



10th Annual

Oregon Department of Fish and Wildlife • Marine Resources Program

Dungeness Crab Fishery Newsletter

November 2018

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Visit Our Website:

<http://www.dfw.state.or.us/MRP/shellfish/commercial/crab/.asp>

Superior Value, Abundant Crab

The 2017-18 Oregon Dungeness crab season brought in a record breaking 74.2 million dollar ex-vessel value! Landings totaled 23.1 million pounds, about 31% above the 10-year average of 16 million pounds. The average price per pound peaked at \$6.95 in April and came in at \$3.22 across the entire season, up from last year's \$3.08 average price per pound. In total, 318 different permit holders made 5,871 separate landings into Oregon ports from the ocean and Columbia River.

The season started with a significantly delayed split coast opening, with the area from Cape Blanco north to the OR/WA border delayed by regulation until January 15 due to low meat yield, and then another seven days for industry price negotiations before fishing commenced. The remaining area south of Cape Blanco was delayed due to a combination of low meat yield and levels of domoic acid in crab viscera exceeding public health thresholds until finally opening up on February 7, 2018. (con't on p.2)

How'd it GO?

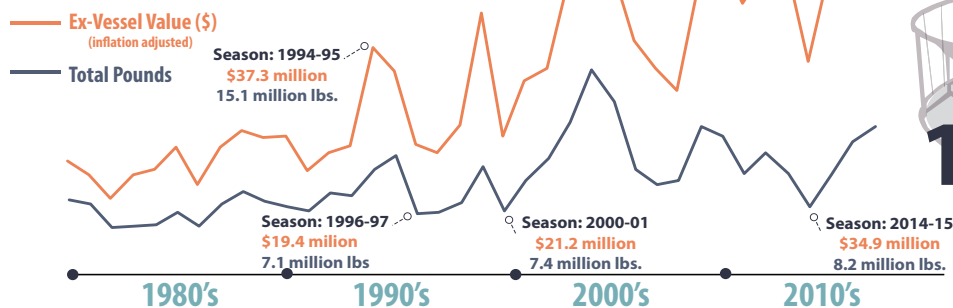
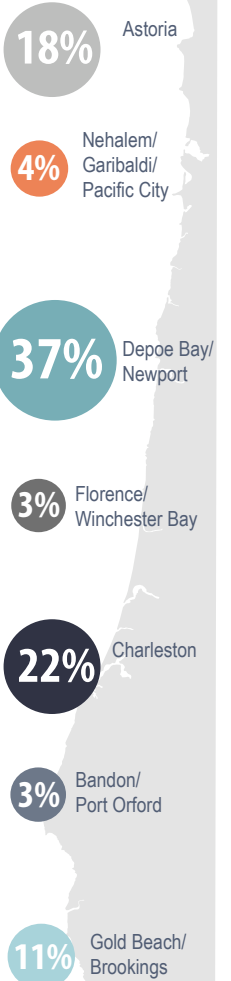
2017-18 Season Summary



318
active permit holders



Pounds Landed

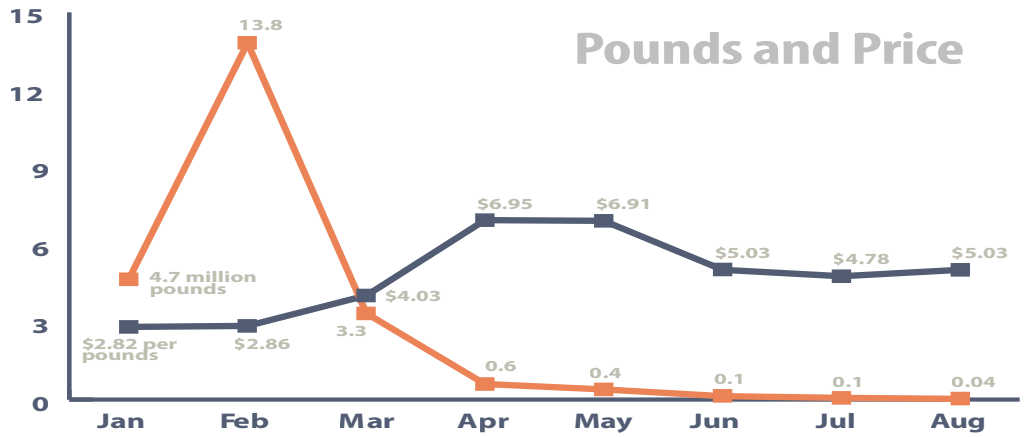


Season Summary (cont'd)

