Description of the new socioeconomic sablefish indicators intended for use in the 2024 Ecosystem and Socioeconomic Profile of the Sablefish stock in Alaska

Economic and Social Science Research Program

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We are proposing the introduction of four new socioeconomic indicators to help communicate economic and community drivers of the Alaska sablefish fishery: 1) historical and inseason sablefish prices and landings sold by size, 2) TAC utilization by region, 3) revenue shares of active vessels in the sablefish fishery by sector and gear type, and 4) regional quotients for communities with the greatest historical value and landings of sablefish. These new socioeconomic indicators reflect trends in sablefish markets, vessel activity, and community involvement to help inform Total Allowable Catch (TAC) decisions. Below is a brief description of each new socioeconomic indicator and the data source(s), variables, and methodology used to calculate each, along with a graphical preview of initial results. The creation of these indicators is in response to the North Pacific Fishery Management Council's (Council) Scientific and Statistical Committee's (SSC) requests for additional socioeconomic information in the Alaska sablefish Ecosystem and Socioeconomic Profile (ESP) (SSC Minutes 2019, 2020). This effort also begins the process of addressing the SSC recommendations for improving coordination of socioeconomic information in multiple Council decision-informing sources including the ESPs and providing socioeconomic information that meets the threshold for best scientific information available (BSIA) to the Council at the time of TAC setting. This allows the Council to consider socioeconomic information along with biological information in TAC recommendations (SSC Minutes 2022, 2023). This document also responds directly to the Council motion to include socioeconomic information in the ESPs.

We will utilize three data sources to calculate the proposed socioeconomic indicators: 1) the National Marine Fisheries Service (NMFS) Alaska Regional Office (AKRO) inseason interagency electronic reporting system for commercial fishery landings in Alaska (eLandings) data, 2) the NMFS AKRO catch accounting system (CAS), and 3) the Alaska Commercial Operators Annual Report (COAR). Inseason eLandings data contains near real-time information on vessel activity, landings, and prices from fish tickets submitted by shoreside processing plants, at-sea catcher processor fishing vessels, and the Community Development Quota (CDQ) program. This data does not consider post-season adjustments or data processing but can be used to analyze inseason trends with minimal lag time. Inseason eLandings data is integrated with on-board observer data to extrapolate information for unobserved vessels to create the NMFS AKRO CAS, described in greater detail in Cahalan et al. (2014). The COAR considers purchasing information from land-based and at-sea processors and other first buyers of raw seafood products including gear types and product delivery conditions. Data from COAR requires additional processing to consider post-season adjustments (such as end-of-year bonuses) and prices of at-sea processors. For these reasons, and the submission date deadline for COAR reports, COAR information is available with a one-year lag. The data source(s) and variable(s) used for each new socioeconomic indicator are described further below:

1. Inseason Pricing and Quantity Sold by Size:

This indicator will report the annual size-specific average price per pound, the weight of landings (in pounds) of sablefish, and the proportion of total landings by size category using AKRO inseason eLandings data. The inseason eLandings data provides size-specific information on the price per-pound of sablefish and the quantity (in pounds) processed by the shoreside processing industry for, primarily, the fixed gear (IFQ) fishery. The catcher-processor fleet does not size sablefish and limited sizing data are recorded by the trawl fleet. Since this indicator utilizes inseason data, we will not have complete annual

information on pricing or landings for the current year. For this reason, we will calculate the historical size-specific price per pound and landings using inseason data between January 1 and September 30 to allow for a consistent retrospective comparison with the current year. Using inseason eLandings data between 2015 and 2023, we compared the absolute difference in price per-pound by year and by size between a full-year (Jan. through Dec.) and a partial year (Jan. through Sept.). We find a less than 5% absolute difference, on average, between the full-year and partial year price per-pound by year and by size categories suggesting a relatively small absolute difference exists between average full-year and partial-year prices per-pound by size. The size categories, measured in pounds, commonly used by shoreside processors when purchasing sablefish are <2, 2 to 3, 3 to 4, 4 to 5, 5 to 7, and >7.[1] We calculate the annual size-specific price per pound as the average price per-pound of all sablefish sold for human consumption within each size category for each year. Similarly, the annual size-specific landings are calculated as the sum of all sablefish sold for human consumption (measured in pounds) within each size category for each year. We use the size-specific landings to calculate the percentage of total annual landings that are associated with each size category by dividing the size-specific landings for each year by the total annual landings. Although AKRO inseason eLandings price information does not account for post-season adjustments, we have found that the trends in the historical price per-pound and landings (not differentiated by size) of sablefish are consistent between the inseason eLandings data, the Commercial Fisheries Entries Commission, which considers post-season adjustments and data processing, and COAR. Interpretations of this indicator should be made with the caveat that the inseason eLandings data does not account for post-season adjustments and only includes inseason eLandings data uploaded and processed by ADF&G before September 1 of each year.

