

WATERBOTTOMS

Louisiana Oyster Task Force
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Oyster Farming Advisory: Dermo Disease Occurrence on State Seed Grounds

John Supan, Ph.D.
Louisiana Sea Grant College Program

by

Tom Soniat, Ph.D.
University of New Orleans

This Dermo disease advisory is a service for Louisiana oyster farmers. It is an attempt to help farmers predict and prevent oyster losses or mortality that have been occurring on their private leases by having a better understanding of the disease, the current infection levels of the state public grounds and how manage around it.

What is Dermo?

Dermo disease was first identified in the late-1940s as the cause of high oyster mortalities in Louisiana and other Gulf states. It is a microscopic parasite growing within the oyster, robbing it of energy and nutrients and may multiply enough to clog the oyster's blood pathways and destroy its tissues, eventually causing death. The disease name is a shortened version of the parasite's old scientific name, *Dermocystidium marinum*, now called *Perkinsus marinus*. Dermo causes oyster mortalities from the western Gulf of Mexico to Long Island Sound on the east coast of the U.S. It is so abundant in oyster growing areas along the Gulf that a survey of 49 sites from Florida to Texas found only one site with a prevalence (infection level) of less than 50%.

Its life cycle is somewhat complex, going through different stages. Infective stages are circulated in the water and are taken up during oyster feeding, so it is very contagious. Many infections are started by parasites being released into the water from decaying dead oysters. Infections usually first occur in the lining of the oysters' stomach or intestine. Once infection occurs, the parasite can rapidly multiply, depending on seawater temperature and salinity.

In the Gulf and Southeast regions, temperatures are likely never low enough to eliminate the parasite, so new infections probably occur whenever oysters are feeding. Both the percent prevalence and intensity are usually low from January through April and highest from August through November. Mortalities are greatest from July through November. However, parasite levels can decline as water temperatures decrease in the fall, although they can increase again with rising summer water temperatures causing oyster mortalities the following summer.

Infection rates and intensity depend on oyster age as well. Young oysters usually have lower infections than older oysters because they filter smaller volumes and, therefore, are less likely to filter out the parasite from the water. Oysters two years old or older, growing in high salinity waters, are more likely to die from Dermo than are small oysters at the same salinity.

Water temperature and salinity have the most effect on infections. Dermo rapidly spreads and kills oysters at water temperatures greater than 77° F. The disease is lower in lower salinity, especially below 8-9 parts per thousand (ppt) (open Gulf water is 30-36 ppt), and greater than 12 ppt is usually considered necessary for increasing disease levels. Low infections in low salinity usually are produced during periodic freshwater flooding that kills the oysters, with oysters recurring before the parasite. Long-term monitoring in the Gulf region shows that multi-year climatic cycles are associated with cycles of Dermo. The La Niña phase with its higher temperatures and salinities favors the parasite, whereas the El Niño phase with its lower temperatures and salinities favors the oyster. Low salinity combined with low temperature reduces infection intensity more than either factor alone.

Infected oysters often have slower growth and lower meat yields than uninfected oysters because their weakened condition. The difference can be 20% in the winter and up to 50% in the summer. The oyster's muscle strength is also weakened, leaving oysters with high infection levels prone to gape when removed from the water, possibly explaining problems the industry sometimes has with box oysters during late-summer. Reduced growth, lower meat yield, and gaping are all a result of the parasite out-competing the oyster for stored nutrients.

To test for Dermo, oyster rectal or other tissues are incubated in a test tube of special broth for about a week, during which time the parasites' cells enlarge. The oyster tissue is then removed, blotted dry, and stained. The parasitic cells are visible as blue-black spheres when viewed with a microscope and the sample is given a rating from 0 (no infection) to 5 (heavy). Tissue samples with infection ratings of 4 and 5 may appear black to the naked eye due to high parasite numbers. Dermo results are then given in two forms, the percent prevalence (the percentage of oysters tested that were infected) and the weighted incidence or infection level (the average of all the individual oyster ratings). During Dermo epidemics or epizootics, about 90% of the dead or dying oysters are parasitized and some have advanced infections with individual ratings of 4 or 5. When a population of oysters has an average infection level greater than 1, oyster mortalities are likely to occur.

