GEORGIA
DEPARTMENT OF NATURAL RESOURCES
COASTAL RESOURCES DIVISION

Monitoring the Health and Abundance of Georgia's Shrimp

The Georgia Department of Natural Resources (GADNR) has monitored the harvest, abundance, size, reproductive potential and health of Georgia's shrimp populations since the 1970's. To accomplish this goal, catch and effort records (landings and trips) are collected via monthly trip tickets from shrimpers, while GADNR biologists conduct a monthly fishery-independent monitoring survey at 42 locations in six sound systems. The commercial (Cooperative Statistics Program) and the fishery-independent (Ecological Monitoring Trawl Survey – EMTS) data are analyzed and compared with historical results to determine the current status of shrimp populations and to develop best management practices.

White shrimp samples collected in the EMTS from August through October 2013 suggest coast wide abundance is roughly half the long-term average (Figure 1), with the coast wide count size approximately 45% below normal for this time of year (Figure 2). Preliminary harvest reports from commercial shrimpers indicate the offshore trawl catch per day is 6% below average (1989-2012) for August and 19% below average for September (Figure 3.) October harvest reports are not due until November 10th.

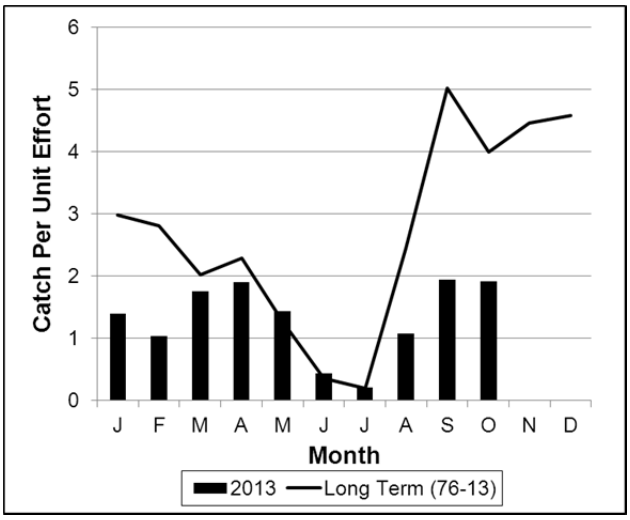

Figure 1: GA DNR research trawl white shrimp estimates by month. Catch per unit effort (CPUE) is kg per standard 15 minute trawl.

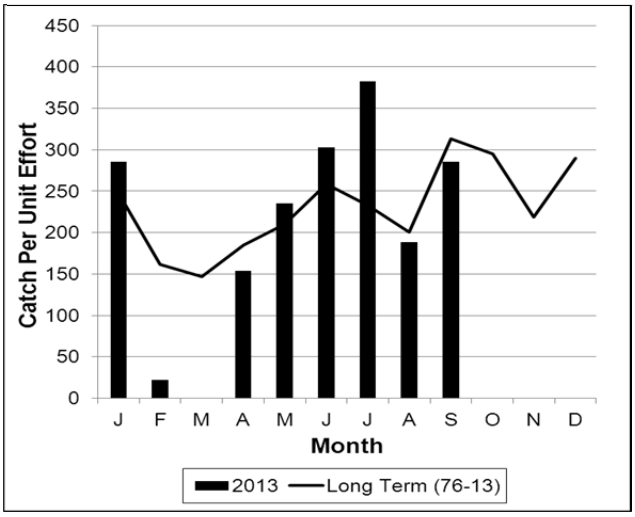

Figure 3: Commercial food shrimp harvest by month. Catch per unit effort (CPUE) is pounds per day of fishing.