This indicator provides information on fishery performance and market conditions for the fixed gear fleet (Figure 1). Information from Figure 1a may help with tracking total sablefish landings and gear selectivity for vessels within the fixed gear fleet. Figure 1b provides additional context into the percentage breakdown of total sablefish landings (Figure 1a) by size category. The trend from Figure 1b, with additional biological information, may allow tracking size and weight distributions of the sablefish stock caught by the fixed gear fleet. For example, Figure 1b suggests that the percentage of total sablefish landings is increasing in the 2 to 3 pound and the 3 to 4 pound size categories while decreasing in the <2 pound and >7 pound categories in recent years which may suggest that there is an increase in small sablefish that are being caught by the fixed gear fleet but decreases in the smallest (and highest) category. This may suggest an increase in sablefish biomass within the 2 to 4 pound size categories with reductions in sablefish biomass smaller (greater) than the <2 (>7) pound category. Figure 1c provides market information on the trends in sablefish prices by size providing additional information that can be compared to the changes in size-specific landings (Figure 1a,b).

2. **Percentage of Total Allowable Catch (TAC) Harvested:**

This indicator will report the inseason and historical cumulative percentage of TAC utilization by week for the BSAI and GOA. This will capture the differences in TAC utilization by region, complimenting the more detailed sector level inseason report presented by the Alaska Regional Office in December. We calculate this indicator using inseason CAS information to track region-specific weekly sablefish landings. Inseason and historical TAC usage is calculated by dividing the cumulative sum of weekly sablefish landings in each region by the associated annual TAC level. We plot the indicator for each region overlaid by years between the current year and prior ten years. Historical TAC utilization by week is illustrated for the full-year (Jan. through Dec.). The current year's TAC utilization by week, however, is only shown through September 1 at the September Groundfish Plan Team meeting and October Council meeting. This will allow for comparisons in TAC utilization trends and magnitudes between historical

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[1] Size categories do not consider differences in quality. Quality grades tend to be processor-specific and difficult to bin across processors. Size categories, however, are very similar across processors allowing us to identify size category bins for approximately 98% of all fish tickets with reported size information.

years and TAC utilization trends with the current year. Although historical TAC utilization tends to level-off by early November, interpretation of TAC utilization in the current year should be made with the caveat that the vessels may continue harvesting sablefish until the end of 2024, and available inseason data are subject to updates/corrections. For this reason, we can only compare historical TAC utilization with the current year until September 1.

This indicator may assist in determining which region is the most sensitive to changes in TAC regulations (Figure 2). Historical utilization of TAC can illustrate if a sector repeatedly under-utilizes TAC or consistently reaches, or over-utilizes, the TAC level. If it is uncommon for TAC to be fully utilized within a region, then changes in the TAC may not have a significant impact on landings. If the TAC is consistently fully utilized or has recently been exceeded, however, then changes in the TAC may have a greater impact on landings within the given region. Additionally, breaking the TAC utilization indicator into weekly units provides decision-makers up-to-date information on TAC utilization in the current year as well as presenting current-year progress in a historical trend context.

