Analysis of COVID-19 Impacts on Surveyed West Coast and Alaskan Commercial Fishing Operations during the First Six Months of the Pandemic

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U.S. Department of Commerce
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Table of Contents

List of Tables

List of Figures

Introduction

Since the start of the COVID-19 pandemic in the United States in 2020, the implementation of public health strategies deemed necessary to limit the spread of the virus have brought about a range of challenges for the commercial fishing industry. Social and physical interaction, which are prevalent when conducting seafood-related business activities like fishing and selling product at markets, were discouraged throughout 2020 in an attempt to contain the virus. During the year, commercial fishermen experienced disruptions to their usual business activities for a multitude of reasons, including: personal or external preventative health guidelines that altered normal fisheries-specific interactions; the infection of self or other individuals related to one's work, family, or other social environments; and/or changes in the predictability of market conditions, patterns of seafood consumption, and the stability of supply and distribution channels.

Each of the challenges listed above are linked in some way to the aim of maintaining physical distance and/or a sufficient respiratory barrier between people to limit the transmission of COVID-19. The West Coast and Alaska, which had some of the United States' first reported COVID-19 cases, took steps in mid-March to prevent the spread of the escalating virus (Jernigan, 2020). Starting March 16, 2020, the states of California, Oregon, Washington, and Alaska all began to impose guidelines to minimize social interactions in response to COVID-19 outbreaks across the U.S. (Hale et al., 2021). Restaurants, a primary distribution channel for seafood, were ordered to shut down the following day in all four states (Sorensen, 2020). By the end of March, stay-at-home orders were in place, with only essential activities and occupations permitted (Love et al., 2020; Hale et al., 2021). As state COVID-19 restrictions relaxed during the summer months, restaurants in West Coast states and in Alaska were permitted to offer limited-capacity outdoor and indoor dining (Hale et al., 2021). But as COVID-19 cases surged during the winter months, restaurant restrictions were temporarily reinstated (Hale et al., 2021).

Even before COVID-19 precautions were enacted in the U.S., commercial fishermen operating off the West Coast and Alaska were being impacted by the COVID-19 pandemic. In response to the rapid spread of the virus, Asian seafood markets and processors began to close in January 2020, shrinking the market for exported seafood on the West Coast (Guldin et al., 2021). Moreover, China explicitly banned imports of live seafood in January of 2020 as the novel coronavirus outbreak intensified in the country, shutting down a key export destination for Dungeness crab and lobster from the West Coast and Alaska (Love et al., 2021). Reductions in consumer and processor demand for seafood in Asia due to coronavirus-related shutdowns significantly altered the supply chain for exporters of seafood on the West Coast of the U.S. (Love et al., 2021). Increases in cost and restrictions in availability of air freight transportation to China also diminished the market for exported seafood on the West Coast and in Alaska (Upton, 2020; Love et al., 2021).

Although the U.S. commercial fishing industry, which was deemed essential[1], continued to operate during the pandemic, the domestic and global closure of restaurants, bars, and other businesses associated with the sale of seafood—such as fresh markets—compounded the losses suffered by commercial fishermen along the West Coast and Alaska, especially during the spring

[1] https://www.cdc.gov/vaccines/covid-19/categories-essential-workers.html

months of 2020. However, for some seafood products like salmon and tuna, the decreased demand from restaurants was offset by a shift towards retail consumption[2] as more people consumed food in the safety of their home (Guldin et al., 2021). As wholesale seafood companies limited their sales amidst restaurant closures, some commercial fishermen on the West Coast turned to direct-to-consumer marketing[3,4] to sell their catch (Guldin et al., 2021). This approach was also adopted by salmon fishermen in Alaska[5], who took to online marketplaces to sell their product to a wider consumer base. Similar direct-to-market strategies were adopted by commercial fishermen on the East Coast but doing so added to the number of hours worked per day (Sorensen et al., 2020). Notably, direct-to-consumer sales only applied to certain commercial operations, mainly those that sold fresh catch.

