Community Participation in U.S. Catch Share Programs

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Community Participation in U.S. Catch Share Programs

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Executive **Summary**

Photo Credit: Carlton Ward Gallery/Carlton Ward, Jr.

A “catch share” is a general term for several fishery management strategies that allocate a share (portion) of the total allowable fish catch (quota) of a given fishery to individuals, groups, communities or other entities. Over the past 20 years, the National Oceanic and Atmospheric Administration’s National Marine Fisheries Service (NMFS or NOAA Fisheries) has overseen the development of various catch share programs to manage the nation’s federal fisheries. According to the NOAA Catch Share Policy, “the purpose of the Policy is to encourage well-designed catch share programs to help maintain or rebuild fisheries, and sustain fishermen, communities and vibrant working waterfronts, including the cultural and resource traditions that have been part of this country since its founding.” Catch share programs take many different forms across fisheries and regions to address the unique circumstances of the fishery and program objectives.

In its role as steward of the nation’s fisheries, NOAA is concerned with risks to the sustainability of communities dependent on marine fisheries. New management strategies such as catch share programs have the power to affect these communities, so the NOAA Fisheries Human Dimensions Team developed measures to examine the impact of regulations, as well as the well-being of the coastal community in which the fisheries are set. These quantitative measures track the sustainability of marine-dependent communities and their involvement in a particular fishery under a specific management regime (here, catch shares). The measures are designed to improve the content and quality of social impact assessments and will help fisheries managers monitor the long-term well-being of communities in their respective regions.

A guiding principle of the NOAA Catch Share Policy is to track the performance of programs to monitor whether they are achieving their goals and objectives. This report focuses on assessing changes in fisheries participation for communities involved in each of the U.S. catch share programs. The indicators included here were chosen to better elucidate catch share performance by providing a comparison between pre- and post-implementation community participation in a particular catch share program. Indicators of community-level social well-being are included to provide a context for understanding community involvement in catch share programs.

U.S. fisheries are managed through a system of eight regional fishery management councils. As of September 2016, there

were 16 federal catch share programs in the U.S. Of these, 15 are variously managed by six of the regional fishery management councils and one is managed by NOAA Fisheries' Atlantic Highly Migratory Species Management Division (Table 1.1). The Caribbean and Western Pacific Fishery Management Councils have no catch share programs at this time. Catch share programs vary across regions in their duration and structure. The oldest program within the U.S. fisheries management system is the Mid-Atlantic Surfclam and Ocean Quahog Individual Transferable Quota (ITQ) Program, which started in 1990. The most recent is the Individual Bluefin Tuna Quota Program, begun in 2015. The North Pacific Fishery Management Council has the most catch share programs, with six, while the New England, Mid-Atlantic, Gulf of Mexico, and Pacific Fishery Management Councils each have two and the South Atlantic Fishery Management Council has one program (See Box 1).

Box 1. U.S. catch share programs by region and management council.

Region	Council	Catch Share Program	Implementation
Greater Atlantic (formerly Northeast)*	**New England**	Northeast General Category Atlantic Sea Scallop IFQ	2010
		Northeast Multispecies Sector Program	2010
	Mid-Atlantic	Mid-Atlantic Surfclam and Ocean Quahog ITQ	1990
		Mid-Atlantic Golden Tilefish IFQ	2009
Southeast	**Gulf of Mexico**	Gulf of Mexico Red Snapper IFQ	2007
		Gulf of Mexico Grouper-Tilefish IFQ	2010
	South Atlantic	South Atlantic Wreckfish ITQ**	1992
NOAA Fisheries **Headquarters**	**Atlantic Highly Migratory Species Management Division**	Individual Bluefin Tuna Quota**	2015
West Coast	**Pacific**	Pacific Coast Sablefish Permit Stacking Program	2001
		Pacific Coast Groundfish Trawl IFQ (Shore-based)	2011
Alaska	**North Pacific**	Western Alaska Community Development Quota (CDQ)**	1992
		Alaska Halibut and Sablefish IFQ	1995
		American Fisheries Act (AFA) Pollock Cooperatives	1999
		Non-Pollock Trawl Catcher/Processor Groundfish Cooperatives (aka Amendment 80)	2008
		Bering Sea and Aleutian Islands Crab Rationalization Program	2005
		Central Gulf of Alaska Rockfish Cooperatives	2007

* Hereafter referred to as Northeast ** Program not included in this report

Community Participation in Catch Share Programs

Trends in community participation in 13 of the 16 federally managed catch share programs in the U.S. were measured using a standard set of indicators. These indicators were calculated for each catch share program and reported by region. A community level pre-implementation Baseline was established and compared to each year post implementation through 2013 for each indicator. The year 2013 was selected as the final year for this analysis because it was the most current year for which all regions had data at the time this report was prepared.

The catch share program-specific Fishing Engagement Index is a measure of the importance of a specific catch share program to a given community relative to other communities in that program and region. The combination of variables used to create the index results in a more holistic measure of community dependence on catch share program species or species group as compared to the consideration of landings or landed value alone. This index is calculated using the pounds and value landed, the number of dealers or first receivers, and the number of permits that are specific to each catch share program. Communities were statistically classified as highly engaged, moderately engaged or having low engagement. Communities that were highly engaged in a catch share program for at least one year from the Baseline through 2013 are highlighted in this report.

The Fishing Engagement Index results were fairly stable across programs and regions for communities that were highly engaged for all years from the Baseline through 2013[i]. In contrast, results were variable for communities that were not consistently highly engaged during the same period. While the majority of these communities were only intermittently highly engaged, some communities for which catch share species were clearly important during the pre-implementation Baseline quickly fell below the highly engaged threshold in subsequent years. This trend was evident for a number of communities in every region, although some communities showed steeper declines than others. Interestingly, the opposite trend was evident for other communities.

Communities that were highly engaged for all years from the Baseline through 2013 were also analyzed for Regional Quotient and Local Quotient. The Regional Quotient and Local Quotient were calculated for both pounds and value landed. The Regional Quotient is a measure of a community's percent contribution to regional pounds/value landed for catch share program species while the Local Quotient is a measure of the percentage of catch share program species pounds/value landed within a community relative to pounds/value of all species landed in that community.

The Regional Quotient results tended to be program-specific. The majority of communities that were highly engaged for all years from the Baseline through 2013 also tended to land the majority of catch share program species in a region. However, there were some exceptions where the majority of regional landings occurred in communities that were not consistently highly engaged. This tended to happen in communities where factors other than landings alone were more important in characterizing community participation, e.g., the number of active permits or the number of fish dealers/first receivers in a community. For example, the majority of red snapper landed under the Gulf of Mexico Red Snapper IFQ Program was landed in communities that were not highly engaged for all years.

The Local Quotient results were variable across regions and programs. There were large fluctuations in the percent contribution of catch share program species pounds/value landed relative to total landings for many communities. While these fluctuations may reflect changes resulting from the introduction of a catch share program, such change may also be indicative of an increase or decrease in landings of other species for that community.

Social Well-Being in Fishing Dependent Communities

Social well-being in communities that participated in the 13 federally managed U.S. catch share programs highlighted in this report was measured using a standard set of eight indices. The Community Social Vulnerability Indicators (CSVIs) are a suite of objective measures of well-being focused on social vulnerability and gentrification pressure vulnerability. The indicators provide the context of overall community well-being for one point in time.

Social Vulnerability Indicators represent social factors that can shape either an individual's or a community's ability to adapt to change (poverty, personal disruption, labor force structure, housing characteristics and population composition vulnerability). Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption and retiree migration). These indicators were calculated for nearly 4,000 communities in U.S. coastal counties

[i] The criteria to retain communities that were highly engaged for all years for further analysis was modified to 10 or more years for the Mid-Atlantic Surfclam and Ocean Quahog ITQ Program fisheries (treated separately in this report) due to the long time series for this program.

primarily using data from the U.S. Census American Community Survey 5-year estimates. The results for each indicator were reported for communities that were highly engaged in a catch share program for any year from the Baseline through 2013.

While there were no clear trends across programs, the majority of these communities were ranked as medium-high or high for at least one of the Social Vulnerability Indicators. These vulnerabilities cut across communities of all sizes: in some cases rural, more isolated communities experience these vulnerabilities, but in other regions it may be the more urban populations that are affected. Although these indicators reflect the overall social well-being in communities, it is important to note that commercial fishing, both in terms of harvesting and in terms of shore support facilities, is one of multiple factors that may influence these conditions.

By examining these multiple community-level indicators, researchers and policy makers can better understand both the current status of and historical trends in community participation and social well-being in U.S. catch share programs. In this, they help to: 1) fulfill multiple requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), including National Standard 8[ii]; 2) improve assessments required under the National Environmental Policy Act (NEPA), such as Social Impact Assessments; 3) provide input to ecosystem models used by NOAA Fisheries and others; and 4) more generally, advance fisheries social science in disciplines such as anthropology and sociology.

[ii] Despite a lack of designated MSA fishing communities in any of the NOAA Fisheries Regions with catch shares, Environmental Impact Statements (EISs) for these fisheries have sections on NS8, e.g., NEFMC (2009:307): "This information helps to meet the legal requirements of the Council under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the National Environmental Policy Act (NEPA), and other applicable laws. Specifically, it addresses National Standard 8, established in a 1996 amendment to the Magnuson-Stevens Act." NS8 requires regulators, to the extent practicable while preventing overfishing and rebuilding overfished stocks, to minimize economic impacts and sustain participation in fisheries in fishing communities. Fisheries Engagement, Regional Quotient, and Local Quotient all allow tracking of changes in fisheries dependence that relate to whether or not fisheries are being sustained in a given community.

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Introduction and Methods

Photo Credit: NOAA Fisheries/Lisa L. Colburn

Introduction

Marine fishing has a long history in the United States and is an important aspect of national heritage. It is a way of life for fishermen and their families and contributes to the social, cultural and economic well-being of many coastal communities across the country. Though the Magnuson-Stevens Fishery Conservation and Management Act (MSA) mandates that sustainability of stocks cannot be compromised, National Standard 8 (NS8) of the MSA also mandates the consideration of social and economic impacts of regulatory change on MSA-defined "fishing communities." It is the responsibility of the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS or NOAA Fisheries) to implement the MSA through regulations.

The MSA defines a fishing community as "substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs" and includes a requirement (National Standard 8) to minimize economic impacts to the extent practicable and to sustain participation in fisheries in these communities, while preventing overfishing and working to rebuild overfished stocks. Agency regulations further describe the requirements of National Standard 8 and define a fishing community as "a social or economic group whose members reside in a specific location and share a common dependency on commercial, recreational, or subsistence fishing or on directly related fisheries dependent services and industries (for example, boatyards, ice suppliers, tackle shops)" (Fed. Reg. Vol. 63, No. 84, p. 24235). The phrase "a specific location" references Congressional intent. In the original legislative debate over fishing communities, both the House version emphasizing "local coastal communities" and the Senate version referencing "any place where vessel owners, operators, and crew or U.S. fish processors are based" were clearly place-based (NOAA Fisheries Office of General Council 1997: sec. 102).

Only the Western Pacific Region (which currently has no catch shares) has actually designated MSA fishing communities. Thus the communities discussed in this report are not official MSA fishing communities, though some will likely be so designated in the future. Nonetheless, the MSA definition and NS8 provide some useful guidance on how to approach fishing communities more generally. In fact, most Environmental Impact Statements (EISs) have sections on NS8, even in the absence of MSA-designated fishing communities.

Given these regulatory requirements, NOAA is concerned with "risks to the sustainability" of fishing communities (NOAA Catch Share Policy) and has highlighted the area of resilience/vulnerability as critical to sustainability. It is therefore essential to understand how the introduction of new fisheries regulations, such as catch share programs, may affect communities that are dependent on marine fisheries. The NOAA Fisheries Human Dimensions and Economics Teams have done this through the development of performance measures for fisheries management programs, including quantitative metrics of sustainability along with measures of fisheries involvement for U.S. catch share programs and the well-being of the coastal fishing communities in which they are based. The ultimate purpose of these measures is to improve the content and quality of social impact assessments as well as to assist fisheries managers in monitoring the sustainability and well-being of fishing communities in their respective regions.

The NOAA Fisheries Human Dimensions and Economics Teams met in August 2009 at the Southwest Fisheries Science Center in La Jolla, California to begin discussions on catch share program performance measures[1]. A second meeting in Silver Spring, Maryland in September 2011 was held specifically to assess the development of social indicators and identify modifications and new indicators for inclusion into the suite of Community Social Vulnerability Indicators (CSVIs) that had been developed. In September 2012 a third meeting in Seattle, Washington was held to identify performance measures for fisheries programs, followed by a meeting in Honolulu, Hawaii in November 2014 to identify specific catch share metrics at the community level and develop a work plan for this report.

This report focuses specifically on the impacts of catch share programs on U.S. fishing communities (in the broadest sense rather than as defined under the MSA, as noted above) and presents a set of community-level catch share performance metrics aimed at understanding changes in social vulnerability and fisheries' participation for communities involved in each of the U.S. catch share programs. The report first provides an overview of catch shares as a management tool and a list of current U.S. catch share programs. Second, the report provides an overview of each of the Catch Share Community Performance Indicators (Table 1.2) followed by a brief review of the methods used to develop these indicators. Finally, the report presents these performance indicators by region in the following order: Northeast, Southeast, West Coast and Alaska. Each regional section includes a general overview of the region followed by an overview of each catch share program within that region and presents trends for Catch Share Community Performance Indicators for each program. Finally, a regional summary identifies all communities that were highly engaged (see fisheries engagement description below) during the Baseline period (pre-implementation three year average) or any year from implementation through 2013.

[1] http://www.st.nmfs.noaa.gov/economics/fisheries/commercial/catch-share-program/background-materials/workshops/workshop-1

What are Catch Shares?

Over the past 20 years, NOAA Fisheries has encouraged the consideration of catch shares as a fishery management tool. Where catch shares are found to be appropriate (they are not in all fisheries), NOAA Fisheries has supported the design, implementation and monitoring of these programs. A "catch share" is a general term for several fishery management strategies that allocate a portion or "share" of the total allowable fish quota or "catch" of a given fishery to individuals, groups, communities or other entities. According to the NOAA Catch Share Policy implemented in November 2010, "the purpose of the Policy is to encourage well-designed catch share programs to help maintain or rebuild fisheries, and sustain fishermen, communities and vibrant working waterfronts, including the cultural and resource traditions that have been part of this country since its founding." Catch share programs take many different forms across fisheries and regions to address the program objectives in the context of the unique circumstances of the fishery. Specific common objectives include a desire to end the race to fish (derby fishing), meet conservation requirements, promote economic efficiency or flexibility, reduce excess capacity, and improve fishing vessel safety (Newell et al. 2005; Brinson and Thunberg 2013; Pfeiffer and Gratz 2016).

In catch share programs, a portion of the catch for a species is allocated to individual fishermen or groups. Each holder of a catch share must stop fishing when his/her/their specific share of the quota is reached, unless they are able to buy or lease more allocation through the program. Catch share programs allow fishermen to plan their fishing effort around the weather, markets, or other business considerations. This also allows other fishery-dependent businesses to plan more effectively. In addition, reduced pressure to "race for the fish" gives fishermen the freedom to experiment with new methods to reduce bycatch such as gear changes. One of the more general types of U.S. catch share programs is referred to as a Limited Access Privilege Program (LAPP), where a federal permit to harvest a quantity of fish expressed by a unit or units representing a portion of the total allowable catch of the fishery may be received or held for exclusive use by a person or group of people. This is in contrast to open access fisheries where anyone may choose to participate as long as they obtain the requisite permits (e.g., Southeast Region Spanish mackerel fishery).

Catch share programs are often referred to as "rights-based management," as they confer to individuals or groups the right to fish (permanently or temporarily) and to access a specified portion of a fishery. U.S. catch share programs, however, do not transfer the full bundle of rights potentially associated with private property (see Furubotn and Pejovich 1972 on "bundles of rights"). Two common types of catch share programs are Individual Transferable Quotas (ITQs) and Individual Fishing Quotas (IFQs). When initially introduced, IFQs and ITQs were differentiated by being transferable (ITQs) or not (IFQs). However, today the two terms are often used interchangeably (Holland et al. 2015). Each confers some portion of a quota. In the U.S. they are federal permits under a limited access system to harvest a percentage of the total catch of a fishery that may be received or held for exclusive use by a person or entity. In addition, per the Limited Access Privilege Program (LAPP) language in section 303A of the Magnuson-Stevens Fishery Conservation and Management Act (MSA - the U.S. law governing marine fisheries), ITQ/IFQ holders in a specific fishery may form management entities either as a Fishing Community[2] (if they all reside in the same community or town) or a Regional Fishery Association, or RFA, (if they live in multiple communities). Fishing Community entities may also join with other Fishing Community entities or with individuals from other communities to form an RFA. There is also a Community Development Quota (CDQ) Program, which is designed for economic development in specific Western Alaska Native communities.

One of the more common problems in open access fisheries is that there are too many people pursuing too few fish. Catch shares are one possible strategy to address this problem. However, limiting the number of people in a fishery is always challenging, as Anderson and Holliday (2007) note specifically for catch share programs. Equitable distribution of harvesting privileges to not only individuals, but to ports and fleets, has become an important concern in many regions (Carothers and Chambers 2012; Olson 2011; Pinkerton and Edwards 2009). Initial allocation of fishing privileges inevitably excludes some existing fishermen and/or provides shares in numbers that limit fishing flexibility and may disproportionately affect younger fishermen, hired captains and crew, and those living in rural areas (GAO 2004). While we recognize that these problems may exist, we currently are unable to clearly discern how the current suite of U.S. catch share programs may or may not contribute to some of these impacts in specific regions and fisheries. This description of community participation in catch share programs takes an initial step to providing background information that may assist in future analyses to address important aspects of these programs and their impacts.

[2] Designation of a Fishing Community as a management entity under the LAPP provisions is not the same as or equivalent to designation as an official MSA fishing community (as defined in MSA sec. 3(17)) in relation to NS8. Such a designation requires an action by the regional fishery management council in coordination with NMFS. At this time, only the Western Pacific Fishery Management Council has officially designated fishing communities in relation to NS8.

U.S. Catch Share Programs

U.S. fisheries are managed through a system of eight regional fishery management councils. As of September 2016, there were 16 federal catch share programs in the U.S. Of these, 15 are variously managed by six of the regional fishery management councils, and one is managed by NOAA Fisheries' Atlantic Highly Migratory Species Management Division (Table 1.1). The Caribbean and Western Pacific Fishery Management Councils have no catch share programs at this time. Catch share programs vary across regions in their duration and structure. The oldest program within the U.S. fisheries management system is the Mid-Atlantic Surfclam and Ocean Quahog ITQ Program, begun in 1990. The most recent is the Individual Bluefin Tuna Quota Program, which started in 2015. The North Pacific Fishery Management Council has the most catch share programs, with six, while the New England, Mid-Atlantic, Gulf of Mexico, and Pacific Fishery Management Councils each have two and the South Atlantic Fishery Management Council has one program (See Box 1).

Table 1.1. Catch share programs as of May 2016.

Region	Council	Catch Share Program	Implementation
Greater Atlantic (formerly Northeast)*	**New England**	Northeast General Category Atlantic Sea Scallop IFQ	2010
		Northeast Multispecies Sector Program	2010
	Mid-Atlantic	Mid-Atlantic Surfclam and Ocean Quahog ITQ	1990
		Mid-Atlantic Golden Tilefish IFQ	2009
Southeast	**Gulf of Mexico**	Gulf of Mexico Red Snapper IFQ	2007
		Gulf of Mexico Grouper-Tilefish IFQ	2010
	South Atlantic	South Atlantic Wreckfish ITQ**	1992
NOAA Fisheries **Headquarters**	**Atlantic Highly Migratory Species Management Division**	Individual Bluefin Tuna Quota**	2015
West Coast	**Pacific**	Pacific Coast Sablefish Permit Stacking Program	2001
		Pacific Coast Groundfish Trawl IFQ (Shore-based)	2011
Alaska	**North Pacific**	Western Alaska Community Development Quota (CDQ)**	1992
		Alaska Halibut and Sablefish IFQ	1995
		American Fisheries Act (AFA) Pollock Cooperatives	1999
		Non-Pollock Trawl Catcher/Processor Groundfish Cooperatives (aka Amendment 80)	2008
		Bering Sea and Aleutian Islands Crab Rationalization Program	2005
		Central Gulf of Alaska Rockfish Cooperatives	2007

* Hereafter referred to as Northeast ** Program not included in this report

With the exception of the CDQ Program, all programs allow for transfer of harvesting privileges in some form. Ownership may be assigned to individuals or entities, and some programs limit ownership to specific categories (e.g., fishermen already involved in the fishery at the time the catch share is introduced). The ability to transfer privileges, quota ownership, and quota use varies widely across programs (re. Holland et al. 2014, 2015), which has implications on how quota ownership and vessel participation can change over time and across geographies. In addition, some programs cap the total amount of

quota that can be owned by a single individual or entity. Therefore, it is important to recognize that all catch share programs are unique and their origins lie in regional solutions to regional issues. Yet because of underlying structural similarities among catch share programs, common elements appear across all regions (see Brinson and Thunberg 2016, Table 1.2).

The Community Catch Share Performance Indicators

A guiding principle of the NOAA Catch Share Policy is to track the performance of programs to monitor whether they are achieving their goals and objectives. Brinson and Thunberg (2013, 2016) developed performance metrics to assess the overall economic performance of U.S. catch share programs. Similar to that report, the indicators included here were chosen to better understand catch share performance by providing a comparison over time of the communities participating in a particular catch share program. There are two important differences between the economic performance indicators in Brinson and Thunberg (2013, 2016) and the indicators presented in this report. First, the analyses presented here focus on the specific communities involved in each fishery rather than involvement in commercial fishing in general. Second, these measures capture community-level social well-being in addition to economic measures (e.g., landed pounds and landed value by community).

This report presents two categories of objective community-level indicators that aim to monitor community dependence on catch share species. Dependence on catch share species is relevant to community well-being, regardless of program design differences. The first category of indicators is intended to measure commercial fishing engagement by community for each catch share species or species group. The second category of indicators includes community-specific measures of social vulnerability and gentrification pressure vulnerability, based on those developed in Jepson and Colburn (2013). For this report, the commercial fishing engagement measure was made species-specific as well as community-specific. In other words, under each individual catch share program the commercial fishing engagement measures are for community landings of specific catch share species only. Additional indicators include the Regional Quotient and the Local Quotient for each fishery (see Table 1.2 for more detail on each). Together, these four metrics form the Community Catch Share Performance Indicators (further defined in Table 1.2).

Table 1.2. Definitions of catch share performance indicators for communities.

Performance Indicator	Definition	Timeframe
Catch Share Program-Specific Fishing Engagement Index*	Index consisting of catch share species pounds and value, number of permitted catch share vessels, number of catch share dealers within a community	Baseline to 2013
Catch Share Program Regional Quotient* (pounds and value)	Community landings of catch share species divided by total landings of catch share species in region	Baseline to 2013
Catch Share Program Local Quotient* (pounds and value)	Community landings of catch share species divided by total landings (all species) in community	Baseline to 2013
Community Social Vulnerability Indicators (CSVIs)	**Social Vulnerability Indicators:** Poverty Index, Population Composition Index, Personal Disruption Index, Housing Characteristics Index, Labor Force Structure Index **Gentrification Pressure Vulnerability Indicators:** Housing Disruption Index, Retiree Migration Index, Urban Sprawl Index	2013 American Community Survey 5-year Estimate

* Catch share program indicators were calculated based on calendar year with the exception of the Bering Sea and Aleutian Islands Crab Rationalization Program, which was calculated based on fishing year.

This report covers all but the following programs: the CDQ Program, the South Atlantic Wreckfish ITQ Program and the Highly Migratory Species (HMS) Bluefin Quota Program, because the metrics chosen for this analysis are incompatible with some of the unique features of each of these programs. Catch share programs are grouped by region of the U.S. because regional issues influence when catch shares are introduced and what form they take. The report examines trends for each program for the four Community Catch Share Performance Indicators over time, from a baseline period including the three years prior to program implementation through 2013. While these trends may show decreases, increases or no change for any given catch share program, we cannot control for confounding factors. Changes in trends can be attributed to many different factors for which we have not controlled, such as natural disasters or the price of fuel. In future reports, with additional metrics and data on non-catch share fisheries, we may be able to better explain trends and more fully compare various fisheries.

Methods

Catch Share Program-Specific Fishing Engagement Index

The catch share program-specific Fishing Engagement Index demonstrates the importance of catch share species to a given community relative to other coastal communities in a region. The index consists of the pounds and value of program-specific species, number of dealers/processors for program-specific species, and the number of program-specific species permits within a community. These variables are factor analyzed to create a single standardized index score. Each index is created through a separate principal components factor analysis (PCFA) of factors that are thought to contribute to (or detract from) community engagement in commercial fishing activities. PCFA is a common method used to reduce the number of variables into a smaller set of components that are linearly independent from one another (Kim and Meuller 1978a, 1978b). The analysis started with an initial PCFA with a set of variables that are known to be linked to commercial fishing engagement. We then used an iterative process of including and removing variables until we achieved a single factor solution for the PCFA, indicating that all variables included in that PCFA related to community fishing engagement. The results of the PCFA were used to construct individual index scores for each community, using the regression method and normalized to have a mean of zero. An Armor's theta reliability test was used in order to test the internal consistency of the variables in each component, where a value of theta greater than 0.5 is considered acceptable. See Jepson and Colburn (2013) for a full description of how the index was constructed. The PCFA was conducted for each year from the Baseline through 2013. The Baseline was established by calculating an average for each variable for three years prior to implementation of each catch share program we examine.

The community Fishing Engagement Index scores were then categorized from high to low based on standard deviations (SD) from the mean, with the mean being zero (high – 1 SD or above, medium-high – .50 to .99 SD, medium – 0.00 to .49 SD and low – below 0.00). The combination of variables used to create the index results in a more holistic measure of community dependence on a catch share program species or species group compared to consideration of landings alone. Communities that were highly engaged, i.e., at or above one standard deviation, for a least one year from the Baseline through 2013 were retained for further description in this report. It was not possible to report the Fishing Engagement Index for the Mid-Atlantic Golden Tilefish IFQ Program, the Alaska Amendment 80 Program or the Central Gulf of Alaska Rockfish Program, due to the small number of communities that have landings and the resultant confidentiality concerns.

Regional Quotient

The Regional Quotient is a measure of a community's contribution to regional landings or value for a particular species or species group. It is expressed as a percentage (community landings of species or species group/total regional landings of species or species group, or community value of species or species group/total regional value of species or species group). The Regional Quotient is reported individually only for those communities that were highly engaged for all years from the Baseline through 2013. All other communities that landed the species or species group in question are grouped as "Other." Due to the 26-year time series for the Mid-Atlantic Surfclam and Ocean Quahog ITQ Program, however, the Regional Quotient is reported for communities that were highly engaged in the program for 10 or more years. The Baseline was established by calculating an average for each variable for three years prior to implementation.

Local Quotient

The Local Quotient is a measure of the importance of a particular species or species group relative to all species landed in a community. It is expressed as a percentage (community landings of the catch share species or species group/total community landings of all species, or community value of the catch share species or species group/total community value for all species). The Local Quotient is reported for those communities that were highly engaged for all years from the Baseline through 2013. The Baseline was established by calculating an average for each variable for three years prior to implementation. The Local Quotient for value and pounds is not reported for the surfclam or ocean quahog fisheries, due to compatibility issues with data sources used for these calculations.

Community Social Vulnerability Indicators (CSVIs)

The Community Social Vulnerability Indicators (CSVIs) are a set of quantitative measures of objective well-being, which include social vulnerability and gentrification pressure vulnerability for nearly 4,000 communities in coastal counties from nineteen states in the Eastern U.S. and Gulf Coast as well as communities from the states of Washington, Oregon, California, Alaska and Hawaii (Colburn and Jepson 2012; Himes-Cornell and Kasperski 2016; Jepson and Colburn 2013)[3]. These indicators were developed based on the work of Jacob et al. (2010, 2012), who operationalized the concepts of social vulnerability and resilience in fishing-dependent communities and Cutter et al. (2008) who did so for natural hazards. The CSVIs are the first

[3] A complete description of the CSVIs, the methodology used to create them, and an exploratory map can be reviewed here: https://www.fisheries.noaa.gov/national/socioeconomics/social-indicators.

such measures developed and operationalized at the community level for application to U.S. fisheries policy on a national scale. Given the MSA requirement in NS8 to monitor place-based communities, 12 indicators were developed at the place level (Census Designated Place (CDP) and Minor Civil Division (MCD)) using 77 variables from seven secondary data sources, primarily the U.S. Census American Community Survey five-year estimates. Following the same methods that were used to calculate and report the catch share program-specific Fishing Engagement Index, the CSVIs were calculated using factor analysis to achieve a single factor solution. Each CSVI represents a different aspect of objective community well-being.

The Social Vulnerability Indicators (Table 1.3) represent social factors that can shape either an individual's or community's ability to adapt to change (Jacob et al. 2010, 2012). The **Personal Disruption Index** includes variables that affect an individual's vulnerability (e.g., low education levels or unemployment) that can then influence the overall well-being of a community. A higher **Personal Disruption Index** score can be associated with lower levels of well-being as communities show higher unemployment rates, higher number of residents without a high school diploma, more residents in poverty, and more separated female residents. The **Population Composition Index** is a measure of the presence of vulnerable populations within a community (e.g., minorities or those who may express vulnerabilities due to their circumstances or a single parent living in a household with children). A higher **Population Composition Index** score indicates lower well-being in the community. The **Poverty Index** is an overall measure of poverty that looks at several different groups experiencing hardship (e.g., receiving social assistance). A higher **Poverty Index** score implies higher vulnerability as more residents receive public assistance and are considered to be below national poverty lines. The **Labor Force Structure Index** measures the stability and overall makeup of the labor force by gauging the number of people participating in it. It is reverse scored so a higher rank means fewer opportunities and a more vulnerable population that relies more on self-employment. The **Housing Characteristics Index** is a measure of infrastructure vulnerability and includes factors that indicate housing that may be vulnerable to coastal hazards. It is also reverse scored so that a high rank means a more vulnerable infrastructure and a more vulnerable population.

Table 1.3. Social Vulnerability Indicators.

	Definition
Personal Disruption Index	• Percent unemployed • Crime index • Percent with no diploma • Percent in poverty • Percent females separated
Population Composition Index	• Percent white alone • Percent female single headed households • Percent population age 0-5 • Percent that speak English less than well
Poverty Index	• Percent receiving assistance • Percent of families below poverty level • Percent over 65 in poverty • Percent under 18 in poverty
Labor Force Structure Index*	• Percent females employed • Percent population in the labor force • Percent of class of worker self employed • Percent population receiving social security
Housing Characteristics Index*	• Median rent in dollars • Median mortgage in dollars • Median number of rooms • Percent mobile homes

* Scores reversed to ensure directional continuity with other scales.

The Gentrification Pressure Vulnerability Indicators (Table 1.4) characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront as non-fishing related businesses compete for waterfront locations and fishing community populations grow with the influx of new residents often from outside the area. The **Retiree Migration Index** characterizes areas with a higher concentration of retirees and elderly people in the population that often bring higher rents and home values and an increased need for services. A high score indicates a population more vulnerable to gentrification as retirees seek out the amenities of coastal living. The **Urban Sprawl Index** indicates areas experiencing increasing population, often a spillover from population centers, and higher costs of living that can lead to gentrification. A high score indicates a population more vulnerable to gentrification. The **Housing Disruption Index** represents factors that signify a changing housing market where rising home values and rents may cause displacement. A high score means more vulnerability for those in need of affordable housing. The **Retiree Migration Index** and **Urban Sprawl Index** were not calculated for Alaska communities due to the lack of regional relevance.

Table 1.4. Gentrification Pressure Vulnerability Indicators.

	Definition
Retiree Migration	• Households with one or more over 65 • Percent population receiving Social Security • Percent receiving retirement income • Percent in labor force
Urban Sprawl Index	• Population Density • Nearest city (in miles) with 50,000 population • Cost of living index • Median home value
Housing Disruption Index	• Percent change in mortgage • Percent change in home values • Percent of owner's monthly costs 35 percent of income

Northeast Region

Regional Overview

Five catch share programs have been implemented for fisheries in the Northeast Region. These programs govern federal fisheries for surfclams, ocean quahogs, tilefish, a set of 17 groundfish stocks (Lee et al. 2016) and a portion of the Atlantic sea scallop catch (Table 2.1). The Northeast Region includes the states of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina. Federal fisheries in the Northeast Region are regulated by the New England Fishery Management Council (NEFMC), the Mid-Atlantic Fishery Management Council (MAFMC) and NOAA Fisheries.

Regional Catch Share Programs

- Mid-Atlantic Quahog ITQ
- Mid-Atlantic Surfclam ITQ
- Mid-Atlantic Golden Tilefish IFQ
- General Category Atlantic Sea Scallop IFQ
- Northeast Multispecies Sector Program

The Atlantic surfclam and ocean quahog ITQ was the first catch share program implemented in the U.S. The MAFMC implemented this program in 1990, followed by an IFQ program for golden tilefish in 2009. The NEFMC then implemented an IFQ program for a portion of the Atlantic sea scallop fishery, partially in 2008 and fully in 2010, and a "sector" management program for a set of groundfish stocks was first authorized in 2004 and then expanded in 2010 (Brinson and Thunberg 2013). There are currently 17 stocks under this catch share program (Lee et al. 2016).

The Northeast is one of the oldest areas of European settlement in North America, and its fisheries play a vital part in maintaining and growing the region's coastal communities. Gloucester, Massachusetts has been a fishing community (though not an MSA fishing community, as noted above) continuously since its founding in 1623 and Belford, New Jersey is reported to be one of the oldest fishing ports on the East Coast. Boston's Fish Pier, which opened in 1914, is the oldest continuously operating fish pier in the U.S. (NMFS 2009).

Table 2.1. Summary of Northeast Region catch share programs in 2013.

	Mid-Atlantic Ocean Quahog ITQ	Mid-Atlantic Surfclam ITQ	Mid-Atlantic Golden Tilefish IFQ	General Category Atlantic Sea Scallop IFQ	Northeast Multispecies Sector Program
Ex-vessel revenue	*confidential*	$28,776,586	$5,657,169	$29,451,902	$57,278,512
Landings	*confidential**	2,456,178*	1,800,749**	2,415,390***	47,703,560**
Number of dealers	*confidential*	8	12	141	159
Number of entities holding share	41****	74*****	12*****	262******	851****
Number of vessels with landings of catch share species	16	40	10	138	231

*Bushels **Whole weight in pounds ***Meat weight in pounds ****Permit holder *****Shareholder ******Individual
Source: NOAA National Performance Indicators for Fisheries database

Mid-Atlantic Surfclam Individual Transferable Quota Program

Program Overview

Since the ITQ jointly covers both Atlantic surfclams and ocean quahogs, but indicators for each species are calculated separately, here we will provide a **joint overview** of common factors, followed by details for each species. Both are found in the U.S. along the Atlantic coast from New England to the Mid-Atlantic with commercial landings concentrated in the Mid-Atlantic and Southern New England. Fishing grounds have slowly shifted north over the last 30 years from the Southern Mid-Atlantic to Southern New England (MAFMC 1989; McCay 1988). Atlantic surfclams and ocean quahogs have been managed by the MAFMC and NOAA Fisheries since 1977. With the exception of the Maine mahogany quahog fishery, today Atlantic surfclam and ocean quahog fisheries in the Northeast Region are harvested by fishermen operating under an ITQ system managed by the MAFMC and NOAA Fisheries since 1990. These fisheries were the first in the U.S. to adopt an ITQ system. Atlantic surfclams have been fished since the 1940s, while ocean quahogs have been fished since the late 1970s. Many vessels fish for both species.

Atlantic surfclams and ocean quahogs are regulated under the same fishery management plan because, prior to the implementation of the ITQ system, there was concern that an ITQ program in the Atlantic surfclam fishery alone would lead to increased effort in the ocean quahog fishery. The principal objectives of the ITQ, which have not changed since implementation, are to conserve and rebuild the Atlantic surfclam and ocean quahog resource, simplify regulatory requirements to minimize the cost to manage the resource, promote economic efficiency by bringing harvesting capacity in balance with processing and biological capacity, and adopt a flexible management approach that can adapt to short-term events.

After implementation of the ITQ system, the composition of the fleet shifted toward larger vessels (McCay and Creed 1990). Moreover, many owners decided to merge harvesting operations as well as to lease their quota rather than fishing their own vessel, leading to a "significant reduction" in vessel numbers (Brandt 2005; Olson 2011). The fishery has always had strong ties to processing plants because of the nature of the fishery (see market description, below). This connection has strengthened over the years, in part due to consolidation following implementation of the ITQ program. Processors now have direct or indirect control over the majority of all quota share (McCay 2004).The Atlantic surfclam and ocean quahog ports have become concentrated and diverse with extensive movement of captains, crews, and boats. As a result, local communities are of less

Table 2.2. Fishing Engagement Index scores of communities highly engaged in the Mid-Atlantic Surfclam ITQ Program for one or more years from the Baseline (1987-1989) through 2013.

Community	Baseline	1990	1991	1992	1993	1994	1995	1996	1997	1998
Milford, DE	3.663	-0.521	-0.520	-0.456	-0.396	-0.386	-0.433	-0.394	-0.428	-0.423
District 3 Northampton/Willis Wharf, VA	3.087	3.098	1.822	-0.456	-0.396	-0.386	-0.433	-0.394	-0.428	-0.423
Cape May, NJ	2.070	2.279	0.877	0.688	2.448	1.873	1.564	1.751	2.295	3.582
District 4 Northampton/ Oyster, VA	1.595	2.487	0.667	4.096	4.315	4.392	0.834	-0.394	-0.428	-0.423
Norfolk, VA	0.917	1.969	2.138	2.630	2.249	1.739	1.846	2.325	1.763	3.039
Warren, RI	0.911	1.045	0.741	0.776	-0.396	-0.386	1.145	0.705	1.543	1.513
District2 Accomack/Atlantic/Mappsville/ Sanford, VA	0.405	-0.521	2.440	0.046	-0.396	-0.386	-0.433	-0.394	-0.428	1.025
Bristol, RI	0.090	0.288	0.474	0.608	-0.396	-0.386	1.486	1.508	1.525	1.698
Port Norris/Bivalve, NJ	-0.075	1.781	3.447	1.573	0.916	0.943	0.281	0.644	0.805	1.580
New Bedford, MA	-0.274	0.768	0.817	0.276	0.797	1.348	1.579	1.639	1.298	1.518
Wildwood, NJ	-0.406	-0.521	-0.520	-0.456	-0.396	-0.386	-0.433	-0.394	-0.428	-0.423
Point Pleasant, NJ	-0.595	-0.521	-0.520	-0.456	-0.396	-0.386	-0.433	-0.394	-0.428	-0.423
Middle/Burleigh, NJ	-0.595	1.044	1.663	2.287	-0.396	-0.386	-0.433	-0.394	-0.428	-0.423
Barnstable/Hyannis/Hyannisport, MA	-0.595	-0.521	-0.520	-0.456	-0.396	-0.386	-0.433	-0.394	-0.428	-0.423
Atlantic City, NJ	-0.595	-0.521	-0.520	-0.456	-0.396	-0.386	-0.433	-0.394	-0.428	-0.423
Ocean City, MD	-0.595	-0.521	-0.520	-0.456	1.726	2.357	4.530	4.421	4.200	-0.423

Note: Highlighted cells indicate high engagement. Table continues at the bottom of the next page and is meant to be viewed as a spread.

importance than social networks formed around management issues and historical factions (McCay et al. 2011).

Atlantic surfclams are found in both state and federal waters, while there is only a federal fishery for ocean quahogs. While initial ITQ shares were allocated only to owners of Atlantic surfclam and ocean quahog fishing vessels (some of whom fished both species), quota shares may be transferred permanently or leased on an annual basis to any individual or entity that is eligible to own a U.S. Coast Guard documented vessel - without requiring actual vessel ownership (Brinson and Thunberg 2013).

The primary market for Atlantic surfclams is for the processed food market: canned and frozen meats, strips, juice, soups, chowders, and stews. Both Atlantic surfclams and ocean quahogs are harvested with hydraulic dredges that use water pressure to lift the clams out of the sand and many vessels fish both.

There are no recreational fisheries for Atlantic surfclams or ocean quahogs.

Trends for Top Participating Communities

Commercial Engagement

The program-specific commercial Fishing Engagement Index scores for the Mid-Atlantic Surfclam ITQ Program are presented in Table 2.2. The index is an indicator of the importance of ITQ Atlantic surfclam fishing in a community relative to other communities in the Northeast Region. It is a measure of the presence of Atlantic surfclam fishing in a community through fishing activity including pounds, value, permits and dealers. There were 16 communities **highly engaged** (1.0 standard deviation above the mean) for at least one year from the Baseline period (1987-1989) through 2013.

None of the communities that were **highly engaged** during the Baseline period, i.e., Cape May, NJ; Willis Wharf and Oyster, VA; and Milford, DE, were found to be **highly engaged** by 2013. Rather, there is a clear geographic shift northward by 2013 for the most **highly engaged** communities. These trends are notable because the most **highly engaged** communities in 1990 were essentially displaced by more northern communities in 2004, matching the northward movement of the Atlantic surfclam fishery as catch rates have declined in the south. A similar trend can be seen in communities that were **highly engaged for fewer than 10 years**. The patterns are more complex as communities move in and out of high engagement, but 2003 to 2004 represents a shift in engagement (either postive or negative) for most communities.

Table 2.2. (*continued*)

1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
-0.410	-0.430	-0.445	-0.436	-0.415	-0.428	-0.282	-0.286	-0.266	-0.272	-0.282	-0.331	-0.325	-0.362	-0.364
-0.410	-0.430	-0.445	-0.436	-0.415	-0.428	-0.282	-0.286	-0.266	-0.272	-0.282	-0.331	-0.325	-0.362	-0.364
3.192	3.342	2.166	2.887	1.504	0.192	-0.069	0.343	-0.266	-0.272	-0.282	-0.331	-0.325	-0.157	-0.364
-0.410	-0.430	-0.445	-0.436	-0.415	-0.428	-0.282	-0.286	-0.266	-0.272	-0.282	-0.331	-0.325	-0.362	-0.364
2.841	2.762	2.196	2.230	2.533	0.655	-0.282	-0.286	-0.266	-0.272	-0.282	-0.331	-0.325	-0.362	-0.364
0.819	0.895	0.848	1.010	0.950	0.022	-0.282	-0.286	-0.266	-0.272	-0.282	0.032	-0.132	-0.362	-0.364
-0.410	-0.430	3.505	3.442	4.216	0.614	-0.282	-0.286	-0.266	-0.272	-0.282	-0.331	-0.325	-0.362	-0.364
2.049	2.037	1.544	1.492	1.125	-0.098	-0.282	-0.286	-0.266	-0.272	-0.282	-0.331	-0.325	-0.362	-0.364
1.719	1.837	0.669	0.277	0.905	0.277	-0.282	-0.286	-0.266	-0.272	-0.282	-0.331	-0.325	-0.362	-0.364
2.709	2.019	2.615	2.020	2.009	1.631	1.150	0.947	0.294	-0.272	0.849	1.688	2.106	3.380	3.357
-0.410	-0.430	-0.445	-0.436	-0.415	1.069	0.202	-0.045	-0.013	-0.272	-0.282	-0.331	-0.325	-0.159	-0.091
-0.410	1.303	0.692	0.598	-0.415	2.058	1.899	1.599	1.657	2.024	1.699	1.990	1.396	1.039	0.831
-0.410	-0.430	-0.445	-0.436	-0.415	-0.428	-0.282	-0.286	-0.266	-0.272	-0.282	-0.331	-0.325	-0.362	-0.364
-0.410	-0.430	-0.445	-0.436	-0.415	-0.428	-0.282	-0.286	-0.266	-0.272	0.133	-0.054	0.315	1.062	1.086
-0.410	-0.430	-0.445	-0.436	-0.415	5.009	5.573	5.633	5.734	5.561	5.632	5.289	5.259	4.526	4.619
-0.410	-0.430	-0.445	-0.436	-0.415	0.270	0.580	1.002	0.970	1.165	0.897	0.790	1.102	0.602	0.216

Note: Highlighted cells indicate high engagement. Table continues at the bottom of the previous page and is meant to be viewed as a spread.

Of the 16 communities shown in Table 2.2, five communities were **highly engaged for at least 10 years** from the Baseline (1987-1989) through 2013 (Figure 2.1). The engagement scores for these top five communities show fluctuation over time; however, some clear trends are evident. Most notably there was a distinct shift in engagement scores from 2003 through 2005. There was a sharp decline in engagement scores for Cape May, NJ and Norfolk, VA and a noticeable increase for Atlantic City, NJ. Only New Bedford, MA and Point Pleasant, NJ were **highly engaged** for some years prior to 2003 and after 2004.

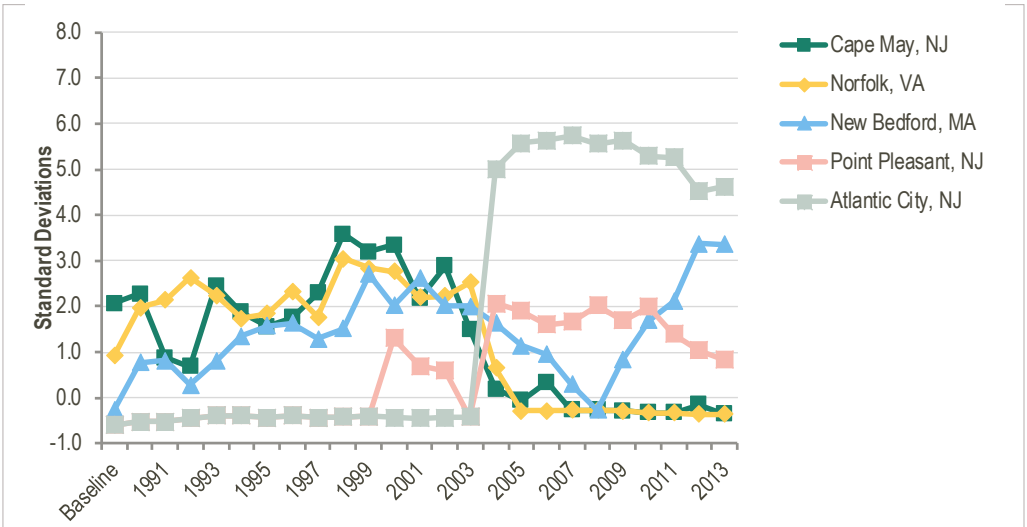


Figure 2.1. Fishing Engagement Index scores of communities highly engaged in the Mid-Atlantic Surfclam ITQ Program for at least 10 years from the Baseline (1987-1989) through 2013.

Atlantic City and Point Pleasant, NJ shifted in 2004 from low to high engagement in the ITQ Atlantic surfclam fishery and stayed there for at least 10 years (Figure 2.2), through 2013. Atlantic City, NJ was not **highly engaged** until 2004 when a dramatic increase occurred and it remained as a dominant port through 2013. Similarly, the engagement score for Point Pleasant, NJ was low prior to 2000, and although the score fluctuated from 2000 through 2013, a trend of increasing engagement is evident. New Bedford, MA was more variable, but apart from 2008, it remained moderately to **highly engaged** for the entire period, with high engagement over the last four years (Figure 2.2).

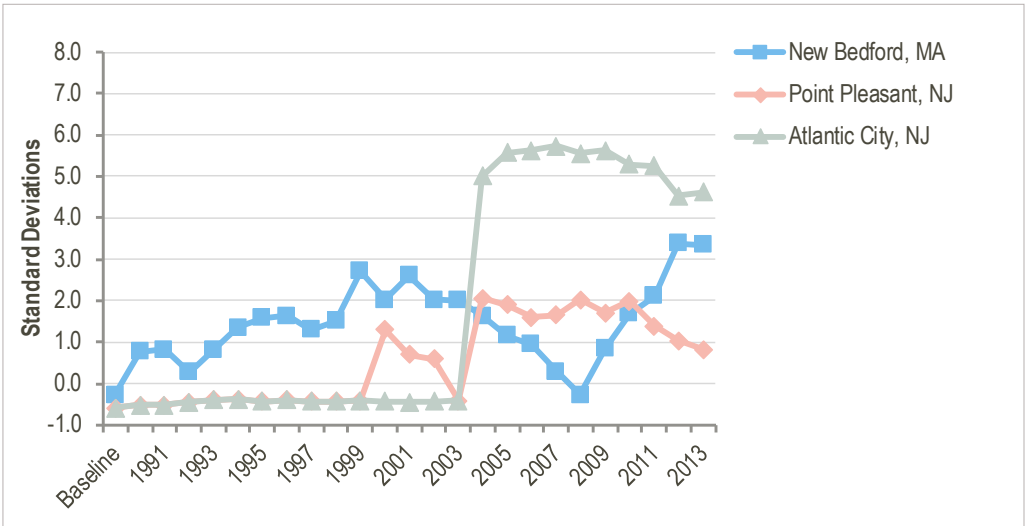


Figure 2.2. Fishing Engagement Index scores of communities highly engaged in the Mid-Atlantic Surfclam ITQ Program for at least 10 years with increasing engagement from the Baseline (1987-1989) through 2013.

Although Cape May, NJ and Norfolk, VA were **highly engaged** in Atlantic surfclam fishing from 1990 to 2003, in 2004 and 2005, engagement in Cape May and Norfolk fell to and remained low through 2013 (Figure 2.3).

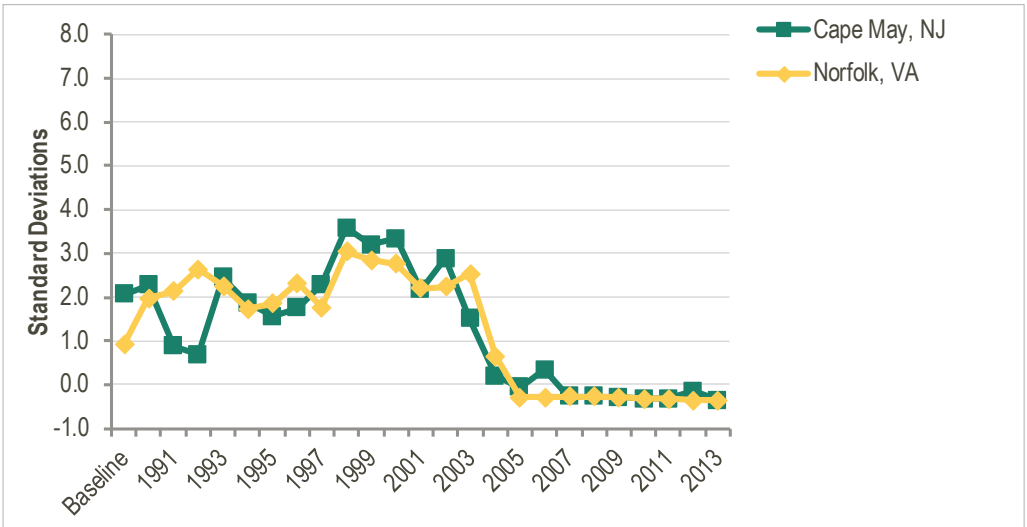


Figure 2.3. Fishing Engagement Index scores of communities highly engaged in the Mid-Atlantic Surfclam ITQ Program for at least 10 years with decreasing engagement from the Baseline (1987-1989) through 2013.

Figure 2.4 shows the 11 communities that were **highly engaged** in the Atlantic surfclam fishery for fewer than 10 years. The majority of these communities were **highly engaged** in the fishery only from the Baseline (1987-1989) through 2004, and generally not for that entire period. Port Norris, NJ showed moderate to high engagement in the Atlantic surfclam fishery from the Baseline through 2004. After experiencing a decrease in 2004, the engagement score for Port Norris stayed at a very low level through 2013. Although engagement fluctuated greatly, Ocean City, MD was sporadically **highly engaged** from 1992 through 1997 and then again from 2006 through 2011. In contrast, the engagement score for Barnstable, MA was low until 2012 and 2013 when the engagement score increased to high.

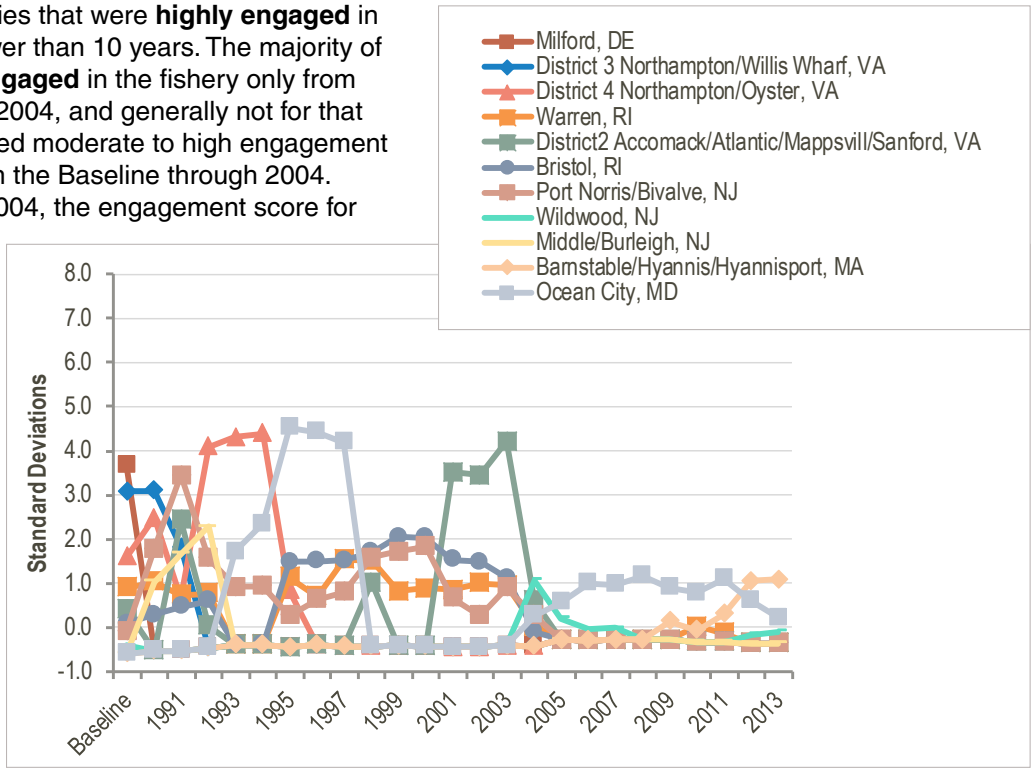


Figure 2.4. Fishing Engagement Index scores of communities highly engaged in the Mid-Atlantic Surfclam ITQ Program for fewer than 10 years from the Baseline (1987-1989) through 2013.

Regional Quotient

Another measure of a community's involvement in the ITQ Atlantic surfclam fishery is its Regional Quotient. Regional Quotient is the proportion of Atlantic surfclams landed within a community out of the total amount of Atlantic surfclams landed within the Northeast Region. It is an indicator of the percent contribution in pounds or value of ITQ Atlantic surfclams landed within that community relative to the regional fishery. The Regional Quotient is reported individually only for those communities that were **highly engaged for at least 10 years** from the Baseline through 2013. All other communities which landed ITQ Atlantic surfclams are grouped as "Other Communities." Figure 2.5 and Figure 2.6 show the Regional Quotient for both in pounds and value from the Baseline through 2013.

There was a 2003 shift from Norfolk, VA and Cape May, NJ, that had high regional quotient during the 1990s, to Atlantic City and Point Pleasant, NJ; and New Bedford, MA (Figure 2.5). However, the communities in the "Other Communities" category contributed to the majority of pounds landed from the Baseline (1987-1989) through 2002.

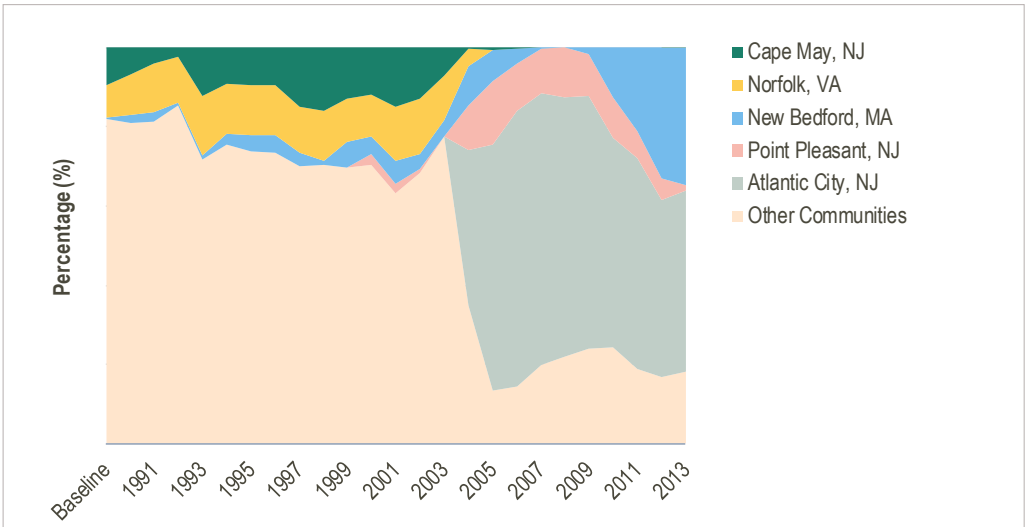


Figure 2.5. Regional Quotient (POUNDS) for communities highly engaged in the Mid-Atlantic Surfclam ITQ Program for at least 10 years from the Baseline (1987-1989) through 2013.