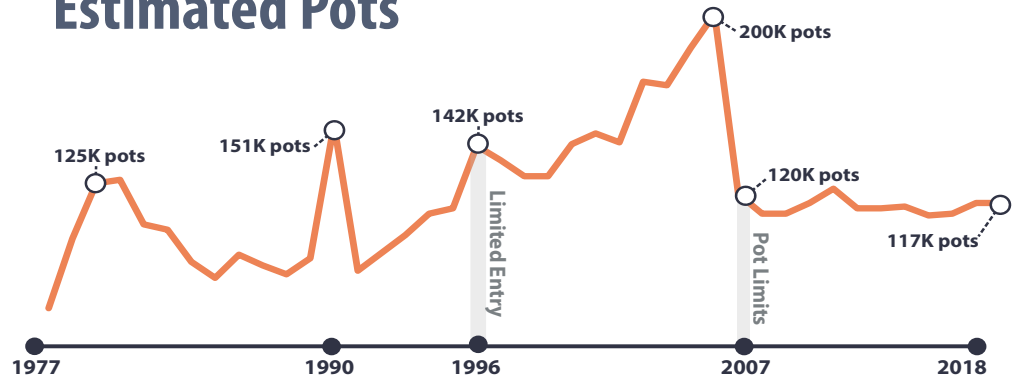
As usual, the vast majority (91%) of crab were caught in the first eight weeks of the fishery. This is slightly higher than recent seasons that ranged from 83%-89% landed in the first eight weeks. The Newport area led all ports in total pounds landed with more than 8.5 million pounds, followed by the Coos Bay and Astoria areas with 5.2 and 4.3 million pounds landed, respectively. Pots used in the fishery this season totaled an estimated 116,400, which is slightly above the estimated average of pots utilized each season since the implementation of pot limits.

Top right: Pounds of crab landed and price per pound (\$/lb) by month of the 2017-18 crab season.

Right: Estimated pots declared, per year, in the Oregon commercial Dungeness crab fishery. The number of pots used have stabilized since the implementation of pot limits.



Estimated Pots



Derelict Gear Program Summary

A total of 858 pots were removed from waters off Oregon in this year's Post-Season Derelict Gear Recovery Program! The number of pots brought in through the program has ranged from 421-957 pots per year since 2014. During this year's program (September 5th – October 12th) we issued 66 permits and just under half recovered gear. Pots were brought into five Oregon ports from 51 separate retrieval trips. Recovered gear was originally from at least 197 different vessels with the majority from this past crab season and more than 90% in fair or better condition. The additional two-week extension of the program allowed for an additional five recovery trips and 19 more pots brought to the dock. Additional outreach efforts this year with recreational ocean users resulted in over 30 reports of derelict gear coastwide, with over 100 locations of pots reported and posted for permitted vessels to target. All gear that was recovered was registered and tagged by ODFW or OSP at the dock and all gear registration forms are posted on our website (<http://www.dfw.state.or.us/MRP/shellfish/commercial/crab/>). This allows any previous gear owners interested in negotiating for retrieved pots to contact retrieving vessels directly.

Overall, the program was successful at raising awareness both within the fleet and with recreational ocean users about efforts to remove crab gear post-season, and at bringing in a significant amount of derelict crab gear. The program continues to operate efficiently, engage the public in reporting derelict gear, and raise awareness about the commercial fleet's removal efforts. Thank you to all who participated in this year's gear recovery program – and please participate next year.

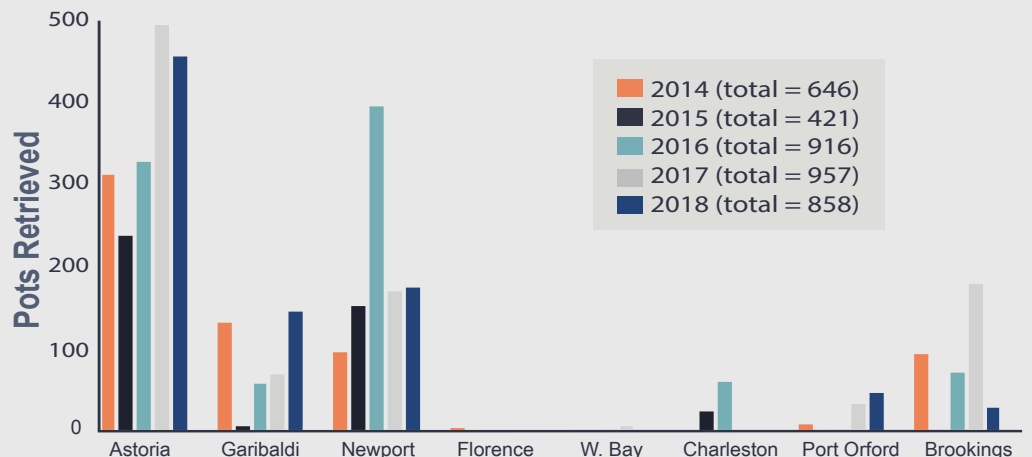


Photo left: Stack of derelict pots brought in through the post-season derelict gear program.