Providing some respite to the lack of seafood demand, dining establishments began to reopen during the summer months of 2020 in the West Coast states and Alaska, which coincided with the final months of interest of the survey described in this report (Love et al., 2021; Hale et al., 2021). Still, during the autumn and winter months of 2020, regional surges in COVID-19 infections and persistent messaging from public health officials about the risks of social interaction continued to alter normal patterns of fishing and seafood consumption around the West Coast and the nation at large (Glazier et al., 2021).

On an individual basis, commercial fishermen had to adapt their operations to mitigate against the danger that COVID-19 posed in the workplace. Commercial fishermen incurred new operational costs related to the pandemic, including expenses for testing and quarantining crew members, accommodating different travel regimes that aligned with public health guidelines, and adapting to shifting markets (Sorensen et al., 2020). In addition to the economic challenges experienced by commercial fishermen, limiting the spread of COVID-19 on fishing vessels presented its own unique set of challenges. Even aboard the larger commercial fishing vessels that are prevalent in West Coast and Alaskan fisheries, work environments present little space for workers, with communal areas and crew bunks typically existing in close quarters, which can promote the spread of respiratory diseases like COVID-19 (White et al., 2020).

Economic State of West Coast and Alaskan Commercial Fisheries in 2020

The following presents a summary of commercial landings revenue from each state in the Pacific Coast fishery region, which includes Alaska. Ex-vessel revenue from 2020 is compared to a baseline median of landings revenue over the previous five calendar years (2015-2019).[6] For further information regarding the data and additional detail on individual fisheries, consult the

[2] https://www.seafoodsource.com/news/foodservice-retail/us-retailers-notched-record-seafood-sales-in-2020?utm_source=marketo&utm_medium=email&utm_campaign=newsletter&utm_content=newsletter&mkt_tok=eyJpIjoiTkdFd1pqZzRaVEZsTXpNNCIsInQiOiIySldUNmQrQitvK3VxRWtWMzJ1a3pBdTgydzVZYnJUMjFSdEFOVHAxb2hKSzc4ekl1Y3VrMjRjdXR0SmU2Z1wvekt0eGJqQzVURVhtQnZ3MGwzYnBzalRYeXVlbXorZlUxUjZhOVozbWFuVG5jRDZuZnQrZ3liOGtZeW5YRXVDZzYifQ%3D%3D

[3] https://newspress.com/were-trying-to-stay-alive-santa-barbara-fishermen-sell-straight-to-consumers-as-the-coronavirus-shuts-down-markets/

[4] https://sandiego.eater.com/2020/4/9/21213982/san-diego-fishermen-seafood-tuna-harbor-dockside-market

[5] https://salmonstate.org/2020/05/12/connecting-people-to-salmon-during-covid-19/

[6] All revenues are reported in constant 2020 dollars using the GDP implicit price deflator.

Northwest Fisheries Science Center's Landings Tracker,[7] Kasperski et al. (2021), and Guldin et al. (2021).

When comparing landings and revenue data from 2020 to the 2015-2019 baseline period, it is important to note that the COVID-19 pandemic was not the sole cause of variation to the economic performance of the West Coast and Alaskan commercial fishing sectors. In addition to COVID-19, factors such as stock sizes, exploitation rates, oceanography, and regional rules and regulations all influenced the economic data presented in this section.

Overall, ex-vessel revenues dropped significantly for the majority of fisheries off the West Coast and Alaska during 2020. Total West Coast shoreside commercial landings revenue declined by 22% compared with the median of $474 million over the previous five years (2015-2019). Before the onset of the COVID-19 pandemic in March, coastwide ex-vessel revenue was higher than the five-year baseline period, largely due to higher Dungeness crab prices in January and February. However, as COVID-19 spread throughout the United States, stay-at-home orders and restaurant closures became more commonplace on the West Coast. COVID-19 restrictions limited commercial fishing opportunities and reduced demand for fresh seafood. Coinciding with the escalation of the pandemic during the months of March-December 2020, ex-vessel revenue was 29% lower than the March-December 2015-2019 median of $330 million.

