

## FY 2015 PHASE I AWARD WINNER

FIRM: The Cultured Abalone Farm, LLC  
9580 Dos Pueblos Canyon Road  
Goleta, CA 93117

AWARD: \$94,647.00

PHONE: 805-685-1956  
E-MAIL: [dswezey@culturedabalone.com](mailto:dswezey@culturedabalone.com)

PRINCIPAL INVESTIGATOR: Dr. Daniel S. Swezey

TITLE OF PROJECT: Developing Ocean Acidification Resistance in Commercial Red Abalone

SUBTOPIC NUMBER: 8.1.1.1F

### TECHNICAL ABSTRACT:

It is now recognized that the pH of the world's oceans is becoming more acidic as a consequence of increasing atmospheric CO<sub>2</sub>. This process, termed "ocean acidification" (OA) will affect the aquaculture of marine shellfish. In order to maintain current levels of commercial mollusk production, the identification and commercialization of resilient shellfish strains will be required. Emerging evidence suggests that wild shellfish populations may be locally adapted to variable pH conditions along the California coast. Our firm will exploit this natural variation, carrying out research towards the development of an OA resistant strain of red abalone. We will also work to develop a reproducible commercial diet and feeding approach that conveys resistance to OA. These products may hold significant commercial and market potential, setting an example for efforts in other shellfish industries. Our proposed OA culture experiment will investigate the relative resilience of different abalone populations under OA, and the effects of varying maternal and juvenile diet. We will identify resilient strains using both growth observations and advanced genetic techniques in collaboration with partner researchers. Our work will identify the genetic signatures of resilience to OA and will provide a foundation for future selective breeding efforts.

### SUMMARY OF ANTICIPATED RESULTS:

Our work will identify abalone strains that are resilient to OA, and generate an assessment of the portions of the red abalone genome that are affected by acidification stress. This will enable the detection of "resilience signatures" in rapidly growing individuals. These analyses will include an assessment of the genetic heritability of this resilience as the foundation for selective breeding efforts. We will also generate an initial assessment of dietary components that convey resilience to OA under commercial aquaculture settings with the goal of developing a feedstock for abalone that conveys OA resistance.