The distribution of landed value for Atlantic surfclams is almost identical to the distribution for pounds (Figure 2.6). There was a clear shift in dominant ports from 2002-2004, as the percent contribution of value landed in communities that were **highly engaged** in the 1990s showed a decrease in their Regional Quotient, while ports including Atlantic City and Point Pleasant, NJ; and New Bedford, MA that were **highly engaged** in the 2000s became dominant through 2013. Atlantic City, NJ gained dominance very quickly from 2002 through 2004, contributing nearly 70 percent of the total value landed at its peak in 2006 and about 45 percent in 2013. The share of New Bedford, MA has increased steadily since 2010, and reached almost 35 percent in 2013. Point Peasant, NJ experienced an increase in its Regional Quotient in value landed from 2002-2004, and remained stable at about a 15 percent contribution through 2010, after which it experienced a steady decline.

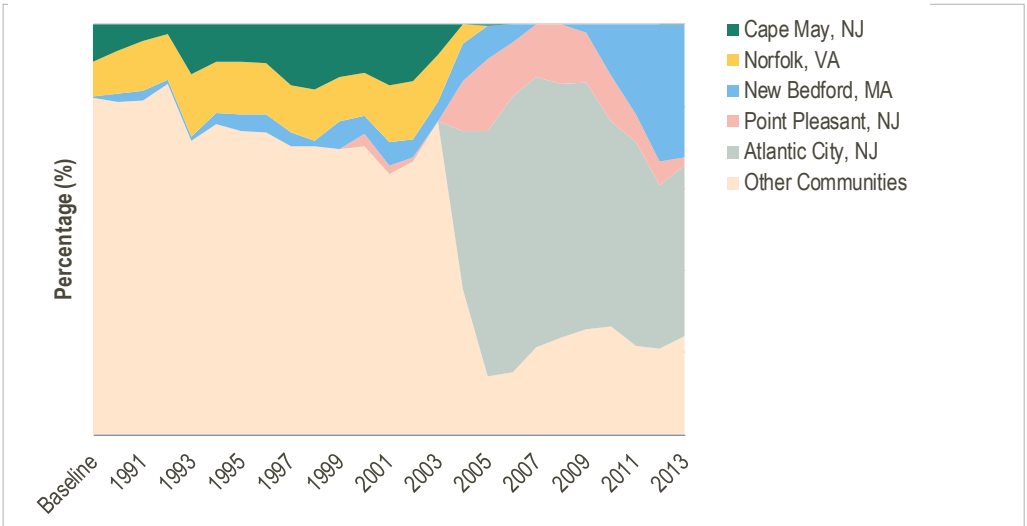


Figure 2.6. Regional Quotient (VALUE) for communities highly engaged in the Mid-Atlantic Surfclam ITQ Program for at least 10 years from the Baseline (1987-1989) through 2013.

Local Quotient

The Local Quotient for value and pounds is not reported for the ITQ Atlantic surfclam fishery due to compatibility issues with data sources used for these calculations.

Community Social Vulnerability Indicators (CSVIs)

The two categories of CSVIs discussed below are social vulnerability and gentrification pressure vulnerability. The Social Vulnerability Indicators represent social factors that can shape either an individual's or community's ability to adapt to change (poverty, personal disruption, labor force structure, and population composition vulnerability). The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption, and retiree migration).

The Social Vulnerability Indicators for communities that were **highly engaged** in the Mid-Atlantic Surfclam ITQ Program for at least one year from the Baseline (1987-1989) through 2013 are included in Table 2.3. Communities **highly engaged for at least 10 years** are highlighted. With the exception of Cape May, NJ, the population size of the majority of these communities is notably larger for the **highly engaged** communities than for other communities. Atlantic City, NJ ranked from moderately to highly vulnerable on all five indices, followed by New Bedford, MA and Norfolk, VA which ranked moderate to high on four vulnerability indicators. This is in contrast to Point Pleasant, NJ which ranked low on all indices. Both the housing characteristics and Labor Force Structure Index scores ranged from moderate to high vulnerability for most communities.

Table 2.3. Social Vulnerability Indicators for communities highly engaged in the Mid-Atlantic Surfclam ITQ Program for one or more years from the Baseline (1987-1989) through 2013.

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
Atlantic City, NJ	39,591	High	High	High	Moderate	Med High
Cape May, NJ	3,585	Low	Low	Low	High	Moderate
New Bedford, MA	94,927	Med High	Med High	High	Low	Moderate
Norfolk, VA	244,090	Med High	Moderate	Med High	Low	Moderate
Point Pleasant, NJ	18,466	Low	Low	Low	Low	Low
Barnstable/Hyannis/ Hyannisport, MA	44,944	Low	Low	Low	Moderate	Low
Bristol, RI	22,531	Low	Low	Low	Low	Moderate
District 3 Northampton/ Willis Wharf, VA	1,516	High	Low	Low	Moderate	High
District 4 Northampton/ Oyster, VA	2,589	Moderate	Moderate	Moderate	Moderate	Med High
District 2 Accomack/ Atlantic/Mappsville/ Sandford, VA	3,432	Low	Low	Low	Moderate	Med High
Middle/Burleigh, NJ	18,864	Moderate	Low	Low	Moderate	Moderate
Milford, DE	9,735	Moderate	Moderate	Moderate	Moderate	Moderate
Ocean City, MD	7,108	Low	Low	Low	Med High	Med High
Port Norris/Bivalve, NJ	1,934	Med High	Med High	High	Moderate	Low
Warren, RI	10,597	Low	Low	Low	Low	Moderate
Wildwood, NJ	5,269	High	Med High	Med High	Low	Med High

Note: Highlighted cells indicate communities that were highly engaged for 10 or more years from the Baseline through 2013.

The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront (urban sprawl, housing disruption and retiree migration). Gentrification Pressure Vulnerability Indicators for communities that were **highly engaged** in the Mid-Atlantic Surfclam ITQ Program for at least one year from the Baseline (1987-1989) through 2013 are included in Table 2.4. Communities **highly engaged for at least 10 years** are highlighted. Two of the most **highly engaged** communities, New Bedford, MA and Point Pleasant, NJ, rated moderately vulnerable or higher for two of the three indices, while Atlantic City, NJ only scored moderately vulnerable or higher for one index. This is in contrast to Cape May, NJ, which showed moderate to high vulnerability for all three indices. The Housing Disruption Index was moderately to highly vulnerable for all communities, followed by the Urban Sprawl Index, which was moderately to highly vulnerable for six communities.

Table 2.4. Gentrification Pressure Vulnerability Indicators for communities highly engaged in Mid-Atlantic Surfclam ITQ Program for one or more years from the Baseline (1987-1989) through 2013.

Community	Housing Disruption	Retiree Migration	Urban Sprawl
Atlantic City, NJ	High	Low	Low
Cape May, NJ	High	High	Moderate
New Bedford, MA	Moderate	Low	Med High
Norfolk, VA	Med High	Low	Low
Point Pleasant, NJ	Moderate	Low	Moderate
Barnstable/Hyannis/Hyannisport, MA	N/A	Moderate	Moderate
Bristol, RI	N/A	Moderate	Low
District 3 Northampton/Willis Wharf, VA	High	Moderate	Low
District 4 Northampton/Oyster, VA	Low	Moderate	Low
District 2 Accomack/Atlantic/Mappsville/ Sandford, VA	Med High	Moderate	Low
Middle/Burleigh, NJ	High	Moderate	Low
Milford, DE	Med High	Moderate	Low
Ocean City, MD	Moderate	High	Low
Port Norris/Bivalve, NJ	High	Low	Low
Warren, RI	Med High	Low	Low
Wildwood, NJ	High	Low	Low

Note: Highlighted cells indicate communities that were highly engaged for 10 or more years from the Baseline through 2013.

Photo Credit: NOAA Fisheries/Lisa L. Colburn

Mid-Atlantic Ocean Quahog Individual Transferable Quota Program

Program Overview

Ocean quahogs in the U.S. are found along the Atlantic coast from the Mid-Atlantic to the U.S./Canada border with commercial landings concentrated in the Mid-Atlantic. Ocean quahog fisheries in the Northeast Region began in the 1970s and have been managed by the MAFMC and NOAA Fisheries since 1977. Fishermen have operated under an ITQ system managed by the MAFMC and NOAA Fisheries since 1990. Along with Atlantic surfclams, these fisheries were the first to adopt an ITQ system in the U.S. While initial ocean quahog quota shares were allocated to owners of ocean quahog fishing vessels, quota shares may be transferred permanently or leased on an annual basis to any individual or entity that is eligible to own a U.S. Coast Guard documented vessel - without requiring actual vessel ownership. For full detail see the **joint program overview** above, under the Mid-Atlantic Surfclam ITQ Program.

Trends for Top Participating Communities

Commercial Engagement

The program-specific commercial Fishing Engagement Index scores for the Mid-Atlantic Ocean Quahog ITQ Program are presented in Table 2.5. The index is an indicator of the importance of ITQ ocean quahog fishing in a community relative to other communities in the Northeast Region. It is a measure of the presence of ITQ ocean quahog fishing through fishing activity including pounds, value, permits, and dealers. The time series for this fishery begins in 1991 as it was not possible to consistently aggregate fisheries data at the community level during either the Baseline period (1987-1989) or the first year of implementation (1990). Therefore, the results presented here should be considered a partial picture of changes in the ITQ ocean quahog fishery. There were seven communities **highly engaged** (1.0 standard deviation or above the mean) in the ITQ ocean quahog fishery for at least one year from 1991 (two years after implementation) through 2013.

Table 2.5. Fishing Engagement Index scores of communities highly engaged in the Mid-Atlantic Ocean Quahog ITQ Program for one or more years from 1991 through 2013. **Note:** The time series for this fishery begins in 1991 as it was not possible to aggregate fisheries data consistently at the community level during either the Baseline period (1987-1989) or the first year of implementation (1990).

Community	Baseline	1990	1991	1992	1993	1994	1995	1996	1997	1998
Cape May, NJ	N/A	N/A	2.380	1.505	2.219	0.296	-0.632	-0.813	-0.614	-0.598
Ocean City, MD	N/A	N/A	1.692	1.126	0.252	0.177	-0.379	-0.069	-0.084	0.556
Atlantic City, NJ	N/A	N/A	1.140	0.259	0.773	1.595	1.406	1.490	1.041	0.814
Point Pleasant, NJ	N/A	N/A	0.953	2.501	1.835	2.450	1.565	1.367	1.525	1.688
Hampton Bays/Shinnecock, NY	N/A	N/A	0.164	-0.277	0.273	0.814	1.126	0.638	0.276	-0.598
Belford, NJ	N/A	N/A	-0.299	1.110	1.365	1.422	0.532	0.040	-0.614	-0.598
New Bedford, MA	N/A	N/A	-0.706	-0.744	-0.735	-0.386	2.263	2.579	2.971	2.799

Note: Highlighted cells indicate high engagement. Table continues at the bottom of the next page and is meant to be viewed as a spread.

Photo Credit: Marine Conservation Institute/Kate Yentes

Table 2.5. (*continued*)

1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
-0.592	-0.601	-0.613	-0.614	-0.613	-0.645	-0.626	-0.514	-0.538	-0.519	-0.516	-0.590	-0.558	-0.482	-0.432
0.318	0.265	0.520	0.434	0.572	0.696	0.539	0.501	0.503	0.380	0.469	0.937	0.890	0.451	-0.432
1.726	1.509	1.768	1.211	0.739	0.734	0.206	0.007	1.025	1.459	1.806	1.604	2.156	2.674	2.474
1.537	1.548	2.233	2.592	2.433	2.086	1.863	1.769	1.325	1.356	1.082	1.501	1.345	0.991	1.137
-0.592	-0.601	-0.613	-0.614	-0.613	-0.645	-0.626	-0.514	-0.538	-0.519	-0.516	-0.590	-0.558	-0.482	-0.432
-0.592	-0.601	-0.613	-0.614	-0.613	-0.645	-0.626	-0.514	-0.538	-0.519	-0.516	-0.590	-0.558	-0.482	-0.432
2.547	2.619	1.771	1.872	2.194	2.528	2.825	3.100	3.121	2.940	2.855	2.531	2.240	2.154	2.443

Note: Highlighted cells indicate high engagement. Table continues at the bottom of the previous page and is meant to be viewed as a spread.

The top three of these communities **highly engaged** in the ITQ ocean quahog fishery for at least 10 years from 1991 through 2013 are shown in Figure 2.7. Point Pleasant and Atlantic City, NJ; and New Bedford, MA are clearly the ports with the highest engagement. The ocean quahog fishery in New Bedford, MA, for instance, gained prominence in 1995 and has remained dominant except for dips from 2001 through 2003 and from 2011 through 2013. Atlantic City, NJ has had a clear dip in prominence from 2002 through 2006, but has shown a steady increase since then (Figure 2.7). Point Pleasant, NJ had more dramatic fluctuations. Though **highly engaged for more than 20 years**, particularly in the early years of the program, after reaching a peak in 2002 its engagement score declined gradually so that in 2013 it was almost at its 1991 level. (Figure 2.7). These three communities that were **highly engaged for 10 or more years** all showed increasing engagement.

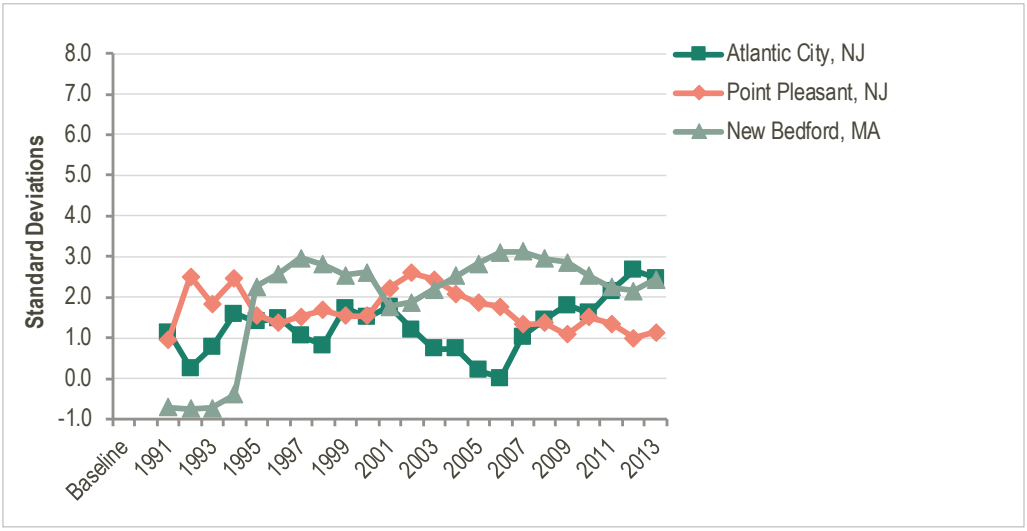


Figure 2.7. Fishing Engagement Index scores of communities highly engaged in the Mid-Atlantic Ocean Quahog ITQ Program for at least 10 years from 1991 through 2013.
Note: The time series for this fishery begins in 1991 as it was not possible to aggregate fisheries data consistently at the community level during either the Baseline period (1987-1989) or the first year of implementation (1990).

Figure 2.8 shows a clear trend for all four communities that were **highly engaged for fewer than 10 years** from 1991 through 2013. Cape May and Belford, NJ; Ocean City, MD; and Hampton Bays/Shinnecock, NY all showed high engagement for at least one year from 1991 through 1994. Engagement decreased gradually in three of the communities (Cape May and Belford, NJ; and Hampton Bays/Shinnecock, NY) and reached a lower than average level by 1998. Only Ocean City, MD consistently showed a moderate level of engagement, until a drop in 2013 to low engagement.

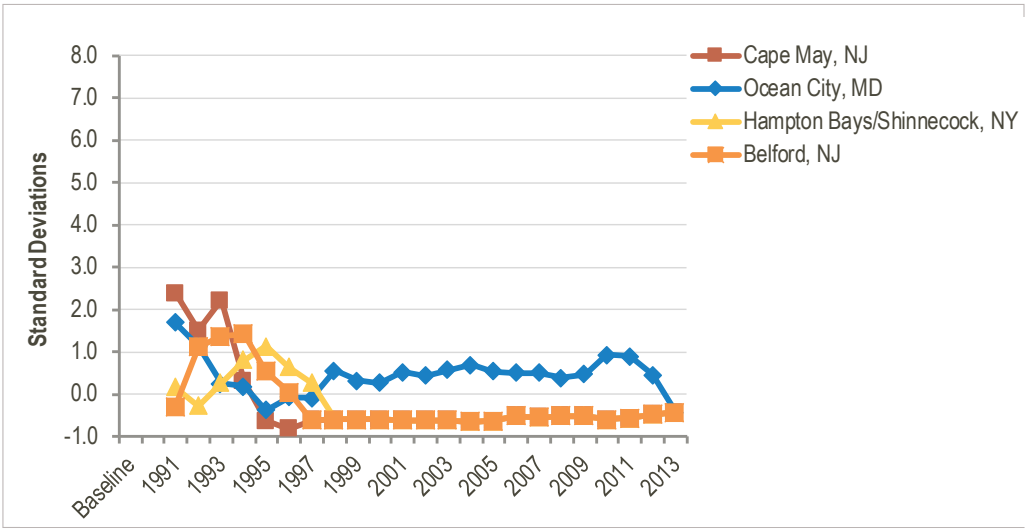


Figure 2.8. Fishing Engagement Index scores of communities highly engaged in the Mid-Atlantic Ocean Quahog ITQ Program for fewer than 10 years from 1991 through 2013.
Note: The time series for this fishery begins in 1991 as it was not possible to aggregate fisheries data consistently at the community level during either the Baseline period (1987-1989) or the first year of implementation (1990).

Regional Quotient

Another measure of a community's involvement in the ITQ ocean quahog fishery is its Regional Quotient. Regional Quotient is the proportion of ITQ ocean quahogs landed within a community out of the total amount of ITQ ocean quahogs landed within the Northeast Region. It is an indicator of the percent contribution in pounds or value of ITQ ocean quahogs landed within that community relative to the regional fishery. The Regional Quotient is reported individually only for those communities that were **highly engaged for at least 10 years** from 1991 through 2013. All other communities that landed ITQ ocean quahogs are grouped as "Other Communities." The time series for this fishery begins in 1991 as it was not possible to aggregate fisheries data consistently at the community level during either the Baseline period (1987-1989) or the first year of implementation (1990). Therefore, the results presented here should be considered a partial picture of changes in the ITQ ocean quahog fishery. Figure 2.9 and Figure 2.10 show the Regional Quotient in pounds and value, respectively, from the Baseline through 2013.

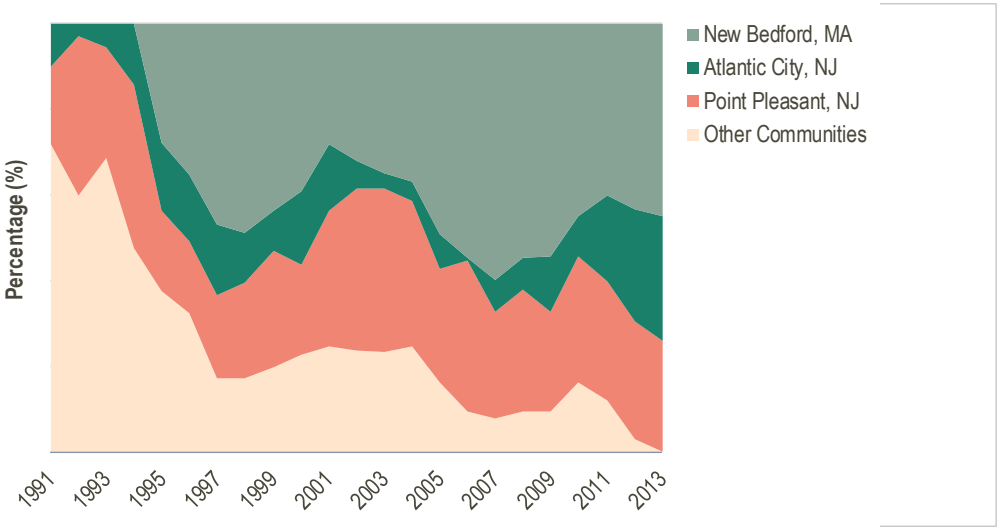


Figure 2.9. Regional Quotient (POUNDS) for communities highly engaged in the Mid-Atlantic Ocean Quahog ITQ Program for at least 10 years from 1991 through 2013.
Note: The time series for this fishery begins in 1991 as it was not possible to aggregate fisheries data consistently at the community level during either the Baseline period (1987-1989) or the first year of implementation (1990).

There was a shift in community dominance for ITQ ocean quahog pounds and value landed from 1991 through 2013. Point Pleasant and Atlantic City, NJ consistently showed landings from the early years of the program through 2013 (Figure 2.9). However, the percent contribution changed over time with both communities contributing nearly the same amount, around 20 percent each, by 2013. Although not involved in the early years of the program, New Bedford, MA quickly gained prominence in 1994 and emerged as the dominant community by 2013, contributing almost half of the total ITQ ocean quahog pounds landed in the region. However, the communities in the "Other Communities" category contributed the majority of pounds landed from 1991 through 1993. Nearly identical trends were found for value landed for the same time period (Figure 2.10).

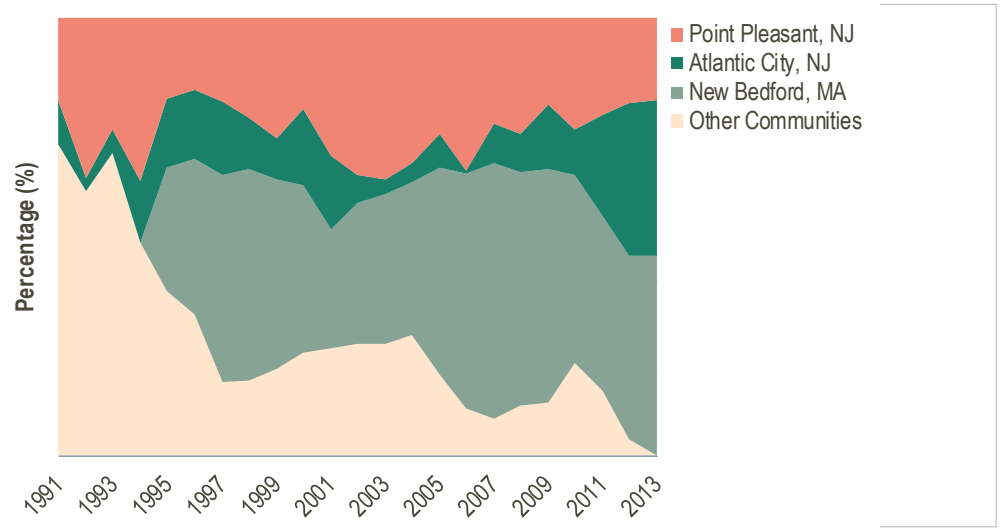


Figure 2.10. Regional Quotient (VALUE) for communities highly engaged in the Mid-Atlantic Ocean Quahog ITQ Program for at least 10 years from 1991 through 2013.
Note: The time series for this fishery begins in 1991 as it was not possible to aggregate fisheries data consistently at the community level during either the Baseline period (1987-1989) or the first year of implementation (1990).

Local Quotient

The Local Quotient for value and pounds is not reported for the ITQ ocean quahog fishery due to compatibility issues with data sources used for these calculations.

Community Social Vulnerability Indicators (CSVIs)

The two categories of CSVIs discussed below include social vulnerability and gentrification pressure vulnerability. The Social Vulnerability Indicators represent social factors that can shape either an individual or community's ability to adapt to change (poverty, personal disruption, labor force structure and population composition vulnerability). The Gentrification Pressure Vulnerability Indicators characterize factors that may over time indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption and retiree migration).

The Social Vulnerability Indicators for communities that were **highly engaged** in the Mid-Atlantic Ocean Quahog ITQ Program for at least one year from 1991 through 2013 are included in Table 2.6. Communities **highly engaged for at least 10 years** are highlighted. The time series for this fishery begins in 1991 as it was not possible to aggregate fisheries data consistently at the community level during either the Baseline period (1987-1989) or the first year of implementation (1990). Therefore, the results presented here should be considered a partial picture of changes in the ITQ ocean quahog fishery. The population size of these communities is notably larger than for the other communities. Atlantic City, NJ ranked moderately to highly vulnerable on all five indices followed by New Bedford, MA, which ranked moderately to highly vulnerable on four indices. This is in contrast to Point Pleasant, NJ, which ranked low on all indices. The Housing Characteristics Index score ranged from moderate to moderately high for four of the seven communities.

Table 2.6. Social Vulnerability Indicators for communities highly engaged in the Mid-Atlantic Ocean Quahog ITQ Program for one or more years from 1991 through 2013.

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
Atlantic City, NJ	39,591	High	High	High	Moderate	Med High
New Bedford, MA	94,927	Med High	Med High	High	Low	Moderate
Point Pleasant, NJ	18,466	Low	Low	Low	Low	Low
Belford, NJ	1,453	Low	Low	Low	Low	Low
Cape May, NJ	3,585	Low	Low	Low	High	Moderate
Hampton Bays/ Shinnecock, NY	12,680	Low	Low	Low	Low	Low
Ocean City, MD	7,108	Low	Low	Low	Med High	Med High

Note: Highlighted cells indicate communities that were highly engaged for 10 or more years from 1991 through 2013.

The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront (urban sprawl, housing disruption and retiree migration). Gentrification Pressure Vulnerability Indicators for communities that were **highly engaged** in the Mid-Atlantic Ocean Quahog ITQ Program for at least one year from 1991 through 2013 are included in Table 2.7. Of the most **highly engaged** communities, New Bedford, MA and Point Pleasant, NJ were moderately vulnerable or higher for two of the three indices while Atlantic City, NJ only scored moderately vulnerable or higher for one index. This is in contrast to Cape May, NJ, which showed moderate to high vulnerability for all three indices. The Housing Disruption Index was moderately to highly vulnerable for all communities followed by the Urban Sprawl Index which was moderate to highly vulnerable for five communities.

Table 2.7. Gentrification Pressure Vulnerability Indicators for communities highly engaged in the Mid-Atlantic Ocean Quahog ITQ Program for one or more years from 1991 through 2013.

Community	Housing Disruption	Retiree Migration	Urban Sprawl
Atlantic City, NJ	High	Low	Low
New Bedford, MA	Moderate	Low	Med High
Point Pleasant, NJ	Moderate	Low	Moderate
Belford, NJ	High	Low	Moderate
Cape May, NJ	High	High	Moderate
Hampton Bays/Shinnecock, NY	High	Low	High
Ocean City, MD	Moderate	High	Low

Note: Highlighted cells indicate communities that were highly engaged for 10 or more years from 1991 through 2013.

Photo Credit: NOAA Fisheries/Lisa L. Colburn

Mid-Atlantic Golden Tilefish Individual Fishing Quota Program

Program Overview

Golden tilefish are found along the Atlantic coast from New England to the Mid-Atlantic with commercial landings concentrated in the Mid-Atlantic. They are often found in and around submarine canyons where they burrow in mud or sand sediment. The directed golden tilefish fishery in the Northeast Region began in the 1970s (though golden tilefish had been landed since the early 1900s) (Rountree et al. 2008). It has been managed by the MAFMC and NOAA Fisheries since 2001. Currently, golden tilefish are primarily harvested by fishermen operating under an IFQ system implemented in 2009. Early commercial harvesters in the 1970s switched in the 1980s to other fisheries, but were included in limited access when it was implemented in 2001 as part of the first management plan for golden tilefish. Ninety-five percent of the annual quota was subdivided among three limited access permit categories (Full-Time Tier 1, Full-Time Tier 2 and Part-Time) with the Full-time Tier 1 category receiving the majority of quota (66 percent). The historical fishermen from the 1970s were placed in either Full-Time Tier 2 or Part-Time, based on their landings (Rountree et al. 2008). Unlike the other two categories, fishermen in the Full-Time Tier 1 category (who had constituted themselves as the Montauk Tilefish Association) had previously agreed to manage the quota for that category cooperatively, through a contract, in order to time harvesting with optimal market conditions and avoid market gluts. These categories were eliminated with the introduction of the IFQ. The members of the Montauk Tilefish Association, located in Montauk, NY (the former Tier 1 vessel owners), were instrumental in creating the Mid-Atlantic Golden Tilefish IFQ Program as they worked collaboratively to create a management regime that encourages resource stewardship at the local level (Kitts et al. 2007). IFQ quota allocations were initially granted to 11 quota holders. Allocations may be transferred permanently or leased to an entity on an annual basis. The cap for quota accumulation is set at 49 percent of total quota. The commercial fishery has remained small, with only 10 vessels landing golden tilefish under the IFQ in 2013 (Brinson and Thunberg 2016).

The primary objectives of this IFQ program are to reduce overcapacity and eliminate problems associated with the race to fish that existed under simple limited access, and to establish an overall quota or Total Allowable Catch (TAC).

The primary market for golden tilefish is for human consumption; it is often used for sushi. Golden tilefish are primarily caught with bottom longline gear. There is also a recreational fishery for golden tilefish in federal waters.

Trends for Top Participating Communities

Commercial Engagement

The program-specific Fishing Engagement Index scores for the Mid-Atlantic Golden Tilefish IFQ Program are presented in Table 2.8. The index is an indicator of the importance of IFQ golden tilefish fishing in a community relative to other communities in the Northeast Region. It is a measure of the presence of golden tilefish fishing in a community through fishing activity including pounds, value, permits, and dealers.

Montauk, NY was the only community **highly engaged** (1.0 standard deviation above the mean) in the IFQ golden tilefish fishery for one or more years from the Baseline period (2007-2009) through 2013 However, given the small scale of this fishery, Barnegat Light, NJ is noted as being moderately engaged from the Baseline through 2013. The engagement score for Montauk, NY was stable from the Baseline through 2013 (Figure 2.11).

Table 2.8. Fishing Engagement Index scores of communities highly engaged in the Mid-Atlantic Golden Tilefish IFQ Program for one or more years from the Baseline (2007-2009) through 2013.

Community	Baseline	2010	2011	2012	2013
Montauk, NY	2.336	2.297	2.305	2.393	2.346

Note: Highlighted cells indicate high engagement.

Photo Credit: NOAA Fisheries/Barbara Rountree

Regional Quotient

Another measure of a community's involvement in the golden tilefish fishery is its Regional Quotient. Regional Quotient is the proportion of IFQ golden tilefish landed within a community out of the total amount of the IFQ golden tilefish landed within the Northeast Region. It is an indicator of the percent contribution in pounds or value of golden tilefish landed within that community relative to the regional fishery. The Regional Quotient is reported individually only for those communities that were **highly engaged for all years** from the Baseline through 2013. All other communities which landed golden tilefish are grouped as "Other Communities." Figure 2.12 and Figure 2.13 show the Regional Quotient for golden tilefish fishery both in pounds and value from the Baseline to 2013.

Montauk, NY was consistently the only **highly engaged** community from the Baseline through 2013. It accounted for 70 percent to 75 percent of the total pounds and value landed in the Northeast Region for that time period.

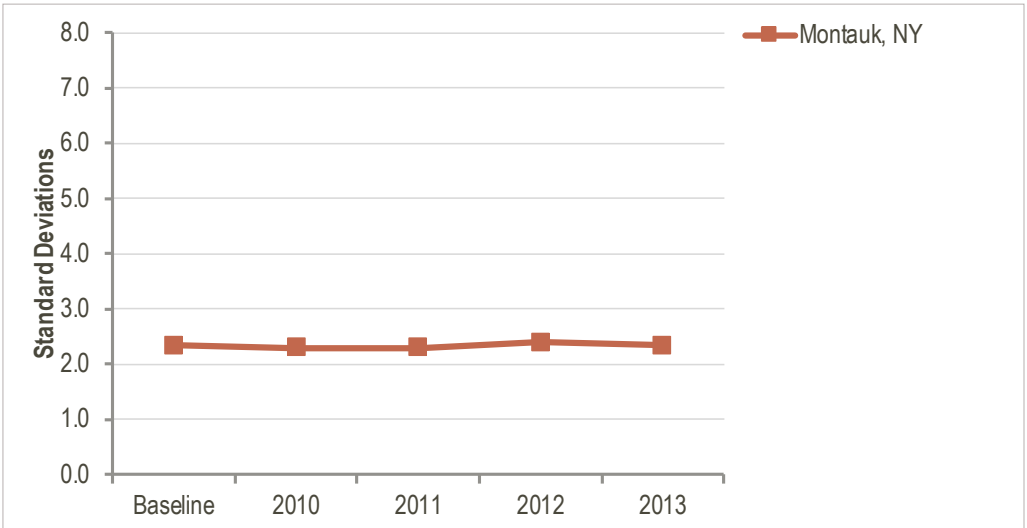


Figure 2.11. Fishing Engagement Index scores of communities highly engaged in the Mid-Atlantic Golden Tilefish IFQ Program for one or more years from the Baseline (2007-2009) through 2013.

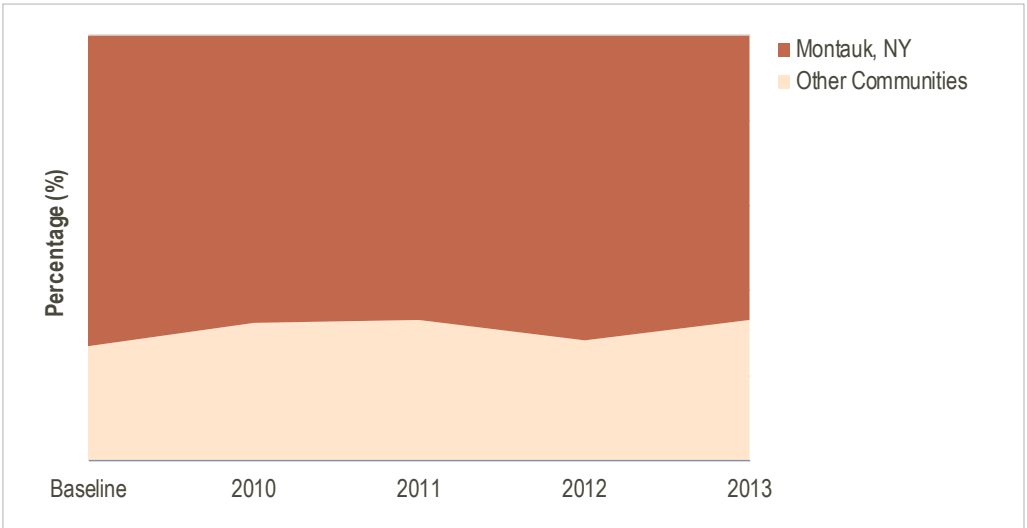


Figure 2.12. Regional Quotient (POUNDS) for communities highly engaged in the Mid-Atlantic Golden Tilefish IFQ Program for all years from the Baseline (2007-2009) through 2013.

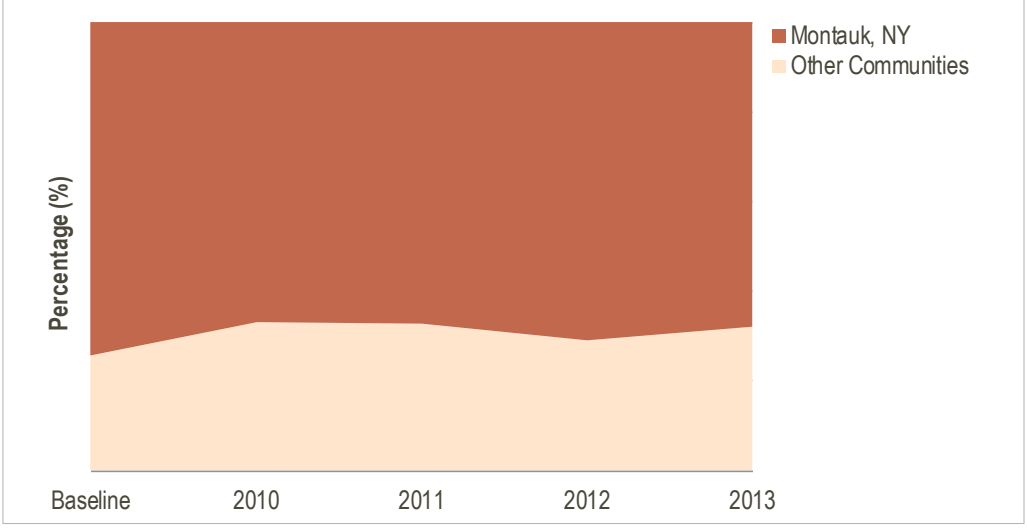


Figure 2.13. Regional Quotient (VALUE) for communities highly engaged in the Mid-Atlantic Golden Tilefish IFQ Program for all years from the Baseline (2007-2009) through 2013.

Local Quotient

The community Local Quotient is the percentage of IFQ golden tilefish landed within a community out of the total amount of all species landed within that community. It is an indicator of the contribution in pounds or value of golden tilefish to the overall landings in a community. Figure 2.14 and Figure 2.15 show the IFQ golden tilefish Local Quotient in Montauk, NY both in pounds and value from the Baseline to 2013. IFQ golden tilefish accounted for 7 to 10 percent of the total pounds and 15 to 20 percent of the total value landed in Montauk, NY from the Baseline through 2013.

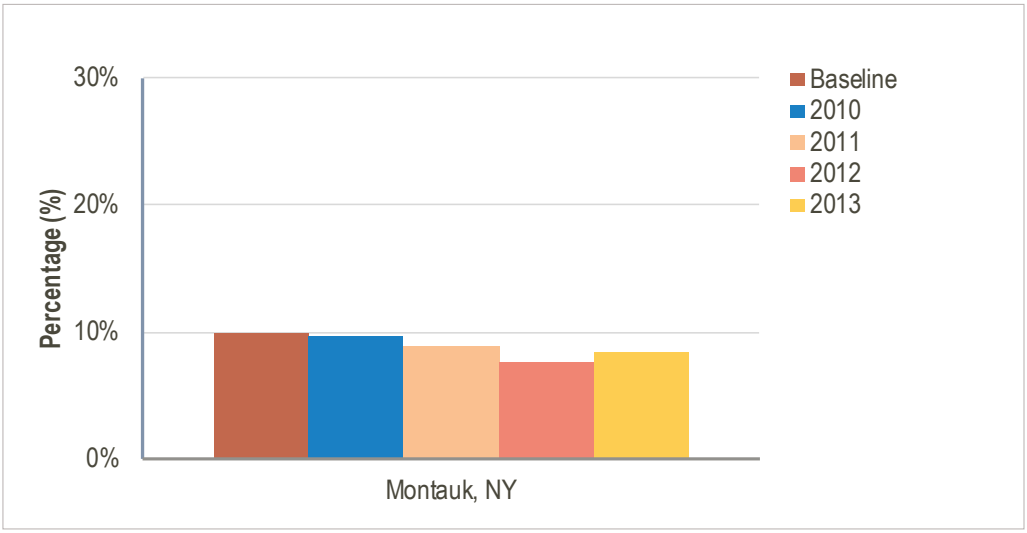


Figure 2.14. Local Quotient (POUNDS) for communities highly engaged in the Mid-Atlantic Golden Tilefish IFQ Program for all years from the Baseline (2007-2009) through 2013.

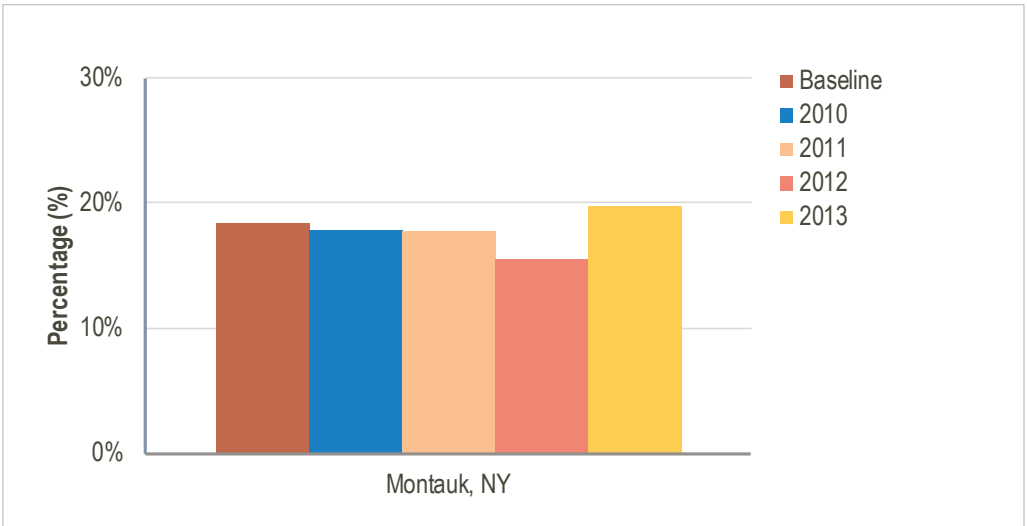


Figure 2.15. Local Quotient (VALUE) for communities highly engaged in the Mid-Atlantic Golden Tilefish IFQ Program for all years from the Baseline (2007-2009) through 2013.

Community Social Vulnerability Indicators (CSVIs)

The two categories of CSVIs discussed below include social vulnerability and gentrification pressure vulnerability. The Social Vulnerability Indicators represent social factors that can shape either an individual or community's ability to adapt to change (poverty, personal disruption, labor force structure and population composition vulnerability). The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption and retiree migration).

The Social Vulnerability Indicators for Montauk, NY are included in Table 2.9. Communities **highly engaged for all years** are highlighted. Montauk, NY was the only community **highly engaged** in the Mid-Atlantic Golden Tilefish IFQ Program for at least one year from the Baseline (2007-2009) through 2013, and it is also the only community **highly engaged** for all four years since the implementation of the program. Montauk, NY ranked low on four out of five indices but ranked moderately vulnerable on the remaining Labor Force Structure Index.

Table 2.9. Social Vulnerability Indicators for communities highly engaged in the Mid-Atlantic Golden Tilefish IFQ Program for one or more years from the Baseline (2007-2009) through 2013.

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
Montauk, NY	3,471	Low	Low	Low	Moderate	Low

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront (urban sprawl, housing disruption and retiree migration). Gentrification Pressure Vulnerability indicators for Montauk, NY are included in Table 2.10. Montauk, NY was highly vulnerable for two of the three indices, housing disruption and urban sprawl, and was moderately vulnerable for the Retiree Migration Index.

Table 2.10. Gentrification Pressure Vulnerability Indicators for communities highly engaged in the Mid-Atlantic Golden Tilefish IFQ Program for one or more years from the Baseline (2007-2009) through 2013.

Community	Housing Disruption	Retiree Migration	Urban Sprawl
Montauk, NY	High	Moderate	High

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

Photo Credit: NOAA Fisheries/Lisa L. Colburn

General Category Atlantic Sea Scallop Individual Fishing Quota Program

Program Overview

Atlantic sea scallops are found along the Atlantic coast from the Mid-Atlantic to the U.S./Canada border, with commercial catch concentrated on Georges Bank and in the Southern New England and Mid-Atlantic regions. The first records of a commercial fishery date from the late 1800s (NEFMC 1993). Managed by the NEFMC and NOAA Fisheries since 1982, Atlantic sea scallops in the Northeast Region are primarily harvested by fishermen operating large offshore vessels under a limited access program that began in 1994, and is now referred to simply as the Limited Access fleet. Initially, a separate small boat fleet was exempt from limited access and governed only by a trip limit. As restrictions increased in other fisheries, more vessels entered the open access or general category scallop fishery. Concerned by this growth in the open access fleet, in 2008 the NEFMC implemented limited entry for the general category (which includes the Atlantic Sea Scallop General Category IFQ Program) with a start date of 2010. Under this program, each qualifying vessel received an individual allocation based on their best year of landings during Atlantic sea scallop fishing years 2000 to 2004 (the sea scallop fishing year runs from March to February). To qualify for an IFQ permit, a vessel had to have at least one year of 1,000 pounds of Atlantic sea scallop landings during this time period. Incidental permits could be acquired by those vessels that did not meet the landings qualification criteria for an IFQ permit. Incidental permits limit Atlantic sea scallop landings to 40 pounds per trip. A third, separate, permit category was created for small-scale Atlantic sea scallop fishing in the Northern Gulf of Maine. The Northern Gulf of Maine permit limits sea scallop landings to 200 meat pounds per trip, and like the incidental permit, is not part of the IFQ program. Landings from incidental and Northern Gulf of Maine permit holders are not included in the analysis to follow. The three permit categories that comprise the Limited Entry General Category (IFQ, incidental, and Northern Gulf of Maine) were allocated 10 percent of the total Atlantic sea scallop annual catch limit for fishing years 2008-2009 and 5.5 percent since fishing year 2011. The IFQ category is given the vast majority (>90 percent) of this 5.5 percent. The IFQ allocation may be leased or permanently transferred within the IFQ fleet. The general category Atlantic sea scallop fishery has always been a comparatively small proportion of the overall scallop fishery and as such has relatively little impact on the availability of sea scallops to processors or seafood consumers; although, since the IFQ fleet is essentially a day-boat fleet they may be able to market their product as fresher than the large vessel, multi-day Limited Access fleet (NEFMC 2007).

The goals of the limited entry general category program (which, as described above, includes but is not limited to the General Category Atlantic Sea Scallop IFQ Program) are to control capacity and mortality and allow for better and timelier integration of sea scallop assessment results into management (Brinson and Thunberg 2013). The NEFMC's vision for the general category fishery is "…a fleet made up of relatively small vessels, with possession limits to maintain the historical character of this fleet and provide opportunities to various participants including vessels from smaller coastal communities" (NEFMC 2007).

The primary market for Atlantic sea scallops is as shucked meats that are graded by the number of meats per pound. Single or paired scallop dredges are the most common gear used, though a scallop trawl is sometimes employed in the Mid-Atlantic. There is no charter/party recreational fishery for scallops in federal waters.

Trends for Top Participating Communities

Commercial Engagement

The program-specific Fishing Engagement Index scores for the General Category Atlantic Sea Scallop IFQ Program are presented in Table 2.11. The index is an indicator of the importance of IFQ Atlantic sea scallop fishing in a community relative to other communities in the Northeast Region. It is a measure of the presence of IFQ Atlantic sea scallop fishing in a community through fishing activity including pounds, value, permits and dealers. There were thirteen communities that were **highly engaged** (1.0 standard deviation or more above the mean) in the IFQ Atlantic Sea Scallop fishery for at least one year from the Baseline (2007-2009) through 2013.

Table 2.11. Fishing Engagement Index scores of communities highly engaged in the General Category Atlantic Sea Scallop IFQ Program for one or more years from the Baseline (2007-2009) through 2013.

Community	Baseline	2010	2011	2012	2013
Point Pleasant, NJ	5.018	5.309	5.704	5.602	6.230
Barnegat Light/Long Beach, NJ	4.337	5.732	4.776	4.392	3.660
New Bedford, MA	4.034	3.370	4.115	4.304	3.408
Cape May, NJ	3.360	1.156	1.456	2.157	1.546
Ocean City, MD	2.855	2.048	0.709	0.206	0.010
Point Judith/Narragansett, RI	1.607	1.153	1.546	1.053	1.128
Chatham, MA	1.533	2.421	2.541	2.508	3.716
Point Lookout, NY	1.379	0.368	0.840	0.778	0.406
Atlantic City, NJ	1.342	0.804	1.572	1.701	1.830
Montauk, NY	1.272	0.935	0.894	1.030	0.936
Hampton Bays/Shinnecock, NY	0.960	1.506	1.230	0.975	1.463
Provincetown, MA	0.574	0.836	1.158	1.493	1.612
Chincoteague, VA	0.201	1.216	0.000	-0.205	-0.172

Note: Highlighted cells indicate high engagement.

Photo Credit: NOAA Fisheries/Angela Silva

Of the thirteen communities found in Table 2.11, six were **highly engaged for all years** from the Baseline through 2013 (Figure 2.16). Point Pleasant, NJ and Barnegat Light, NJ followed by New Bedford, MA have the highest engagement scores.

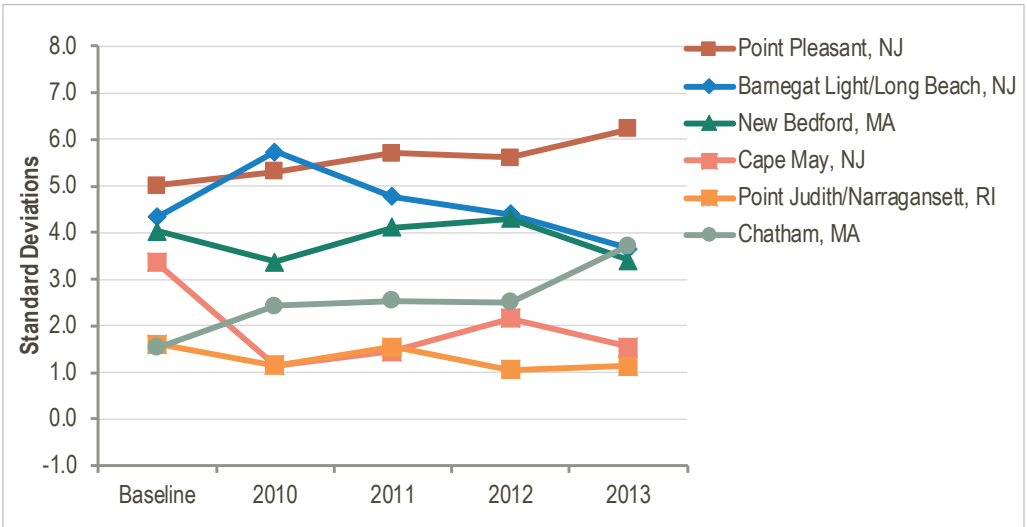


Figure 2.16. Fishing Engagement Index scores of communities highly engaged in the General Category Atlantic Sea Scallop IFQ Program for all years from the Baseline (2007-2009) through 2013.

Communities that demonstrated an increasing IFQ Atlantic sea scallop engagement score from the Baseline through 2013 are depicted in Figure 2.17. Point Pleasant, NJ was clearly a dominant community, **highly engaged for all years**, with its engagement score increasing steadily over time. Similarly, Chatham, MA was **highly engaged for all years** with a clearly increasing trend in the engagement score, slightly surpassing the scores of the **highly engaged** communities of Barnegat Light, NJ and New Bedford, MA in 2013.

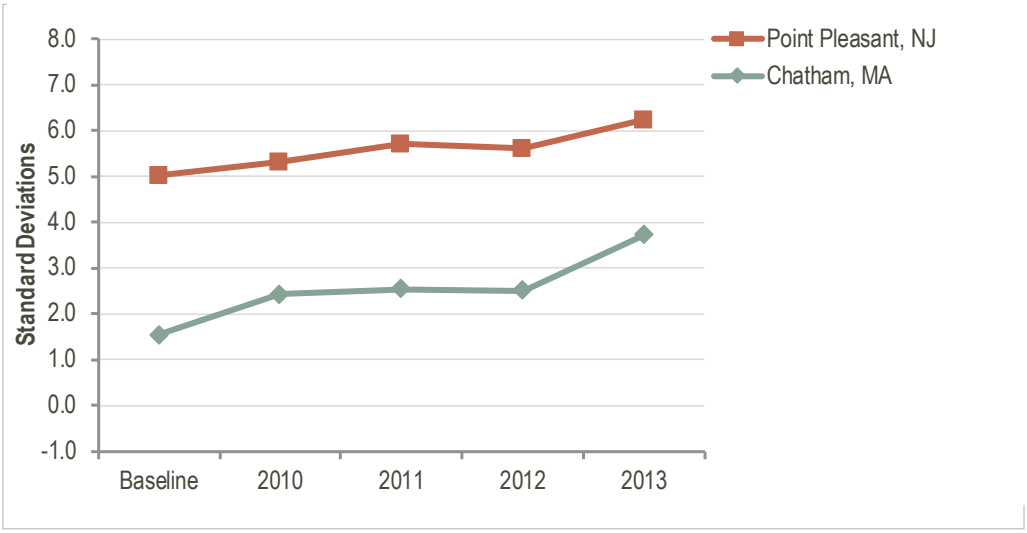


Figure 2.17. Fishing Engagement Index scores of communities highly engaged in the General Category Atlantic Sea Scallop IFQ Program for all years with increasing engagement from the Baseline (2007-2009) through 2013.

Communities that demonstrated a decreasing IFQ Atlantic sea scallop engagement score from the Baseline through 2013 are depicted in Figure 2.18. Barnegat Light, NJ and New Bedford, MA were dominant and **highly engaged** ports from the Baseline through 2013, in spite of decreasing engagement scores. This trend seems clearer for Barnegat Light, NJ, however, which has been on a clear downward trend since 2010, than for New Bedford, MA which has fluctuated over the life of the program. The other two **highly engaged** communities, Cape May, NJ and Point Judith, RI, also showed a decreasing trend in the engagement score for the same time period (Figure 2.18).

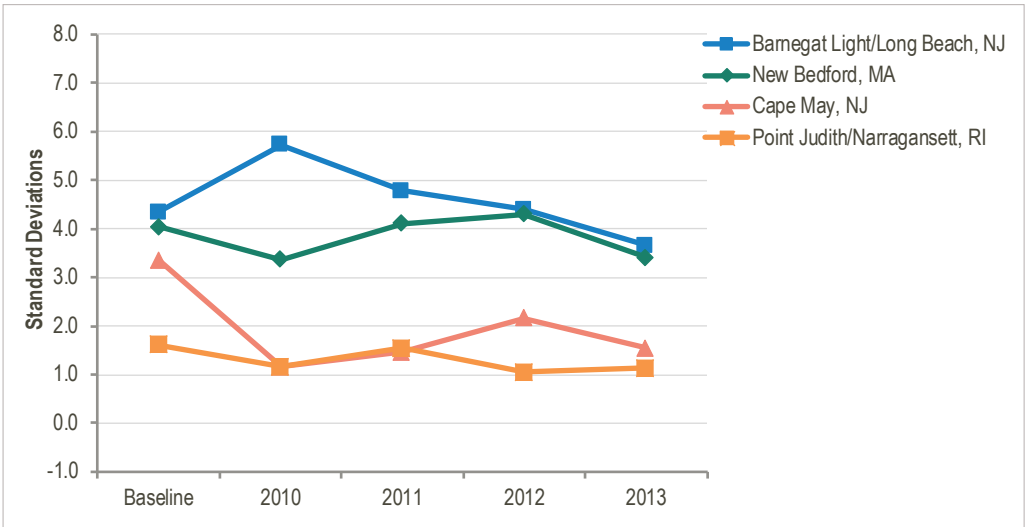


Figure 2.18. Fishing Engagement Index scores of communities highly engaged in the General Category Atlantic Sea Scallop IFQ Program for all years with decreasing engagement from the Baseline (2007-2009) through 2013.

Communities **highly engaged** with the IFQ Atlantic sea scallop fishery for fewer than all years are depicted in Figure 2.19. Among the seven communities, Atlantic City, NJ and Provincetown, MA showed a clearly increasing trend in the engagement score over time. The score for Hampton Bays/Shinnecock, NY fluctuated but also showed a generally increasing trend over time. In contrast, Ocean City, MD and Point Lookout, NY were **highly engaged** during the Baseline period, but experienced clearly decreasing engagement scores after the program was implemented. The decrease was especially noticeable for Ocean City, MD, as the engagement score dropped steadily from the Baseline period to 2013. Point Lookout, NY also experienced a dip in 2010, although the engagement score then somewhat bounced back. Still, the score remained lower than the Baseline level during 2011-2013. Also showing a decreasing trend in engagement score was Chincoteague, VA. After a jump in 2010, the engagement score for Chincoteague, VA dropped and remained lower than the mean. Slightly different from the above communities, the engagement score remained relatively stable (around 1.00) for Montauk, NY after experiencing a drop in engagement score after program implementation in 2010.

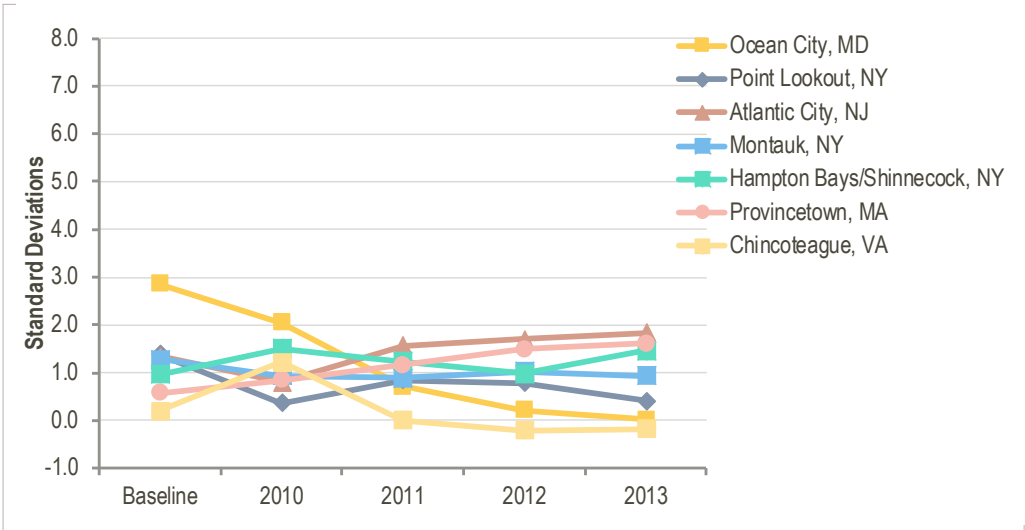


Figure 2.19. Fishing Engagement Index scores of communities highly engaged in the General Category Atlantic Sea Scallop IFQ Program for fewer than all years from the Baseline (2007-2009) through 2013.