On the West Coast, comparisons of 2020 landings to the baseline period vary by state. In California, the fisheries that contributed most to 2020 ex-vessel revenue were crab, market squid, and selected other species. Total ex-vessel revenue in 2020 decreased by 29% from the five-year baseline median of $188 million. In Oregon, crab, shrimp, and shoreside Pacific whiting contributed most to commercial landings revenue in 2020. Total ex-vessel revenue from commercial fishing in Oregon fell by 6% in 2020 compared to the baseline median of $157 million. And in Washington, the fisheries that contributed most to landings revenue were crab, tuna, and Puget Sound fisheries. There, total ex-vessel revenue was down by 26% in 2020 compared to the baseline median of $120 million.

Commercial fisheries in Alaska endured similar economic losses to the rest of the Pacific Coast fishery region. In 2019, Alaska led all 50 states in both the volume (5.6 billion pounds) and value ($1.8 billion) of landings from commercial fishing operations, making it one of the most important U.S. fisheries (NMFS, 2021). However, in 2020, landings revenue from commercial operations in Alaska were estimated to have declined by 23% when compared to the average ex-vessel revenue over the previous five years (2015-2019) across all state and federal fisheries. Alaska represents the region of the U.S. with the largest annual seafood export value (about $2 billion), with much of the exported catch (including cod, crab, flatfish, pollock, and salmon) being transported to China. In 2020, the value of exported seafood from Alaska declined by 16% relative to 2019, and exports to China decreased from the baseline average of $667 million to $474 million, representing a 29% decline.

[7] https://dataexplorer.northwestscience.fisheries.noaa.gov/fisheye/landings_tracker/

Survey Purpose and Methods

Once it became evident that the high transmissibility of SARS-CoV-2 was likely to disrupt the fishing industry across the United States, NOAA Fisheries' social scientists began to examine how the pandemic would impact seafood sectors and supply chains. As a part of this investigation, a survey instrument measuring the economic and social impacts of the COVID-19 pandemic on commercial fishermen was created and administered across the New England, Mid-Atlantic, South Atlantic, Caribbean, Gulf of Mexico, West Coast, and Alaskan fishery management regions. For the West Coast and Alaska, the opportunistic survey was carried out by Ocean Strategies, a public affairs firm focused on fisheries with connections to commercial harvesters and processors on the West Coast and Alaska. The survey was implemented during October and November of 2020 and collected over 400 responses from commercial fishermen in California, Oregon, Washington, and Alaska.

This report conveys a preliminary stage of research intended to gain a better understanding of the effects of the COVID-19 pandemic on commercial fishing operations based on the West Coast and in Alaska. This work represents an important part of NOAA Fisheries' mission, which upholds productive and sustainable fisheries, access to safe sources of seafood, conservation of protected resources and species, and healthy marine ecosystems. By examining the effects of the COVID-19 pandemic on West Coast and Alaskan commercial fishing operations, these outreach and research efforts provide fishery managers, policy makers, scientists, and other stakeholders with initial information about the condition of a regional fishery altered by the impacts of a global pandemic and offer an initial baseline for evaluating pandemic impacts in the future.

The focus of this report is to present readers with firsthand information from this survey pertaining to changes in West Coast and Alaskan commercial fishing operations in concurrence with the progression of the COVID-19 pandemic through September 2020. Because the pandemic continues to affect the nation and its fisheries in complex and continuously changing ways, the data featured in this report offers only a snapshot of the impacts of COVID-19 on two regional fisheries and the analysis therein is necessarily modest. Where appropriate, this report draws comparisons to the results of the other commercial sector surveys carried out in NOAA Fisheries' regions of interest during 2020. Accordingly, this report provides early insight about a new source of change in domestic fisheries to those with responsibilities and interests in marine fisheries across the study regions.

Characteristics of the Respondents

A total of 426 fishermen in the West Coast and Alaska responded during October and November of 2020 regarding the impacts of the COVID-19 pandemic on their fishing operations from January to September of calendar year 2020. Of the 426 fishing business operators, 331 completed the survey, for a 78% completion rate.

