

**OREGON DUNGENESS CRAB COMMISSION and UNIVERSITY OF OREGON
INTERGOVERNMENTAL AGREEMENT No. '20-'21/001**

This Intergovernmental Agreement (IGA) is entered into by and between the Oregon Dungeness Crab Commission (Commission) and the University of Oregon (UofO).

WHEREAS, UofO and Commission are each authorized to contract with other public bodies including agencies of the State of Oregon to carry out their missions; and

WHEREAS, the Commission is willing to provide financial assistance as defined in Article 4 of this IGA to enable UofO to conduct the project set forth in Exhibit A Statement of Work, and UofO is willing to accept the financial assistance on the terms and conditions of this IGA;

NOW THEREFORE, in consideration of the mutual promises and covenants contained herein, the parties hereto agree as follows:

ARTICLE 1. SCOPE OF WORK

UofO agrees to complete the services described in Exhibit A hereto, which by this reference is incorporated herein and made a part of this IGA.

ARTICLE 2. PERIOD OF AGREEMENT

This IGA shall be effective upon execution by both parties and shall terminate June 30, 2021 or by the date of the final payment, whichever is later. Subsequent extension, supplement, continuation or renewal of this IGA must be mutually agreed upon in writing between the two parties.

ARTICLE 3. PROJECT STAFF

UofO's Principal Investigator on this IGA is Dr. Alan Shanks ("PI"). UofO agrees to notify Commission promptly if at any time PI is unable or unwilling to continue the direction and supervision of the work. Within sixty (60) days after such incapacity or expression of unwillingness, UofO may nominate a successor to be Principal Investigator. The Commission will not decline unreasonably to accept the nominated successor. UofO is not authorized to change the Principal Investigator without prior written approval from Commission.

ARTICLE 4. CONSIDERATION

Commission agrees to pay UofO a fixed fee of \$9,944.00 to conduct the services described in Exhibit A, attached hereto. Payment will be made on the basis of an invoice for 100% of the fixed fee of this agreement, to be submitted no later than by May 31, 2021 to the Commission's contact identified below in Article 5. The Commission will make the payment no later than June 15, 2021.

ARTICLE V. NOTICE

Any notice provided for under this IGA shall be sufficient if in writing and delivered to the following addressee:

If to UofO:

Pre-Award
Sponsored Projects Services
5219 University of Oregon
Eugene, OR 97403-5295
Phone: 541-346-5131
Fax: 541 346-5138

If to Commission:

Hugh R. Link, Executive Director
Oregon Dungeness Crab Commission
P.O. Box 1160
Coos Bay, OR 97240-0301
Phone: 541-267-5810
Fax: 541-267-5772

ARTICLE 6. PERFORMANCE and REPORTING REQUIREMENT

UofO is responsible for the performance of work under this IGA as described in Exhibit A, and during the performance period will provide periodic oral progress reports of findings, if any, as requested by the Commission. UofO shall maintain fiscal records pertinent to this IGA for at least six (6) years following completion of work under this IGA. UofO shall maintain all fiscal records relating to the IGA in accordance with generally accepted accounting principles. In addition, UofO shall maintain all other records pertinent to this IGA in such a manner as to clearly document its performance hereunder. Based on UofO's work on the project funded under this IGA, UofO shall submit a final formal written project report by June 30, 2021, presenting any results of any studies conducted under this IGA. UofO will permit Commission, the Secretary of State of the State of Oregon, and/or their duly authorized representative's access to the books, documents, papers and records of UofO, which are directly pertinent to this IGA for the purpose of making audit, examination, excerpts and transcripts.

Any final written research report must include a statement that the research was funded in whole or in part by the Oregon Dungeness Crab Commission.

ARTICLE 7. CONFIDENTIALITY

Each party agrees that it will make reasonable efforts to maintain the confidentiality of any Confidential Information received from the other party and shall not use such Confidential Information except in performing its obligations pursuant to this IGA. For purposes of this Section, "Confidential Information" means information marked or designated in writing by either party as "Confidential" prior to initial disclosure. The confidentiality obligations imposed by this section do not apply to: (a) information that becomes part of the public domain through lawful means and without breach of any confidentiality obligation by the recipient; (b) information subsequently and rightfully received from third parties who have the necessary rights to transfer said information without any obligation of confidentiality; (c) information that was known to the recipient prior to the Effective Date without obligation of confidentiality; (d) information that is independently developed by recipient and documented in writing without use of, or reference to, any Confidential Information of the other party; (e) information required to be disclosed by compulsory judicial or administrative process or by law or regulation; provided that if either party is required to disclose

Confidential Information under clause (e), that party shall first give the other party notice and shall provide such information as may reasonably be necessary to enable the other party to take such action to protect its interests.