Graph above: Number of pots retrieved by port from all five years of the post-season derelict gear program. 2

Reducing Risk of Whale Entanglement

Since 2014, there has continued to be an increase in the number of reported whales entangled in fishing gear from fixed gear fisheries along the West Coast, primarily in Dungeness crab gear. In some cases, entanglement in fishing gear has led to serious injury and directly caused death of whales. The most recent summary of entanglement information is available on NOAA Fisheries website: http://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/fisheries_interactions.html.

To address the issue, Oregon Sea Grant has been convening a collaborative Oregon Whale Entanglement Working Group (OWEWG) since May, 2017. The goal of the OWEWG is to gather Oregon stakeholders together to develop and help prioritize options for short- and long-term modifications to gear and fishery practices to reduce the risk of whale entanglements in Dungeness crab gear and other fixed gear fisheries. This past winter and spring the OWEWG sent Dungeness crab permit holders a survey to gather information about your concerns regarding entanglements, about the Best Practices Directive developed by the OWEWG, and about the management options developed by the OWEWG to reduce risk of entanglement. Thank you to those of you who responded to the survey! Since then, the OWEWG has worked further on its recommendations, focusing on improving information about entanglements that occur (such as through enhanced gear markings), and management options to reduce risk (such as various ways to reduce the number of vertical lines in the water). Summarized results from the survey and proceedings of all of the meetings held to-date are on Sea Grant's website at <https://seagrant.oregonstate.edu/whale-entanglement>.

Developing Management Alternatives to Minimize Entanglement Risk

ODFW is now beginning to develop proposals for regulation changes which will be considered by the Fish and Wildlife Commission. As a first step, we met with many of you during our coastwide crab industry meetings in October, when we provided information about the current state of the entanglement issue and led discussions on management options. Dan Lawson, from NMFS Protected Resources Division, also traveled with us and met with you. We shared the results of the OWEWG survey and described the management options that have been proposed to reduce risk of entanglements. Although lightly attended in some ports, we really appreciate those of you who participated and helped us develop options for moving forward on this issue in order to maintain this very important fishery.

Based on our engagement with the OWEWG, industry survey responses, and discussions with you, we are in the process of developing a package of management measures that will likely include the following components for the later months of each crab season:

- **Reduced pot limit** – to reduce the number of vertical lines that pose a risk of entanglement when feeding aggregations of whales are known to be more prevalent in waters off Oregon;
- **Additional buoy tag** – to enforce the reduced pot limit, facilitate earlier derelict gear clean up and learn more about the timing of entanglements;
- **Control date** – to limit qualifying landings for any type of late season endorsement to past landings, should an endorsement be needed at some point in the future.

We plan to continue engaging the OWEWG to further refine this management package and consider alternative measures, before taking recommendations to the Fish and Wildlife Commission. Initially, we will be briefing the Commission in Spring 2019 on this issue and the measures we are considering to reduce entanglement risk. We plan to continue to work closely with NOAA, the other states, and the Dungeness crab industry at-large on the West Coast to minimize risks of whale entanglements in fishing gear. We are also working in collaboration with Oregon State University Marine Mammal Institute to seek funding for finer scale whale surveys to learn more about the timing and habitat use of whales off Oregon. Continued awareness, work, research and discussions towards addressing this issue on multiple fronts will strengthen the ability of Oregon's Dungeness crab fishery to adapt and thrive under changing ecological and socioeconomic conditions. ODFW is committed to taking reasonable, effective steps towards reducing the risk of whale interactions with crab gear.