On average, the responding commercial fishermen had owned their vessel(s) for 26 years. This aligns with the average duration of vessel ownership (26.9 years) from similar surveys of NOAA's other fishery regions of interest (see Glazier et al., 2021). The average number of crew employed by each respondent on all their vessels combined was 8. However, the responses

ranged widely from 1 to 600 employees. This range is representative of the diversity of West Coast and Alaskan fisheries. For instance, many commercial salmon operations on the West Coast are captain-only or have one additional crew member on board, while at-sea Pacific whiting fleets involve larger catcher-processor vessels and mothership vessels—operations consisting of hundreds of workers (Guldin et al., 2021). Commercial fishing operations on the West Coast and Alaska had a significantly higher average crew size compared to commercial operations in NOAA's other fishery regions of interest, which averaged 1.84 crew members per operation overall. Certain fisheries on the West Coast and in Alaska, such as the Pacific whiting and Bering Sea pollock fisheries and the Alaskan pollock fleet, utilize larger fleets that rely on mothership boats to process harvests by catcher vessels while on the water. These larger operations employ more crew members on average compared to typical commercial fishing operations in the other fishery regions.

The large average crew size indicated for commercial fishing operations on the West Coast and Alaska is of particular relevance to this report because crew size determines the risk of exposure to COVID-19. The size and configuration of the vessel also impacts the overall risk of viral spread, with more tightly occupied boats and more socially interactive operations posing a greater risk of spread than vessels occupied and operated alone or with smaller numbers of trusted crew members. Several surveyed commercial operators disclosed that they intentionally decreased the number of crew members on board their vessel to mitigate against the spread of COVID-19.[8] Other commercial captains mentioned that they had difficulty finding crew members that could be trusted to socially distance effectively when they were not on the job, limiting the crew size and productivity of the operation.

The majority of survey participants reported fishing in both state waters (0 to 3 miles offshore) and federal waters (beyond three miles offshore) (see Fig. 1). Few participants reported operating in federal waters only. Lastly, 85.7% of respondents considered fishing to be their primary source of income.

[8] Such strategies were and remain commonplace among respondents. But it should be noted that it can be difficult to maintain productivity in certain fisheries without sufficient crew, with potentially serious implications for those who do participate during the pandemic. See Addetia et al., 2020 and Doughton, 2021 for more detail about these difficulties.

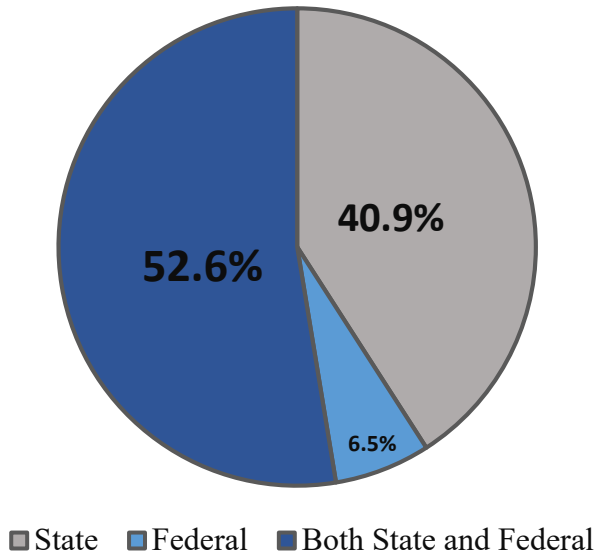

Figure 1. Percent of respondents fishing in jurisdictional waters.*

*Based on the question "Do you fish in state/territorial waters, federal waters, or both?"

COVID-19 Pandemic Impacts on West Coast and Alaskan Commercial Fishing Sectors

Based on completed responses by survey participants, about 98% of commercial fishing operations on the West Coast and Alaska were affected in some way by the COVID-19 pandemic. Approximately 70% of surveyed commercial operators reported that they stopped fishing at some point during 2020 because of the COVID-19 pandemic. Table 1 provides a breakdown of how long fishing activities ceased for those that stopped fishing. The majority of respondents stopped fishing for three months or less. Nearly 2% of surveyed commercial fishing operations on the West Coast and Alaska went out of business during the pandemic. Corresponding with the reported reductions in fishing activity on the West Coast and Alaska, respondents approximated a 33% average reduction in fishing activity for 2020 compared to 2019, indicating that operational impacts of the COVID-19 pandemic persisted throughout September 2020 and interfered with harvesting efforts.

