatest percentage reductions occurred in New Bedford (42%: 59-34 vessels) and Boston (34%: 64-42 vessels). Overall, the number of vessels decreased by 61 between 2007 and 2008, 32 between 2008 and 2009 and 117 between 2009 and 2010.

5.2. Number of Active Vessels by Vessel Size

Declines in the number of active vessels occurred in all vessel size categories between 2007 and 2010 (Figure 10). The 30' to <50' vessel size category, which has the largest number of active vessels (revenue from any species on all trips), experienced an 18% decline (536-440 vessels) during the past 4 years. The 50' to <75' vessel size category, containing the second largest number of vessels, experienced a 20% reduction during 2007 to 2010 (283-226 vessels). The number of active vessels in both the smallest (less than 30') and largest (75' and above) vessel size categories declined by 16% between 2007 and 2010 (Figure 10).

The 30' to 50' vessel size category also contains the largest number of active groundfish vessels (with revenue from any species on groundfish trips only) (Figure 11). Between 2007 and 2010, this vessel size category experienced a 28% reduction in active groundfish vessels (375-269 vessels). The 50' to 75' vessel size category, containing the second largest number of active groundfish vessels, underwent a 36% reduction, declining from 220 vessels in 2007 to 140 vessels in 2010. Between 2007 and 2010, the over 75' vessel size category experienced a 24% decline in active groundfish vessels (87-66 vessels), while the number of active groundfish vessels in the <30' vessel size category declined by 8% (36-33 vessels) (Figure 11).

5.3. Distribution of Vessel Revenue

Groundfish revenues were not evenly distributed among groundfish vessels (or groundfish vessel categories) during the past 4 years (nor probably at any time). During 2007-2010, the amount of overall revenue concentrated in the top earning categories gradually increased. Distribution of revenue was examined in two ways:

- (1) Active vessels in each year were divided into eight revenue categories, with the smallest revenue category including vessels earning less than \$50,000 for all trips and species landed during the first 9 months of 2007–2010, and the highest revenue category including vessels earning over \$1 million (Figure 12).
- (2) Vessels were ranked by revenue from highest to lowest, and then categorized into 10 brackets, each containing 10% of the total number of vessels (Table 14).

Between 2007 and 2010, the number of vessels in the five lowest revenue categories (includes vessels that earned from \$1 to \$499,999) declined (Figure 12). The number of vessels in the top three revenue categories was relatively constant during the past 4 years, except for the pronounced increase in 2010 in the number of vessels in the largest revenue category (\$1.0 million and greater).

During 2007-2010, approximately 60% of the total revenue from all species has been concentrated in the top 20% of vessels (Table 14). In 2010, the top three earning brackets experienced an increase from 2007 in their share of total revenue from all species landed of less than 2%. In 2010, there was no change in the share of the bottom three revenue earning categories for all-species revenues.

During 2007-2010, groundfish revenues became increasingly more concentrated in the highest-earning 20% of vessels, increasing from 66% in 2007 to 75% in 2010 (Table 15). Most of this increase occurred between 2009 and 2010. As a consequence, the share of groundfish revenues earned by the bottom revenue earning categories declined during this time period.

The distribution of Common Pool groundfish revenue is highly skewed to the top 10% of vessels (Table 15), which accounted for 80% of the Common Pool groundfish revenues in 2010. As there is evidence indicating that Common Pool vessels are shifting away from groundfish, this concentration of groundfish revenue may be due to the shift primarily occurring among low groundfish revenue earning vessels. However, Common Pool groundfish revenues in 2010 represent a very small percentage (3%: \$2M/\$62.3M, Table 1) of the total 2010 groundfish revenues.

5.4. Consolidation of Revenue among Vessels

To evaluate any consolidation of revenues, the number of vessels accounting for 25%, 50%, 75%, and 100% of the revenue from all species on all trips during the first 9 months of the fishing year was tabulated (Table 16). From 2007 to 2009, the number of vessels that accounted for the top 25% of all species revenue fell by one vessel each year (52-50), but declined to 41 vessels in 2010. However, because the total all species fleet size also decreased between 2007 and 2010 (1,034-847 vessels), the percentage of vessels accounting for the top 25% of all species revenues only changed from 5.0-5.5% during 2007-2009 to 4.8% in 2010. From 2007 to 2009, the number of vessels that accounted for the top 50% of all species revenue fell by three vessels in 2008 and by four vessels in 2009 (from 148 in 2007 to 141 in 2009), but declined by 26 vessels to 115 vessels in 2010. This accompanying change in the percentage of the fleet accounting for 50% of the all species revenues was from 14.3-15.4% during 2007-2009 to 13.6% in 2010 (Table 16).

With respect to groundfish revenues, the number of vessels that accounted for the top 25% of groundfish revenue on all trips declined from 26 to 13 during 2007- 2010 (Table 17). On a fleet percentage basis, 2.8% of the 2010 fleet accounted for 25% of the groundfish revenues vs. 3.6-3.8% of the fleet during 2007-2009. The number of vessels that accounted for the top 50% of groundfish revenue during the past 4 years fell from 83 to 41. On a fleet percentage basis, 9% of the 2010 fleet accounted for 50% of the groundfish revenues vs. 11.6-12.3% of the fleet during 2007-2009 (Table 17).

While consolidation has occurred at the vessel level, these analyses do not provide information about consolidation at the ownership/business entity level, which is broadly defined as individual owners, ownership groups, or legally constituted corporations having a financial and management interest in more than one vessel. An analysis of entity-level consolidation would evaluate whether revenues were concentrated among fewer entities rather than fewer vessels. For example, if the same number of entities used fewer vessels, a vessel-level analysis would show consolidation whereas an entity level analysis would not. Better information on vessel ownership is required to perform entity-level consolidation analyses. This issue will be more fully addressed in future reports.

6. EMPLOYMENT

Changes in employment levels can result from changes in fishery regulations. If new management approaches such as catch shares foster vessel consolidation or reductions in fishing effort, working conditions may be affected, such as pay and time spent at sea, and the number of jobs. Although NMFS does not track employment in the fishing industry in the Northeast, Vessel Trip Reports contain information about crew size on fishing trips and the duration of trips. While these data do not identify the actual number of individuals employed (e.g., crew often work for more than one vessel owner), the data can be used to indicate the number of crew positions available and the length of time crew spend at sea.

6.1. Number of Crew Positions

The number of crew positions, measured by summing the average crew size of all active vessels on all trips during the first 9 months of the fishing year, declined from 2,697 positions in 2007 to 2,239 positions in 2010 (a 17% decline) (Table 18). Declines in crew positions occurred within all vessel size categories during 2007-2010, with the largest percentage reduction (20%: 857 to 688 crew positions) occurring in the 50' to <75' vessel size category. Declines in crew positions also occurred across all home port states (Table 19). Vessels with a home port in Maine experienced the largest percentage decline (23%: 292 to 226 crew positions), while vessels home ported in New York had the lowest percentage decline (6%: 211 to 199 crew positions). All other home port states had crew position reductions ranging from 16 to 19% between 2007 and 2010 (Table 19).

6.2. Number of Crew Trips

Although the number of crew positions is an indicator of the availability of jobs, this measure is uninformative about whether positions are part-time or full-time¹⁶. To account for this full-time/part-time distinction, a crew-trip indicator was derived. Because most crew members are paid on a per trip basis, this crew-trip indicator provides a measure of the total opportunities for crew to earn a share of the landing revenues.

Total crew trips were calculated by summing the crew size of all trips taken in the first 9 months of each fishing year across vessel size category (Table 18), and also across home port state (Table 19). Total crew trips declined from 126,342 in 2007 to 106,257 in 2010 (a 16% decline). The largest percentage decline occurred in the 30' to <50' vessel size category (18% decline). The home port state with the largest percentage decline was Connecticut (31% decline).

6.3. Number of Crew Days

Crew days, calculated by multiplying a trip's crew size by the days absent from port, were summed across vessel size categories and home port states to provide additional information about the time crew spend at sea to earn a share of the revenues. Since the number of trips affects the crew-days indicator, the indicator is also a measure of work opportunity. Conversely, crew days can be viewed as an indicator of time invested in the pursuit of "crew share" (the share of trip revenues received at the end of a trip). The time spent at sea has an opportunity cost. For example, if crew trips and crew earnings remain constant, a decline in crew

¹⁶ For example, a vessel with three crew members that makes 10 trips a year is considered equivalent with respect to crew positions as a vessel with three crew members that makes 60 trips per year.

days would reveal a benefit to crew in that less time was forgone for the same amount of earnings.

The ratio of crew days to crew trips takes account of these factors. The absolute value of the ratio, in and of itself, does not provide information about opportunities for crew. However, changes in the ratio over time are informative. For example, a declining trend would imply a reduction in time spent per “earning opportunity” (a crew trip).

Since average trip length has remained relatively constant within vessel size categories during 2007 to 2010, the crew-days indicator closely tracks the crew-trips indicator in percentage terms across vessel length classes and home port states. As a result, the ratio of crew days to crew trips has also remained relatively constant across vessel size categories and home port states over the time series (Tables 18 and 19). This means that the time spent per earning opportunity has not changed during the 2007-2010 period.

Crew-based changes, by themselves, do not indicate whether income for crew has changed. Crew income is determined by many factors such as the revenue/cost sharing formula used, the amount of revenue a vessel receives from fish sales, the costs of fishing, the number of vessels actively fishing, and the intensity of fishing.

7. CONCLUDING REMARKS

Our analyses of fishery performance measures of the Northeast Multispecies (Groundfish) Fishery revealed some notable changes in the fishery between 2007 and 2010. Many of these reflect trends apparent since 2007, while other changes are of more recent origin. The measures that reflect continuation of trends into 2010 include: (1) declining landings since 2008 of both groundfish and non-groundfish species; (2) increased specialization at the trip level (higher amounts of groundfish on groundfish trips and non-groundfish on non-groundfish trips); (3) declining number of active vessels; (4) declining number of groundfish trips and days absent and an increasing number of non-groundfish trips; (5) increasing concentration of groundfish revenue among top earning vessels; (6) consolidation of revenue on fewer number of vessels; and (7) declining employment opportunities for crew.

Changes of a more recent origin include: (1) increases in groundfish and non-groundfish revenues; (2) increases in prices of groundfish and non-groundfish species; and (3) increased economic performance in terms of revenue per unit effort, particularly among Sector vessels.

