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**COMMERCIAL AND RECREATIONAL HARVEST OF ALBACORE TUNA  
(*Thunnus alalunga*) IN OREGON  
2020 Annual Report  
Oregon Albacore Port Sampling Program**

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## **ANNUAL REPORT, ALBACORE PORT SAMPLING PROGRAM**

Pacific States Marine Fisheries Commission Contract 20-42G, Amendment 1  
Subcontract of NOAA Award Number NA19NMF4370239

### **INTRODUCTION**

Albacore tuna (*Thunnus alalunga*) is a highly migratory species found worldwide in temperate seas. Albacore caught off Oregon belong to the North Pacific stock and are generally juvenile or sub-adult fish that have not spawned. During their trans-Pacific migrations, vessels of several nations target albacore including the United States, Canada, Taiwan, and Japan. The United States West Coast fishery harvests this stock during the summer and early fall months.

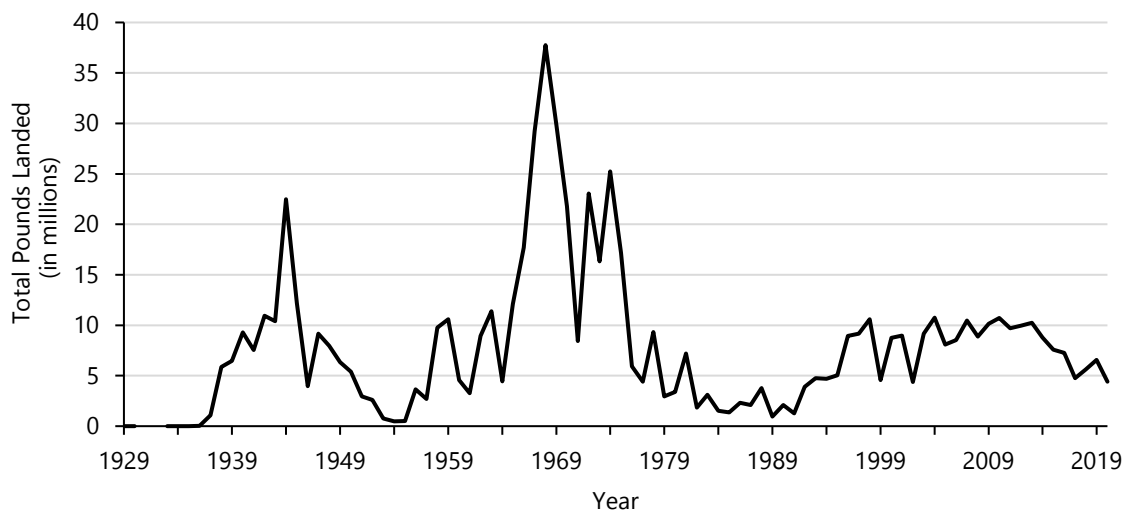
Commercial harvest of hook-and-line caught, or “troll-caught” albacore tuna has occurred off Oregon since 1929 when the fishery expanded north from the traditional Southern California grounds. Originally, both bait-boats and jig-boats fished for albacore off Oregon, but in recent years jig boats have predominated. Bait fishing with live anchovies is once again beginning to gain some popularity, especially late in the season, but is still less common in Oregon due to live anchovies being unavailable in Oregon ports. The west coast fleet consists primarily of vessels ranging from 20 to 60 feet in length, with multiple permits to harvest crab, salmon, or groundfish at other times of the year. Crews range in size from single-handed small boats up to large freezer boats with a crew of 10 or more, but on most boats there are two to four aboard. Albacore boats employ several methods of preservation including ice for one to three-day fishing trips, and blast- or brine-freezing equipment for indefinite excursions at sea. Some of the larger freezer boats (>60 ft.) travel the North Pacific year-round while primarily fishing for albacore.

An agreement under the 1981 US/Canada Albacore treaty allows up to 45 Canadian vessels to fish and land tuna in the US Exclusive Economic Zone (EEZ), between June 15 and September 15. Authorized ports for Canadian vessels landing albacore in Oregon are Astoria, Newport, and Coos Bay.

Commercial albacore landings in Oregon have been highly variable long-term (Figure 1). Low years include zero landings in the early 1930s and less than half a million pounds in 1954, to over 22 million pounds in 1944, and almost 38 million pounds in 1968. Over the last 30 years (1990-2019), landings in Oregon have averaged 7.5 million pounds per year.

Beginning in 2005 under the Highly Migratory Species Fisheries Management Plan, the National Marine Fisheries Service (NMFS) required vessels to submit logbook data while fishing for albacore inside the 200-mile EEZ. Prior to this, the logbook program was voluntary and only vessels fishing outside the EEZ were required to submit logbooks under the High Seas Fishing Compliance Act.

Sampling of Oregon’s commercial albacore fishery is a cooperative effort between the Oregon Department of Fish and Wildlife (ODFW), the NMFS Southwest Fisheries Science Center (SWFSC) and the Pacific States Marine Fisheries Commission (PSMFC). This report summarizes information about Oregon’s sampling effort, sampling data for the 2020 albacore season, and information from the recreational albacore fishery. ODFW’s Ocean Recreational Boat Survey (ORBS) conducts recreational albacore fishery sampling. Sport fishing for albacore off Oregon has grown in popularity since 2000, especially in the past decade.



**Figure 1.** Historical landings of albacore tuna into Oregon from 1929-2020.

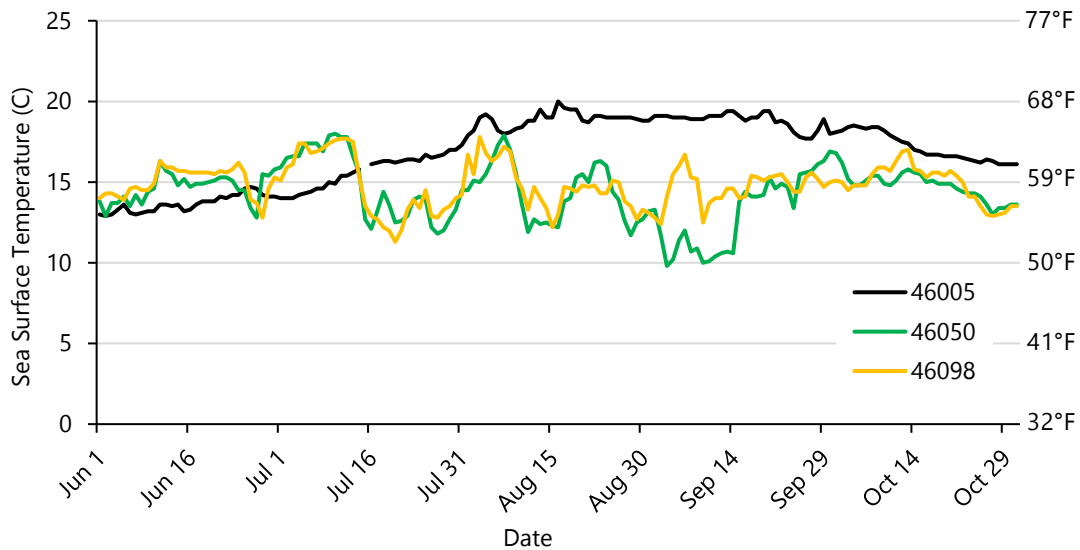
## **2020 COMMERCIAL ALBACORE FISHERY**

### **Ocean Conditions**

Weather patterns were generally moderate throughout the season, with periodic northwest winds. Warm water began approaching the coast from the southwest in mid-June. Sea surface temperature (SST) data from the weather buoy off Tillamook Bay, which has been used in previous reports, were unavailable this year. Buoy 46005, 300 nautical miles off Aberdeen, WA, showed a fairly smooth rise in SST over June and July, peaking in mid-August at around 20° C (68° F) and gradually tapering off to about 16° C (60.8° F) at

the end of October. In contrast, buoys close to shore showed stronger fluctuations in temperature as wind events caused upwelling to occur multiple times over the course of the season (Figure 2). Sea surface temperature maps are presented in Appendix A.