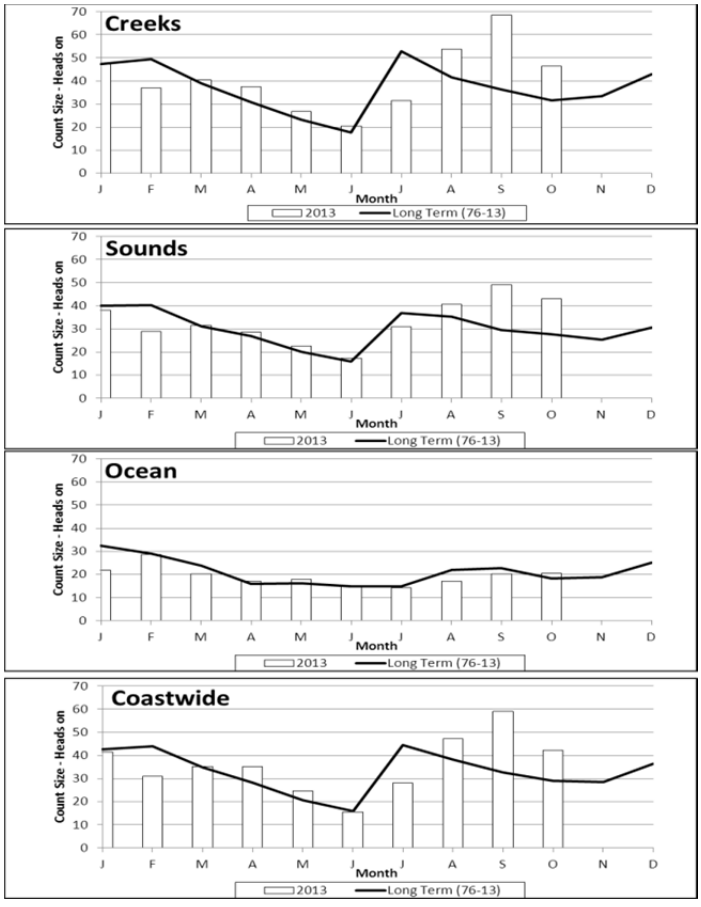

Figure 2: GA DNR EMTS monthly count size of white shrimp.

Black Gill 11/12/2013

Annual commercial food shrimp landings continue to show a downward trend, with the 2012 harvest 33% below the average (89-12) of 3.7 million pounds. The food shrimp trawl fishery is typically the second largest commercial fishery in Georgia in terms of pounds landed and first in value ($13.9 million annually). The annual harvest has been declining since the late 1990's (Figure 4); however, this is more a result of reduced fishing effort than issues regarding the health of the population. Although the 2012 harvest is 33% below the long-term average (1989-2012), fishing effort (number of trips) has declined 60%. There are presently 243 vessels licensed to trawl our state waters, and in 2012 the fleet made a total of 1903 trips.

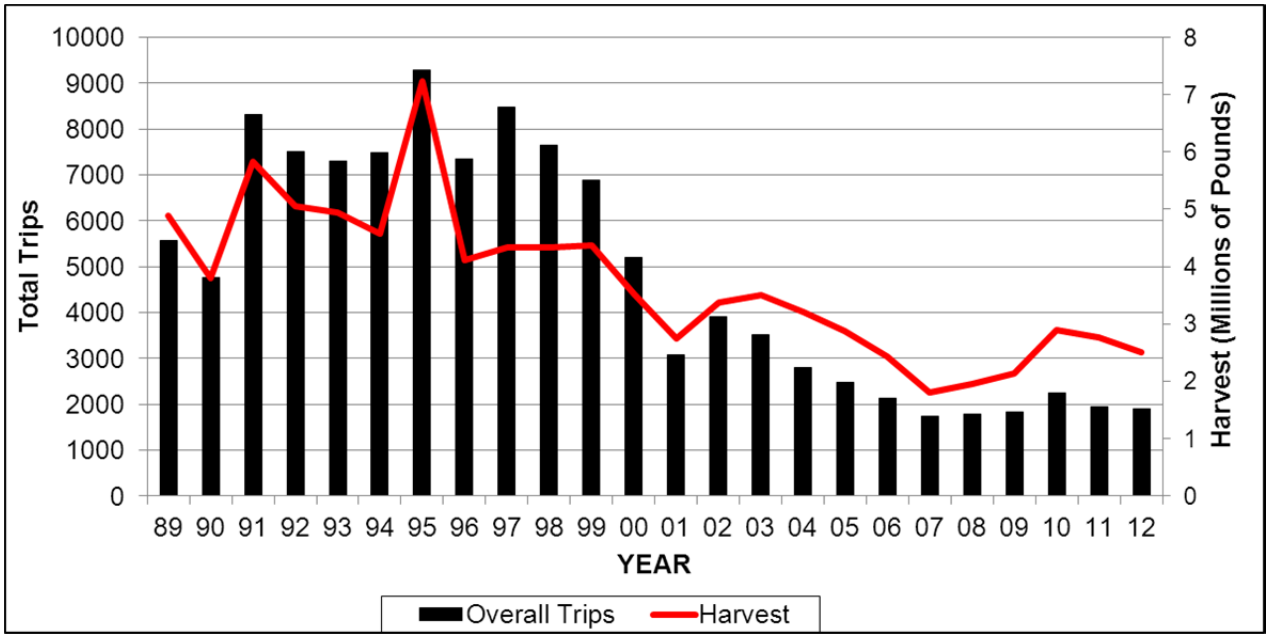

Figure 4: Annual trawl harvest and fishing effort of commercially caught food shrimp as reported to the GADNR.