A year-end performance report of the Northeast Multispecies (Groundfish) Fishery will be prepared at the conclusion of the 2010 fishing year. The year-end report may include some measures at the vessel ownership level. Vessel operating cost data may also be used to better evaluate changes in financial performance, including estimates of crew earnings. If information about the cost of Sector membership is available, this will also be included. The impact on all job categories, beyond crew, of changes in landings patterns may be evaluated as well. To the extent possible, information about quota trading will be analyzed to understand how Sector management and hard TACs have affected fishery performance.

8. ACKNOWLEDGEMENTS

The authors would like to thank the following reviewers for their valuable suggestions: Eric Thunberg, Scott Steinback, Patricia Clay, Chad Demarest, Tom Nies, Anne Hawkins, Jessica Melgey, Richard Merrick, Paul Rago, Chris Legault, Fred Serchuk, Hannah Goodale, Doug Christel, Teri Frady, Mark Grant, and Pat Kurkul.

Table 2. Total landings and revenue from all trips by fishing year.

	2007	2008	2009	2010		
Landed Pounds				Total	Sector Vessels	Common Pool
Groundfish	49,954,359	55,907,106	51,224,145	43,592,368	42,318,750	1,273,618
Non-Groundfish	164,450,774	169,874,763	155,977,246	148,557,469	79,627,322	68,930,147
Total Pounds	214,405,133	225,781,869	207,201,391	192,149,837	121,946,072	70,203,765
Revenue						
Groundfish	\$66,340,671	\$68,111,880	\$59,585,006	\$62,253,513	\$60,243,035	\$2,010,478
Non-Groundfish	\$164,144,030	\$154,210,277	\$143,130,849	\$164,148,551	\$90,144,555	\$74,003,996
Total Revenue	\$230,484,701	\$222,322,157	\$202,715,855	\$226,402,064	\$150,387,590	\$76,014,474

Table 3. Total landings and revenue from groundfish trips by fishing year.

	2007	2008	2009	2010		
Landed Pounds				Total	Sector Vessels	Common Pool
Groundfish	49,946,051	55,600,809	51,028,115	43,485,436	42,223,652	1,261,784
Non-Groundfish	43,639,898	32,093,878	27,519,645	22,634,983	18,777,524	3,857,459
Total Pounds	93,585,949	87,694,687	78,547,760	66,120,419	61,001,176	5,119,243
Revenue						
Groundfish	\$66,325,326	\$67,758,471	\$59,392,603	\$62,107,647	\$60,117,561	\$1,990,086
Non-Groundfish	\$40,663,094	\$26,258,852	\$19,547,653	\$16,348,993	\$13,655,668	\$2,693,325
Total Revenue	\$106,988,420	\$94,017,323	\$78,940,256	\$78,456,640	\$73,773,229	\$4,683,411

Table 4. Value of landings of all species by state and port of landing (all trips).

	Fishing Year			
	2007	2008	2009	2010
CT	\$1,852,788	\$2,643,133	\$2,515,762	\$2,598,311
MA	\$129,055,629	\$120,484,930	\$119,003,976	\$134,714,162
Boston	\$7,275,354	\$7,248,285	\$6,983,894	\$8,974,666
Chatham	\$10,333,190	\$8,642,285	\$6,998,881	\$7,194,597
Gloucester	\$26,672,983	\$27,298,363	\$27,376,723	\$30,933,119
New Bedford	\$68,464,561	\$62,537,004	\$63,027,458	\$72,949,632
ME	\$20,524,531	\$19,497,228	\$13,646,958	\$16,239,067
Portland	\$10,031,177	\$11,324,547	\$5,974,336	\$5,218,503
NH	\$5,460,763	\$5,663,071	\$6,806,345	\$6,105,343
NJ	\$20,214,094	\$21,873,347	\$16,444,818	\$19,174,360
NY	\$14,642,857	\$14,329,698	\$15,030,374	\$17,238,440
RI	\$31,264,100	\$29,028,813	\$21,933,177	\$22,666,213
Point Judith	\$20,184,403	\$20,726,433	\$15,505,737	\$16,196,065
All Other States	\$7,469,939	\$8,801,937	\$7,334,445	\$7,666,168
Grand Total	\$230,484,701	\$222,322,157	\$202,715,855	\$226,402,064

Table 5. Value of landings of all species by home port state and home port (all trips).

	Fishing Year			
	2007	2008	2009	2010
CT	\$3,170,556	\$3,141,179	\$2,758,345	\$4,190,602
MA	\$117,570,931	\$109,645,481	\$105,079,304	\$115,427,711
Boston	\$25,911,807	\$21,608,510	\$19,015,847	\$20,022,730
Chatham	\$8,187,084	\$6,617,838	\$5,716,015	\$6,356,116
Gloucester	\$15,982,816	\$16,123,465	\$16,130,301	\$19,442,226
New Bedford	\$44,822,481	\$43,431,109	\$43,442,231	\$49,194,171
ME	\$22,483,772	\$21,195,275	\$19,190,315	\$24,582,373
Portland	\$6,976,362	\$6,115,038	\$6,982,708	\$9,325,598
NH	\$7,000,732	\$8,935,009	\$8,051,430	\$6,645,462
NJ	\$17,536,626	\$17,500,908	\$14,953,736	\$15,638,040
NY	\$15,985,071	\$19,351,569	\$18,378,359	\$20,727,846
RI	\$34,696,061	\$30,779,726	\$23,451,932	\$26,800,525
Point Judith	\$21,726,748	\$21,408,395	\$15,106,565	\$17,400,444
All Other States	\$12,040,952	\$11,773,010	\$10,852,434	\$12,389,505
Grand Total	\$230,484,701	\$222,322,157	\$202,715,855	\$226,402,064

Table 6. Value of landings of groundfish by state and port of landing (all trips).

	Fishing Year			
	2007	2008	2009	2010
CT	\$131,610	\$112,421	\$12,830	\$5,836
MA	\$48,080,835	\$51,578,177	\$49,229,285	\$54,538,745
Boston	\$5,389,310	\$5,779,047	\$5,718,686	\$7,371,559
Chatham	\$3,290,721	\$3,507,357	\$3,128,260	\$2,200,453
Gloucester	\$15,770,913	\$19,320,803	\$19,981,725	\$20,827,015
New Bedford	\$20,180,553	\$19,904,728	\$16,882,813	\$21,808,420
ME	\$8,425,453	\$9,546,747	\$4,874,718	\$3,628,458
Portland	\$7,365,799	\$8,983,956	\$4,012,818	\$2,701,984
NH	\$3,167,612	\$3,754,494	\$4,146,524	\$3,183,236
NJ	\$918,351	\$424,216	\$28,642	\$10,444
NY	\$949,851	\$445,092	\$52,201	\$79,328
RI	\$4,652,250	\$2,244,739	\$1,236,423	\$806,031
Point Judith	\$3,997,443	\$1,867,027	\$1,164,217	\$707,037
All Other States	\$14,709	\$5,994	\$4,383	\$1,435
Grand Total	\$66,340,671	\$68,111,880	\$59,585,006	\$62,253,513

Table 7. Value of landings of groundfish by home port state and home port (all trips).

	Fishing Year			
	2007	2008	2009	2010
CT	\$459,230	\$294,524	\$104,345	\$22,569
MA	\$41,706,946	\$44,170,832	\$40,924,492	\$44,095,686
Boston	\$11,242,036	\$10,603,535	\$9,340,947	\$10,102,406
Chatham	\$2,796,301	\$2,866,279	\$2,703,324	\$2,398,457
Gloucester	\$9,086,714	\$10,420,173	\$10,834,250	\$12,488,871
New Bedford	\$11,848,092	\$13,206,583	\$10,927,270	\$13,231,367
ME	\$10,771,096	\$11,607,370	\$9,992,747	\$11,179,804
Portland	\$4,682,096	\$4,868,154	\$5,638,658	\$7,696,119
NH	\$3,966,116	\$6,236,906	\$4,954,863	\$3,388,823
NJ	\$1,012,492	\$539,733	\$313,726	\$294,758
NY	\$1,512,905	\$1,031,274	\$338,185	\$552,040
RI	\$5,969,561	\$3,462,893	\$2,224,638	\$2,131,278
Point Judith	\$4,066,699	\$2,484,051	\$1,595,094	\$1,532,507
All Other States	\$942,325	\$768,348	\$732,010	\$588,555
Grand Total	\$66,340,671	\$68,111,880	\$59,585,006	\$62,253,513

Table 8. Number of active vessels by fishing year.

Number of Vessels	2007	2008	2009	2010	2010	
					Sector Vessels	Common Pool
Vessels issued limited access groundfish permits as of May 1 each year*	1,413	1,410	1,381	1,347	740	607
With valid groundfish permit and revenue from any species	1,034	966	917	847	441	406
With valid groundfish permit and revenue from at least one groundfish trip	717	656	624	507	321	186
Number and percent of inactive (no landings) vessels	379 (27%)	444 (31%)	464 (34%)	500 (37%)	299 (40%)	201 (33%)

* These numbers exclude groundfish limited access eligibilities held as Confirmation of Permit History (CPH). Starting in 2010, Amendment 16 authorized CPH owners to join Sectors and to lease DAS. For purposes of comparison, CPH vessels are not included in the 2010 data for either sector or Common Pool.

Table 9. Effort by active vessels.

Vessel Size	2007	2008	2009	2010	2010	
					Sector Vessels	Common Pool
Less than 30'						
Number of groundfish trips	326	241	416	182	25	157
Number of non-groundfish trips	1,759	1,806	1,719	1,662	442	1,220
Number of days absent on groundfish trips	119	79	180	70	9	61
Number of days absent on non-groundfish trips	615	627	632	589	186	403
Average trip length on groundfish trips (standard deviation)	0.37 (0.16)	0.33 (0.14)	0.44 (0.70)	0.38 (0.13)	0.37 (0.19)	0.39 (0.12)
Average trip length on non-groundfish trips (standard deviation)	0.35 (0.30)	0.35 (0.29)	0.37 (0.42)	0.35 (0.38)	0.42 (0.67)	0.33 (0.17)
30' to < 50'						
Number of groundfish trips	16,264	16,415	16,861	9,187	7,479	1,708
Number of non-groundfish trips	20,591	20,419	20,561	22,584	9,148	13,436
Number of days absent on groundfish trips	8,229	8,075	7,667	4,687	3,779	908
Number of days absent on non-groundfish trips	9,093	8,746	8,697	9,559	3,968	5,590
Average trip length on groundfish trips (standard deviation)	0.51 (0.64)	0.49 (0.58)	0.46 (0.56)	0.51 (0.59)	0.51 (0.59)	0.53 (0.61)
Average trip length on non-groundfish trips (standard deviation)	0.45 (0.48)	0.43 (0.52)	0.43 (0.50)	0.42 (0.37)	0.43 (0.39)	0.42 (0.37)

Table 9, continued. Effort by active vessels.