Regional Quotient

Another measure of a community's involvement in the IFQ Atlantic sea scallop fishery is its Regional Quotient. Regional Quotient is the proportion of IFQ Atlantic sea scallops landed within a community out of the total amount of IFQ Atlantic sea scallops landed within the Northeast Region. It is an indicator of the percentage contribution in pounds or value of IFQ Atlantic sea scallops landed within that community relative to the regional fishery. The Regional Quotient is reported individually only for those communities that were **highly engaged for all years** from the Baseline through 2013. All other communities which landed IFQ sea scallops are grouped as "Other Communities." Figure 2.20 and Figure 2.21 show the Regional Quotient both in pounds and value from the Baseline to 2013.

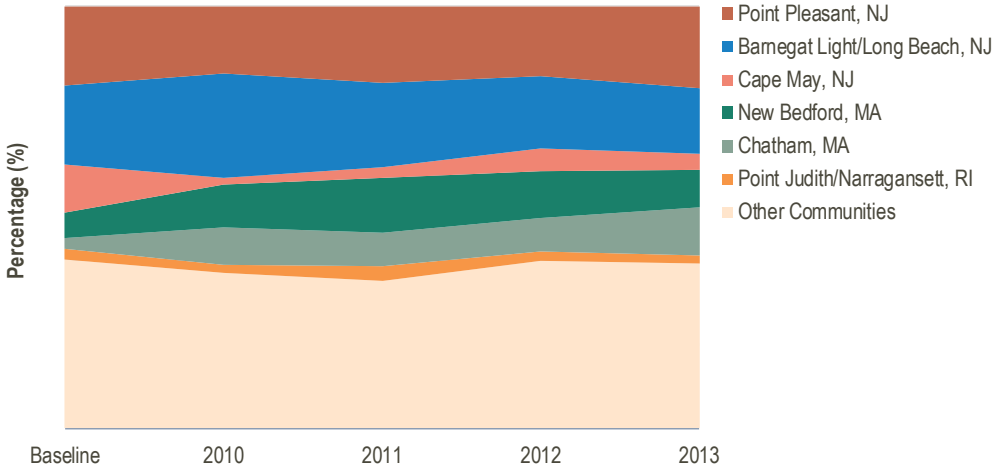


Figure 2.20. Regional Quotient (POUNDS) for communities highly engaged in the General Category Atlantic Sea Scallop IFQ Program for all years from the Baseline (2007-2009) through 2013.

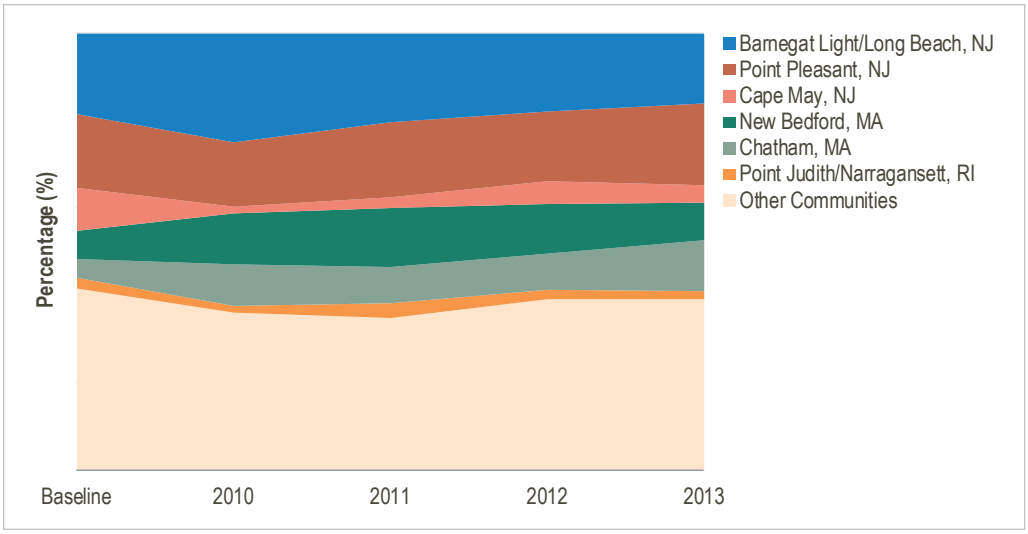


Figure 2.21. Regional Quotient (VALUE) for communities highly engaged in the General Category Atlantic Sea Scallop IFQ Program for all years from the Baseline (2007-2009) through 2013.

The dominant IFQ Atlantic sea scallop communities from the Baseline onward have been Point Pleasant and Barnegat Light, NJ, each contributing 15 to 20 percent of the regional pounds landed (Figure 2.20). They were followed by New Bedford and Chatham, MA which each accounted for about 10 percent of the total pounds landed. Cape May, NJ showed a decreasing share of the regional total as its percentage dropped from above 10 percent in the Baseline to only 4 percent in 2013. Despite its being **highly engaged**, Point Judith, RI only contributed a small portion of the regional total pounds landed. The remaining 40 percent of the total pounds landed were distributed among the all other communities involved in the fishery.

The distribution of regional value landed is very similar to that of the regional pounds landed. The dominant communities, Point Pleasant and Barnegat Light, NJ, contributed nearly 35 percent of the total value landed in the region (Figure 2.21). New Bedford and Chatham, MA together contributed another 10 to 20 percent of the total value landed. While an increasing share has been observed for Chatham, MA from Baseline to 2013, a decreasing share was found for Cape May, NJ. Again, Point Judith, RI landed a small percentage of the regional total value landed. The communities in Figure 2.21 in the "Other Communities" category contributed the remaining 40 percent of the regional value landed from the Baseline (2007-2009) through 2013.

Local Quotient

The community Local Quotient is the percentage of IFQ Atlantic sea scallops landed within a community out of the total amount of all species landed within that community. It is an indicator of the contribution in pounds or value of IFQ Atlantic sea scallops to the overall landings within a community. Figure 2.22 and Figure 2.23 show the Local Quotient

in both pounds and value from the Baseline to 2013. Of communities most **highly engaged** in the General Category Atlantic Sea Scallop IFQ Program, Barnegat Light, NJ stands out in its community Local Quotient of IFQ Atlantic sea scallops pounds. Although the percentage dropped from more than 10 percent in the Baseline period to round 5 percent in 2013, it was still much higher than any other **highly engaged** community. Sea scallop pounds from the IFQ fishery made up only 1 to 3.5 percent of the total pounds landed in Point Pleasant, NJ and Chatham, MA, and less than 1 percent in Cape May, NJ; Point Judith, RI; and New Bedford, MA. However, it should be noted that when combined with Atlantic sea scallops from the offshore Limited Access fleet, Atlantic sea scallops have led to New Bedford being consistently one of the top two ports in the U.S. based on value and have contributed a large portion of New Bedford's landings by weight.

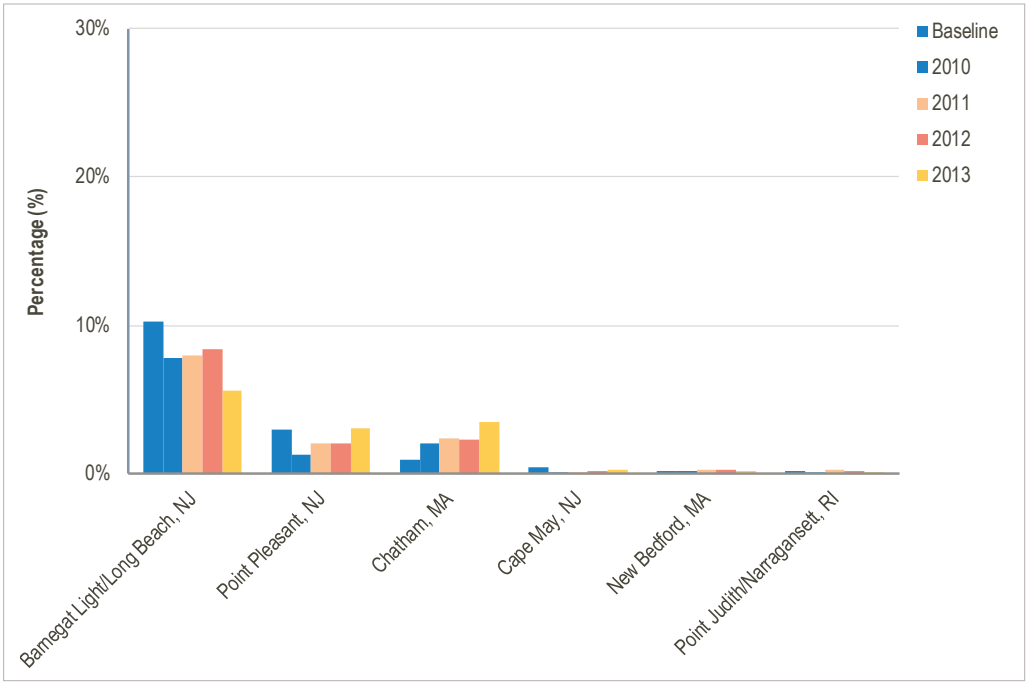


Figure 2.22. Local Quotient (POUNDS) for communities highly engaged in the General Category Atlantic Sea Scallop IFQ Program for all years from the Baseline (2007-2009) through 2013.

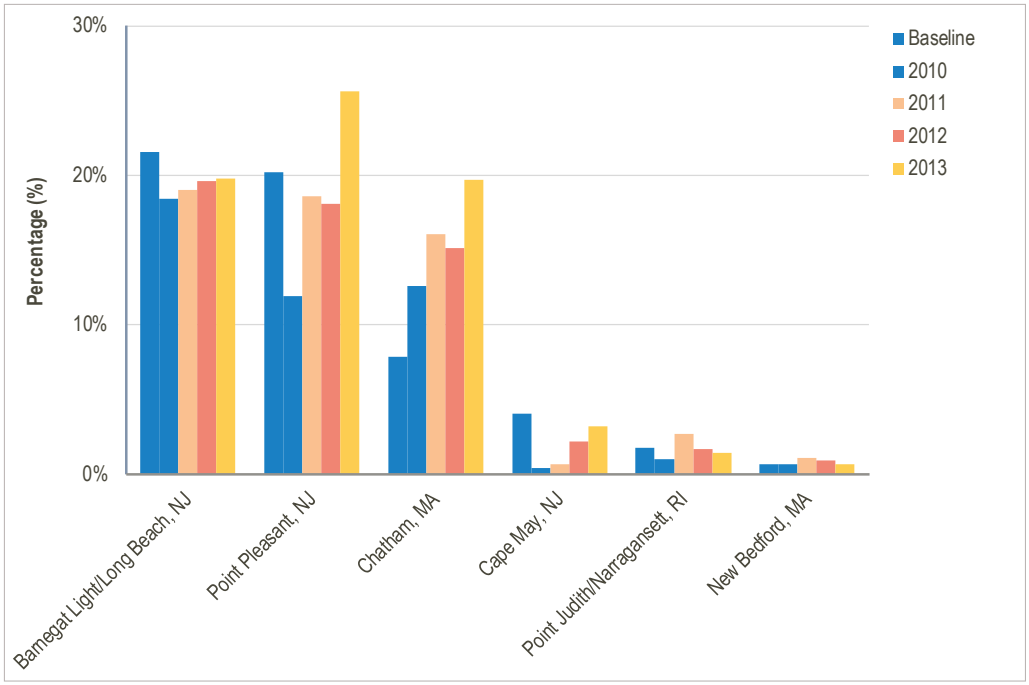


Figure 2.23. Local Quotient (VALUE) for communities highly engaged in the General Category Atlantic Sea Scallop IFQ Program for all years from the Baseline (2007-2009) through 2013.

Although IFQ Atlantic sea scallops pounds landed contributed only a small percentage of the total pounds landed in most communities, the percent of IFQ Atlantic sea scallops value landed was more substantial in some. For example, IFQ Atlantic sea scallops contributed about 20 percent of the total value landed in Barnegat Light, NJ from the Baseline through 2013. Point Pleasant, NJ experienced a dip in 2010, though the Local Quotient for value landed then rose to nearly 20 percent in most years and increased to more than 25 percent in 2013. IFQ Atlantic sea scallops contributed 8 percent of the total value landed in Chatham, MA during the Baseline period, with the percentage increasing steadily since then and reaching almost 20 percent in 2013. The Local Quotient from the IFQ fishery remained low, less than 5 percent, in other communities **highly engaged** in the fishery, such as Cape May, NJ; Point Judith, RI; and New Bedford, MA. In general, then, the Local Quotient value landed was higher than the Local Quotient pounds in these communities. This is due to the high price per lb for Atlantic sea scallops.

Community Social Vulnerability Indicators (CSVIs)

The two categories of CSVIs discussed below include social vulnerability and gentrification pressure vulnerability. The Social Vulnerability Indicators represent social factors that can shape either an individual or community's ability to adapt to change (poverty, personal disruption, labor force structure and population composition vulnerability). The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption and retiree migration).

The Social Vulnerability Indicators for communities that were **highly engaged** in the General Category Atlantic Sea Scallop IFQ Program for at least one year from the Baseline through 2013 are included in Table 2.12. Communities **highly engaged for all years** are highlighted. With the exception of New Bedford, MA, the populations of the most **highly engaged** communities are relatively low compared with other communities. Five out of the six most **highly engaged** communities ranked low on personal disruption, population composition and poverty indices. The only exception was New Bedford, MA which ranked moderately high to highly vulnerable on these three indices. The Labor Force Structure Index score was moderately high to high for three of the most **highly engaged** communities, Barnegat Light and Cape May, NJ; and Chatham, MA, but was low for the other three **highly engaged** communities. All of these most **highly engaged** communities were low to moderately vulnerable on the Housing Characteristics Index.

Table 2.12. Social Vulnerability Indicators for communities highly engaged in the General Category Atlantic Sea Scallop IFQ Program for one or more years from the Baseline (2007-2009) through 2013.

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
Barnegat Light/ Long Beach, NJ	609	Low	Low	Low	Med High	Low
Cape May, NJ	3,585	Low	Low	Low	High	Moderate
Chatham, MA	1,362	Low	Low	Low	High	Moderate
New Bedford, MA	94,927	Med High	Med High	High	Low	Moderate
Point Judith/ Narragansett, RI	15,809	Low	Low	Low	Low	Low
Point Pleasant, NJ	18,466	Low	Low	Low	Low	Low
Atlantic City, NJ	39,591	High	High	High	Moderate	Med High
Chincoteague, VA	2,965	Moderate	Low	Low	Moderate	High
Hampton Bays/ Shinnecock, NY	12,680	Low	Low	Low	Low	Low
Montauk, NY	3,471	Low	Low	Low	Moderate	Low
Ocean City, MD	7,108	Low	Low	Low	Med High	Med High
Point Lookout, NY	1,250	Low	Low	Low	Low	Low
Provincetown, MA	2,808	Moderate	Low	Low	Low	Med High

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront (urban sprawl, housing disruption and retiree migration). Gentrification Pressure Vulnerability Indicators for communities that were **highly engaged** in the General Category Atlantic Sea Scallop IFQ Program for at least one year from the Baseline (2007-2009) through 2013 are included in Table 2.13. Communities **highly engaged for all years** are highlighted. Of the most **highly engaged** communities, Barnegat Light and Cape May, NJ; and Chatham, MA were highly vulnerable for the Retiree Migration Index. This is in contrast to New Bedford, MA; Point Judith, RI; and Point Pleasant, NJ which showed low vulnerability for the same index. All six of these communities ranked moderately to highly vulnerable for both the Housing Disruption Index and the Urban Sprawl Index.

Table 2.13. Gentrification Pressure Vulnerability Indicators for communities highly engaged in General Category Atlantic Sea Scallop IFQ Program for one or more years from the Baseline (2007-2009) through 2013.

Community	Housing Disruption	Retiree Migration	Urban Sprawl
Barnegat Light/Long Beach, NJ	N/A	High	High
Cape May, NJ	High	High	Moderate
Chatham, MA	Med High	High	Med High
New Bedford, MA	Moderate	Low	Med High
Point Judith/Narragansett, RI	High	Low	Moderate
Point Pleasant, NJ	Moderate	Low	Moderate
Atlantic City, NJ	High	Low	Low
Chincoteague, VA	Med High	Moderate	Low
Hampton Bays/Shinnecock, NY	High	Low	High
Montauk, NY	High	Moderate	High
Ocean City, MD	Moderate	High	Low
Point Lookout, NY	Med High	Moderate	High
Provincetown, MA	Moderate	Low	Med High

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

Photo Credit: NOAA Fisheries/Angela Silva

Northeast Multispecies Sector Program

Program Overview

The Northeast multispecies fishery occurs along the Atlantic coast from the US/Canada border to the Mid-Atlantic, with commercial landings concentrated in the New England region. The Northeast multispecies fishery, hereafter referred to as the groundfish fishery, has been managed by the NEFMC and NOAA Fisheries since 1986, though the commercial fishery first began in 1893 (NEFMC 1985).The groundfish stocks in the Northeast Region are primarily harvested by fishermen operating under a sector allocation program that was first introduced in Amendment 13 in 2004. The sector allocation program was revised and expanded in Amendment 16, which was implemented in 2010 (Clay et al. 2014). Of the 17 stocks currently managed under the sector allocation program (Lee et al. 2016), three stocks (Georges Bank cod, haddock, and yellowtail flounder) are jointly managed between the U.S. and Canada under a transboundary resource sharing arrangement.

Groundfish sectors operate in a manner similar to a harvest cooperative, and account for over 90 percent of the groundfish quota. Permit holders can join a sector or remain in a "common pool" that continues to operate under the previous effort control restrictions. Sectors receive an "allocation"[1] or ACE (Annual Catch Entitlement) that is determined by summing the Potential Sector Contribution or PSC (based on individual catch history) of each member[2]. It is up to each sector to determine how this ACE is then harvested by its members. Sectors can trade ACE of specific stocks to avoid going over the limits of each. Permit holders can also change sectors, but only at the end of each fishing year. If they leave a sector, their PSC goes with them and that amount is subtracted from the ACE of the sector they leave and added to that of their new sector (Clay et al. 2014).

Amendment 16, building on Amendment 13, retained the six Amendment 13 goals and its ten objectives. Not all of the common goals and objectives were directly related to sectors. Grouped generally, they refer to managing stocks sustainably; making the fleet more efficient while retaining both directed commercial and recreational fisheries; maintaining fleet diversity in terms of gear types, vessel sizes, geographic locations, and levels of participation developing biological, economic and social measures of success for the fishery to insure achieving objectives; developing biological, economic and social measures of success; adopting habitat measures, identifying and minimizing bycatch and bycatch mortality and minimizing, "to the extent practicable, adverse impacts on fishing communities and shoreside infrastructure." This last is a re-phrasing of National Standard 8 in the MSA. As such, it applies to all fisheries. However, at the times that Amendment 13 and later Amendment 16 were being implemented, the groundfish fishery – much more so than many other fisheries in the Northeast -- was concerned with overfishing of most stocks, consolidation of fleets, and an ongoing loss of many small and/or rural fishing communities. This issue was important enough to include as a specific goal. Furthermore, A16 notes with regard specifically to evaluating the alternatives for the sector allocation process and the determination of sector contributions (section 4.3.2), the following goals would be considered: address bycatch; simplify management; "[g]ive industry greater control over their own fate; [p]rovide a mechanism for economics to shape the fleet rather than regulations (while working to achieve fishing and biomass targets); and [p]revent excessive consolidation that would eliminate the day boat fishery."

The primary market for groundfish is for human consumption. Fish are sold fresh and frozen, whole, filleted, and processed. Both fixed gear (gillnet and hook gears including bottom longline (most common), tub trawls, and rod and reel) and otter trawl gear are used to harvest groundfish. There is a charter/party recreational boat fishery for groundfish in federal waters and a recreational fishery in state waters.

Trends for Top Participating Communities

Commercial Engagement

The program-specific Fishing Engagement Index scores for the Northeast Multispecies Sector Program are presented in Table 2.14. The index is an indicator of the importance of groundfish sector fishing in a community relative to other communities in the Northeast Region. It is a measure of the presence of groundfish sector fishing in a community through fishing activity including pounds, value, permits, and dealers. There were eight communities that were **highly engaged** (1.0 standard deviation above the mean) in the Northeast groundfish sector fishery for at least one year from the Baseline period (2007-2009) through 2013.

[1] It is not a direct allocation to the sector, as it varies depending on the members and their PSCs.
[2] The PSC cannot be fished until the fisherman joins a sector.

Table 2.14. Fishing Engagement Index scores of communities highly engaged in the Northeast Multispecies Sector Program for one or more years from the Baseline (2007-2009) through 2013.

Community	Baseline	2010	2011	2012	2013
Gloucester, MA	6.811	6.936	6.695	6.962	6.669
New Bedford, MA	5.542	5.805	6.033	5.287	5.535
Portland, ME	2.091	0.838	1.452	1.925	2.223
Point Judith/Narragansett, RI	1.817	1.769	1.924	1.819	2.267
Boston, MA	1.691	2.117	2.054	2.324	2.378
Chatham, MA	1.083	1.008	0.892	0.91	0.631
Montauk, NY	1.028	0.173	0.337	0.185	0.432
Scituate, MA	0.603	0.927	0.754	1.358	0.943

Note: Highlighted cells indicate high engagement.

Photo Credit: NOAA Fisheries/Tarsila Seara

Of the eight communities found in Table 2.14, four were **highly engaged for all years** from the Baseline through 2013 (Figure 2.24). Gloucester and New Bedford, MA are clearly the communities with the highest engagement scores followed by Point Judith, RI and Boston, MA.

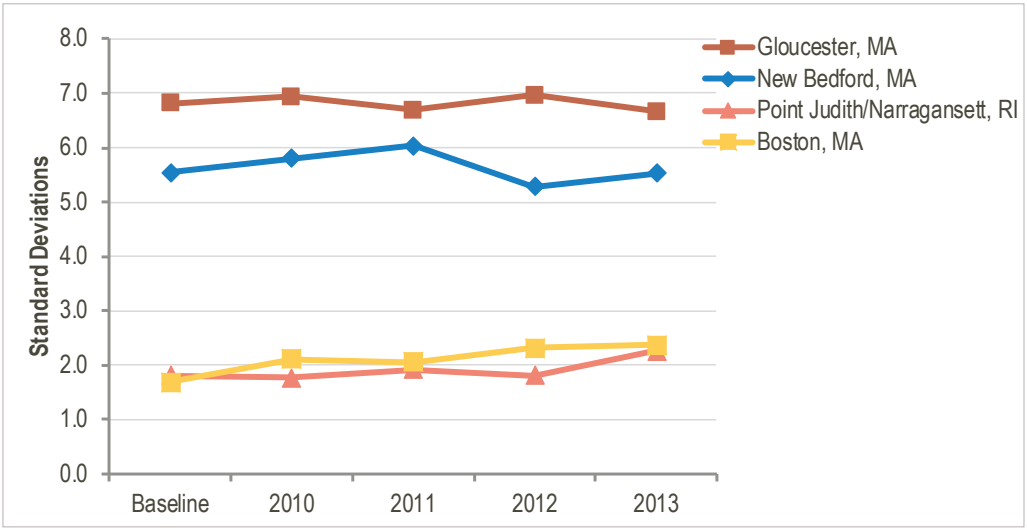


Figure 2.24. Fishing Engagement Index scores of communities highly engaged in the Northeast Multispecies Sector Program for all years from the Baseline (2007-2009) through 2013.

Point Judith, RI and Boston, MA, though having lower scores overall than Gloucester and New Bedford, MA, have shown a slight increase in engagement in the groundfish sector fishery since program implementation (Figure 2.25).

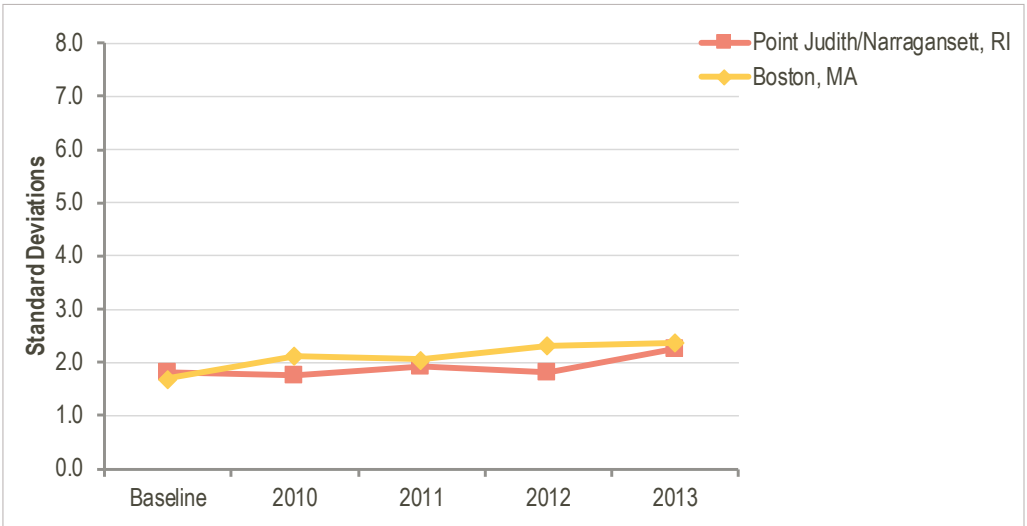


Figure 2.25. Fishing Engagement Index scores of communities highly engaged in the Northeast Multispecies Sector Program for all years with increasing engagement from the Baseline (2007-2009) through 2013.

Despite having the highest overall engagement scores in the groundfish sector fishery, Gloucester and New Bedford, MA have shown a subtle decrease in engagement scores over time (Figure 2.26).

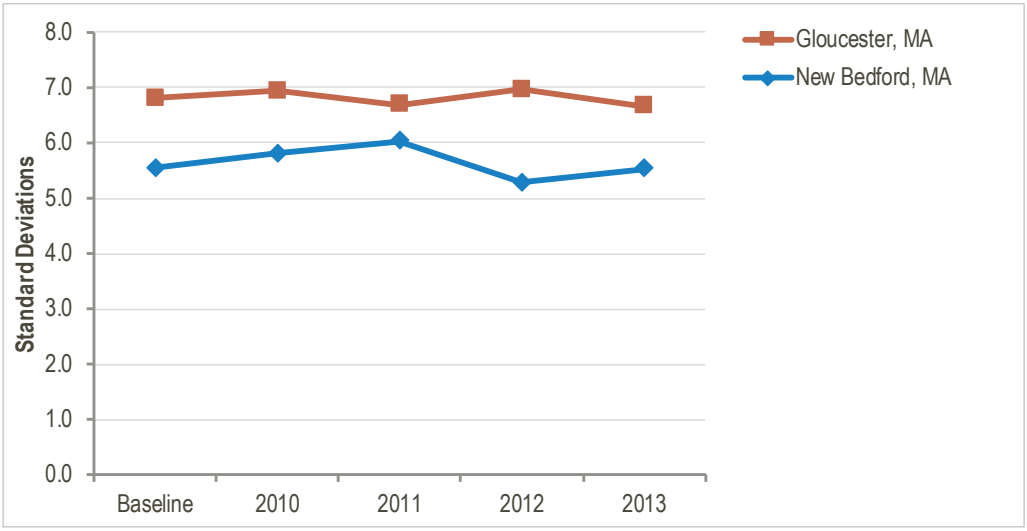


Figure 2.26. Fishing Engagement Index scores of communities highly engaged in the Northeast Multispecies Sector Program for all years with decreasing engagement from the Baseline (2007-2009) through 2013.

Communities that were **highly engaged** for fewer than all years are depicted in Figure 2.27. Portland, ME was **highly engaged** during the Baseline period and from 2011 to 2013, in fact returning to its pre-implementation level in 2013. Chatham, MA and Montauk, NY were both **highly engaged** in the groundfish sector fishery during the Baseline period but have experienced a gradual decrease in engagement since program implementation. In contrast, Scituate, MA was not **highly engaged** during the Baseline period, but showed a clear increase, with fluctuation, in its engagement score from program implementation in 2010 through 2013.

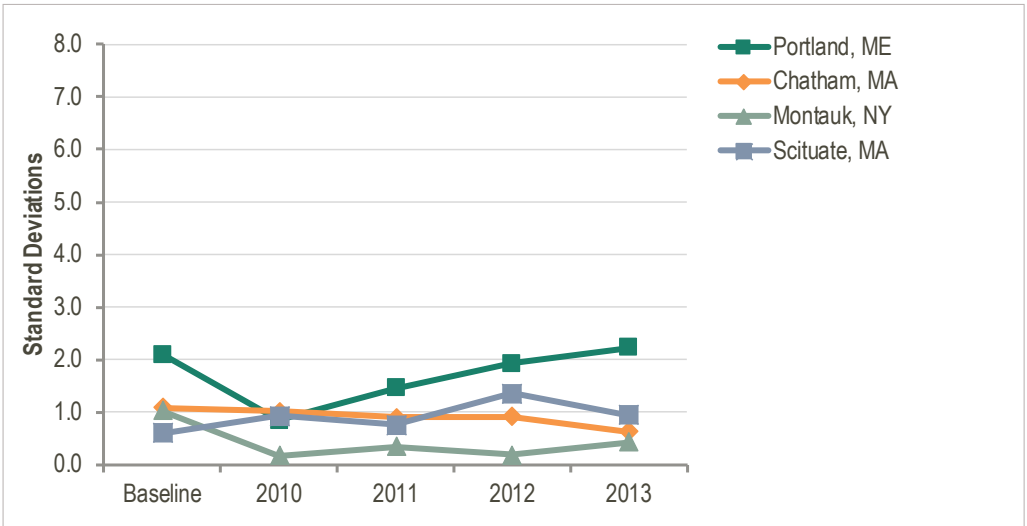


Figure 2.27. Fishing Engagement Index scores of communities highly engaged in the Northeast Multispecies Sector Program for fewer than all years from the Baseline (2007-2009) through 2013.

Regional Quotient

Another measure of a community's involvement in the groundfish sector fishery is its Regional Quotient. Regional Quotient is the proportion of groundfish sector landed within a community out the total amount of groundfish sector landed within the Northeast Region. It is an indicator of the percent contribution in pounds or value of multispecies landed within that community relative to the regional fishery. The Regional Quotient is reported individually only for those communities that were **highly engaged for all years** from the Baseline through 2013. All other communities which landed the species in question are grouped as "Other Communities." Figure 2.28 and Figure 2.29 show the Regional Quotient both in pounds and value from the Baseline to 2013.

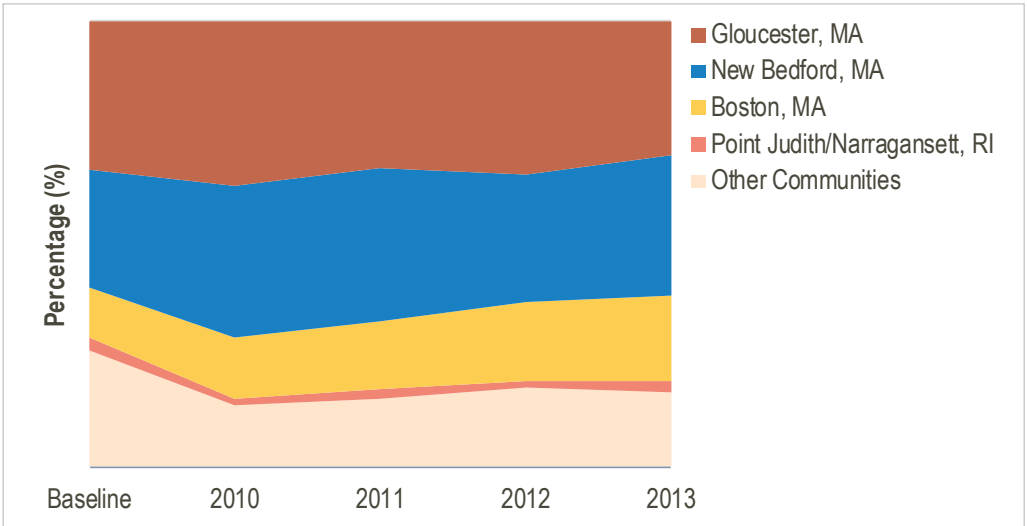


Figure 2.28. Regional Quotient (POUNDS) for communities highly engaged in the Northeast Multispecies Sector Program for all years from the Baseline (2007-2009) through 2013.

The dominant groundfish sector communities from the Baseline onward have been Gloucester and New Bedford, MA. Gloucester, MA accounted for slightly more than 30 percent of the regional pounds landed, followed by New Bedford, MA which contributed nearly 30 percent (Figure 2.28). Boston, MA has increased its contribution from around 10 percent in the Baseline period to almost 20 percent in 2013. Despite its being **highly engaged for all years**, Point Judith, RI accounted for less than 5 percent of the regional pounds landed. Together, these four most **highly engaged** communities have contributed around 85 percent of the regional pounds landed since program implementation, leaving the other communities involved in the groundfish sector fishery sharing the remaining 15 percent of total pounds landed in the region.

The distribution of regional value landed is very similar to that of regional pounds landed (Figure 2.29). The dominant communities of Gloucester and New Bedford, MA each accounted for about 30 percent of the regional value landed, followed by Boston, MA which contributed from about 10 percent in the Baseline period to nearly 20 percent in 2013 (Figure 2.29). As with pounds landed, Point Judith, RI accounted for a very small portion of the regional total value landed. These four most **highly engaged** communities together have contributed around 85 percent of the regional value landed since program implementation. The remaining 15 percent of regional value landed was distributed among the other communities involved in the groundfish sector fishery.

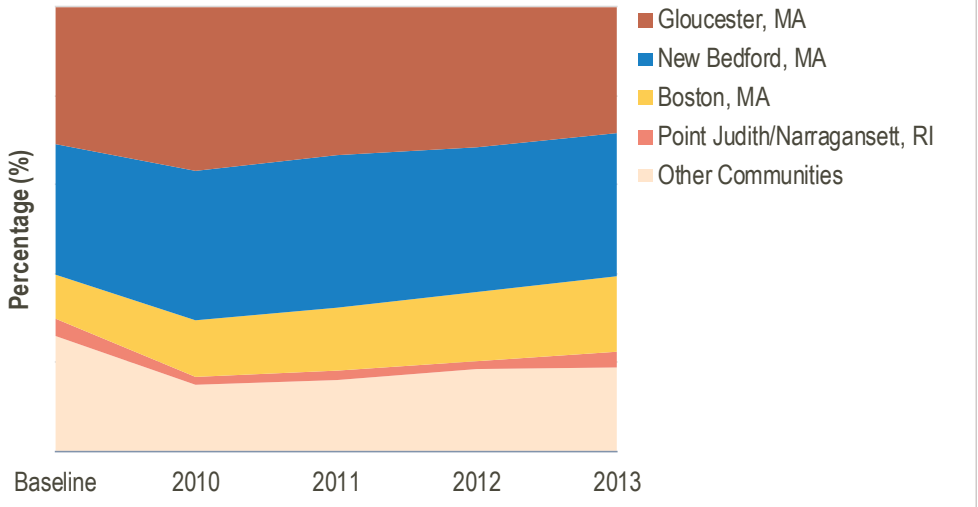


Figure 2.29. Regional Quotient (VALUE) for communities highly engaged in the Northeast Multispecies Sector Program for all years from the Baseline (2007-2009) through 2013.

Local Quotient

The community Local Quotient is the percentage of groundfish sector landings within a community out of the total amount of all species landed within that community. It is an indicator of the contribution in pounds or value landed of the groundfish sector fishery to the overall landings in a community. Figure 2.30 and Figure 2.31 show the Local Quotient both in pounds and value from the Baseline to 2013.

The community Local Quotient of groundfish sector pounds landed in Boston, MA made up more than 80 percent of total pounds landed in the community from Baseline through 2012. Despite a drop in 2013, the percentage of groundfish sector pounds landed in Boston, MA was still the highest among the communities compared. Local Quotient of groundfish sector pounds landed remained stable for Gloucester and New Bedford, MA, ranging from 20-30 percent for Gloucester, and 13-20 percent for New Bedford. Groundfish sector pounds landed contributed a very small portion (less than 5 percent) of the total landed pounds in Point Judith, RI.

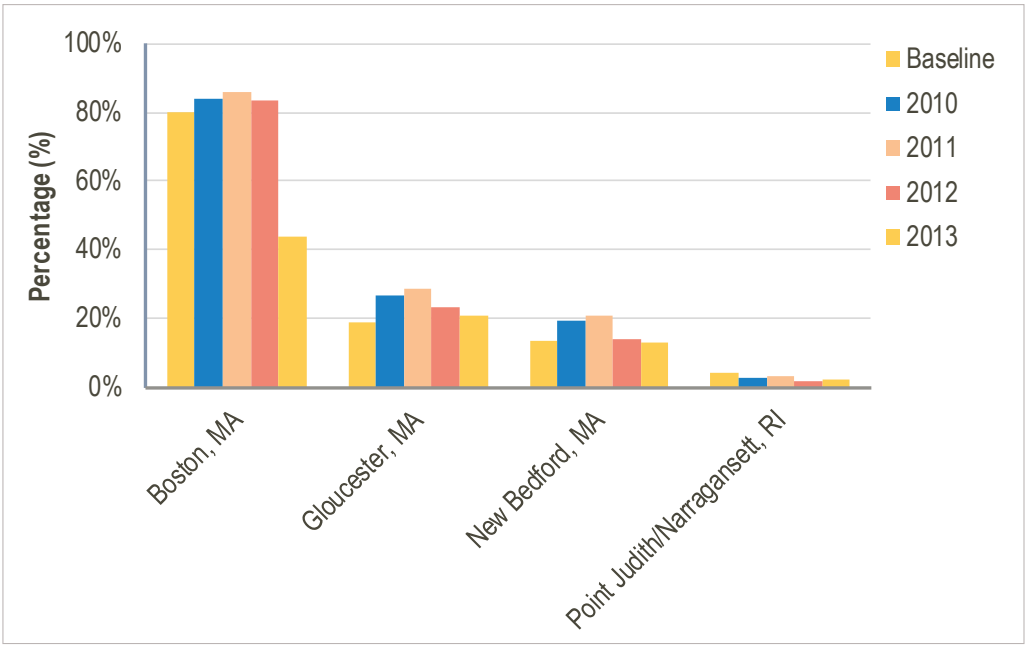


Figure 2.30. Local Quotient (POUNDS) for communities highly engaged in the Northeast Multispecies Sector Program for all years from the Baseline (2007-2009) through 2013.

Similarly to its groundfish sector pounds, the percent of groundfish sector value landed in Boston, MA was much higher than in the other communities, contributing more than 80 percent of the total value landed in the community. Although groundfish sector pounds landed contributed less than 30 percent of the total pounds landed in Gloucester, MA, the percent of groundfish sector value landed is noticeably higher, ranging from 40 percent to more than 50 percent. In contrast, percent groundfish sector value landed in New Bedford (less than 10 percent of total) is much lower than its percent pounds landed (20-30 percent).

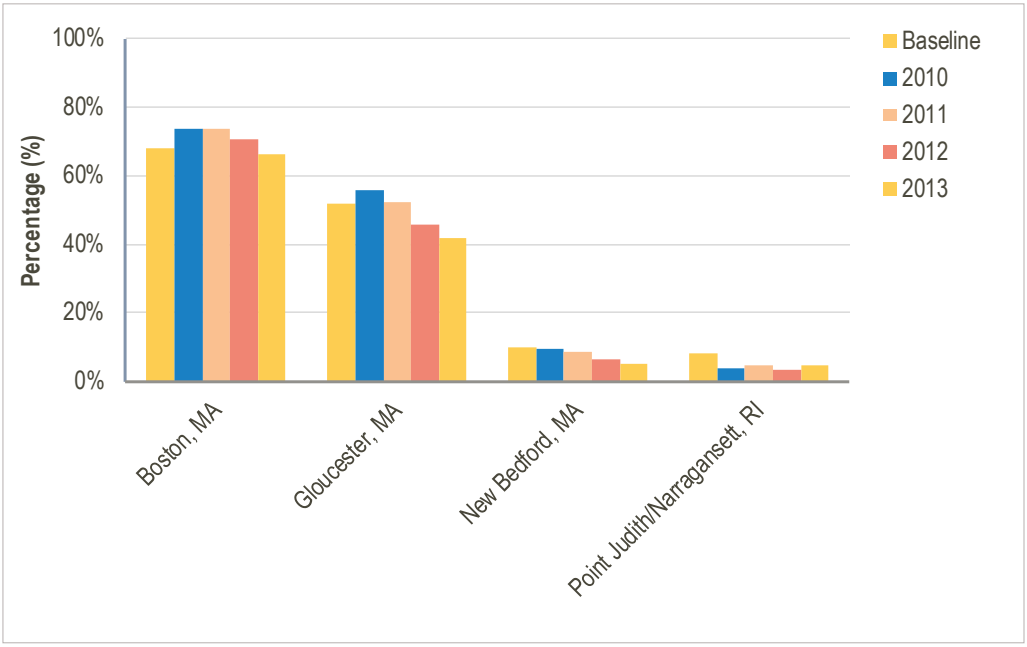


Figure 2.31. Local Quotient (VALUE) for communities highly engaged in the Northeast Multispecies Sector Program for all years from the Baseline (2007-2009) through 2013.

Community Social Vulnerability Indicators (CSVIs)

The two categories of CSVIs discussed below include social vulnerability and gentrification pressure vulnerability. The Social Vulnerability Indicators represent social factors that can shape either an individual or community's ability to adapt to change (poverty, personal disruption, labor force structure and population composition vulnerability). The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption and retiree migration).

The Social Vulnerability Indicators for communities that were **highly engaged** in the Northeast Multispecies Sector Program for at least one year from the Baseline (2007-2009) through 2013 are included in Table 2.15. Communities **highly engaged for all years** are highlighted. Of these communities, Gloucester, MA and Point Judith, RI showed low vulnerability on all of the five indices. New Bedford, MA was moderately high to highly vulnerable on four vulnerability indices, followed by Boston, MA, which ranked moderate to highly vulnerable on three vulnerability indices. It is worth noting that Labor Force Structure Index was low in all of the four most **highly engaged** communities, and Housing Characteristics Index was low in three communities and was only moderately vulnerable in New Bedford, MA.

Table 2.15. Social Vulnerability Indicators for communities highly engaged in the Northeast Multispecies Sector Program for one or more years from the Baseline (2007-2009) through 2013.

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
Boston, MA	629,182	Moderate	Med High	Med High	Low	Low
Gloucester, MA	29,043	Low	Low	Low	Low	Low
New Bedford, MA	94,927	Med High	Med High	High	Low	Moderate
Point Judith/ Narragansett, RI	15,809	Low	Low	Low	Low	Low
Chatham, MA	1,362	Low	Low	Low	High	Moderate
Montauk, NY	3,471	Low	Low	Low	Moderate	Low
Portland, ME	66,227	Moderate	Low	Med High	Low	Moderate
Scituate, MA	18,181	Low	Low	Low	Low	Low

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

Gentrification Pressure Vulnerability Indicators for communities that were **highly engaged** in the Northeast Multispecies Sector Program for at least one year from the Baseline (2007-2009) through 2013 are included in Table 2.16. Communities **highly engaged for all years** are highlighted. Of the most **highly engaged** communities, Point Judith, RI was highly vulnerable on the Housing Disruption Index while the other indices showed moderate vulnerability. In contrast, Point Judith, RI ranked moderately vulnerable on the Urban Sprawl Index while the other communities scored medium-high for the same index. All of these communities showed low vulnerability for the Retiree Migration Index.

Table 2.16. Gentrification Pressure Vulnerability Indicators for communities highly engaged in the Northeast Multispecies Sector Program for one or more years from the Baseline (2007-2009) through 2013.

Community	Housing Disruption	Retiree Migration	Urban Sprawl
Boston, MA	Moderate	Low	Med High
Gloucester, MA	Moderate	Low	Med High
New Bedford, MA	Moderate	Low	Med High
Point Judith/Narragansett, RI	High	Low	Moderate
Chatham, MA	Med High	High	Med High
Montauk, NY	High	Moderate	High
Portland, ME	Moderate	Low	Moderate
Scituate, MA	Moderate	Low	Med High

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

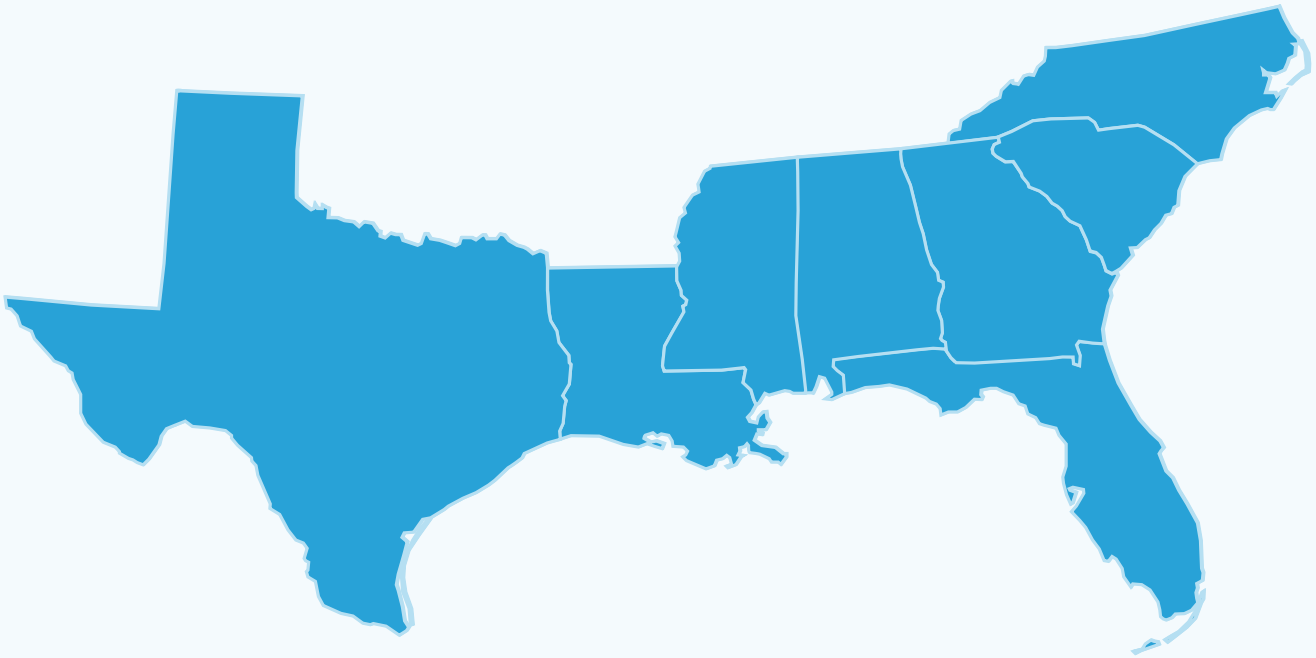
Regional Summary

Those communities that were highly engaged for at least one year in one or more catch share program or were highly engaged during the Baseline are listed in Table 2.17 along with the number of years of high engagement within each program. Overall, there were 27 communities in the Northeast Region that were highly engaged for at least one year in any program. Of those 27 communities, nine were highly engaged in two or more programs. Atlantic City, Cape May, and Point Pleasant NJ; and Ocean City, MD were highly engaged in three programs. New Bedford, MA was highly engaged in four of the five programs.

Table 2.17. Number of years Northeast Region communities were highly engaged in a catch share program from the Baseline through 2013.

Community	Mid-Atlantic Surfclam ITQ	Mid-Atlantic Ocean Quahog ITQ*	Mid Atlantic Golden Tilefish IFQ	General Category Atlantic Sea Scallop IFQ	Northeast Multispecies Sector Program
Atlantic City, NJ	10	16	-	4	-
Belford, NJ	-	3	-	-	-
Barnegat Light/Long Beach, NJ	-	-	-	All	-
Barnstable/Hyannis/Hyannisport, MA	2	-	-	-	-
Boston, MA	-	-	-	-	All
Bristol, RI	9	-	-	-	-
Cape May, NJ	13	3	-	All	-
Chatham, MA	-	-	-	All	2
Chincoteague, VA	-	-	-	1	-
District 3 Northampton/Willis Wharf, VA	3	-	-	-	-
District 4 Northampton/Oyster, VA	5	-	-	-	-
District 2 Accomack/Atlantic/ Mappsville/Sandford, VA	5	-	-	-	-
Gloucester, MA	-	-	-	-	All
Hampton Bays/Shinnecock, NY	-	1	-	3	-
Middle/Burleigh, NJ	3	-	-	-	-
Milford, DE	1	-	-	-	-
Montauk, NY	-	-	All	2	1
New Bedford, MA	16	19	-	All	All
Norfolk, VA	14	-	-	-	-
Ocean City, MD	8	2	-	2	-
Point Judith/Narragansett, RI	-	-	-	All	All
Point Lookout, NY	-	-	-	1	-
Point Pleasant, NJ	10	21	-	All	-
Portland, ME	-	-	-	-	4
Port Norris/Bivalve, NJ	6	-	-	-	-
Provincetown, MA	-	-	-	3	-
Scituate, MA	-	-	-	-	1
Warren, RI	5	-	-	-	-
Wildwood, NJ	1	-	-	-	-

Note: It was not possible to calculate the Fishing Engagement Index for the Mid-Atlantic Ocean Quahog ITQ Program for the Baseline and 1990 due to data aggregation issues at the community level for those years.



Southeast Region

Regional Overview

Three catch share programs have been implemented for fisheries in the Southeast Region. These programs govern federal fisheries for wreckfish, red snapper and some species of grouper and tilefish. The Southeast Region includes the states of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana and Texas, and the islands of Puerto Rico, St. Croix, St. Thomas and St. John's. Fisheries in the Southeast Region are governed by the South Atlantic Fishery Management Council (SAFMC), the Gulf of Mexico Fishery Management Council (GMFMC) and the Caribbean Fishery Management Council (CFMC). There are no catch share programs under the jurisdiction of the CFMC.

Regional Catch Share Programs

- Gulf of Mexico Red Snapper IFQ
- Gulf of Mexico Grouper-Tilefish IFQ
- South Atlantic Wreckfish ITQ*

*Not included in this report due to the small number of participants.

The South Atlantic Wreckfish ITQ Program is one of the oldest in the nation, having been established in 1992, but is also one of the smallest. The SAFMC modified the program in October of 2012 with Amendment 20A to the Snapper Grouper Fishery Management Plan to accommodate a revised annual catch limit and redistribute shares and allocation as a number of permits were not being utilized (SAFMC 2012). Because the program is so small, it will not be covered in this report due to confidentiality concerns. The GMFMC Red Snapper IFQ Program was implemented in 2007, followed by the Grouper-Tilefish IFQ Program implemented in 2010. Table 3.1 provides summary statistics for the two IFQ programs under the purview of the GMFMC.

Table 3.1. Summary of Southeast Region catch share programs in 2013.

	Gulf of Mexico Red Snapper IFQ	Gulf of Mexico Grouper-Tilefish IFQ
Ex-vessel revenue	$21,108,505	$25,498,408
Landings*	4,908,598	6,835,196
Number of dealers	81	96
Number of entities holding share**	399	644
Number of vessels with landings of catch share species	368	430

* Gutted weight, **Shareholder

Fishing communities in the Southeast tend to be small and located in more rural areas. Larger urban centers with substantial fishing activity are present, like Houston, TX; New Orleans, LA; and Miami, Tampa and Jacksonville, FL, but for the most part, fisheries within the Southeast are small boat fisheries and do not require a large infrastructure to operate. Commercial fishing communities often co-exist, especially in Florida, alongside a well-developed tourism industry that includes a robust recreational fishing sector. For many Southeast coastal communities, increasing development and redevelopment related to the tourism industry has raised the cost of living and fishermen find it difficult to afford to live and sometimes work near the water. Furthermore, the Southeast Region has the nation's highest potential for annual hurricanes that can disrupt commercial and recreational fishing, as well as tourism and the general livelihood of towns and cities (NMFS 2009).

Gulf of Mexico Red Snapper Individual Fishing Quota Program

Program Overview

Red snapper are found primarily on or near rocky bottom habitat such as ledges, ridges, and artificial reefs, often forming large schools. The fishery was initially established along the northeastern Gulf coast in the mid-1800s but has expanded both westward to Texas and southward along Florida's west coast. There are important commercial and recreational fisheries for red snapper, which has become an iconic fish for the U.S. Gulf of Mexico fisheries.

The Red Snapper IFQ Program was implemented in 2007 by the GMFMC and was the first catch share program implemented in the Gulf region (GMFMC 2006). The program goals were to address issues related to overcapacity, derby fishing, and safety at sea. The Gulf Council began developing an IFQ plan for the red snapper in the mid-1990s and initially approved it in 1995 through Amendment 8 to the Reef Fish Management Plan. However, when Congress imposed a moratorium on IFQ programs through the 1996 Sustainable Fisheries Act, the Council was unable to finalize the amendment. The moratorium ended in October of 2000 and the Council proceeded with the development of the IFQ program for red snapper through Amendment 26 to the Reef Fish Fishery Management Plan. The program was finally implemented in 2007. It initially allowed for the transfer of quota shares only to an individual with a valid commercial reef fish permit; however, transfer of shares to the general public was opened up after the first five years of the program. The Gulf of Mexico Red Snapper IFQ Program recently underwent a five year review, completed in 2013 (NMFS 2013).

The Gulf of Mexico Red Snapper IFQ Program five-year review report specified that the program had moderate success in reducing overcapacity, and was successful in reducing quota overages and removing derby fishing, all of which were goals of the program. Biological outcomes for the fishery were generally positive, although discard rates for the eastern Gulf continued to be high. Success of social objectives was mixed as large shareholders were generally satisfied with the program, while medium and smaller shareholders were not as satisfied. Additionally, entry into the program has become more expensive, while revenues per trip have risen. Crew sizes have become smaller, yet are more stable (NMFS 2013). The most recent annual report for the IFQ program (NMFS 2016a) noted that 2015 was the first year where shareholder numbers increased, though relative proportions of small, medium, and large shareholders remained similar to previous years.

The primary market for red snapper is regional restaurants and retail markets, although it is sold throughout the U.S. and exported. The commercial fishery is currently allotted 51 percent of the total quota amount. The bandit reel is the most common gear, followed by longlines. The recreational fishery for red snapper is currently allotted 49 percent of the quota and the most common gear is rod and reel. There is also some spear fishing for red snapper both commercially and recreationally.

Photo Credit: NOAA Fisheries/Jessica Stephens

Photo Credit: Carlton Ward Gallery/Carlton Ward, Jr.

Trends for Top Participating Communities

Commercial Engagement

The program-specific commercial Fishing Engagement index scores for the Red Snapper IFQ Program are presented in Table 3.2. The index is an indicator of the importance of IFQ red snapper fishing in a community relative to other communities. It is a measure of IFQ red snapper fishing through fishing activity including pounds and value of red snapper, number of reef fish permits, and number of reef fish dealers. There were 14 communities **highly engaged** (1.0 standard deviation or more above the mean) in the IFQ red snapper fishery for at least one year from the Baseline (2004-2006) through 2013 (Table 3.2). Half of these communities are from Florida.

Of the 14 communities found in Table 3.2, five communities were **highly engaged for all years** from the Baseline through 2013. Golden Meadow/Leeville, LA and Tarpon Springs, FL have been **highly engaged** for most of the time period with the exception of one year. The communities of Madeira Beach, FL and Pascagoula, MS have both become **highly engaged** in the latter years of the program.

Table 3.2. Fishing Engagement Index scores of communities highly engaged in the Gulf of Mexico Red Snapper IFQ Program for one or more years from the Baseline (2004-2006) through 2013.

Community	Baseline	2007	2008	2009	2010	2011	2012	2013
Panama City, FL	6.690	5.163	4.203	3.792	4.351	4.706	5.089	6.065
Galveston, TX	5.405	4.796	4.913	5.233	4.335	3.870	3.966	4.829
Destin, FL	3.087	5.768	7.067	5.955	6.048	6.565	6.602	5.832
Golden Meadow/Leeville, LA	2.428	3.092	2.443	3.692	3.573	3.357	2.567	0.176
Houston, TX	1.641	1.119	0.207	0.403	0.491	-0.050	-0.064	-0.083
Port Isabel, TX	1.627	0.677	0.645	1.207	0.633	-0.410	-0.393	-0.426
St. Petersburg, FL	1.381	1.101	1.223	2.395	1.495	1.676	1.781	1.219
Pensacola, FL	1.269	1.419	1.383	1.270	1.562	1.509	1.746	1.336
Tarpon Springs, FL	1.134	1.589	0.988	1.250	1.432	1.579	1.434	1.500
Madeira Beach, FL	1.060	0.949	0.953	0.816	1.634	1.296	1.304	1.456
Apalachicola, FL	0.908	0.856	0.760	0.957	1.719	0.992	0.981	0.827
Grand Bay, AL	0.606	1.011	0.664	0.496	-0.462	-0.459	-0.445	-0.426
Pascagoula, MS	0.131	0.501	0.474	0.476	1.544	1.292	1.243	1.174
Houma, LA	-0.295	-0.113	0.229	0.254	0.164	0.149	0.377	1.186

Note: Highlighted cells indicate high engagement.

Of the 14 communities found in Table 3.2, the five communities **highly engaged for all years** from the Baseline through 2013 are included in Figure 3.1. The engagement scores for these **highly engaged** communities demonstrate some fluctuation, but tend to be fairly stable despite both upward and downward movement in engagement scores. Most of these communities are from Florida (see Figure 3.1), with the exception being Galveston, TX. The communities of Panama City, FL; Galveston, TX; and Destin, FL have all remained as top communities although their relative rankings have shifted over time.