During July and August, a wide band of chlorophyll extended up to 100 miles offshore over most of the Oregon Coast, especially north of Stonewall Banks, and affected landings this season. This chlorophyll band held albacore far enough offshore that smaller boats did not make as many trips as they normally would have.



**Figure 2.** Sea Surface Temperature (SST) June through October, 2020, at Buoys 46005, 300 nm off Aberdeen, WA; 46050, Stonewall Bank, OR; and 46098, outer Heceta Bank, OR. Temperatures in Fahrenheit are indicated on the right.

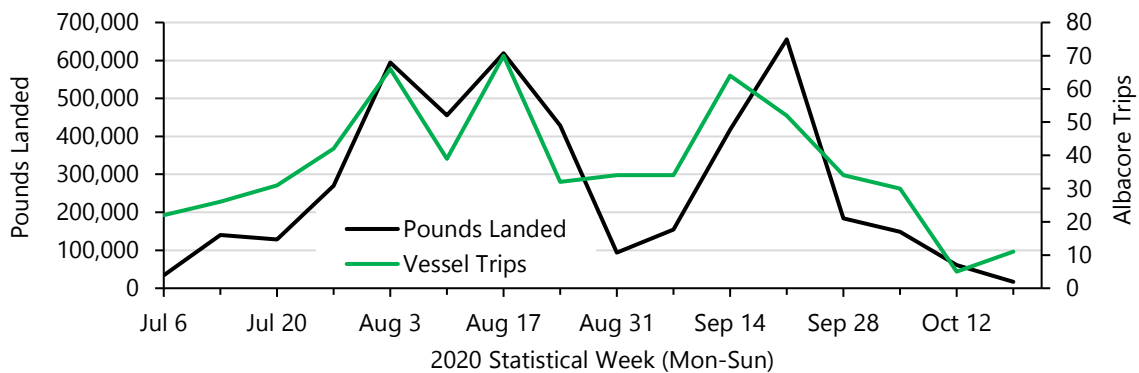
### Fleet Activity

An exploratory landing of a small load of albacore in early June preceded a long pause until the rest of the fleet began to look for fish in early July. Sporadic landings before mid-July showed a good grade of fish, but they were quite a distance from shore, at least 100-150 miles out by most vessels reporting. Later in July, more boats began landing fish but few were pleased with the price, or with the range they were having to go for tuna. Over the course of the season, the main body of tuna stayed well offshore, at least 75 miles generally. The distance to the fish and market disturbances caused by Covid-19 likely caused many small boats not to fish tuna this year. Occasional periods of stronger northwest wind tended to bring boats to port and cause a spike in landings. Larger brine and blast-freezer vessels are generally less affected by these weather events, but smaller boats are often forced into port for one or more days while waiting for conditions to improve.

Canadian vessels were reported to have landed their fish back into Canada this year, instead of into Newport as they have in the past. Large wildfires in the Willamette Valley and in the Coast Range inland of Cascade Head resulted in very thick smoke in coastal ports and over the ocean in the first half of September, but these had minimal effect on fishing activities. August and September saw moderately strong landings totals, tempered by a sharp, temporary dip in landings in late August and early September. The season tapered off with the last landings seen in late-October, and one final straggler in mid-November.

### Albacore Landings

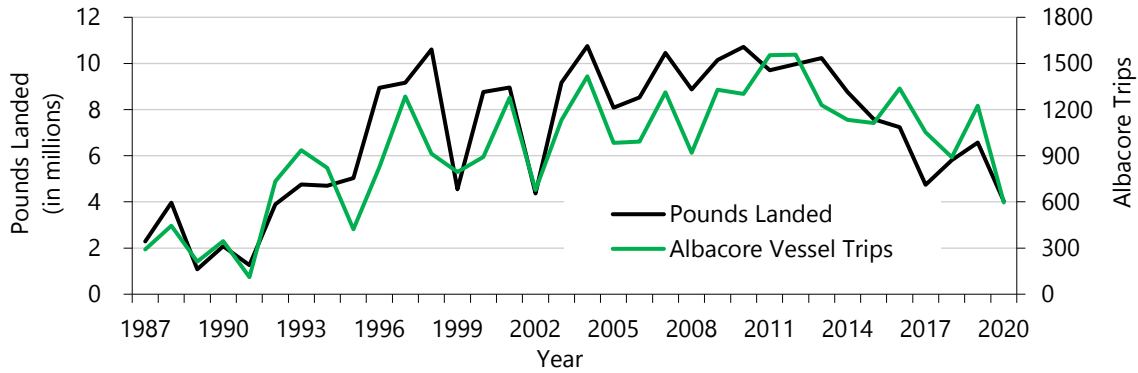
A single landing was made in early June, and no more, even though waters offshore were warming steadily. Commercial landings began again in early July and 541,268 pounds were landed during the month. August was a moderately productive month, producing just over 2 million pounds. After a lull in early September, fishing effort peaked again late in the month, when 650,000 pounds were brought to port in a single week (Figure 3). The last half of October brought the close of the season as landings wound sharply down, and there was one late landing in mid-November.



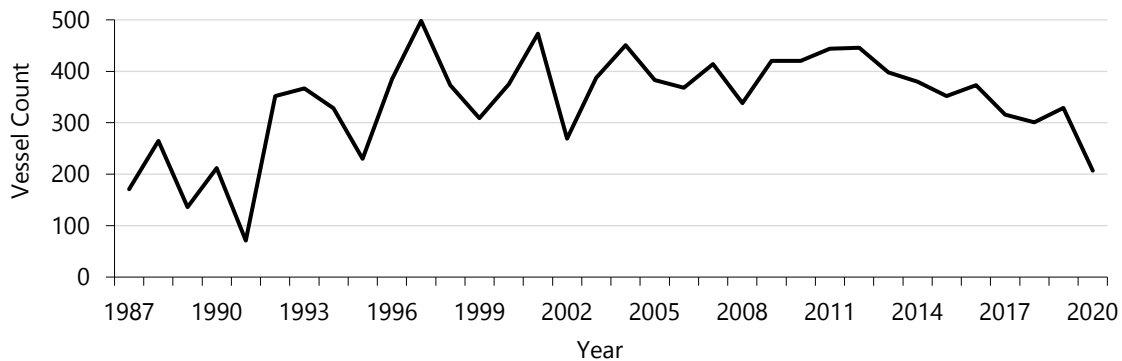
**Figure 3.** Total pounds of albacore landed (left axis) and number of albacore vessel trip landings (right axis) per week in 2020.