Vessel Size	2007	2008	2009	2010	2010	
					Sector Vessels	Common Pool
50' to < 75'						
Number of groundfish trips	6,488	5,575	4,255	2,824	1,936	888
Number of non-groundfish trips	7,938	9,028	10,421	10,805	5,289	5,516
Number of days absent on groundfish trips	8,643	7,448	5,990	4,238	3,767	471
Number of days absent on non-groundfish trips	9,162	9,895	11,000	10,555	5,661	4,894
Average trip length on groundfish trips (standard deviation)	1.34 (2.03)	1.34 (2.03)	1.41 (2.16)	1.50 (2.20)	1.95 (2.51)	0.53 (0.59)
Average trip length on non-groundfish trips (standard deviation)	1.17 (1.69)	1.10 (1.66)	1.06 (1.67)	0.98 (1.52)	1.07 (1.50)	0.89 (1.53)
75' and above						
Number of groundfish trips	1,221	1,050	920	923	842	81
Number of non-groundfish trips	2,180	2,950	3,011	2,574	1,338	1,236
Number of days absent on groundfish trips	5,842	5,218	4,991	5,056	4,950	107
Number of days absent on non-groundfish trips	7,616	8,385	8,391	7,511	4,475	3,036
Average trip length on groundfish trips (standard deviation)	4.80 (3.29)	4.97 (3.15)	5.43 (3.08)	5.48 (2.88)	5.89 (2.66)	1.32 (1.49)
Average trip length on non-groundfish trips (standard deviation)	3.53 (3.56)	2.85 (3.16)	2.79 (3.20)	2.92 (3.39)	3.35 (3.44)	2.46 (3.27)

Table 9, continued. Effort by active vessels.

All Vessel Sizes	2007	2008	2009	2010	2010	
					Sector Vessels	Common Pool
Number of groundfish trips	24,299	23,281	22,452	13,116	10,282	2,834
Number of non-groundfish trips	32,468	34,203	35,712	37,625	16,217	21,408
Number of days absent on groundfish trips	22,832	20,820	18,827	14,052	12,505	1,546
Number of days absent on non-groundfish trips	26,485	27,653	28,720	28,214	14,290	13,924
Average trip length on groundfish trips (standard deviation)	7.02 (6.11)	7.14 (5.90)	7.73 (6.51)	7.88 (5.81)	8.71 (5.94)	2.77 (2.81)
Average trip length on non-groundfish trips (standard deviation)	5.49 (6.03)	4.73 (5.62)	4.65 (5.80)	4.68 (5.66)	5.27 (6.00)	4.10 (5.34)

Table 10. Average revenue per vessel.

Vessel Size	2007	2008	2009	2010	2010	
					Sector Vessels	Common Pool
Less than 30'						
Average all species revenue per vessel (standard deviation)	\$11,458 (\$28,027)	\$14,333 (\$36,470)	\$13,924 (\$32,417)	\$16,509 (\$40,963)	\$37,118 (\$75,714)	\$11,659 (\$26,335)
Average groundfish revenue per vessel (standard deviation)	\$3,393 (\$8,271)	\$1,987 (\$2,829)	\$4,768 (\$10,477)	\$1,180 (\$1,610)	\$2,214 (\$1,880)	\$973 (\$1,508)
Average all species revenue per vessel on groundfish trips (standard deviation)	\$4,044 (\$9,157)	\$2,219 (\$3,043)	\$5,515 (\$11,054)	\$1,969 (\$3,581)	\$2,191 (\$2,086)	\$1,920 (\$3,864)
30' to < 50'						
Average all species revenue per vessel (standard deviation)	\$120,804 (\$128,049)	\$124,939 (\$127,998)	\$116,961 (\$104,511)	\$128,907 (\$117,891)	\$159,108 (\$130,433)	\$98,152 (\$94,377)
Average groundfish revenue per vessel (standard deviation)	\$62,282 (\$80,788)	\$78,046 (\$120,130)	\$75,063 (\$92,192)	\$70,055 (\$102,719)	\$98,417 (\$112,884)	\$16,166 (\$44,807)
Average all species revenue per vessel on groundfish trips (standard deviation)	\$97,166 (\$130,969)	\$100,766 (\$129,729)	\$91,587 (\$101,930)	\$87,014 (\$113,843)	\$124,935 (\$126,834)	\$27,786 (\$48,738)

Table 10, continued. Average revenue per vessel.

Vessel Size	2007	2008	2009	2010	2010	
					Sector Vessels	Common Pool
50' to < 75'						
Average all species revenue per vessel (standard deviation)	\$276,402 (\$241,501)	\$285,675 (\$219,781)	\$283,436 (\$221,870)	\$333,323 (\$298,878)	\$376,327 (\$275,808)	\$278,156 (\$319,083)
Average groundfish revenue per vessel (standard deviation)	\$103,595 (\$116,677)	\$108,407 (\$135,789)	\$103,869 (\$139,473)	\$145,459 (\$208,001)	\$188,523 (\$223,117)	\$14,783 (\$32,347)
Average all species revenue per vessel on groundfish trips (standard deviation)	\$170,500 (\$176,559)	\$159,306 (\$162,327)	\$135,740 (\$163,008)	\$158,164 (\$221,235)	\$224,883 (\$244,493)	\$26,146 (\$39,220)
75' and above						
Average all species revenue per vessel (standard deviation)	\$618,950 (\$396,894)	\$600,394 (\$440,370)	\$581,218 (\$351,539)	\$790,779 (\$461,342)	\$847,600 (\$465,496)	\$671,157 (\$434,387)
Average groundfish revenue per vessel (standard deviation)	\$244,342 (\$277,409)	\$241,069 (\$289,823)	\$234,847 (\$285,627)	\$366,414 (\$422,190)	\$434,915 (\$429,468)	\$18,643 (\$51,888)
Average all species revenue per vessel on groundfish trips (standard deviation)	\$378,112 (\$324,981)	\$336,804 (\$314,915)	\$312,151 (\$314,990)	\$497,604 (\$447,454)	\$559,829 (\$442,007)	\$46,471 (\$59,943)

Table 11. Average revenue per trip and day absent.

Vessel Size	2007	2008	2009	2010	2010	
					Sector Vessels	Common Pool
Less than 30'						
Average revenue per groundfish trip	\$450	\$287	\$910	\$384	\$707	\$333
(standard deviation)	(\$623)	(\$330)	(\$3,434)	(\$559)	(\$1,224)	(\$335)
Average revenue per non-groundfish trip	\$469	\$518	\$456	\$734	\$1,225	\$566
(standard deviation)	(\$829)	(\$815)	(\$610)	(\$1,626)	(\$2,391)	(\$1,219)
Average revenue per day on groundfish trips	\$1,538	\$1,016	\$1,674	\$1,204	\$2,035	\$1,071
(standard deviation)	(\$2,808)	(\$1,134)	(\$2,695)	(\$1,879)	(\$3,019)	(\$1,601)
Average revenue per day on non-groundfish trips	\$1,396	\$1,575	\$1,361	\$2,007	\$2,764	\$1,747
(standard deviation)	(\$2,713)	(\$2,660)	(\$1,843)	(\$3,530)	(\$3,244)	(\$3,588)
30' to < 50'						
Average revenue per groundfish trip	\$2,245	\$2,153	\$1,832	\$2,551	\$2,737	\$1,740
(standard deviation)	(\$5,147)	(\$8,522)	(\$1,999)	(\$2,805)	(\$2,873)	(\$2,318)
Average revenue per non-groundfish trip	\$1,388	\$1,487	\$1,347	\$1,623	\$1,882	\$1,470
(standard deviation)	(\$2,113)	(\$3,667)	(\$3,118)	(\$2,512)	(\$2,294)	(\$2,620)
Average revenue per day on groundfish trips	\$7,452	\$5,630	\$5,942	\$6,568	\$7,181	\$3,885
(standard deviation)	(\$79,614)	(\$26,877)	(\$94,275)	(\$12,476)	(\$13,521)	(\$5,287)
Average revenue per day on non-groundfish trips	\$3,507	\$4,028	\$3,617	\$4,053	\$4,582	\$3,740
(standard deviation)	(\$5,543)	(\$20,892)	(\$11,000)	(\$7,550)	(\$6,752)	(\$7,969)

Table 11, continued. Average revenue per trip and day absent.

Vessel Size	2007	2008	2009	2010	2010	
					Sector Vessels	Common Pool
50' to < 75'						
Average revenue per groundfish trip (standard deviation)	\$5,787 (\$13,663)	\$5,582 (\$13,115)	\$5,419 (\$8,935)	\$7,847 (\$12,464)	\$10,788 (\$13,962)	\$1,450 (\$3,097)
Average revenue per non-groundfish trip (standard deviation)	\$5,185 (\$15,890)	\$5,571 (\$15,239)	\$4,996 (\$12,902)	\$5,481 (\$16,330)	\$5,879 (\$15,349)	\$5,133 (\$17,134)
Average revenue per day on groundfish trips (standard deviation)	\$6,764 (\$27,903)	\$6,622 (\$49,352)	\$7,192 (\$53,538)	\$7,497 (\$38,018)	\$9,847 (\$45,497)	\$2,381 (\$6,948)
Average revenue per day on non-groundfish trips (standard deviation)	\$4,483 (\$10,516)	\$5,627 (\$19,883)	\$5,165 (\$11,577)	\$5,319 (\$10,873)	\$5,666 (\$8,327)	\$5,017 (\$12,674)
75' and above						
Average revenue per groundfish trip (standard deviation)	\$26,942 (\$30,954)	\$26,328 (\$20,451)	\$26,892 (\$19,836)	\$35,620 (\$25,201)	\$38,609 (\$24,038)	\$4,590 (\$13,265)
Average revenue per non-groundfish trip (standard deviation)	\$25,429 (\$40,165)	\$24,080 (\$41,672)	\$21,971 (\$41,950)	\$28,795 (\$54,497)	\$33,533 (\$56,268)	\$24,039 (\$52,256)
Average revenue per day on groundfish trips (standard deviation)	\$10,459 (\$56,034)	\$7,726 (\$21,084)	\$6,411 (\$12,615)	\$7,785 (\$12,251)	\$8,318 (\$12,667)	\$2,257 (\$3,044)
Average revenue per day on non-groundfish trips (standard deviation)	\$9,114 (\$26,979)	\$8,715 (\$16,961)	\$7,616 (\$30,913)	\$9,600 (\$32,027)	\$8,914 (\$20,411)	\$10,288 (\$40,448)

Table 12. Number of vessels with revenue from any species (all trips).