REPORT Entangled Whales IMMEDIATELY

1-877-SOS-WHALE (1-877-767-9425) or hail the U.S. Coast Guard on Channel 16

Fishery Monitoring Update

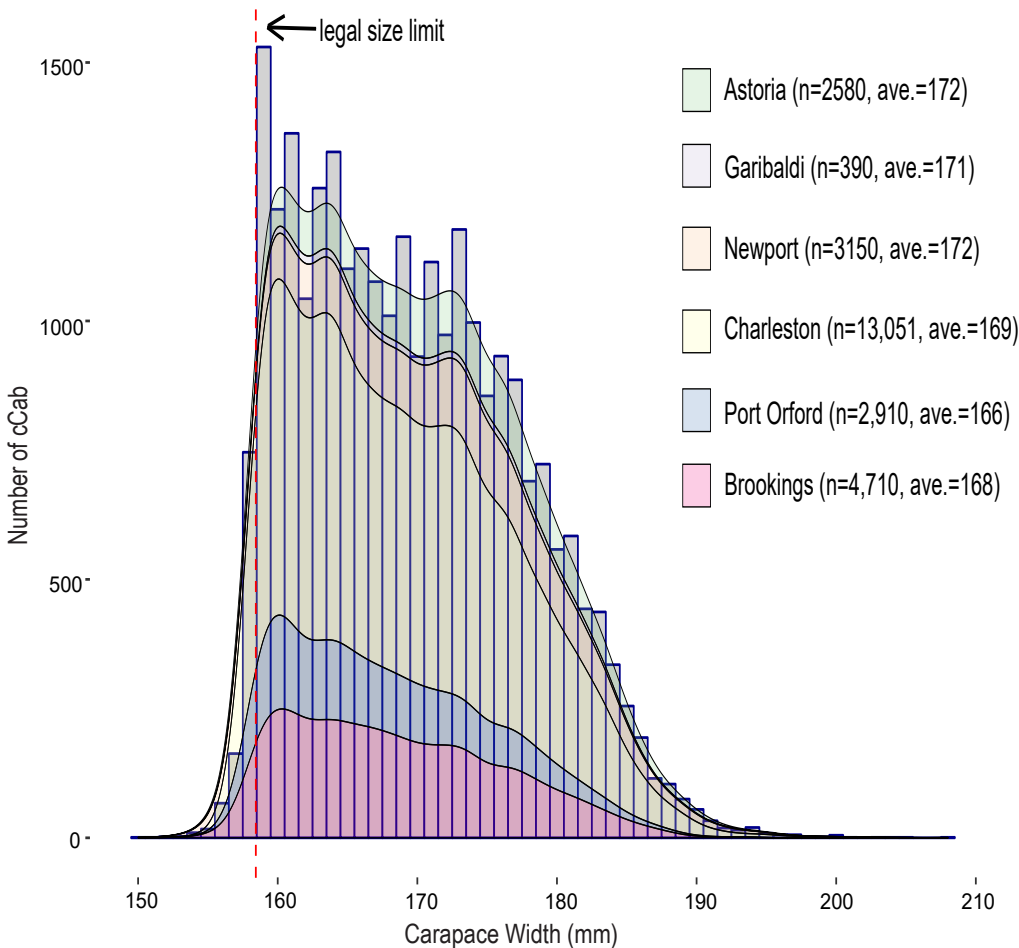
In recent years, ODFW has implemented multiple fishery monitoring projects to collect information on the crab resource and commercial fishery. This past season we continued our coast-wide preseason test fishery sampling, dockside sampling and at-sea sampling programs. Brief summaries of the data we collected this past season are below. For the 2018-19 season, we will have samplers back for coast-wide sampling coverage through the majority of the season. These samplers will be focusing on our at-sea monitoring efforts to continue to assess and quantify bycatch rates of female crab, undersize crab and other species caught throughout the season. If you are interested in participating in the at-sea portion of the sampling program, please contact us soon so we can start lining up trips. ODFW samplers will also be out sampling crab at the docks as resources allow.

Preseason Testing

Prior to the 2017-18 season getting underway, we sampled a subset of pots on every preseason test trip (22 out of 6 ports) to evaluate bycatch of crab and non-crab species just before the season opens. In total we sampled 174 pots and measured 4,265 crab. Results of this sampling continue to indicate catch per unit effort (CPUE) of sub-legal male Dungeness crab is the highest of all the categories of bycatch, followed by female Dungeness crab, other invertebrates (sea stars, etc.) and fish species at this time of year.

Ride-along Sampling

This past crab season, we rode-along on 14 trips to conduct at-sea monitoring to assess bycatch rates of crab and non-crab species. Trips originated out of the ports of Newport, Charleston, Port Orford, and Brookings between the months of March and August. This is a similar number of trips to the 2015-16 and 2014-15 seasons where we rode-along on 14 and 15 trips, all between the months of February and August, respectively. This sampling continues to indicate sub-legal male and female Dungeness crab are the highest of all categories of bycatch.