For the purposes of this report, a landing is considered the total weight of the tuna offloaded from a vessel for that fishing trip. If there were multiple fish tickets for that trip, all ticket weights were combined to give a single total landing weight for that trip.

Total landings were down for 2020, with 4.4 million pounds landed in Oregon. (Figure 4). Tuna fishers collectively made 597 trips on 207 different commercial vessels (Figures 4 and 5). The number of trips was just 48% of the 10-year average (1,239), while the number of vessels participating was 55% of the 10-year average (376).



**Figure 4.** Total pounds of albacore landed (left axis) and number of albacore vessel trip landings (right axis) in Oregon by year, 1987-2020.



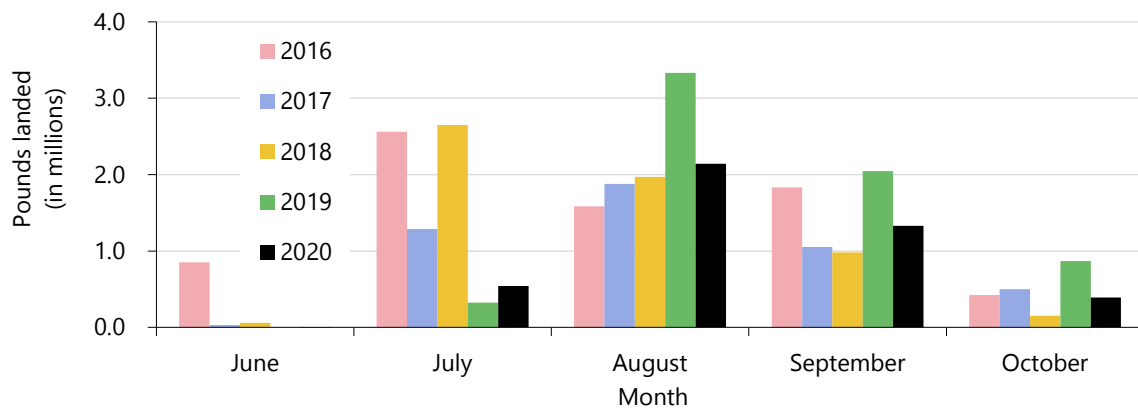
**Figure 5.** Total number of different vessels landing albacore in Oregon, 1987-2020.

August was the peak month for albacore landings in 2020, yielding 2,141,600 pounds, or 49% of the total landings for the year (Figure 6). Historically, August has yielded the highest quantity of tuna and profit for fishers.

The preliminary total for 2020 commercial landings is 4,409,012 pounds, only 54% of the ten-year average (2010-19) of 8.1 million pounds.

This year, no Canadian vessels made albacore landings into Oregon.

Newport had the highest albacore landings of any Oregon port in 2020, with 44.7% of the total weight (Table 1). Charleston landed 32.3% of the total weight, followed by Astoria.



**Figure 6.** Total pounds of albacore landings by month, 2016-20.

**Table 1.** Albacore landings by port for 2020 (pounds and percentage) and average landings (pounds and percentage), 2010-19.

Port	2020		10-Year Average	
	Landings (lbs.)	Landing %	Landings (lbs.)	Landing %
Newport	1,973,496	44.76%	3,392,253	41.71%
Charleston	1,425,369	32.33%	1,949,176	23.96%
Astoria	655,588	14.87%	2,211,587	27.19%
Garibaldi	168,722	3.83%	245,697	3.02%
Winchester Bay	98,603	2.24%	152,803	1.88%
Brookings	53,353	1.21%	114,248	1.40%
Port Orford	14,718	0.33%	28,849	0.35%
Florence	9,606	0.22%	19,950	0.25%
Gold Beach	6,634	0.15%	3,706	0.05%
Bandon	2,399	0.05%	5,278	0.09%
Pacific City	524	0.01%	7,265	0.06%

**Table 2.** Quartile points of 2020 Oregon commercial albacore landings.

All Landings		
Quartile		Pounds
100%	<b>Max</b>	114,220
75%	<b>Quartile</b>	8,348
50%	<b>Median</b>	3,133
25%	<b>Quartile</b>	1,133
0%	<b>Min</b>	38
	<b>Average</b>	7,385

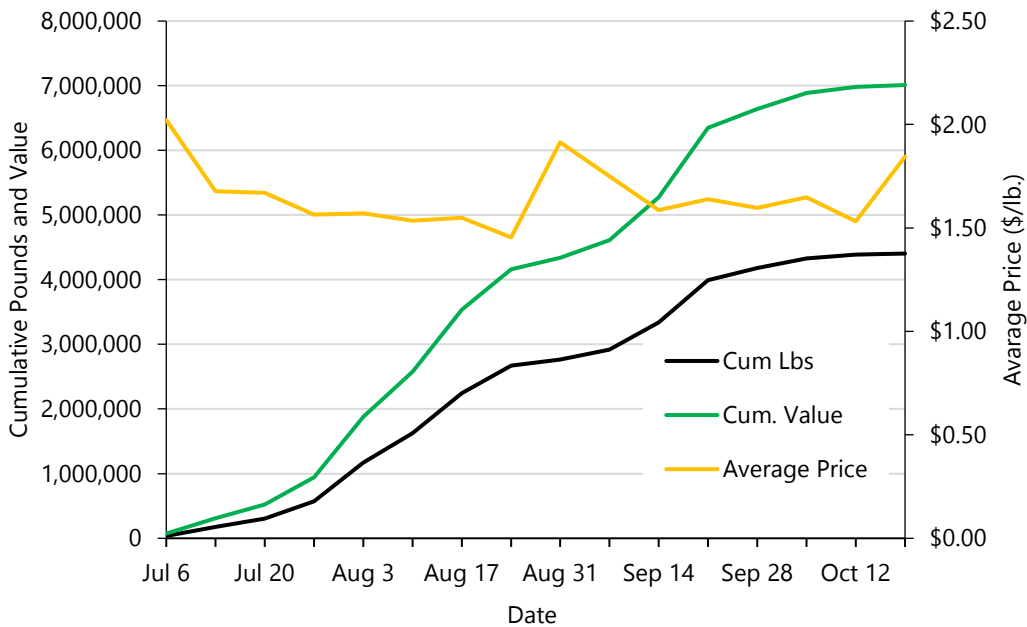
The average size of a tuna landing in Oregon for 2020 was 7,385 pounds, which is over 2,000 pounds higher than the previous 2 years (Table 2). Small and moderate sized vessels normally make up the bulk of the albacore fleet. However, this year the distance of the fish from port resulted in many smaller boats not participating (Figure 4), resulting in average load sizes being larger.

Dividing the landings into quartiles reveals the wide range in the size of landings in this fishery. While the largest landing of the season was well over 100,000 pounds, the median landing was just 3,133 pounds. Of 597 landings, there were only 29 landings of 30,000 pounds or more, while 75%, or 448 landings, were of 8,348 pounds or less.

### Albacore Prices and Value

Albacore prices started the season in the \$2.00 range and quickly dropped to around \$1.50 in a market disrupted by Covid-19, the resulting closures of restaurants, and seafood marketers struggling to develop new ways of moving product. When the volume finally began to flow in late July, prices stabilized for the rest of the season (Figure 7). Prices spiked moderately at the end of August during a lull in fishing. Throughout the season, buyers of fresh-iced tuna complained of a lack of supply as the smaller boats were making fewer trips, in part because of albacore continuing to hang well offshore.