Home Port State/City	Fishing Year				2010	
	2007	2008	2009	2010	Sector	Common
					Vessels	Pool
CT	18	13	12	12	4	8
MA	513	477	462	420	257	163
BOSTON	81	69	65	55	40	15
CHATHAM	40	38	39	42	30	12
GLOUCESTER	116	112	110	101	65	36
NEW BEDFORD	91	91	85	69	48	21
ME	120	104	100	93	63	30
PORTLAND	22	18	16	16	14	2
NH	64	63	56	52	36	16
NJ	69	72	65	56	6	50
NY	100	98	94	92	16	76
RI	107	100	93	85	44	41
POINT JUDITH	59	54	50	47	35	12
All Other States	43	39	35	37	15	22
Grand Total	1,034	966	917	847	441	406

Table 13. Number of vessels with revenue from at least one groundfish trip.

Home Port State/City	Fishing Year				2010	
	2007	2008	2009	2010	Sector	Common
					Vessels	Pool
CT	10	9	10	9	3	6
MA	365	341	330	263	194	69
BOSTON	64	56	48	42	35	7
CHATHAM	28	26	28	28	23	5
GLOUCESTER	98	91	95	75	57	18
NEW BEDFORD	59	62	53	34	30	4
ME	79	65	62	43	38	6
PORTLAND	21	15	14	14	13	1
NH	51	49	48	43	31	12
NJ	46	40	38	31	4	27
NY	66	61	57	47	10	37
RI	82	75	65	54	34	20
POINT JUDITH	46	41	35	33	27	6
All Other States	18	16	14	17	7	9
Grand Total	717	656	624	507	321	186

Table 14. Distribution of revenue from all species (all trips).

Percent Bracket	2007	2008	2009	2010	2010	
					Sector Vessels	Common Pool
Top 10%	\$92,013,546 (39.9%)	\$85,445,617 (38.4%)	\$77,144,573 (38.1%)	\$93,015,705 (41.1%)	\$54,274,735 (35.9%)	\$37,314,905 (49.7%)
20%	\$45,854,129 (19.9%)	\$45,138,300 (20.3%)	\$39,754,505 (19.6%)	\$46,704,089 (20.6%)	\$28,258,007 (18.7%)	\$13,327,553 (17.8%)
30%	\$30,414,963 (13.2%)	\$29,950,177 (13.5%)	\$27,045,608 (13.3%)	\$29,196,410 (12.9%)	\$20,996,951 (13.9%)	\$8,345,414 (11.1%)
40%	\$21,266,772 (9.2%)	\$21,410,964 (9.6%)	\$19,504,758 (9.6%)	\$19,640,067 (8.7%)	\$15,189,763 (10.0%)	\$6,495,486 (8.7%)
50%	\$16,065,005 (7.0%)	\$15,805,087 (7.1%)	\$14,844,199 (7.3%)	\$14,583,275 (6.4%)	\$11,288,434 (7.5%)	\$4,631,602 (6.2%)
60%	\$11,872,486 (5.2%)	\$11,280,470 (5.1%)	\$11,362,363 (5.6%)	\$10,589,375 (4.7%)	\$7,942,844 (5.2%)	\$2,743,611 (3.7%)
70%	\$7,858,907 (3.4%)	\$7,666,991 (3.4%)	\$7,775,205 (3.8%)	\$7,374,529 (3.3%)	\$5,880,920 (3.9%)	\$1,428,699 (1.9%)
80%	\$3,761,453 (1.6%)	\$4,203,438 (1.9%)	\$3,980,852 (2.0%)	\$4,014,123 (1.8%)	\$4,294,735 (2.8%)	\$487,996 (0.7%)
90%	\$1,168,558 (0.5%)	\$1,212,255 (0.5%)	\$1,091,613 (0.5%)	\$1,100,152 (0.5%)	\$2,713,136 (1.8%)	\$216,563 (0.3%)
Bottom 10%	\$208,882 (0.1%)	\$208,858 (0.1%)	\$212,179 (0.1%)	\$184,339 (0.1%)	\$529,473 (0.3%)	\$41,237 (0.1%)
Grand Total	\$230,484,701	\$222,322,157	\$202,715,855	\$226,402,064	\$151,368,998	\$75,033,066
Number of vessels	1,034	966	917	847	441	406

Table 15. Distribution of revenue from groundfish (all trips).

Percent Bracket	2007	2008	2009	2010	2010	
					Sector Vessels	Common Pool
Top 10%	\$29,026,594 (43.8%)	\$30,769,617 (45.2%)	\$26,902,309 (45.1%)	\$32,698,190 (52.5%)	\$26,438,674 (43.9%)	\$1,596,476 (80.3%)
20%	\$14,534,092 (21.9%)	\$14,685,142 (21.6%)	\$12,911,557 (21.7%)	\$14,285,318 (22.9%)	\$12,720,572 (21.1%)	\$239,202 (12.0%)
30%	\$9,198,799 (13.9%)	\$9,837,986 (14.4%)	\$8,165,596 (13.7%)	\$7,433,424 (11.9%)	\$8,139,660 (13.5%)	\$81,887 (4.1%)
40%	\$5,944,320 (9.0%)	\$6,117,010 (9.0%)	\$5,786,972 (9.7%)	\$4,508,226 (7.2%)	\$5,133,992 (8.5%)	\$35,375 (1.8%)
50%	\$4,027,995 (6.1%)	\$3,740,198 (5.5%)	\$3,608,997 (6.1%)	\$2,268,594 (3.6%)	\$3,585,274 (5.9%)	\$21,249 (1.1%)
60%	\$2,352,007 (3.5%)	\$1,966,850 (2.9%)	\$1,614,643 (2.7%)	\$763,119 (1.2%)	\$2,338,761 (3.9%)	\$9,041 (0.5%)
70%	\$908,806 (1.4%)	\$712,343 (1.0%)	\$447,330 (0.8%)	\$223,814 (0.4%)	\$1,300,615 (2.2%)	\$3,807 (0.2%)
80%	\$279,190 (0.4%)	\$231,335 (0.3%)	\$113,675 (0.2%)	\$61,189 (0.1%)	\$489,016 (0.8%)	\$1,340 (0.1%)
90%	\$62,143 (0.1%)	\$46,803 (0.1%)	\$31,372 (0.1%)	\$10,908 (0.0%)	\$111,209 (0.2%)	\$301 (0.0%)
Bottom 10%	\$6,725 (0.0%)	\$4,596 (0.0%)	\$2,555 (0.0%)	\$731 (0.0%)	\$7,029 (0.0%)	\$33 (0.0%)
Grand Total	\$66,340,671	\$68,111,880	\$59,585,006	\$62,253,513	\$60,264,802	\$1,988,711
Number of vessels	677	631	579	458	311	147

Table 16. Number of vessels with revenue from all species by cumulative (high to low) quartile (all trips).

Percent of all species revenue	2007	2008	2009	2010
25%	52 (5.0%)	51 (5.3%)	50 (5.5%)	41 (4.8%)
50%	148 (14.3%)	145 (15.0%)	141 (15.4%)	115 (13.6%)
75%	329 (31.8%)	314 (32.5%)	309 (33.7%)	257 (30.3%)
100%	1,034 (100%)	966 (100%)	917 (100%)	847 (100%)

Table 17. Number of vessels with revenue from groundfish by cumulative (high to low) quartile (all trips).

Percent of groundfish revenue	2007	2008	2009	2010
25%	26 (3.8%)	23 (3.6%)	21 (3.6%)	13 (2.8%)
50%	83 (12.3%)	74 (11.7%)	67 (11.6%)	41 (9.0%)
75%	177 (26.1%)	158 (25.0%)	147 (25.4%)	89 (19.4%)
100%	677 (100%)	631 (100%)	579 (100%)	458 (100%)

Table 18. Changes in employment indicators by vessel size category (all trips).

Vessel Size	Year			
	2007	2008	2009	2010
Less than 30'				
Total Crew Positions	113	101	104	95
Total Crew Trips	3,078	3,127	3,359	2,853
Total Crew Days	1,068	1,071	1,209	981
Crew Days/Crew Trips	0.35	0.34	0.36	0.34
30' to < 50'				
Total Crew Positions	1,086	1,019	970	901
Total Crew Trips	72,488	67,655	68,855	59,330
Total Crew Days	36,175	33,724	32,184	28,515
Crew Days/Crew Trips	0.50	0.50	0.47	0.48
50' to < 75'				
Total Crew Positions	857	786	757	688
Total Crew Trips	37,525	34,477	34,686	32,335
Total Crew Days	56,336	51,981	52,682	46,070
Crew Days/Crew Trips	1.50	1.51	1.52	1.42
75' and above				
Total Crew Positions	641	638	617	556
Total Crew Trips	13,251	13,167	12,728	11,739
Total Crew Days	60,760	57,448	56,198	53,781
Crew Days/Crew Trips	4.59	4.36	4.42	4.58
All Sizes				
Total Crew Positions	2,697	2,543	2,448	2,239
Total Crew Trips	126,342	118,426	119,628	106,257
Total Crew Days	154,338	144,224	142,272	129,346
Crew Days/Crew Trips	1.22	1.22	1.19	1.22

Table 19. Changes in employment indicators by home port state (all trips).

Home Port State	Year			
	2007	2008	2009	2010
CT				
Total Crew Positions	52	38	41	42
Total Crew Trips	2,135	1,498	1,365	1,470
Total Crew Days	3,185	2,667	2,799	2,668
Crew Days/Crew Trips	1.49	1.78	2.05	1.81
MA				
Total Crew Positions	1,388	1,304	1,253	1,128
Total Crew Trips	57,555	54,071	55,015	46,587
Total Crew Days	75,012	69,572	70,464	62,597
Crew Days/Crew Trips	1.30	1.29	1.28	1.34
ME				
Total Crew Positions	292	254	243	226
Total Crew Trips	13,891	12,229	12,370	12,121
Total Crew Days	15,214	12,390	11,879	11,772
Crew Days/Crew Trips	1.10	1.01	0.96	0.97
NH				
Total Crew Positions	129	128	119	108
Total Crew Trips	8,470	8,614	9,367	7,236
Total Crew Days	4,434	4,848	5,040	3,429
Crew Days/Crew Trips	0.52	0.56	0.54	0.47

Table 19, continued. Changes in employment indicators by home port state (all trips).