Graph: Crab carapace width measurements recorded during dockside sampling in the 2017-18 crab season. In total, we observed very minimal (0.30%) short crab coming to the docks coastwide.

Why Monitor?



Monitoring provides data to compare historical stock trends with current info.

Allows investigation of year class structure, recruitment trends and relative abundance.



Provides data to assess and quantify bycatch rates of female crabs, undersize crabs and other species.

Offers a communication channel between ODFW and the fleet, processors and enforcement.



Provides information to evaluate the success of management measures.

Dockside Sampling

Dockside sampling consisted of measuring carapace widths and weighing a portion of the crabs landed, based on size of the offload. Coast wide, we sampled 370 different offloads from 155 different vessels in six separate ports. Carapace widths averaged 170 mm from all ports sampled combined between January and August. Crab were generally larger on the North and Central coast with Astoria and Newport having the largest average crab sizes and Port Orford and Brookings having the smallest. The size and numbers of crab sampled by port is depicted in the graph on the left.

Fish Tickets and Logbooks - Why so much paperwork?

The primary tools we use to monitor the crab fishery are fish tickets to track harvest and crab logbooks to track effort over space and time, throughout the season. In addition to the Department's own uses (see previous newsletters for more information), crab logbook and fish ticket data have been used to describe the crab resource and the fishery you participate in, to both benefit the management and to provide rationale for protecting the crab fishery itself. This year these have included providing data for Seafood Watch's fishery review, MSC pre-assessment of the fishery, dredge disposal siting off Coos Bay, an OSU trans-disciplinary assessment of potential impacts to the crab fishery from changing ocean conditions, an update to NOAA's whale and crab fishing co-occurrence model and the development of a seasonal ocean condition forecasts for the crab fishery (see more on this, below). The use of any logbook and fish ticket data follows a rigorous data request process and development of a Data Use and Non-Disclosure Agreement between the Department and all data users.

Going electronic...

There are many issues facing the crab fishery where increased harvest area accountability is becoming more and more important, including crab biotoxin management, whale entanglements and season opening issues. To improve the efficiency of harvest area tracking on fish tickets we are planning to require electronic fish tickets for crab by the start of the 2019-20 season (see next page for more info). In the longer term, we intend to continue to investigate electronic logbooks to further increase harvest area accountability, streamline the crab fishery's fishing effort data collection and reduce the burden of writing down so much information on paper logs. Stay tuned for updates.

Experiments with Season Forecasts of Ocean Conditions in the PNW to Aid the Crab Fishery

A new research team has been developing seasonal (1-6 month) forecasts of ocean conditions that may affect Dungeness crab including: temperature, oxygen, chlorophyll, and integrated metrics of pH or saturation state variability. This partnership includes the ODFW, WDFW, the Quinault Indian Nation, NOAA, University of Washington, and University of Connecticut. The effort is adapting the J-SCOPE forecast system, which translates global, seasonal weather predictions from NOAA's Climate Forecast System down to the scale of Oregon and Washington's coastal ocean. The team is now investigating the relationship between local ocean conditions and three decision-oriented metrics of the crab fishery: (1) preseason meat quality, (2) spatial and inter-annual variability in the crab harvest, and (3) summertime hypoxic events. The ODFW, WDFW, and Washington tribal managers have been serving as an advisory panel for this project, and the state agencies have provided both logbook and preseason meat quality data to determine relationships between ocean conditions and the fishery. Figures below showcase a series of new visualizations of the oxygen forecast that is being made available on the J-SCOPE website, with input from the advisory panel. All forecasts are available from the existing J-SCOPE app on the Northwest Association of Networked Ocean Observing Systems (NANOOS) portal (<http://www.nanoos.org/products/j-scope/>).

