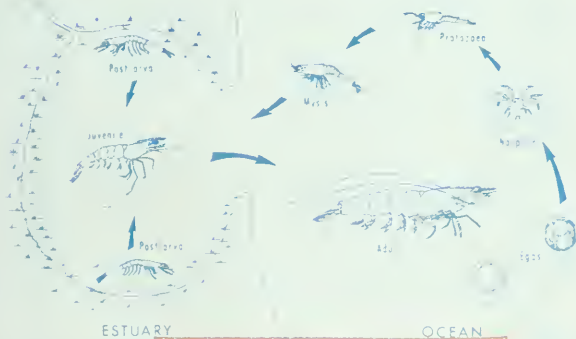


Bureau of Commercial Fisheries Biological Laboratory

Galveston, Texas

Penaeid Shrimp Life Cycle



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DEPARTMENT OF THE INTERIOR

U.S. FISH AND WILDLIFE SERVICE
Bureau of Commercial Fisheries

The Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex. 77550, was established in 1950 on the site of the U.S. Army's deactivated Fort Crockett. There are 59 employees, of whom 33 are professionals. The Marine Laboratory of Texas A&M University is adjacent to this Laboratory, and there is a free exchange of knowledge between staff members of the two installations.

Facilities at the BCF Laboratory include a library, recirculating and constant-flow sea-water systems, four large controlled-temperature rooms, culture rooms, a small greenhouse for the culture of algae, outdoor artificial ponds for shrimp culture, a sedimentology laboratory, a chemical laboratory, and small boats for estuarine work. A large sea-water station is at East Lagoon, 4 miles from the Laboratory, and a field station is maintained at Miami, Fla.

The major research of the Laboratory is directed at commercially important species of shrimp in the Gulf of Mexico through four research programs: (1) Shrimp Dynamics; (2) Shrimp Aquaculture; (3) Estuarine Studies; and (4) Gulf Oceanography. The programs are designed to: determine growth, survival, and movements of shrimp stocks; determine the maximum yield of the stocks of shrimp by deciding what size the shrimp should be when they are harvested; refine the methods developed for predicting the abundance of



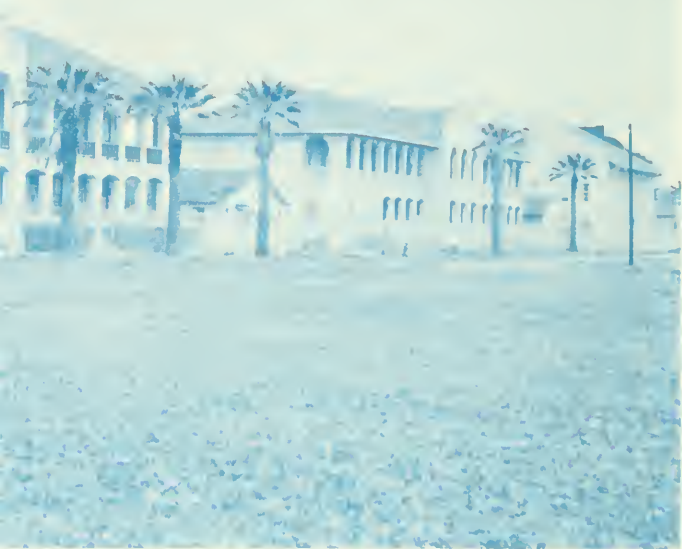
Shrimp that are caught, stained or tagged, and released on the fishing grounds by biologists provide information on migration, growth, and mortality when recaptured by fisherman and returned to the biologist. These men are staining shrimp aboard a shrimp trawler.



The BCF Biological Laboratory, Galveston, established in 1950, is today the center of Federal research on Gulf of Mexico shrimp

shrimp crops; develop methods for rearing shrimp commercially; understand the physiological requirements of larval, juvenile, and adult shrimp; evaluate natural and altered shrimp nursery grounds in estuaries; and determine the oceanographic and bottom factors that affect the survival of shrimp. Eggs of the commercially important brown, white, and pink shrimp have been successfully hatched at the Galveston Laboratory and thousands of young reared through the larval stages. Although the initial purpose for rearing shrimp was to identify the young, the techniques that are being developed can be applied toward commercial shrimp farming in the United States.