Home Port State	Year			
	2007	2008	2009	2010
NJ				
Total Crew Positions	177	189	179	148
Total Crew Trips	11,322	11,015	10,545	9,153
Total Crew Days	10,122	10,195	9,038	8,101
Crew Days/Crew Trips	0.89	0.93	0.86	0.89
NY				
Total Crew Positions	211	205	215	199
Total Crew Trips	13,279	12,362	13,240	13,142
Total Crew Days	12,432	11,593	12,554	11,753
Crew Days/Crew Trips	0.94	0.94	0.95	0.89
RI				
Total Crew Positions	301	278	268	253
Total Crew Trips	16,353	14,515	13,676	12,861
Total Crew Days	24,359	22,023	20,418	19,954
Crew Days/Crew Trips	1.49	1.52	1.49	1.55
All Other States				
Total Crew Positions	148	146	131	135
Total Crew Trips	3,337	4,122	4,050	3,687
Total Crew Days	9,579	10,936	10,080	9,072
Crew Days/Crew Trips	2.87	2.65	2.49	2.46
Total				
Total Crew Positions	2,697	2,543	2,448	2,239
Total Crew Trips	126,342	118,426	119,628	106,257
Total Crew Days	154,338	144,224	142,272	129,346
Crew Days/Crew Trips	1.22	1.22	1.19	1.22

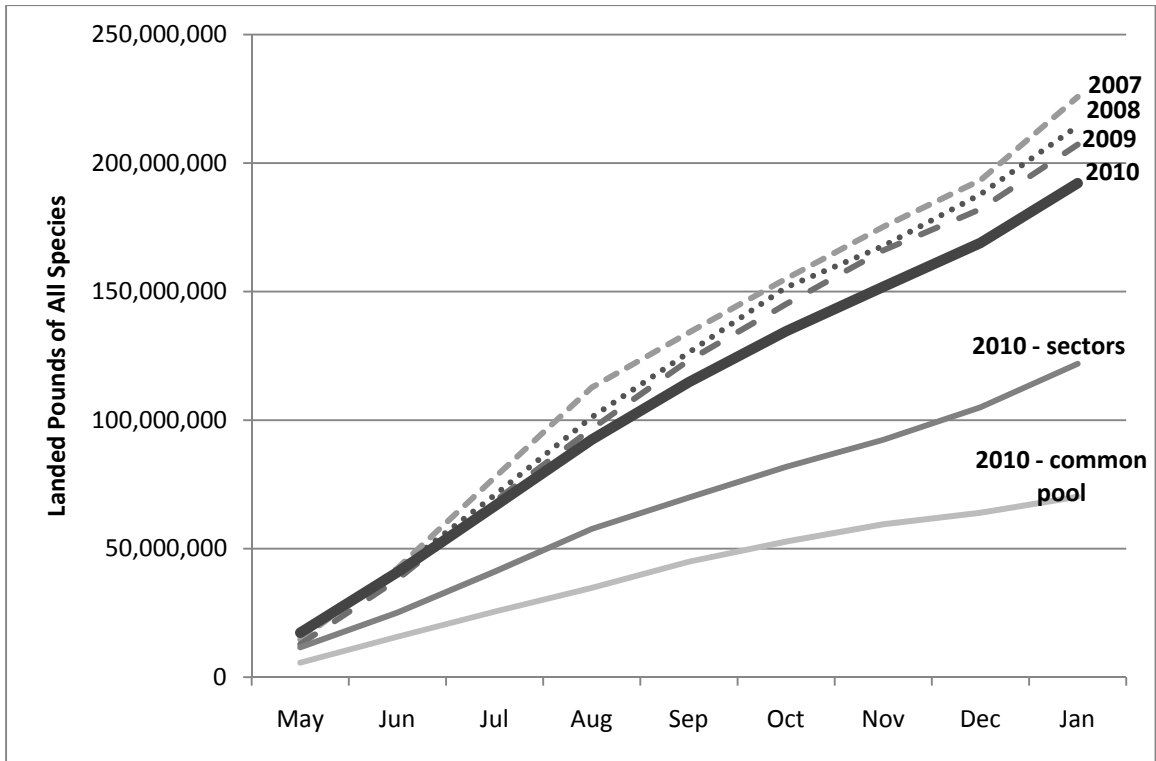


Figure 1. Cumulative landings of all species (all trips).

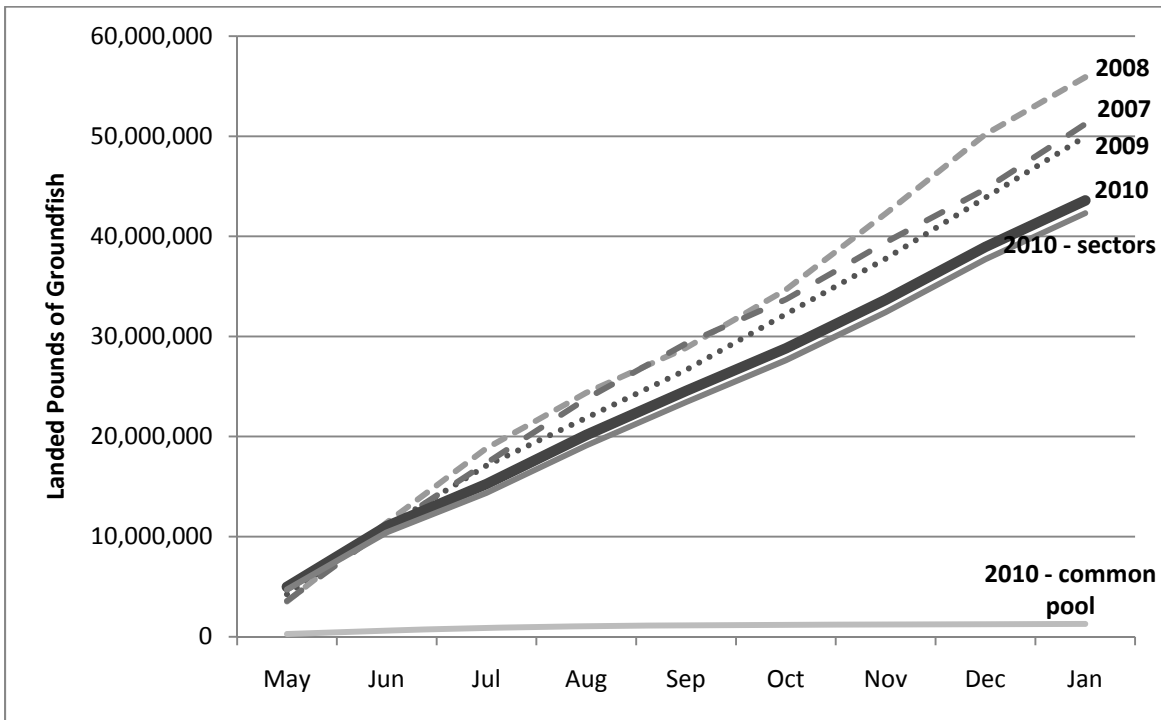


Figure 2. Cumulative landings of groundfish (all trips).

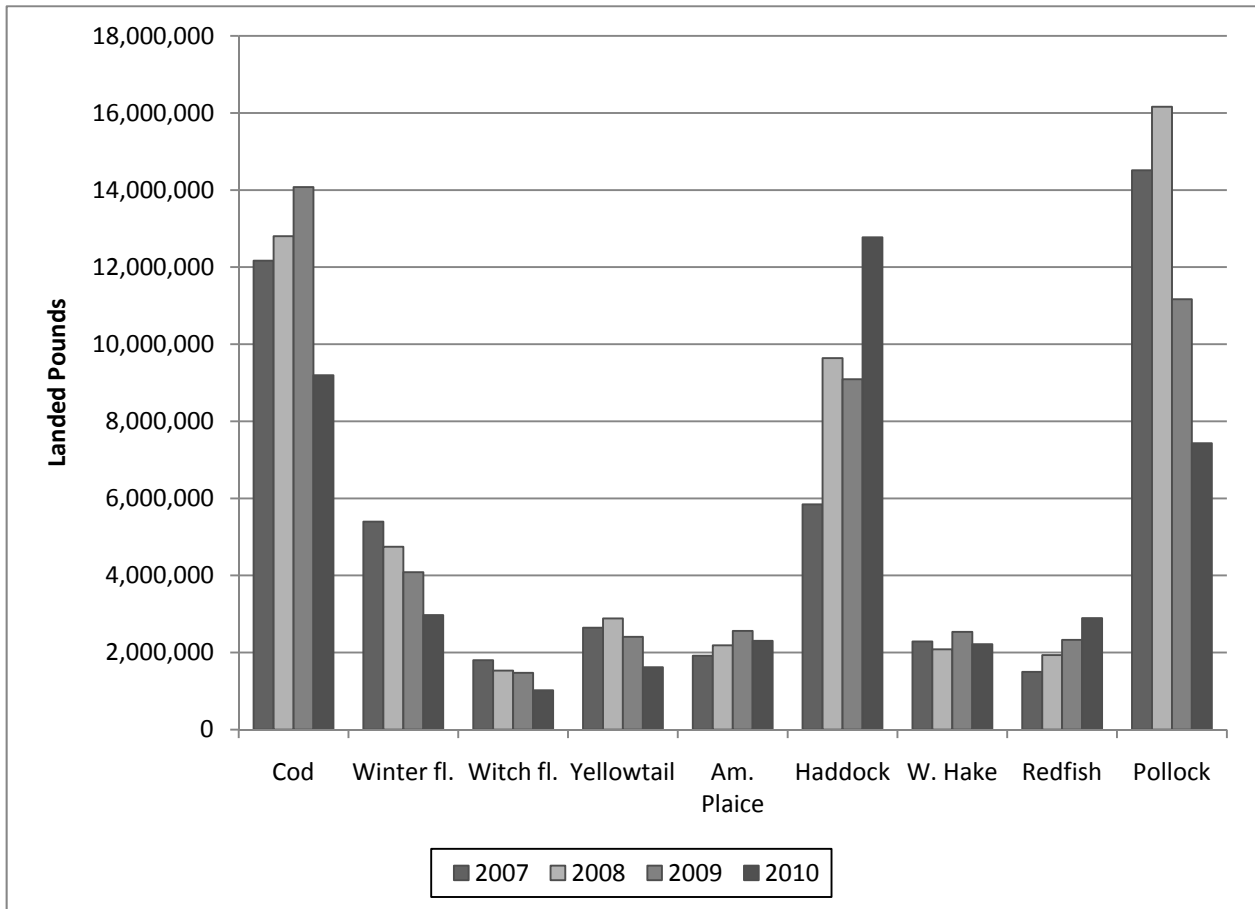


Figure 3. Groundfish landings by species (all trips).