Potential Causes for Observed Declines

1) Increased Levels of Freshwater/Rain

Georgia DNR is exploring possible reasons for the observed declines in abundance. One cause may be the very wet weather experienced on the coast during the summer and early fall (May – September). Rainfall for this period in 2013 was 47.29% above average (36.83 vs. 25.00 inches long term average – recorded at Malcolm McKinnon Airport, St. Simons Island) (Figure 5), resulting in some rivers exceeding flood stage for several weeks, and resulting in slightly cooler than normal water temperatures (-1 to 4%). These increased levels of freshwater may also contribute to the smaller count size shrimp observed in September and October surveys (Figure 2).

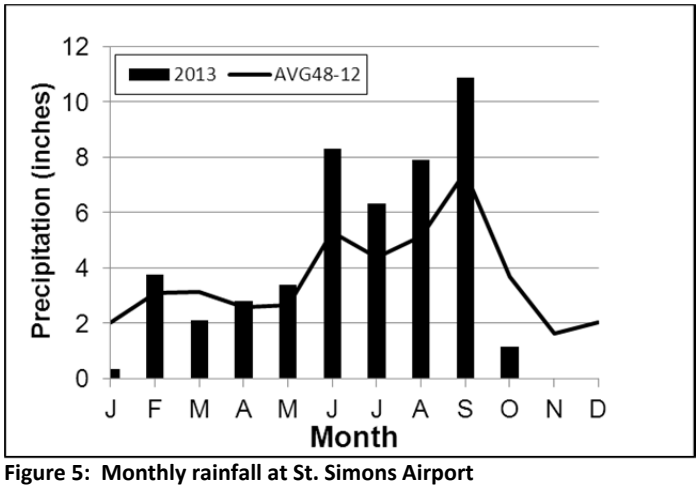

Figure 5: Monthly rainfall at St. Simons Airport

2) Black Gill

Figure 6: Black gill in white shrimp.

Black gill is a syndrome observed in numerous shrimp species. The dark coloration of the gills is a response to the presence of a ciliated protozoan that causes irritation and melaninization (darkening) of the gills which results in impaired respiratory surfaces (Figure 6). The ciliate is naturally occurring, but environmental conditions can lead to stress in shrimp, making them more susceptible to this organism. Black gill has been observed and recorded by GADNR since 1996 and its presence has been observed in all but three years (1997, 1998, and 2001). Generally, black gill first appears in the northern part of the state in August and is observed coast wide in September and October, eventually dissipating by December. The occurrence rates observed by the GADNR in 2013 have been above normal. Of the shrimp sampled, 20.43% in August, 38.68% in September, and 43.27% in October had black gill. This is 18.32%, 12.06%, and 7.30% higher than normal, respectively (Figure 7). The GADNR is working with Skidaway Institute of Oceanography (SKIO) to identify the specific species of ciliate that causes black gill, determine its life cycle and its relationship to white shrimp. GADNR will also be examining environmental variables to see what relationships enhance the presence of the organism in white shrimp.

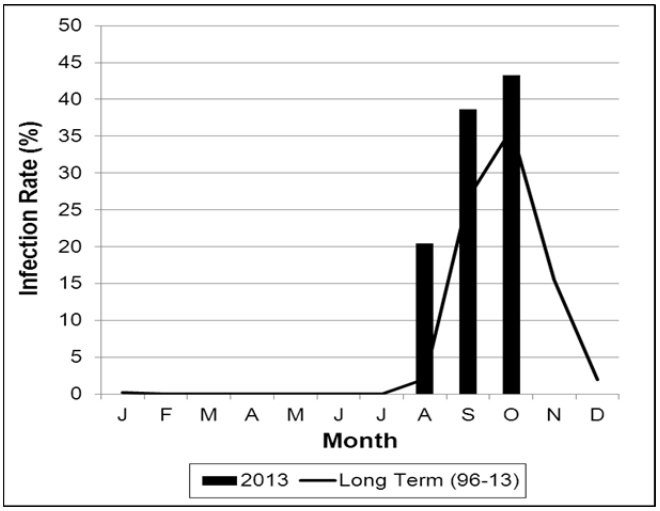

Figure 7: Black gill monthly infection rate in white shrimp observed by GA DNR EMTS.

"There's no smoking gun for the decline in shrimp abundance observed this year", said Patrick Geer, Chief of Marine Fisheries for DNR. "We've had an unusually large amount of rain this summer and fall which have lowered both salinity and water temperatures. These environmental conditions may be contributing to the smaller than normal shrimp size and creating conditions for the protozoan involved in black gill to flourish. It's difficult to say for certain that black gill is killing the shrimp, but the impacts to the respiratory system and less than optimum environmental conditions for the shrimp may increase stress leading to greater predation. Regardless, it is imperative that consumers understand that the affected gills pose no health risk to the general public and shrimp are still safe to eat", Geer said.

Georgia DNR will continue to monitor black gill and work with SKIO to learn more about this syndrome. Georgia DNR also will be working with the shrimp industry to determine the best course of action if the shrimp abundance and commercial harvest do not show signs of recovery.