

Proposal #: 20SER006-010

Project Title: Epidemiology and Reproductive Impacts of the newly discovered Egg Parasite *Carcinonemertes obrieni* on the Caribbean Spiny Lobster Fishery in Florida and the Caribbean.

Applicant: Department of Biological Sciences, Clemson University

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

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Abstract: The Caribbean spiny lobster *Panulirus argus* is the target of the most socio-economically important fishery in Florida and the Caribbean. Most populations, including Florida, are fully- or over-exploited. We have recently discovered a new species of predatory worm of the genus *Carcinonemertes* from egg masses of *P. argus* in Florida. *Carcinonemertes* worms, including the newly described *C. obrieni*, are voracious egg-predators previously tied to the collapse of other fisheries (e.g., red king crab fishery in Alaska in the 1980's). *Carcinonemertes obrieni* prevalence has risen from 7.4% in summer 2015 to 100% in summer 2017. Furthermore, *C. obrieni* impacts reproductive performance (fecundity plummeted ~40%) of ovigerous female lobsters. This proposal offers a unique opportunity to examine the epidemiology and reproductive impacts of this emergent parasite *C. obrieni* on the lobster fishery in Florida, Mexico, and Belize. Specifically, we will determine the prevalence of *Carcinonemertes obrieni* among *Panulirus argus* populations in Florida as well as in Mexico and Belize, which supply larvae to Florida. We will also determine the impact of *C. obrieni* on *P. argus* reproduction and the potential for infection in the co-occurring Florida stone crab *Menippe mercenaria* and spotted spiny lobster *Panulirus guttatus*

Summary of potential commercial benefits to the fishing community of the research results: Lobster populations throughout the Caribbean, and especially Florida, are highly dependent on exchange of their long-lived pelagic larvae. If this new pathogen also emerges among females from Florida's larval source populations, which includes Mexico and Belize, it may jeopardize the already depressed Florida fishery. Therefore, this proposal will generate information that will aid in the adaptive management of the fishery in light of combined habitat and pathogen impacts. We will be cooperating directly with commercial lobster fishermen during this project (letter of cooperation attached) and will have a direct line to the fishery management agency as results become available.