Commission hereby acknowledges that any disclosures Commission makes to UofO under this IGA are subject to the Oregon Public Records Laws, including but not limited to ORS 192.410-192.505, and the provisions for the Custody and Maintenance of Public Records, 192.005-192.170.

ARTICLE 8. INDEMNIFICATION

To the extent authorized by Article XI, section 7 of the Oregon Constitution and the Oregon Tort Claims Act (ORS 30.260-30.300), each party shall hold harmless and indemnify the other party, its officers, agents, and employees from and against all claims, demands, actions and suits asserted by third parties and resulting from the negligent acts or omissions of either party in the performance of work under this IGA. It is provided, however, that either party shall have no such obligations under this subsection for any claim, suit or action that results from or arises out of the intentional misconduct of the other party or its officers, employees or agents.

ARTICLE 9. COMPLIANCE WITH APPLICABLE LAW

This IGA shall be governed and construed in accordance with the laws of the State of Oregon. The UofO and Commission shall comply with all federal, state and local laws and ordinances applicable to work to be done under this IGA.

ARTICLE 10. ASSIGNMENT

Neither party shall assign or transfer any interest in this IGA, nor assign any claims for money due or to become due during this IGA, without the prior written approval of the other party.

ARTICLE 11. TERMINATION

Either party may terminate this IGA, in whole or in part, upon thirty (30) days written notice. Upon receipt of such notification, UofO must not make further commitments under the IGA and must take all reasonable actions to cancel outstanding obligations. The total cost of the IGA may then be renegotiated between UofO and the Commission.

Commission may terminate this IGA immediately if UofO commits any breach or default of any covenant, warranty, obligation or agreement under this IGA and such breach or default is not cured within fourteen (14) calendar days after Commission's notice. Upon receipt of such notification, UofO must not make further commitments under the IGA and must take all reasonable actions to cancel outstanding obligations.

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ARTICLE 12. OWNERSHIP

12.1 Patent

Except as provided in Section 12.2, patent ownership and rights to intellectual property created or first reduced to practice under this IGA shall be determined pursuant U.S. law. UofO shall promptly disclose in writing to Commission all inventions (whether patentable or not) created or first reduced to practice under this IGA.

12.2 Copyright

For original materials, including data, computations, plans, drawings, correspondence and other pertinent data and information gathered, first created and produced by and owned by UofO and subsequently provided to Commission for analysis, manipulation, computation, or other enhancements (“modified materials”) in performance of the work as specified in Exhibit A, such materials shall remain the property of UofO as original owner. For materials, including data, computations, plans, drawings, correspondence and other pertinent data and information gathered, first created and produced by UofO under this IGA shall be owned by UofO. Commission reserves a royalty-free, non-exclusive and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use, for non-commercial purposes, any product originating in performance of the work pursuant to this Agreement.

For materials first created and produced by Commission in the performance of the work under this Agreement, such original materials shall be considered the property of Commission. UofO has the right to use and reuse these modified materials for educational purposes and the results of research performed hereunder must be publishable. Commission agrees that UofO and its employees and students engaged in work under this Agreement shall be free to present at symposia or professional meetings, and to publish such results. UofO agrees to furnish three copies of proposed manuscripts to Commission for review and comment prior to publication or presentation, and Commission will delay publications for not-to-exceed sixty (60) days for completion of such review and comment.

For materials jointly created and produced in the performance of the work, Commission and UofO shall be joint owners of the original materials, and both shall be entitled to reproduce, publish or otherwise use, and to authorize others to use, for non-commercial purposes, the materials jointly originating in performance of the work pursuant to this Agreement. UofO agrees to furnish three copies of proposed manuscripts to Commission for review and comment prior to publication, and Commission will delay publications for not-to-exceed sixty (60) days for completion of such review.

The UofO agrees that it will not knowingly include any material copyrighted by others in any written or copyrightable material furnished or delivered under this IGA, unless it obtains specific written authorization without becoming liable to pay compensation to such copyright owner solely because of the inclusion of such copyrighted material.

ARTICLE 13. PUBLICITY AND USE OF NAME

UofO must not use Commission's name or logo in advertising or other publicity matter, or as an endorsement, without the prior written permission of Commission, granted in its sole and absolute discretion, except as required by law or regulation. In any permitted statements, the parties must describe the scope and nature of their participation accurately and appropriately.