Table 1. Reported reductions in fishing activity.*

Time Period that Fishing Activities Ceased	Percent of Respondents Reporting Time Period
Less Than One Month	29.3 (*n*=60)
1-3 Months	38.5 (*n*=79)
3-6 Months	14.2 (*n*=29)
More Than 6 Months	6.3 (*n*=13)
Indefinitely With Plan to Resume Fishing	9.8 (*n*=20)
Went Out of Business	1.9 (*n*=4)

*Based on the request "For how long did you stop fishing?"

Table 2 offers insight into how the COVID-19 pandemic impacted commercial fishing operations for harvesters on the West Coast and in Alaska. Respondents indicated that a reduction in the number of fishing trips during the onset of viral spread in the U.S. and difficulties finding supplies were the most common issues facing their operations compared to the same period during 2019.

Table 2. Effects of the pandemic on fishing operations among commercial operators.*

Type of Impact on Fishing Operations	Percent of Respondents Reporting Selected Pandemic Impact
Reduced Number of Trips	22.7 (*n*=63)
Difficulty Finding Supplies†	21.3 (*n*=59)
Had to Find New Markets	4.3 (*n*=12)
Difficulty Sourcing Bait	2.2 (*n*=6)
Had to Shift to Different Fisheries	1.1 (*n*=3)
Other Effects	54.9 (*n*=152)

*Based on the question "How were your normal business operations affected by the COVID-19 pandemic compared to the same time period last year (January-September 2019), even if only temporarily? (check all that apply)"
†Including fishing gear, ice, parts, and other elements essential to commercial and for-hire fishing operations.

Many respondents elected to enter additional factors that were impactful to their business operation using the "Other Effects" text box selection. Of the 152 respondents that provided a text response, over half of them cited various seafood market and pricing issues as having a considerable effect on their fishing operations during the pandemic. Other factors that were described to be particularly impactful were difficulty sourcing crew members, processor plant restrictions/closures, government regulations related to COVID, as well as the costs associated with testing, travel, and quarantining for crew members.

In Table 3, commercial harvest business operators that responded to the survey on the West Coast and Alaska also assessed which pandemic-related factors had the greatest impact on their fishing operations during the calendar year of 2020. Low prices, restrictions on fishing activities, and loss of crew were found to be among the most impactful factors resulting from the pandemic. Based on the large number of "Other Effects" text responses from Table 3 that cited market and pricing issues, it makes sense that low prices received the greatest number of responses for this question.

Table 3. Top three COVID-19 related impacts on commercial harvesters.*

Factors Impacting Fishing Operation	Percent of Operators Reporting Factor as Most Impactful
Low Prices	40.9 (*n*=121)
Told Not to Fish	23.0 (*n*=68)
Lack of Crew	15.9 (*n*=47)
Health and Safety	5.7 (*n*=17)
Government Restrictions	2.0 (*n*=6)
No Market of Buyers	1.3 (*n*=4)
Other Factors	11.2 (*n*=33)

*Based on the request "Choose the top three COVID-19 pandemic factors that have had the largest impact on your business."

When asked about changes in employment of crew members during the pandemic, 67% of respondents reported no changes in crew size while 32% acknowledged a decrease in their number of employees (see Fig. 2). Notably, less than 1% of respondents reported any increase in the number of crew members employed on their vessel(s). Therefore, bringing additional crew onto payroll was suspended for nearly all responding commercial businesses. Of the 32% of respondents that reported losing employees, the mean decrease in crew size was between 1.86 and 5.44 employees, with 95% confidence.