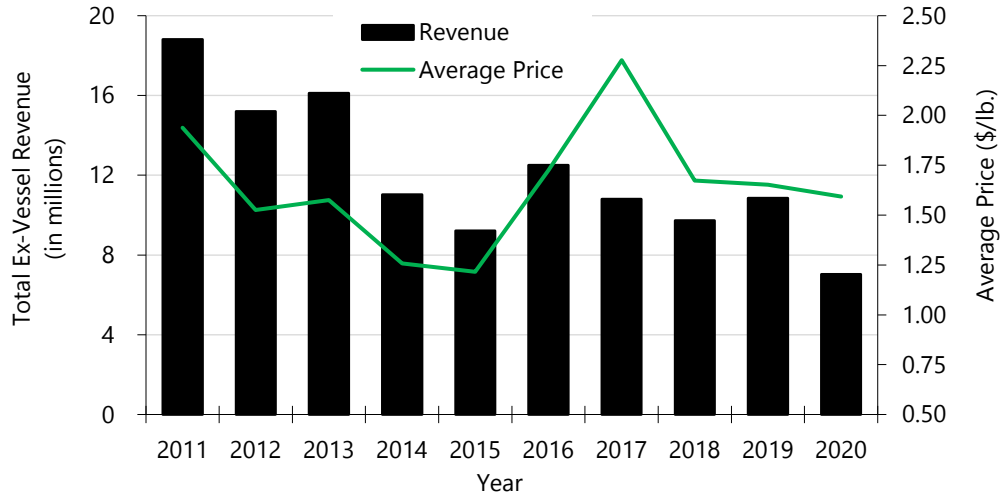
The “peanuts” that played a large role in the 2018 and 2019 seasons failed to materialize this year. Buyers will often sort albacore into three market size-grades upon unloading, especially blast-frozen fish. These market size-grades are typically graded into small “peanuts” (under 9 pounds); medium (9-15 pounds); and large fish (over 15 pounds). Prices for the differing grades can vary, and boats with a significant percentage of peanuts in their load are often paid a lower price for these smaller fish.



**Figure 7.** Cumulative landings, cumulative ex-vessel revenue, and average price by week in 2020.



The 2020 Oregon albacore season generated \$7,022,691 in total value paid to vessels (Figure 8). The average price was \$1.59 per pound, down 6 cents from 2019, and very close to the ten-year average of \$1.56 per pound.



**Figure 8.** Total revenue (ex-vessel) and average price for 2020 Oregon commercial albacore landings.

Albacore has typically ranked fourth or fifth for total annual revenues generated in Oregon marine fisheries. This year, albacore tuna revenue ranked sixth relative to other Oregon fisheries, representing 4.7% of the total annual revenue (Table 3).

**Table 3.** Oregon annual marine fish revenue (ex-vessel) for calendar year 2020 through December 3, ranked by ex-vessel revenue percentage.

Fishery Species	Pounds Landed	Revenue	Revenue Percentage
<b>Dungeness Crab<sup>o</sup></b>	19,709,443	\$71,857,670	48.1%
<b>Pink Shrimp</b>	43,142,587	\$22,584,189	15.1%
<b>Pacific Whiting</b>	219,616,170	\$15,178,027	10.2%
<b>Groundfish<sup>*</sup></b>	35,108,132	\$13,690,727	9.2%
<b>All Other Marine Species<sup>**</sup></b>	13,992,208	\$9,698,084	6.5%
<b>Albacore Tuna</b>	4,409,012	\$7,022,691	4.7%
<b>Salmon</b>	1,504,454	\$4,993,438	3.3%
<b>Sablefish</b>	3,730,351	\$4,366,283	2.9%
<b>Total</b>	<b>341,212,357</b>	<b>\$149,391,109</b>	<b>100.0%</b>

<sup>o</sup>Includes Bay and Ocean Dungeness fisheries, Jan 1 – Dec. 3, 2020.

<sup>\*</sup> Groundfish excluding Pacific Whiting and Sablefish.

<sup>\*\*</sup> Including Pacific Halibut.

## Sampling & Coverage Rate Analysis

The sampling rate goals for the 2020 albacore port samplers in Oregon were again set at 20% for Astoria and Newport and 10% for Charleston, unchanged from 2015-19. Sampling rate is the percentage of the total albacore trips with landings sampled for length frequency in each required port (Astoria, Newport, and Charleston). Port sampling coverage rates were well above the specified goals (Table 4), and samplers achieved an overall statewide 2020 coverage rate of 29%. Appendix B presents additional summary information required by the contractual agreement with NMFS and PSMFC for albacore sampling.

**Table 4.** 2020 preliminary Oregon commercial albacore sampling season summary. Pacific City, Depoe Bay, Florence, Bandon, Port Orford, Gold Beach, and Brookings combined as "Other Ports."

Port	Total Pounds Landed	Trips	Trips Sampled	Fish Sampled	Average number of tuna sampled	Sampling Rate
<b>Astoria</b>	655,588	60	23	679	29.5	<b>38.3%</b>
<b>Garibaldi</b>	168,722	53	2	105	52.5	<b>3.8%</b>
<b>Newport</b>	1,973,496	280	96	2,310	24.1	<b>34.3%</b>
<b>Winch. Bay</b>	98,603	26	0	0	--	--
<b>Charleston</b>	1,425,369	140	52	1,470	28.3	<b>37.1%</b>
<b>Other Ports</b>	87,234	38	0	0	--	--
<b>Total</b>	<b>4,409,012</b>	<b>597</b>	<b>173</b>	<b>4,564</b>	<b>26.4</b>	<b>29.0%</b>

The funding for tuna samplers is allocated to cover July through October, and allows for samplers in Astoria (4 months), Newport (4 months), and Charleston (4 months at half time). Sampling activities included measuring 20-100 albacore for fork length, collecting information on fishing patterns, distributing logbooks to vessels, and providing information to fishers.

Concern about Covid-19 caused us to modify sampling of all commercial fisheries in Oregon in 2020. Samplers wore protective gear, including masks, shields, and any other equipment they felt appropriate to the situation. Sampling sites were evaluated for safety, and some offloading sites were consequently placed off-limits to samplers. Samplers modified procedures at all sites so they could do their work at a safe distance from other workers. Most albacore buyers and vessels understood and fully cooperated. Samplers limited their sample sizes in order to minimize time in crowded areas. Sampling of albacore aboard vessels at the dock was eliminated this year because of the inability to maintain 6-foot distancing. An average sample size of 26.4 fish per sampled boat was a sharp reduction of the 49.7 fish average in 2019.

Comparing quartile divisions (quarters) of the landing weights of sampled trips against those of all commercial landing weights helps our understanding of potential sampling bias with regard to landing size (Table 5). Large landings are defined as those with weights greater than 75% of all individual albacore trip landing weights (8,348 lbs.). In 2019, 45% of the samples came from “large” loads in this top quarter, representing the larger boats offloading at the plants, which are relatively easy to sample. This year, 50% of our samples were from the top quarter (reflecting difficulties posed while sampling during Covid-19 conditions). Comparing the median weights and the average weights reinforces the suggestion that our sampling was biased towards larger landings.