3. **Total Revenue Share by Sector and Gear Type:**

This indicator will report the historical proportion of total region-specific (BSAI and GOA) sablefish revenue associated with catcher vessels (CV) and catcher processor (CP) vessels and trawl, slinky pot (POT), and hook-and-longline (HAL) gear. This will provide two historical region-specific (four total) revenue share indicators by vessel and gear type allowing for comparisons between CP and CV vessels and trawl, POT, and HAL gear. Using inseason CAS and historical COAR data, we calculate the total region-specific sablefish revenue for the BSAI and GOA. Then, we calculate the total region-specific sablefish revenue associated with CPs and CVs in addition to gear types. We divide the vessel- and gear-specific revenue within each region by the total region-specific sablefish revenue to get the proportion of total region-specific sablefish revenue associated with each vessel and gear type. We report the average vessel- and gear-specific proportions for each region between 2010 and 2023 (Figure 3). We only report lagged data for this indicator to account for post-season adjustments and prices of at-sea processors that are reported through COAR. This indicator also provides additional information on the proportion of value derived from between sectors (CV and CP) and gear types. The proportion of value derived between sectors and gear types may assist with predicting the distributive impact a TAC decision may have on the overall value share of the fishery and the impact on revenue of select fleets. Additionally, understanding the revenue share may provide additional information on TAC allocation based on the percentage of value derived between sectors and gear types. These indicators provide insight for decision-makers in setting TAC in consideration of economic and social factors consistent with the management objectives of the FMP and management framework, recognizing the inherent trade-offs in fishery objectives as directed in the Magnuson-Stevens Fishery Conservation and Management Act National Standard 1 Guidelines.

4. **Regional Quotient:**

The regional quotient is defined as the involvement of communities (determined by landings port and vessel owner registration residence) in the sablefish fishery. This is measured as a proportion of community-specific sablefish landings and value relative to the total sablefish landings and value in all communities. We will illustrate the regional quotient for the top communities that, on average, recorded the greatest involvement in the sablefish fishery. Using inseason CAS and historical COAR data, we calculate the regional quotient (by landings port and vessel owner registration residence) for each community by dividing the community-specific sablefish landings and value by the total sablefish landings and value from all communities. Similar to the revenue share indicator, we report the regional quotient for landings and value between 2008 and 2022 using lagged data to account for post-season adjustments for sablefish and data processing (Figure 4). Since 2008, two communities (Seattle, WA and Sitka) have the highest regional quotient by vessel owner registration residence and three communities

(Homer, Petersburg, and Kodiak) have a regional quotient by vessel owner registration residence between 5% and 15%. Similarly, three communities (Sitka, Seward, and Kodiak) consistently have the highest regional quotient (between 10% and 25%) and four communities (Juneau, Petersburg, Cordova, and Sand Point) have a regional quotient by landings port of 3-5% (all other communities' regional quotient are less than 1%).

This community-based indicator will provide information on the distribution and trend of sablefish participation using two community classifications (landings port and vessel owner registration residence). Community participation information may be beneficial when discussing community level impacts from changes to sablefish, or other species', TAC and other regulations. Trends in community participation may also allow tracking the communities (i.e. processing plants) that are of the greatest importance for the sablefish fishery allowing for predictions from changes in stock or community (closures in processing plants, etc.) dynamics. Additionally, the regional quotient helps depict which communities may have high levels of importance on the sablefish fishery based on trends in their historical participation. The regional quotient reflects social factors such as the involvement of local communities on the sablefish fishery, and helps decision-makers take into account the importance of fishery resources to fishing communities consistent with National Standard 8. In conjunction with community level information provided in public comment and in reports like the Annual Community Engagement and Participation Overview (ACEPO), the Council can weigh whether cumulative past and reasonably foreseeable future management decisions along with non-fishery indicators, i.e. unemployment and school enrollment may impact ability to adapt to changes in TAC in a community with a high regional quotient for sablefish. This information will be useful when discussing TAC changes for sablefish and, potentially, other fisheries.