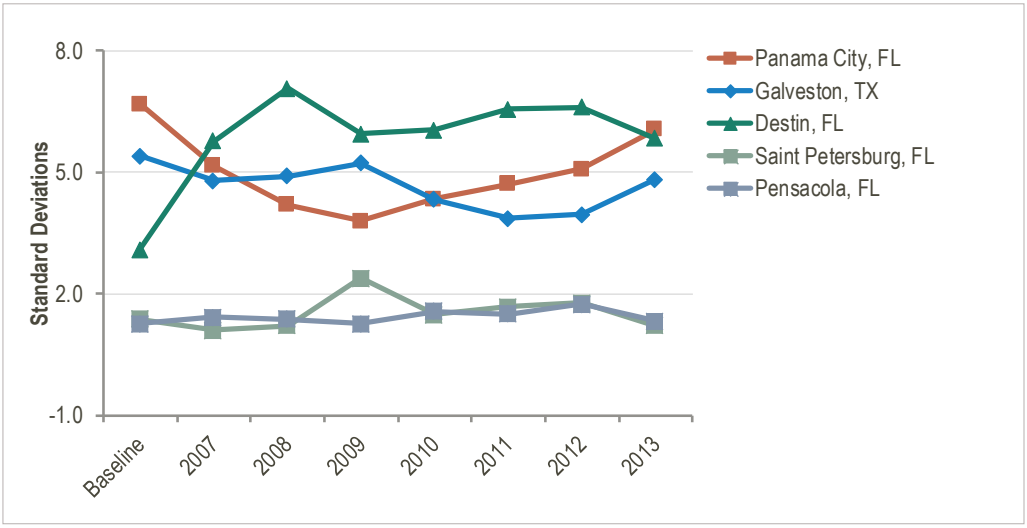


Figure 3.1. Fishing Engagement Index scores of communities highly engaged in the Gulf of Mexico Red Snapper IFQ Program for all years from the Baseline (2004-2006) through 2013.

Communities that demonstrated an increase in the red snapper IFQ Fishing Engagement Index score from the Baseline period through 2013 are depicted in Figure 3.2. As mentioned above, despite recently leveling off, Destin, FL has seen the greatest increase in levels of red snapper engagement over time. The other community with increasing engagement was Pensacola, FL, which seemed to remain fairly stable in engagement scores from the Baseline period through implementation to 2013.

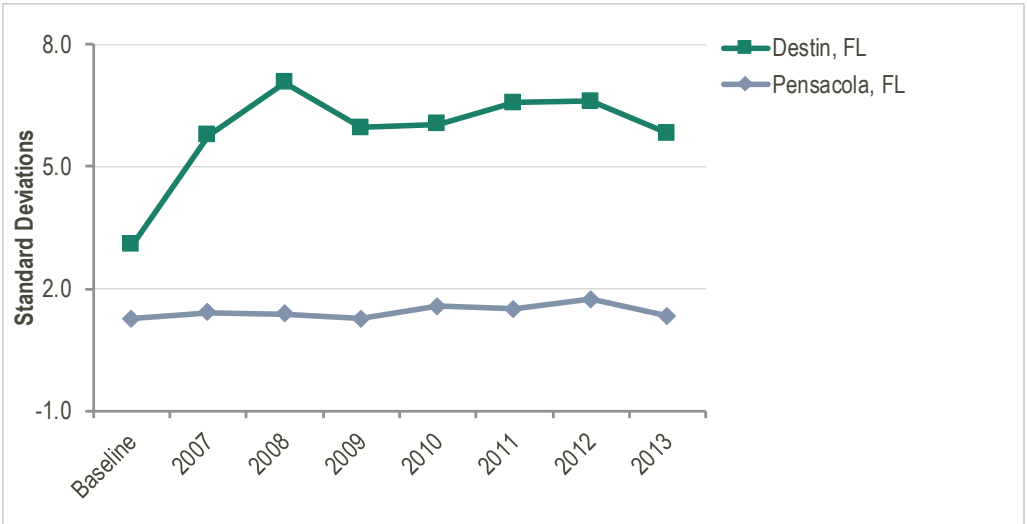


Figure 3.2. Fishing Engagement Scores for communities highly engaged in the Gulf of Mexico Red Snapper IFQ Program for all years with increasing engagement from the Baseline (2004-2006) through 2013.

Communities that demonstrated a decreasing red snapper Fishing Engagement Index score from the Baseline through 2013 are depicted in Figure 3.3. The decreasing engagement scores do not seem to indicate a significant decline in involvement for any community. The communities of Panama City, FL and Galveston, TX, while exhibiting some fluctuation over time, seem to have regained any loss in engagement over the time period, with only slightly less engagement at the end of the period than they showed during the Baseline. St. Petersburg, FL did see a rise in 2009, but has recently seen a slight decline, falling close to its engagement score during the Baseline period.

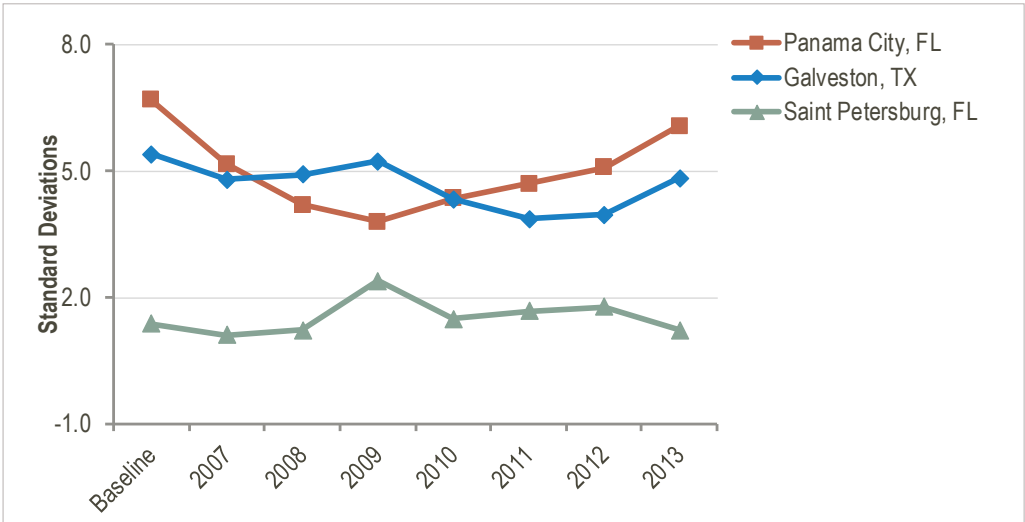


Figure 3.3. Fishing Engagement Scores for communities highly engaged in the Gulf of Mexico Red Snapper IFQ Program for all years with decreasing engagement from the Baseline (2004-2006) through 2013.

Communities that were **highly engaged** for fewer than all years within the red snapper fishery are depicted in Figure 3.4. Although the crowded group of communities toward the bottom make it difficult to follow any particular trend, for many it demonstrates decreasing engagement. However, the communities of Pascagoula, MS and Houma, LA have seen a substantial increase in their engagement and seem to stand out in later years. Golden Meadow/Leeville, LA saw a significant decline in its engagement and seems to be only tangentially involved in the most recent year. Grand Bay, AL and Port Isabel, TX also saw significant declines from 2009 to 2010 from which neither has recovered. Houston, TX has seen a steady decline in engagement since implementation.

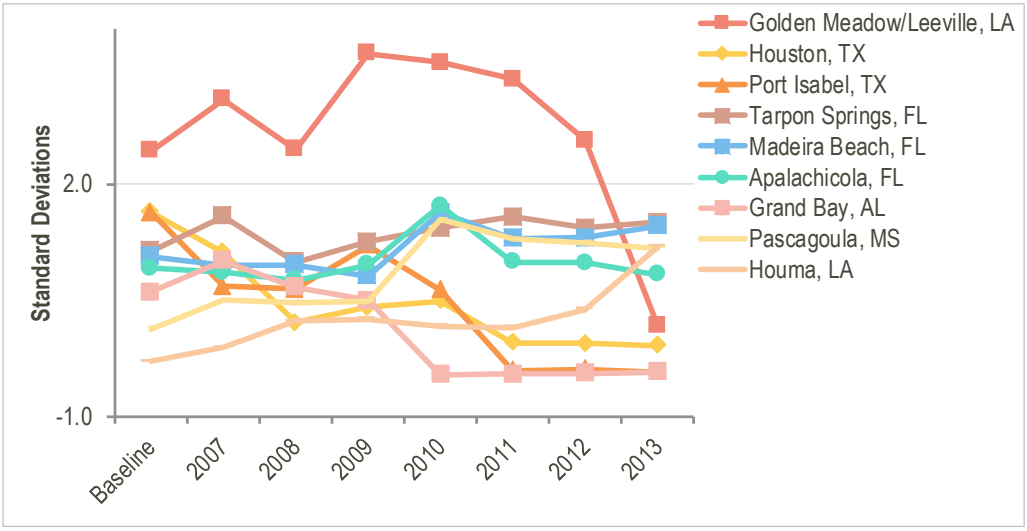


Figure 3.4. Fishing Engagement Index scores of communities highly engaged in the Gulf of Mexico Red Snapper IFQ Program for fewer than all years from the Baseline (2004-2006) through 2013.

Regional Quotient

Another measure of a community's involvement in the IFQ red snapper fishery is its Regional Quotient. Regional Quotient is the proportion of IFQ red snapper landed within a community out of the total amount of red snapper landed within the Southeast region. It is an indicator of the percent contribution in pounds or value of IFQ red snapper landed within that community relative to the regional fishery. The Regional Quotient is reported individually only for those communities that were **highly engaged for all years** from the Baseline through 2013. All other communities that landed IFQ red snapper are grouped as "Other Communities." Figure 3.5 and Figure 3.6 show the Regional Quotient both in pounds and value, respectively, from the Baseline to 2013.

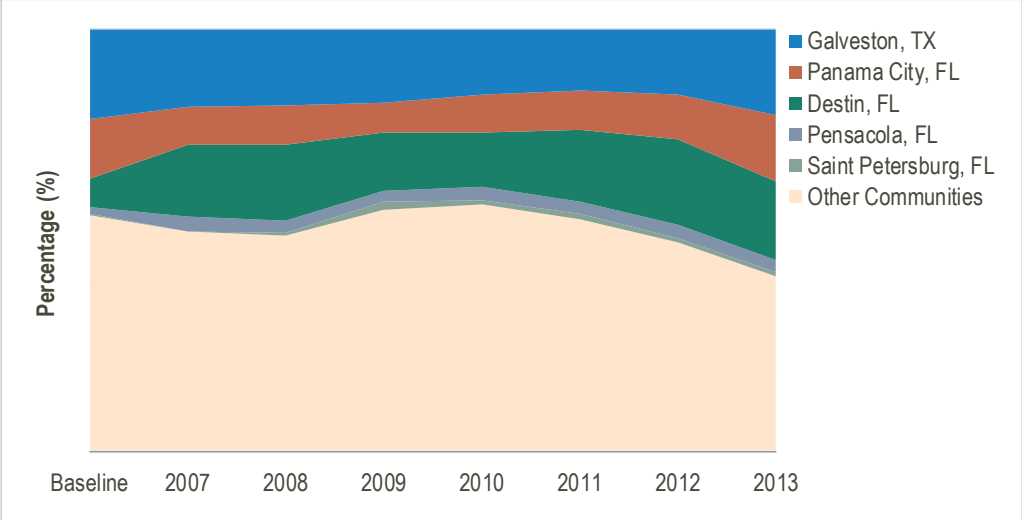


Figure 3.5. Regional Quotient (POUNDS) for communities highly engaged in the Gulf of Mexico Red Snapper IFQ Program for all years from the Baseline (2004-2006) through 2013.

The dominant IFQ red snapper communities in terms of Regional Quotient for pounds landed during the Baseline period include Galveston, TX; and Panama City and Destin, FL (Figure 3.5). Of the three leading communities, Destin, FL has seen the largest increase in Regional Quotient since implementation. The other two dominant communities saw some retraction in their Regional Quotient for pounds in the intermediate years, but more recently their Regional Quotient has risen to near their Baseline status.

The Regional Quotient trend for IFQ red snapper value landed is similar to that for pounds landed (Figure 3.6). The dominant communities for Regional Quotient value landed are Galveston, TX; and Panama City and Destin, FL. About half of the regional pounds landed and value landed are grouped as "Other Communities" that were not **highly engaged** for all years. This suggests a large proportion of IFQ red snapper is landed outside of those dominant communities, which may in turn suggest that landings of IFQ red snapper are spread out among many other vessels that are most likely participating in the Gulf of Mexico Grouper-Tilefish IFQ Program. This is particularly true for vessels off Florida's west coast that now encounter red snapper more frequently as the population has expanded. However, these communities have fewer shares of red snapper and are therefore not **highly engaged**.

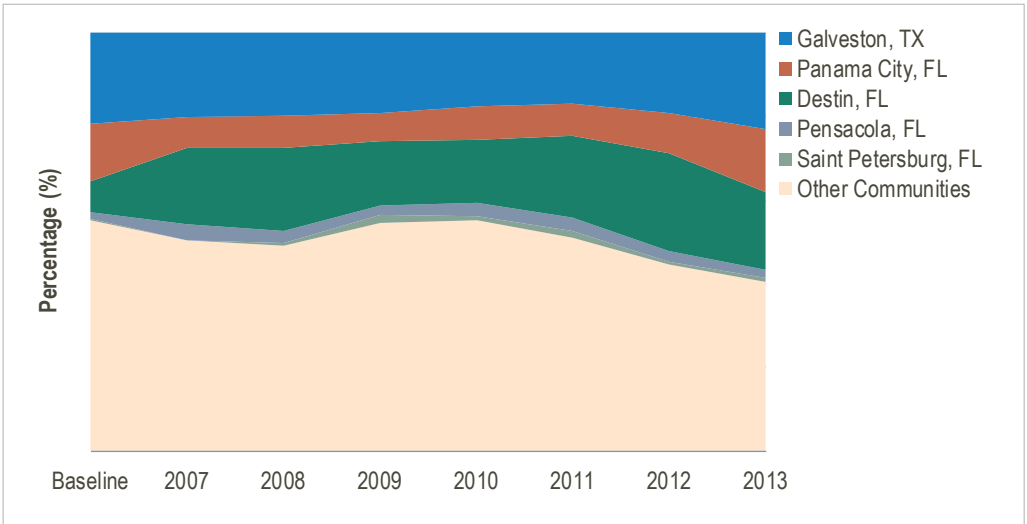


Figure 3.6. Regional Quotient (VALUE) for communities highly engaged in the Gulf of Mexico Red Snapper IFQ Program for all years from the Baseline (2004-2006) through 2013.

Local Quotient

The community Local Quotient is the percentage of IFQ red snapper landed within a community out of the total of all species landed within that community. It is an indicator of the contribution in pounds or value of IFQ red snapper to the overall landings in a community. Figure 3.7 and Figure 3.8 show the Local Quotient both in pounds and value from the Baseline (2004-2006) to 2013. The Local Quotient for pounds landed for the top four communities fluctuated from the Baseline through 2013 (Fig. 3.7). Galveston, TX and Panama City, FL saw declines in their IFQ red snapper Local Quotient for the first three years after implementation, followed by a steady increase. The Local Quotient for Destin and Pensacola, FL increased the first year after implementation and then declined until 2009, after which it steadily increased. Of the five communities that were **highly engaged for all years**, four communities surpassed the Baseline in 2013. St. Petersburg, FL has seen an increase in IFQ red snapper Local Quotient since the implementation of the program, albeit one that is much smaller than the top communities. Red snapper seems to play a smaller role in overall landings for St. Petersburg than it does in the other **highly engaged** communities.

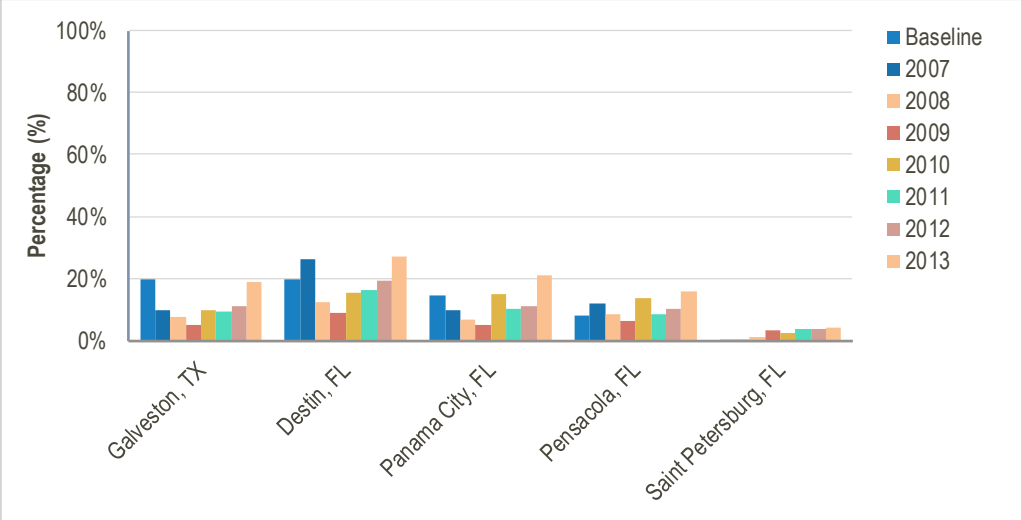


Figure 3.7. Local Quotient (POUNDS) for communities highly engaged in the Gulf of Mexico Red Snapper IFQ Program for all years from the Baseline (2004-2006) through 2013.

Although the percentage of value landed for IFQ red snapper is higher than for pounds landed for most communities, the trend for IFQ red snapper Local Quotient for value landed is almost a mirror image of the Local Quotient for pounds landed (Fig. 3.7). Destin, FL shows the largest difference in the IFQ red snapper Local Quotient value landed, reaching close to 40 percent in 2013. St. Petersburg and Pensacola, FL both have seen increases in their IFQ red snapper Local Quotient value over the years, with Pensacola experiencing substantial spikes in some years. Of the five communities in Figure 3.6 and 3.7, 2009 was the low for four after which all four increased steadily through 2013 with three communities exceeding the Baseline.

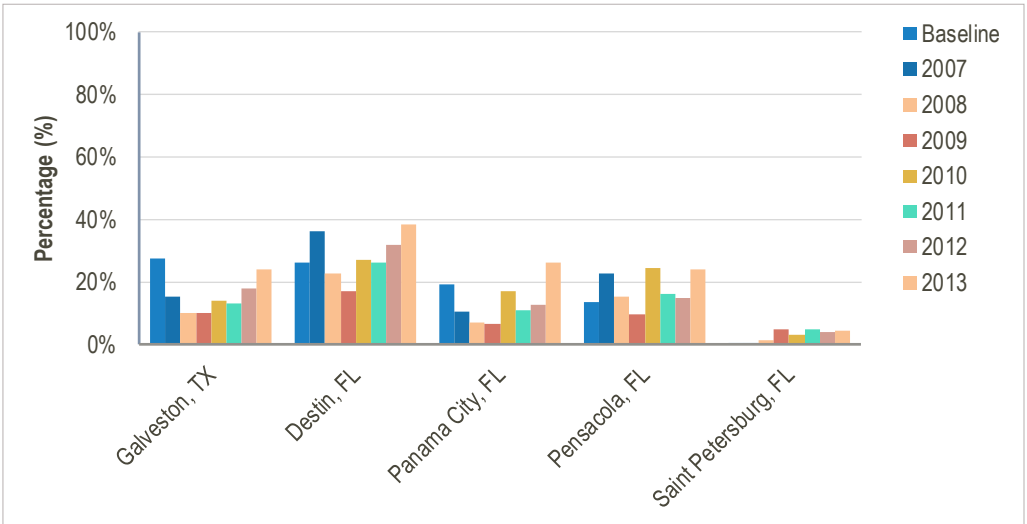


Figure 3.8. Local Quotient (VALUE) for communities highly engaged in the Gulf of Mexico Red Snapper IFQ Program for all years from the Baseline (2004-2006) through 2013.

Community Social Vulnerability Indicators (CSVIs)

The two categories of CSVIs discussed below include social vulnerability and gentrification pressure vulnerability. The Social Vulnerability Indicators represent social factors that can shape either an individual's or community's ability to adapt to change (poverty, personal disruption, labor force structure, and population composition vulnerability). The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption and retiree migration).

The Social Vulnerability Indicators for communities that were **highly engaged** in the Gulf of Mexico Red Snapper IFQ Program for at least one year from the Baseline to 2013 are included in Table 3.3. Communities **highly engaged for all years** are highlighted. These communities tend to have larger than average populations compared to others participating in this fishery. The communities in Mississippi and Texas seem to have slightly higher vulnerabilities among the indices than the communities in other states. Apalachicola and Panama City, FL have high vulnerabilities in comparison to other Florida communities. All communities seem to have high vulnerabilities related to housing. At least half of the communities have either high or medium-high values for the personal disruption and poverty indices.

Table 3.3. Social Vulnerability Indicators for communities highly engaged in the Gulf of Mexico Red Snapper IFQ Program for one or more years from the Baseline (2004-2006) through 2013.

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
Destin, FL	12,623	Low	Low	Low	Low	Moderate
Galveston, TX	48,178	Med High	Moderate	Med High	Low	Med High
Panama City, FL	36,205	Med High	Moderate	Med High	Moderate	Med High
Pensacola, FL	52,268	Moderate	Low	Moderate	Low	Med High
St. Petersburg, FL	246,642	Low	Low	Low	High	High
Apalachicola, FL	1,916	Med High	Moderate	High	Moderate	High
Golden Meadow/Leeville, LA	1,790	Med High	Low	Moderate	Med High	High
Grand Bay, AL	3,637	Low	Low	Low	Moderate	Med High
Houma, LA	33,788	Moderate	Moderate	Moderate	Moderate	Med High
Houston, TX	2,134,707	Med High	High	Med High	Low	Med High
Madeira Beach, FL	4,283	Low	Low	Low	Moderate	Moderate
Pascagoula, MS	22,372	Med High	Moderate	Med High	Moderate	Med High
Port Isabel, TX	5,019	High	High	High	Med High	High
Tarpon Springs, FL	23,564	Moderate	Low	Moderate	Med High	Med High

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

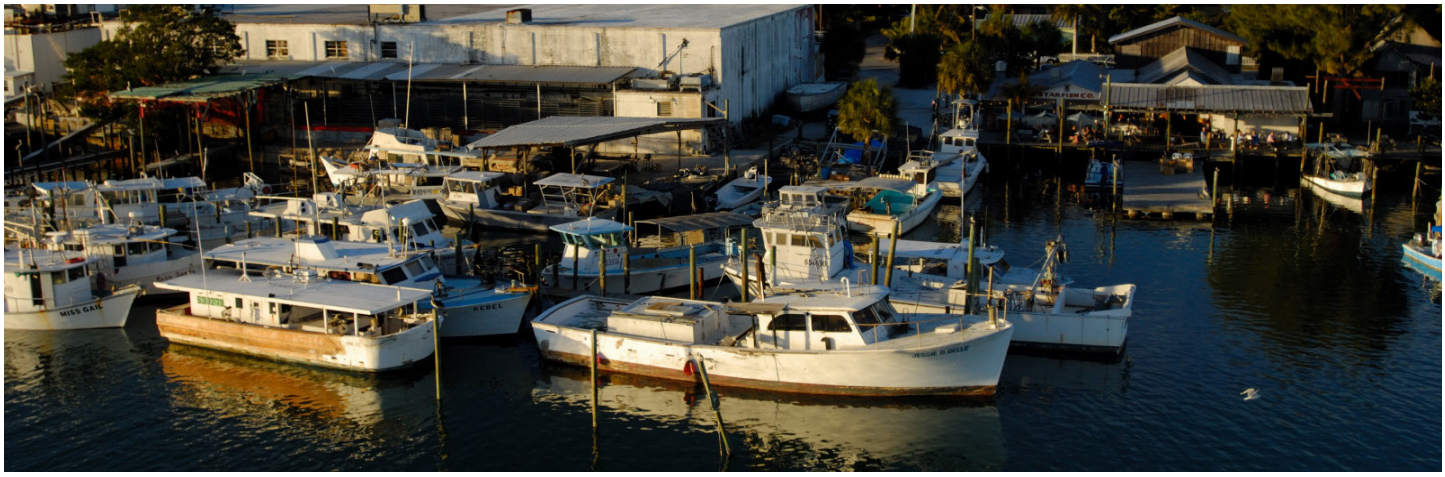


Photo Credit: Carlton Ward Gallery/Carlton Ward, Jr.

The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront (urban sprawl, housing disruption and retiree migration). Gentrification Pressure Vulnerability Indicators for communities that were **highly engaged** in the Gulf of Mexico Red Snapper IFQ Program for at least one year from the Baseline to 2013 are included in Table 3.4. The most **highly engaged** communities scored moderately vulnerable or low for most indices. This is in contrast to Madeira Beach, FL, which showed moderate to high vulnerability for all three indices. Madeira Beach is in Pinellas County, which is the most densely populated county in Florida, as is Tarpon Springs, FL, which is slightly higher than most communities regarding gentrification scores. The Urban Sprawl Index shows that most communities experience low vulnerabilities and none above moderate.

Table 3.4. Gentrification Pressure Vulnerability Indicators for communities highly engaged in the Gulf of Mexico Red Snapper IFQ Program for one or more years from the Baseline (2004-2006) through 2013.

Community	Housing Disruption	Retiree Migration	Urban Sprawl
Destin, FL	Moderate	Low	Low
Galveston, TX	Moderate	Low	Low
Panama City, FL	Moderate	Low	Low
Pensacola, FL	Low	Moderate	Low
St. Petersburg, FL	Med High	High	Low
Apalachicola, FL	Low	Moderate	Low
Golden Meadow/Leeville, LA	Low	Low	Low
Grand Bay, AL	Low	Low	Low
Houma, LA	Low	Low	Low
Houston, TX	Low	Low	Low
Madeira Beach, FL	High	Moderate	Moderate
Pascagoula, MS	Low	Low	Low
Port Isabel, TX	Moderate	Moderate	Low
Tarpon Springs, FL	Moderate	Med High	Low

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

Gulf of Mexico Grouper-Tilefish Individual Fishing Quota Program

Program Overview

The Gulf of Mexico Grouper-Tilefish IFQ Program includes 13 species that are primarily found on or near bottom habitat. The fishery runs from Florida's southwest coast (including the Keys) to Texas, with commercial landings concentrated in the eastern Gulf of Mexico along Florida's central west coast (GMFMC 2009).

The Gulf of Mexico Grouper-Tilefish IFQ Program became effective January 1, 2010. The purpose of the amendment was to improve economic efficiency and reduce overcapacity in the commercial grouper and tilefish fisheries to achieve optimum yield (GMFMC 2009). The program established red grouper, gag, other shallow water grouper, deep water grouper, and tilefish share categories, with shares based upon species-specific landings. Shares and allocation are transferable and shareholders do not need a commercial fishing permit to buy and trade shares or allocation.

The Gulf of Mexico Grouper-Tilefish IFQ Program is currently undergoing a five-year review and results are pending. However, an initial survey of fishermen, dealers, fisheries managers, and academics conducted prior to implementation found that fishermen and dealers were skeptical of the benefits of the proposed IFQ program. Larger commercial operators were more likely to agree with academics and managers that the IFQ program would provide benefits, while smaller operators were concerned that the program might force them out of business (Tokotch et al. 2012). The five year review will be completed over the next calendar year (2017) and some results may be compared to Tokotch et al. (2012). In addition, the most recent annual review for this fishery (NMFS 2016b) shows an approximate doubling in the number of shareholders for any previous year, likely because 2015 was the first year in which those not already holding a Gulf of Mexico commercial reef fish permit were allowed to apply. However, these new permits are not allowed to harvest grouper-tilefish species, only to hold and transfer shares and allocation.

The primary market for grouper-tilefish is commercial seafood sales, regional restaurant sales and individual sales in retail markets, although some is marketed nationally or exported (to Canada among others). The longline and bandit reel are the most common gears used within the commercial fishery. There is also a recreational fishery for grouper-tilefish managed by four Gulf States in coordination with the GMFMC. Allocations between the commercial and recreational sectors are species-specific.

Trends for Top Participating Communities

Commercial Engagement

The program-specific commercial Fishing Engagement Index scores for the Gulf of Mexico Grouper-Tilefish IFQ Program are presented in Table 3.5. The index is an indicator of the importance of IFQ grouper-tilefish fishing in a community relative to other communities. It is a measure of the presence of IFQ grouper-tilefish fishing activity including pounds and value of grouper-tilefish, number of reef fish permits and number of reef fish dealers within the community. There were 54 communities in Table 3.5 that were **highly engaged** (1.0 standard deviation or more above the mean) in the IFQ grouper-tilefish fishery for at least one year from the Baseline through 2013.

Table 3.5. Fishing Engagement Index scores of communities highly engaged in the Gulf of Mexico Grouper-Tilefish IFQ Program for one or more years from the Baseline (2007-2009) through 2013.

Community	Baseline	2010	2011	2012	2013
Madeira Beach, FL	17.038	20.328	19.511	18.171	18.958
Panama City, FL	11.105	6.677	8.029	8.966	9.444
St. Petersburg, FL	9.937	8.373	8.258	8.518	9.179
Key West, FL	9.049	7.950	8.405	10.327	10.272
Apalachicola, FL	7.664	4.809	5.442	5.645	4.107
Destin, FL	6.308	6.966	6.992	5.740	5.288
Tarpon Springs, FL	6.110	6.656	6.250	7.916	7.811
Cortez, FL	4.967	6.200	7.214	6.710	4.337
Tampa, FL	3.486	1.345	2.296	0.619	0.295
Islamorada, FL	2.930	2.234	1.851	1.734	1.465

Note: Highlighted cells indicate high engagement. Table continues on the next page.

Table 3.5. *(continued)*

Community	Baseline	2010	2011	2012	2013
Panacea, FL	2.922	2.452	1.860	1.139	1.418
Naples, FL	2.836	1.953	1.689	1.900	1.184
Fort Myers, FL	2.682	2.384	2.631	2.516	2.889
Spring Hill, FL	2.418	0.419	-0.164	-0.161	-0.157
Pensacola, FL	2.409	3.176	2.725	3.244	2.433
Redington Shores, FL	2.310	3.440	4.476	5.593	6.248
Marathon, FL	2.272	3.862	4.186	3.166	4.228
Golden Meadow/Leeville, LA	2.248	2.376	3.017	1.926	1.485
Ruskin, FL	2.159	2.403	2.879	2.285	2.193
Clearwater, FL	2.018	2.629	2.118	3.192	2.781
Crystal River, FL	1.991	2.362	2.302	2.208	1.878
Key Largo, FL	1.901	4.843	2.288	2.282	1.586
Galveston, TX	1.849	1.633	2.308	1.637	3.106
Tallahassee, FL	1.844	1.326	1.140	0.911	0.609
Summerland Key, FL	1.832	2.006	3.314	1.766	1.982
Bon Secour, AL	1.779	1.394	0.907	1.152	-0.157
Largo, FL	1.712	-0.167	-0.164	-0.161	0.267
Steinhatchee, FL	1.566	2.200	1.262	2.136	1.188
St. Marks, FL	1.369	0.454	1.015	0.498	0.408
Fort Walton Beach, FL	1.360	1.419	1.380	0.392	0.825
Port Isabel, TX	1.358	1.229	-0.164	-0.161	-0.157
Hudson, FL	1.358	1.182	0.633	1.121	0.844
Sarasota, FL	1.347	0.415	0.296	-0.161	-0.157
St. James City, FL	1.269	0.930	0.946	1.110	0.808
Grand Bay, AL	1.225	-0.167	-0.164	-0.161	-0.157
Indian Shores, FL	1.224	-0.167	-0.164	-0.161	-0.157
Bayou La Batre, AL	1.122	1.176	1.262	1.028	0.915
Eastpoint, FL	1.118	0.626	0.640	0.624	0.513
Hernando Beach, FL	1.046	-0.167	0.297	0.252	0.265
Theodore, AL	1.006	0.578	0.598	0.373	1.205
Grand Isle, LA	0.869	1.147	0.375	-0.161	0.467
Houston, TX	0.864	0.684	1.043	0.837	0.703
Freeport, TX	0.758	0.866	0.929	1.040	0.777
Port Bolivar, TX	0.602	1.057	0.928	0.938	0.732
Fort Myers Beach, FL	0.600	0.651	1.107	1.617	0.796
Dunedin, FL	0.591	0.588	1.304	1.135	1.395
Homosassa, FL	0.585	0.998	1.058	0.850	0.795
Anna Maria, FL	0.449	-0.167	0.298	1.059	0.849
Pascagoula, MS	0.353	1.477	0.910	0.911	0.876
Land O Lakes, FL	0.334	1.598	1.175	0.752	0.231
Tavernier, FL	0.310	1.381	0.449	1.737	1.582
Matlacha, FL	0.029	0.562	0.797	1.309	0.523
Big Pine Key, FL	-0.035	-0.167	0.296	-0.161	1.408
Slidell, LA	-0.182	-0.167	-0.164	1.382	0.393

Note: Highlighted cells indicate high engagement. Table begins on the previous page.

Most **highly engaged** communities are in Florida, with Galveston, TX and Golden Meadow/Leeville, LA the only communities outside the state that were **highly engaged** throughout the time series. Other communities, like Bayou La Batre, AL, have been **highly engaged** four out of the five time periods. The communities of Dunedin, Tavernier, Tallahassee, Hudson, and Fort Walton Beach, FL and Bon Secour, AL have been **highly engaged** either early on or in the latter years of the program for at least three out of the five time periods.

Of the 54 communities found in Table 3.5, the 23 communities that were **highly engaged for all years** from the Baseline through 2013 (Figure 3.9) will be discussed in the following description. The engagement scores for those **highly engaged** communities display some fluctuation, but tend to be fairly stable for most communities. The community of Madeira Beach, FL has remained at the top throughout the time series presented in Figure 3.9 with an upward spike in 2010 that may be related to the fishery closures as a result of the Deepwater Horizon MC252 oil spill. Because the closures were primarily to the northwest of Madeira Beach, fishermen homeported there may not have been affected as much by the closures (as depicted by engagement scores in Figure 3.9), whereas many communities in Florida's Panhandle experienced a downward spike in 2010.

For those communities midway between the upper community and those at the bottom, engagement has fluctuated. Those at the bottom of the scale have fairly stable engagement scores over time.

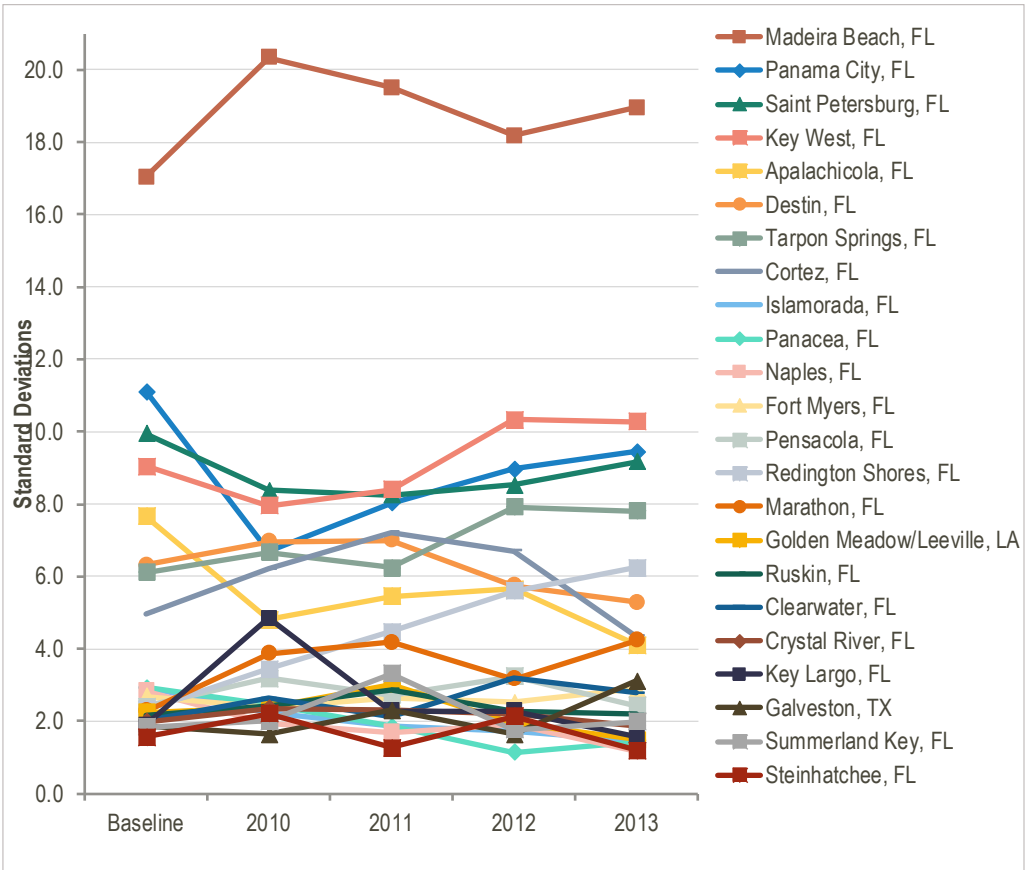


Figure 3.9. Fishing Engagement Index scores of communities highly engaged in the Gulf of Mexico Grouper-Tilefish IFQ Program for all years from the Baseline (2007-2009) through 2013.

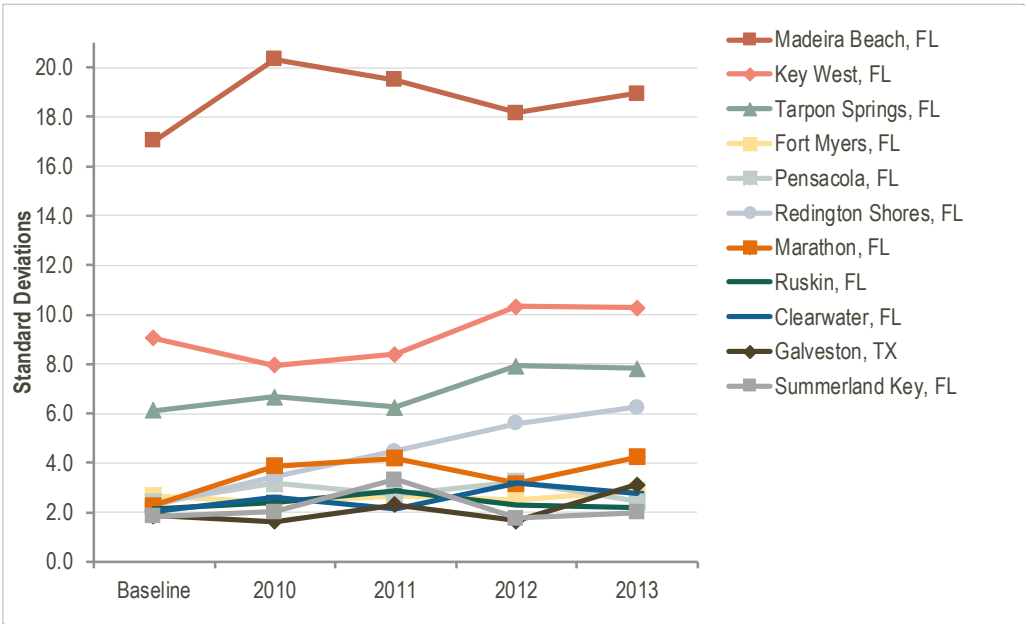


Figure 3.10. Fishing Engagement Index scores of communities highly engaged in the Gulf of Mexico Grouper-Tilefish IFQ Program for all years with increasing engagement from the Baseline (2007-2009) through 2013.

Communities that demonstrated a stable or increase in the IFQ grouper-tilefish Fishing Engagement Index score from the Baseline period through 2013 are depicted in Figure 3.10. Redington Shores, FL has seen the greatest increase in

levels of IFQ grouper-tilefish engagement over time, with a rise of several standard deviations. Most communities with increasing engagement seemed to remain fairly stable in their engagement scores, with the top community of Madeira Beach, FL showing just a slight decrease after the upward spike in 2010 and subsequent decline in engagement.

Communities that demonstrated a decreasing IFQ grouper-tilefish Fishing Engagement Index score from the Baseline through 2013 are depicted in Figure 3.11. The decreasing engagement scores do not indicate a significant decline in involvement, but do demonstrate considerable fluctuation from the Baseline through implementation to the most recent years. The communities of Panama City and Apalachicola, FL both saw a significant drop in 2010 that is likely related to the fishing closures due to the Deepwater Horizon MC252 oil spill. Other fluctuations depicted are difficult to explain as they may have occurred for numerous reasons, e.g., vessel migration, weather, and other closures.

Communities that were **highly engaged** for fewer than all years within the Gulf of Mexico Grouper-Tilefish IFQ Program are depicted in Figure 3.12. Although a crowded group of communities make it difficult to follow any particular trend, for many it demonstrates decreasing engagement. However, the communities of Tavernier, Dunedin, and Big Pine Key, FL and Theodore, AL have seen an increase in their engagement and seem to stand out in later years. Tampa, Spring Hill, Largo, and Tallahassee, FL and Bon Secour, AL have all seen significant declines in engagement since implementation of the program.

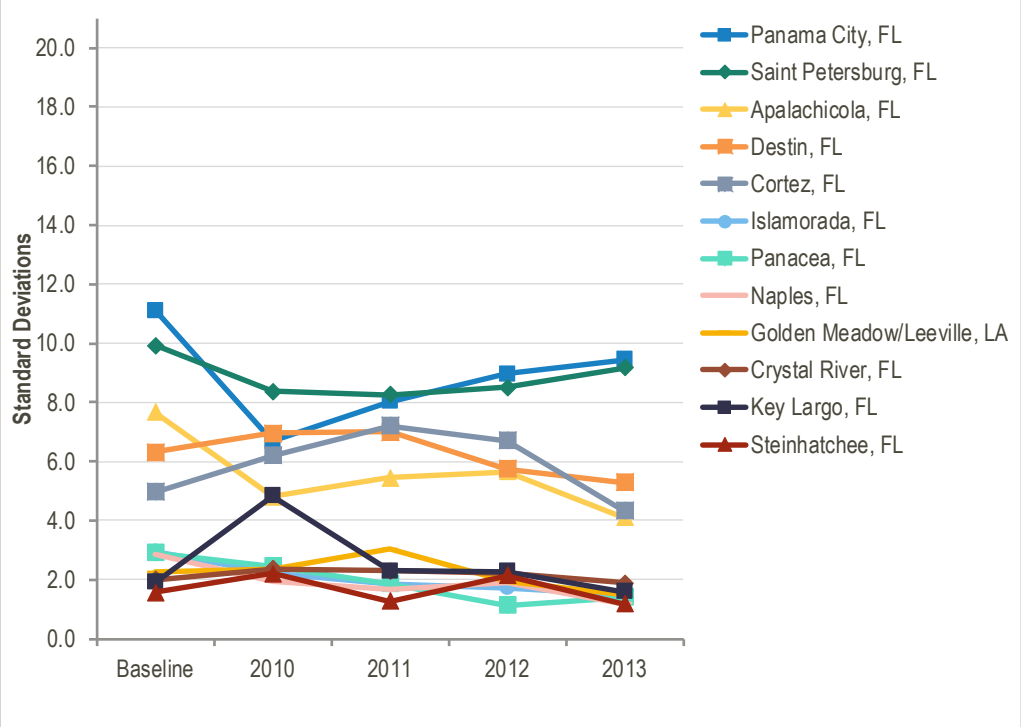


Figure 3.11. Fishing Engagement Index scores of communities highly engaged in the Gulf of Mexico Grouper-Tilefish IFQ Program for all years with decreasing engagement from the Baseline (2007-2009) through 2013.

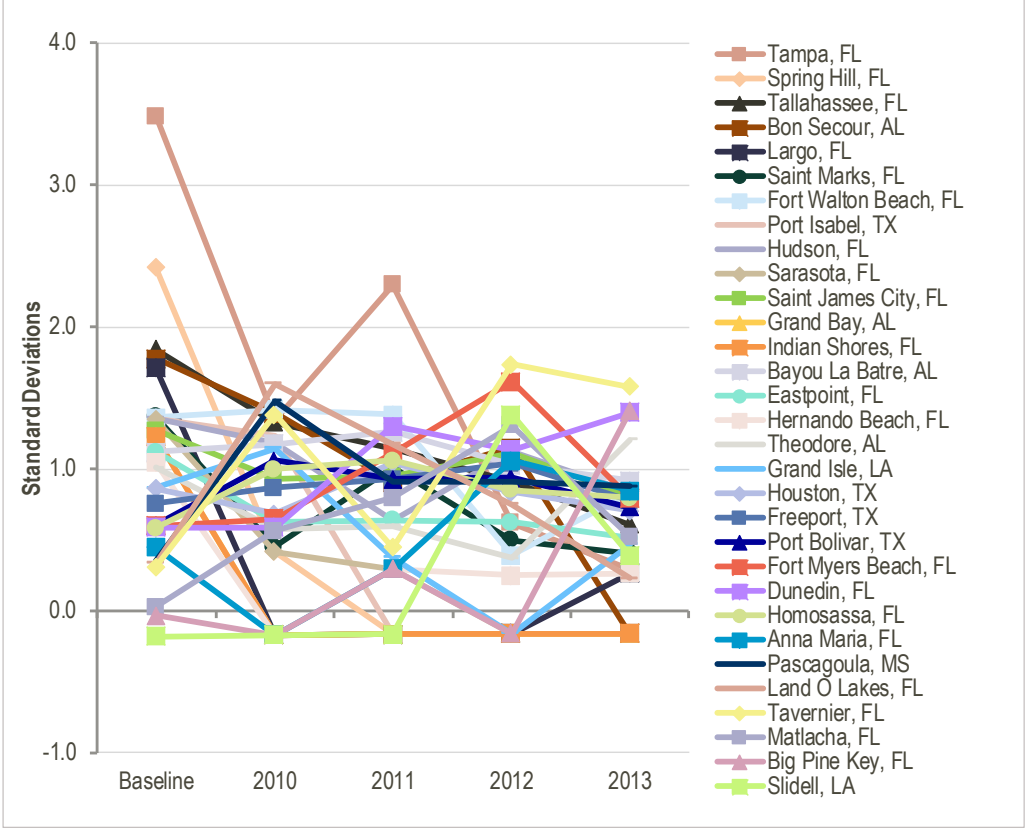


Figure 3.12. Fishing Engagement Index scores of communities highly engaged in the Gulf of Mexico Grouper-Tilefish IFQ Program for fewer than all years from the Baseline (2007-2009) through 2013.

Regional Quotient

Another measure of a community's involvement in the IFQ grouper-tilefish fishery is its Regional Quotient. Regional Quotient is the proportion of IFQ grouper-tilefish landed within a community out of the total amount of IFQ grouper-tilefish landed within the Southeast region. It is an indicator of the percent contribution in pounds or value of IFQ grouper-tilefish landed within that community relative to the regional fishery. The Regional Quotient is calculated as a species group that comprises all grouper and tilefish species included in the IFQ program, excluding all other grouper and tilefish species in the reef fish fishery. The Regional Quotient is reported individually only for those communities that were **highly engaged for all years** from the Baseline through 2013. All other communities that landed IFQ grouper-tilefish are grouped as "Other Communities." Figure 3.13 and Figure 3.14 show the Regional Quotient both in pounds and value, respectively from the Baseline to 2013.

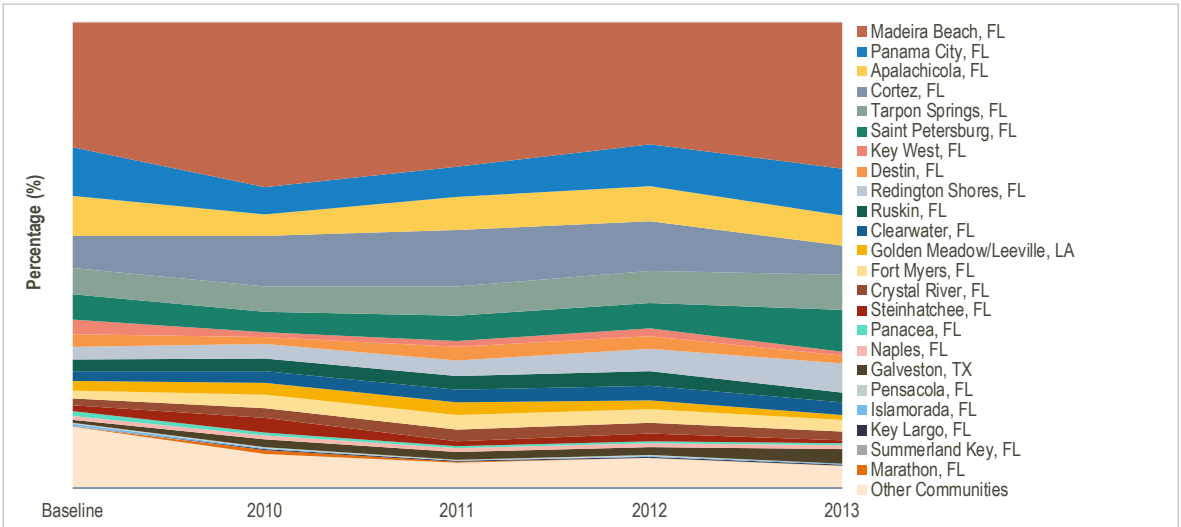


Figure 3.13. Regional Quotient (POUNDS) for communities highly engaged in the Gulf of Mexico Grouper-Tilefish IFQ Program for all years from the Baseline (2007-2009) through 2013.

The dominant IFQ grouper-tilefish communities for pounds landed included the Florida communities of Madeira Beach, Panama City, Apalachicola, Cortez, St. Petersburg, and Tarpon Springs (Fig. 3.13). Most communities saw some fluctuation in their Regional Quotient with several seeing a decrease in 2010, likely related to the fishery closures as a result of the Deepwater Horizon MC252 oil spill. Other communities, like Madeira Beach and Cortez, saw slight increases in their Regional Quotient during that time period with decreases following. Overall trends in Regional Quotient for pounds seem to be fairly stable for most communities.

The dominant IFQ grouper-tilefish communities for value landed are roughly the same as for pounds landed (Fig. 3.14). Most communities saw similar fluctuation in their Regional Quotient for value to that for pounds. One change was that the communities of St. Petersburg and Tarpon Springs, FL switched rankings in terms of value when compared to pounds in the Regional Quotient. However, they are very close on both measures. Again, the overall trend in Regional Quotient value seems to be fairly stable for most communities, although the category of "Other Communities" does show a decline in Regional Quotient over time.

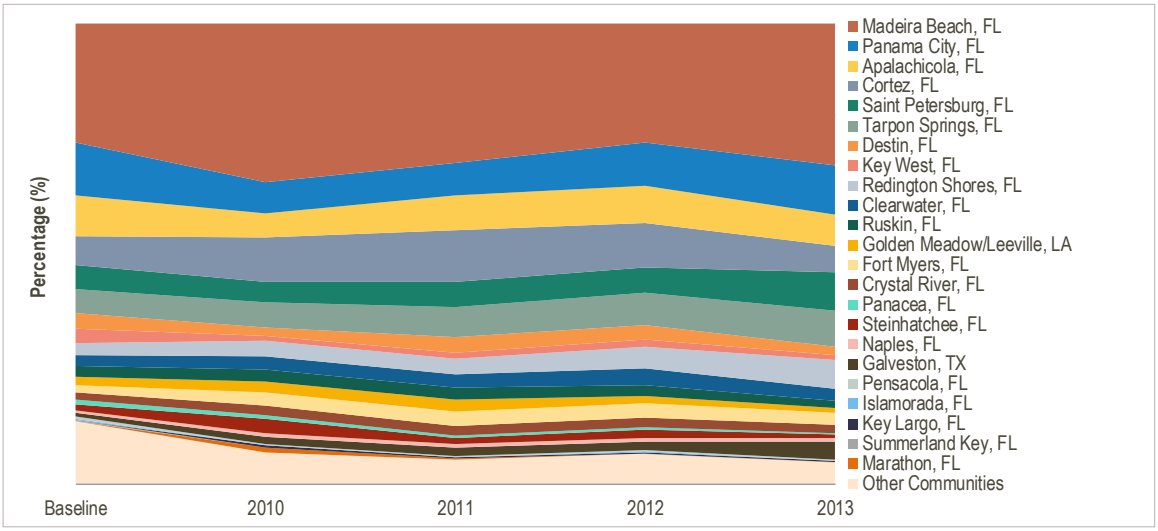


Figure 3.14. Regional Quotient (VALUE) for communities highly engaged in the Gulf of Mexico Grouper-Tilefish IFQ Program for all years from the Baseline (2007-2009) through 2013.

Local Quotient

The community Local Quotient is the percentage of IFQ grouper-tilefish landed within a community out of the total amount of all species landed within that community. It is an indicator of the contribution in pounds or value of IFQ grouper-tilefish to the overall landings in a community. Figure 3.15 and Figure 3.16 show the Local Quotient both in pounds and value from the Baseline to 2013.

The Local Quotient for pounds landed for several communities fluctuated from the Baseline through 2013 (Fig.3.15). The communities of Redington Shores, Ruskin, Steinhatchee, and St. Petersburg, FL all saw considerable fluctuation over time in their IFQ grouper-tilefish Local Quotient for pounds landed. St. Petersburg, FL saw a substantial increase in its Local Quotient, while Steinhatchee, FL saw a considerable decrease. The Local Quotient for IFQ grouper-tilefish pounds landed remained fairly stable for most communities although not high in terms of its overall contribution to pounds landed. In contrast, the Local Quotient for Madeira Beach, Redington Shores, Ruskin, and Tarpon Springs, FL often contributed well over 30 percent of total pounds landed in these communities.

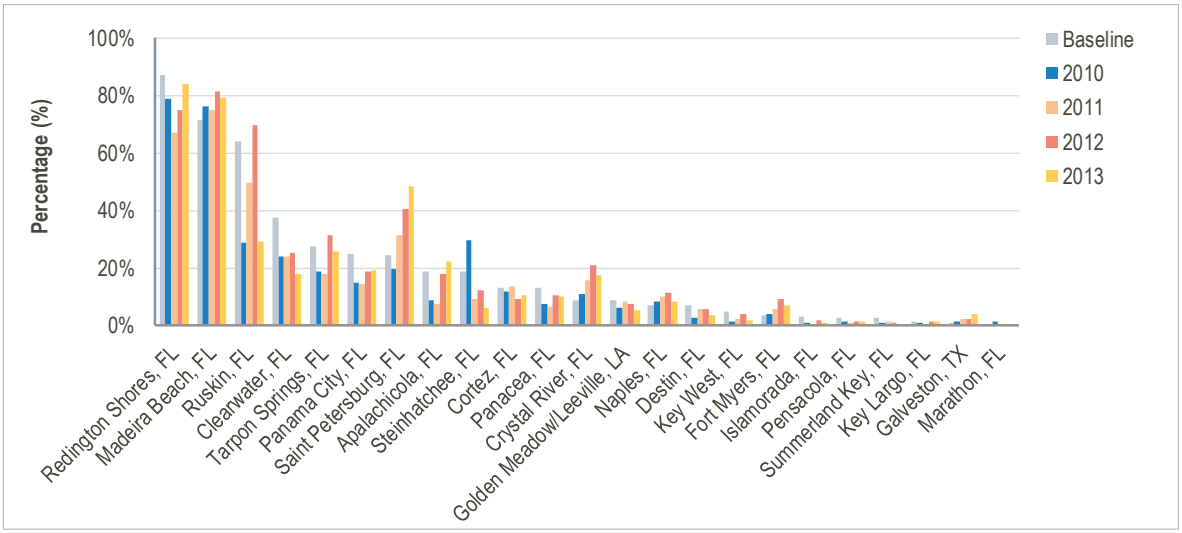


Figure 3.15. Local Quotient (POUNDS) for communities highly engaged in the Gulf of Mexico Grouper-Tilefish IFQ Program for all years from the Baseline (2007-2009) through 2013.

The trend for IFQ grouper-tilefish Local Quotient for value landed is almost identical to the Local Quotient for pounds, except that the value makes up a higher percentage of total species value than pounds landed within most communities (Fig. 3.16). Cortez, FL showed the most marked difference in its IFQ grouper-tilefish Local Quotient for value over that for pounds landed, with its value contributing over 40 percent of its total landings value while the Local Quotient for pounds landed is just over 10 percent. For most years, the Local Quotient for Madeira, FL is close to 90 percent for value landed and 80 percent for pounds landed.

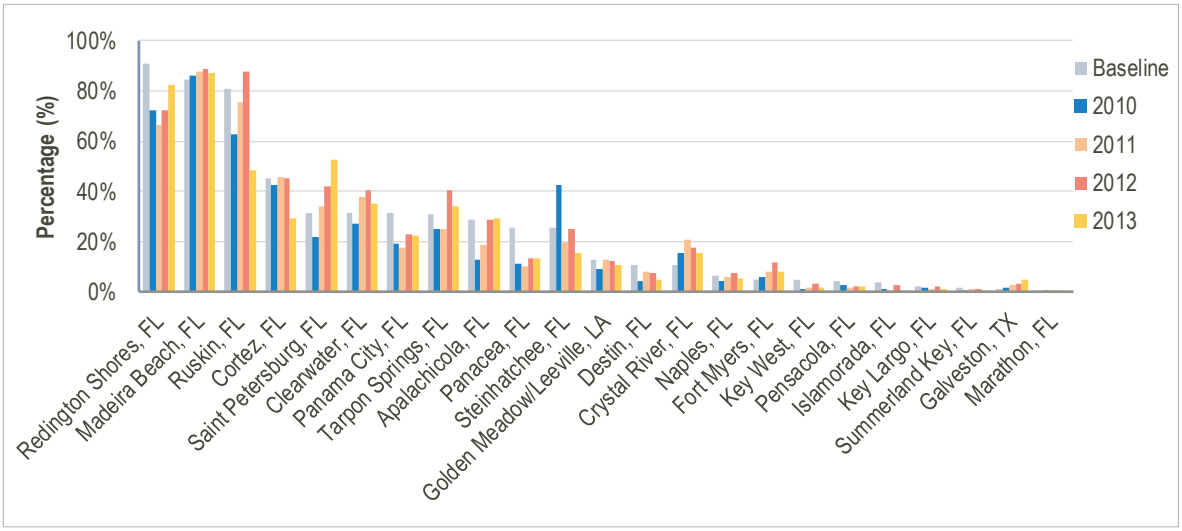


Figure 3.16. Local Quotient (VALUE) for communities highly engaged in the Gulf of Mexico Grouper-Tilefish IFQ Program for all years from the Baseline (2007-2009) through 2013.