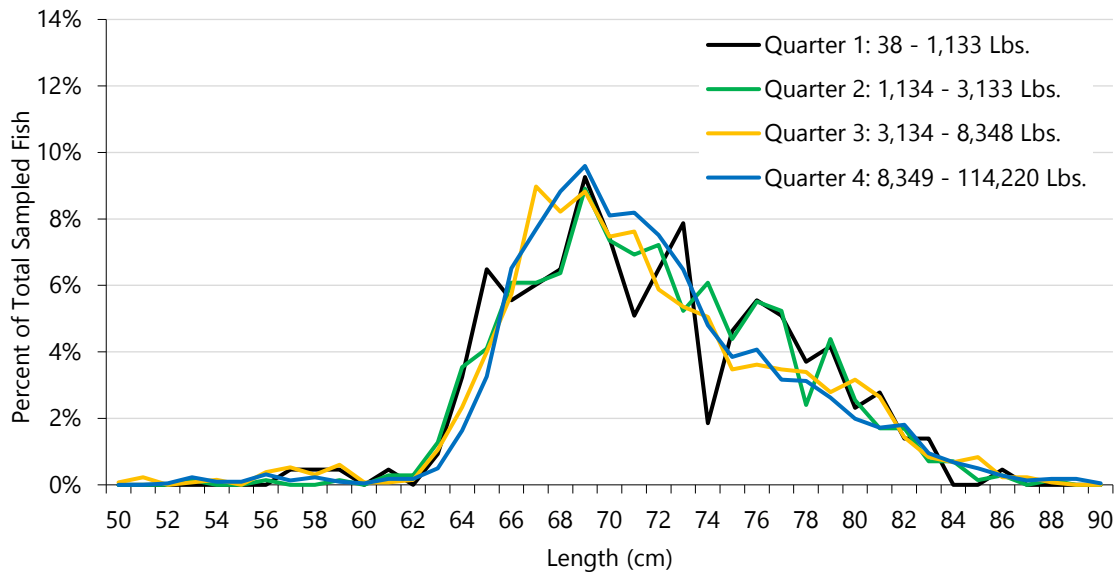
**Table 5.** Quartile points for all Oregon albacore landings and sampled landings in 2020.

<b>All Landings</b>			<b>Sampled Landings</b>		
<b>Quartile</b>		<b>Pounds</b>	<b>Quartile</b>		<b>Pounds</b>
100%	<b>Max</b>	114,220	100%	<b>Max</b>	114,220
75%	<b>Quartile</b>	8,348	75%	<b>Quartile</b>	16,576
50%	<b>Median</b>	3,133	50%	<b>Median</b>	8,348
25%	<b>Quartile</b>	1,133	25%	<b>Quartile</b>	4,291
0%	<b>Min</b>	38	0%	<b>Min</b>	204
	<b>Average</b>	7,385		<b>Average</b>	13,579

The purpose of our sampling is to develop length-frequencies for albacore landed in Oregon in accordance with contract requirements. We have acknowledged a sampling bias by landing size. An analysis of the length frequencies of the sampled fish for each quarter (from Table 5) suggests that regardless of the size of the vessel offload, the length-frequency curves of the sampled fish did not differ (Figure 9). Good sampling practice encourages us to continue to try to obtain samples from all vessels regardless of size or method of offloading.

*Recommendation for 2021 sampling:* Be aware of the large-boat sampling bias. Samplers, while not ignoring opportunities at processors and buying stations, should also focus on the smaller buyers operating from trucks or skiffs, and supplying local retailers and restaurants. Establish solid communications with these smaller buyers as early as possible in the season. Do not wait for landings at the plants to diminish in the latter half of the season before working more with the smaller boats and buyers. Treat all landings with equal importance throughout the season. If Covid-19 continues to impose restrictions on sampling activities, do your best to work out compromise procedures that will allow sampling to continue at as many sites

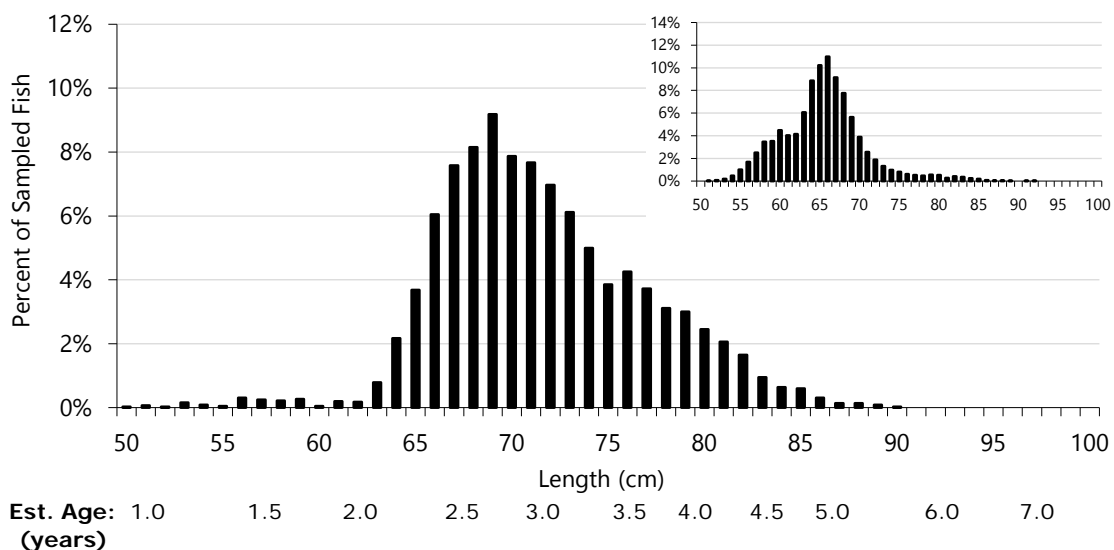
as possible following ODFW sampling guidelines to preserve sampler safety.



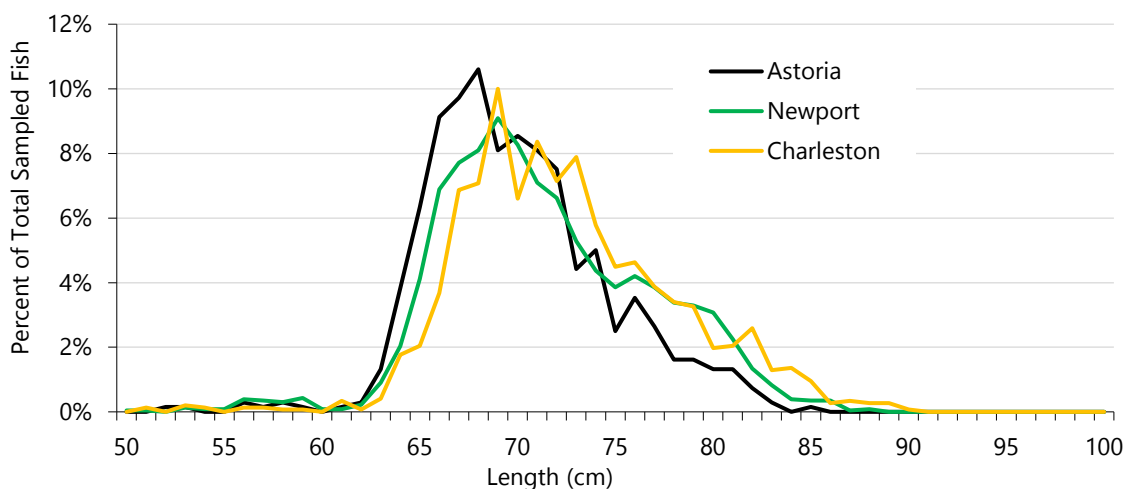
**Figure 9.** Comparison of length-frequencies for each of the four quarters of all the 2020 Oregon sampled albacore. Quarter 1 n=216; Quarter 2 n=707; Quarter 3 n=1326; Quarter 4 n=2210. Samples from Garibaldi excluded here.