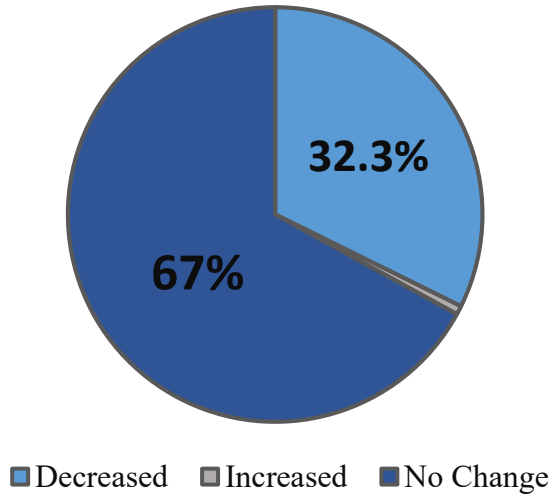

Figure 2. Change in number of employees during the COVID-19 pandemic.*

*Based on the request "Has the number of crew/employees changed because of the COVID-19 pandemic?"

As noted previously, the COVID-19 pandemic dramatically altered existing patterns of social and economic interaction within the commercial fishing sector at least through September 2020 as fishermen grappled with changing health guidelines. In addition, disruptions throughout the larger economy and society caused by the pandemic negatively affected the commercial fishing industry. With temporary lockdowns and restaurant closures being initiated in mid-March, far

fewer people were traveling and eating out following the onset of the pandemic in the United States. Seafood restaurants, which commercial fishermen heavily rely on as buyers of product, were detrimentally affected, and demand for fresh seafood diminished. While it might be expected that retail seafood demand would increase as more people cooked and ate at home during the first months of the pandemic, this transition did not clearly offset losses in demand and revenues sustained by commercial harvest operations on the West Coast and Alaska. Fisheries that were less established in the retail sector, such as the non-whiting groundfish fishery, which sells most of its fresh catch to the food service sector, struggled to adapt to this change (Rowe and Hennig, 2020).

Correspondingly, nearly 95% of responding commercial operators disclosed that they experienced decreased revenues compared to January-September of 2019. With 95% confidence, the average decrease in revenues for operations that reported revenue losses (n=255) was between 46.7% and 52.1%. Only four, or 1.34% of the 299 responses, indicated that their revenues had increased during 2020 compared to 2019. Given that roughly 85% of respondents relied on fishing as their primary source of income, this drop in revenues, if not offset by direct payments to the respondents, would likely have a significant impact on the economic welfare of commercial operators along the West Coast and Alaska. Along with revenue losses, commercial harvester businesses also had to bear the costs of COVID-19 prevention for their crew members, such as those associated with testing and providing accommodations for crew members in quarantine.

In May 2020, the Secretary of Commerce allocated funding to assist the nation's fishing industry in Sec. 12005 of the Coronavirus Aid, Relief, and Economic Security Act, also called the CARES Act. The bill provided funds to support coastal and marine fishery participants who were negatively affected by the pandemic, giving $50 million to Alaska, $50 million to Washington, $18.35 million to California, and nearly $16 million to Oregon[9]. Funds from Sec. 12005 of the CARES Act were to be used on direct payments, fishery-related infrastructure, and fishery-related education, as regional fisheries commissions saw fit. As of the survey's completion, CARES Act Fisheries Assistance relief checks were sent out in Washington on August 9, 2020, and in California during early November. CARES Act relief checks would be mailed out in Alaska[10] and Oregon[11] in 2021. Funds from the CARES Act contributed to paycheck protection and supplemental unemployment benefits, both of which were included as selection options in the survey.

Despite the fact that most responding commercial fishing operations on the West Coast and Alaska experienced significant revenue declines during the COVID-19 pandemic, over a third of commercial harvesters reported that they did not request any financial assistance (Table 4). Nevertheless, the proportion of respondents who elected to request financial assistance was higher in the West Coast and Alaskan fisheries than in NOAA's other fishery regions of interest. Of those who did request assistance, paycheck protection, unemployment benefits, and Small Business Administration (SBA) loans were the most common options.

[9] https://www.fisheries.noaa.gov/national/funding-and-financial-services/300-million-assistance-allocated-secretary-commerce-cares
[10] https://relief.psmfc.org/alaska-cares-act-information/
[11] https://relief.psmfc.org/oregon-cares-act-information/

Table 4. Financial assistance sought by commercial operators.*

Type of Assistance	Percent of Respondents Receiving Assistance by Type
No Assistance Requested	35.6 (*n*=90)
Paycheck Protection	26.1 (*n*=66)
Unemployment Benefits	16.6 (*n*=42)
SBA Loan	9.1 (*n*=23)
Bank Loans	3.2 (*n*=8)
Other	12.6 (*n*=32)

*Based on the request "Please indicate if this business has received loans/financial assistance from any of the following since January 2020 (check all that apply)."