Community Social Vulnerability Indicators (CSVIs)

The two categories of CSVIs discussed below include social vulnerability and gentrification pressure vulnerability. The Social Vulnerability Indicators represent social factors that can shape either an individual's or community's ability to adapt to change (poverty, personal disruption, labor force structure, and population composition vulnerability). The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption and retiree migration).

The Social Vulnerability Indicators for communities that were **highly engaged** in the Gulf of Mexico Grouper-Tilefish IFQ Program for at least one year from the Baseline to 2013 are included in Table 3.6. Communities **highly engaged for all years** are highlighted. These communities have a wide range of populations. Apalachicola and Panama City, FL have high vulnerabilities in relation to other Florida communities. The communities in Mississippi and Texas have higher vulnerabilities than the communities in other states. Almost every **highly engaged** community has high vulnerabilities related to housing characteristics.

Table 3.6. Community Social Vulnerability Indicators for communities highly engaged in the Gulf of Mexico Grouper-Tilefish IFQ Program for one or more years from the Baseline (2007-2009) through 2013.

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
Apalachicola, FL	1,916	Med High	Moderate	High	Moderate	High
Clearwater, FL	108,551	Moderate	Low	Moderate	Moderate	Med High
Cortez, FL	4,051	Low	Low	Low	High	High
Crystal River, FL	3,095	Moderate	Low	Moderate	High	Med High
Destin, FL	12,623	Low	Low	Low	Low	Moderate
Fort Myers, FL	64,488	High	Med High	High	Med High	Med High
Galveston, TX	48,178	Med High	Moderate	Med High	Low	Med High
Golden Meadow/Leeville, LA	1,790	Med High	Low	Moderate	Med High	High
Islamorada, FL	6,230	Low	Low	Low	Med High	Low
Key Largo, FL	10,959	Low	Low	Low	Low	Med High
Key West, FL	24,934	Low	Low	Low	Low	Low
Madeira Beach, FL	4,283	Low	Low	Low	Moderate	Moderate
Marathon, FL	8,405	Med High	Moderate	Med High	Low	Med High
Naples, FL	19,990	Low	Low	Low	High	Low
Panacea, FL	775	High	Low	High	Med High	N/A
Panama City, FL	36,205	Med High	Moderate	Med High	Moderate	Med High
Pensacola, FL	52,268	Moderate	Low	Moderate	Low	Med High
Redington Shores, FL	1,804	Low	Low	Low	High	Moderate
Ruskin, FL	17,311	Med High	Med High	Moderate	Low	High
St. Petersburg, FL	246,642	Low	Low	Low	High	High
Steinhatchee, FL	935	Low	Low	Low	High	High
Summerland Key, FL	N/A	N/A	N/A	N/A	N/A	N/A
Tarpon Springs, FL	23,564	Moderate	Low	Moderate	Med High	Med High
Anna Maria, FL	1,556	Low	Low	Low	High	Low
Bayou La Batre, AL	2,646	High	Med High	High	Moderate	High
Big Pine Key, FL	5032	N/A	N/A	N/A	N/A	N/A
Bon Secour, AL	743	N/A	N/A	N/A	N/A	N/A
Dunedin, FL	35,421	Low	Low	Low	Med High	Med High

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

Table continues on the next page.

Table 3.6. *(continued)*

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
Eastpoint, FL	2,229	Med High	Low	High	Low	High
Fort Myers Beach, FL	6,457	Low	Low	Low	High	Moderate
Fort Walton Beach, FL	19,962	Moderate	Low	Moderate	Low	Moderate
Freeport, TX	12,105	High	High	High	Low	High
Grand Bay, AL	3,637	Low	Low	Low	Moderate	Med High
Grand Isle, LA	854	Low	Low	Moderate	Moderate	Med High
Hernando Beach, FL	1,962	Low	Low	Low	Med High	Moderate
Homosassa, FL	2,403	Moderate	Low	Med High	High	Med High
Houston, TX	2,134,707	Med High	High	Med High	Low	Med High
Hudson, FL	11,738	Moderate	Low	Moderate	High	High
Indian Shores, FL	1,423	Low	Low	Low	High	Moderate
Land O Lakes, FL	32,831	Low	Low	Low	Low	Low
Largo, FL	77,898	Moderate	Low	Moderate	Moderate	High
Matlacha, FL	884	Low	Low	N/A	High	High
Pascagoula, MS	22,372	Med High	Moderate	Med High	Moderate	Med High
Port Bolivar, TX	1907	N/A	N/A	N/A	N/A	N/A
Port Isabel, TX	5,019	High	High	High	Med High	High
St. James City, FL	3,451	Med High	Moderate	Med High	Moderate	Med High
St. Marks, FL	246	Moderate	Low	Moderate	High	Med High
Sarasota, FL	52,588	Low	Low	Low	Moderate	High
Slidell, LA	27,257	Med High	Low	Moderate	Moderate	Moderate
Spring Hill, FL	99,779	Moderate	Low	Moderate	Low	Med High
Tallahassee, FL	181,376	N/A	N/A	N/A	N/A	N/A
Tampa, FL	343,768	Med High	Med High	Med High	Low	Moderate
Tavernier, FL	2,290	Low	Low	Moderate	Low	Med High
Theodore, AL	5,895	Med High	Moderate	Moderate	Low	High

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

Table begins on the previous page.

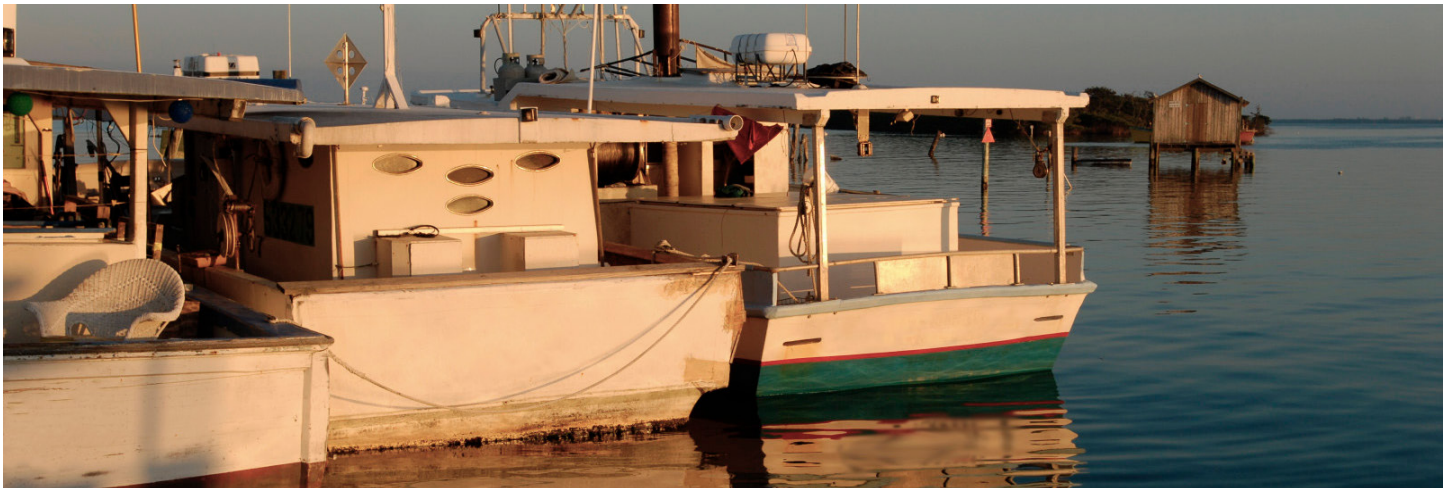


Photo Credit: Carlton Ward Gallery/Carlton Ward, Jr.

The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront (urban sprawl, housing disruption and retiree migration). Gentrification Pressure Vulnerability Indicators for communities that were **highly engaged** in the Gulf of Mexico Grouper-Tilefish IFQ Program for at least one year from the Baseline (2007-2009) to 2013 are included in Table 3.7. Communities **highly engaged for all years** are highlighted. The most **highly engaged** communities scored moderately vulnerable or low for most indicators. This is in contrast to Madeira Beach, Naples, Redington Shores, Cortez, and Tarpon Springs, which showed moderate to high gentrification vulnerability for at least two and sometimes three indices. The Urban Sprawl Index did demonstrate a trend, with most communities registering low vulnerabilities and none above moderate.

Table 3.7. Gentrification Pressure Vulnerability Indicators for communities highly engaged in the Gulf of Mexico Grouper-Tilefish IFQ Program for one or more years from the Baseline (2007-2009) through 2013.

Community	Housing Disruption	Retiree Migration	Urban Sprawl
Apalachicola, FL	Low	Moderate	Low
Clearwater, FL	Moderate	Moderate	Low
Cortez, FL	Moderate	High	Low
Crystal River, FL	Low	High	Low
Destin, FL	Moderate	Low	Low
Fort Myers, FL	Moderate	Moderate	Low
Galveston, TX	Moderate	Low	Low
Golden Meadow/Leeville, LA	Low	Low	Low
Islamorada, FL	High	Med High	Low
Key Largo, FL	Moderate	Low	Low
Key West, FL	Moderate	Low	Low
Madeira Beach, FL	High	Moderate	Moderate
Marathon, FL	Moderate	Low	Low
Naples, FL	Med High	High	Moderate
Panacea, FL	N/A	Low	Low
Panama City, FL	Moderate	Low	Low
Pensacola, FL	Low	Moderate	Low
Redington Shores, FL	Med High	Med High	Moderate
Ruskin, FL	Moderate	Low	Low
St. Petersburg, FL	Med High	High	Low
Steinhatchee, FL	N/A	High	N/A
Summerland Key, FL	N/A	N/A	N/A
Tarpon Springs, FL	Moderate	Med High	Low
Anna Maria, FL	Moderate	High	Moderate
Bayou La Batre, AL	High	Low	Low
Big Pine Key, FL	N/A	N/A	N/A
Bon Secour, AL	N/A	N/A	N/A
Dunedin, FL	Low	Med High	Low
Eastpoint, FL	Low	Low	Low
Fort Myers Beach, FL	Med High	High	Low
Fort Walton Beach, FL	Med High	Low	Low
Freeport, TX	Moderate	Low	Low
Grand Bay, AL	Low	Low	Low
Grand Isle, LA	High	Moderate	Low

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013. Table continues on the next page.

Table 3.7. *(continued)*

Community	Housing Disruption	Retiree Migration	Urban Sprawl
Hernando Beach, FL	Moderate	High	Low
Homosassa, FL	Low	High	Low
Houston, TX	Low	Low	Low
Hudson, FL	Low	High	Low
Indian Shores, FL	Low	High	Low
Land O Lakes, FL	Low	Low	Low
Largo, FL	Low	Med High	Low
Matlacha, FL	Med High	High	Low
Pascagoula, MS	Low	Low	Low
Port Bolivar, TX	N/A	N/A	N/A
Port Isabel, TX	Moderate	Moderate	Low
St. James City, FL	Moderate	Moderate	Low
St. Marks, FL	Low	High	Low
Sarasota, FL	High	Moderate	Low
Slidell, LA	Moderate	Moderate	Low
Spring Hill, FL	Moderate	Low	Low
Tallahassee, FL	N/A	N/A	N/A
Tampa, FL	Med High	Low	Low
Tavernier, FL	Low	Low	Low
Theodore, AL	Low	Low	Low

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

Table begins on the previous page.

Photo Credit: NOAA Fisheries/Michael Jepson

Regional Summary

Those communities that were highly engaged in one or more catch share programs are presented in Table 3.8 with the number of years of high engagement within each program including the Baseline. Overall, there were 54 communities in the Gulf of Mexico that were engaged at least one or more years in either or both IFQ programs. Of those 54 communities, 13 were highly engaged at least one year in both programs. There were five communities that were highly engaged all years for both programs: Destin, Panama City, Pensacola, and St. Petersburg, FL; and Galveston, TX.

Table 3.8. Number of years Southeast Region communities were highly engaged in a catch share program from the Baseline through 2013.

Community	Gulf Of Mexico Red Snapper IFQ	Gulf Of Mexico Grouper-Tilefish IFQ
Bayou La Batre, AL	-	4
Bon Secour, AL	-	3
Grand Bay, AL	1	1
Theodore, AL	-	1
Anna Maria, FL	-	1
Apalachicola, FL	1	All
Big Pine Key, FL	-	1
Clearwater, FL	-	All
Cortez, FL	-	All
Crystal River, FL	-	All
Destin, FL	All	All
Dunedin, FL	-	3
Eastpoint, FL	-	1
Fort Myers, FL	-	2
Fort Myers Beach, FL	-	All
Fort Walton Beach, FL	-	3
Hernando Beach, FL	-	1
Homosassa, FL	-	1
Hudson, FL	-	3
Indian Shores, FL	-	1
Islamorada, FL	-	All
Key Largo, FL	-	All
Key West, FL	-	All
Land O Lakes, FL	-	2
Largo, FL	-	1
Madeira Beach, FL	5	All
Marathon, FL	-	All
Matlacha, FL	-	1
Naples, FL	-	All
Panacea, FL	-	All
Panama City, FL	All	All
Pensacola, FL	All	All
Redington Shores, FL	-	All
Ruskin, FL	-	All
St. James City, FL	-	2
St. Marks, FL	-	2
St. Petersburg, FL	All	All
Sarasota, FL	-	1
Spring Hill, FL	-	1
Steinhatchee, FL	-	All
Summerland Key, FL	-	All
Tallahassee, FL	-	3
Tampa, FL	-	3
Tarpon Springs, FL	6	All
Tavernier, FL	-	3
Grand Isle, LA	-	1
Houma, LA	1	-
Golden Meadow/Leeville, LA	7	All
Slidell, LA	-	1
Pascagoula, MS	4	1
Freeport, TX	-	1
Galveston, TX	All	All
Houston, TX	2	1
Port Bolivar, TX	-	1
Port Isabel, TX	2	2

The catch share programs implemented in the Gulf of Mexico include a large number of communities throughout the region. Only a few communities are highly engaged in both IFQ programs, but have remained so from the Baseline years through 2013; this is likely because there are fewer communities that were highly engaged in the Gulf of Mexico Red Snapper IFQ Program. There are several communities that have seen their engagement decline since the Baseline period. This decline may have occurred for a variety of reasons and at this time we cannot speculate as to the cause of decreases or increases in specific fisheries engagement levels. It must be remembered that these programs are focused on a few species and many of the communities involved may participate in many other fisheries.

Photo Credit: Gulf of Mexico Fishery Management Council/Ava Lasseter

West Coast Region

Regional Overview

Two catch share programs have been implemented in the West Coast Region[1]. These programs govern federal fisheries for sablefish and other species of groundfish. The West Coast Region includes the states of Idaho, Washington, Oregon and California. Fisheries in this region are managed by the Pacific Fishery Management Council (PFMC) in conjunction with NOAA Fisheries, the federal agency charged with producing the regulatory language that allows for management.

Regional Catch Share Programs

- Pacific Coast Sablefish Permit Stacking Program
- Pacific Coast Groundfish Trawl IFQ (Shore-Based)

The first catch share program in this region was the Pacific Coast Sablefish Permit Stacking Program, implemented in 2001 to manage the fixed gear caught sablefish fishery. The Groundfish Trawl Rationalization Program was implemented in 2011 and effectively encompasses two catch share programs: an Individual Fishing Quota (IFQ) to manage the shore-based trawl caught groundfish fishery, and a cooperative structure to manage the at-sea Pacific whiting fishery. This report focuses on the IFQ program, hereafter referred to as the (shore-based) Pacific Coast Groundfish Trawl IFQ Program. Summary statistics for these programs are found in Table 4.1.

West Coast Region communities vary greatly in terms of their population size, demographic profiles, and dependence on commercial fishing. For example, Seattle, WA is an ethnically diverse urban area with over 600,000 inhabitants while Neah Bay, WA is a small rural Native American community, home to the Makah Tribe, with a population of approximately 1,000. Commercial fishing is important to both communities in different ways. Seattle is a commercial hub for many of the important processors, fisheries and fishing companies of both the West Coast and the North Pacific, and exists as a home port for many of the larger catcher/processer vessels. Residents of Neah Bay are actively involved in both commercial and subsistence fishing and the Makah Tribe, centered in the community, is one of 23 “treaty tribes” whose status as co-managers of many fisheries and treaty rights to a share of the fishery harvest were guaranteed by a significant federal court decision in 1974 (Brown 1994).

Table 4.1. Summary of West Coast Region catch share programs in 2013.

	Pacific Coast Sablefish Permit Stacking Program	Pacific Coast Groundfish Trawl IFQ (Shore-Based)
Ex-vessel revenue	$5,356,945	$27,329,-725
Landings	2,221,310*	41,471,224*
Number of first receivers	51	34
Number of entities holding share	111**	128***
Number of vessels with landings of catch share species	91	86

*Gutted weight ** Permit holder *** Shareholder
Source: NOAA National Performance Indicators for Fisheries database

[1] West Coast sablefish and groundfish fisheries were managed by NOAA’s Northwest Regional Office (NWRO) in conjunction with the Pacific Fishery Management Council up to 2013, when the Northwest Regional Office and Southwest Regional Office merged to form a single West Coast Region. The West Coast Region, along with the Council, now has the regulatory responsibilities of all “West Coast Region” fisheries, including the two catch share programs described here.

Pacific Coast Sablefish Permit Stacking Program

Program Overview

Pacific Coast sablefish are found on or near bottom habitat. The fishery is prosecuted along the U.S. West Coast from Washington's Cape Flattery to Southern California, with commercial landings concentrated in the northern half of the West Coast. Sablefish have been managed by the PFMC and NOAA Fisheries since 1987.

Deliberations on an IFQ program began in 1991 and continued through 1994, when they were halted due to the Magnuson-Stevens Fishery Conservation and Management Act (MSA) moratorium on individual quota programs. When the moratorium expired in 2000, the Council again took up the IFQ. However, it did so in phases, first implementing a permit "stacking" program in 2001 that allowed for the use of more than one permit on a single vessel. The Pacific Coast Sablefish Permit Stacking Program objectives included promoting efficiency, maintaining or directing benefits toward fishing communities, preventing excessive concentration of harvest privileges, promoting equity and safety, improving product quality and value, and creating a program that would readily transition to an IFQ program. Sablefish caught via trawl net eventually came under an IFQ as part of the Pacific Coast Groundfish Trawl IFQ Program that was implemented in 2011. The Pacific Coast Groundfish Trawl IFQ Program is discussed below, following the Pacific Coast Sablefish Permit Stacking Program section.

While sablefish (commercially known as "black cod") are included among the species described as "groundfish," the Pacific Coast Sablefish Permit Stacking Program, implemented in 2001, was developed specifically for the limited entry fixed gear sablefish fishery. A maximum of three permits may be "stacked" on a single vessel. Further, ownership of permits by corporations or other business entities is forbidden. The program requires a permit owner on board, and prohibits at-sea processing. However, a grandfather clause was provided for each of these provisions. In addition, permits (or "endorsements") are tiered. Tier 1 permits allow permit holders a greater share of the annual sablefish allocation, as compared to Tiers 2 and 3, which allow for progressively smaller amounts of the allocated harvest.

Although vessels in this program target sablefish, other marketable species (such as Pacific halibut and rockfish) are sometimes part of the bycatch and are also landed where allowed. Deliveries of the catch are to shore-based processors in West Coast communities.

The primary market for sablefish is for human consumption for restaurants or retail sales in both the U.S. and Japan. Japan is one of the world's largest importers of sablefish (Sonu 2014). Fish are sold fresh and frozen, whole, filleted, and processed. Both fixed gear and trawl nets are used to harvest groundfish. There is a charter/party recreational boat fishery for groundfish in federal waters and a recreational fishery in state waters.

Photo Credit: NOAA Fisheries/Max Van Oostenburg

Trends for Top Participating Communities

Commercial Engagement

The program-specific commercial Fishing Engagement Index scores for the Pacific Coast Sablefish Permit Stacking Program are presented in Table 4.2. The index is an indicator of the importance of commercial fishing in a community relative to other communities. It is a measure of the presence of commercial fishing through fishing activity including value, pounds, permits and vessels engaged in a specific fishery. There were 23 communities that were **highly engaged** (1.0 standard deviation or above the mean) in the sablefish permit stacking fishery for at least one year from the Baseline through 2013. The years in which these communities were **highly engaged** are highlighted. Ten of these communities were **highly engaged** from the Baseline (1998-2000) every year through 2013, and these communities were distributed between Washington, Oregon and California. These consistently **highly engaged** communities demonstrated some fluctuation in their levels of engagement, though their engagement levels mostly remained stable through the examined time period.

For those communities with the highest engagement index scores for all years from the Baseline through 2013, engagement has remained stable over the years of the Pacific Coast Sablefish Permit Stacking Program, as is demonstrated in Figure 4.1. A few of the communities with the very highest index results have seen their engagement measures moderately increase since implementation, including Newport, OR and Bellingham, WA. However, for most **highly engaged** communities, engagement with this fishery seems to be fairly stable.

Table 4.2. Fishing Engagement Index scores of communities highly engaged in the Pacific Coast Sablefish Permit Stacking Program for one or more years from the Baseline (1998-2000) through 2013.

Community	Baseline	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Newport, OR	11.562	11.312	10.628	11.692	11.934	9.833	10.566	11.52	12.101	13.175	11.022	12.604	13.549	11.967
Astoria, OR	9.211	7.226	7.044	3.725	5.12	6.245	4.304	4.092	3.975	3.325	0.518	2.205	2.124	3.309
Port Orford, OR	5.18	4.329	3.757	3.539	3.314	3.558	3.385	4.125	4.182	4.396	3.713	4.245	2.176	3.881
Bellingham, WA	3.482	6.636	8.638	7.549	7.667	8.494	11.374	9.276	7.811	7.193	4.44	4.386	3.505	6.537
Seattle, WA	3.405	2.041	2.203	2.606	1.349	1.406	1.204	1.659	1.297	1.53	1.345	1.816	1.73	1.984
Westport, WA	3.255	4.352	3.835	5.261	5.038	6.531	1.82	2.133	3.699	2.589	3.151	1.28	2.254	1.245
Coos Bay, OR	3.186	4.462	4.186	3.973	4.585	6.383	3.744	5.267	5.242	4.049	7.323	5.037	4.659	6.322
Neah Bay, WA	2.799	3.71	3.431	3.176	2.549	2.12	3.015	3.517	1.983	1.754	1.664	1.485	1.843	2.567
Crescent City, CA	2.469	2.542	2.381	3.11	2.332	2.341	2.792	2.044	2.475	2.792	1.96	2.127	2.038	1.745
Moss Landing, CA	2.334	1.735	1.078	1.045	1.594	0.293	0.83	0.552	0.568	0.487	0.727	0.843	1.711	1.173
Eureka, CA	2.139	1.906	2.962	2.861	1.66	2.168	2.764	2.81	3.055	2.009	2.276	1.347	1.101	1.52
Florence, OR	2.137	1.652	0.733	1.423	0.037	0.101	0.156	0.333	0.031	0.034	0.134	-0.026	-0.031	-0.122
Fort Bragg, CA	2.052	2.426	2.488	2.686	2.657	2.286	1.826	2.83	3.516	3.982	4.837	5.713	6.405	5.728
San Francisco, CA	1.938	2.386	1.25	1.439	1.077	1.066	0.259	0.494	0.303	0.49	0.4	1.383	1.842	1.143
Port Angeles, WA	1.299	0.73	1.164	1.117	4.065	1.486	0.692	0.703	0.652	0.874	0.735	0.993	0.803	0.702
Winchester Bay, OR	0.936	0.126	0.764	0.363	-0.201	-0.017	0.289	0.104	0.163	0.932	0.532	0.294	1.097	0.469
Brookings, OR	0.4	0.666	1.411	1.571	0.54	0.54	0.533	0.763	0.168	1	0.18	1.062	2.257	1.773
Bodega Bay, CA	0.28	-0.212	-0.21	-0.221	-0.201	-0.2	-0.193	-0.201	-0.199	-0.196	-0.196	0.757	0.805	2.585
Reedsport, OR	0.192	0.521	0.297	0.291	0.276	0.202	0.244	0.226	0.261	0.38	0.684	0.851	1.113	0.885
Ilwaco, WA	0.134	0.53	0.315	3.399	0.283	0.161	2.392	2.667	3.572	3.912	8.494	6.962	4.744	3.125
Lake Forest Park, WA	-0.035	0.416	0.297	1.06	0.991	0.904	0.506	0.44	0.836	0.495	0.024	-0.201	-0.207	-0.213
Morro Bay, CA	-0.08	-0.212	-0.21	-0.221	-0.201	-0.2	-0.193	-0.201	-0.199	-0.196	-0.196	1.065	2.452	1.462
Chinook, WA	-0.151	-0.212	-0.21	-0.221	-0.201	0.469	2.482	0.757	0.673	0.773	1.096	1.468	1.241	0.738

Note: Highlighted cells indicate high engagement.

For those communities with the highest engagement index scores for all years from the Baseline through 2013, engagement has remained stable over the years of the Pacific Coast Sablefish Permit Stacking Program, as is demonstrated in Figure 4.1. A few of the communities with the very highest index results have seen their engagement measures moderately increase since implementation, including Newport, OR and Bellingham, WA. However, for most **highly engaged** communities, engagement with this fishery seems to be fairly stable.

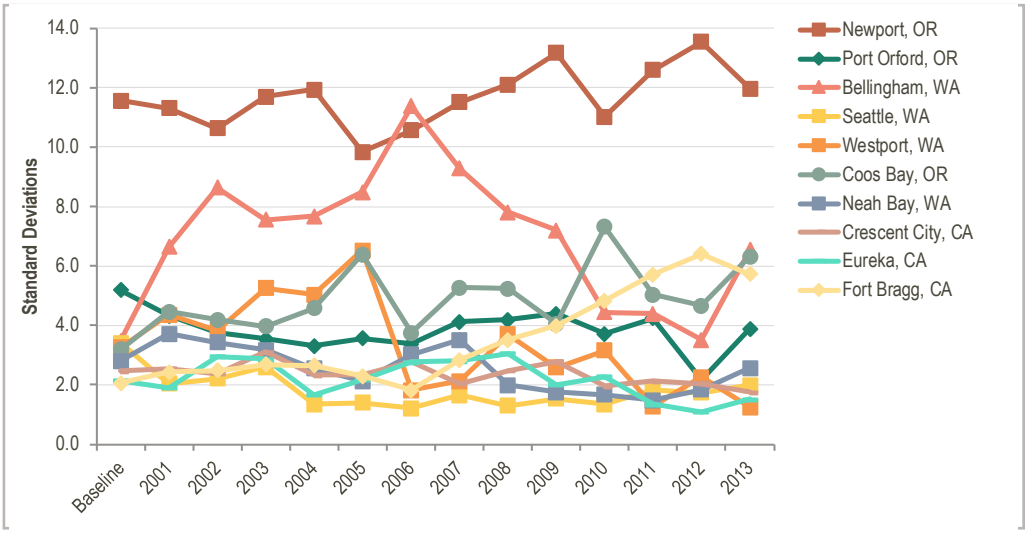


Figure 4.1. Fishing Engagement Index scores of communities highly engaged in the Pacific Coast Sablefish Permit Stacking Program for all years from the Baseline (1998-2000) through 2013.

Communities that demonstrated an increasing engagement with the Pacific Coast Sablefish Permit Stacking Program from the Baseline period through 2013 are depicted in Figure 4.2. Drawn from among those communities that were **highly engaged** with this program for all years, there are only four of these communities that showed increasing engagement with the fishery.

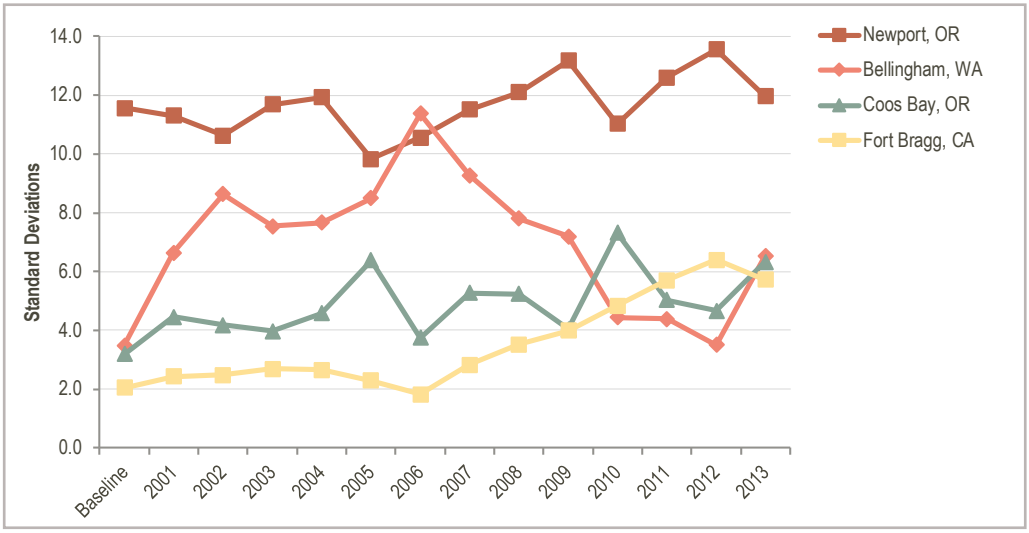


Figure 4.2. Fishing Engagement Index scores of communities highly engaged in the Pacific Coast Sablefish Permit Stacking Program for all years with increasing engagement from the Baseline (1998-2000) through 2013.

Communities that were **highly engaged for all years** within the Pacific Coast Sablefish Permit Stacking Program, but were also home to decreasing engagement with this fishery, are depicted in Figure 4.3. The general trend for these communities as the Pacific Coast Groundfish Trawl Individual Fishing Quota Program has evolved is for decreasing engagement. Although these communities were places where engagement with the Pacific Coast Sablefish Permit Stacking Program was decreasing, communities exhibited a degree of annual variability in their engagement results.

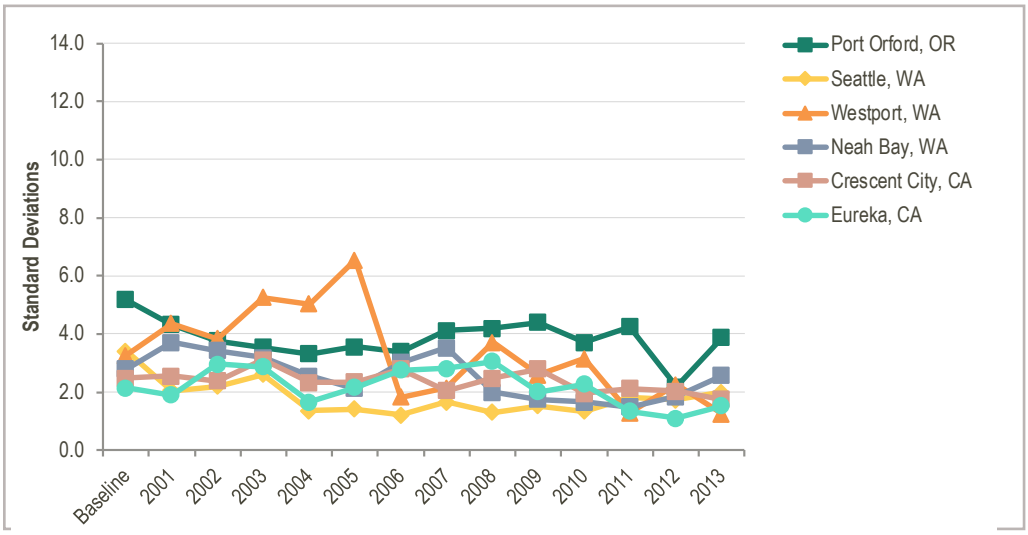


Figure 4.3. Fishing Engagement Index scores of communities highly engaged in the Pacific Coast Sablefish Permit Stacking Program for all years with decreasing engagement from the Baseline (1998-2000) through 2013.

Communities that were **highly engaged** for only some of the years within the Pacific Coast Sablefish Permit Stacking Program are depicted in Figure 4.4. The general trend for these communities as the Pacific Coast Groundfish Trawl IFQ Program has evolved is for stable or increasing engagement. These communities are distributed relatively evenly between the three states of the region. In general, communities have presented variable results over the 13 years of the program presented here, and the variability among these top-scoring communities that were less than **highly engaged**, such as Ilwaco, WA and Astoria, OR, has been marked.

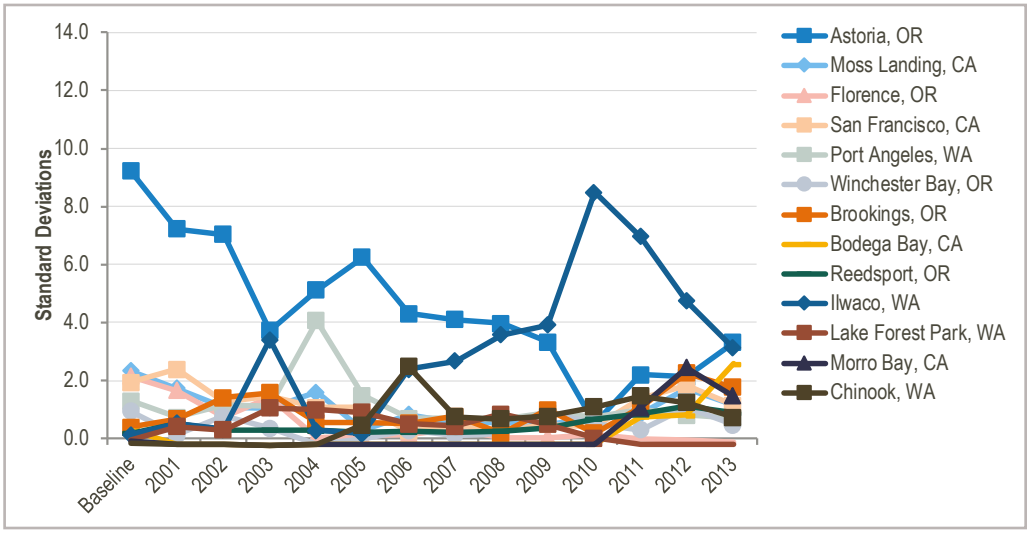


Figure 4.4. Fishing Engagement Index scores of communities highly engaged in the Pacific Coast Sablefish Permit Stacking Program for fewer than all years from the Baseline (1998-2000) through 2013.

Regional Quotient

Another measure of a community's involvement in a particular fishery is its Regional Quotient. Regional Quotient is the proportion of a species or species group landed within a community out of the total amount of that species or species group landed within the region. It is an indicator of the percent contribution of a community in value or pounds landed to the regional fishery. Figure 4.5 and Figure 4.6 show the Regional Quotient for both pounds and then value from the Baseline to 2013.

As depicted in Figure 4.5, particularly active sablefish permit stacking communities during the Baseline period in terms of pounds landed included Newport and Coos Bay, OR; Bellingham, WA; and Fort Bragg, CA. Fort Bragg has seen its Regional Quotient for pounds landed increase for one or more years while most of the other important Regional Quotient communities remained relatively constant since the implementation of the Pacific Coast Groundfish Trawl IFQ Program in 2001.

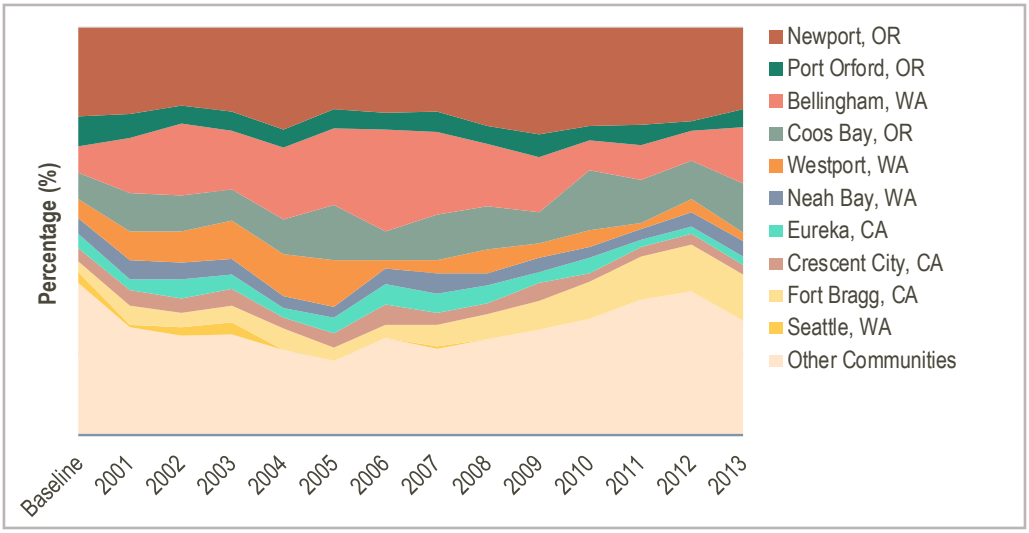


Figure 4.5. Regional Quotient (POUNDS) for communities highly engaged in the Pacific Coast Sablefish Permit Stacking Program for all years from the Baseline (1998-2000) through 2013.

The dominant sablefish permit stacking communities, in terms of value, represent nearly 70 percent of the regional value and include 10 communities in Washington, Oregon and California, as is demonstrated in Figure 4.6. With some annual variability, the share of the Regional Quotient for these nine communities has remained relatively stable or increased. All other communities combined have seen their share of value landed vary annually, but with a net decrease in Regional Quotient from the Baseline to 2013.

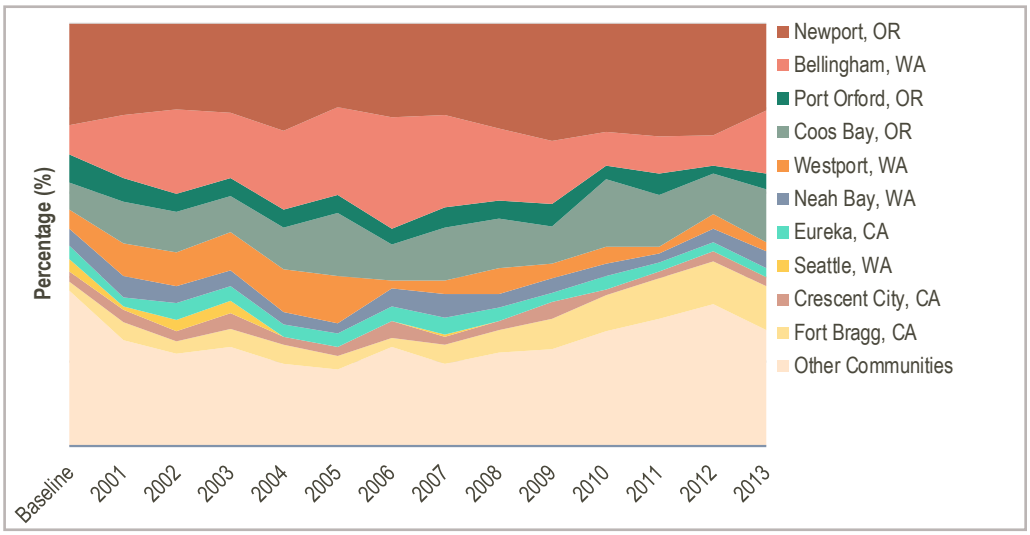


Figure 4.6. Regional Quotient (VALUE) for communities highly engaged in the Pacific Coast Sablefish Permit Stacking Program for all years from the Baseline (1998-2000) through 2013.

Local Quotient

The community Local Quotient is the percentage of sablefish permit stacking catch landed within a community out of the total amount of all species landed within that community. It is an indicator of the contribution in pounds or value of sablefish permit stacking catch to the overall landings in a community. Figure 4.7 and Figure 4.8 show the Local Quotient both in pounds and value from the Baseline to 2013. There is a notable difference between pounds and value in that while pounds represent a relatively small percentage of total landings for most communities, value is noticeably higher due to the typically higher prices per pound attributed to sablefish.

The Local Quotient for sablefish permit stacking catch for pounds landed for Coos Bay and Newport, OR and Bellingham, WA remained relatively stable from the Baseline through 2013 while Port Orford, OR, has seen a steady decrease (Figure 4.7). The Local Quotient for Neah Bay, WA, has fluctuated since implementation with a notable spike in 2012.

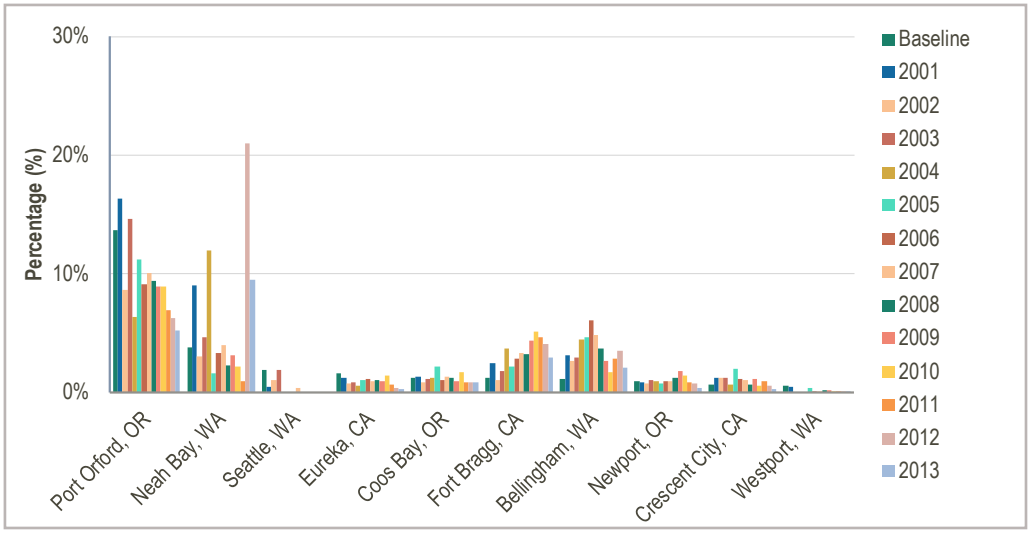


Figure 4.7. Local Quotient (POUNDS) for communities highly engaged in the Pacific Coast Sablefish Permit Stacking Program for all years from the Baseline (1998-2000) through 2013.

The Local Quotient for sablefish permit stacking catch value landed has fluctuated for most communities (Figure 4.8). Fort Bragg, CA steadily increased from the Baseline to 2009 and 2010, then substantially decreased. For this reason, we see annual fluctuations in the Local Quotient for nearly every community, but with Local Quotient results ultimately appearing, in 2013, close to what they were during the Baseline period prior to 2001. One notable exception to this pattern is the smaller, relatively isolated community of Port Orford, OR, where Local Quotient amounts for sablefish permit stacking catch have decreased relatively consistently for the 13 years of the catch share program.

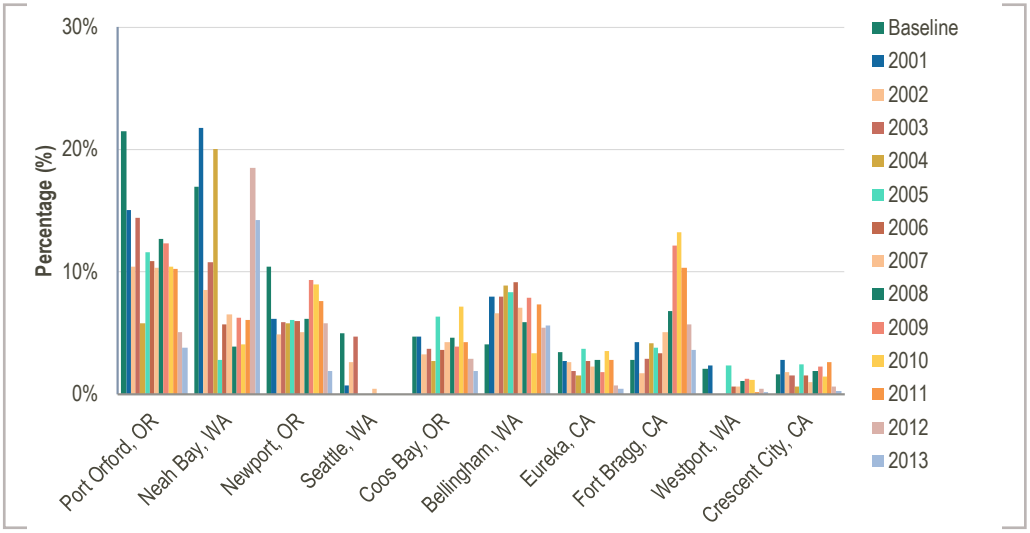


Figure 4.8. Local Quotient (VALUE) for communities highly engaged in the Pacific Coast Sablefish Permit Stacking Program for all years from the Baseline (1998-2000) through 2013.

Community Social Vulnerability Indicators (CSVIs)

The two categories of CSVIs discussed below include social vulnerability and gentrification pressure vulnerability. The Social Vulnerability Indicators represent social factors that can shape either an individual's or community's ability to adapt to change (poverty, personal disruption, labor force structure, and population composition vulnerability). The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption and retiree migration).

The Social Vulnerability Indicators for communities that were **highly engaged** in the Pacific Coast Sablefish Permit Stacking Program for at least one year from the Baseline through 2013 are included in Table 4.3. Communities **highly engaged for all years** are highlighted. These communities have a wide range of populations. The **highly engaged** communities have a low index score for population composition, with the exceptions of Fort Bragg, Crescent City, and San Francisco, CA. For many of the other indicators of social vulnerability, communities **highly engaged** in the Pacific Coast Sablefish Permit Stacking Program exhibit results that are moderate, medium-high or high. These communities are important centers of fishing activity in Washington, Oregon and California.

Table 4.3. Social vulnerability indicators for communities highly engaged in the Pacific Coast Sablefish Permit Stacking Program for one or more years from the Baseline (1998-2000) through 2013.

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
Bellingham, WA	81,576	Moderate	Low	Moderate	Low	Med High
Coos Bay, OR	15,982	Moderate	Low	Moderate	Med High	Med High
Crescent City, CA	7,470	High	Moderate	High	High	Med High
Eureka, CA	27,037	Med High	Low	Med High	Low	Med High
Fort Bragg, CA	7,259	Med High	Med High	Med High	Low	Moderate
Neah Bay, WA	869	Med High	High	High	Moderate	High
Newport, OR	10,013	Moderate	Low	Moderate	Moderate	Med High
Port Orford, OR	1,229	Med High	Low	High	High	High
Seattle, WA	624,681	Low	Low	Low	Low	Moderate
Westport, WA	1,701	Moderate	Low	Moderate	Moderate	High
Astoria, OR	9,518	Moderate	Low	Med High	Low	Med High
Bodega Bay, CA	516	Low	Low	N/A	High	N/A
Brookings, OR	6,334	Low	Low	Low	Med High	Med High
Chinook, WA	224	Low	Low	Moderate	Med High	N/A
Florence, OR	8,463	Moderate	Low	Moderate	High	High
Ilwaco, WA	1,074	Low	Low	Med High	Med High	Med High
Lake Forest Park, WA	12,811	Low	Low	Low	Low	Low
Morro Bay, CA	10,322	Low	Low	Low	Moderate	Moderate
Moss Landing, CA	218	High	High	High	Low	Moderate
Port Angeles, WA	19,099	Moderate	Low	Med High	Med High	Med High
Reedsport, OR	4,130	High	Low	Med High	High	High
San Francisco, CA	817,501	Low	Med High	Moderate	Low	Low
Winchester Bay, OR	295	Low	Low	Low	High	N/A

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront (urban sprawl, housing disruption and retiree migration). Gentrification Pressure Vulnerability indicators for communities that were **highly engaged** in the Pacific Coast Sablefish Permit Stacking Program for at least one year from the Baseline (1998-2000) through 2013 are included in Table 4.4. Communities **highly engaged for all years** are highlighted. The Housing Disruption Index showed moderate to medium-high vulnerability for several of the communities that were **highly engaged** in the fishery for at least one year. The Retiree Migration Index shows a wide range of vulnerability for communities participating in this fishery, though Port Orford and Coos Bay, OR show particularly high retiree migration vulnerability. The Urban Sprawl Index generally shows low vulnerability for this fishery's communities, though Bellingham and Seattle, WA show moderate to medium-high urban sprawl vulnerability, respectively.

Table 4.4. Gentrification Pressure Vulnerability Indicators for communities highly engaged in the Pacific Coast Sablefish Permit Stacking Program for one or more years from the Baseline (1998-2000) through 2013.

Community	Housing Disruption	Retiree Migration	Urban Sprawl
Bellingham, WA	Low	Low	Moderate
Coos Bay, OR	Moderate	Med High	Low
Crescent City, CA	Low	Med High	Low
Eureka, CA	Med High	Low	Low
Fort Bragg, CA	High	Low	Low
Neah Bay, WA	Low	Low	Low
Newport, OR	Low	Moderate	Low
Port Orford, OR	High	High	Low
Seattle, WA	Low	Low	Med High
Westport, WA	Low	Moderate	Low
Astoria, OR	Moderate	Low	Low
Bodega Bay, CA	Moderate	High	High
Brookings, OR	Low	Med High	Low
Chinook, WA	N/A	Moderate	Low
Florence, OR	Moderate	High	Low
Ilwaco, WA	Low	Moderate	Low
Lake Forest Park, WA	Low	Low	Moderate
Morro Bay, CA	Med High	Moderate	Moderate
Moss Landing, CA	Moderate	Low	Low
Port Angeles, WA	Low	Moderate	Low
Reedsport, OR	Low	Med High	Low
San Francisco, CA	Med High	Low	High
Winchester Bay, OR	Low	High	Low

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

Pacific Coast Groundfish Trawl Individual Fishing Quota Program (Shore-Based)

Program Overview

Pacific Coast groundfish are found on or near bottom habitat. The fishery runs along the U.S. West Coast from Washington's Cape Flattery to Southern California, with commercial landings concentrated in the northern half of the West Coast. Groundfish in the Pacific are caught by commercial mothership catcher vessels, catcher/processor vessels and shore-based vessels. Groundfish have been managed by PFMC and NOAA Fisheries since 1982.

The Pacific Coast Groundfish Trawl IFQ Program for participants using shore-based vessels was implemented in 2011 by the PFMC, as part of the larger Pacific Coast Groundfish Trawl Rationalization Program. The vessels that participate in the shore-based IFQ program target both whiting and non-whiting species (including sablefish) and land the fish to shore-based processors. In contrast, whiting is also harvested by catcher vessels that land whiting to motherships at sea and by catcher/processor vessels that both catch and process whiting on board at sea. While all three sectors are under the Pacific Coast Groundfish Rationalization Program umbrella, this report focuses only on the Pacific Coast Groundfish Trawl IFQ Program for shore-based vessels, which was the first fishery to adopt an IFQ system on the West Coast. Of the 91 species managed under the Pacific Coast Groundfish Trawl Rationalization Program, the shore-based IFQ program designates shares for 66 of these species which are placed within 30 IFQ species groups (some rockfish, for example, are grouped into complexes).

The goals of the Pacific Coast Groundfish Trawl IFQ Program for shore-based vessels included rationalizing the fishery in terms of capacity, providing for stability, developing efficiency in realizing the fullest use of the sector allocation, and ensuring environmental and individual accountability for both the target species and bycatch. Program objectives included developing catch accounting systems, developing efficiency through bycatch reduction and operational flexibility, minimizing adverse impacts on fishing communities and connected fisheries, and providing for both product quality and enhanced fishery safety.

The program includes the unique feature of separating "quota pounds" and "quota shares," both of which are transferable. Each year, NOAA Fisheries issues quota pounds to online quota share accounts, in proportion to the sector allocation and each permit owner's quota share holdings. Permit owners must then transfer the pounds to a vessel account in order for those pounds to be fished. Quota share permit owners may sell their quota shares in any increment (to the thousandth decimal place) at any time through the online account system. The sale of the share confers the ongoing privilege to access a specific portion of the sector allocation. The program initially only allowed for the leasing of quota pounds, with a moratorium on the sale of quota shares to allow fishermen and permit owners a transition period to the new management program, but shares have been transferable since January 1, 2014.

The Pacific Coast Groundfish Trawl IFQ Program has several unique features, including a gear-switching provision where vessels registered to limited entry trawl permits may fish using fixed gear. All vessels have 100 percent catch monitoring for discards and landings. Each vessel must have a human observer or electronic monitoring cameras on board to observe and track discards, and a human catch monitor must be present to monitor each IFQ offload and ensure all landings are recorded to IFQ species.

As with many catch share programs, the development and implementation of the Pacific Coast Groundfish Trawl IFQ Program was not without competing interests. Some stakeholders were concerned with the possibility for catch share-centered management to increase, by design, community-level consolidation in the fishery.

Photo Credit: NOAA Fisheries/Craig D'Angelo

Additionally, although it is early in the implementation of this program, an initial analysis suggests continued decreases in fisheries income diversification among some West Coast vessels have occurred alongside catch share implementation (Kasperski and Holland 2013). There have also been concerns over the distribution of quota for constraining overfished rockfish species. Some of these concerns were centered on the notion that the unintended catch of even a few pounds of such a species, for instance yelloweye rockfish, would inhibit the rest of the species quotas for an individual fisherman. In some cases, the totals were small enough that fishermen participating in the Pacific Coast Groundfish Trawl IFQ Program were compelled to share their bycatch risk in organized "risk pools." The risk pools were institutions associated with certain expectations and prohibitions for participants, and included rules primarily aimed at reducing the bycatch risk (Holland and Norman 2015). Lastly, for program participants, concerns have primarily centered on the costs of monitoring (observers, electronic monitoring, catch monitors) and costs associated with buyback loans and cost recovery fees.

The primary market for Pacific Coast groundfish is commercial seafood sale, with diverse species-specific markets ranging from the Pacific whiting (whiting) catch used in surimi and other processed seafood products to the larger sablefish (black cod) harvest sought for restaurants and individual sales, as well as export to Japan. The trawl sector catches the largest volume of all groundfish sectors. There is a recreational fishery for groundfish managed by three West Coast states with input and coordination from the PFMC.

Trends for Top Participating Communities

Commercial Engagement

The program-specific commercial Fishing Engagement Index scores for the Groundfish Trawl IFQ Program are presented in Table 4.5. The index is an indicator of the importance of commercial fishing in a community relative to other communities. It is a measure of the presence of commercial fishing through fishing activity including value, pounds, permits and vessels engaged in a specific fishery. There were 16 communities that were **highly engaged** (1.0 standard deviation or above the mean) in the shore-based Groundfish Trawl IFQ Program for at least one year from the Baseline through 2013. The years in which these communities were **highly engaged** are highlighted in Figure 4.5.

Table 4.5. Fishing Engagement Index scores of communities highly engaged in the shore-based Pacific Coast Groundfish Trawl IFQ Program for one or more years from the Baseline (2008-2010) through 2013.

Community	Baseline	2011	2012	2013
Astoria, OR	9.729	12.112	11.207	10.549
Newport, OR	9.021	8.158	9.554	10.499
Coos Bay, OR	6.439	4.204	4.062	3.421
Westport, WA	4.526	3.687	4.007	3.412
Fort Bragg, CA	3.938	2.789	2.783	3.145
Eureka, CA	3.105	2.367	2.347	3.656
Crescent City, CA	2.443	1.187	0.842	0.793
Seattle, WA	2.290	2.448	2.269	2.394
Monterey, CA	2.240	2.055	2.129	2.080
Morro Bay, CA	1.920	3.663	3.087	1.630
San Francisco, CA	1.892	1.330	1.743	1.855
Brookings, OR	1.720	1.421	1.516	1.872
Half Moon Bay, CA	1.423	1.329	1.021	1.405
Bellingham, WA	1.052	1.023	1.158	0.606
Chinook, WA	0.433	1.099	0.961	0.814
Ilwaco, WA	0.433	1.099	0.961	0.814

Note: Highlighted cells indicate high engagement.

Of the 16 communities found in Table 4.5, the 12 communities that were **highly engaged for all years** from the Baseline through 2013 are highlighted in more detail in Figure 4.9. The engagement score for some communities was fairly stable or increased over time while for others it showed a decrease. Newport and Astoria, OR are clearly important ports to the IFQ program because they have the highest engagement in all years.

As presented in Figure 4.9, for those communities with the highest Pacific Coast Groundfish Trawl Program engagement index scores, engagement has remained stable or increased over the years of the catch share program. Others have seen their engagement results decrease since implementation, particularly for communities in California. However, for most **highly engaged** communities, engagement scores seem to be fairly stable.