ARTICLE 14. MERGER CLAUSE

THIS INTERGOVERNMENTAL AGREEMENT CONSTITUTES THE ENTIRE AGREEMENT BETWEEN THE PARTIES. NO WAIVER, CONSENT, MODIFICATION OR CHANGE OF TERMS OF THIS INTERGOVERNMENTAL AGREEMENT SHALL BIND EITHER PARTY UNLESS IN WRITING AND SIGNED BY BOTH PARTIES. SUCH WAIVER, CONSENT, MODIFICATION OR CHANGE, IF MADE, SHALL BE EFFECTIVE ONLY IN THE SPECIFIC INSTANCE AND FOR THE SPECIFIC PURPOSE GIVEN.

THERE ARE NO UNDERSTANDINGS, AGREEMENTS, OR REPRESENTATIONS, ORAL OR WRITTEN, NOT SPECIFIED HEREIN REGARDING THIS INTERGOVERNMENTAL AGREEMENT. THE PARTIES, BY THE SIGNATURE BELOW OF THEIR AUTHORIZED REPRESENTATIVES, HEREBY ACKNOWLEDGE HAVING READ THIS INTERGOVERNMENTAL AGREEMENT, UNDERSTAND IT, AND AGREE TO BE BOUND BY ITS TERMS AND CONDITIONS.

ARTICLE 15. WAIVER OF BREACH

The waiver by either party of a breach of any provisions of this IGA is not a waiver by that party of any subsequent breaches.

ARTICLE 16. SURVIVAL

All rights and obligations cease upon termination or expiration of this IGA, except for the rights and obligations and declarations set forth in Articles 3, 7, 8, 12, 15, 16, and 17 and any and all provisions which by their nature would survive such termination or expiration.

ARTICLE 17. SEVERABILITY

The parties agree that if any term or provision of this IGA is declared by a court of competent jurisdiction to be illegal or in conflict with any law, the validity of the remaining terms and provisions are not affected, and the rights and obligations of the parties will be construed and enforced as if this IGA did not contain the particular term or provision held to be invalid.


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ARTICLE 18. AVAILABILITY OF FUNDS

Commission shall employ good-faith efforts to request and seek funding, appropriations, limitations, allotments, or other expenditure authority sufficient to allow Commission to perform its payment obligations throughout the term of this Agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Intergovernmental Agreement to be executed as of the date set forth herein by their duly authorized representatives.

FOR UNIVERSITY OF OREGON


Digitally signed by Elizabeth Thomson Denecke
Date: 2020.07.08 22:07:30 -07'00'

Name: Elizabeth Thomson Denecke

Title: Assoc. Dir. Sponsored Projects Services


Date: July 8, 2020

FOR OREGON DUNGENESS CRAB COMMISSION


Name: Hugh R. Link
Title: Executive Director

Date: 7/9/20

Reviewed: OREGON DEPARTMENT OF AGRICULTURE (Oversight Agency)


Name: Kristyn Anderson
Title: Commodity Commission Oversight Program Manager

Date: July 1, 2020

EXHIBIT A**The Annual Recruitment of Dungeness Crab Megalopae and the Prediction of the Future Commercial Catch; Funding for Spring/ Summer 2020**

The purpose of the proposed research is to continue the investigation of the relationship between the annual return of Dungeness crab megalopae and the size of the future commercial catch. The sampling in 2020 will allow the prediction of the size of the catch for the 2023/2024 commercial fishing-season. This proposal builds on 19 years of previous research (5 years funded by NOAA and 14 by the Crab Commission) and will provide support for sampling in the spring/summer of 2020.

The 19 years of data has provided us with a much better understanding of what drives variation in the annual return of megalopae to the shore and a model that allows us to predict the size of the commercial catch four years in the future from the abundance of megalopae that return to Coos Bay during the annual settlement season. This is a unique data set. These insights are explained in detail in the annual report so I will provide only a brief overview here.