Below are Dermo levels of seed and sack oysters collected at Louisiana Department of Wildlife and Fisheries public oyster ground monitoring sites. These data are also available online at www.oystersentinel.org. The web site includes data from Florida and Texas as well. Monitoring Dermo in those states provides an early warning system for Louisiana, since Dermo appears earlier and persists longer there. Keep these Dermo levels in mind when bedding oysters this season and see how they survive on your leases next spring and summer. Dermo is very contagious among oysters and it is important to avoid moving infected seed oysters to uninfected areas. Take note of rising water temperatures and salinities and oyster mortalities over and on the leases during the spring and summer months and consider harvesting before severe oyster losses. Or, bed your oysters and pray for cool, wet weather, but not too wet.



2009 DERMO RESULTS EAST OF RIVER & HACKBERRY BAY

	Seed		Market	
	Weighted Prevalance	Incidence	Weighted Prevalence	Incidence
Bay Gardene	73%	0.4	93%	0.5
Lonesome I.	53%	0.4	80%	0.4
Mozambique Pt.	60%	0.6	92%	0.5
N. Black Bay	20%	0.1	53%	0.3
S. Black Bay	93%	0.5	100%	0.5
Bay Crabe	73%	0.4	93%	1.0
Telegraph Pt.	80%	0.4	100%	0.8
Grand Pass	60%	0.3	100%	1.2
Three Mile	96%	0.4	93%	0.5
Hackberry Bay	60%	0.3	47%	0.2

West of the Mississippi River

Station	Date col- lected	Salinity (ppt)	Tempera- ture (°C)	Oyster size range(mm)	Prevalence	Weighted incidence
Rat Bayou	7/1/09	17.5	29.4	93-110	0%	0.00
Buckskin Bayou	7/1/09	6.3	31.0	75-105	0%	0.00
Grand Pass	7/1/09	16.0	31.1	81-100	0%	0.00
Old Camp	7/1/09	11.7	31.4	85-120	10%	0.03
Indian Point	7/8/09	28.3	29.9	55-71	0%	0.00
South Point	7/8/09	28.9	29.3	40-59	0%	0.00
Lake Chien	7/2/09	16.4	32.1	80-92	40%	0.20
Lake Felic- ity	7/2/09	15.8	31.4	82-106	10%	0.03
West Cove	7/13/09	22.0	31.5	78-114	80%	0.50
Mid Lake	7/13/09	23.9	31.3	77-117	70%	0.57

MOSTLY FROM: S. E. FORD AND M. R. TRIPP, 1996. CHAPTER 17. DISEASES AND DEFENSE MECHANISMS. IN. THE EASTERN OYSTER CRASSOSTREA VIRGINICA. V. KENNEDY, R. NEWELL AND A. EBLE (EDITORS). MARYLAND SEA GRANT PROGRAM, COLLEGE PARK, MD. PAGES 581-642.

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Louisiana Sea Grant Law & Policy Program Provides Memo Concerning Oyster Leases in Wildlife Management Area.

The Oyster Task Force (OTF) recently contacted the Louisiana Sea Grant Law and Policy Program (LSGLPP) requesting a memorandum concerning legal issues pertaining to the Biloxi Wildlife Management Area (WMA) and other areas in the state where oyster farming is prevalent. The Biloxi Marsh Lands Corporation currently leases the Biloxi WMA to the State; however, the lease expires, after 25 years, in January 2012, and there is no mention in the document as to whether or not the lease will be renewed. The OTF's concerns pertained to oyster leases granted by the State within the boundaries of the 39,583-acre WMA. At some point between 1996 and 2004, the Department of Wildlife and Fisheries internally adopted a policy, which prevented them from renewing oyster leases within the State's WMAs.¹ At least one of the leases in the Biloxi WMA has reached its 15 year term and been denied renewal by the State. The Oyster Task Force suspects that the Biloxi Marsh Lands Corporation has been granting permission to farm oysters on previously leased water bottoms to persons without a State-issued oyster lease.