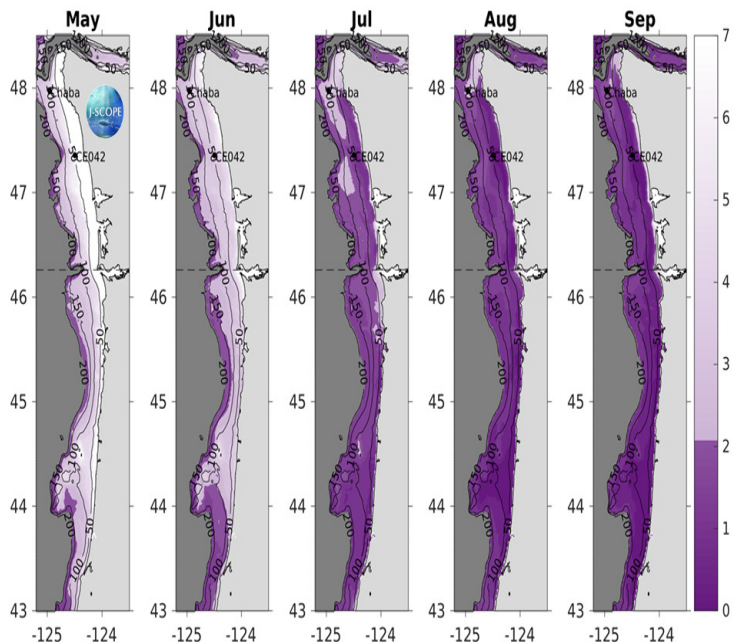


Figure: Bottom hypoxia (<2 mg/l) January-initialized 2018 forecast.

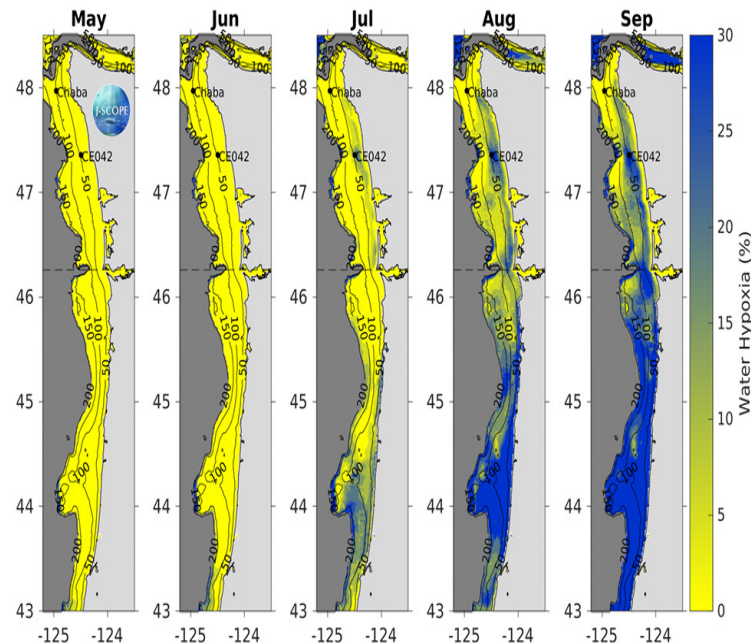


Figure: Percent of the water column that is hypoxic (<2 mg/l) from the January-initialized 2018 forecast.

Crab Biotoxin Management Updates

This year, we continued to strengthen our crab traceability measures in Oregon by enhancing record keeping requirements. We have prioritized improving traceability of crab in response to the fleet's desire to have an option for mandatory evisceration, which can protect public health while continuing to allow crab harvest during biotoxin events under some circumstances. Senate Bill 1550 clarified ODFW record keeping authority, gave Oregon Department of Agriculture (ODA) authority to use ODFW required records for public health and ensure that electronic record keeping is allowed. In April, the OFWC permanently adopted the temporary record keeping requirements that were put in place at the start of the 17-18 crab season. The rules require each seafood business in the crab market chain maintain records of whom they have bought crab from (1-back records) and whom they have sold crab to (1-forward records). The changes, in combination with ODA's new rules (clarifying biotoxin testing procedures and potential management responses), allows the agencies to make management decisions quickly (i.e. same day test results are available), allows industry to respond quickly to management decisions, and protects public health while minimizing fishery disruptions and economic impacts.



Crab in the process of being eviscerated. Biotoxins enter crab via food and accumulate in the organs first. Cleaning crab removes the organs from the meat.

