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Novel Larval Trapping Technique Indicates Importance of Rare Events Driving Connectivity of Geoduck Clams in Puget Sound, Washington

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integrated land-based multi-trophic aquaculture system (Zeeuwse Tong). The cockles will be fed live microalgae grown in nutrient rich water derived from flatfish ponds. However, information on the dietary requirements for this species and dietary effects on growth and survival are lacking. One of the most recently researched topics in shellfish nutrition is the fatty acid (FA) composition of the diet. It has been shown that eicosapentaenoic acid (20:5 *n*-3 EPA) and docosahexaenoic acid (22:6 *n*-3 DHA) are essential for shellfish, but whether the presence of one or both will provide better growth seems to be species specific. To evaluate the effect of dietary *n*-3 polyunsaturated fatty acids live microalgae diets were fed to cockles (6mm). The growth response, as well as survival and fatty acid composition of the neutral and polar lipids of the animals was determined. Present results provide a better understanding of the importance of dietary FA for growth, as well as their impact on FA composition of neutral and polar lipids of *C. edule*.

NOVEL LARVAL TRAPPING TECHNIQUE INDICATES IMPORTANCE OF RARE EVENTS DRIVING CONNECTIVITY OF GEODUCK CLAMS IN PUGET SOUND, WASHINGTON.

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Quantifying connectivity among populations of sessile bivalves has implications for key conservation and management questions. Traditional sampling techniques, such as nets and pumps, collect larvae during a discrete period. These approaches are further limited by the resource-intensive task of sorting and identifying larvae from the rest of the plankton, restricting the number of time points that can realistically be sampled. We use a novel approach, passive larval trapping, which takes a time-integrated sample, paired with Fluorescent In Situ Hybridization with Cell Sorting (FISH-CS), which automates the sorting and identification processes, to map larvae of geoduck clams (*Panopea generosa*) in Quartermaster Harbor, Puget Sound, WA. Our preliminary findings indicate that although there is a low level of small larvae in the Harbor throughout the season, a pulse of larger larvae was captured in early summer. In contrast, medium sized larvae were found in the slow-moving inner harbor. Our results imply that at least some of the larvae were retained in the harbor for their entire planktonic larval duration. Our results underscore the importance of time-integrated sampling of ecological parameters that are dominated by rare events rather than average conditions.

CAN AN ABALONE IN THE BAG SAVE TWO IN THE BUSH? Tal Ben-Horin, Sarah R. Valencia, Hunter S. Lenihan, Kevin D. Lafferty.

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An explicit consideration of pathogens into fisheries management can profoundly shift reference targets and criteria for sustainability. By driving host populations below thresholds for transmission, fishing supports a number of desirable outcomes, including the extirpation, or *fishing out*, of pathogens. Southern California abalone fisheries closed in 1996 due to a combination of heavy exploitation and a fatal infectious disease caused by a Rickettsiales-like pathogen. Although this disease remains enzootic in southern California, red abalone (*Haliotis rufescens*) populations have shown widespread signs of recovery, particularly at San Miguel Island. The re-opening of a small-scale, limited access fishery is currently proposed for this region, and in response we constructed an age-structured epidemiological model, parameterized by fisheries-independent demographic and epidemiological data, to test whether harvest could not only provide fishery benefits but enhance the recovery of red abalone at San Miguel Island as well. The results show that a limited effort fishery will enhance the recovery of red abalone, as long as size limits and effort are strictly maintained. These results will have widespread implications for epidemiological theory and the management of fisheries in the face of enzootic disease.

SIGNIFICANT WAVE HEIGHT, TIDAL LEVEL, AND DISTANCE BETWEEN NEIGHBORING INDIVIDUALS OF OPPOSITE SEX AFFECT PROBABILITY FOR FERTILIZATION IN SPAWNING BLACK ABALONE (*HALIOTIS CRACHERODII* LEACH, 1814).

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Black abalone (*Haliotis cracherodii* Leach, 1814) are listed as endangered in their U.S. range due to disease and overexploitation. Abalone are dioecious broadcast spawners, and as intertidal organisms exposed to oceanic surf, black abalone typically spawn in conditions of strong and turbulent water flow. To determine the minimum and maximum proximity between male and female