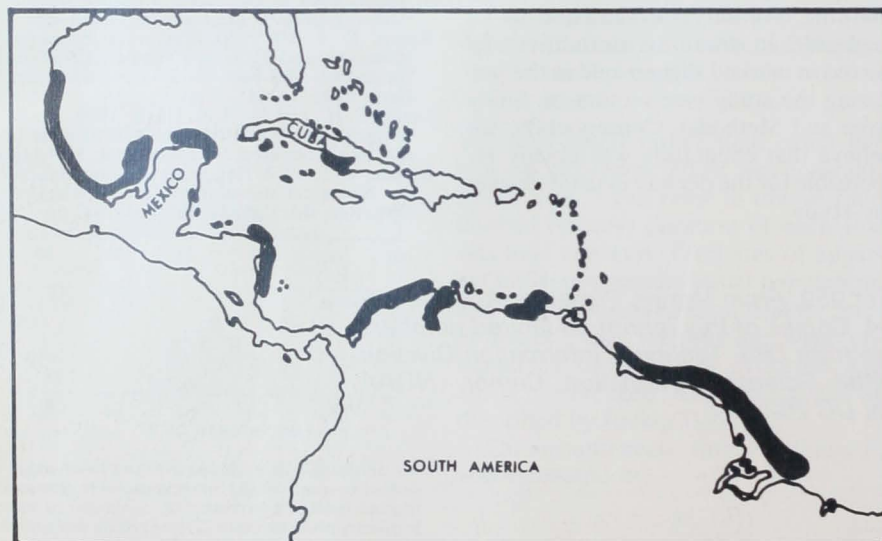


The NMFS laboratory in Miami is engaged in studies of the shrimp fisheries off Mexico, in the Caribbean, and off South America.

Shrimp Research Program at Southeast Fisheries Center

Shrimp research at the Southeast Fisheries Center, Miami, concerns shrimp stocks off foreign coasts. The United States has important distant-water shrimp fisheries in the Gulf of Mexico off Mexico, in the Caribbean Sea, and off the northeast coast of South America (Figure 1). In 1970 landings by U.S. boats from these fisheries were approximately 30 million pounds (heads-off weight). The U.S. vessels operating in these waters are based either in foreign ports close to the fishing grounds or in U.S. domestic ports, depending on the distance of the fishing grounds from the continental United States. In the late 1940's and 1950's the U.S. shrimp industry and NMFS were instrumental in establishing and devel-

Figure 1.—Important shrimp fishing grounds in the Gulf of Mexico (south of the continental United States), in the Caribbean Sea, and off the northeastern coast of South America. Shrimp stocks on these grounds, some of which are fished by U.S. flag vessels, are under study at the Southeast Fisheries Center.



oping these fisheries that now are participated in by fishermen of a number of countries.

The Center's research program assembles and analyzes biological and statistical data on these fisheries, makes projections of their future prospects, and provides the information necessary to protect U.S. fishing rights and U.S. interests in conservation and management of the resources.

The Guianas shrimp fishery off the northeast coast of South America began in 1959. At present about 200 U.S. flag shrimp trawlers and also trawlers of Trinidad and Tobago, Guyana, Brazil, Japan, and Korea fish in coastal waters between Brazil and Guyana. These trawlers are modern in design and many of them are fitted with mechanical refrigeration for preservation of the catch and constructed of steel or fiberglass to reduce maintenance costs and prolong their life in tropical waters. In May 1972 the United States and Brazil signed an

The figure shows a 'SHRIMP LOG BOOK' form. At the top is a map of the fishing area with labels for 'WEST GROUND', 'MIDDLE GROUND', 'EAST GROUND', 'WEST GULLIES', and 'EAST GULLIES'. Below the map are fields for 'VESSEL NAME', 'CAPTAIN', 'DEPART FROM', 'DATE', 'LANDED AT', 'DATE', 'NET SIZE', 'LENGTH OF HEADLINE IN FEET', and 'CAPTAIN'S NAME'. Below these fields is a table with columns for 'DATE', 'FISHING AREA', 'FISHING TIME', 'VESSEL', 'SPECIES', 'WEIGHT', 'LENGTH', and 'REMARKS'. The table has several rows for data entry.

Figure 2.—Record form used by U.S. vessels.

Agreement covering the operations of U.S. and Brazilian flag vessels in a specified area off Brazil during the period 1972-1973. As part of the Agreement, U.S. vessels keep logbook records of their catch and effort in the area. Figure 2 shows the record form that is used by U.S. vessels. On a voluntary basis, these vessels also record the same information for other parts of the fishing grounds. The Center's scientific staff processes and analyzes these data by computer techniques. The data have been submitted since July 1972 and form the nucleus of a shrimp fishery data bank which will provide information on the seasonal and areal variations in catch and effort, the structure of the stocks, and the expected yield from the fishery.