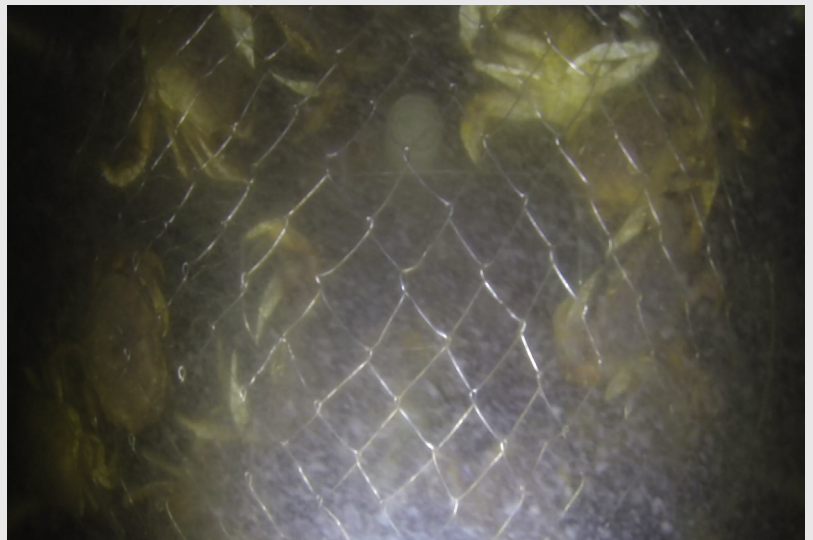
Looking ahead, we are continuing work to improve crab traceability and regional biotoxin management. As discussed at the industry meetings this October, within Oregon we are working on getting the new crab harvest areas into the electronic fish ticket system to improve traceability efficiency. We are also planning to move towards mandatory electronic fish tickets for all crab landings by the start of the 2019-20 crab season. At the regional level, this past July we worked on revisions to a Tri-State Crab Biotoxin Plan to facilitate coordination and to implement successful responses to biotoxin events affecting the crab fishery. A summary of these changes are on PSMFC's website at: <http://www.psmfc.org/crab>.

Did you notice dead crabs in your pots this summer?

We heard from a number of you over the last several months of the crab season that you found dead crab in your pots or washed up on our beaches. Yet at the same time, we received reports of lots of live crab in the bays and estuaries of the central coast. We are tracking these patterns and beginning to piece together the puzzle of how changing ocean conditions are altering hotspots for crab fishing – especially in the months when we see upwelling, acidified conditions and hypoxia events.

Your observations from crabbing are an important source of information and are directly relayed to researchers both within ODFW and at OSU. Past observations have led to early identification of a hypoxia (low oxygen) event off the Oregon coast. The bottom line? We have seen a number of strong hypoxia events over the last 4 years, since “The Blob” or marine heatwave first hit in 2015.

This year, a few of you have been (or plan to be) involved in deploying sensors to collect the data first hand – thank you for your willingness to collaborate on this important issue! There are additional actions that we can take to continue to tackle and respond to changing ocean conditions. This year, Oregon's Ocean Acidification and Hypoxia (OAH) Coordinating Council started to convene. The Council includes 13 members, one of which (Al Pazar, Florence) represents the fishing community. Over the next 6 months, the Council's recommendations will be formalized into an Oregon OAH Action Plan and we hope you will get involved in shaping that plan. The Council's initial report, which will be foundational for the Action Plan, can be found here: <https://www.oregonocean.info/index.php/ocean-acidification>. Comments or questions? Want to help with this research by putting sensors on your pots? Call Caren Braby, Marine Resources Program Manager at 541-867-4741 or email Caren.E.Braby@state.or.us.



View of crabs inside a crab pot on July 26, 2017 from a video showing a localized die-off of crabs unable to move out of an area of low dissolved oxygen.

2018-19 Season Opener Info

Preseason Testing Updates

Crab Quality

In partnership with the Oregon Dungeness Crab Commission (ODCC), the first round of Oregon preseason Dungeness crab quality testing is targeted for completion by November 15th and no later than November 22nd. Crab will also be collected during the first round for toxin testing by the Oregon Department of Agriculture (ODA). Results of all of these tests will be reported as soon as they are available and posted on our website at https://www.dfw.state.or.us/MRP/shellfish/commercial/crab/season_weekly_updates.asp.



Bottom Water Sampling

In addition to our regular preseason test sampling, this year we are part of a collaborative project funded by the Eder Family Fund for Dungeness Crab Research, with Oregon State University to better understand the domoic acid producing harmful algal species, *Pseudo-nitzschia*, in bottom waters off of Oregon. We will be deploying modified time-delayed baiting devices (picture below) to sample water at the bottom during round one of preseason testing. This will give us a first look at how pseudo-nitzschia concentrations differ between the surface and bottom waters where crab actually live. Ultimately, this will help us better understand the dynamics of annual Harmful Algae Blooms and how they affect Dungeness crab. Thanks to all of the vessels willing to help out with this project!



A bottom-water sampler attached to a crab pot to collect information on HAB concentrations at depth.