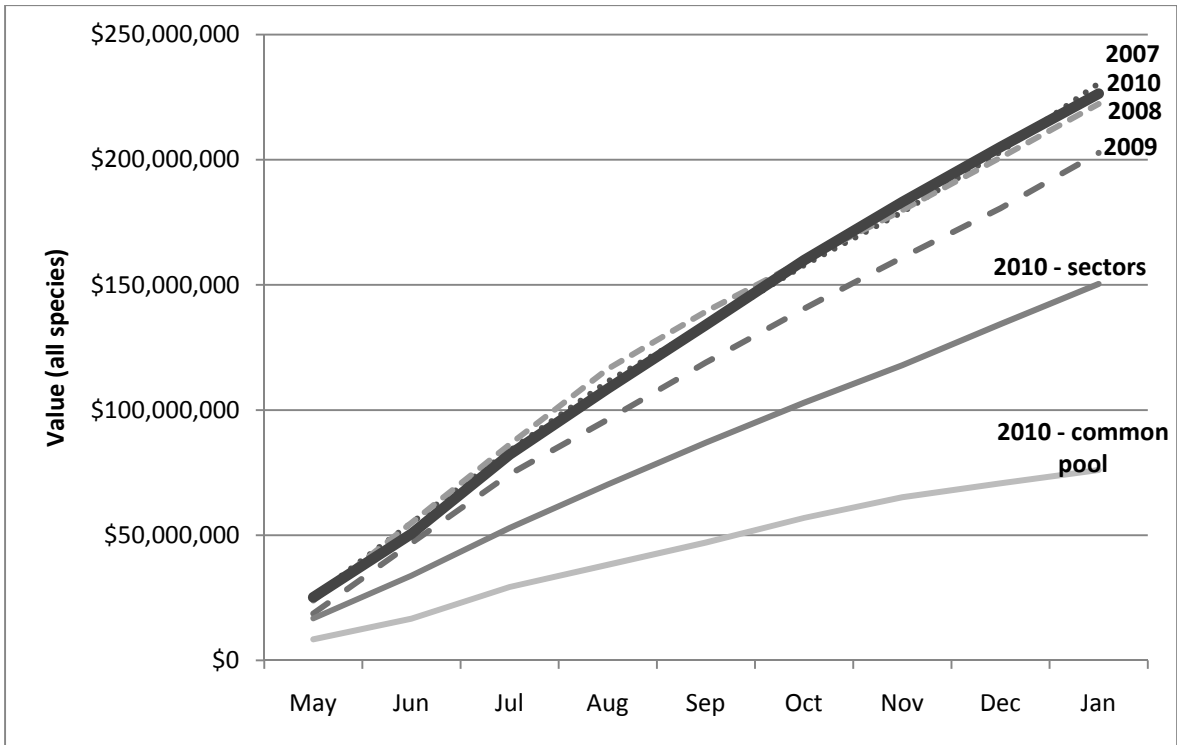


Figure 4. Cumulative revenue from all species (all trips).

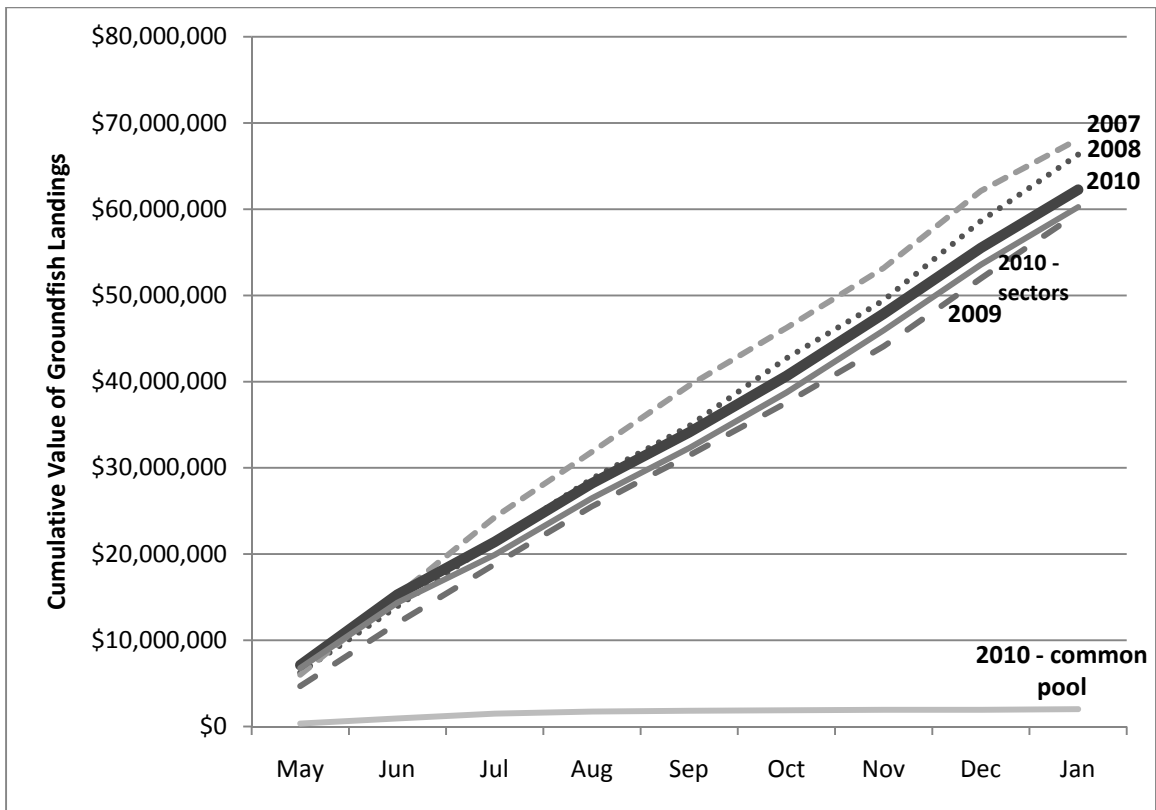


Figure 5. Cumulative revenue from groundfish (all trips).

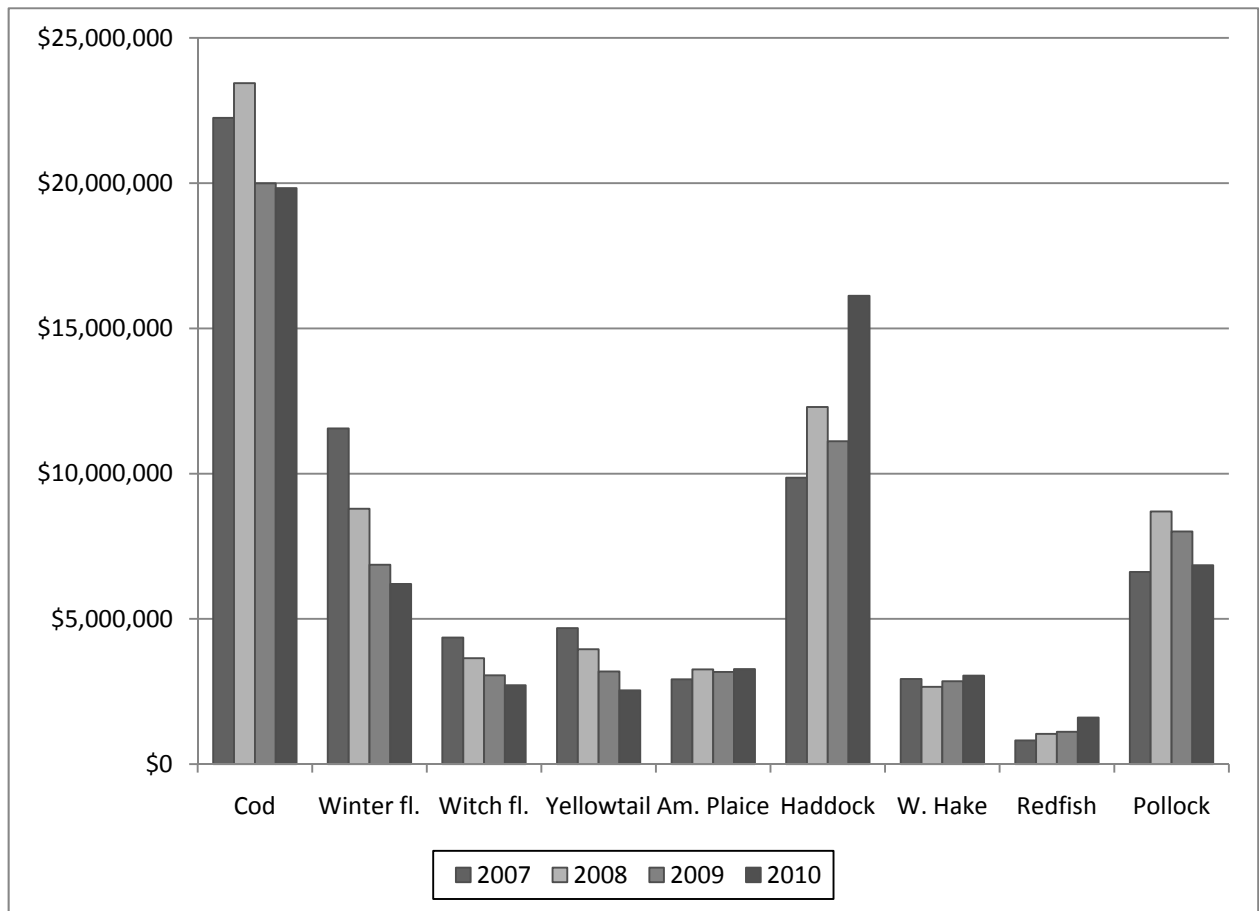


Figure 6. Groundfish revenue by species (all trips).

