

Zooplankton Studies in Port Royal Sound, 2015

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The first ever study of the animal (zoo-) plankton of Port Royal Sound (PRS) continues in 2015, with grant funds provided by the Low Country Institute. Sampling has been successfully accomplished from March, when water temperatures reached >15 degrees C stimulating an initiation of reproduction of aquatic invertebrates and fish, through October on a general frequency of sampling twice each month. A total of 18 station locations representing the full length of the Okatie, Colleton, and Chechessee Rivers and lower PRS from the tip of Daws Island to it's mouth connecting with the coastal waters of the Atlantic Ocean is being sampled. Nets of two different mesh sizes are used to adequately capture the different zooplankton size fractions present, and physical and chemical parameters of the water column being sampled are measured concurrently to determine water mass characteristics. The frequency of sampling is allowing for an adequate determination of the seasonality of fish and invertebrate reproduction in PRS.

Sampling conducted to date reveals diverse and productive communities of invertebrates and fish that are using the tidal rivers and PRS for the full variety of life-history functions. There is a diverse and productive zooplankton community that serves as the base of the animal food chain and whose existence is permanently planktonic (i.e., drifting with the currents: holoplanktonic) and there are equally diverse and productive fish and benthic invertebrate communities that use the rivers/PRS system for reproduction and nursery functions for their young (i.e., their existence in the plankton is temporary: meroplanktonic).

Assemblages of both holoplanktonic and meroplanktonic forms in the rivers and Sound are typical of warm-water, tidal creek estuaries with a preponderance of intertidal marsh and mud/sand bottom habitats as found along the southeastern U.S. and Gulf of Mexico coasts. The assemblages include organisms able to withstand a fairly wide salinity gradient but also occasional incursions of more offshore/coastal forms from higher salinity waters. Holoplanktonic assemblages are dominated by fauna typically found in southeastern U.S. (coastal areas which are strongly influenced by the Gulf Stream) and eastern Gulf of Mexico coastal and estuarine waters including copepods, cladocerans, ostracods, larvaceans, planktonic worms, chaetognaths, sea spiders, and jellyfish. Meroplanktonic assemblages include both invertebrate and fish larval and post-larval forms. Invertebrates include: clams, oysters, snails, squid, segmented worms, barnacles, mud crabs (including stone crabs), swimming crabs (including blue crabs), porcelain crabs, white and brown penaeid shrimps, sergestid shrimps, mysid shrimps, caridean shrimps, spider crabs, fiddler and ghost crabs, starfish, sea squirts, bryozoans, and hydroids. Meroplanktonic forms (eggs and larvae) of fish include: menhaden (eggs), bay and striped anchovy, Atlantic silverside, feather blenny, naked goby, striped mullet, northern puffer, chain pipefish, Atlantic needlefish, spotted seatrout, weakfish, other drum, and hogchoker.

The high zooplankton abundance and diversity found in this study suggests the Port Royal Sound system presently is a unique and relatively pristine water body, benefiting from ideal conditions including: physical structure (sand and mud bottom and tidal marsh), latitudinal (temperature) location, and salinity conditions allowing it to function as a well-balanced and productive estuary, at the higher end of productivity and diversity of marine life of any estuary in the southeastern U.S. and Gulf of Mexico coasts.