OPENING THE BLACK BOX OF COASTAL CRAB LIFE HISTORY: OBSERVATION OF AN EXCEPTIONALLY HIGH-DENSITY SETTLEMENT EVENT

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On a dive in April 2015 at Port Orford, Oregon, Galloway observed an aggregation of *Cancer* (*Metacarcinus*) *magister* recruits at densities of 22,000–65,000 individuals/m^2, covering every rocky and sandy surface, two to three individuals deep. Subsequent opportunistically gathered videos and diving observations suggest that *C. magister* settlement events on the outer coast nearshore benthos may be common, but their ecology at this life stage is poorly studied. Aggregations of this magnitude represent large subsidies of biomass (~1 kg/m^2) from the open ocean to nearshore reefs. Recruits are notoriously cannibalistic and are both voracious predators and key prey items for nearshore fish.

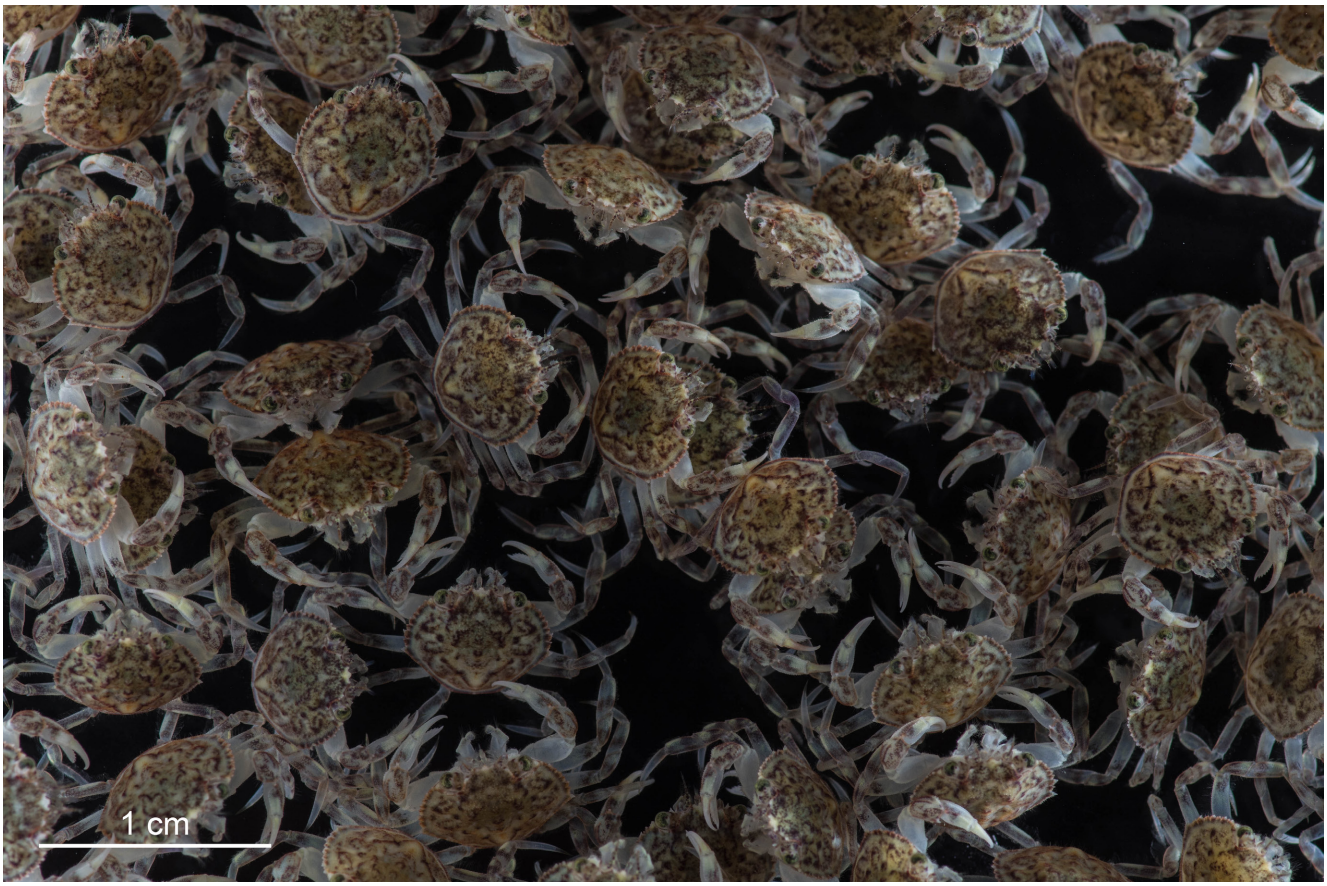

Photo 1. In this image, taken at Galloway's Coastal Trophic Ecology Lab at the Oregon Institute of Marine Biology (OIMB), we recreated the low end of the originally estimated density of *Cancer magister* recruits observed on the exceptionally high-density settlement event at Port Orford on 19 April 2016. The carapace width of the initial settlers in the field was 7.1 mm. The actual density of recruits in this photo is 23,394/m^2. This cohort was collected as megalopae in Shanks' light trap at OIMB in early April 2017, and settled in the lab under a range of experimental densities. Photograph by Reyn Yoshioka, used with permission.

