Office distributed
12.16.47

Carson - Int. 4236

DEPARTMENT OF THE INTERIOR

INFORMATION SERVICE

FISH AND WILDLIFE SERVICE

For Release SUNDAY, DECEMBER 21, 1947

SCIENTISTS' FINDINGS ON FLORIDA RED TIDE REPORTED

A report on an emergency survey of the recent "red tide" invasion of the Gulf Coast of Florida was submitted today to Albert M. Day, Director of the Fish and Wildlife Service, by the Service's chief shellfish biologist, Dr. Paul S. Galtsoff, who directed the scientific survey.

In addition to recommending research to discover whether such marine plagues can be predicted and controlled in the future, the report explained the 1946-47 red tide as follows:

The Florida red tide was caused by the appearance in nearby coastal waters of extraordinary numbers of a microscopic sea creature, known to scientists as Gymnodinium.

Although individually so small as to be invisible to the human eye, the concentration of billions of Gymnodinium caused the sea water to take on a reddish or amber color because of the pigment granules contained within each organism.

The mass destruction of fish and certain other aquatic animals which accompanied the red tide was caused by a deadly toxin, the chemical composition of which is still unknown, which Gymnodinium liberated into the water. Normally, Gymnodinium is not abundant enough for this poison to produce any harmful effects.

Poisons given off by the red tide organism were also carried inland, causing extreme discomfort among the human population of the area. The poisons were carried in tiny droplets of wind-borne spray, liberated by wave action from red-water areas. This "gas" -- more correctly termed an aerosol -- is so irritating to human mucous membranes that whole communities developed symptoms like those of a severe cold during the height of the red tide invasion.

The report submitted to Director Day summarizes investigations conducted by the Service and several cooperating institutions in Florida during the past summer, at the peak of the red tide outbreak. Scientists from the Woods Hole Oceanographic Institution, the Scripps Institute of Oceanography, the United States Food and Drug Administration, and the University of Miami, cooperated with the Service in studying the red tide.

Chemical analysis of water samples from the red tide areas revealed a significant fact -- the total phosphorus content was "five to ten times as high as ever

encountered in uncontaminated ocean water." Gymnodinium and related simple forms of marine life are unable to survive, grow, and reproduce without certain chemicals, including phosphorus. Since phosphorus ordinarily is present in very limited quantities in the ocean, it is believed that the unusually high phosphorus concentrations occurring in the Gulf last year might have been responsible for the rapid and uncontrolled multiplication of Gymnodinium.

Although more extensive studies are needed to determine the source of this unusual quality of phosphorus, Dr. Galtsoff made the following comment: "It may have come from the greater depths of the Gulf of Mexico or had its origin in the rich phosphate deposits which are extensively mined in Florida. If the latter is the case, the manner in which the phosphate salts reach the sea should be determined and if possible controlled."

The report emphatically discounts the theory widely held in Florida that the red tide and its accompanying disturbances were caused by chemicals from munitions allegedly dumped in coastal waters. One important objection to this theory according to Dr. Galtsoff, is the fact that the minute, drifting marine life collectively known as "plankton" -- the members of which are delicate and extremely susceptible to chemicals -- was normally abundant in the red tide areas. Had there been chemical pollution, Dr. Galtsoff said, the waters would have been largely barren of plankton.

Another argument against the munitions theory is the fact that last year's red tide was probably the ninth to occur in Florida, earlier plagues of discolored water and dead fish having occurred in 1844, 1854, 1878, 1880, 1882, 1883, 1908, and 1916. Published accounts of the 1916 occurrence are similar in practically all details to the red tide of 1947, even including the production of irritating gas.

Last year's occurrence was first noticed in November, 1946, when fishermen operating along the Gulf coast of southern Florida reported a large number of dead and dying fish floating about 10 to 14 miles offshore, in patches of discolored ocean water. By late January, 1947, millions of fish had died all along the coast from Naples north to Sarasota, the mortality occurring always in areas where the water had turned red or brown.

After a brief respite during the spring months, the red tide reappeared in the same general areas in July, this time extending beyond Clearwater and again causing extensive destruction of marine life. By early September the shore communities appealed in desperation for federal aid in cleaning up the accumulation of dead fish on the beaches. The mid-September hurricane, however, apparently scattered the masses of red water so thoroughly that no traces of it have been seen since that time.

Estimates place the destruction of valuable food and game fishes at several hundred million pounds. Attendant economic losses, including interruption of sport and commercial fishing and damage done to resort centers reached a large, but unknown figure.

Practically all species of fish, including such large forms as tarpon and jewfish, were included in the victims of the red water. Most oysters in affected areas died. Horseshoe crabs died by the thousand, while the true crab apparently was unharmed. Sponges showed no ill effects, although the principal sponge beds were outside the red tide areas. Reports that gulls died from feeding on dead fish were not confirmed by scientific observers.

Gymnodinium, the red tide organism that afflicted the Gulf coast of Florida intermittently from November, 1946 to September, 1947, has a long history as a marine trouble maker. This organism and a number of closely related forms have been responsible for "red tides" in various parts of the world for many years. Such phenomena, usually accompanied by widespread destruction of fish, oysters, or other aquatic animals, have occurred in Australia, Peru, Japan, India, California, Rhode Island, Oregon, Washington and in Florida. Probably the first described by a scientific observer occurred off the coast of Chile in 1832, and was recorded by the naturalist Charles Darwin in his account of the voyage of H. M. S. Beagle. Certain permanently discolored bodies of water, like the Red Sea or the Lake of Blood in Sicily, owe their unusual hue to the presence of astronomical numbers of minute plant or animal life. Depending upon the species responsible, "red tide" may or may not be accompanied by the production of toxins dangerous to aquatic life.

Despite the fact that red tides have been occurring in many parts of the world at least for the past century, scientific studies of such marine phenomena have been largely descriptive. A comprehensive program of research which would attack the basic problem of why red tides occur and whether man can predict and control them should now be undertaken, Dr. Galtsoff recommended.

Such a survey should include a study of seasonal changes in the physical and chemical conditions in the Gulf of Mexico, the path of water currents, the cycles of phosphates and other salts, and the nutritional requirements of Gymnodinium and related forms, according to Dr. Galtsoff.

x x x