References

Cahalan, J., J. Gasper, and J. Mondragon. 2014. Catch sampling and estimation in the federal groundfish fisheries off Alaska, 2015 edition. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-286, 46 p. Available at: http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAATM-AFSC-286.pdf
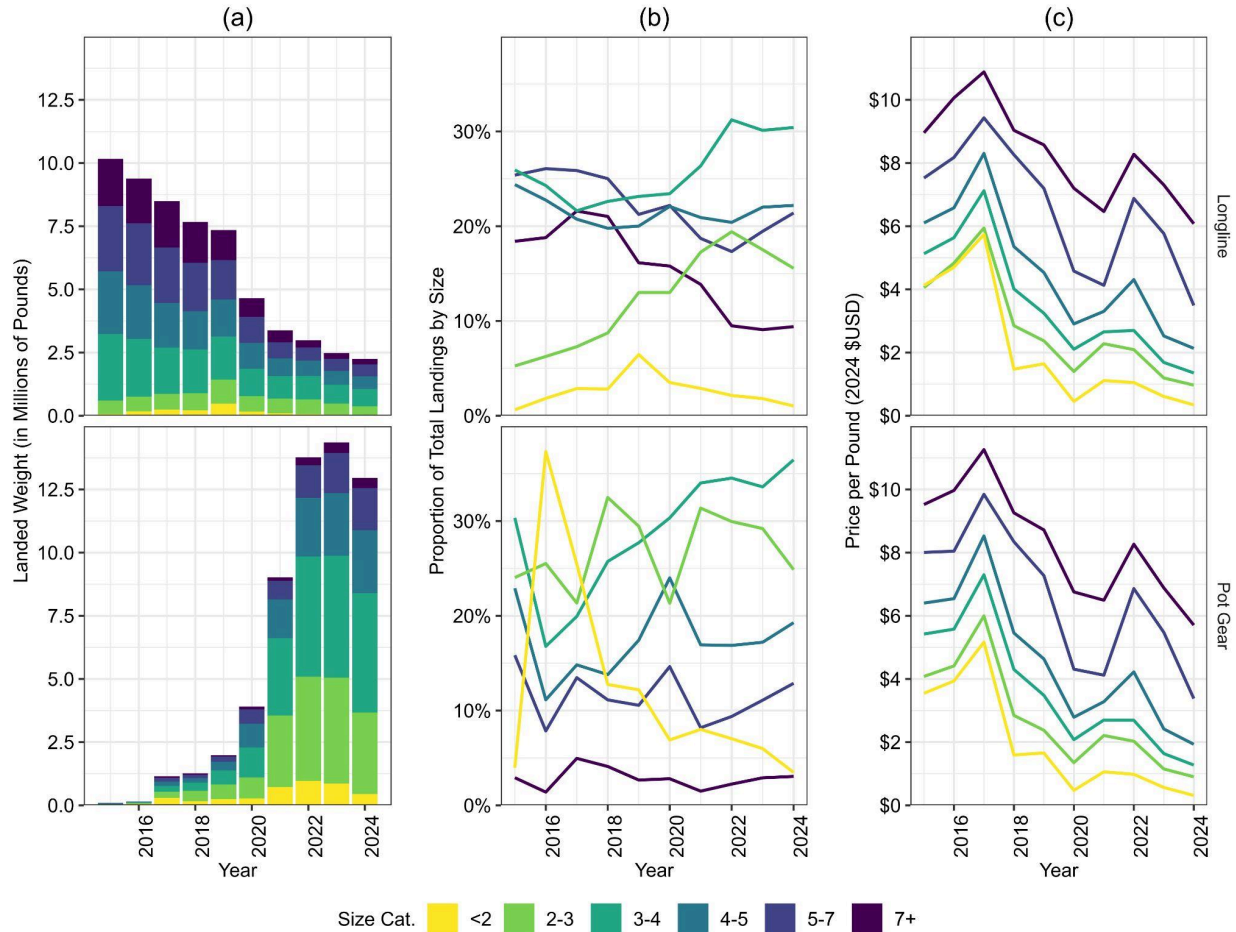
Figures

Figure 1: (a) Total sablefish landings by gear type and size class; (b) Percent of total sablefish landings by gear type differentiated by size class and; (c) Average price per-pound differentiated by size class. Note: The information above considers data between January through August for sablefish sold for human consumption from catcher-vessels (no size reporting submitted by catcher-processors) in the fixed gear fishery (limited information from the trawl fishery). All prices are adjusted to 2024 dollars using the BLS CPI to account for inflation.[2]