For populations reliant on the harvest of natural resources for their livelihood, disaster situations are known to produce significant social and psychological impacts (Béné et al., 2015). When faced with a disaster situation, affected households in fishing-oriented communities often depend on various mechanisms for coping and resilience, including important social bonds, such as family, friends, co-workers, church, and community groups (Clay et al., 2016). The COVID-19 pandemic may be perceived as a disaster that disrupts the social and economic status quo for a prolonged period of time, with the potential for lasting problems that differ from more common natural disasters.

Table 5 represents some of the important social and economic means that survey respondents were using to cope with the COVID-19 pandemic and the associated challenges it produced in the U.S. Personal savings were found to be the most utilized, as well as the most helpful, coping mechanism for a significant number of the respondents. Because of the financial hardship brought on by the pandemic, it is no surprise that so many commercial operators resorted to using their own savings to support themselves as revenues were depressed. Social connections were also a very helpful coping mechanism, comprising 36% of responses (family and friends, church, community groups, employees, and crew). The most helpful coping mechanisms were reported to be personal savings, family and friends, and government assistance in that order. It should be noted that 52% of survey respondents in NOAA's other fishery regions of interest selected family and friends as an important coping mechanism for the pandemic—far more than surveyed fishermen on the West Coast and Alaska (Glazier et al., 2021). The reported reliance on church and community groups was also lower in the West Coast and Alaskan fishery regions compared to NOAA's other fishery regions. Based on the Oxford COVID-19 Government Response Tracker[12], West Coast states enacted some of the most stringent policies to limit the spread of the virus. These policies, which restricted social interaction among the populace, may

[12] https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker

have contributed to lower-than-average selections for coping mechanisms related to social contact. For instance, in Washington and California, religious gatherings were banned during the start of the pandemic because of strict stay-at-home orders. While relationships with family and friends represented a less utilized coping mechanism compared to the other fishery regions, respondents in the West Coast and Alaska still reported that these relationships were among the most helpful in terms of coping with the pandemic.

Table 5. Pandemic coping mechanisms used by respondents.*

Type of Coping Mechanism	Percent of Respondents Utilizing Select Coping Mechanism	Percent of Respondents Reporting Mechanism as Most Helpful
Personal Savings	56.0 (*n*=154)	30.0 (*n*=60)
Government Assistance	12.0 (*n*=33)	22.0 (*n*=44)
Family and Friends	11.3 (*n*=31)	29.0 (*n*=58)
Fishing Industry Associations	5.1 (*n*=14)	5.5 (*n*=11)
Church, Community Groups	2.9 (*n*=8)	3.5 (*n*=7)
Employees or Crew	2.2 (*n*=6)	3.5 (*n*=7)
Other Mechanisms	10.5 (*n*=29)	6.5 (*n*=13)

*Based on the questions "What has helped you cope with the effects of the COVID-19 pandemic? (Check all that apply)" and "Which has been the most helpful in coping with the effects of the COVID-19 pandemic?"

Clearly, the outbreak of the COVID-19 pandemic proved to be a challenge for commercial fishermen on the West Coast and in Alaska. Global supply chain disruptions, restaurant closures, processor plant shutdowns, travel restrictions, regional public health policies, and the costs of COVID-19 prevention all changed the nature of commercial fishing operations during the pandemic. Related to these new challenges, commercial fishing businesses on the West Coast and in Alaska generally experienced declines in fishing activity and ex-vessel revenue from January–September of 2020. Finally, West Coast and Alaskan commercial fishermen adapted and coped with the hardships brought about by the pandemic using economic and social measures, as represented in the survey results. As the COVID-19 pandemic progresses, the effectiveness and longevity of these strategies remain uncertain, and are best examined through further research and observation of fisheries communities along the West Coast and Alaska.

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