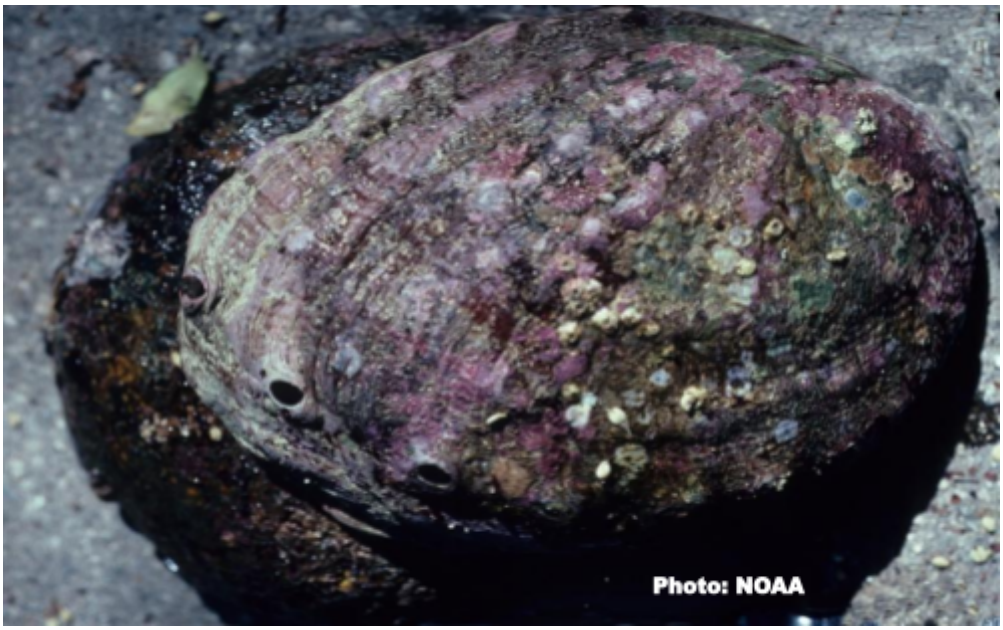
SUCCESS STORY



THE CULTURED ABALONE FARM

Developing Resilience to Ocean Acidification in Red Abalone Aquaculture

Goleta, CA

Ocean waters are becoming more acidic as they absorb increasing concentrations of atmospheric carbon dioxide – a process termed ocean acidification (OA). OA is proving detrimental to marine organisms, such as the red abalone. The State of California has witnessed diminishing populations of wild red abalone in the state's coastal waters to the extent that it is now illegal to harvest wild red abalone there. OA is also of concern to aquaculturists who rely upon ocean waters to produce red abalone in their commercial fisheries. The research done by the Cultured Abalone Farm increased understanding of how to develop OA-resistant red abalone strains which benefits the ecosystem as well as the economy.

Web
http://culturedabalone.com

The NOAA Technology Partnerships Office (TPO) consists of the NOAA Small Business Innovation Research (SBIR) Program and the NOAA Technology Transfer (T2) Program. The SBIR Program provides funding to small businesses that participate in

Photo: NOAA NMFS/SWFSC/PRD

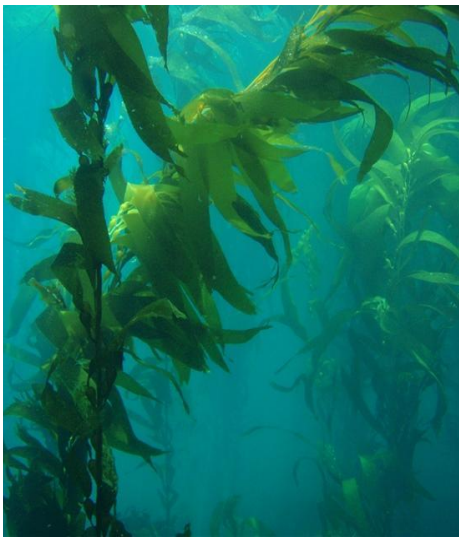


Photo: CINMS

PROJECT

The Cultured Abalone Farm conducted a Phase I SBIR project focused on understanding if red abalone with diets higher in nutrients and proteins would produce heartier offspring that are better equipped to endure future OA by studying the genetic variation that occurs when feeding the abalone macro algae and red seaweed. By the end of Phase I, research showed the altered diets do impact red abalone OA-resistance. In Phase II, the Cultured Abalone Farm went on to discover that wild red abalone growing in more acidic waters off the California coast are more likely to thrive in OA conditions than those growing in less acidic waters. To conduct this research the Cultured Abalone Farm needed a way to identify and quantify specific genes associated with resilience to OA. In order to do so, they collaborated with an evolutionary geneticist from the University of California Davis to begin developing a reference transcriptome (i.e., a gene library) for red abalone. The assembly of this transcriptome is an important milestone in the advancement of genetic resources for red abalone aquaculture.

BENEFITS

Red abalone stabilize rocky reefs and kelp forests which house numerous marine organisms. They also provide a food source to an array of marine wildlife and this research provides insight to help increase their dwindling population in California and around the world. The SBIR award of $418,872 generated a total output of $611,344, of which $250,611 went to the state of California. The development of a patented process that can be sold to aquaculture operations is currently underway and once in place will have greater impact on the economy.

NOAA SUPPORT

Lead Scientist for the Cultured Abalone Farm, Dan Swezey, conveyed that the SBIR Program has allowed the concept of understanding and exploring a possible OA-resistant strain of red abalone to become a reality. Through Phase I and Phase II awards, the Cultured Abalone Farm was able to generate research that has the potential to restore populations of red abalone in California and beyond; benefitting aquaculture businesses, consumers, and ecosystems alike.