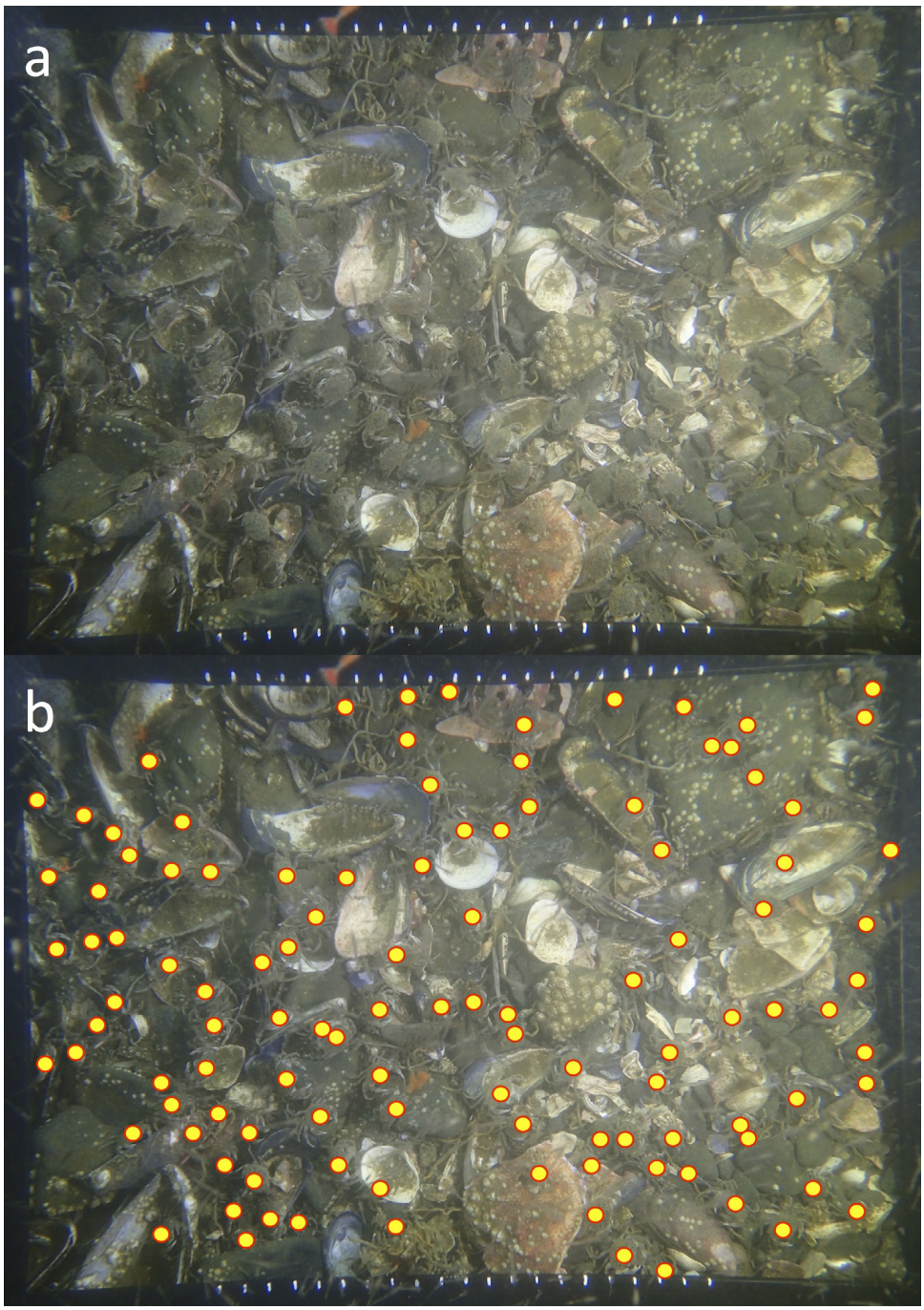

Photo 2. During follow-up dive surveys and several remote-operated video surveys in the Port Orford area, spanning April–September 2016, we regularly encountered moderate density aggregations of age 0+ crabs (i.e., settled that year) and subadults, which were observed preying upon juveniles. In the summer, such groups were much patchier in space and less commonly observed in the open. This image, taken on 17 August 2016, highlights a typical aggregation encountered in the field (panel a). This shell-hash substrate was at the base of a 5-m rock wall, in 12 m depth adjacent to a Port Orford reef ~1 km from the original observation site. There are 112 visible individuals in this picture (density of 1,272 individuals/m^2; ~12 mm carapace width, marked with dots in panel b); many more were found hiding under the shells when stirred up. The camera framer-scale marks are 1 cm. Photograph by Aaron Galloway.

Photo 3. *Cancer magister* megalopae that recruited to a Shanks' light trap in the Charleston boat harbor on 4 April 2017. The catch that day was ~16,000 megalopae. Shanks has maintained a daily collection of larvae throughout the settlement season from this trap location for 17 years. Annual catch by the light trap varies among years by a factor of 1,000 and has been shown to be predictive of the commercial catch of coastal Oregon Dungeness crab four years later. Photograph by Aaron Galloway.

These photographs illustrate the article "Massive crab recruitment events to the shallow subtidal zone" by A. W. E. Galloway, A. L. Shanks, S. Groth, S. R. Marion, and A. R. Thurber, published in *Ecology* 98:1468–1470. https://doi.org/10.1002/ecy.1740