### Length Frequency Analysis

Albacore samplers collected fork length measurements from unsorted commercially harvested albacore during offloading from July through October of 2020. Samplers measured 4,564 albacore tuna in the ports of Astoria, Newport, Charleston, and Garibaldi. A frequency distribution of the length data displays a strong mode at 69 cm, with the distribution skewed to the right (Figure 10). The 69 cm mode represents an age-class of 2.5 to 3-year-old tuna, while the shoulder extending to the right (75-85 cm) represents older 3.5- to 4.5-year-old fish (Wells, 2013). A comparison of the length distributions of the sampled catches in the three primary Oregon ports does not suggest any differences between ports. (Figure 11).

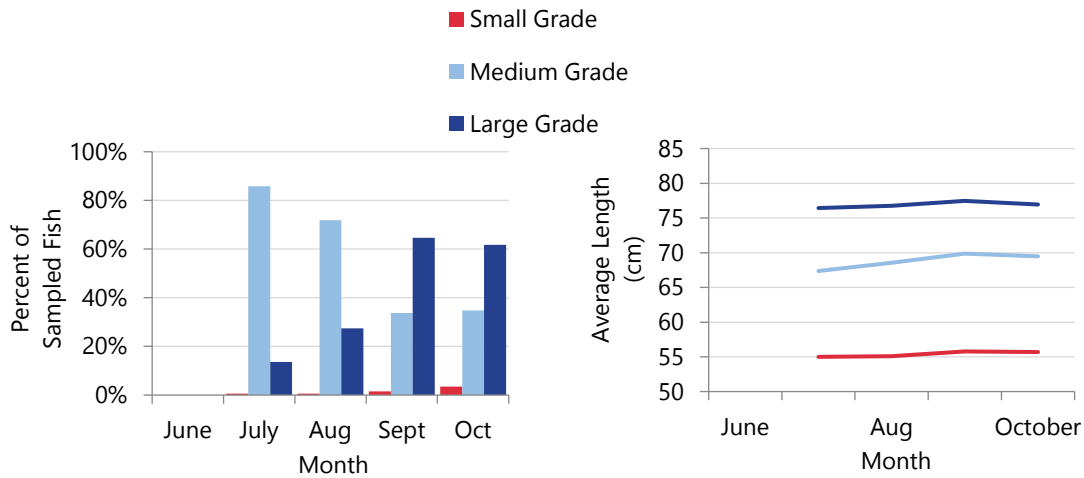


**Figure 10.** Length frequency data for all sampled ports and all months combined in 2020. Average length = 71.6 cm, N = 4,564. Estimated age at length from Wells, 2013. Inset shows 2019 length frequency data for comparison.



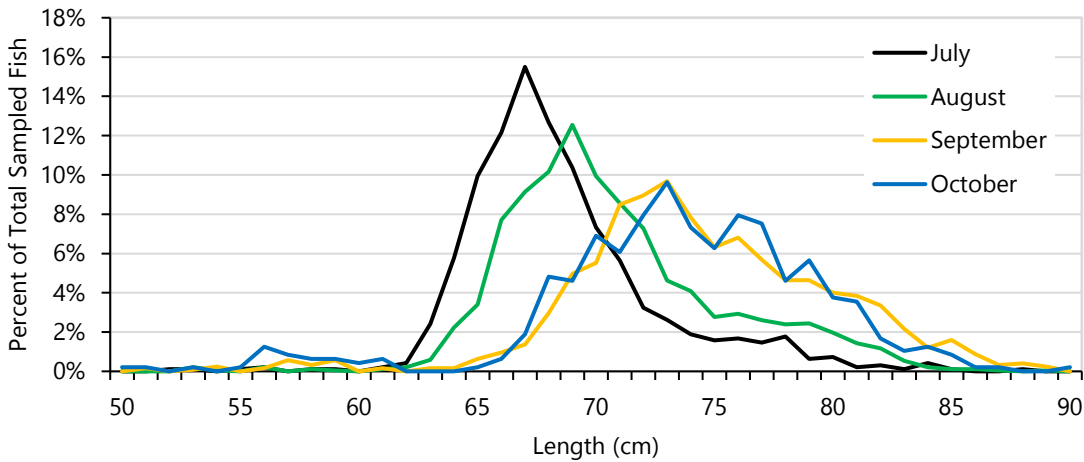
**Figure 11.** Length frequency data by port for all sampled months in 2020. Astoria n = 679; Newport n = 2,310; Charleston n = 1,470 (samples from Garibaldi not included here).

As described previously, many buyers sort albacore into three grades upon offloading: small, under 9 lbs. (<59 cm), medium, 9-15 lbs. (59-73 cm) and large, over 15 lbs. (>73 cm). The needs of customers from day-to-day may cause the buyer to shift the large-grade breakpoint to 14 or 16 pounds, but this is uncommon. The proportion of each grade in the catch changed markedly over the course of the season, with medium grade fish displaced by large fish (Figure 12). The average size within each grade increased slightly from July to September.



**Figure 12.** Proportion (left) & average length (right) of small, medium & large grade fish sampled each month in 2020. Small n=52; Medium n=2,725; Large n=1,682.

Smaller fish usually start to show up in the catch in September and October. This year very few “peanuts” under 60 cm (~24”) were encountered, a distinct change from the previous two seasons. The average length of this year’s fish was notably larger at 68.5 cm in July, increasing to 74.4 cm in September.

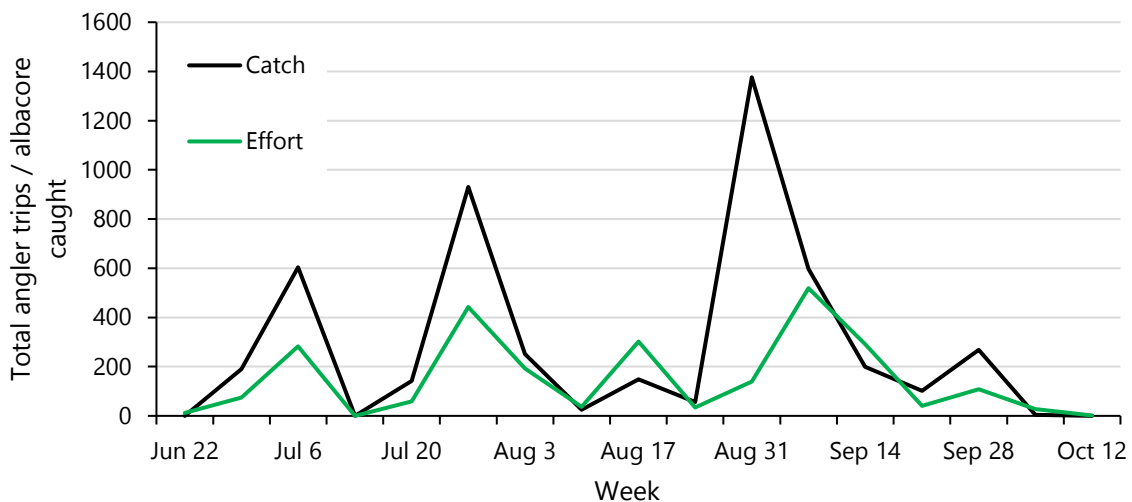


**Figure 13.** Comparison of length-frequency distributions by month July-October 2020 for all ports in Oregon. July n = 955; August n = 1,881; September n = 1,145; October n = 478.