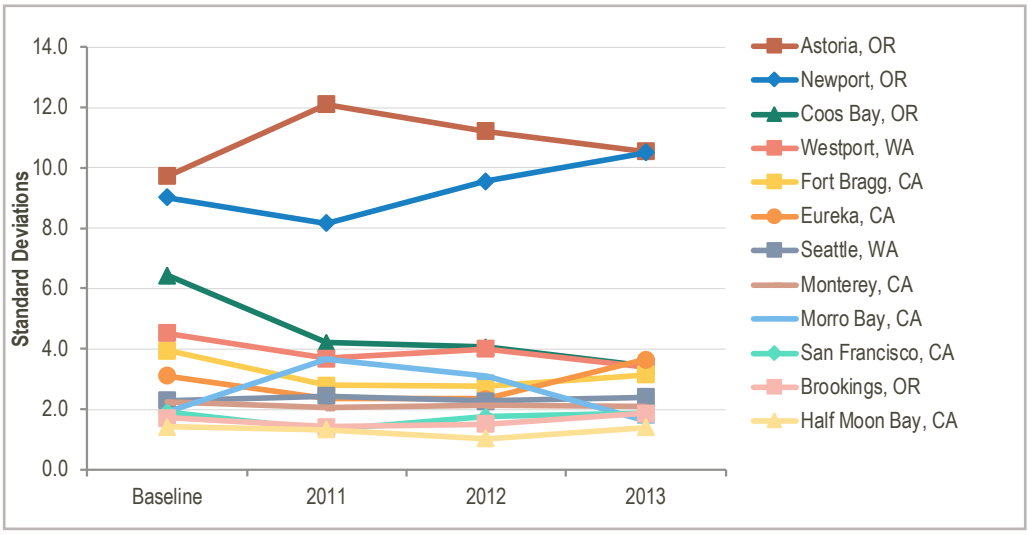


Figure 4.9. Fishing Engagement Index scores of communities highly engaged in the shore-based Pacific Coast Groundfish Trawl IFQ Program for all years from the Baseline (2008-2010) through 2013.

Communities that demonstrated a relatively stable or increased participation in the Pacific Coast Groundfish Trawl Program commercial engagement index score from the Baseline period through 2013 are depicted in Figure 4.10. Astoria and Newport, OR have the highest levels of commercial engagement with both communities showing a slight increase between the two time periods. Seattle, WA; Brookings, OR; and Eureka, CA are communities that have also retained or seen slightly increasing engagement with the groundfish trawl fishery within the context of the still developing IFQ program.

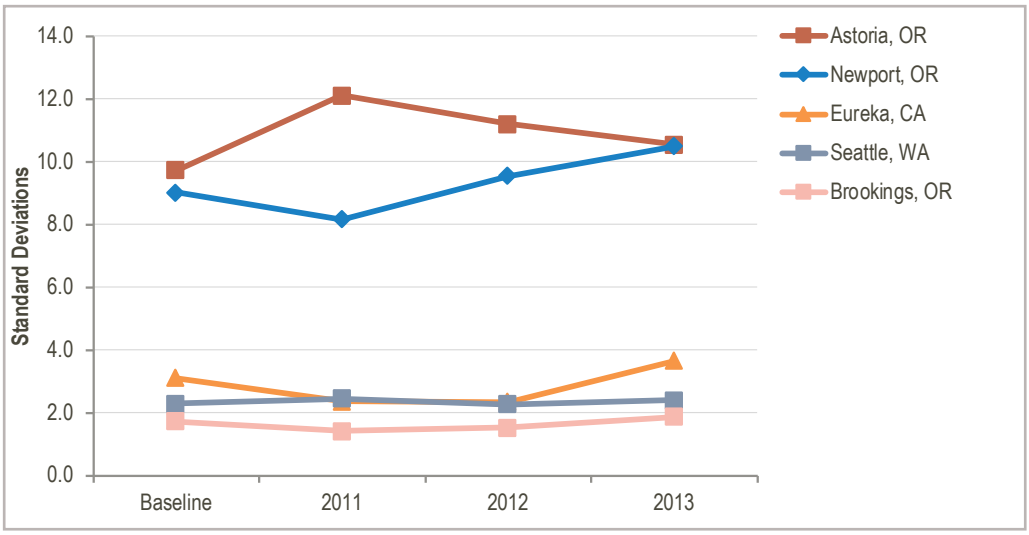


Figure 4.10. Fishing Engagement Index scores of communities highly engaged in the shore-based Pacific Coast Groundfish Trawl IFQ Program for all years with increasing engagement from the Baseline (2008-2010) through 2013.

Communities that demonstrated a decreasing groundfish trawl engagement index score from the Baseline through 2013, are depicted in Figure 4.11. The decreasing engagement scores highlight the declining involvement of smaller Oregon and California communities as the IFQ program has developed.

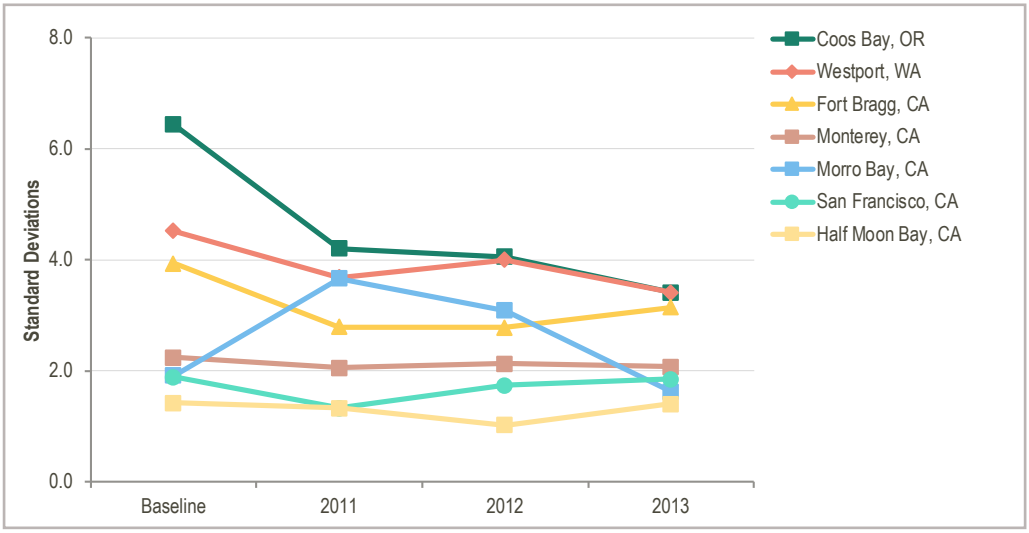


Figure 4.11. Fishing Engagement Index scores of communities highly engaged in the shore-based Pacific Coast Groundfish Trawl IFQ Program for all years with decreasing engagement from the Baseline (2008-2010) through 2013.

Communities that were **highly engaged** for fewer than all years within the groundfish trawl fishery are depicted in Figure 4.12. The general trend for these communities as the groundfish trawl IFQ program has evolved is for flat levels of engagement. The majority of these communities are located in Washington.

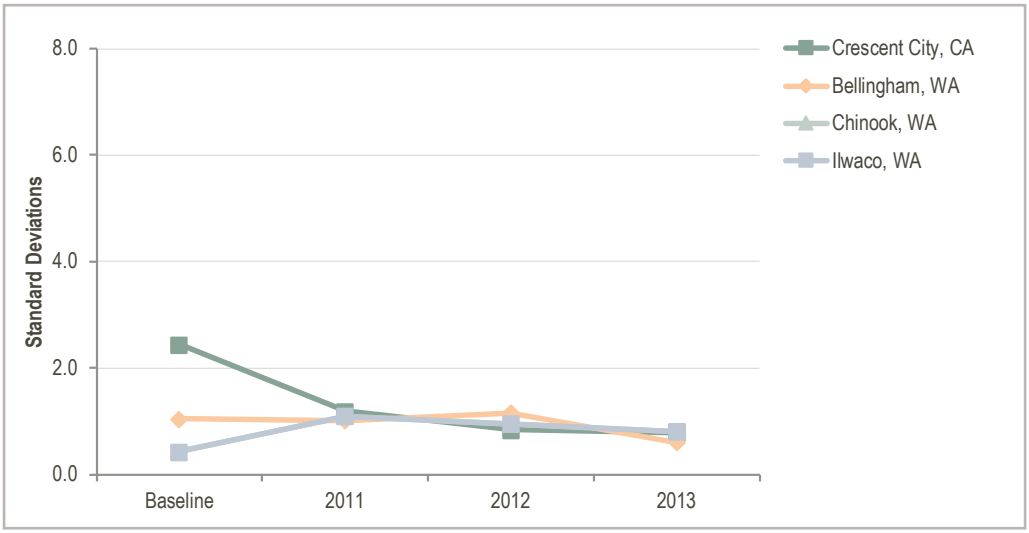


Figure 4.12. Fishing Engagement Index scores of communities highly engaged in the shore-based Pacific Coast Groundfish Trawl IFQ Program for fewer than all years from the Baseline (2008-2010) through 2013.

Regional Quotient

Another measure of a community's involvement in a particular fishery is its Regional Quotient. Regional Quotient is the proportion of IFQ groundfish trawl species landed within a community out of the total amount of IFQ groundfish trawl species landed within the West Coast region. It is an indicator of the percent contribution in pounds or value of IFQ groundfish trawl species landed within that community relative to the regional fishery. The Regional Quotient is reported individually only for those communities that were **highly engaged for all years** from the Baseline through 2013. All other communities that landed IFQ groundfish trawl species are grouped as "Other Communities." Figure 4.13 and Figure 4.14 show the Regional Quotient for both pounds and value from the Baseline to 2013.

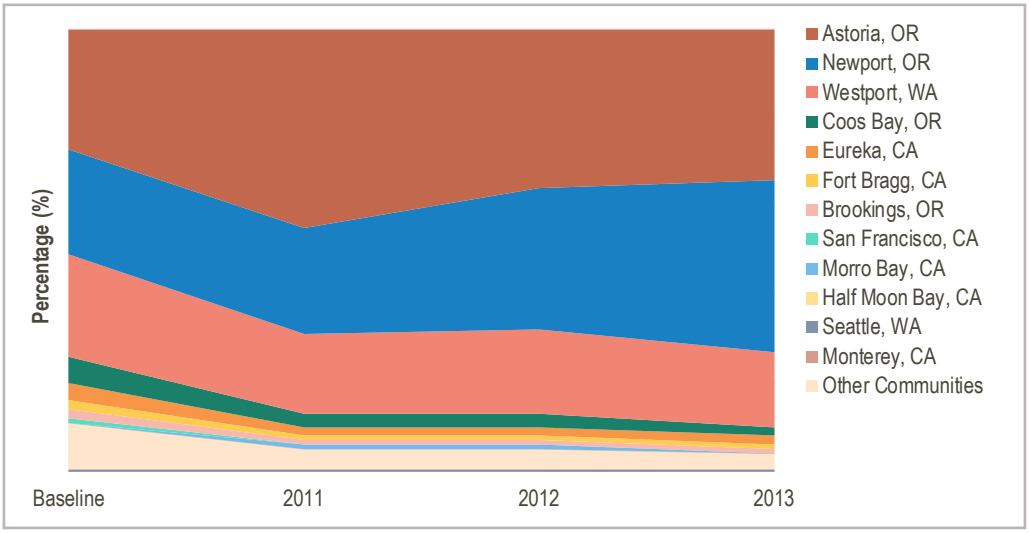


Figure 4.13. Regional Quotient (POUNDS) for communities highly engaged in the shore-based Pacific Coast Groundfish Trawl IFQ Program for all years from the Baseline (2008-2010) through 2013.

Dominant Pacific Coast IFQ Groundfish Trawl Program communities during the Baseline period included Astoria and Newport, OR and Westport, WA, accounting for more than 80 percent of the regional pounds landed (Figure 4.13). Both Astoria and Newport, OR have seen their Regional Quotient for pounds landed increase for one or more years while the pounds landed attributed to Westport, WA remained relatively constant since the implementation of the groundfish IFQ program in 2011.

The three dominant IFQ groundfish trawl communities of Astoria and Newport, OR and Westport, WA represent more than 70 percent of the regional value landed (Figure 4.14). Both communities have seen an increase in their regional percentage of value landed. This is in contrast to "Other Communities" where the regional percentage of value landed has either remained relatively stable or decreased slightly when compared to the Baseline. Part of the explanation for these less pronounced trends lies in differences in the types of groundfish landed. Some species of groundfish, including sablefish, tend to provide higher prices per pound as compared to other species within the groundfish fishery management group. Even as some communities have decreased in importance in the groundfish trawl fishery, these communities may have targeted higher value species in their continued participation in the fishery.

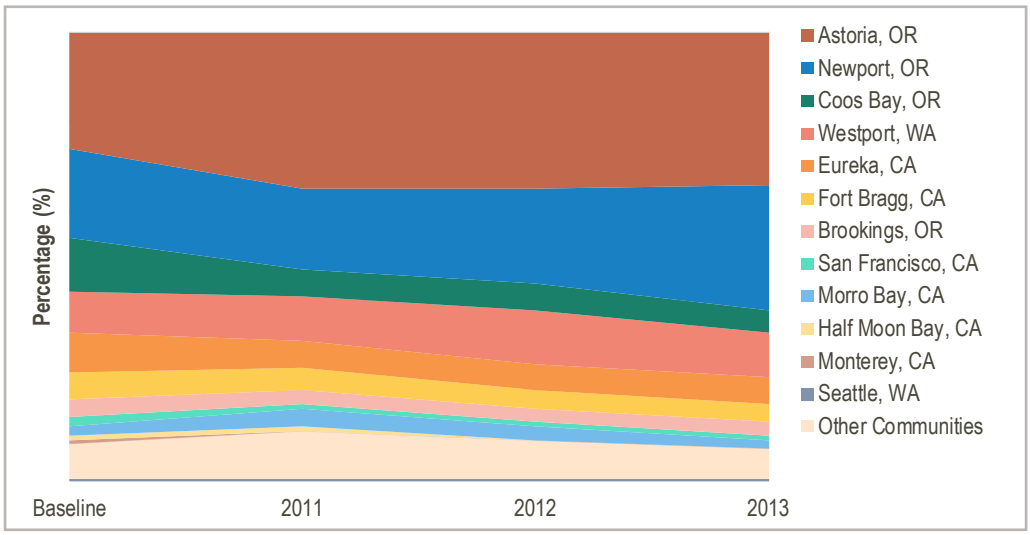


Figure 4.14. Regional Quotient (VALUE) for communities highly engaged in the shore-based Pacific Coast Groundfish Trawl IFQ Program for all years from the Baseline (2008-2010) through 2013.

Local Quotient

The community Local Quotient is the percentage of the IFQ groundfish trawl species landed in a community out of the total amount of all species landed within that community. It is an indicator of the contribution in pounds or value of IFQ groundfish trawl species to the overall landings within a community. Figure 4.15 and Figure 4.16 show the Local Quotient in both pounds and value, respectively, from the Baseline to 2013.

While the Local Quotient for pounds landed for Newport and Astoria, OR and Westport, WA has remained relatively stable from the Baseline through 2013, most communities have seen their share of IFQ groundfish trawl species decrease (Figure 4.15).

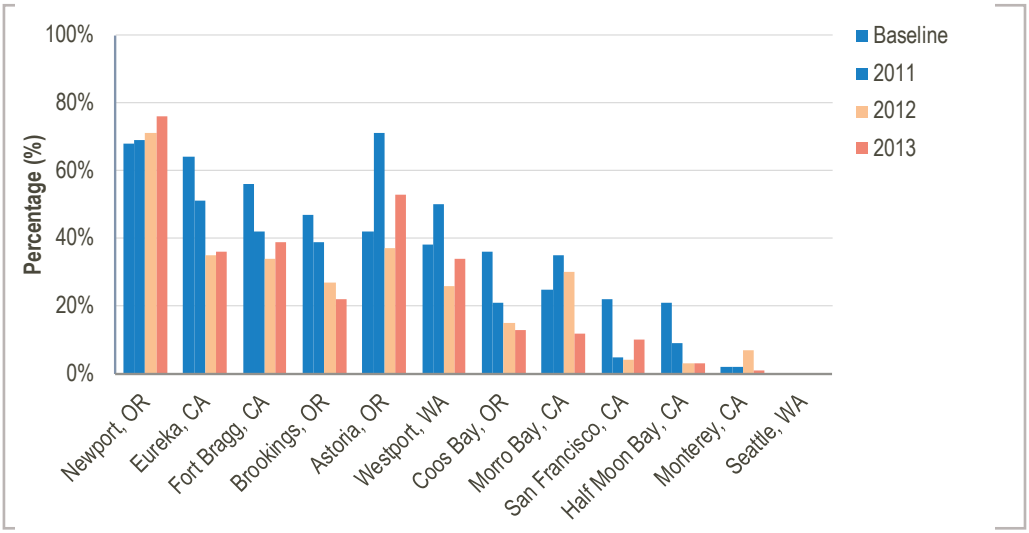


Figure 4.15. Local Quotient (POUNDS) for communities highly engaged in the shore-based Pacific Coast Groundfish Trawl IFQ Program for all years from the Baseline (2008-2010) through 2013.

The Local Quotient for IFQ groundfish trawl species value landed decreased for most communities with the exception of Astoria and Newport, OR, both of which have seen an increase since implementation (Figure 4.16). Many West Coast fishermen who access the trawl groundfish fishery are also known to take advantage of the crab season, which has become a very high value fishery on the West Coast, and may account for some of the redirected fishing effort.

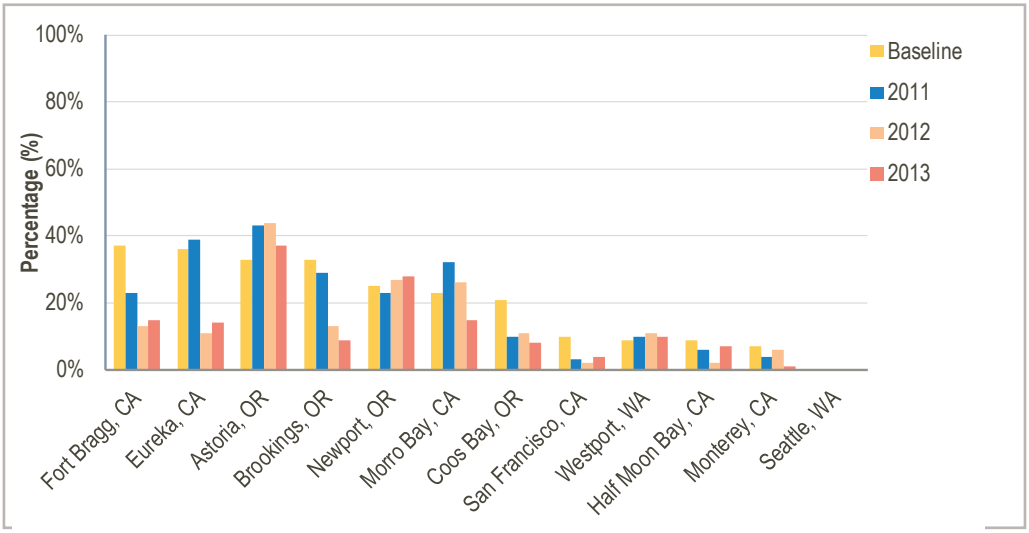


Figure 4.16. Local Quotient (VALUE) for communities highly engaged in the shore-based Pacific Coast Groundfish Trawl IFQ Program for all years from the Baseline (2008-2010) through 2013.

Community Social Vulnerability Indicators (CSVIs)

The two categories of CSVIs discussed below include social vulnerability and gentrification pressure vulnerability. The Social Vulnerability Indicators represent social factors that can shape either an individual's or community's ability to adapt to change (poverty, personal disruption, labor force structure, and population composition vulnerability). The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption and retiree migration).

Photo Credit: NOAA Fisheries

The Social Vulnerability Indicators for communities that were **highly engaged** in the shore-based Pacific Coast Groundfish IFQ Trawl Program for at least one year from the Baseline to 2013 are included in Table 4.6. Communities **highly engaged for all years** are highlighted. These communities have a wide range of populations. The majority of these communities have a low index score for population composition, with the exceptions of Fort Bragg and San Francisco, CA. Many of these communities have low index scores for labor force structure as well, excluding Coos Bay and Brookings OR and Ilwaco, WA. These latter three communities are relatively isolated rural communities along the coasts of Washington and Oregon. The **highly engaged** communities for all years seem to show higher vulnerabilities according to their poverty and housing characteristics indicators, as compared to those communities that were **highly engaged** with the shore-based Pacific Coast Groundfish IFQ Trawl Program for fewer than all years. These communities include important centers of fishing activity in Washington, Oregon and California.

Table 4.6. Social Vulnerability Indicators for communities highly engaged in the shore-based Pacific Coast Groundfish Trawl IFQ Program for one or more years from the Baseline (2008-2010) through 2013.

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
Astoria, OR	9,518	Moderate	Low	Med High	Low	Med High
Brookings, OR	6,334	Low	Low	Low	Med High	Med High
Coos Bay, OR	15,982	Moderate	Low	Moderate	Med High	Med High
Eureka, CA	27,037	Med High	Low	Med High	Low	Med High
Fort Bragg, CA	7,259	Med High	Med High	Med High	Low	Moderate
Half Moon Bay, CA	11,555	Low	Moderate	Low	Low	Low
Monterey, CA	27,939	Low	Low	Low	Low	Low
Morro Bay, CA	10,322	Low	Low	Low	Moderate	Moderate
Newport, OR	10,013	Moderate	Low	Moderate	Moderate	Med High
San Francisco, CA	817,501	Low	Med High	Moderate	Low	Low
Seattle, WA	624,681	Low	Low	Low	Low	Moderate
Westport, WA	1,701	Moderate	Low	Moderate	Moderate	High
Bellingham, WA	81,576	Moderate	Low	Moderate	Low	Med High
Chinook, WA	224	Low	Low	Moderate	Med High	N/A
Crescent City, CA	7,470	High	Moderate	High	High	Med High
Ilwaco, WA	1,074	Low	Low	Med High	Med High	Med High

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront (urban sprawl, housing disruption and retiree migration). Gentrification Pressure Vulnerability Indicators for communities that were **highly engaged** in the Pacific Coast Groundfish Trawl IFQ Program for at least one year from the Baseline (2008-2010) through 2013 are included in Table 4.7. Communities **highly engaged for all years** are highlighted. The Housing Disruption Index showed moderate to medium-high vulnerability for many of the communities that were **highly engaged** in the fishery for at least one year. The Retiree Migration Index shows a wide range of vulnerability for communities participating in this fishery, though Morro Bay, CA and Coos Bay, OR show moderate to medium-high retiree migration vulnerability, respectively. The Urban Sprawl Index generally shows low vulnerability for this fishery's communities, though California communities and Seattle, WA show moderate to high urban sprawl vulnerability.

Table 4.7. Gentrification Pressure Vulnerability Indicators for communities highly engaged in the shore-based Pacific Coast Groundfish Trawl IFQ Program for one or more years from the Baseline (2008-2010) through 2013.

Community	Housing Disruption	Retiree Migration	Urban Sprawl
Astoria, OR	Moderate	Low	Low
Brookings, OR	Low	Med High	Low
Coos Bay, OR	Moderate	Med High	Low
Eureka, CA	Med High	Low	Low
Fort Bragg, CA	High	Low	Low
Half Moon Bay, CA	Low	Low	High
Monterey, CA	Low	Low	Med High
Morro Bay, CA	Med High	Moderate	Moderate
Newport, OR	Low	Moderate	Low
San Francisco, CA	Med High	Low	High
Seattle, WA	Low	Low	Med High
Westport, WA	Low	Moderate	Low
Bellingham, WA	Low	Low	Moderate
Chinook, WA	N/A	Moderate	Low
Crescent City, CA	Low	Med High	Low
Ilwaco, WA	Low	Moderate	Low

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

Regional Summary

Those communities that were highly engaged in one or more catch share programs are presented in Table 4.8 with the number of years of high engagement within each program including the Baseline. Overall, there were 25 communities on the West Coast that were engaged for at least one or more years in either or both IFQ programs. Of those 25 communities, 14 were highly engaged for at least one year in both programs. There were five communities that were highly engaged for all years for both programs: Coos Bay and Newport, OR; Eureka and Fort Bragg, CA; and Seattle and Westport, WA.

Table 4.8. Number of years Pacific Coast communities were highly engaged in a catch share program from the Baseline through 2013.

Community	Pacific Coast Sablefish Permit Stacking Program	Pacific Coast Groundfish Trawl IFQ (Shore-Based)
Astoria, OR	13	All
Bellingham, WA	All	3
Bodega Bay, CA	1	-
Brookings, OR	6	All
Chinook, WA	4	1
Coos Bay, OR	All	All
Crescent City, CA	All	2
Eureka, CA	All	All
Florence, OR	3	-
Fort Bragg, CA	All	All
Half Moon Bay, CA	-	All
Ilwaco, WA	9	1
Lake Forest Park, WA	1	-
Monterey, CA	-	All
Morro Bay, CA	3	All
Moss Landing, CA	7	-
Neah Bay, WA	All	-
Newport, OR	All	All
Port Angeles, WA	5	-
Port Orford, OR	All	-
Reedsport, OR	1	-
San Francisco, CA	9	All
Seattle, WA	All	All
Westport, WA	All	All
Winchester Bay, OR	1	-

The catch share programs implemented on the West Coast include a large number of communities throughout the region. Only a few communities are highly engaged in both IFQ programs and have remained so since implementation through 2013; this is likely because there are fewer communities that were highly engaged in the Pacific Coast Groundfish Trawl IFQ Program. There are several communities that have seen their engagement decline since the Baseline period. This decline may have occurred for a variety of reasons and at this time we cannot speculate as to the cause of decreases or increases in specific fisheries' engagement levels. It must be remembered that these programs are focused on a few species and many of the communities involved may participate in many other fisheries.

Photo Credit: NOAA Fisheries

Alaska Region

Regional Overview

Six catch share programs have been implemented in the Alaska Region. These programs govern federal fisheries for halibut and sablefish, pollock and other groundfish species caught in the Bering Sea and Aleutian Islands (BSAI), BSAI crab species and Central Gulf of Alaska rockfish. An additional catch share program, the Western Alaska Community Development Quota (CDQ) Program, also governs catch allocations for many of these species; however, due to its unique nature, this program is not covered in this report. The Alaska Region section of this report primarily includes communities within the state of Alaska; however, fisheries participants from Washington, Oregon and California, as well as other states, play a significant role in harvesting the species managed by these catch share programs. Federal fisheries in the North Pacific are regulated by the North Pacific Fishery Management Council (NPFMC), NOAA Fisheries and the International Pacific Halibut Commission (IPHC; halibut only).

Regional Catch Share Programs

- Alaska Halibut and Sablefish IFQ
- American Fisheries Act Pollock Cooperatives
- Bering Sea and Aleutian Islands Crab Rationalization Program (2013/2014 season)
- Non-Pollock Trawl Catcher/Processor Groundfish Cooperatives (Amendment 80)
- Central Gulf of Alaska Rockfish Cooperatives
- Western Alaska Community Development Quota (CDQ)*

*Not included in this report.

The first catch share program in the North Pacific was the Alaska Halibut and Sablefish Individual Fishing Quota Program implemented in 1995, followed by the American Fisheries Act (AFA) Pollock Cooperatives Program in 1999 for the catcher/processor sector and in 2000 for the catcher vessel and mothership sectors. The Bering Sea and Aleutian Islands (BSAI) Crab Rationalization Program was then implemented in 2005, the Central Gulf of Alaska Rockfish Cooperatives Pilot Program in 2007 (later replaced by the Central Gulf of Alaska Rockfish Cooperatives Program in 2012), and the Non-Pollock Trawl Catcher/Processor Groundfish Cooperatives (aka Amendment 80) Program in 2008. Summary statistics for these programs are found in Table 5.1.

Table 5.1. Summary of Alaska Region catch share programs in 2013.

	Alaska Halibut and Sablefish IFQ					
	Halibut	Sablefish	American Fisheries Act Pollock Cooperatives	Bering Sea and Aleutian Islands Crab Rationalization Program (2013/2014 season)	Non-Pollock Trawl Catcher/ Processor Groundfish Cooperatives (Amendment 80)	Central Gulf of Alaska Rockfish Cooperatives
Ex-vessel revenue	$101,162,000	$72,688,000	$451,631,833	$204,785,772	$220,396,418	$13,658,914
Landings *	20,831,308	25,479,833	2,423,576,920	63,908,880	521,225,698	36,234,609
Number of processors and/or catcher/processor vessels	88	62**	29**	30	18**	17**
Number of entities holding share	2,570***	845***	127****	501***	27**	57*****
Number of vessels with landings of catch share species	937	331	100	75	18	57

*Landed weight is reported in net pounds (head and gut removed) for the Halibut and Sablefish IFQ Program, and in retained round pounds for all other programs, **Includes catcher/processor vessels, ***Quota Shareholders, ****Eligible Vessels, *****License Limitation Program (LLP) licenses

Source: NOAA National Performance Indicators for Fisheries database

Regional Overview *(Continued)*

With the exception of Anchorage, Fairbanks and Juneau, all Alaska communities are smaller than 10,000 people; 65 percent have fewer than 400 residents. In general, Alaska communities are either dominated by white residents or by Alaska Native residents. The presence of a large number of federally recognized Alaska Native tribes, most of which are engaged predominantly in subsistence harvests in addition to commercial and recreational fishing, is unique among other regions in the U.S. A significant number of Alaska communities are heavily dependent on fishing activities to support their local economy and cultural traditions. Most Alaska communities are home to individual fishermen who possess fishing permits, own fishing boats, or own quota shares. Over one third of all coastal communities are also home to fish processing plants. Many non-Alaskans, often hailing from Washington and Oregon, also participate in commercial fisheries in the state. Across the state, communities in rural areas have been experiencing significant out-migration and population declines in recent decades (Himes-Cornell and Hoelting 2015). This decline has been linked to the loss of active fishing businesses and fishing-related employment opportunities (Donkersloot 2005; Carothers 2008; Langdon 2008; Carothers 2010; Carothers et al. 2010).

Alaska Halibut Individual Fishing Quota Program

Program Overview

Although Alaska halibut and sablefish are both part of the Alaska Halibut and Sablefish Individual Fishing Quota (IFQ) Program implemented in 1995, the indicators for each species are considered separately in this report as they are managed separately within the same catch share program. The present section specifically refers to the halibut IFQ portion of this catch share program.

Alaska halibut are primarily found on or near bottom habitat. The fishery runs in the Gulf of Alaska and the Bering Sea, with commercial landings concentrated in the central Gulf of Alaska. Alaska halibut in the North Pacific are caught by commercial catcher vessels, catcher/processor vessels, recreational charter fishing vessels, private anglers, and subsistence fishermen. The International Pacific Halibut Commission (IPHC), the NPFMC and NOAA Fisheries are each responsible for managing different aspects of the Alaska halibut fishery.

The halibut IFQ portion of the Alaska Halibut and Sablefish IFQ Program specifically manages the longline halibut fishery. Quota shares for Alaska halibut were allocated based on historic participation of individual fishermen or non-individual entities (e.g.,

Table 5.2. Fishing Engagement Index scores of communities highly engaged in the halibut IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for one or more years from the Baseline (1992-1994) through 2013.

Community	Baseline	1995	1996	1997	1998	1999	2000	2001
Kodiak, AK	5.789	5.796	5.173	5.252	3.770	4.183	4.364	3.877
Homer, AK	4.379	3.806	3.889	3.738	5.914	5.728	5.058	6.142
Petersburg, AK	2.392	2.210	2.306	1.802	1.801	1.544	1.243	1.549
Seward, AK	2.371	2.603	2.786	2.630	2.963	3.126	2.642	2.586
Sitka, AK	2.249	2.860	2.841	2.712	2.616	1.914	2.220	1.849
Unalaska/Dutch Harbor, AK	1.626	2.390	2.231	3.115	1.654	2.373	3.704	2.922
Bellingham, WA	1.232	0.982	1.705	1.554	1.591	1.195	1.122	1.107
Seattle, WA	1.225	0.645	0.628	0.555	0.160	0.023	-0.015	-0.350
Kenai, AK	1.129	0.318	0.019	0.069	0.081	0.021	0.114	0.084
Juneau, AK	0.522	1.321	1.517	1.343	1.654	1.888	1.941	1.314
Cordova, AK	0.514	0.681	0.724	0.943	0.868	0.610	0.837	0.796
Hoonah, AK	0.205	0.932	1.394	1.346	1.032	0.785	0.669	0.865
Yakutat, AK	0.069	0.316	0.381	0.810	0.644	0.622	0.426	0.650
Sand Point, AK	0.044	0.036	0.085	0.225	0.102	0.026	0.260	0.276

Note: Highlighted cells indicate high engagement. Table continues at the bottom of the next page and is meant to be viewed as a spread.

partnerships, corporations) in the halibut fishery. The primary objectives of the Alaska Halibut and Sablefish IFQ Program for the halibut fishery were to eliminate gear conflicts, address safety concerns, and improve product quality and value.

Since the Alaska Halibut and Sablefish IFQ Program was implemented, the annual allocation of halibut catch has been split between active commercial halibut fishermen and other entities. From the inception of the IFQ program, between 20 percent and 100 percent of the halibut total allowable catch in areas 4B, 4C, 4D, and 4E (much of the Bering Sea and Aleutian Islands) has been directed towards six Community Development Quota (CDQ) entities.[1] In 2014, the Alaska halibut portion of the IFQ program was modified to allow recreational charter vessel operators to lease commercial IFQs in order to augment the halibut available for their clients.[2]

The NPFMC developed and modified the Alaska Halibut and Sablefish IFQ Program with the goal of maintaining the owner-operator characteristics of the fleet. Only individuals are able to purchase catcher vessel quota shares. Non-individual entities (e.g., partnerships and corporations) are only allowed to purchase quota shares designed for catcher/processor vessel operations. In addition, there are owner-on-board requirements aimed at limiting the use of hired skippers in the harvest of catcher vessel IFQs. Quota shares and pounds are also area and vessel-size-class specific, to maintain a diverse fleet. Consolidation is limited through caps on quota ownership and quota usage, as well as through the creation of small quota share blocks to provide opportunities for small operations and new entrants to participate in the fishery.

The primary market for Alaska halibut is human consumption. Fish are delivered after being headed and gutted and typically sold to consumers either fresh or frozen as fillets, steaks, or fletches (AFSC, 2016). Only longline gear is used in the halibut IFQ program fisheries. There is also a charter vessel and private angler recreational fishery and an important subsistence fishery for halibut in Alaska.

Trends for Top Participating Communities

Commercial Engagement

The program-specific Fishing Engagement Index scores for the halibut IFQ portion of the Halibut and Sablefish IFQ Program are presented in Table 5.2. The index is an indicator of the importance of the halibut IFQ fishery in a community relative to other communities in the region. It is a measure of the presence of commercial halibut IFQ fishing through fishing activity including value, pounds, processors and vessels with landings in the halibut fishery.[3] There were 14 communities that were **highly engaged** (1.0 standard deviation above the mean) in the halibut IFQ fishery for at least one year from the Baseline period (1992-1994) through 2013.

Table 5.2. (*continued*)

2002	**2003**	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
3.425	3.627	3.987	4.128	4.312	4.789	4.870	4.213	4.166	5.036	5.265	4.378
6.127	5.656	5.429	5.447	5.516	5.377	5.391	6.609	6.540	5.627	5.587	5.757
1.596	1.608	1.791	2.026	1.885	1.545	1.533	1.425	1.418	1.327	1.589	1.809
3.060	3.342	3.216	2.540	2.694	2.775	2.794	2.651	2.825	2.680	2.661	3.272
1.886	2.253	2.549	2.702	2.652	2.653	2.405	2.035	2.080	2.026	1.917	2.146
2.964	2.849	2.208	2.269	1.999	2.034	1.983	1.088	1.111	1.876	1.745	1.470
0.879	0.602	0.746	0.585	0.898	0.779	0.817	-0.374	0.164	0.225	0.264	0.215
-0.345	-0.353	-0.346	-0.225	-0.219	-0.429	-0.314	-0.374	-0.394	-0.288	-0.271	-0.270
0.072	0.015	0.057	-0.021	-0.049	0.032	0.069	0.186	0.011	0.032	0.071	0.117
1.498	1.618	1.596	1.939	1.888	1.515	1.348	1.753	1.733	1.505	1.526	1.853
0.930	0.955	1.010	1.061	0.938	0.957	1.014	1.149	0.852	1.093	0.734	0.940
0.530	0.648	1.090	0.630	0.617	0.481	0.439	0.308	0.321	0.488	0.790	0.499
0.368	0.183	0.247	0.938	0.815	0.984	0.702	0.726	0.708	0.689	0.674	1.081
0.922	1.219	1.563	1.261	1.020	0.757	1.235	0.507	0.765	1.169	0.801	0.477

Note: Highlighted cells indicate high engagement. Table begins at the bottom of the previous page and is meant to be viewed as a spread.

[1] For more information about the Western Alaska CDQ Program, please refer to the following website: https://alaskafisheries.noaa.gov/cdq/.
[2] For more information about this catch sharing plan, please refer to the following website: http://cdn1.safmc.net/Library/pdf/SGAM20A_FINAL.pdf.
[3] Vessels are assigned to communities based on the owner address on their Alaska Commercial Fisheries Entry Commission vessel registration.

Of the 14 communities found in Table 5.2, six communities were **highly engaged for all years** from the Baseline through 2013. These are highlighted (Figure 5.1). Homer and Kodiak, AK are the communities with the highest engagement scores, despite a decrease in Kodiak's engagement over time. Conversely, Homer, AK showed a significant increase in engagement after the first few years of the program, experiencing large increases in engagement in 1998 and 2009. The engagement score was fairly stable for the remaining four communities.

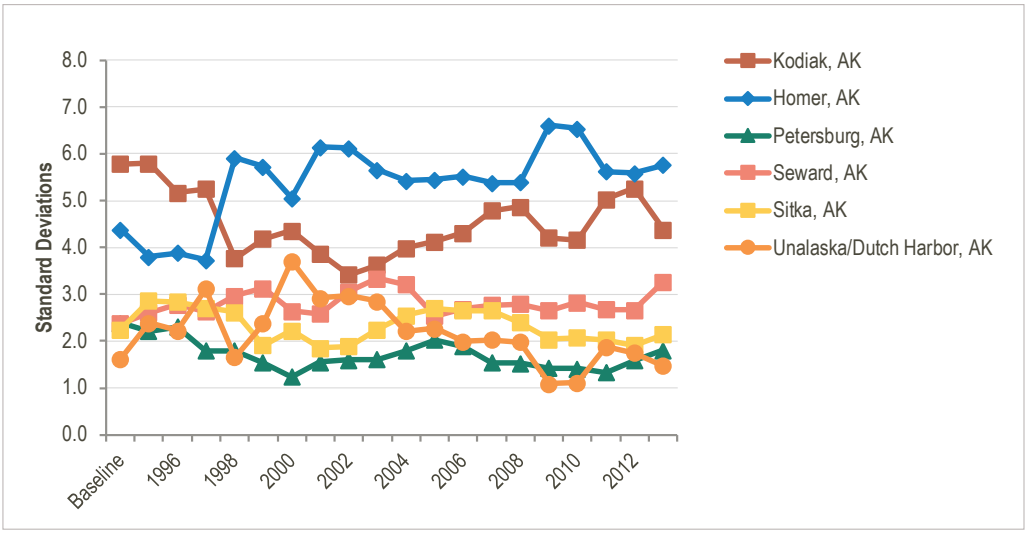


Figure 5.1. Fishing Engagement Index scores of communities highly engaged in the halibut IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for all years from the Baseline (1992-1994) through 2013.

Only Homer and Seward, AK demonstrated an overall increase in the halibut commercial engagement score from the Baseline through 2013 (Figure 5.2). However, while Homer, AK showed a significant increase, Seward's engagement score remained relatively stable during this time period.

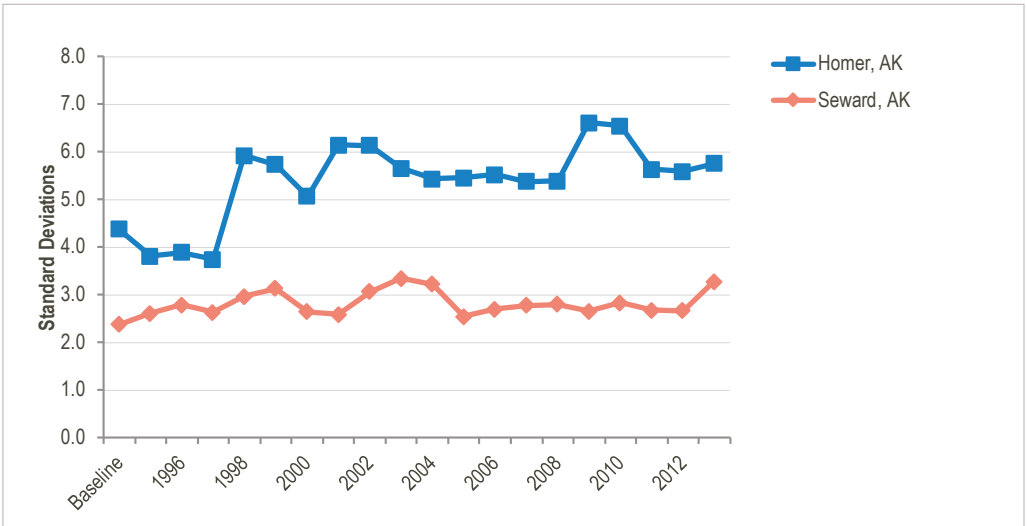


Figure 5.2. Fishing Engagement Index scores of communities highly engaged in the halibut IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for all years with increasing engagement from the Baseline (1992-1994) through 2013.

Communities that demonstrated a decreasing commercial halibut engagement score from the Baseline through 2013 are depicted in Figure 5.3. The decreasing engagement scores highlight the declining involvement of Unalaska/Dutch Harbor in the halibut fishery, particularly after reaching a peak in 2000. Although both Sitka and Petersburg, AK showed declines in their index score, their engagement remained relatively stable over time. Although there is variation and an ultimate decline in Kodiak's engagement, this community consistently remained the most engaged of those with decreasing engagement.

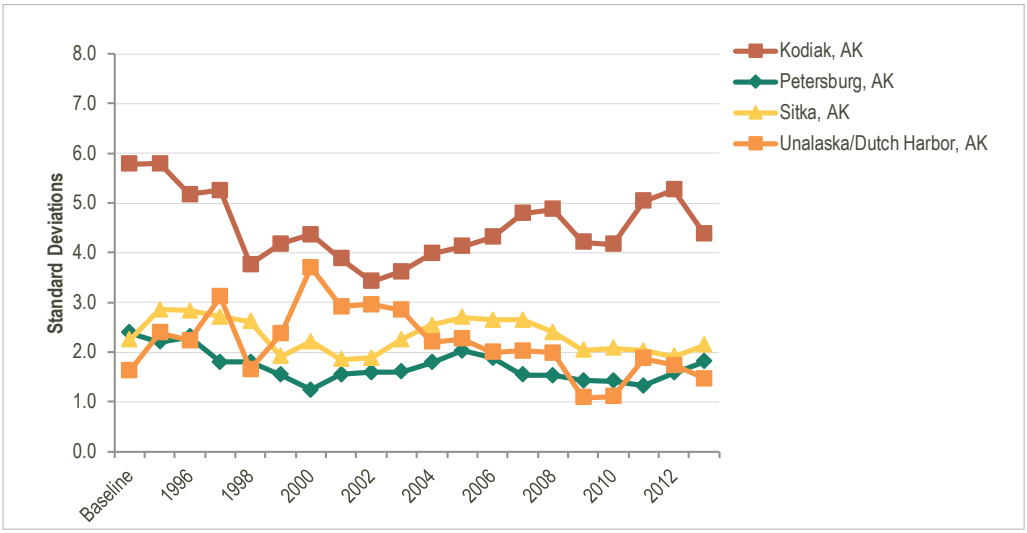


Figure 5.3. Fishing Engagement Index scores of communities highly engaged in the halibut IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program with decreasing engagement from the Baseline (1992-1994) through 2013.

Communities that were **highly engaged** with the halibut IFQ fishery for fewer than all years are depicted in Figure 5.4. Independent of the Baseline year, Juneau, AK was **highly engaged for all years**. Cordova, Sand Point and Yakutat, AK each had increasing engagement scores. The remaining communities depicted in Figure 5.4 showed substantial declines in engagement.

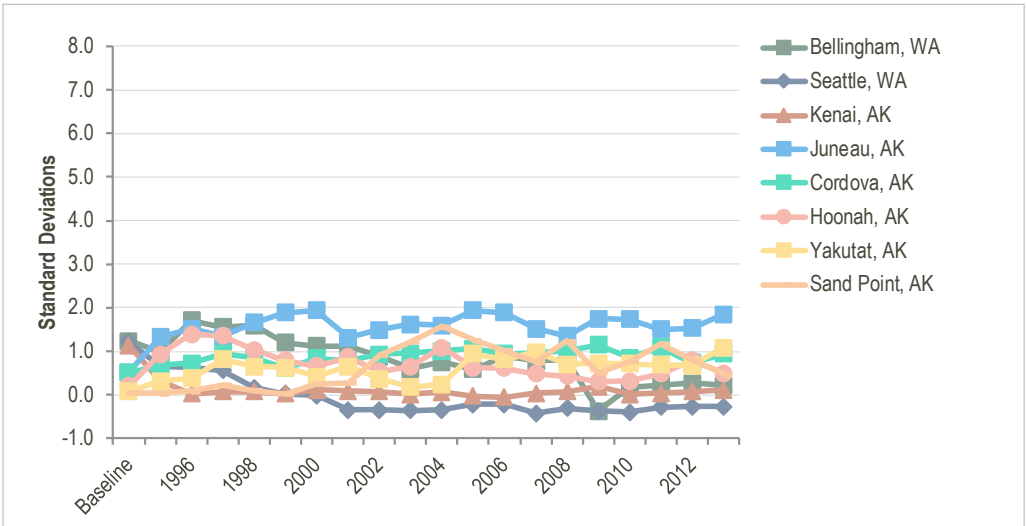


Figure 5.4. Fishing Engagement Index scores of communities highly engaged in the halibut IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for fewer than all years from the Baseline (1992-1994) through 2013.

Regional Quotient

Another measure of a community's involvement in the halibut IFQ portion of the Alaska Halibut and Sablefish IFQ Program is its Regional Quotient. Regional Quotient is the proportion of IFQ halibut landed within a community out of the total amount of IFQ halibut landed within the Alaska region. It is an indicator of the percent contribution in pounds or value of IFQ halibut landed in that community relative to the regional fishery. The Regional Quotient is reported individually only for those communities that were **highly engaged for all years** from the Baseline through 2013. All other communities that landed IFQ halibut are grouped as "Other Communities." Figures 5.5 and 5.6 show the Regional Quotient both in pounds and value, respectively, from the Baseline to 2013.

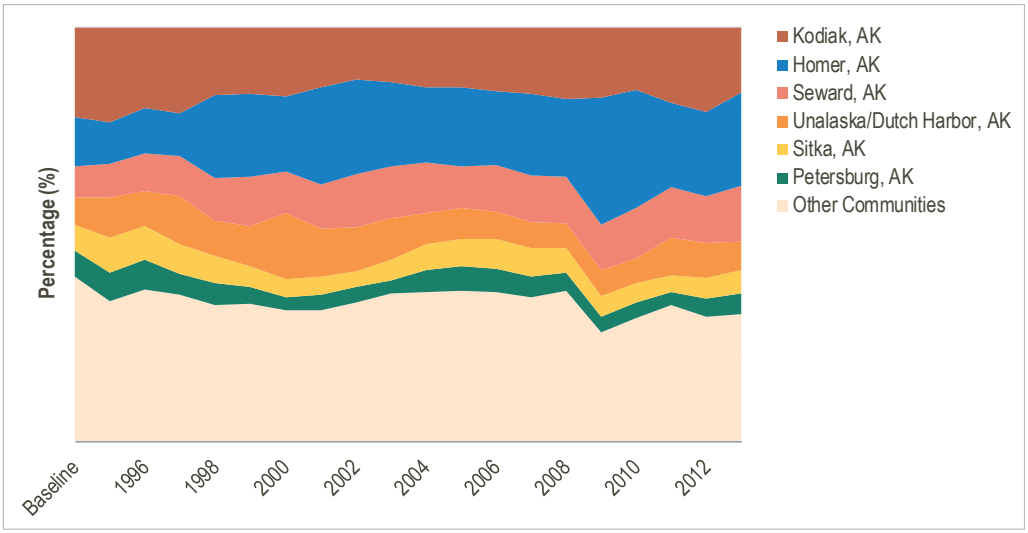


Figure 5.5. Regional Quotient (POUNDS) for communities highly engaged in the halibut IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for all years from the Baseline (1992-1994) through 2013.

The dominant commercial IFQ halibut communities from the Baseline onward have been Kodiak and Homer, AK, accounting for almost 35 percent of the regional pounds landed (Figure 5.5). Homer, AK saw its Regional Quotient for pounds landed increase over time, while the Regional Quotient for Kodiak, AK has decreased slightly since the implementation of the Halibut IFQ Program in 1995. However, the Regional Quotient for the "Other Communities" that were not **highly engaged** for all years accounted for approximately 40 percent of the regional pounds landed in the Baseline years. This decreased to approximately 30 percent of the regional pounds landed in 2013.

Similar to the Regional Quotient for pounds landed, the dominant communities of Kodiak and Homer, AK represented 32 percent of the regional value landed in the Baseline years (Figure 5.6). This increased to approximately 38 percent of the regional value landed in 2013. The **highly engaged** communities represented almost 60 percent of the regional value landed in the Baseline years, which increased to approximately 70 percent of the regional value landed in 2013. While Seward, AK saw a near doubling of its Regional Quotient, Unalaska/Dutch Harbor, Sitka, and Petersburg, AK all showed a small decrease in the Regional Quotient percentage from the Baseline through 2013.

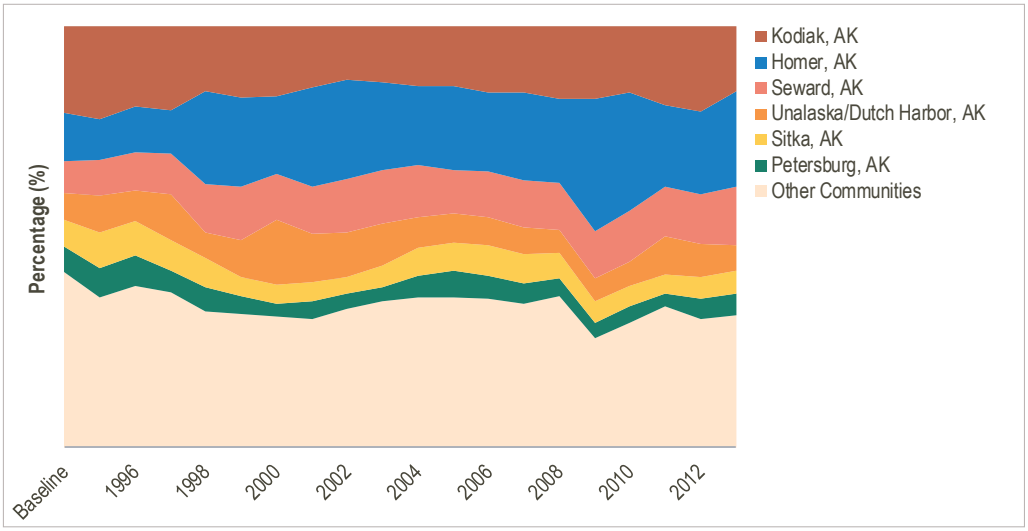


Figure 5.6. Regional Quotient (VALUE) for communities highly engaged in the halibut IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for all years from the Baseline (1992-1994) through 2013.

Local Quotient

The community Local Quotient is the percentage of IFQ halibut landed within a community out of the total amount of all species landed within that community. It is an indicator of the contribution in value or pounds of IFQ halibut to the overall landings in a community. Figure 5.7 and Figure 5.8 show the Local Quotient both in pounds and value from the Baseline to 2013.

While the community Local Quotient of IFQ halibut pounds landed compared to other species has increased dramatically for Homer, AK, the percentage of IFQ halibut pounds landed in Sitka and Seward, AK have notably decreased. The percentage of IFQ halibut pounds landed in the other **highly engaged** communities has declined, with some fluctuation, particularly in Petersburg, AK (Figure 5.7).

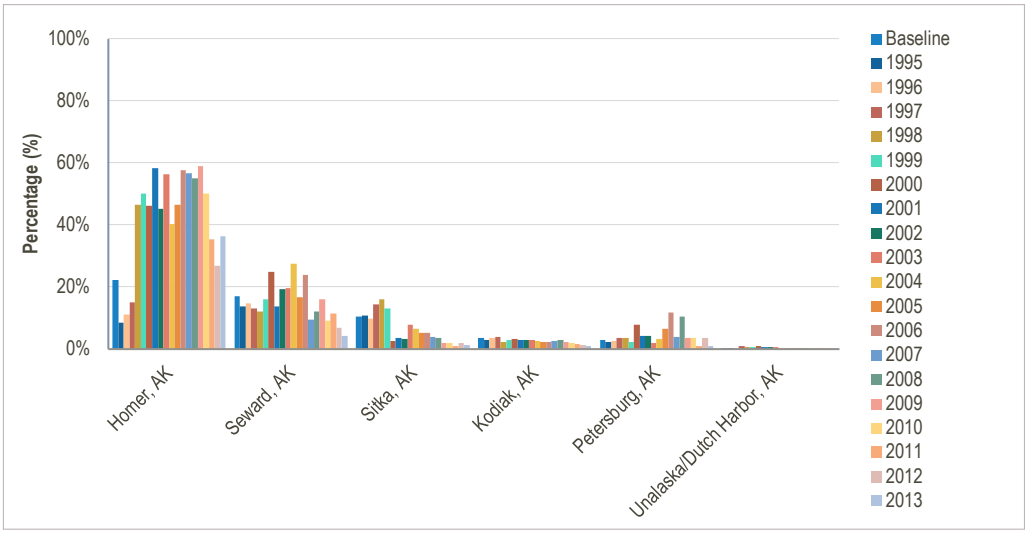


Figure 5.7. Local Quotient (POUNDS) for communities highly engaged in the halibut IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for all years from the Baseline (1992-1994) through 2013.

Similarly, the percentage of IFQ halibut value landed in Homer, AK compared to other species landed in the community increased dramatically after the first few years of the program (Figure 5.8). The percentages in Figure 5.8 are different from those in Figure 5.7 because they reflect differences in the relative price of halibut with the other species landed in the community and since halibut is a high value species, the Local Quotient for value landed in a community is generally higher than the Local Quotient for pounds landed. The Local Quotient for value landed increased in the first 10 years of the program for both Seward and Petersburg, AK, which is a result of shifting from a primarily frozen market to a higher value fresh market after program implementation. In recent years, however, it has decreased. The remaining communities showed a relatively consistent increase in the share of value of IFQ halibut landings over the first 10 years of the program, followed by a decline in relative share of value in more recent years.

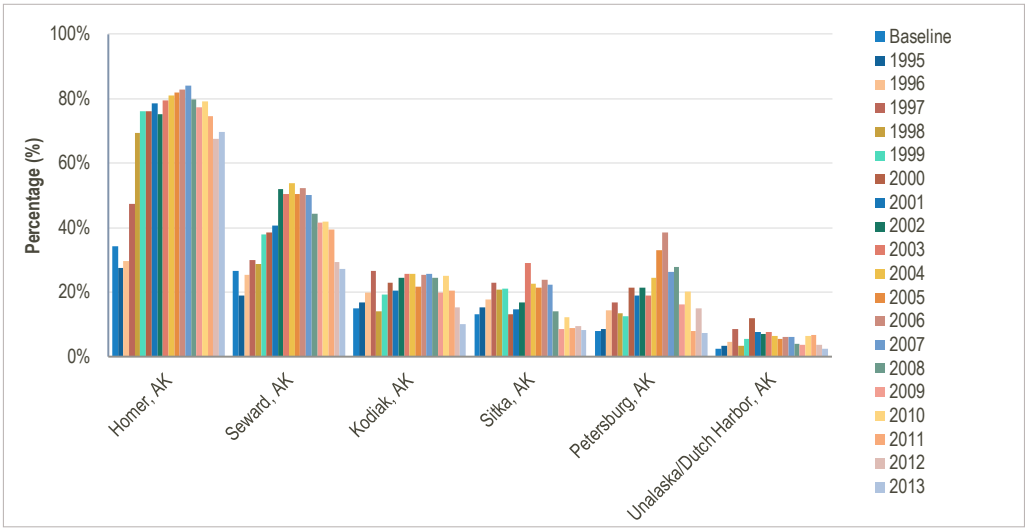


Figure 5.8. Local Quotient (VALUE) for communities highly engaged in the halibut IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for all years from the Baseline (1992-1994) through 2013.

Community Social Vulnerability Indicators (CSVIs)

The two categories of CSVIs discussed below include social vulnerability and gentrification pressure vulnerability. The Social Vulnerability Indicators represent social factors that can shape either an individual's or community's ability to adapt to change (poverty, personal disruption, labor force structure and population composition vulnerability). The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption and retiree migration).

The Social Vulnerability Indicators for communities that were **highly engaged** in the halibut IFQ portion of the Alaska Halibut and Sablefish IFQ Program for at least one year from the Baseline (1992-1994) through 2013 are included in Table 5.3. Communities **highly engaged for all years** are highlighted. These communities are in Alaska and have populations of fewer than 10,000. Hoonah, AK ranked moderate to highly vulnerable on all five Social Vulnerability Indicators followed by Sand Point, AK, which ranked moderately to highly vulnerable on four vulnerability indicators. The majority of communities have a low index score for personal disruption, population composition, poverty, and labor force structure indicators. A substantial deviation from this pattern occurs for the Housing Characteristics Index, for which all communities scored moderate or higher vulnerability. The Housing Characteristics Index is comprised of variables that highlight the value of housing and structural vulnerability of building materials. The communities **highly engaged for all years** of the program do not seem to be experiencing a higher number of vulnerabilities than those that were **highly engaged** for fewer than all years. Of those that were **highly engaged** for fewer than all years, only those communities with small populations (fewer than 10,000) score higher on a greater number of vulnerability indicators.