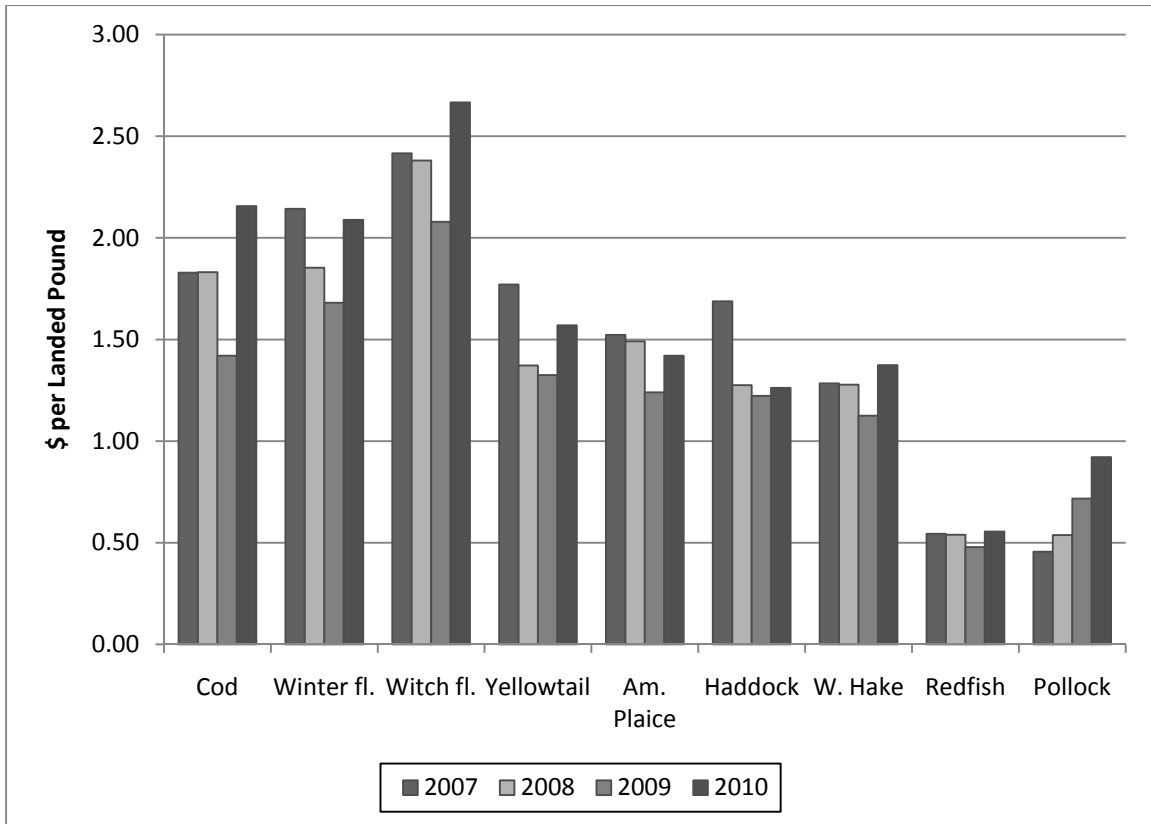


Figure 7. Yearly average price by groundfish species.

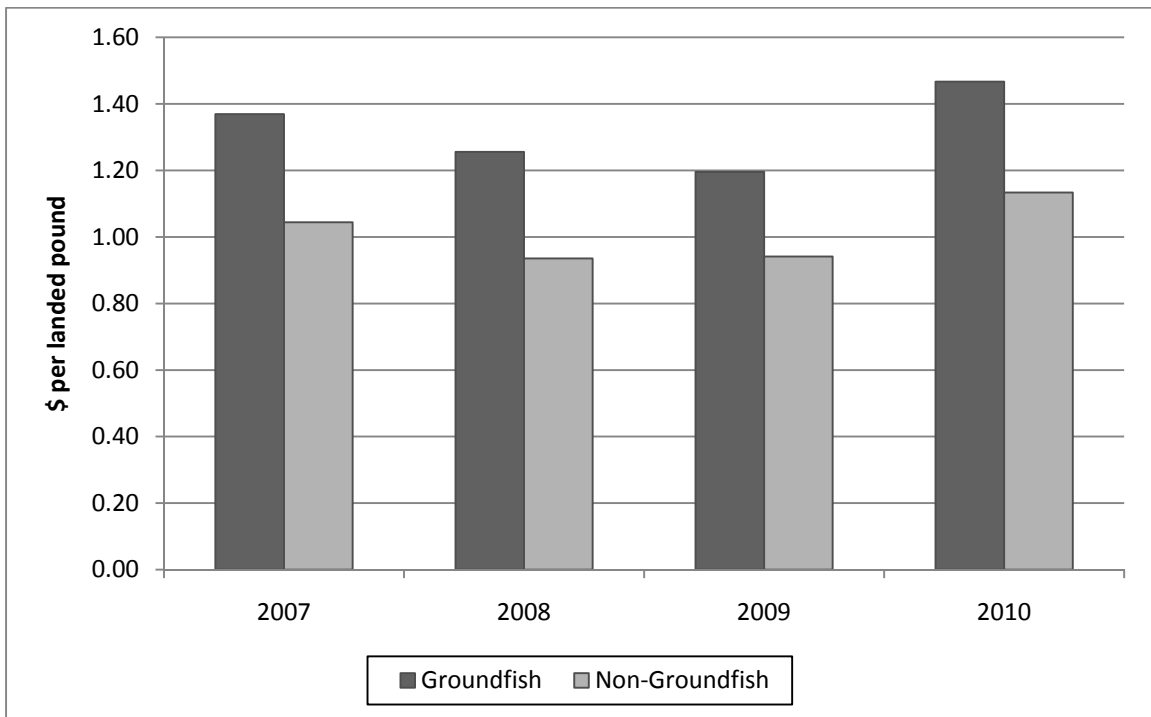


Figure 8. Yearly nominal average price of combined groundfish and nongroundfish species.

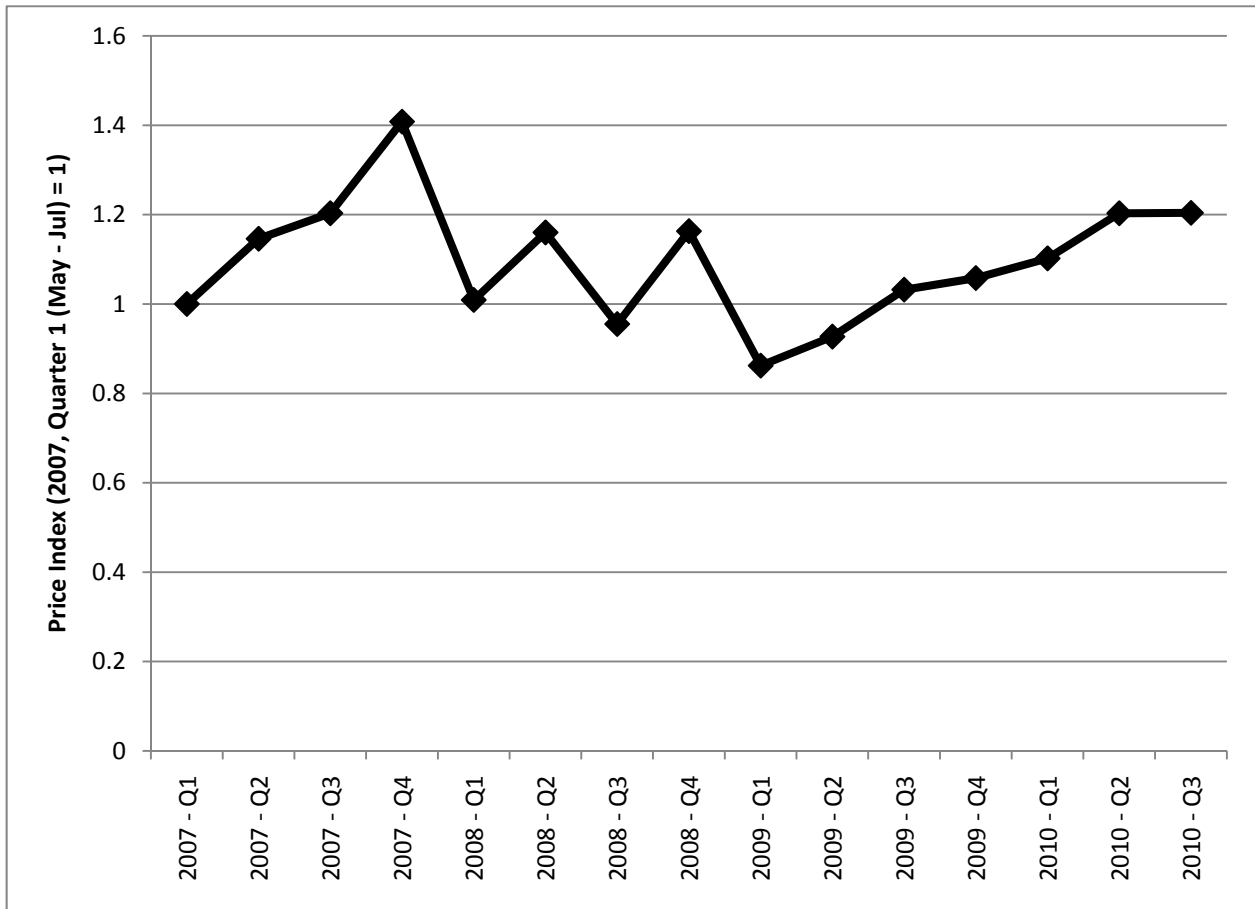


Figure 9. Quantity adjusted price index (base period = May through July, 2007).

