Gulf and South Atlantic Regional Panel on Invasive Species:
South Carolina Update for April 2011 Meeting.

Peter Kingsley-Smith & David Knott
South Carolina Department of Natural Resources
Marine Resource Research Institute
Charleston, SC USA 29422-2559

1) **Infection of the invasive swim bladder parasite *Anguillicoloides crassus* in South Carolina populations of American eel *Anguilla rostrata*.**

During 2010, Jan-Alexis Barry, a summer intern working with the South Carolina Department of Natural Resources (SCDNR) Inshore Fisheries section as part of the NSF-funded Minorities in Marine and Environmental Sciences (MIMES) Program investigated infection of the American eel, *Anguilla rostrata* by the nematode parasite *Anguillicoloides crassus*. Jan-Alexis concentrated on eels captured in the Cooper River and Winyah Bay by the SCDNR electrofishing survey. Overall, 38% of eels (n = 139) were infected, although infection levels were higher in June (62%, n= 65) than in July (18%, n =74). In June, infection was also very size-dependent, with 83% of eels < 300 mm in length being infected compared with only 43% in eels < 500 mm. In fall 2010, a Master's project was initiated on *A. crassus* (Jen Hein, College of Charleston; Major Advisor: Isaure De Buron, College of Charleston). Jen received a fellowship from the National Estuarine Research Reserve System (NERRS, NOAA) to investigate *A. crassus* infection of America eels in the ACE (Ashepoo-Combahee-Edisto) Basin, North Inlet and Cooper River. Work to date has shown that even the very small elver stages have high levels of infection. Laboratory experiments are currently underway to examine the effects of the parasite on eel growth and survival.

2) **Understanding the impacts of the Asian seaweed, *Gracilaria vermiculophylla* on estuarine community dynamics.**

During the last decade, the Asian seaweed, *Gracilaria vermiculophylla*, has rapidly proliferated along high-salinity mudflats in several Georgia and South Carolina estuaries. The seaweed invasion is particularly noteworthy because the mudflats in these estuaries were historically devoid of macrophyte-based primary production and structure. *Gracilaria* has few native analogues in these mudflat environments, and thus represents an important opportunity to examine the ecosystem consequences of an invasion within an historically-unexploited niche. In theory, *Gracilaria* affects populations of species that are directly dependent on the invader for structure and food, as well as altering community- and ecosystem-level processes such as detrital production and food web structure. An NSF-funded project is currently underway through collaboration between the College of Charleston (Dr. Erik Sotka) and the University of Georgia (Dr. Jeb Byers). This project will provide a mechanistic understanding of the multiple cascading impacts of this invasive species within the estuarine community. Through a combination of manipulative field experiments, laboratory assays and stable isotope analysis these investigators plan to test three mechanisms by which *Gracilaria* influences native community structure. The novel primary production generated by *Gracilaria vermiculophylla* may be 1) increasing rates of secondary production 2) increasing levels of mudflat microbial production through leeching of dissolved nutrients, and 3) increasing detrital input to microbial and macrobial food webs.

3) Updated numbers for Asian tiger shrimp, *Penaeus monodon* catches from SC commercial trawling activity.

At the previous meeting in St. Petersburg (October 2010), 10 *Penaeus monodon* had been reported from commercial shrimp trawls in the Gulf and South Atlantic coastal states (SC n=4; FL n=1; LA n=5). Additional catches after that meeting raised the total number of *P. monodon* captured in the region to 30 animals for the 2010 season (SC n=20; GA n=1; FL n=2; LA n=7), the majority of which were collected in South Carolina.

4) Collection of live adult specimens of Island apple snails, *Pomacea insularum* and hatching of juveniles under laboratory conditions.

Also, since that last meeting, when a new infestation of apple snails, *Pomacea insularum* near Charleston was reported (based on empty shells and egg masses), a live snail and several egg masses have been collected at the same location in Mt. Pleasant. Egg masses were held in an aquarium and several of them proved viable, hatching out as hundreds of juvenile snails that were raised for 3 months. At 6 intervals during these 3 months, several specimens were preserved to generate preliminary growth rate data at an ambient laboratory temperature of ~22°C. This husbandry was an informal exercise, since feeding was not controlled and the snails were held in mass culture. As yet these snails have not been measured.