Comparing monthly length-distributions, the strong mode around the 67 cm peak in July shifts to the right by 2 cm in August, and another 4 cm in September (Figure 13). At the same time, the area under the right half of the curve increased as the proportion of large fish in the catch rose (refer back to Figure 12). We saw also observed this size shift in 2019, suggesting rapid growth, and/or the progressive movement along the coast of groups of smaller and larger fish in response to ocean conditions, food availability, and other factors.

## 2020 RECREATIONAL ALBACORE FISHERY

Access to albacore for recreational vessels off Oregon can be highly variable, depending on weather conditions and distance offshore to the fish. During the 2020 season albacore remained well offshore most of the season, particularly north of Florence. The same wide band of chlorophyll that challenged the commercial small-boat fleet also affected recreational anglers attempting to move far enough offshore to encounter the fish. The season was difficult overall, with very little charter activity occurring and only sporadic private boat activity when weather was good (Figure 14). The weather was generally favorable throughout August and September, however the fish were never as close to the coast as in 2019.

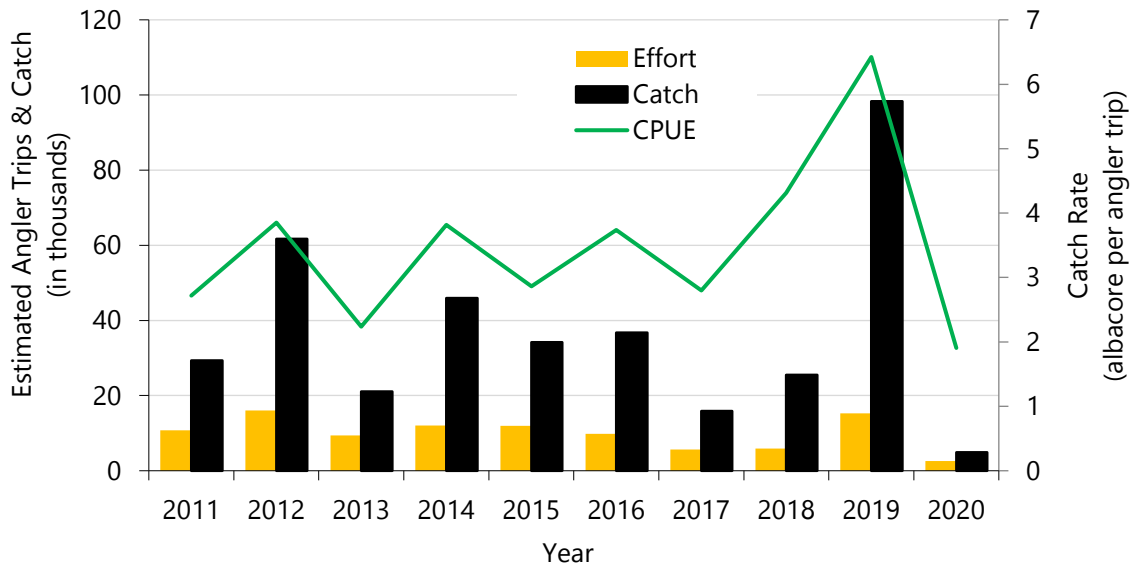


**Figure 14.** Oregon recreational albacore catch (number of tuna landed) and angler-trips by week from tuna-specific fishing trips in 2020.

ODFW's Ocean Recreational Boat Survey (ORBS) deploys samplers to monitor Oregon's sport fisheries and provide estimates of overall effort and catch. In this report, we combine the charter and private effort and catch estimates for the recreational fishery. The total estimated recreational fishing effort for albacore was 2,566 angler trips in 2020, roughly 26% of the five-year average of 9,730 angler trips. The number of albacore tuna landed from tuna-specific trips was 4,892 fish, or 12% of the five-year average, down dramatically from the nearly 100,000 albacore caught in 2019 (Figure 15). Anglers caught an additional 465 albacore on either a bottomfish trip, halibut trip, or "combo" trip (salmon & other fish) for an estimated total of 5,357 albacore tuna during five months of fishing in 2020.

The Catch Per Unit Effort (CPUE) in Brookings was much higher than any other port this year at 4.2, while all other ports including Garibaldi were held to a

CPUE of 1.8 or less. Brookings received more recreational albacore than any other port, with 32% of the catch, followed by Garibaldi at 25%, then Newport, Depoe Bay, and Charleston in that order (Table 6). ORBS samplers did not sample in Florence, Bandon, Port Orford, or Gold Beach. ORBS samplers performed no length measurements this year due to Covid-19 concerns.



**Figure 15.** Oregon recreational albacore fishing effort (number of angler trips), catch (number of tuna landed) and catch per unit-effort (CPUE, or albacore per angler trip) from tuna-specific fishing trips 2011-20.

**Table 6.** Oregon’s recreational albacore catch by port in 2020, for all trip types. “NS” means there was no sampler stationed at that port.

Port	Estimated # of fish	Landing %	CPUE
Astoria	87	1.6%	1.3
Garibaldi	1,345	25.1%	1.4
Pacific City	78	1.5%	0.8
Depoe Bay	595	11.1%	1.8
Newport	1,011	18.9%	1.7
Florence	NS	NS	--
W. Bay	57	1.1%	0.5
Charleston	465	8.7%	1.5
Bandon	NS	NS	--
Port Orford	NS	NS	--
G. Beach	NS	NS	--
Brookings	1,719	32.1%	4.2