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[2] U.S. Census Bureau of Labor Statistics [BLS]. (2024). *Consumer Price Index for All Urban Consumers: All Items in Urban Alaska (CBSA) [CUUSA427SA0]*. Retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/CUUSA427SA0, August 1, 2024.
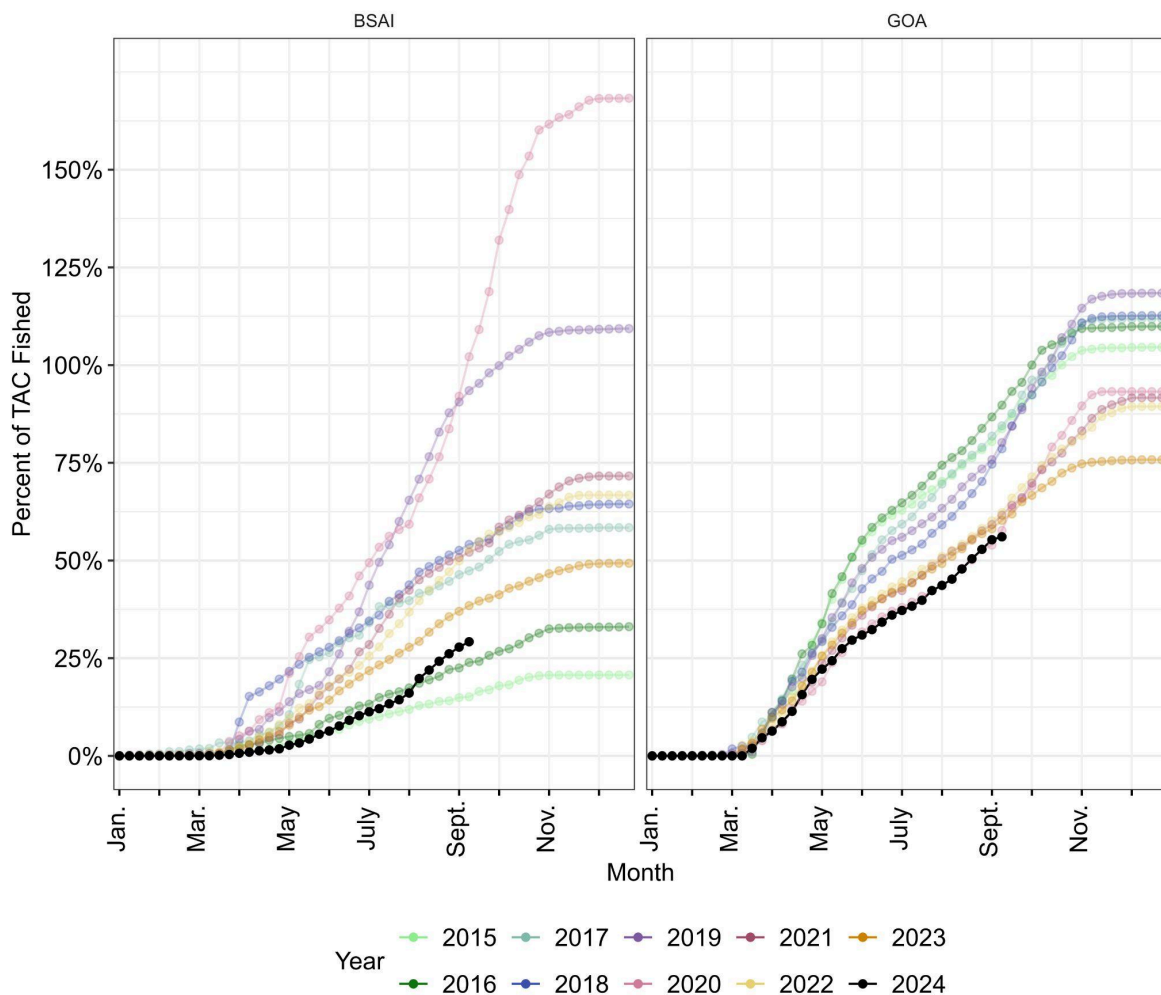
Figure 2: Percentage of Total Allowable Catch (TAC) by week and year differentiated by