

Proposal #: 20SER026-012

Project Title: Application of IMTA-Technology to Revive and Sustain Livelihood of Fishing Communities in Puerto Rico

Applicant: Florida Institute of Technology

Priority Addressed Priority #2 – Science or Technology that Promotes Sustainable U.S. Seafood Production and Harvesting

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Abstract: The 70% decline in the total fish and shellfish landed, especially along the southwest coast of Puerto Rico, since 2001, a loss in fisheries revenue of about 50%, is likely caused by an assemblage of drivers including overfishing, habitat loss, pollution, climate change, and hurricanes including Irma and Maria in 2017. This proposed work is the first application of the Integrated Multi-Trophic Aquaculture (IMTA) technology to revitalize and sustain the livelihood of coastal fishing communities in Puerto Rico. The IMTA framework involves the simultaneous culture of marketable species, each occupying a different niche within the system, thus, playing complementary roles in mitigating the adverse impacts of aquaculture effluents on the ecosystem. In the IMTA system, the basic flow of food/energy are as follows: (1) organic wastes and uneaten feeds high in protein from fish cages or tanks (2) serve as food for organicextractive species including sea urchins and oysters, and (3) inorganic wastes are captured by seaweeds (inorganic-extractive species). The key species in each of these components is edible and marketable, thus, food and income from one IMTA operation is at least three times more than a traditional monoculture (single-species production) method.

Summary of potential commercial benefits to the fishing community of the research results:

As in coastal small-scale fishing communities worldwide, mariculture remains the only viable option to provide food, income, and livelihood, and revitalize and sustain traditional fishing communities in Puerto Rico. In this proposed pilot work, we will train fishermen how to construct and use recirculating IMTA to produce pompano, oyster, and seaweed, and provide continuing education to them in the U. Puerto Rico Marine Sciences Field Laboratory. At the end of this 2-year pilot study, we would have provided additional income and food supply to 50 fishing families that have been severely affected by hurricanes Irma and Maria.