Tri-State Protocol

This past July, the Tri-State Dungeness Crab committee agreed to a number of short term and long term modifications to the preseason testing and season opening protocol. The short term agreements that will be in place for this upcoming season involved formalizing fair start provisions and additional processing guidelines within the testing protocol. The main longer term agreements included allowing for more than two fishing zones with different opening dates and extending the latest possible opening date to Feb 1. All of these changes were made to generally improve consistency, transparency and flexibility of the protocols amongst the three states. The full summary of this year's Tri-State meeting can be found on <http://www.psmfc.org/crab/>. The updated Tri-State protocol will also be posted on this page once signed by all three states.

Going Paperless!!

Season Opening Industry Notices Electronic Only

All season opening industry notices will be posted as soon as possible on our weekly season opening webpage. We are no longer planning to mail these notices directly to you. Starting in mid-Oct, we start posting brief weekly updates on preseason testing and information about the season opening status. Updates on this webpage continue until a decision to open the season is made

http://www.dfw.state.or.us/MRP/shellfish/commercial/crab/season_weekly_updates.asp.

Commercial Licensing Changes

Starting this fall, when your commercial license applications are processed, ODFW will send you an email with your commercial licensing documents attached. This means you can present them for inspection electronically on handheld devices such as your cellphone. You will also be able to print them out yourself to carry with you and you have the ability to reprint them yourself if they get lost. Commercial boat stickers will still be sent to you by mail. To receive your licenses as soon as they are processed, make sure you include your email address on your application. If you do not include an email address, your license will be mailed to you. If you have questions about these changes, please contact License Services at 503-947-6101.

We Want YOU!

Volunteer to collect crab for testing!

If you are interested in volunteering to collect crab for quality and toxin testing in your port, call ODCC (541-267-5810) or ODFW (541-867-4741).

Other Updates and Reminders

Want Opener Updates?

Here's how you get them:



Visit Website

Starting mid-Oct we post weekly updates on preseason testing and information about the season opening status. Updates on this webpage will continue until a decision to open the season is made.

Want opener updates? Visit: http://www.dfw.state.or.us/MRP/shellfish/commercial/crab/season_weekly_updates.asp



Sign-up for Text & Email Updates

If you would like to receive email and/or text messages with up-to-date information about the ocean commercial Dungeness fishery please visit the link below.

Want text updates? Sign-up here: <http://dfw.state.or.us/MRP/>

You can cancel your subscription at any time by logging in on the same webpage listed above.

Wave Energy Updates

As of September 2018, there are no energy facility structures in the water and no upcoming wave energy device deployments currently permitted off of Oregon. OSU has filed a Draft License Application with the Federal Energy Regulatory Commission for the proposed Pacific Marine Energy Center – South Energy Test Site. If licensed, construction of the test facility off of Newport could commence in 2020, with site operations beginning in 2021 potentially accommodating testing of up to 20 wave energy converters within a 2-square-nautical-mile area. Areas targeted for research for potential wave energy development include waters off of Warrenton, Newport, Reedsport, Lakeside and Coos Bay. Two entities have formally expressed interest in offshore wind development off of Morro Bay, CA; anyone fishing off of central CA and landing in OR can follow potential offshore wind development in CA at <https://www.boem.gov/California/>. For more information please contact Delia Kelly, ODFW's Ocean Energy Coordinator, at 541-867-0300 ext. 292 or email her at: Delia.R.Kelly@state.or.us.

Marine Reserves Fishing Regulations

A reminder that the marine reserve sites at Cape Falcon, Cascade Head, Otter Rock, Cape Perpetua, and Redfish Rocks are closed to crabbing and fishing. Crab gear that has accidentally drifted into a marine reserve can be removed with prior approval from Oregon State Police (no species may be retained). For marine reserve rules, maps, and coordinates visit oregonmarinereserves.com/rules or call the ODFW Newport office at 541-867-4741. To report violations or for permissions to remove derelict fishing gear contact Oregon State Police at 1-800-452-7888.



And before we go... Due to the national changes in recycling, we unfortunately cannot recycle buoy tags for now. We will continue to look for alternative companies to recycle the tags and investigate alternative materials to make them out of that might be recyclable. However, until further notice, please dispose of your buoy tags directly.

Have a safe and productive crab season!

We are always interested in hearing from you about your fishery and the issues that are important to you. Please give us a call or stop by our office in Newport any time.

Kelly Corbett, Commercial Crab Project Leader (541) 867-0300 x244 Kelly.C.Corbett@state.or.us

Troy Buell, State Fishery Management Program Leader (541) 867-0300 x225 Troy.V.Buell@state.or.us