## **ACKNOWLEDGEMENTS**

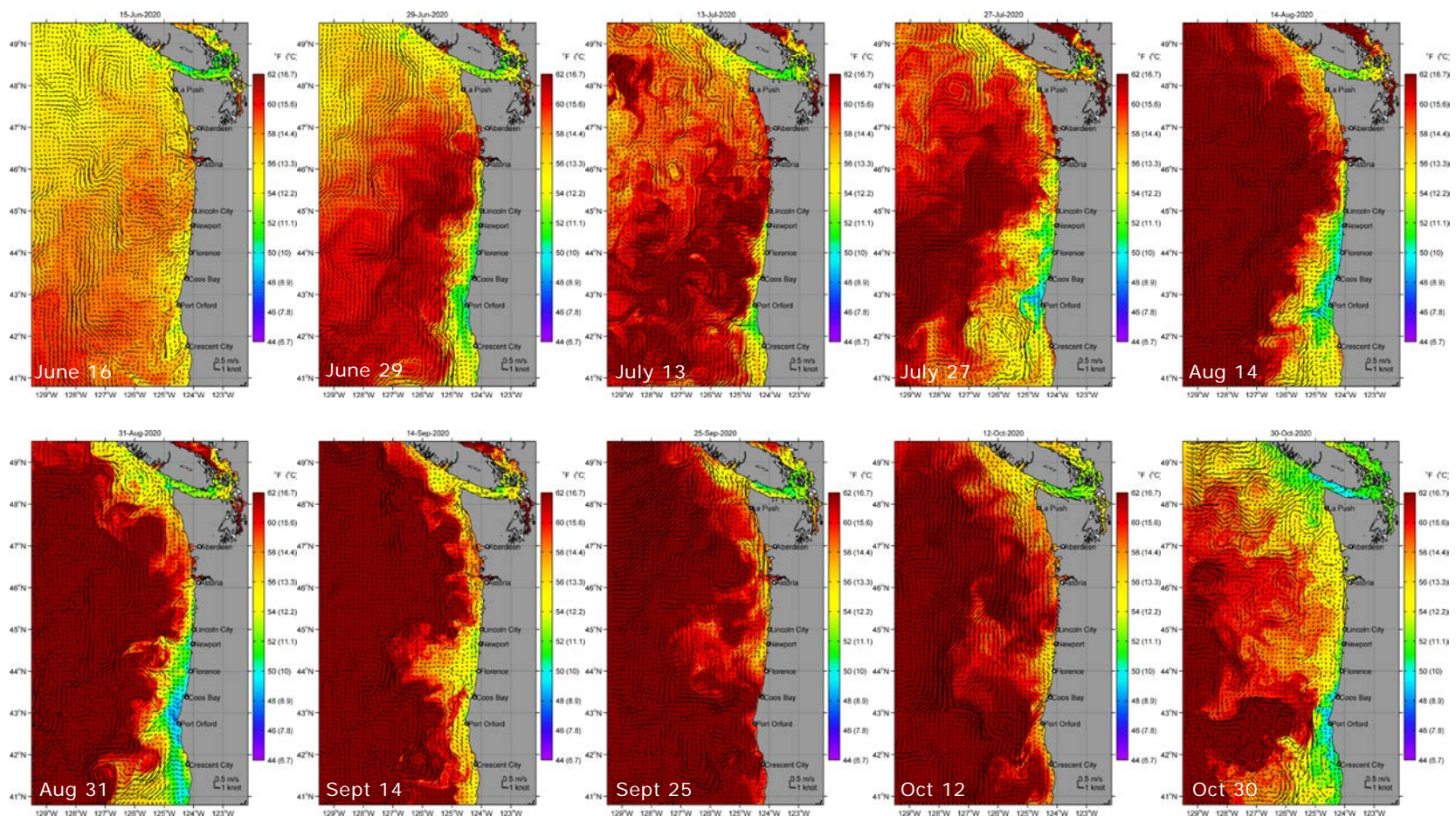
Thank you to all the albacore fishing vessel operators and crew who cooperatively provided fishing information during the 2020 sampling project, as well as fish plant staff and buyers who supported and assisted with efficient sampling on their property. Many thanks go to CJ Adams in Astoria, and Dean Headlee and Shawn Ruzzi in Charleston as primary albacore samplers. Thanks also to ODFW Port Biologists and staff for collecting additional samples and distributing logbooks: Sheryl Flores, Valerie Miranda, Scott Malvitch, Lindsey Noordman, and Kylee Mroz. I am grateful to Mark Freeman, Ted Calavan and Nadine Hurtado for their support with fish ticket data and databases. Thanks to Ellen Veile-Smuts and Amanda Reich for their assistance in the office setting. Thank you to Eric Schindler, Justine Kenyon-Benson, and Jessica Moll for providing the ORBS recreational data component for monthly and annual reports. Many thanks to Craig Risien of OSU/NANOOS for the sea-surface temperature images in Appendix A. In addition, many thanks to Kevin Hill and Yuhong Gu of the NMFS Southwest Fisheries Science Center for technical and data support and to Chris Wheaton and Kate Al-Sheikhly of Pacific States Marine Fisheries Commission for contract administration support. Finally, a special thanks to Justin Ainsworth, Cameron Sharpe, and Jessica Watson of ODFW for their steady professional assistance and support.

Cover photo: Reuben Roelle hauls an albacore aboard the Manatee II in 2016. Photo by Patrick "Fishpatrick" Roelle from the wheelhouse.

## **REFERENCES**

Wells et al., 2013. Age and Growth of North Pacific albacore (*Thunnus alalunga*): implications for stock assessment. *Fisheries Research* 147 (2013) 55-62.

## APPENDIX A



Nowcast sea surface temperature plots off Oregon and Washington out to 129°W from June 16 through October 30, 2020. Dark red areas indicate the warmest surface waters at or above 17° C (62° F), and lighter yellow, green, and blue areas the cooler waters. Images courtesy Craig Risien, Oregon State University, Northwest Association of Networked Ocean Observing Systems (NANOOS).

[http://agate.coas.oregonstate.edu/data/ocs\\_tuna\\_nowcast.html](http://agate.coas.oregonstate.edu/data/ocs_tuna_nowcast.html)

<http://nvs.nanoos.org/TunaFish>

## APPENDIX B

### 2020 Summary Statistics for Oregon's Albacore Port Sampling Program

<b>PORT NAME</b>	<b>Astoria</b>	<b>Garibaldi</b>	<b>Newport</b>	<b>W. Bay</b>	<b>Charleston</b>	<b>Other Ports</b>	<b>TOTAL</b>
<b>Logbooks issued</b>	3	0	11	0	2	2	<b>32</b>
<b>Lbs. landed by commercial sampled vessels</b>	335,754	37,651	1,275,408	0	700,271	0	<b>2,349,084</b>
<b>Total number of commercial fish measured</b>	679	105	2,310	0	1,470	0	<b>4,564</b>
<b>No. commercial trips sampled</b>	23	2	96	0	52	0	<b>173</b>
<b>Total no. of commercial trips/landings</b>	60	53	280	26	140	38	<b>597</b>
<b>Total no. of commercial vessels*</b>	26	23	101	12	68	19	<b>207</b>
<b>Lbs. landed by US vessels</b>	655,588	168,722	1,973,496	98,603	1,425,369	87,234	<b>4,409,012</b>
<b>Lbs. landed by Canadian vessels</b>	0	0	0	0	0	0	<b>0</b>
<b>Total lbs. landed by all commercial vessels</b>	655,588	168,722	1,973,496	98,603	1,425,369	87,234	<b>4,409,012</b>
<b>Lbs. landed by sport vessels**</b>	1,174.5	18,157.5	13,648.5	769.5	6,277.5	32,292.0	<b>72,319.5</b>
<b>Percent commercial sampling coverage (trips)</b>	<b>38.3%</b>	3.8%	<b>34.3%</b>	0.0%	<b>37.1%</b>	0%	<b>29.0%</b>

\* Several vessels made trips into multiple ports, so total numbers of vessels at each port will add up to more than Oregon's total.

\*\* Number of albacore landed in each port multiplied by the 13.5 lb. overall weighted average.