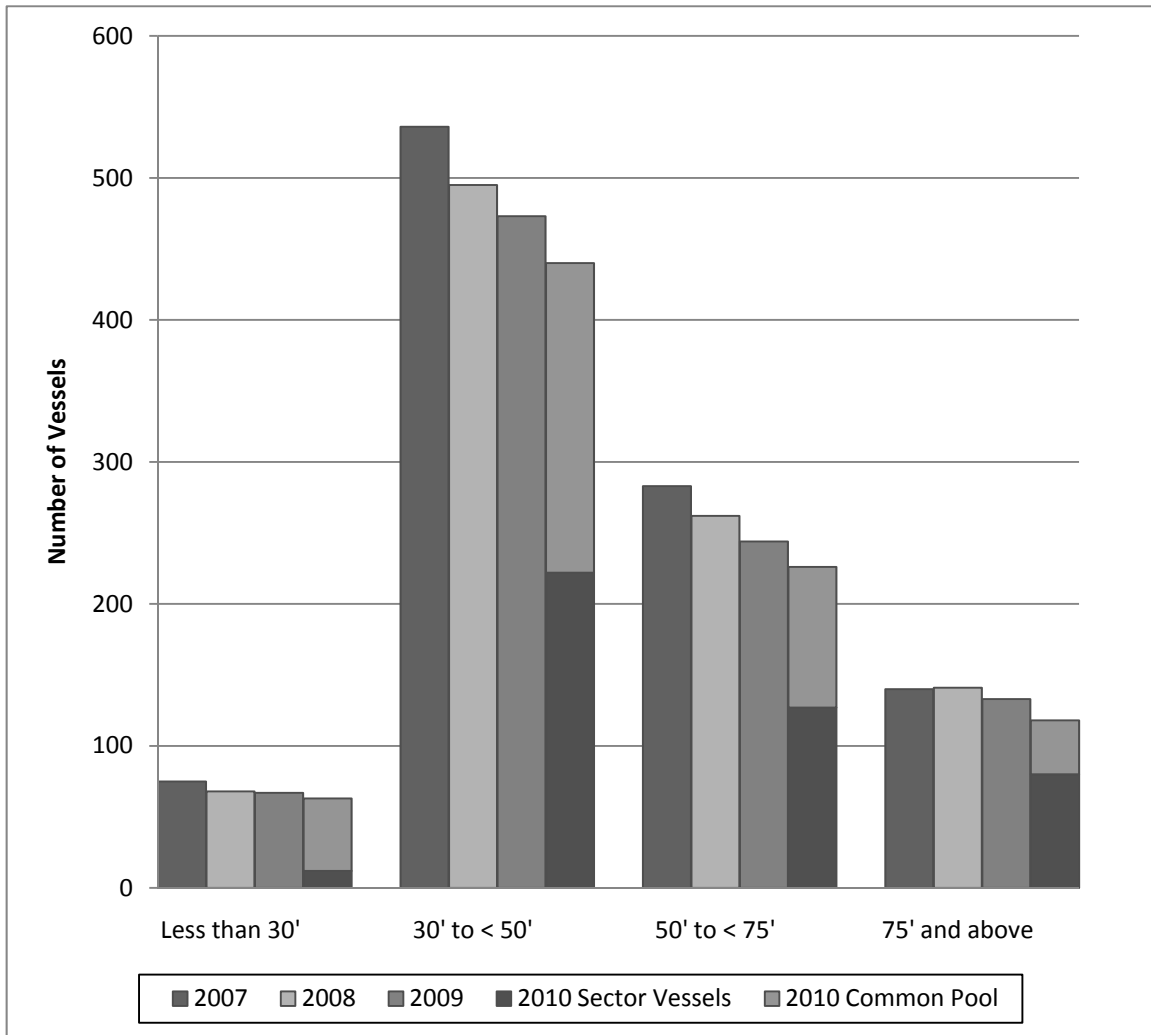


Figure 10. Number of vessels with revenue from any species by vessel size category (all trips).

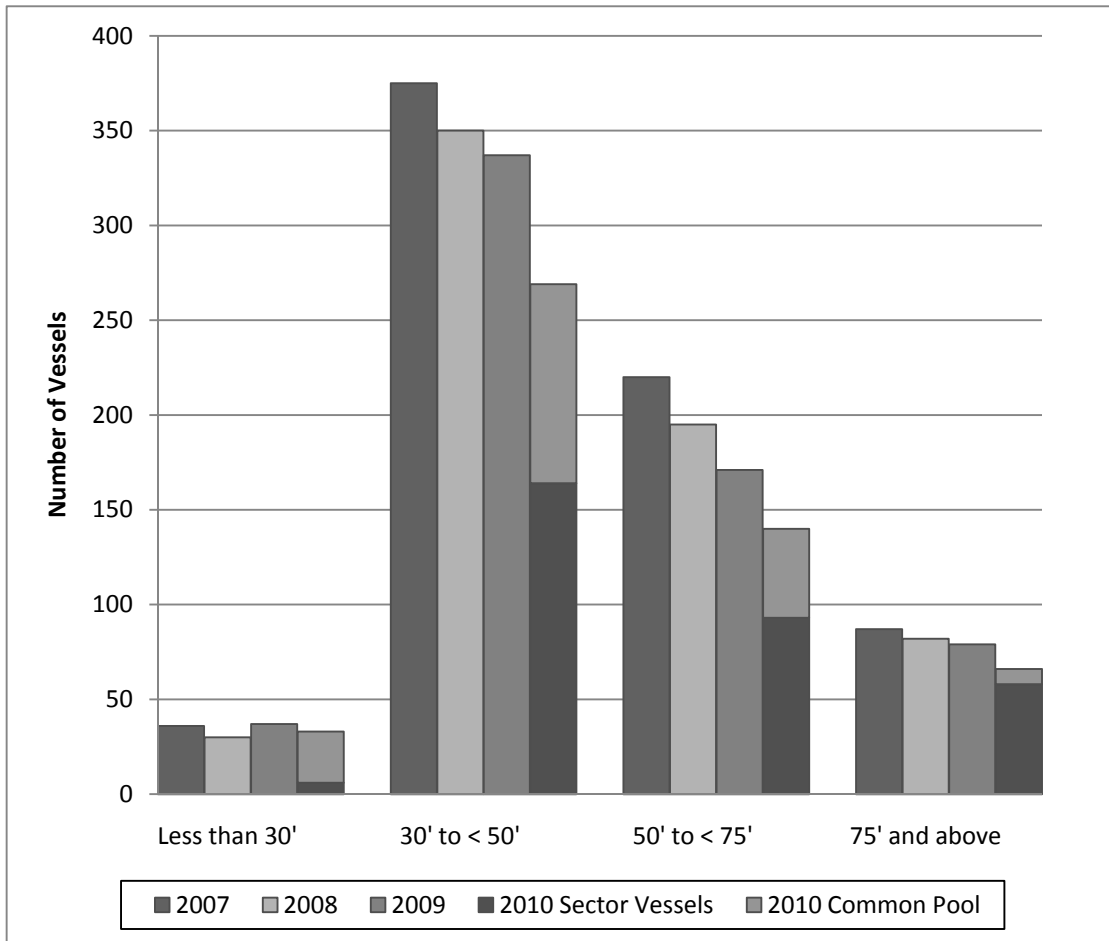


Figure 11. Number of vessels with revenue from any species on at least one groundfish trip by vessel size category.

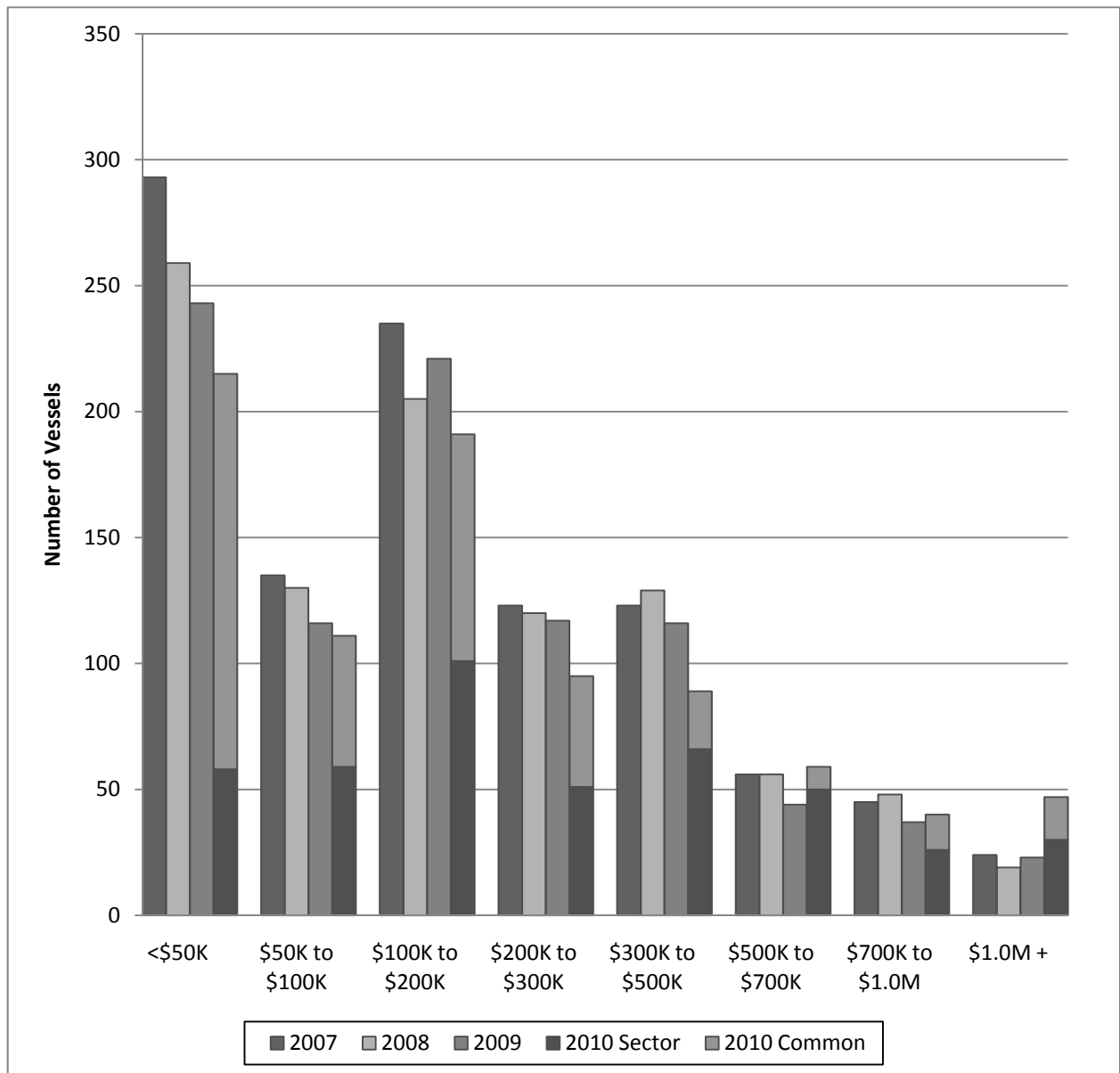


Figure 12. Number of vessels with revenue from any species by total revenue category (all trips).

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