From studies on the early life history of penaeid shrimp in the northwestern Gulf of Mexico and off Florida, information has been obtained on the abun-



stocks, landings of which, in 1967, were worth more than \$100 million to the fisherman.

dance and on the seasonal, areal, and vertical distributions of planktonic stage shrimp.

The abundance of the very young stages of brown shrimp has been measured and used to predict the magnitude of the population of commercial-size brown shrimp.

The most profitable marketing size for pink shrimp was established from growth and mortality estimates obtained by mark-recapture experiments.

Studies of estuaries have shown that the edges and grass beds of bays and lagoons are important as nursery areas for many commercial species of fish and shellfish. Specific studies have shown how alteration or destruction of nursery areas by bulkheading destroys the value of the estuary as a habitat for the commercially important shrimp.

Oceanographic surveys of the Gulf of Mexico have furnished important information on currents, circulation, temperature, salinity, plankton, and bottom sediments, all of which affect directly or indirectly the spawning and distribution of shrimp and finfishes. In cooperation with the National Aeronautics and Space Administration, the Navy, and the Geological Survey, BCF is studying how spacecraft oceanography may be applied to commercial fisheries. With such advanced techniques, it may be possible to detect oceanic phenomena that concentrate fishes and to pinpoint the location of fish schools for the benefit of the commercial fishing fleets.

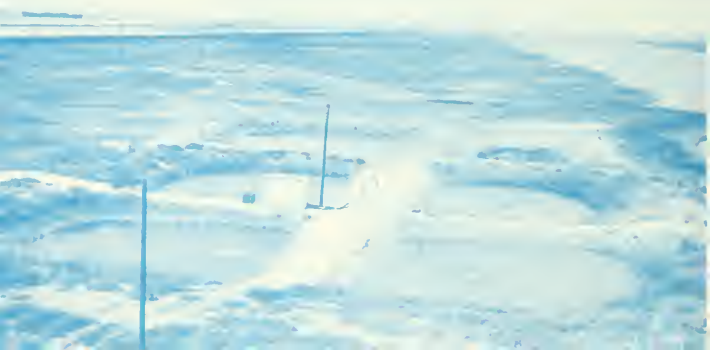
Laboratory and office space are available for a limited number of visiting scientists. Arrangements for space should be made by writing to the Laboratory director.



Biologists raised white shrimp in experimental ponds from about $\frac{1}{2}$ inch in total length to about $4\frac{1}{2}$ inches in 5 weeks. When placed in the pond, the shrimp were so tiny that more than 43,000 were needed to weigh 1 pound. They grew so rapidly that in 5 weeks it took only 79 shrimp to weigh 1 pound. These shrimp had been reared through the larval stages from eggs spawned and hatched in the BCF Biological Laboratory, Galveston.



Sampling shrimp with specially designed net in one of many tidal marshlands or nursery grounds along the Texas coast provides marine biologist with valuable information.





A shrimp trawler used by fishermen to exploit stocks of white, brown, and pink shrimp in the Gulf of Mexico. This vessel was chartered to assist biologists in their research on shrimp.

SOMETHING ABOUT BCF

The Bureau was first known as the United States Fish Commission and functioned as an independent agency from 1871 to 1903. In 1903, it was placed in the newly established Department of Commerce and Labor and was renamed the Bureau of Fisheries. In 1913, the Department of Labor was separated from Commerce, and the Bureau of Fisheries remained in the Department of Commerce until 1939. At that time the Bureau of Fisheries and the Department of Agriculture's Bureau of Biological Survey were transferred to the Department of the Interior. A year later, on June 30, 1940, the two Bureaus were merged to form the Fish and Wildlife Service. The Fish and Wildlife Act of 1956 created the Bureau of Commercial Fisheries and the Bureau of Sport Fisheries and Wildlife. BCF has six regional offices and one area office; the headquarters office is in Washington, D.C.

Ponds in which biologists at the BCF Biological Laboratory, Galveston, are experimenting to determine the feasibility of farming shrimp.

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The Department works to assure the wisest choice in managing all our resources so each will make its full contribution to a better United States—now and in the future.

Washington, D.C.
November 1968