Table 5.3. Social Vulnerability Indicators for communities highly engaged in the halibut IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for one or more years from the Baseline (1992-1994) through 2013.

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
Homer, AK	5,150	Low	Low	Moderate	Low	Med High
Kodiak, AK	6,269	Low	Med High	Moderate	Low	Med High
Petersburg, AK	2,987	Low	Low	Moderate	Low	Med High
Seward, AK	2,722	Low	Low	Low	Med High	Med High
Sitka, AK	8,945	Low	Low	Low	Low	Moderate
Unalaska/ Dutch Harbor, AK	4,362	Moderate	Med High	Low	Low	Moderate
Bellingham, WA	81,576	Moderate	Low	Moderate	Low	Med High
Cordova, AK	2,604	Low	Low	Low	Low	Med High
Hoonah, AK	722	Med High	Moderate	Med High	Moderate	High
Juneau, AK	31,897	Low	Low	Low	Low	Moderate
Kenai, AK	7,251	Low	Low	Low	Low	Med High
Sand Point, AK	1,238	Moderate	High	Med High	Low	Med High
Seattle, WA	624,681	Low	Low	Low	Low	Moderate
Yakutat, AK	569	Low	Moderate	Low	Low	Med High

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront (urban sprawl, housing disruption and retiree migration). Gentrification Pressure Vulnerability Indicators for communities that were **highly engaged** in the halibut IFQ portion of the Alaska Halibut and Sablefish IFQ Program for at least one year from the Baseline (1992-1994) through 2013 are included in Table 5.4. Communities **highly engaged for all years** are highlighted. The Housing Disruption Index showed low vulnerability for all communities that were **highly engaged** in the fishery for at least one year. The Retiree Migration and Urban Sprawl Indicators were not calculated for Alaska communities due to data limitations and limited applicability of the indicators to Alaska.

Table 5.4. Gentrification Pressure Vulnerability Indicators for communities highly engaged in the halibut IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for one or more years from the Baseline (1992-1994) through 2013.

Community	Housing Disruption	Retiree Migration	Urban Sprawl
Homer, AK	Low	N/A	N/A
Kodiak, AK	Low	N/A	N/A
Petersburg, AK	Low	N/A	N/A
Seward, AK	Low	N/A	N/A
Sitka, AK	Low	N/A	N/A
Unalaska/Dutch Harbor, AK	Low	N/A	N/A
Bellingham, WA	Low	Low	Moderate
Cordova, AK	Low	N/A	N/A
Hoonah, AK	Low	N/A	N/A
Juneau, AK	Low	N/A	N/A
Kenai, AK	Low	N/A	N/A
Sand Point, Alaska	Low	N/A	N/A
Seattle, WA	Low	Low	Med High
Yakutat, AK	Low	N/A	N/A

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

Photo Credit: NOAA Fisheries/Kristin Hoelting

Alaska Sablefish Individual Fishing Quota Program

Program Overview

Although Alaska sablefish and halibut are both part of the Alaska Halibut and Sablefish Individual Fishing Quota (IFQ) Program implemented in 1995, the indicators for each species are considered separately in this report as they are managed separately within the same catch share program. The present section specifically refers to the IFQ Sablefish portion of this catch share program.

Sablefish in the North Pacific are primarily found on or near bottom habitat. The fishery runs along the coast of the Gulf of Alaska and the Aleutian Islands as well as most of the Eastern Bering Sea. Commercial landings are concentrated in the central Gulf of Alaska.

The sablefish IFQ portion of the Alaska Halibut and Sablefish IFQ Program specifically manages the fixed gear sablefish fishery. The primary objectives of the Alaska Halibut and Sablefish IFQ Program for the sablefish fishery were to eliminate gear conflicts, address safety concerns, and improve product quality and value. Quota shares for Alaska sablefish were allocated based on historic participation of individual fishermen in the sablefish fishery. Each year 20 percent of the Bering Sea and Aleutian Islands (BSAI) fixed gear total allowable catch of sablefish is allocated to the CDQ Program entities. The remaining catch is allocated to quota shareholders as annual IFQ pounds based on the number of quota shares owned.

Quota shareholders can be either individuals or non-individuals (e.g., corporations). However, quota shares do have specifications for use in particular geographical areas and on vessels in specific size classes. These conditions are intended to maintain a diverse fleet and limit the amount of sablefish caught in specific areas. Consolidation is also limited through the incorporation of ownership caps and small quota share blocks. This is intended to maintain opportunities for small operations and new entrants to participate in the fishery.

The primary market for Alaska sablefish is human consumption. Fish are sold primarily as frozen fillets in Japan and other niche Asian markets destined for high end restaurants, but there is a growing domestic market as well (AFSC 2016). Longline is the primary gear used to harvest sablefish, but pot gear has also recently been allowed due to whale depredation with longline gear. There is a very limited recreational fishery for sablefish in federal and state waters due to their deep depths.

Table 5.5. Fishing Engagement Index scores of communities highly engaged in the sablefish IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for one or more years from the Baseline (1992-1994) through 2013.

Community	Baseline	1995	1996	1997	1998	1999	2000	2001
Seward, AK	4.781	5.412	5.175	5.202	4.757	5.113	4.938	4.526
Kodiak, AK	3.704	2.599	2.776	2.602	2.492	2.614	2.424	2.519
Sitka, AK	2.447	3.092	3.437	3.188	3.351	3.389	3.572	3.224
Homer, AK	2.026	1.515	1.614	1.682	2.325	2.064	2.125	2.655
Petersburg, AK	1.622	0.801	0.987	0.724	0.695	0.728	0.791	0.823
Unalaska/Dutch Harbor, AK	0.905	1.561	1.463	1.946	1.503	1.259	1.522	1.658
Pelican, AK	0.845	1.040	0.171	0.069	-0.459	-0.175	0.027	0.154
Yakutat, AK	0.812	1.012	0.896	1.071	1.391	1.336	1.052	1.255
Cordova, AK	0.621	0.833	0.686	0.683	0.593	0.577	0.626	0.988
Juneau, AK	0.157	0.097	0.375	0.573	1.147	1.103	1.350	1.496
Hoonah, AK	0.116	0.533	0.866	1.236	1.476	0.740	0.822	0.870
Sand Point, AK	-0.189	-0.046	0.063	-0.087	0.038	0.012	-0.075	0.145

Note: Highlighted cells indicate high engagement. Table continues at the bottom of the next page and is meant to be viewed as a spread.

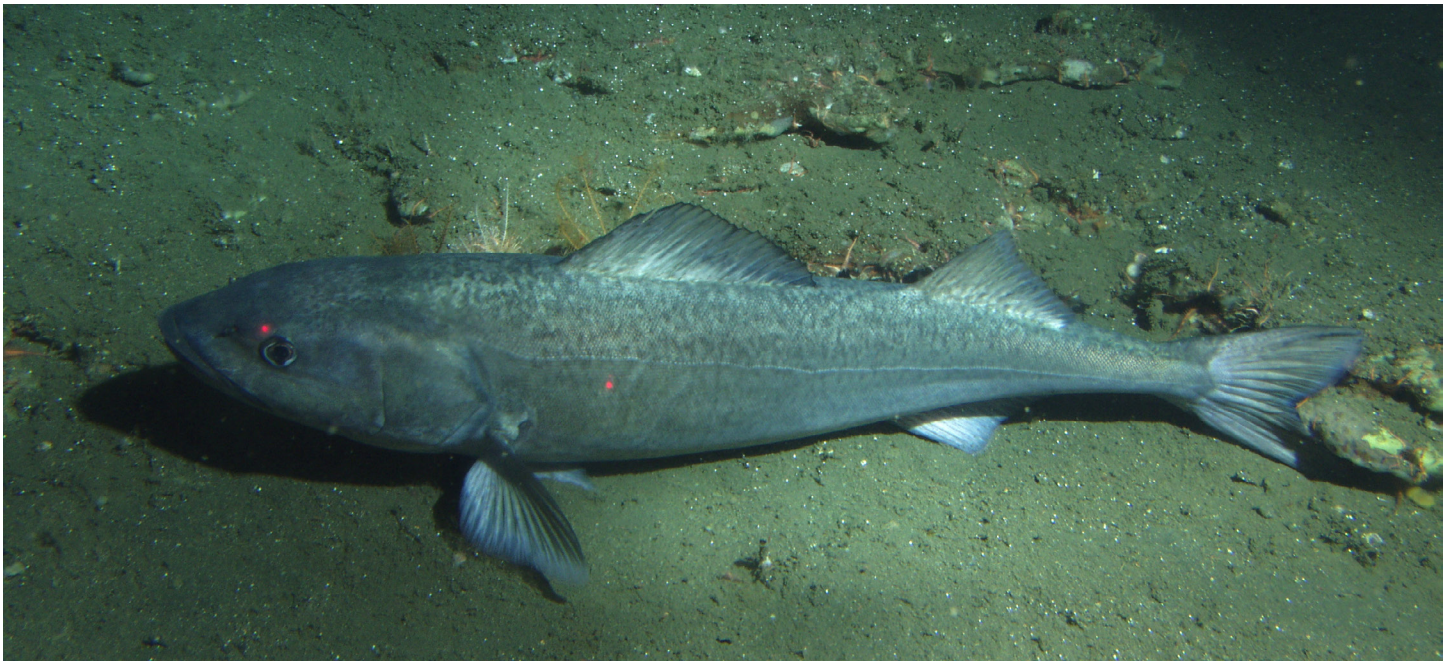


Photo Credit: NOAA/Rick Starr

Trends for Top Participating Communities

Commercial Engagement

The program-specific Fishing Engagement Index scores for the sablefish IFQ portion of the Alaska Halibut and Sablefish IFQ Program are presented in Table 5.5. The index is an indicator of the importance of sablefish IFQ fishing in a community relative to other communities. It is a measure of the presence of sablefish IFQ fishing in a community through fishing activity including pounds, value, permits, and dealers. There were 12 communities that were **highly engaged** (1.0 standard deviation above the mean) in the sablefish IFQ fishery for at least one year from the Baseline period (1992-1994) through 2013.

Table 5.5. (*continued*)

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
4.439	4.534	4.867	3.884	4.275	4.038	3.660	3.826	3.641	3.857	4.233	4.331
2.006	2.261	2.136	2.545	2.502	3.169	2.824	2.650	3.317	3.245	3.735	3.462
3.051	3.611	3.415	4.030	4.135	3.932	4.244	4.250	4.220	4.084	3.624	3.569
3.115	2.635	2.851	2.513	2.338	2.005	2.434	2.681	2.049	1.791	1.305	1.683
1.498	0.883	0.845	1.138	0.957	1.232	1.155	0.896	0.719	0.866	0.872	1.047
2.145	2.153	1.761	1.509	1.702	1.664	1.145	1.070	0.907	0.977	1.127	0.873
0.306	0.516	-0.428	-0.459	-0.070	0.158	-0.302	-0.463	-0.481	-0.476	-0.453	-0.459
0.656	0.332	-0.118	1.106	1.085	1.303	1.568	1.231	1.498	1.723	1.695	1.675
0.915	0.957	0.854	1.554	0.838	0.837	0.727	0.917	0.866	0.806	0.599	0.738
1.311	0.996	1.090	1.374	0.913	0.780	1.171	1.232	1.278	1.172	1.055	1.202
0.577	0.389	0.682	0.392	0.115	0.204	0.354	0.318	0.166	0.284	0.344	0.064
0.573	0.749	0.903	0.670	0.882	0.750	0.819	0.704	0.750	0.871	0.941	1.012

Note: Highlighted cells indicate high engagement. Table continues at the bottom of the previous page and is meant to be viewed as a spread.

Of the 12 communities found in Table 5.5, the four communities that were **highly engaged for all years** from the Baseline through 2013 are highlighted in Figure 5.9. Sitka, Seward, and Kodiak, AK are the primary ports with the highest engagement scores, despite a slight decrease in Seward's engagement over time. Conversely, Sitka, AK showed a slow increase in engagement, but has experienced a slight decline over the past several years. The engagement score initially decreased for Kodiak, AK, but has increased again in the last few years. Homer, AK, however, showed an initial increase in engagement, but has since declined to below the Baseline level.

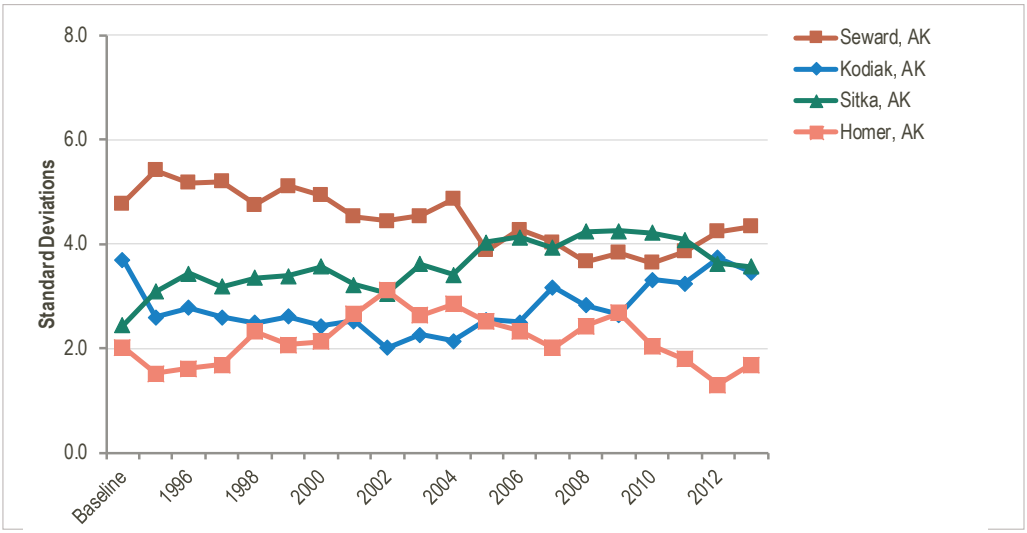


Figure 5.9. Fishing Engagement Index scores of communities highly engaged in the sablefish IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for all years from the Baseline (1992-1994) through 2013.

Communities that demonstrated a relatively stable engagement or increase in the sablefish IFQ commercial Fishing Engagement Index score from the Baseline period through 2013 are depicted in Figure 5.10. Although there is annual variation present, only Sitka, AK shows an increase between the two time periods.

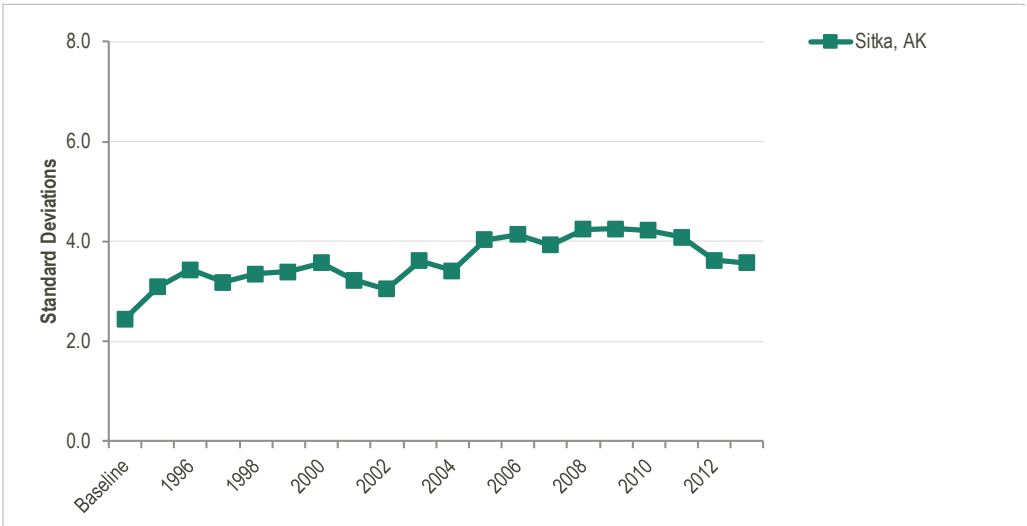


Figure 5.10. Fishing Engagement Index scores of communities highly engaged in the sablefish IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for all years with increasing engagement from the Baseline (1992-1994) through 2013.

Communities that demonstrated a decreasing sablefish IFQ commercial Fishing Engagement Index score from the Baseline through 2013 are depicted in Figure 5.11. Seward, AK has the only consistently decreasing engagement score; however, annually Seward still has a higher score than Kodiak or Homer, AK. Although Kodiak and Homer both show a decreasing commercial engagement score, they have experienced very different trends in the most recent five years with Homer decreasing in engagement while Kodiak has increased, both of which are back to near Baseline levels of engagement in 2013.

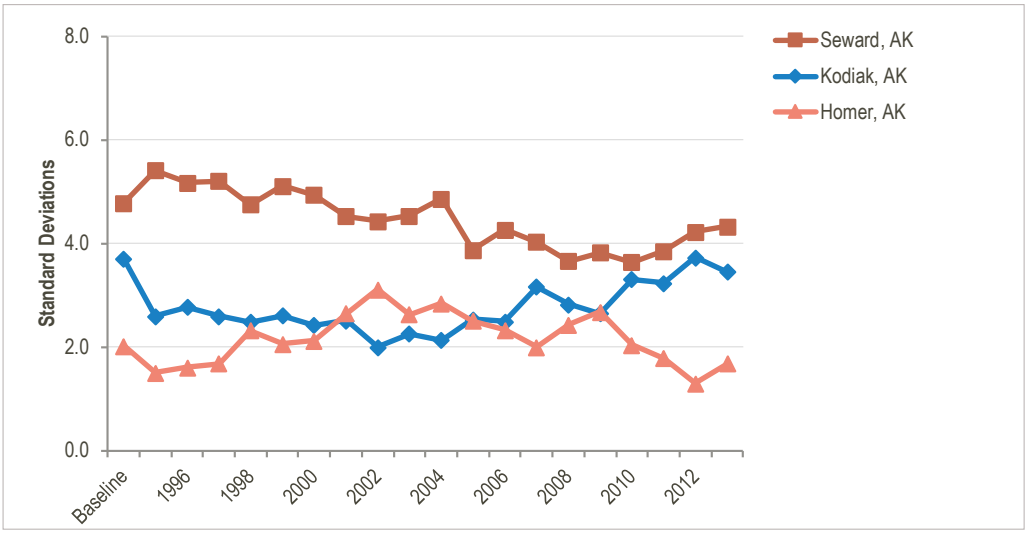


Figure 5.11. Fishing Engagement Index scores of communities highly engaged in the sablefish IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for all years with decreasing engagement from the Baseline (1992-1994) through 2013.

Communities that were **highly engaged** for fewer than all years within the sablefish IFQ portion of the Alaska Halibut and Sablefish IFQ Program are depicted in Figure 5.12. Some of these communities have shown an overall decrease in engagement, some have shown an overall increase, and some such as Pelican, AK have left the fishery altogether. The majority of these communities are located in Southeast Alaska. Juneau, Unalaska/Dutch Harbor, and Yakutat were each **highly engaged** for more than half of the years from the Baseline through 2013. The other communities were only **highly engaged** for between one and six years.

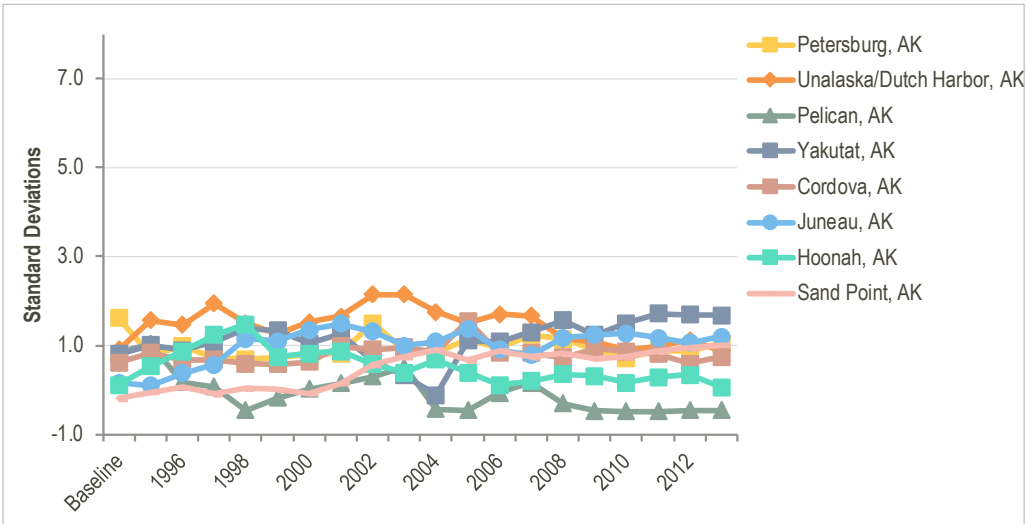


Figure 5.12. Fishing Engagement Index scores of communities highly engaged in the sablefish IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for fewer than all years from the Baseline (1992-1994) through 2013.

Regional Quotient

Another measure of a community's involvement in the IFQ sablefish fishery is its Regional Quotient. Regional Quotient is the proportion of IFQ sablefish landed within a community out of the total amount of IFQ sablefish landed within the Alaska region. It is an indicator of the percent contribution in pounds or value of IFQ sablefish landed within that community to the regional fishery. The Regional Quotient is reported individually only for those communities that were **highly engaged for all years** from the Baseline through 2013. All other communities that landed IFQ sablefish are grouped as "Other Communities." Figure 5.13 and Figure 5.14 show the Regional Quotient both in pounds and value from the Baseline to 2013.

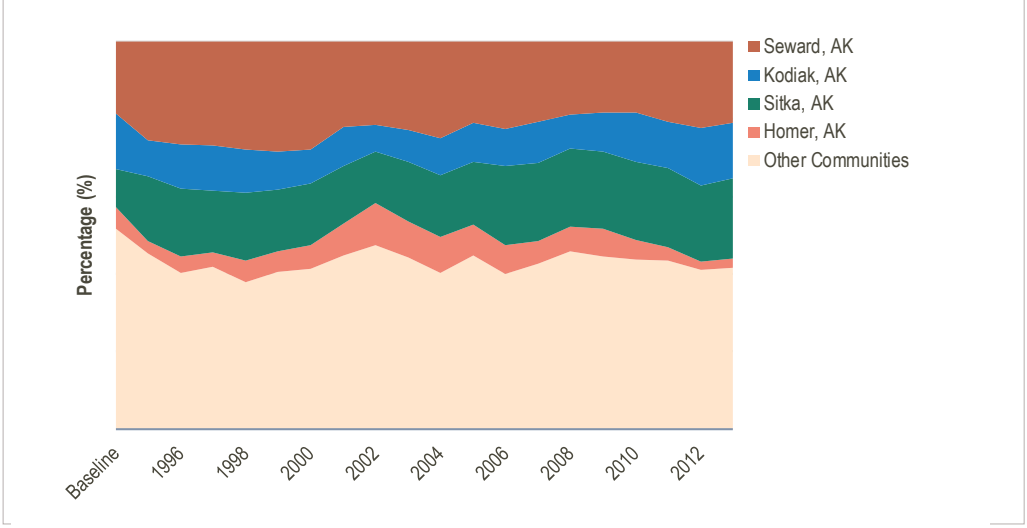


Figure 5.13. Regional Quotient (POUNDS) for communities highly engaged in the sablefish IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for all years from the Baseline (1992-1994) through 2013.

The dominant IFQ sablefish communities during the Baseline include Seward, Kodiak, Sitka, and Homer, AK. Combined, they accounted for nearly 50 percent of the total regional pounds landed (Figure 5.13). From the Baseline through 2013, Sitka, AK experienced a near doubling of its Regional Quotient for pounds landed, while Seward, AK experienced a slight increase. In contrast, Kodiak, AK did not experience much of a change, while Homer, AK's Regional Quotient fell by half. By 2013, these communities accounted for 58 percent of the total regional pounds landed.

The four dominant IFQ sablefish communities represented almost 48 percent of the regional value landed in the Baseline years (Figure 5.14). Kodiak, Seward, and Sitka, AK saw an increase in their regional percentage of value landed from the Baseline through 2013. Seward, AK initially saw a substantial increase in regional value landed, but has since decreased from its peak in the mid-2000s while still being above its Baseline level in 2013. Homer, AK saw a slight increase between 2000 and 2009, but has since seen a decrease in its regional percentage of value landed to below Baseline levels.

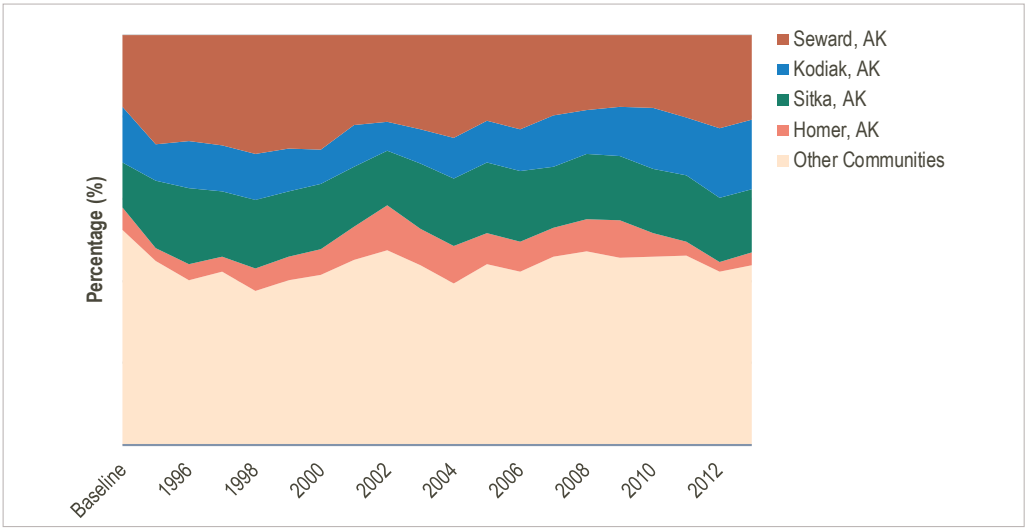


Figure 5.14. Regional Quotient (VALUE) for communities highly engaged in the sablefish IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for all years from the Baseline (1992-1994) through 2013.

Local Quotient

The community Local Quotient is the percentage of IFQ sablefish landed within a community out of the total amount of all species landed within that community. It is an indicator of the contribution in pounds or value of IFQ sablefish to the overall landings within a community. Figure 5.15 and Figure 5.16 show the Local Quotient both in pounds and value from the Baseline to 2013.

All **highly engaged** communities have seen substantial declines in their Local Quotient for pounds landed from the Baseline through 2013 (Figure 5.15). Homer, AK, on the other hand, showed an increase in its percentage of community pounds landed from the Baseline through 2006, followed by a decrease between 2006 and 2013.

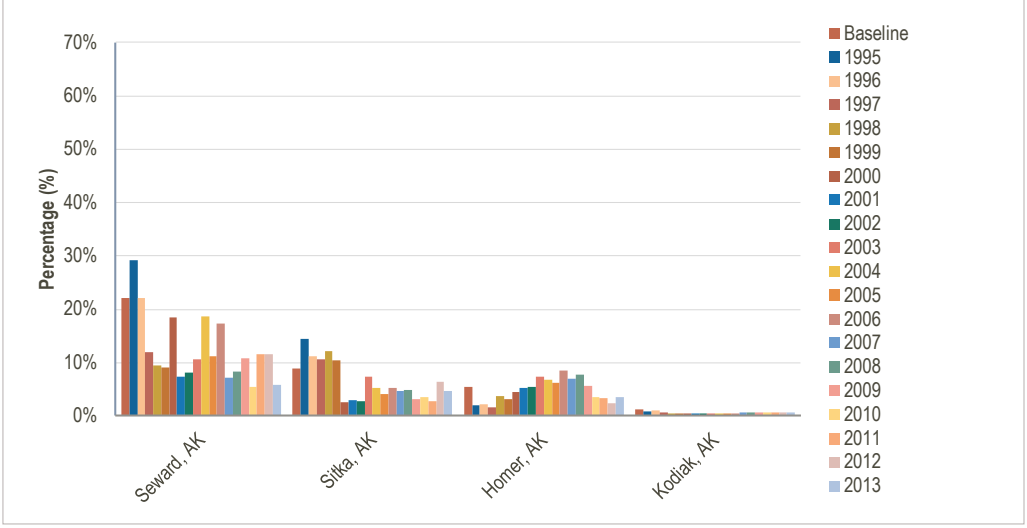


Figure 5.15. Local Quotient (POUNDS) for communities highly engaged in the sablefish IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for all years from the Baseline (1992-1994) through 2013.

Similar to the Local Quotient for pounds, all **highly engaged** communities experienced a decline in their Local Quotient for IFQ sablefish value landed from the Baseline through 2013 (Figure 5.16). Seward and Sitka, AK showed similar large decreases in the percentage of IFQ sablefish value landed relative to the value from other species landed in those communities while Homer, AK experienced a more moderate decline in its Local Quotient. Kodiak, AK saw a relatively stable percentage of sablefish value landed relative to the value of other species landed there.

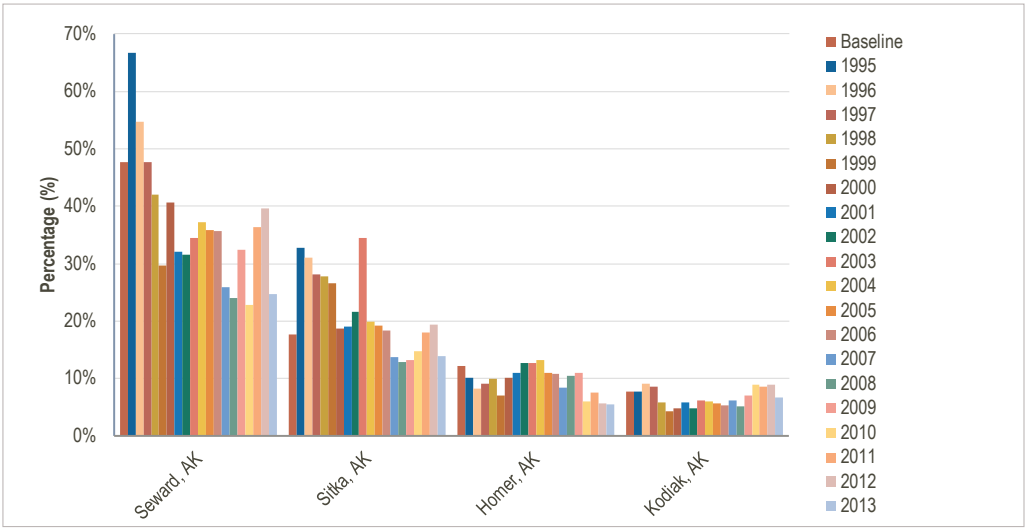


Figure 5.16. Local Quotient (VALUE) for communities highly engaged in the sablefish IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for all years from the Baseline (1992-1994) through 2013.

Community Social Vulnerability Indicators (CSVIs)

The two categories of CSVIs discussed below include social vulnerability and gentrification pressure vulnerability. The Social Vulnerability Indicators represent social factors that can shape either an individual's or community's ability to adapt to change (poverty, personal disruption, labor force structure and population composition vulnerability). The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption and retiree migration).

The Social Vulnerability Indicators for communities that were **highly engaged** in the sablefish IFQ portion of the Alaska Halibut and Sablefish IFQ Program for at least one year from the Baseline (1992-1994) through 2013 are included in Table 5.6. Communities **highly engaged for all years** are highlighted. These communities, with the exception of Juneau, AK, are all small Alaska communities with populations between 2,500 and 9,000. Hoonah, AK ranked moderate to highly vulnerable on all five Social Vulnerability Indicators. The other communities scored moderate to highly vulnerable on one to three indicators. Between three and five of the 12 communities have a low index score for Personal Disruption, Population Composition, Poverty, and Labor Force Structure indices. A substantial deviation from this pattern occurs for the Housing Characteristics Index for which all communities scored moderate or higher vulnerability. The Housing Characteristics Index is comprised of variables that highlight the value of housing and structural vulnerability of building materials. The **highly engaged** communities do not seem to be experiencing fewer vulnerabilities than those that were less than **highly engaged** all years.

Table 5.6. Social Vulnerability Indicators for communities highly engaged in the sablefish IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for one or more years from the Baseline (1992-1994) through 2013.

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
Homer, AK	5,150	Low	Low	Moderate	Low	Med High
Kodiak, AK	6,269	Low	Med High	Moderate	Low	Med High
Seward, AK	2,722	Low	Low	Low	Med High	Med High
Sitka, AK	8,945	Low	Low	Low	Low	Moderate
Cordova, AK	2,604	Low	Low	Low	Low	Med High
Hoonah, AK	722	Med High	Moderate	Med High	Moderate	High
Juneau, AK	31,897	Low	Low	Low	Low	Moderate
Pelican, AK	60	Moderate	Low	Low	Moderate	N/A
Petersburg, AK	2,987	Low	Low	Moderate	Low	Med High
Sand Point, AK	1,238	Moderate	High	Med High	Low	Med High
Unalaska/Dutch Harbor, AK	4,362	Moderate	Med High	Low	Low	Moderate
Yakutat, AK	569	Low	Moderate	Low	Low	Med High

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront (urban sprawl, housing disruption and retiree migration). Gentrification Pressure Vulnerability Indicators for communities that were **highly engaged** in the sablefish IFQ portion of the Alaska Halibut and Sablefish IFQ Program for at least one year from the Baseline (1992-1994) through 2013 are included in Table 5.7. Communities **highly engaged for all years** are highlighted. For the most **highly engaged** communities, the Housing Disruption Index showed low vulnerability. The Retiree Migration and Urban Sprawl indices were not calculated for communities located in Alaska due to data limitations and limited applicability of the indicators for Alaska communities.

Table 5.7. Gentrification Pressure Vulnerability Indicators for communities highly engaged in the sablefish IFQ portion of the Alaska Halibut and Sablefish Individual Fishing Quota Program for one or more years from the Baseline (1992-1994) through 2013.

Community	Housing Disruption	Retiree Migration	Urban Sprawl
Homer, AK	Low	N/A	N/A
Kodiak, AK	Low	N/A	N/A
Seward, AK	Low	N/A	N/A
Sitka, AK	Low	N/A	N/A
Cordova, AK	Low	N/A	N/A
Hoonah, AK	Low	N/A	N/A
Juneau, AK	Low	N/A	N/A
Pelican, AK	N/A	N/A	N/A
Petersburg, AK	Low	N/A	N/A
Sand Point, AK	Low	N/A	N/A
Unalaska/Dutch Harbor, AK	Low	N/A	N/A
Yakutat, AK	Low	N/A	N/A

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

American Fisheries Act Pollock Cooperatives

Program Overview

Walleye pollock in the North Pacific (hereafter referred to as 'pollock') are primarily found in mid-water areas near the bottom. The pollock fishery in the North Pacific runs primarily in the Eastern Bering Sea, with commercial landings concentrated in the Aleutian Islands and at-sea processing facilities. Work on the fishery is divided between catcher vessels that deliver to shore-side processing plants, catcher/processors that catch and process at sea, and motherships that process fish from catcher vessels at sea but do not undertake harvesting activities themselves. Overall, the fishery is the largest by volume in the United States. This fishery has been managed by the NPFMC and NOAA Fisheries under the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area since 1982.

The American Fisheries Act (AFA) Pollock Cooperatives Program was established by the United States Congress under the American Fisheries Act in 1998. The program was implemented for the catcher/processor sector in 1999 and for the catcher vessels and motherships in 2000. The AFA Pollock Cooperatives Program specifically manages the commercial catch of walleye pollock by individual vessels named in the AFA.

The goal of the AFA Pollock Cooperatives Program was to resolve disputes between the inshore and offshore sectors by codifying the allocation of the total allowable catch between sectors and authorizing the formation of cooperatives. Participation in the AFA Pollock Cooperatives Program is limited to only those vessels explicitly nominated in the AFA. Those vessels are authorized to form cooperatives, which in turn are allocated a specified amount of catch each year. Seven inshore cooperatives have formed and include all the shore-side processing plants, while the entire catcher/processor sector and mothership sector each have a single cooperative. The total catch per cooperative is allocated based on the historical participation of the cooperative members in the fishery. In addition, 10 percent of the total allowable catch each year is allocated to the CDQ Program entities.

The primary market for walleye pollock is human consumption. Pollock is processed into fillets, surimi, roe, head and gutted (H&G), fish meal, fish oil, and other products with Europe, Japan, and the U.S. being the primary consumer markets (AFSC 2016). The mid-water pelagic trawl net is the only gear permitted. There is no recreational fishery for pollock in federal or state waters.

Trends for Top Participating Communities

Commercial Engagement

The program-specific commercial Fishing Engagement Index scores for the American Fisheries Act Pollock Cooperatives Program are presented in Table 5.8. The index is an indicator of the importance of AFA pollock fishing in a community relative to other communities. It is a measure of the presence of AFA pollock fishing in a community through fishing activity including pounds, value, permits, and dealers. There were only three communities that were **highly engaged** (1.0 standard deviation above the mean) in the AFA Pollock Cooperatives fishery for at least one year from the Baseline period (1997-1999) through 2013.

Table 5.8. Fishing Engagement Index scores of communities highly engaged in the American Fisheries Act Pollock Cooperatives Program for one or more years from the Baseline (1997-1999) through 2013.

Community	Baseline	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
At-Sea Sector	2.775	2.102	1.763	1.949	1.981	1.872	2.037	1.812	2.009	2.257	2.142	2.286	2.617	2.460	2.370
Unalaska/Dutch Harbor, AK	1.736	2.347	2.655	2.422	2.468	2.530	2.390	2.492	2.481	2.296	2.308	2.230	1.892	2.085	2.082
Akutan, AK	0.872	1.142	1.054	1.229	1.082	1.112	1.147	1.219	0.991	0.919	1.109	1.050	0.960	0.961	1.105

Note: Highlighted cells indicate high engagement.

Of the communities found in Table 5.8, Unalaska/Dutch Harbor, AK and the At-Sea Sector were **highly engaged for all years** from the Baseline through 2013, as shown in Figure 5.17. Akutan, AK is the only other port in this fishery that is **highly engaged** for some but not all years. The engagement scores for Unalaska/Dutch Harbor, AK and the At-Sea Sector are nearly inversely related (correlation of -.98). Unalaska/Dutch Harbor, AK increased substantially in the first year of the program and then steadily decreased in subsequent years, while the reverse is true for the At-Sea Sector. However, overall, Unalaska/Dutch Harbor, AK had a higher engagement score in 2013 than the Baseline years while the At-Sea Sector had a lower engagement score in 2013 compared with the Baseline.

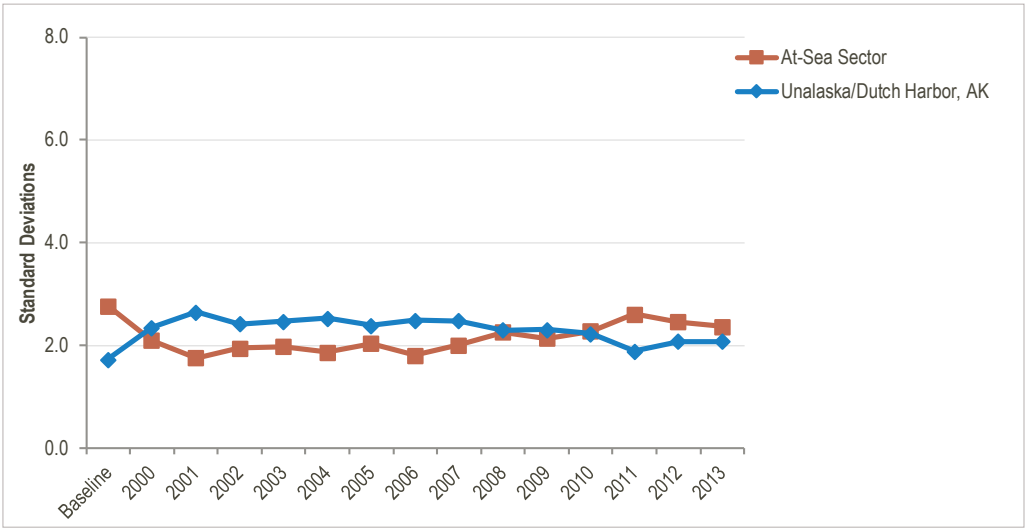


Figure 5.17. Fishing Engagement Index scores of communities highly engaged in the American Fisheries Act Pollock Cooperatives Program for all years from the Baseline (1997-1999) through 2013.

Only Akutan, AK was **highly engaged** in all but five years within the AFA Pollock Cooperatives fishery, as depicted in Figure 5.18. Akutan, AK's engagement score increased in the first few years of the program, but had a declining trend from 2006 through 2013. However, its engagement in 2013 is above the Baseline level.

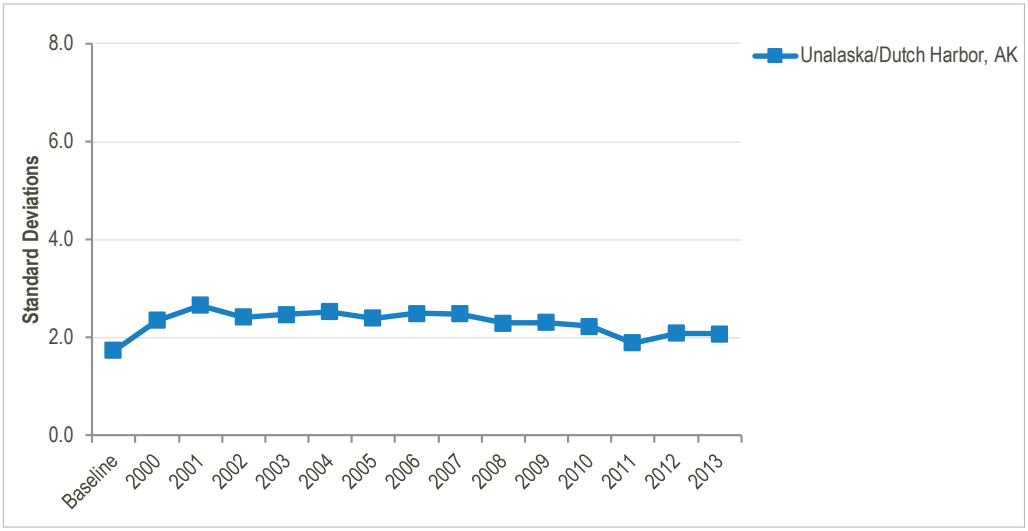


Figure 5.18. Fishing Engagement Index scores of communities highly engaged in the American Fisheries Act Pollock Cooperatives Program for fewer than all years from the Baseline (1997-1999) through 2013.

Regional Quotient

Another measure of a community's involvement in the AFA pollock fishery is its Regional Quotient. Regional Quotient is the proportion of AFA pollock landed within a community out of the total amount of AFA pollock landed within the Alaska region. It is an indicator of the percent contribution in pounds or value landed of that community to the regional fishery. The Regional Quotient is reported individually only for those communities that were **highly engaged for all years** from the Baseline through 2013. All other communities that landed AFA pollock are grouped as "Other Communities," for which the principal contribution can be attributed to Akutan, AK. Figure 5.19 and Figure 5.20 show the Regional Quotient both in pounds and value from the Baseline to 2013.

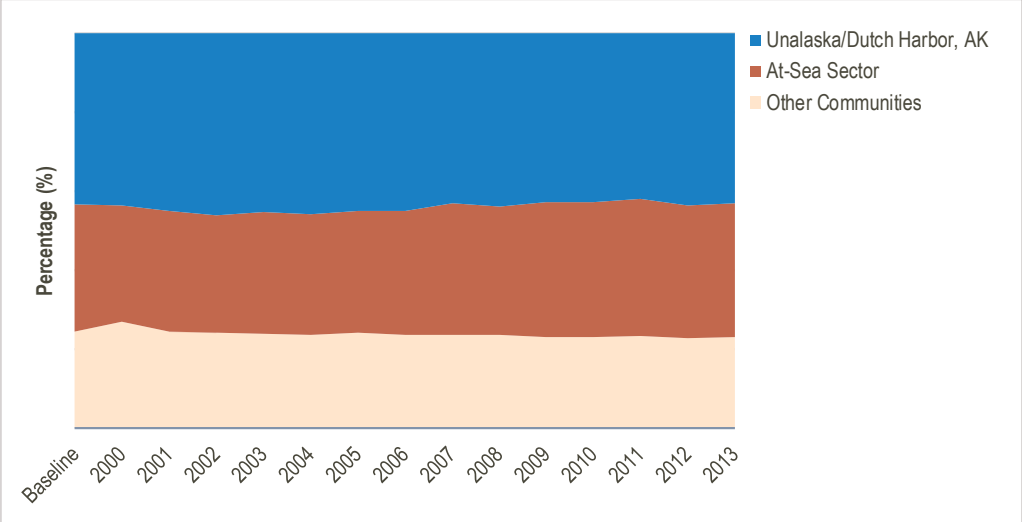


Figure 5.19. Regional Quotient (POUNDS) for communities highly engaged in the American Fisheries Act Pollock Cooperatives Program for all years from the Baseline (1997-1999) through 2013.

The dominant AFA Pollock community from the Baseline to 2013 was Unalaska/Dutch Harbor, AK (Figure 5.19). Unalaska/Dutch Harbor, AK accounted for an average of approximately 44 percent of the total regional pounds landed, followed by the At-Sea Sector and "Other Communities," representing approximately 32 percent and 22 percent, respectively. The Regional Quotient for pounds landed stayed relatively stable throughout the history of the American Fisheries Act Pollock Cooperatives Program, which is not surprising given the structure of the program.

Alternatively, Unalaska/Dutch Harbor and "Other Communities" accounted for approximately 16 percent and eight percent, respectively, of the annual regional value landed in the fishery, while the At-Sea Sector accounted for approximately 75 percent of the total value accruing to the harvesting sector (Figure 5.20). This is a result of using the ex-vessel value for the catcher vessel sector and the first wholesale value for the catcher/processor sector, which is an "ex-vessel" value for the catcher/processor sector, and better represents the revenue flows to each of the different harvesting sectors. In Figure 5.20, this results in skewing the revenue shares toward the At-Sea Sector and away from the shore-side processors in Unalaska/Dutch Harbor and "Other Communities." Similar to the Regional Quotient for pounds landed, the regional percentage of value landed was relatively steady through time from the Baseline to 2013.

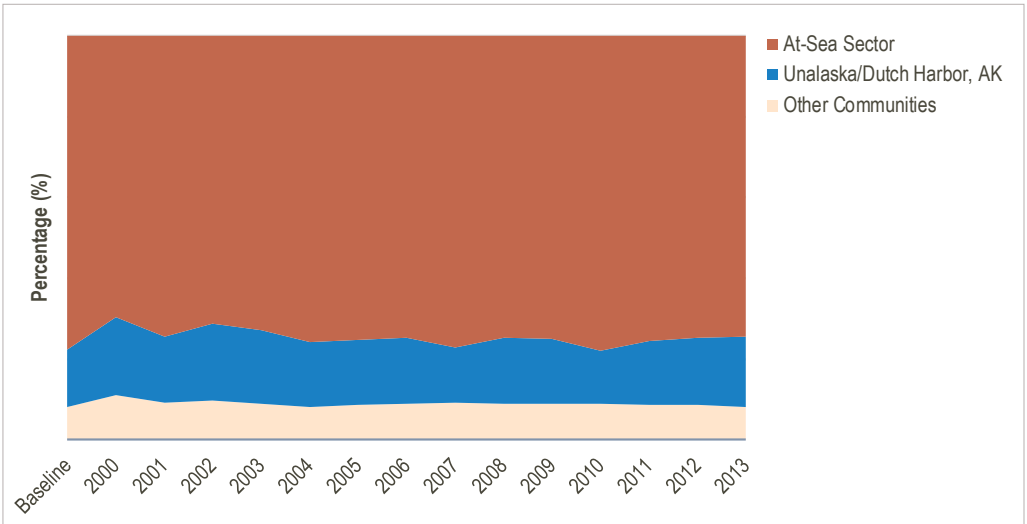


Figure 5.20. Regional Quotient (VALUE) for communities highly engaged in the American Fisheries Act Pollock Cooperatives Program for all years from the Baseline (1997-1999) through 2013.

Local Quotient

The community Local Quotient is the percentage of AFA pollock landed within a community out of the total amount of all species landed within that community. It is an indicator of the contribution in pounds or value of AFA pollock to the overall landings within a community. Figure 5.21 and Figure 5.22 show the Local Quotient both in pounds and value, respectively, from the Baseline to 2013. The Local Quotient is not calculated for the At-Sea Sector because it is not a specific geographic location and the At-Sea Sector as a whole contains more than just those vessels participating in the AFA Pollock Cooperatives Program.

The Local Quotient for pounds landed for Unalaska/Dutch Harbor, AK increased from approximately 75 percent in the Baseline years to approximately 90 percent in the second year of the program and has averaged 88 percent in the years following program implementation (Figure 5.21).

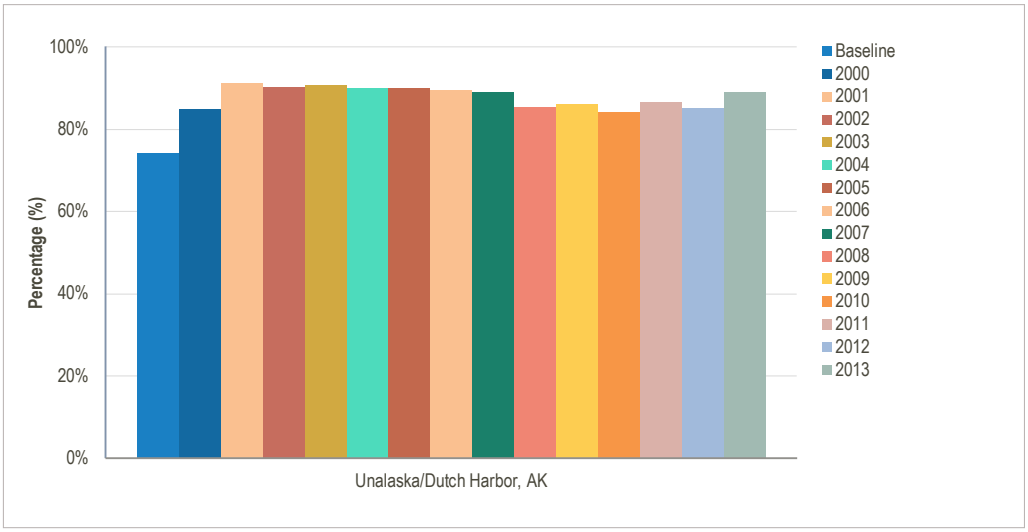


Figure 5.21. Local Quotient (POUNDS) for communities highly engaged in the American Fisheries Act Pollock Cooperatives Program for all years from the Baseline (1997-1999) through 2013.

Unalaska/Dutch Harbor had a more variable Local Quotient for AFA Pollock value landed compared with the Local Quotient for AFA Pollock pounds landed (Figure 5.22). Unalaska/Dutch Harbor, AK saw an increasing percentage of AFA Pollock value landed relative to the value of other species landed for the first three years of the program followed by small increases and decreases between 2003 and 2013.

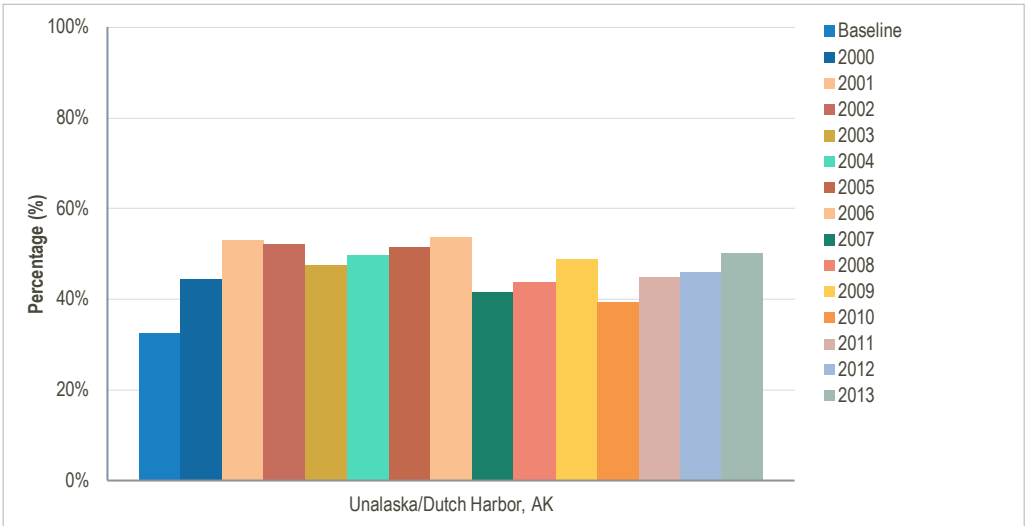


Figure 5.22. Local Quotient (VALUE) for communities highly engaged in the American Fisheries Act Pollock Cooperatives Program for all years from the Baseline (1997-1999) through 2013.

Community Social Vulnerability Indicators (CSVIs)

The two categories of CSVIs discussed below include social vulnerability and gentrification pressure vulnerability. The Social Vulnerability Indicators represent social factors that can shape either an individual's or community's ability to adapt to change (poverty, personal disruption, labor force structure and population composition vulnerability). The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption and retiree migration).

The Social Vulnerability Indicators for communities that were **highly engaged** in the AFA Pollock Cooperatives Program for at least one year from the Baseline (1997-1999) through 2013 are included in Table 5.9. Communities **highly engaged for all years** are highlighted. Unalaska/Dutch Harbor, AK is the only community highlighted given the unavailability of social data for the At-Sea Sector as a whole. Unalaska/Dutch Harbor, AK ranked moderate to medium-high on three of the five indices and low vulnerability for two indices. Akutan, AK ranked low on three indices, while also ranking high on population composition and housing characteristics.

Table 5.9. Social Vulnerability Indicators for communities highly engaged in the American Fisheries Act Pollock Cooperatives Program for one or more years from the Baseline (1997-1999) through 2013.

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
At-Sea Sector	N/A	N/A	N/A	N/A	N/A	N/A
Unalaska/Dutch Harbor, AK	4,362	Moderate	Med High	Low	Low	Moderate
Akutan, AK	932	Moderate	High	Moderate	Low	High

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront (urban sprawl, housing disruption and retiree migration). Gentrification Pressure Vulnerability Indicators for communities that were **highly engaged** in the AFA Pollock Cooperatives Program for at least one year from the Baseline (1997-1999) through 2013 are included in Table 5.10. Communities **highly engaged for all years** are highlighted. The Housing Disruption Index showed low vulnerability for Unalaska/Dutch Harbor and Akutan, AK. The Retiree Migration and Urban Sprawl Indices were not calculated for communities located in Alaska due to data limitations and limited applicability of the indicators for Alaska communities.

Table 5.10. Gentrification Pressure Vulnerability Indicators for communities highly engaged in the American Fisheries Act Pollock Cooperatives Program for one or more years from the Baseline (1997-1999) through 2013.

Community	Housing Disruption	Retiree Migration	Urban Sprawl
At-Sea Sector	N/A	N/A	N/A
Unalaska/Dutch Harbor, AK	Low	N/A	N/A
Akutan, AK	Low	N/A	N/A

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

Photo Credit: NOAA Fisheries/Sam Zmolek

Bering Sea and Aleutian Islands Crab Rationalization Program

Program Overview

The crab species included in the Bering Sea and Aleutian Islands (BSAI) Crab Rationalization Program are red king crab, tanner crab, and opilio crab, as well as blue king crab and golden king crab. These species are primarily found on bottom habitat. The crab fisheries operate in the southeastern and central Bering Sea using large industrial vessels and a shore-side and at-sea processing sector that processes the harvest. There is a small catcher/processor sector active in some crab fisheries, and the At-Sea Sector includes both catcher/processors as well as any crab processed by floating processors (which often operate in port) as their location of processing cannot be determined ex-post. These species have been managed by the NPFMC, the state of Alaska, and NOAA Fisheries under the Bering Sea and Aleutian Islands King and Tanner Crab FMP since 1989.

The BSAI Crab Rationalization Program was implemented in 2005. This catch share program is the only U.S. program to utilize both harvester and processor quota shares. The principal aims of the BSAI Crab Rationalization Program are to better conserve the target resource, eliminate the race for fish, diminish excess harvesting and processing capacity, minimize bycatch and discard mortality, improve economic stability for harvesters, processors and coastal communities, and make the fishery safer to prosecute. Under the BSAI Crab Rationalization Program, harvesting quota shares were allocated to individuals and businesses that had historically participated in the fisheries. Shares were initially allocated by participant type: 97 percent of quota shares were allocated to limited license program (LLP) crab permit holders (aka owner shares) and three percent of quota shares were allocated to active skippers (aka crew shares). Since the program's inception, owner shares have been transferable, subject to limits on the amount of shares a person may own or use. Crew shares, on the other hand, can only be held by individuals who are actively fishing as skippers or crew on vessels making landings in the fisheries.[4]

Community interests in the BSAI Crab Rationalization Program crab fisheries are protected by three program elements: (1) regional landings and processing requirements, (2) the Community Development Quota Program and Adak community allocations, and (3) community protection measures. First, most owner shares have regional designations that require the harvester to deliver annual landings to processors in a specific region. This requirement was intended to provide stability to the shore-side processing sector in order to protect historical investments in processing capacity and to preserve the historic distribution of landings and processing between regions of the state. Second, the BSAI Crab Rationalization Program allocates 10 percent of the annual total allowable catch between the community of Adak, AK and the six CDQ groups.[5] Between them, these groups represent 65 coastal communities in Western Alaska. This allocation is either harvested or leased out by the community of Adak, AK or the CDQ entities. The CDQ groups then use the proceeds to develop other fisheries in the region and provide economic benefits to their member communities. Lastly, the BSAI Crab Rationalization Program includes community protection measures for nine communities, including the Right of First Refusal that gives communities the opportunity to keep processing shares and assets in a community in the event that a processing plant is in danger of closing down.