region. Note: Data on landings used within the TAC utilization calculation includes catch and discards.
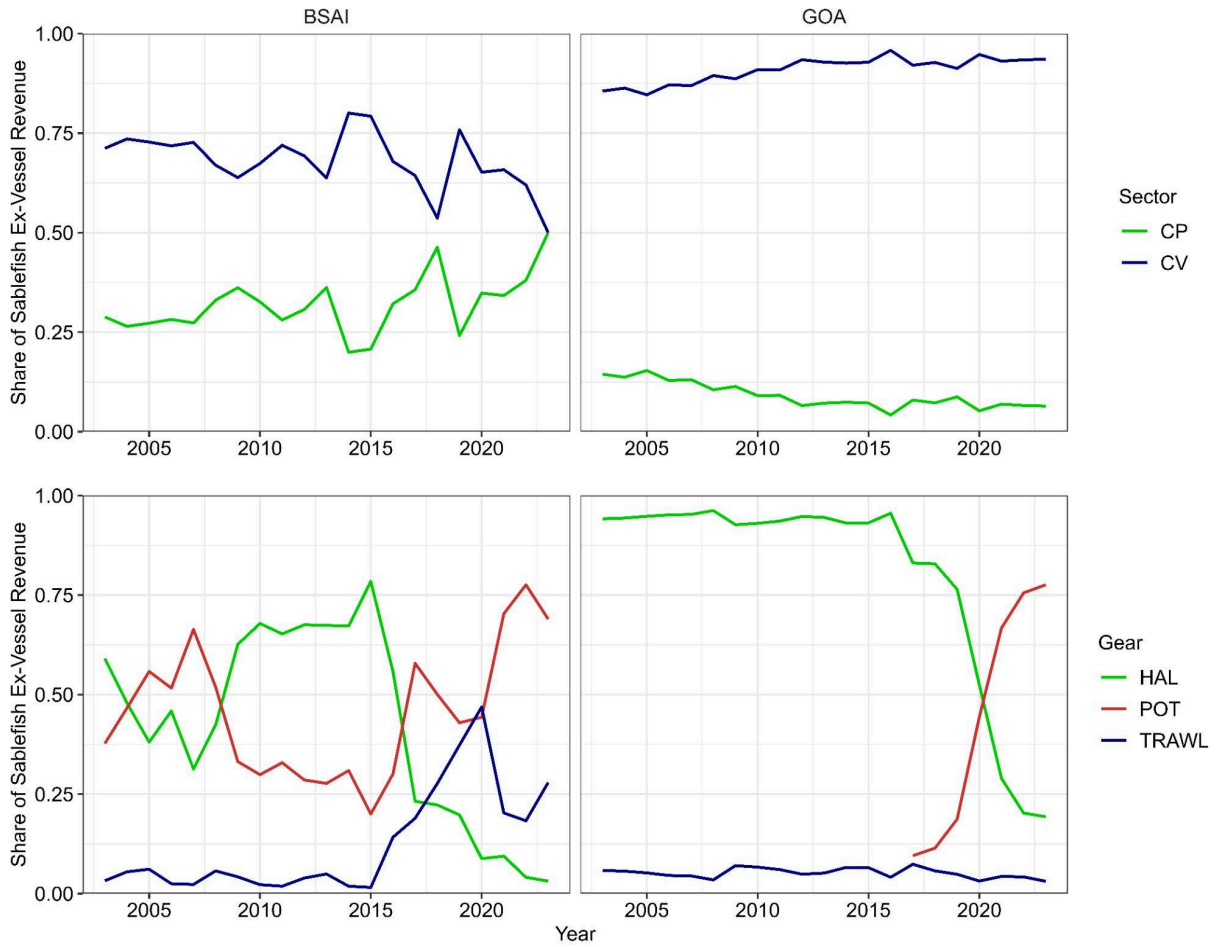
Figure 3: Revenue share by sector and gear type differentiated by region. Note: The sum of each line by year within each subplot equals 1 (or 100%) representing the full sablefish revenue in each area. Pot gear includes slinky pots. In GOA, the revenue share for POT gear is not shown before 2017 due to confidentiality.