1. The abundance of returning megalopae is directly related to the size of the commercial catch four years later (the time needed for megalopae to grow to legal sized crabs).
2. We have, thus far, identified three variables that drive year-to-year variation in the abundance of returning megalopae, the Pacific Decadal Oscillation (PDO) index, the day of the year of the spring transition, and the amount of upwelling in the spring.
3. Very tentatively, it also looks like whether there were marine heat waves during the four-year recruitment period (megalopae to market sized crab) may have a large affect on the relationship between number of megalopae and the size of the commercial catch. Again tentatively, it looks like a greater percentage of juveniles survive to become market-sized crabs if they grow during a marine heat wave.
4. Starting in 2007 and continuing to about 2014, the number of returning megalopae increased dramatically. The most likely cause of this abrupt shift to higher returns was a shift from a positive to a negative PDO index. This shift indicates that more water from the West Wind Drift current (the current from Japan to the Eastern Pacific) is directed southward into the California Current increasing the speed of this current. This appears to enhance the southward transport of megalopae and this is associated with much higher returns of megalopae.
5. In addition, as climate change and global warming progresses, the effects of marine heat waves and ocean acidification on the biology of the Dungeness crab may become more apparent. The commercial landings from last year and the year before were far larger than predicted and I suspect this is related to the combined marine heat waves caused by the 'blob' and the strong El Nino. Given that the marine climate is changing, maintaining this time series seems even more important as the number of returning megalopae may be a sensitive indicator of the health of the crab

population.

6. We have developed a model relationship that can be used to predict the future commercial catch from the abundance of returning megalopae. This relationship is still evolving. Using the equation from these two curves, I can predict the commercial landings to within about 15% on average. However, the effect of marine heat waves on this predictive model is evolving.

The purpose of the proposed study is to build upon this past very successful work. Specifically, I will:

1. Provide a measure of the annual abundance of megalopae returning to Coos Bay for the spring and summer of 2020.
2. Using the relationship between the number of returning megalopae and size of the commercial catch four years in the future, provide an estimate of the size of the commercial catch in the 2023/2024 fishing season.
3. Refine the model relating the number of returning megalopae to the size of the commercial catch.
4. Use the daily recruitment data to better understand the processes transporting megalopae back to shore and causing variation in the annual abundance of returning megalopae.
5. Using the insights gained in #2, to refine the predictive power of the relationship between annual megalopae abundance and future commercial catch.
6. Determine the date of the spring transition, the amount of upwelling in the spring, and the PDO index using available oceanographic and meteorological data (e.g., wind, sea level and ocean currents). These are all variables that affect the number of returning megalopae. I am working on how to quantify a measure of marine heat wave impact, but this may take some time (i.e., several years of data).
7. Write an annual report describing the year's work and providing predictions as to the future size of the commercial catch.

Methods

The methods used will be the same as those I have used previously. A light trap will be deployed in the outer boat basin in Charleston Harbor at the end of F dock. The trap will consist of a 5-gallon clear plastic water bottle, funnels are inserted into the side of the trap to allow animals to enter, and a waterproofed LED lamp is suspended in the trap (power comes from the dock outlet). The trap fishes each night all night. The trap will be visited daily, the sample removed, and preserved in formalin. Crab megalopae will be identified to species and counted using a dissecting microscope. Sampling commenced on 1 April (sampling for 2020 has started) and run through September. Using the previously determined relationship between the number of megalopae returning to the coast and the size of the commercial catch, I will predict the commercial catch for the 2023/2024 fishing season. In addition, I will use wind data from weather buoys, sea level data from the Coos Bay Coast Guard station, and continental shelf current direction (data from Oregon State University Oceanography Dept.) to determine

the date of the spring transition, I will use data on the upwelling index to compute the amount of upwelling in the spring, and I will use online data on the PDO index to calculate the summed PDO index during the period Dungeness crab larvae are pelagic.

Budget

Personnel	2020 yr
Alan Shanks 10% summer salary	4,376
Student helper, \$12/hr	3,700
Total	8,076
Fringe Benefits	
Alan Shanks	1,357
Student Helper, 3% of Wages	111
Total	1,468
Supplies	
Field work supplies	400
Total	400
Total Direct Cost	9,944
Indirect Costs	
0% of Direct Cost	0
Total Cost	9,944

I am requesting support to continue daily sampling of megalopae in Coos Bay. I am requesting 10% of my summer salary (approximately 1 week) and help from a student worker during summer with their pay at \$12.00 per hour. I will oversee the student helper, train them to sample, identify and count the megalopae. The student will begin work on the project sometime in May or June (or as soon as funding is finalized) and continue through to the end of the recruitment season (about the beginning of October). He/she will be responsible for the daily sampling and sample processing. Prior to the student starting, I will collect the samples and store them for later processing. Lastly, I am requesting \$400 for supplies for the repair and construction of light traps, sample jars, formalin, and miscellaneous laboratory supplies related to the project.

Note that due to COVID19 there may not be any undergraduates working at the marine lab this summer, in which case I will continue the sampling. If this happens then the salary for the student worker will simply be shifted to my pay and fringe benefits. At this time I am assuming that there will be undergraduates on the OIMB campus this summer, hence, the budget in its current form.