The primary market for Alaska crab is for human consumption, including retail, food service, secondary processing (mostly in China), and restaurants (AFSC 2016). Alaska crab are harvested using pots. There is no recreational fishery for BSAI Crab Rationalization Program species in federal waters.

[4] To continue to hold crew shares, an initial recipient must participate in 30 days of fishing in a commercial fishery managed by the State of Alaska or in a U.S. commercial fishery off Alaska during the three preceding crab fishing years. If the holder is not an initial recipient, he or she must participate in one delivery of crab in the Bering Sea and Aleutian Islands Crab Rationalization Program during the crab fishing year preceding the annual Individual Fishing Quota application.

[5] The CDQ groups receive 10 percent of the total allowable catch in all Bering Sea and Aleutian Islands Crab Rationalization Program fisheries except the Western Aleutian Islands golden king crab, which is allocated uniquely to the community of Adak.

Photo Credit: NOAA Fisheries/Amber Himes Cornell

Trends for Top Participating Communities

Commercial Engagement

The program-specific Fishing Engagement Index scores for the BSAI Crab Rationalization Program are presented in Table 5.11. The index is an indicator of the importance of BSAI crab fishing in a community relative to other communities. It is a measure of the presence of BSAI crab fishing in a community through fishing activity including pounds, value, permits, and dealers. Because the crab fishing season crosses calendar years, all following analyses are conducted on a crab season basis rather than by calendar year. There were six communities that were **highly engaged** (1.0 standard deviation above the mean) in the BSAI crab fisheries for at least one at least one crab fishing season from the Baseline period (2002/2003-2004/2005) through 2013/2014. The Baseline for the BSAI Crab Rationalization Program refers to the average of the 2002/2003, 2003/2004, and 2004/2005 seasons.

Table 5.11. Fishing Engagement Index scores of communities highly engaged in harvesting in the Bering Sea and Aleutian Islands Crab Rationalization Program for one or more crab seasons from the Baseline (2002/2003-2004/2005) through 2013/2014.

Community	Baseline	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014
Unalaska/Dutch Harbor, AK	7.266	7.414	7.203	7.185	7.358	6.788	6.590	6.117	6.428	6.942
At-Sea Sector	5.371	4.403	5.473	1.596	3.083	4.130	3.641	3.481	2.649	2.250
Saint Paul Island, AK	1.548	2.606	0.222	5.081	4.397	4.108	4.791	5.124	5.228	4.997
King Cove, AK	1.470	1.812	1.883	1.360	1.649	1.824	1.627	1.432	1.427	1.486
Akutan, AK	1.227	1.882	1.823	2.294	1.481	2.049	2.226	3.166	3.215	2.849
Kodiak, AK	0.859	0.836	0.862	1.335	0.927	0.981	1.110	0.665	0.509	0.561

Note: Highlighted cells indicate high engagement.

Four of the six communities found in Table 5.11, the At-Sea Sector, Unalaska/Dutch Harbor, Akutan, and King Cove, AK were **highly engaged** in the BSAI Crab Rationalization Program for all seasons and are shown in Figure 5.23. The engagement score for Unalaska/Dutch Harbor, AK remained relatively constant for the first few seasons of the program, then declined between 2009 and 2011 before increasing again in 2012 and 2013, but did show a slight decrease in engagement over time from the Baseline through 2013/2014. Both Akutan and King Cove, AK experienced increases in engagement from the Baseline through the 2013/2014 season, but King Cove, AK experienced increases followed by decreases and ended up roughly at the Baseline levels while Akutan, AK more than doubled its engagement index from the Baseline through the 2013/2014 season. The At-Sea Sector includes both catcher/processors and floating processors and has been experiencing a declining trend in engagement throughout the program.[6]

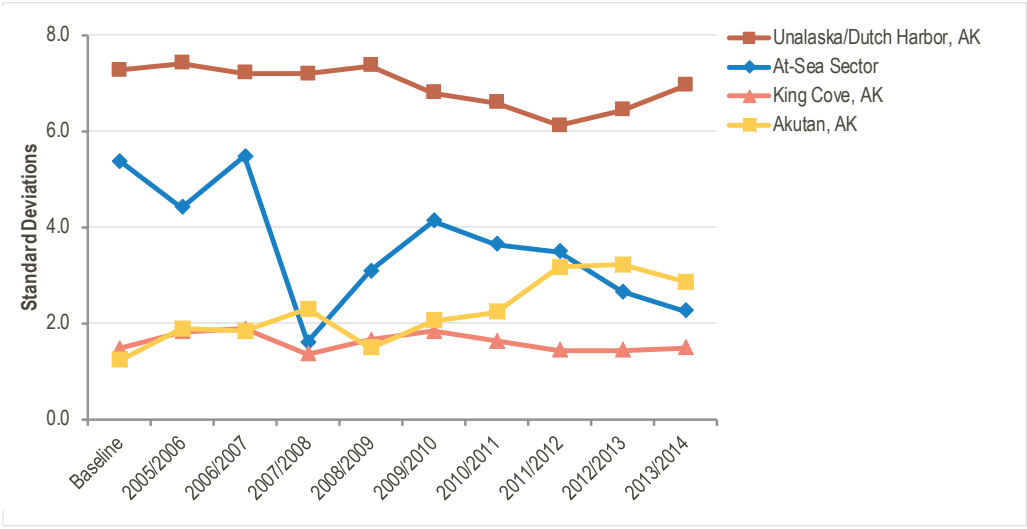


Figure 5.23. Fishing Engagement Index scores of communities highly engaged in the Bering Sea and Aleutian Islands Crab Rationalization Program for all crab seasons from the Baseline (2002/2003-2004/2005) through 2013/2014.

Only King Cove and Akutan, AK demonstrated an overall increase in the crab engagement score from the Baseline through 2013 (Figure 5.24). However, while Akutan, AK showed a significant increase, King Cove's engagement score remained relatively stable during this time period.

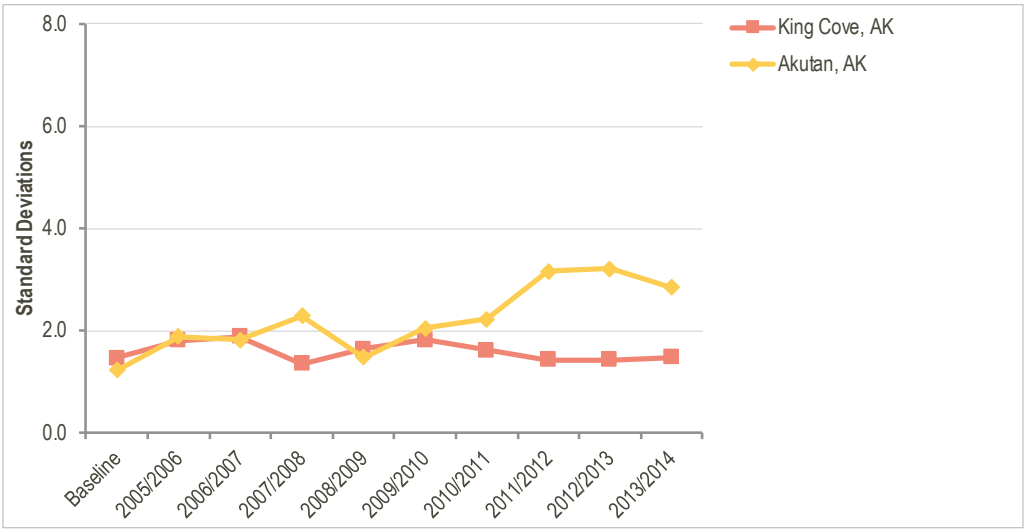


Figure 5.24. Fishing Engagement Index scores of communities highly engaged in the Bering Sea and Aleutian Islands Crab Rationalization Program for all crab seasons with increasing engagement between the Baseline(2002/2003-2004/2005) through 2013/2014.

[6] Some caution is warranted when interpreting the indicators for the At-Sea Sector. For this sector, the reporting of landings is not always consistent within and across years with regard to the location of landings. Changes in the indicators could be indicative of changes in reporting rather than changes in actual landings.

Communities that demonstrated a decreasing commercial halibut engagement score from the Baseline through 2013/2014 are depicted in Figure 5.25. The decreasing engagement scores highlight the declining involvement of the At-Sea Sector in the BSAI crab fishery. Although Unalaska/Dutch Harbor, AK showed declines in its index score, its engagement remained relatively stable over time.

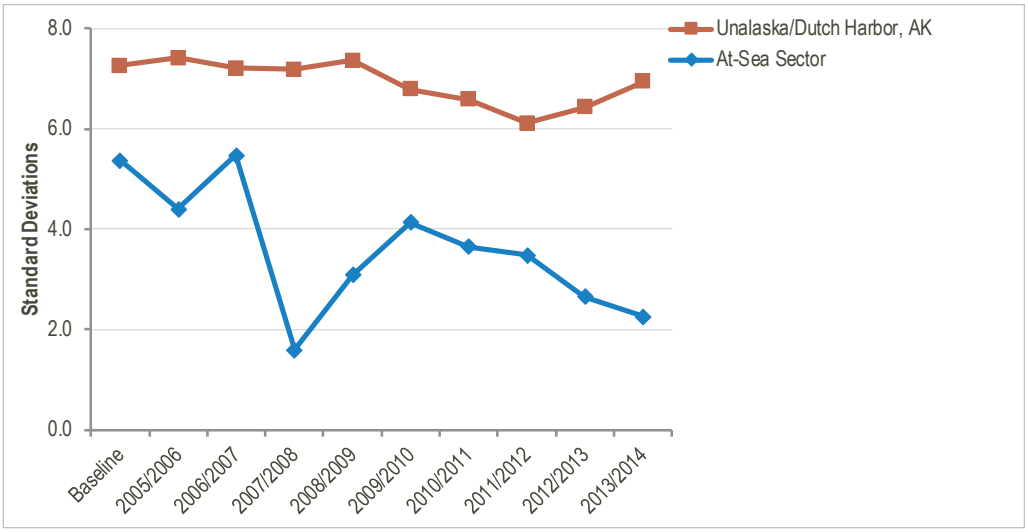


Figure 5.25. Fishing Engagement Index scores of communities highly engaged in the Bering Sea and Aleutian Islands Crab Rationalization Program for all crab seasons with decreasing engagement from the Baseline (2002/2003-2004/2005) and 2013/2014.

The communities of Kodiak and Saint Paul, AK were **highly engaged** for fewer than all crab seasons within the BSAI Crab Rationalization Program and are depicted in Figure 5.26. Saint Paul, AK had high engagement during the Baseline and first crab season but was iced in for much of the 2006/2007 crab season and could not get deliveries to the shore-side plant. Two floating processors (included in the At-Sea Sector here) received those deliveries, which therefore resulted in an increase in the relative engagement of the At-Sea Sector for that crab season while resulting in a large decrease in the engagement score for Saint Paul, AK. If not for this anomaly in 2006/2007, Saint Paul would have otherwise been **highly engaged** for all crab seasons. In contrast, Kodiak, AK was **highly engaged** for only two crab seasons, 2007/2008 and 2010/2011, and had relatively constant engagement from the Baseline through the 2010/2011 crab season, but then has declined in its relative engagement over the three most recent crab seasons presented (2011/2012-2013/2014).

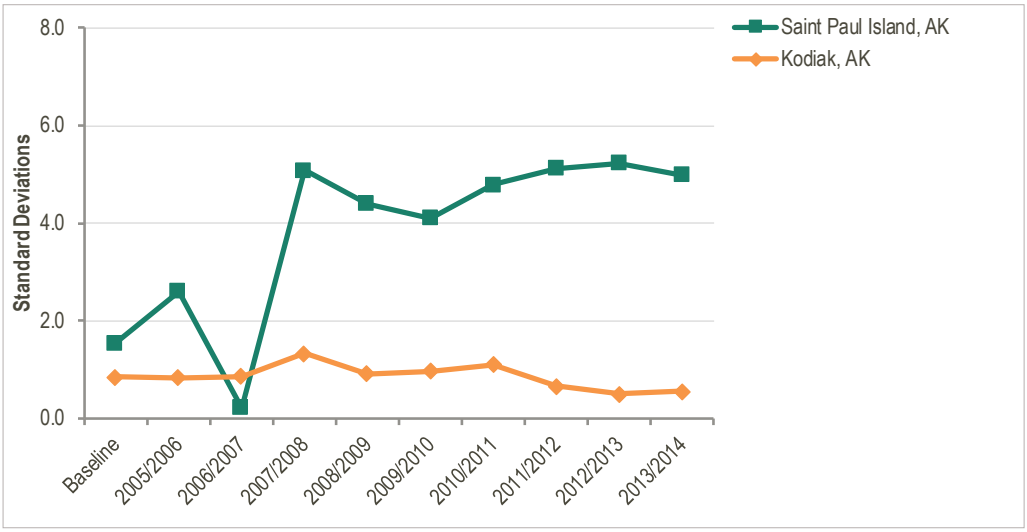


Figure 5.26. Fishing Engagement Index scores of communities highly engaged in the Bering Sea and Aleutian Islands Crab Rationalization Program for fewer than all crab seasons from the Baseline (2002/2003-2004/2005) through 2013/2014.

Regional Quotient

Another measure of a community's involvement in the BSAI Crab Rationalization Program is its Regional Quotient. Regional Quotient is the proportion of BSAI crab landed within a community out of the total amount of BSAI crab landed within the Alaska region. It is an indicator of the percent contribution in pounds or value of BSAI crab within that community to the regional fishery. The Regional Quotient is reported individually only for those communities that were **highly engaged** for all crab seasons from the Baseline through 2013/2014. All other communities that landed BSAI crab are grouped as "Other Communities." Figure 5.27 and Figure 5.28 show the Regional Quotient both in pounds and value from the Baseline to 2013/2014.

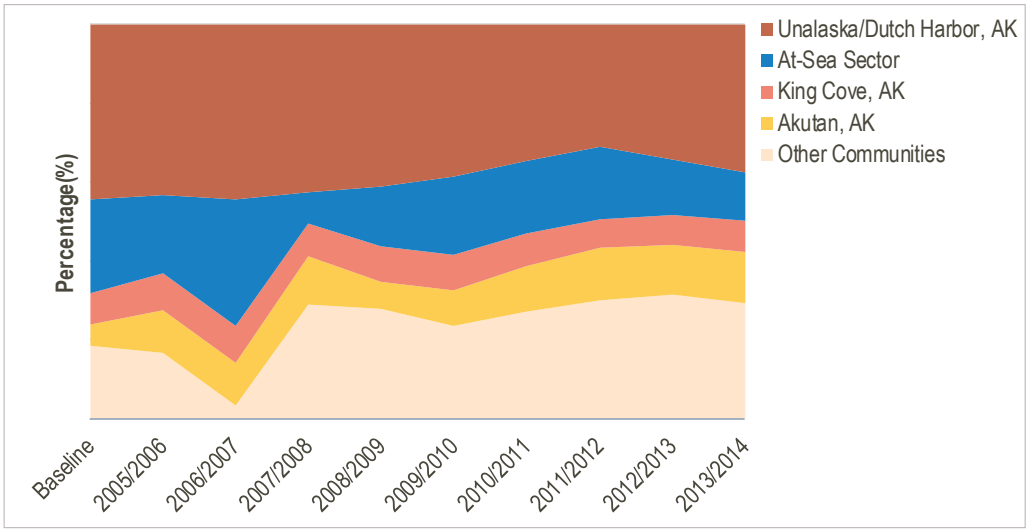


Figure 5.27. Regional Quotient (POUNDS) for communities highly engaged in the Bering Sea and Aleutian Islands Crab Rationalization Program for all crab seasons from the Baseline (2002/2003-2004/2005) through 2013/2014.

The dominant BSAI Crab Rationalization Program community from the Baseline to 2013/2014 was Unalaska/Dutch Harbor, AK (Figure 5.25). Unalaska/Dutch Harbor, AK accounted for 45 percent of pounds landed in the Baseline crab seasons and slowly decreased to 38 percent of the total regional pounds landed in 2013/2014. As discussed above, the At-Sea Sector experienced a big increase in the 2006/2007 crab season due to the icing in of the port of Saint Paul, AK, which makes up the vast majority of the "Other Communities" grouping, but has been declining over time while "Other Communities" (primarily Saint Paul, AK) has increased over time. King Cove, AK's share of regional pounds has been relatively stable while Akutan, AK increased its Regional Quotient over time.

The share of regional value from landings in the BSAI Crab Rationalization Program is similar to the Regional Quotient for pounds landed (Figure 5.26). The total regional value of landings in Unalaska/Dutch Harbor, AK fluctuated between 36 percent and 50 percent, while "Other Communities" (primarily Saint Paul, AK) and Akutan, AK experienced relative increases in value and King Cove, AK remained stable over time.

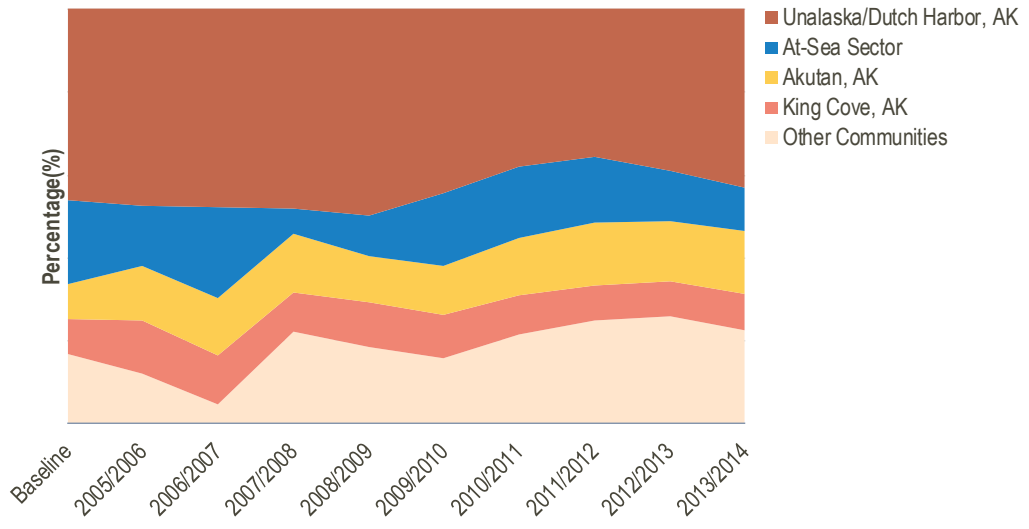


Figure 5.28. Regional Quotient (VALUE) for communities highly engaged in the Bering Sea and Aleutian Islands Crab Rationalization Program for all crab seasons from the Baseline (2002/2003-2004/2005) through 2013/2014.

Local Quotient

The community Local Quotient is the percentage of Bering Sea and Aleutian Island crab landed within a community out of the total amount of all species landed within that community. It is an indicator of the contribution in pounds or value of Bering Sea Aleutian Island crab to the overall landings in a community. Figure 5.29 and Figure 5.30 show the Local Quotient both in pounds and value from the Baseline to 2013/2014.

The Local Quotient for pounds landed for the three communities **highly engaged** for all crab seasons are displayed in Figure 5.29. Both Unalaska/ Dutch Harbor and King Cove, AK experienced increases in the first few crab seasons of the BSAI Crab Rationalization Program, but have fallen from that peak in the most recent crab seasons. In contrast, Akutan, AK has experienced a general increase in the Local Quotient for pounds landed. However, all are still above their Baseline levels in the 2013/2014 crab season. The Local Quotient for pounds landed was below 10 percent for nearly all crab seasons for all communities, which is not surprising given their involvement in the high volume Bering Sea groundfish fisheries.

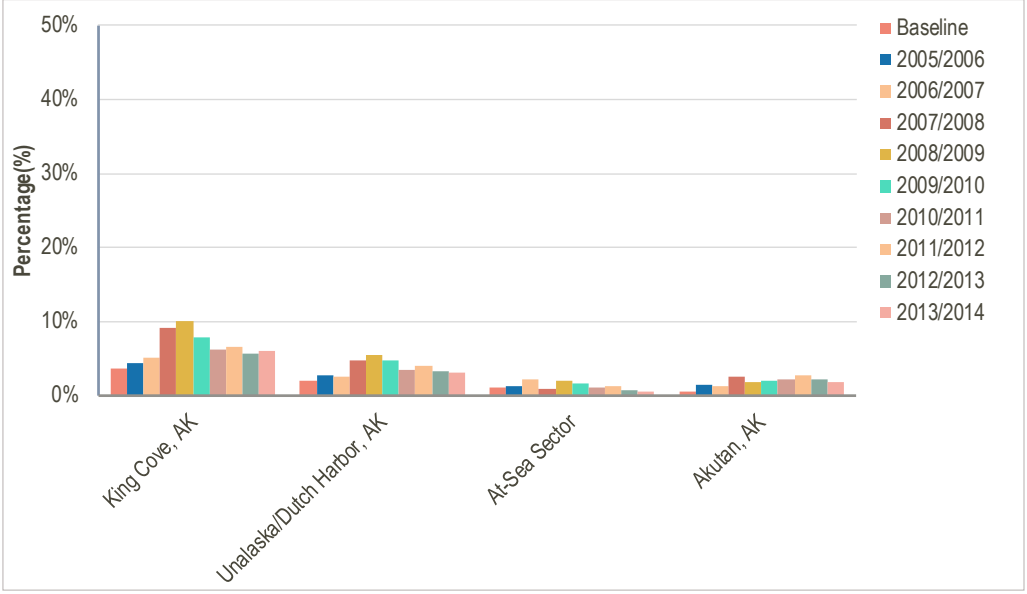


Figure 5.29. Local Quotient (POUNDS) for communities highly engaged in the Bering Sea and Aleutian Islands Crab Rationalization Program for all crab seasons from the Baseline (2002/2003-2004/2005) through 2013/2014.

As Bering Sea and Aleutian Island crab is a high value species, the percentage of local value is a larger share than the share of local pounds, and the Local Quotient for value landed is shown in Figure 5.30. In contrast to the Local Quotient for pounds landed, there is less variability in the Local Quotient for value landed and all communities have experienced an increase relative to the Baseline in the most recent crab seasons. While not shown in Figures 5.29 and 5.30 because it was not **highly engaged** for all crab seasons, Saint Paul, AK is highly dependent on these fisheries with nearly 75 percent of its pounds and value landed in all crab seasons (excluding the 2006/2007 season) coming from species included in the BSAI Crab Rationalization Program.

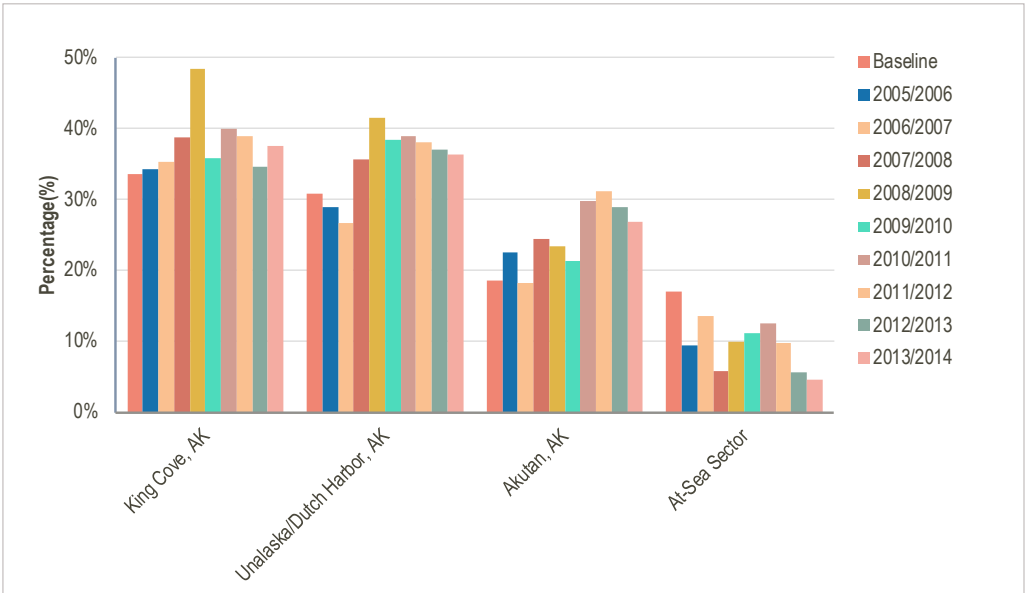


Figure 5.30. Local Quotient (VALUE) for communities highly engaged in the Bering Sea and Aleutian Islands Crab Rationalization Program for all crab seasons from the Baseline (2002/2003-2004/2005) through 2013/2014.

Community Social Vulnerability Indicators (CSVIs)

The two categories of CSVIs discussed below include social vulnerability and gentrification pressure vulnerability. The Social Vulnerability Indicators represent social factors that can shape either an individual's or community's ability to adapt to change (poverty, personal disruption, labor force structure and population composition vulnerability). The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption and retiree migration).

The Social Vulnerability Indicators for communities that were **highly engaged** in the BSAI Crab Rationalization Program for at least one crab season from the Baseline (2002/2003-2004/2005) through 2013/2014 are included in Table 5.12. Communities **highly engaged** for all crab seasons are highlighted. Of these communities, Unalaska/Dutch Harbor and Kodiak, AK are significantly larger than the other three communities that were **highly engaged** for at least one crab season, but Kodiak, AK was only **highly engaged** in the BSAI Crab Rationalization Program for two crab seasons. The other communities of Akutan, King Cove, and Saint Paul, AK have populations of less than 1,000. Unalaska/Dutch Harbor, AK scored moderate to medium-high vulnerability for three of the five vulnerability indices. Akutan and Saint Paul, AK both scored moderate to high on four of the five indices, indicating that they have relatively more vulnerabilities. In contrast, Kodiak and King Cove scored low on three and medium-high or high on two. All five communities scored medium-high to high for the Population Composition Index and moderate to high for the Housing Characteristics Index, indicating that these communities are not very diverse and have limited housing.

Table 5.12. Social Vulnerability Indicators for communities highly engaged in the Bering Sea and Aleutian Islands Crab Rationalization Program for one or more crab seasons from the Baseline (2002/2003-2004/2005) through 2013/2014.

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
Akutan, AK	932	Moderate	High	Moderate	Low	High
At-Sea Sector	N/A	N/A	N/A	N/A	N/A	N/A
King Cove, AK	831	Low	High	Low	Low	High
Unalaska/Dutch Harbor, AK	4,362	Moderate	Med High	Low	Low	Moderate
Kodiak, AK	6,269	Low	Med High	Moderate	Low	Med High
Saint Paul Island, AK	675	Med High	High	Low	Moderate	Med High

Note: Highlighted cells indicate communities that were highly engaged for all crab seasons from the Baseline through 2013.

The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront (urban sprawl, housing disruption and retiree migration). Gentrification Pressure Vulnerability Indicators for communities that were **highly engaged** in the BSAI Crab Rationalization Program for at least one crab season from the Baseline (2002/2003-2004/2005) through 2013/2014 are included in Table 5.13. Communities **highly engaged** for all crab seasons are highlighted. All of the most **highly engaged** communities showed low vulnerability for housing disruption. The Retiree Migration and Urban Sprawl Indicators were not calculated for communities located in Alaska due to data limitations and limited applicability of the indicators for Alaska communities.

Table 5.13. Gentrification Pressure Vulnerability Indicators for communities highly engaged in the Bering Sea and Aleutian Islands Crab Rationalization Program for one or more crab seasons from the Baseline (2002/2003-2004/2005) through 2013/2014.

Community	Housing Disruption	Retiree Migration	Urban Sprawl
Akutan, AK	Low	N/A	N/A
At-Sea Sector	N/A	N/A	N/A
King Cove, AK	Low	N/A	N/A
Unalaska/Dutch Harbor, AK	Low	N/A	N/A
Kodiak, AK	Low	N/A	N/A
Saint Paul Island, AK	Low	N/A	N/A

Note: Highlighted cells indicate communities that were highly engaged for all crab seasons from the Baseline through 2013.

Photo Credit: NOAA Fisheries/David Csepp

Non-Pollock Trawl Catcher/Processor Groundfish Cooperatives (Amendment 80) Program

Program Overview

In 1998, the U.S. Congress passed the American Fisheries Act (AFA), which created a management regime specific to the commercial fleet targeting walleye pollock in the Bering Sea and Aleutian Islands (as described under the section titled American Fisheries Act Pollock Cooperatives Program). For those commercial groundfish catcher/processor vessels that were not explicitly named in that program, the NPFMC adopted Amendment 80 to the Bering Sea and Aleutian Islands Groundfish Management Plan to allow additional vessels into the fishery. All of the vessels that are eligible for this allocation are catcher/processors and are commonly referred to as the Amendment 80 sector or fishery. The Non-Pollock Trawl Catcher/Processor Groundfish Cooperatives Program will thus be referred to hereafter as the Amendment 80 Program.

The principal species targeted by vessels included in the Amendment 80 Program are Atka mackerel, Pacific Ocean perch, flathead sole, Pacific cod, rock sole and yellowfin sole. The fishery runs in the Bering Sea and Aleutian Islands region, using large catcher/processor vessels.

The Amendment 80 Program created an allocation of each of the groundfish species, as well as of prohibited species catch allowances of halibut and crab, to each of the 27 eligible vessels and authorized them to form cooperatives. The formal objectives of the Amendment 80 Program are to improve retention and utilization and reduce bycatch for the sector. Annual allocations are given to each of the cooperatives based on the vessel catch history of their membership. Amendment 80 Program quota shares may be transferred between individuals by selling the combined vessel, permits and catch history. In addition, the annual allocation may be transferred between program cooperatives, but not between individuals.

The primary market for this fishery is human consumption. Fish are all frozen at sea and primarily head and gutted or whole and shipped to China for secondary processing into fillets and other product forms (AFSC 2016) before they are sold to distributors in Europe, Japan, and the United States. This fishery is harvested with bottom trawl gear. The vessels typically head and gut their fish and then export that frozen product to secondary processors in China. These Chinese processors transform the fish primarily into fillets that are sold to distributors in Europe, Japan, and the United States. There is no recreational fishery for Amendment 80 Program species in federal waters.

Photo Credit: NOAA Fisheries/Connor Maguire

Trends for Top Participating Communities

Commercial Engagement

Since the analysis requires a comparison between fishing ports, the program-specific commercial fishing engagement scores were not calculated for the Amendment 80 Program due to the fact that the only landing location is at sea by catcher/processor vessels.

Regional quotient

Another measure of a community's involvement in the Amendment 80 Program fishery is its Regional Quotient. Regional Quotient is the proportion of Amendment 80 Program species landed within a community out of the total amount of Amendment 80 species landed within the Alaska region. It is an indicator of the percent contribution in pounds or value of Amendment 80 Program species landed within that community relative to the regional fishery. The Regional Quotient is reported individually only for those communities that were **highly engaged for all years** from the Baseline through 2013. All other communities that landed Amendment 80 Program species are grouped as "Other Communities." Figure 5.31 and Figure 5.32 show the Regional Quotient both in pounds and value, respectively, from the Baseline to 2013.

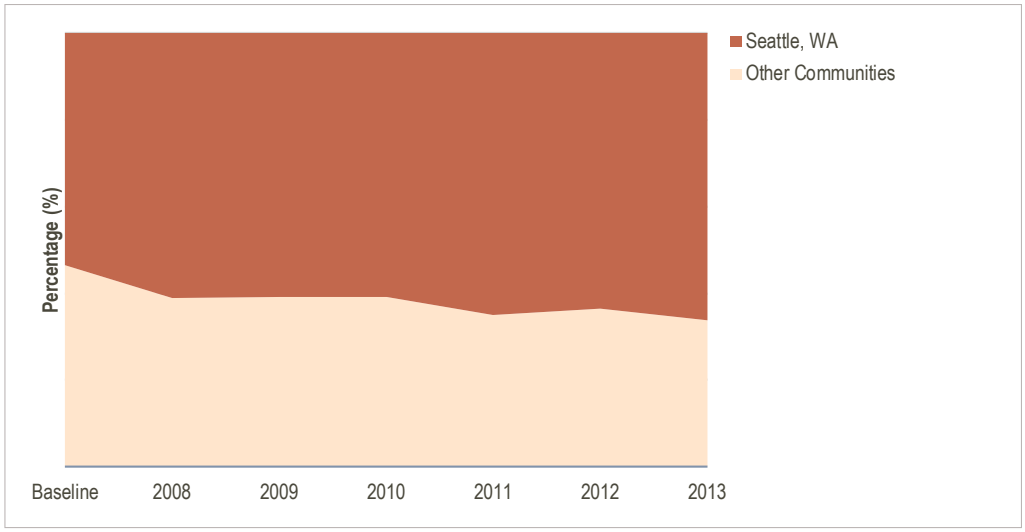


Figure 5.31. Regional Quotient (POUNDS) for communities highly engaged in the Amendment 80 Program for all years from the Baseline (2005-2007) through 2013.

In contrast to the other catch share programs included in this report that use fisheries data for the port of landing, this section attributes the pounds landed and revenue of the vessel to its owner's address because there is no port of landing given that the catch is processed at sea. These vessels are owned by companies in Seattle, Kirkland, Renton, Bellingham, and Sequim, WA. Kirkland and Renton, WA are included in the Seattle Metropolitan Statistical Area, but are considered independently in this report.

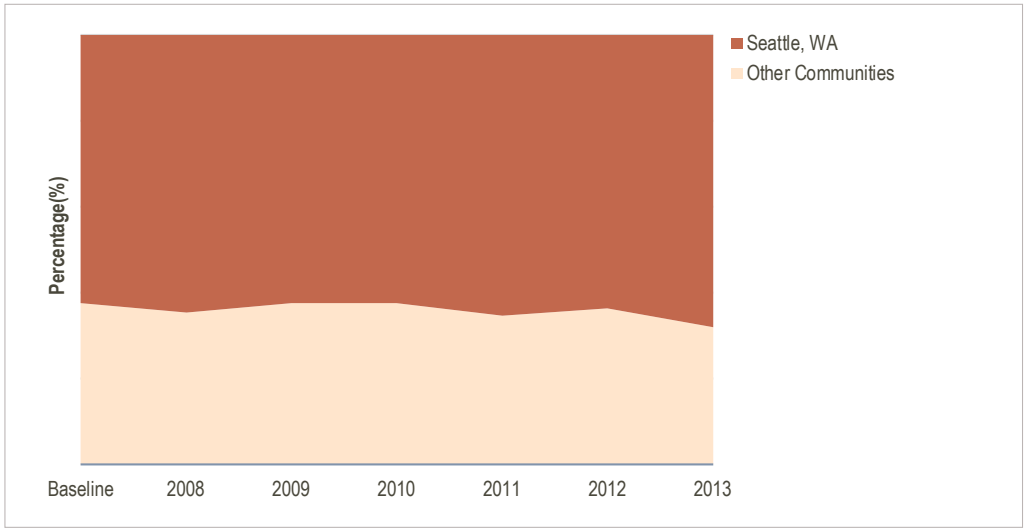


Figure 5.32. Regional Quotient (VALUE) for communities highly engaged in the Amendment 80 Program for all years from the Baseline (2005-2007) through 2013.

The dominant Amendment 80 Program community from the Baseline to 2013 was Seattle, WA (Figure 5.31). Seattle, WA accounted for slightly more than half of the total regional pounds landed in the Baseline period and slowly increased to two-thirds of the total regional pounds landed in 2013. Similarly, the total regional value of landings attributed to Seattle, WA remained at approximately two-thirds of all landings in the regional fishery (Figure 5.32).

Local Quotient

The Local Quotient was not calculated for the Amendment 80 Program due to the fact that this program only includes at-sea catcher/processor vessels. We were able to calculate the Regional Quotient because we have information on where all the vessel owners are located, but we do not have a full accounting of landings of all vessels owned by residents of communities outside Alaska due to vessels participating in both Pacific and North Pacific fisheries.

Community Social Vulnerability Indicators (CSVIs)

The two categories of CSVIs discussed below include social vulnerability and gentrification pressure vulnerability. The Social Vulnerability Indicators represent social factors that can shape either an individual's or community's ability to adapt to change (poverty, personal disruption, labor force structure and population composition vulnerability). The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption and retiree migration).

The Social Vulnerability Indicators for Seattle, WA are included in Table 5.14. Seattle, WA is the only community included given all but two vessels in the program are owned by entities located within the Seattle Metropolitan Statistical Area. Seattle, WA is a large city with a population over 600,000. Seattle, WA ranked low for all vulnerability indices with the exception of the Housing Characteristics Index.

Table 5.14. Social Vulnerability Indicators for communities highly engaged in the Amendment 80 Program for one or more years from the Baseline (2005-2007) through 2013.

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
Seattle, WA	624,681	Low	Low	Low	Low	Moderate

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront (urban sprawl, housing disruption and retiree migration). Gentrification Pressure Vulnerability Indicators for Seattle, WA are included in Table 5.15. The Housing Disruption Index showed low vulnerability for Seattle, WA. Similarly, Seattle, WA has a low score for the Retiree Migration Index. On the contrary, Seattle, WA showed a medium-high Urban Sprawl Index score.

Table 5.15. Gentrification Pressure Vulnerability Indicators for communities highly engaged in the Amendment 80 Program for one or more years from the Baseline (2005-2007) through 2013.

Community	Housing Disruption	Retiree Migration	Urban Sprawl
Seattle, WA	Low	Low	Med High

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

Photo Credit: NOAA Fisheries

Alaska Central Gulf of Alaska Rockfish Cooperatives Program

Program Overview

The Central Gulf of Alaska Rockfish Cooperatives Program (hereafter referred to as the Rockfish Program) was initially implemented as the Central Gulf of Alaska Rockfish Pilot Program in 2007. During the years the Pilot Program was in place, a more formal program was designed, following similar regulations, and was implemented in 2012.

The eight species that are targeted under the Rockfish Program are found at or near bottom habitat. Commercial landings are almost exclusively made in Kodiak, AK. Historically, rockfish caught in the central Gulf of Alaska have been delivered to processing plants in Kodiak, AK. In order to maintain that historical processing link, the Rockfish Program requires that deliveries be made within the city limits of Kodiak, AK unless exceptions are granted.

The Rockfish Program annually allocates fishing quota to cooperatives based on the fishing history of their member vessels. Quota is also allocated to the shore-side sector and the catcher/processor sector. The overarching goals of the Rockfish Program are to reduce bycatch and discards, encourage conservation-minded practices, improve product quality and value, and provide stability to the processing labor force by allowing for better timing of deliveries of rockfish and salmon in the summer months.

The primary market for Rockfish Program species is for human consumption. Fish are typically headed and gutted, frozen, and sent to China for secondary processing into fillets and other product forms (AFSC 2016). The primary gear is the bottom trawl net followed by pelagic trawl nets depending on where fish aggregations are located. There is a recreational fishery targeting rockfish species in the Gulf of Alaska, with the predominant species including yelloweye, black, and dusky rockfish primarily within Alaska state waters.

Photo Credit: NOAA/Crew and Officers of NOAA Ship *Miller Freeman*

Trends for Top Participating Communities

Commercial Engagement

Since the analysis requires a comparison between fishing ports, the program-specific commercial fishing engagement scores were not calculated for the Rockfish Program due to the fact that the only landing location is Kodiak, AK.

Regional Quotient

Since the analysis requires a comparison between fishing ports, the Regional Quotient were not calculated for the Rockfish Program due to the fact that the only landing location is Kodiak, AK.

Local Quotient

The community Local Quotient is the percentage of Rockfish Program species landed within a community out of the total amount of all species landed within that community. It is an indicator of the contribution in pounds or value of the Rockfish Program species to the overall landings in a community. Figure 5.33 and Figure 5.34 show the Local Quotient both in pounds and value from the Baseline to 2013. The Local Quotient for pounds and value landed for Kodiak, AK dropped the first year following implementation, but then remained relatively stable at that lower level between 2008 and 2013.

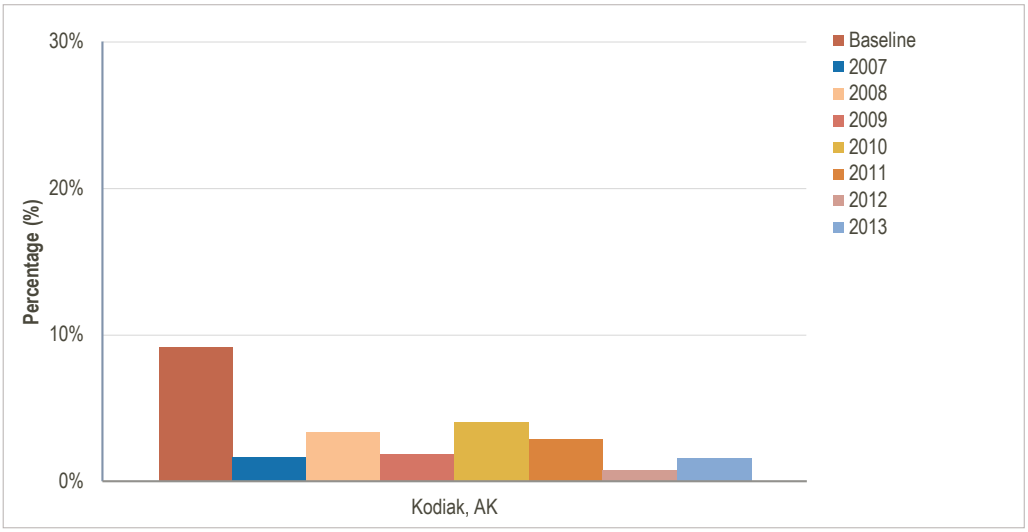


Figure 5.33. Local Quotient (POUNDS) for communities highly engaged in the Rockfish Program for all years from the Baseline (2004-2006) through 2013.

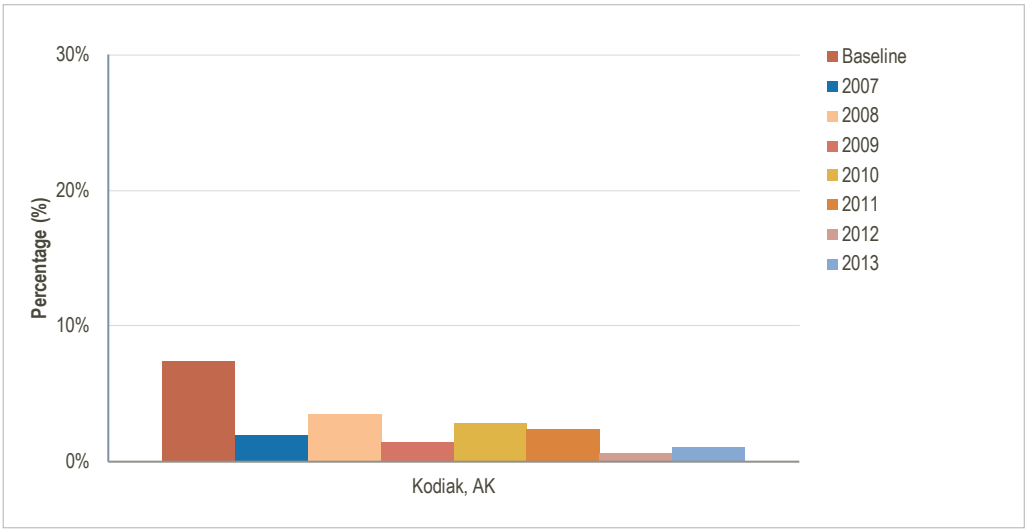


Figure 5.34. Local Quotient (VALUE) for communities highly engaged in the Rockfish Program for all years from the Baseline (2004-2006) through 2013.

Community Social Vulnerability Indicators (CSVIs)

The two categories of CSVIs discussed below include social vulnerability and gentrification pressure vulnerability. The Social Vulnerability Indicators represent social factors that can shape either an individual's or community's ability to adapt to change (poverty, personal disruption, labor force structure and population composition vulnerability). The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront including property and businesses (urban sprawl, housing disruption and retiree migration).

The Social Vulnerability Indicators for Kodiak, AK are included in Table 5.16. Kodiak, AK is the only community included given its status as the only community that can receive landings under the Rockfish Program. Kodiak, AK scored moderate to medium-high vulnerability on three of the five indices and low vulnerability for two.

Table 5.16. Social Vulnerability Indicators for communities highly engaged in the Rockfish Program for one or more years from the Baseline (2004-2006) through 2013.

Community	Population Size (2013)	Personal Disruption	Population Composition	Poverty	Labor Force Structure	Housing Characteristics
Kodiak, AK	6,269	Low	Med High	Moderate	Low	Med High

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

The Gentrification Pressure Vulnerability Indicators characterize factors that over time may indicate a threat to the viability of a vibrant commercial working waterfront (urban sprawl, housing disruption and retiree migration). Gentrification Pressure Vulnerability Indicators for Kodiak, AK are included in Table 5.17. The Housing Disruption Index showed low vulnerability for Kodiak, AK. The Retiree Migration and Urban Sprawl indices were not calculated for communities located in Alaska due to data limitations and limited applicability of the indicators for Alaska communities.

Table 5.17. Gentrification Pressure Vulnerability Indicators for communities highly engaged in the Rockfish Program for one or more years from the Baseline (2004-2006) through 2013.

Community	Housing Disruption	Retiree Migration	Urban Sprawl
Kodiak, AK	Low	N/A	N/A

Note: Highlighted cells indicate communities that were highly engaged for all years from the Baseline through 2013.

Regional Summary

Those communities that were highly engaged in one or more catch share programs are displayed in Table 5.18 with the number of years of high engagement within each program including the Baseline. Overall, there were 19 communities in Alaska and the Pacific Northwest that were engaged at least one or more years in any program. Of those 19 communities, 12 were included because they were highly engaged in either the Halibut or Sablefish Individual Fishing Quota Programs only and Saint Paul and King Cove, AK were only included for their involvement in the BSAI Crab Rationalization Program. The other five communities (the At-Sea Sector; Akutan, Kodiak, and Unalaska/Dutch Harbor, AK; and Seattle, WA) were highly engaged for one or more year in at least two different programs.

Table 5.18. Number of years Alaska communities were highly engaged in a North Pacific catch share program from the Baseline through 2013.

	Alaska Halibut and Sablefish IFQ		American Fisheries Act Pollock Cooperatives	Bering Sea and Aleutian Islands Crab Rationalization Program (2013/2014 season)	Non-Pollock Trawl Catcher/ Processor Groundfish Cooperatives (Amendment 80)**	Central Gulf of Alaska Rockfish Cooperatives***
	Halibut	Sablefish				
At-Sea Sector	-	-	All	All	-	-
Bellingham, WA	7	-	-		-	-
Akutan, AK	-	-	10	All	-	-
Cordova, AK	5	1	-	-	-	-
Homer, AK	All	All	-	-	-	-
Hoonah, AK	4	2	-	-	-	-
Juneau, AK	19	13	-	-	-	-
Kenai, AK	1	-	-	-	-	-
King Cove, AK	-	-	-	All	-	-
Kodiak, AK	All	All	-	2	-	
Pelican, AK	-	1	-	-	-	-
Petersburg, AK	All	6	-	-	-	-
Sand Point, AK	5	1	-	-	-	-
Seattle, WA	1	-	-	-	-	-
Seward, AK	All	All	-	-	-	-
Sitka, AK	All	All	-	-	-	-
Saint Paul, AK	-	-	-	9	-	-
Unalaska/Dutch Harbor, AK	All	16	All	All	-	-
Yakutat, AK	1	15	-	-	-	-

*This represents the number of Bering Sea and Aleutian Islands Crab Rationalization Program crab seasons through the 2013/2014 season.
**Commercial engagement scores were not calculated for the Amendment 80 Program since all activity occurs at-sea by catcher/processor vessels.
***Commercial engagement scores were not calculated for the Rockfish Program as all shoreside landings occur within Kodiak, AK.

Conclusion

In this first ever review of U.S. catch share programs at the community level, we have chosen to describe 13 of the 16 currently active catch share programs. The three excluded programs all have some feature that is unique to each program and differentiates each sufficiently from the others that a cross-comparison requires their exclusion. In addition, both the Northeast Region Atlantic Surfclam and Ocean Quahog ITQ and the Alaska Halibut and Sablefish IFQ Programs consist of two separate species that were not initially combined. Thus, for these programs, each of its two species has its own section. There are therefore 15 program descriptions, though only 13 actual programs. The 13 catch share programs described here show important differences in the length of time each program has existed and the number of communities involved. In this report, NOAA Fisheries has provided a comprehensive overview of these U.S. catch share fisheries at the community level using a common set of metrics established by the NOAA Fisheries Human Dimensions Team.

The metrics chosen here provide an overview of both program-specific species or species group landings data and human well-being data for the communities involved in each catch share program. The metrics offer an ability to compare communities within each program, but also make possible comparisons of community participation across programs. While many of the catch share programs have common objectives (e.g., reduce overcapacity, improve safety at sea), it becomes clear that they are often tied to specific issues within a particular fishery and region. Some programs have distinct objectives focused on the fishing community (e.g., Northeast Multispecies Sector Program, BSAI Crab Rationalization Program), while other programs are more dedicated to the individual or business entity (e.g., Red Snapper ITQ, Golden Tilefish ITQ). Nevertheless, within the Magnuson-Stevens Fishery Conservation and Management Act (MSA), National Standard 8 requires NOAA Fisheries and the Fishery Management Councils to identify and consider the impacts of regulatory actions on fishing communities; therefore, the focus of this report is on community participation within a catch share program and community-level changes in participation over time. Below, an overview of each performance metric across programs is provided to give some perspective on whether there are general trends that communities may be experiencing through participation in these catch share programs.

Catch Share Program Commercial Fishing Engagement

The program-specific catch share commercial engagement metric seems to be fairly stable across all programs for communities that were highly engaged for all years, but more variable for other communities. For example, in the Red Snapper IFQ and Grouper-Tilefish IFQ Programs in the Southeast; the Golden Tilefish, Atlantic Sea Scallop IFQ and Northeast Multispecies Sector Programs in the Northeast; the Groundfish Trawl IFQ Program on the West Coast, and most of the catch share programs in Alaska, there are fluctuations and changes from the Baseline through the most current year for all communities, but for those communities that have been highly engaged for all years these changes are rarely larger than one standard deviation. On the other hand, in the Mid-Atlantic Surfclam/Ocean Quahog ITQs in the Northeast and the Pacific Coast Sablefish Permit Stacking Program on the West Coast, the communities highly engaged for all years seem to demonstrate a higher amount of fluctuation in engagement over time. The Mid-Atlantic Surfclam/Ocean Quahog ITQ Programs demonstrate large fluctuations several years after implementation of the programs for several communities that were highly engaged all years. The Pacific Coast Sablefish Permit Stacking Program also exhibited substantial fluctuation among the subset of communities that were highly engaged all years, but with generally decreasing engagement.

For communities that have been highly engaged fewer than all years there generally seems to be more fluctuation. For instance, Saint Paul, AK in the BSAI Crab Rationalization Program in Alaska has experienced a substantial increase in engagement relative to the three years prior to program implementation. In the Red Snapper IFQ Program in the Southeast, on the other hand, many communities have seen declines in engagement since the inception of the program, especially Leeville/Golden Meadow, LA. Similarly, the Pacific Coast Sablefish Permit Stacking Program on the West Coast has several communities highly engaged fewer than all years experiencing substantial swings in engagement, some increasing their levels of engagement (e.g., Ilwaco, WA), and others decreasing their engagement over time (e.g., Moss Landing, CA).

Regional Quotient

Regional quotient is a reflection of a community's engagement in a catch share program. If there is considerable fluctuation in a community's engagement score, there is a comparable fluctuation mirrored in a community's Regional Quotient. While engagement is a measure of both landings and value along with permits and dealers/processors/first receivers in the region, Regional Quotient includes only landings and value and is a measure that explicitly compares these to other communities in the region. One aspect of Regional Quotient that is not captured within the engagement

metric is the portion of a particular catch share species or species group that is landed outside of the communities that were highly engaged for all years. Most of the programs reported here have communities that were highly engaged for all years and in these cases those communities capture most of the landings within the program. However, the Red Snapper IFQ Program has a substantial amount of landings in communities that were highly engaged for fewer than all years. This is likely because of the close relationship between the two Gulf of Mexico IFQ programs, with a considerable number of fishermen in the Grouper-Tilefish IFQ Program also landing red snapper. In the Northeast Region Atlantic Surfclam/Ocean Quahog ITQ Program, there is a substantial amount of product landed by communities highly engaged for fewer than all years in the early years of the programs, but the preponderance of communities shifts significantly toward those highly engaged in the later years of the program.

Local Quotient

The Local Quotient metric provides a glimpse of the importance of catch share species or species groups to a community's overall landings. For many communities, there can be rather large fluctuations in both their pounds and value Local Quotient over time. These fluctuations are not always a reflection of changes with regard to a particular catch share program, but may be indicative of changes in landings of other species. Yet Local Quotient does signify how important some catch share species are for a community, and even where the percent pounds of Local Quotient may not be significant, the percent value of that Local Quotient is often times much greater. For some communities, the trends for Local Quotient can demonstrate either an increasing or decreasing reliance upon catch share species. This was especially evident in the Pacific Coast Sablefish Permit Stacking Program that saw some communities showing a decreasing reliance upon sablefish, while others saw a large increase in reliance. Similarly, in the Pacific Coast Groundfish Trawl IFQ Program, communities where percent pounds landed have remained constant over time may be becoming centers of groundfish trawl species landings as the IFQ Program takes hold, while other communities show decreases in terms of both their Local Quotient results and Regional Quotient results. In several of the Alaska programs, such as the high value/low volume fisheries for halibut, sablefish, and crab, while Local Quotient (both pounds and value) was rather stable over time for most communities, in some communities there was a significant difference between pounds and value, with Local Quotient value being as much as 30 percent higher than Local Quotient pounds. The same was true for the IFQ programs in the Southeast where some communities in both the Red Snapper IFQ and Grouper-Tilefish IFQ Programs saw similar differences of the same magnitude. For the Pacific Coast Groundfish Trawl IFQ, the reverse was evident as the Local Quotient pounds were always higher than the value, sometimes by large margins.

Community Social Vulnerability Indicators

While there were no clear trends within the Social Vulnerability Indicators across programs, it is worth noting that many communities are experiencing medium-high to high social vulnerabilities on several indices. Because these measures are able to provide metrics of the broader socioeconomic status of communities, there is no direct link between the Social Vulnerability Indicators and the fishing activity within a community. However, because the fishing activity does take place within particular communities and some of these communities are experiencing social vulnerabilities, the people in these communities, including fishermen and their families, would find it more difficult to adapt to adverse impacts to their livelihood. This will likely be especially true for more isolated rural communities that may have fewer alternative opportunities compared to larger urban areas. Therefore, it is important to look at changes in catch share programs within those communities that are experiencing higher levels of these types of social vulnerabilities.

Alaska has many rural communities that participate in its catch share programs. In particular, the communities of Hoonah, Sand Point, and Akutan seem to be experiencing the highest social vulnerabilities and have the smallest population sizes. In the Northeast, it is some of the more urban areas that seem to have the highest social vulnerabilities: Atlantic City, NJ; New Bedford, MA; and Norfolk, VA all have high social vulnerabilities but larger populations. Some smaller communities, including Port Norris and Wildwood, NJ, are also experiencing these same levels of social vulnerability. The West Coast Region has several communities participating in catch share programs exhibiting high social vulnerability scores. The communities of Port Orford, OR; Neah Bay, WA; and Crescent City, Moss Landing, and Fort Bragg, CA all have medium-high to high scores on several social vulnerability indices; some of these are communities with small populations and others are slightly larger. None are large urban areas. The Southeast seems to have the most communities experiencing high levels of social vulnerability, with 12 communities having medium-high to high scores on three or more social vulnerability indices. The communities of Port Isabel and Freeport, TX; Bayou La Batre, AL; and Fort Myers, FL seem to be experiencing the highest levels of social vulnerability among those communities participating in catch share programs in the Southeast.

The Gentrification Vulnerability metric provides some measure of potential development pressures that may exist within a community. As waterfront property becomes more valuable following demographic shifts due to new residents moving into coastal communities, property values may increase. This can lead to higher value being placed on non-traditional uses that may have little to do with fishing. In the Northeast, communities from New York seem to be experiencing the highest gentrification pressures as Hampton Bays, Montauk, and Point Lookout, NY all have high gentrification pressure. Cape May, NJ and Chatham, MA are also experiencing high gentrification pressure. In the Southeast, Florida's Central West Coast has the most communities with significant gentrification pressure: Redington Shores, St. Petersburg, Sarasota, Fort Myers Beach, Naples, and Matlacha, FL all have at least two gentrification indices at medium-high to high. Islamorada is the only community from the Florida Keys participating in catch share programs that also fits into that category. The two California communities of Bodega Bay and San Francisco have high gentrification scores and the community of Port Orford, OR is the only other West Coast community with high gentrification scores. Alaska communities were not included in the Gentrification Vulnerability metric as most communities in that state had relatively little gentrification pressure.

By examining these multiple community-level indicators, researchers, and policy makers can better understand both the current status and historical trends of community fisheries participation and social well-being in U.S. catch share programs. In this, they help to:

1. fulfill multiple requirements of the MSA, including National Standard 8;
2. improve assessments required under the National Environmental Policy Act (NEPA), such as Social Impact Assessments;
3. provide input to ecosystem models used by NOAA Fisheries and others; and
4. more generally, advance fisheries social science in disciplines such as anthropology and sociology.

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