The Center's research vessel *Oregon II* was assigned in June-July 1972 to collect information on the species composition of the shrimp in the Guianas fishery. Three species of grooved shrimp (the southern pink shrimp, the southern brown shrimp, and the spotted pink shrimp), make up the majority of the commercial catch, but the percentage composition of the catch by species and the differences in distribution between the three species were unknown. Data collected on the cruise showed that, in the area surveyed, the southern brown shrimp and the spotted pink shrimp were more abundant than the southern pink shrimp and, furthermore, that the distribution patterns of the three species were different. This information is expected to be useful in interpreting the logbook data submitted by the fishermen, since a necessary requisite of management is that the catch of each species be estimated separately.

The U.S. shrimp fishery in the Gulf of Mexico off the coast of Mexico began in 1945. The fishery reached a peak in the early 1950's, when about 25 million pounds were caught. Since that time, the U.S. fishery has declined (to 9 million pounds in 1970) because of economic and industry problems and an unexplained decline in the Campeche shrimp population in the middle 1960's. Fishing by Mexican and more recently by Cuban vessels has increased. The U.S. shrimp fishery off Mexico can be

divided into: the brown shrimp fishery off the east coast of Mexico west of longitude 94°W, the pink shrimp fishery in the Campeche area, and the spotted pink shrimp and rock shrimp fishery in the Yucatan (Contoy) area. Work at the Center includes summarizing the extensive statistical data collected for the U.S. fishery since 1956 and using these data and other information about the stocks to determine the available yield and the best means to harvest the resource.

Since these distant-water shrimp fisheries are participated in by foreign as well as by U.S. fleets, international cooperation is essential to collect and analyze the total data for each fishery. The Center participates in the fisheries program of CICAR (Cooperative Investigations in the Caribbean and Adjacent Regions) which currently has under review the shrimp fisheries in this geographical area.

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Distribution of Commercial Shrimp off the Northeastern Coast of South America

ROBERT C. CUMMINS, JR., and ALBERT C. JONES

The shrimp fishing grounds off the coasts of Guyana, Surinam, and French Guiana were surveyed by the RV *Oregon II* of the Southeast Fisheries Center in June and July 1972 to determine the species distribution of shrimp available to the commercial fishery. The survey was conducted along 14 transect lines approximately 30 miles apart, from Georgetown, Guyana to Cabo Orange, Brazil. A total of 67 fishing stations was occupied along the transects, generally at 5-fathom intervals between 15 and 35 fathoms (Figure 1). At each station double-rigged, standard 40-foot, 4-seam flat trawls fabricated with 2-inch stretched mesh nylon netting and 1 3/4-inch mesh cod ends were used. Water temperatures and surface and bottom

Robert C. Cummins, Jr., and Albert C. Jones are with the NMFS Southeast Fisheries Center, Brunswick, Ga. and Miami, Fla. This paper is Contribution No. 226, NMFS Southeast Fisheries Center, Miami, Fla. 33149.

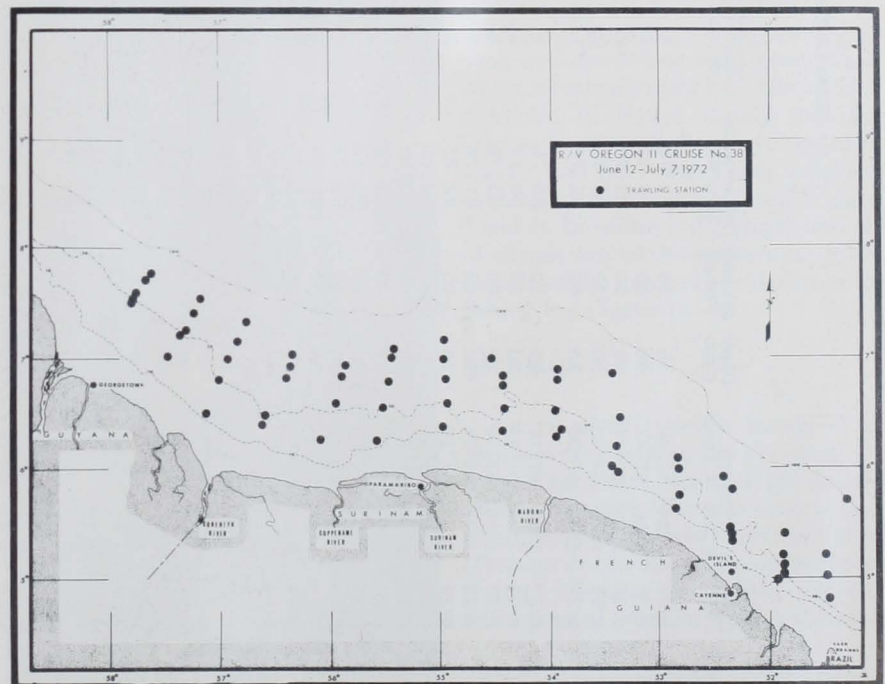


Figure 1.—Trawling stations occupied on RV *Oregon II* cruise 38. Positions, depths, and water temperatures at the stations and a summary of the catches are given in the fishing log (Table 1).