

OYSTER INVESTIGATION
Quarterly Report

From: January, 1953
To: April, 1953
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The purpose*of this investigation is to develop a management program for the oyster resources in Galveston Bay. Most of the time has been devoted to a survey of the major oyster reefs to determine their condition and extent. Information on the spawning and setting of the oyster has been gathered although no intensive work has, as yet, been done. The distribution of the parasite, *Dermocystidium marinum*, has been studied with the aid of Mr. Sammy Ray of Rice Institute.

Other data has been gathered as an aid in understanding some of the physical, chemical and biological conditions under which the oyster must live. Stations have been established for the collection of water samples and analyses of salinity, turbidity, pH and temperature are made. Plankton samples have been collected to determine the relative abundance and variety of the plankton populations in different bay areas. They also indicate the occurrence and distribution of the oyster larvae. Water current studies have been made by use of drift cards but the results have not been satisfactory.

The most important project at the present time is the survey of the live oyster reefs. The survey has been confined to Red Fish Bar, and more specifically, to that portion of the Bar lying between San Leon and the Houston Ship Channel. This area is known locally as Todd's Dump and has been one of the most productive reefs in the bay.

Three cross-sectional sampling runs have been completed and a fourth started. Approximately 60 acres have been covered by sampling but a large portion remains. Since the data obtained so far can not be considered representative of the reef as a whole, no attempt will be made to discuss it. However, some general observations may be reported at this time.

During the quarter, the oysters have shown good, though not remarkable, shell growth. This growth was first observed early in December but was most apparent in January and February. Oysters were in their best condition from late December to March. Oyster boats worked the reef (Todd's Dump) the entire season beginning in September. Since the deep water portions of the reef had been worked extensively during the past season, the boats were forced to work in the shallower waters. Although they benefited the reef to some extent by breaking up the oyster clumps and spreading them over a larger area, continued dredging will do harm. Therefore this reef should be closed for the next season. All reefs in the bay will have to be watched closely next season to prevent damage from dredging.

Fouling has been moderate over the area sampled with bryozoans and barnacles being the predominant fouling organisms. A heavy set of barnacles was noted in January with small barnacles covering most of the clean shell. Since the barnacles apparently have peak setting periods which precede the setting periods of the

oyster spat, they decrease the amount of surface area available for the attachment of the oyster spat. Observations made during the spawning period last year revealed a light spatfall which was at least partly due to lack of suitable cultch. In order to increase the spatfall it will be necessary to supply cultch during the peak setting period. At the present time the shell accumulated at the shucking houses is not returned to the water. This shell would be the cheapest and most suitable cultch to use.

Observations on the gonadal development of the oysters were begun in March. During the middle of March less than 10 % of the oysters were actually "milky" although about half showed slight development of the gonads. Water temperatures at the time were between 17 and 19 degrees Centigrade. At the end of March water temperatures were above 20 degrees Centigrade. Oystermen said that "milky" oysters were found in the shallow waters but none were present on the deep water reefs. No mass spawning activities had taken place but the temperatures were gradually approaching 25 degrees C., the critical point.

Apparently some spawning took place early in February. Plankton samples taken in the upper part of the bay contained a number of straight hinge oyster larvae and one "milky" oyster was found in Clear Lake. This spawning took place during a period of warm weather when the water temperatures reached 19 degrees C. Warm weather lasted for about a week and thereafter was a general warming trend again until the middle of March.

Spawning and setting will be given more attention during the second quarter and observations will be made on more reefs. The survey of Todd's Dump will be continued and perhaps completed. Condition factor analyses will be made when the equipment has been collected.

INTRODUCTION

The purpose of this investigation is to formulate a program for the management of the oyster resources in Galveston Bay. The first step in the program, a survey of the condition and extent of the live oyster reefs is now in progress.

AREA WORKED

All projects have been confined to Galveston Bay proper, exclusive of East and West Bays. Most work has been concentrated on Todd's Dump, the oyster reef lying off San Leon.

ACTIVITIES

Adverse weather curtailed field activities to a large extent. The survey of Todd's Dump was continued with the third cross-section being completed and the fourth marked off. Water and plankton samples were taken whenever time permitted. Spat collectors were prepared for the coming spawning season and oysters were examined to determine the gonadal development. Assistance was given Mr. Sammy Ray in collecting oysters for the study of the parasite, *Dermosystidium marinum*. Plankton samples remaining from previous collections were examined and counts made of the organisms collected. Data accumulated was organized and analysed as an aid in planning future work.

BIOLOGICAL DATA ACCUMULATED

1. Oyster reef survey

The data which has been obtained so far will not be presented until the entire reef may be discussed as a unit. A large portion of the reef remains to be sampled. However, some general remarks may be made at this time.

Good to excellent shell growth was noted among the oysters sampled. This was especially true in January and the early part of February. Fouling has not been excessive although a heavy set of barnacles was noted in some regions of the reef. Since the barnacles set before general spawning activities begin among the oysters, much space is taken that might otherwise provide suitable cultch for the oyster spat. Thus any improvement program for the oyster reefs must include the provision of clean shell at the peak of the oyster setting period to provide cultch for as many of the spat as possible. In this manner the number of fouling organisms that compete for space with the oysters would be kept at a minimum.

2. Oyster spawning

No mass spawning has taken place although water temperatures were gradually approaching 25 degrees C. by the end of March. During the middle of March less than 10 percent of the oysters examined were "milky" although about half showed a slight development of the gonads. Oystermen stated that there were no milky oysters on the reefs in the deeper waters although shallow water reefs contained "milky" oysters near the end of March.

Apparently, some spawning took place early in February. Plankton samples taken in the upper part of the bay revealed a number of straight hinge oyster larvae. One milky oyster was found in Clear Lake on February 13. This occurred during and shortly after a period of warm weather when water temperatures reached 17 - 19 degrees C. Colder weather returned and no general warmup took place again until the middle of March.

3. Plankton

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Poor weather and lack of time prevented adequate sampling during this quarters. However, all stations were visited and quantitative samples obtained by use of a Clarke-Bumpus sampler.

The number and variety of diatoms increased at all stations and only slight differences were noted among stations. Species of *Coscinodiscus*, *Biddulphia* and *Rhizosolenia* were most abundant in that order. Other diatoms made up small percentages of the total diatom population.

Copepods, copepod larvae and barnacle nauplius larvae composed the largest percentage of the zooplankton. Rotifers were very abundant at most stations although they had never been taken in samples collected at other times of the year. Pelecypod and gastropod larvae were common.

In general, ~~the largest amount of plankton~~ the bay waters were more productive of plankton during this quarter than at any other time. This is especially true of the waters in the upper part of the bay where plankton production has generally been poor.

SUMMARY

1. The oyster reef survey has been continued at Todd's Dump. The data is not complete enough to allow presentation at this time.
2. No mass spawning of oysters took place although water temperatures were gradually approaching the critical point at the end of March. Unusually warm weather in February caused some spawning to take place but few milky oysters were found.
3. Plankton increased in variety and abundance at all stations during the quarter. Little difference could be noted between the samples collected at different areas in the bay.

UTILIZATION OF TIME

	Biologist Hrs	Crew Hrs
Field work	98	88
Laboratory work	310	
Reports and Correspondence	35	
Travel	24	
Sick leave and holidays	50	
Miscellaneous (Meetings, interviews) .	15	
Total	532	88

Note - Crew hours include only the time actually spent in operating the boat and does not include time spent in maintenance of boat, equipment, etc.