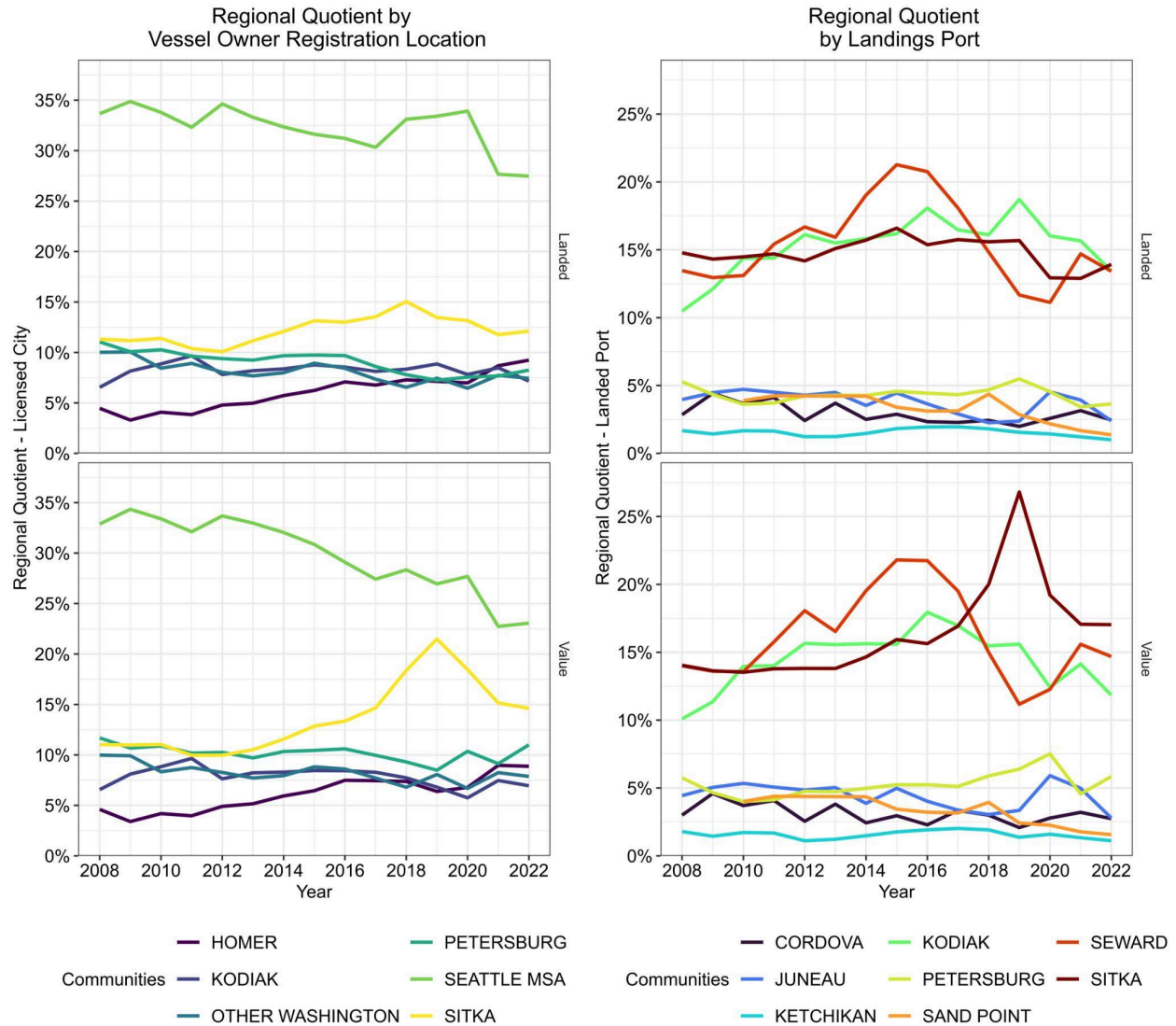
Figure 4: Regional quotient by vessel owner residence and by port of landings. Note: The vessel owner residence column (1) shows locations that have an average regional quotient greater than 5% between 2008 and 2022 and the landings port column (2) shows the locations with an average regional quotient greater than 2.5% between 2008 and 2022.