Essentially, the OTF wanted to know who (if anyone) had the right to harvest oysters in the Biloxi WMA, which requires determining whether the water bottoms in question belong to the State or to private parties. The State of Louisiana owns those water bottoms that lie below the beds of some natural navigable waterways and the beds and banks of others; however if the water bottom is below a non-navigable waterway, it may be susceptible to private ownership.² In order for a water body to be classified as "navigable," the facts must show that, in its natural state, it is suitable in width, depth, and location for commerce.³ The State also owns the territorial sea and the seashore. Therefore if the water bottoms in question were determined to be below a navigable water body, an arm of the sea, or the seashore, then the State would be the owner.⁴ If the State owns the water bottoms in question then a private entity would not have the legal capability to lease portions to oyster farmers.

The water bottoms in the Biloxi WMA have not yet been officially classified concerning their navigability or ownership. However, the State, through the Department of Wildlife and Fisheries, believes that it owns all of the water bodies within the WMA. Biloxi Land Management Corporation has officially challenged the State's ownership with the State Land Office.⁵ Unfortunately, such questions can only be answered after one of the disagreeing parties alleges the navigability of the waterways in a formal legal proceeding, and then fails to fulfill or fulfills their burden of proof.⁶

~S. Beaux Jones- LA Sea Grant Law & Policy Program

1 This policy was not brought about by a change in the law, and the Department of Wildlife and Fisheries have given no official reason.

2 La. Civ. C. art. 450.

3 *State of Louisiana v. Two O'clock Bayou*, 365 So. 2d 1174, 1177. (La. App. 3 Cir.1978).

4 *Supra* note 2.

5 This is evidenced by the State GIS map listing the land as "Claimed by the State and Adjoining Land Owner- Enter at your own risk."

6 *Supra* note 3.

***Vibrio Vulnificus* and *Vibrio Parahaemolyticus* Management Strategies**

The Louisiana Molluscan Shellfish *Vibrio parahaemolyticus* (Vp) control plan was promulgated in 2008 by Louisiana Department of Health and Hospitals (DHH) in order to reduce the number of illnesses associated with Vp. The plan requires oysters harvested for the half-shell market must be refrigerated within 5 hours after harvest in the months of June through September. The Vp control plan is based on water temperatures exceeding an average of 81°F.

Vibrio vulnificus(Vv) plan was originally created in 2000 by Louisiana DHH. The plan included educating high risk consumers who are at most risk when consuming raw oysters. In May of 2010, the proposed Vv plan will require oysters being sold on the half-shell to be refrigerated within 2 hours after harvest in the months of May through September. The 2 hour time frame is based on the Vv risk calculator developed by the U.S. Food and Drug Administration.

As of today, DHH will continue to provide educational workshops and materials to the Louisiana medical community and high risk individuals regarding the risk associated with eating raw oysters. In order to manage the Vv plan, Louisiana DHH inspectors will board the harvesting vessels. At this time the inspector will check temperatures of the coolers and the internal meat temperatures of the oyster and document the temperatures on log sheets.

This information regarding the proposed Vv plan in reference to coolers and meat temperatures will be further discussed at the Interstate Shellfish Sanitation Conference in October of 2009.

2009 Oyster Legislation Summary:

Act 363 (House Bill [HB] 191) Rep. Dove- Provides relative to selection of a biologist by the Oyster Lease Damage Evaluation Board.

Act 417 (HB 390) Rep. Henderson- Authorizes the Department of Health and Hospitals to give licensed harvesters and certified dealers exemptions from the *Vibrio parahaemolyticus* and *Vibrio vulnificus* management programs in the National Shellfish Sanitation Program guidelines if the harvester or dealer has not been epidemiologically linked to one of the above oyster related illnesses.

Act 374 (HB 542)- Rep. LaBruzzo- Allows purchase of commercial licenses with credit cards and business checks.

Act 376 (HB 587)- Rep. Harrison - Provides an extension until December 31, 2009 to apply for an Oyster Seed Ground Vessel Permit. Act changes existing law by limiting the permit requirement to certain vessels by adding "for commercial purposes" to existing law: All oysters taken "for commercial purposes" from the public natural reefs or the oyster seed grounds or reservations, except those in Calcasieu Lake or Sabine Lake, shall be placed only on a vessel which has an oyster seed ground vessel permit. Act also changes the date requirement needed to receive an oyster seed ground permit. Current requirement: Person must show that they owned a vessel, or they purchase or constructed a vessel and licensed that vessel in Louisiana, between January 1, 2004 and May 1, 2009 and can demonstrate through trip ticket submissions that that vessel had oyster landings in Louisiana between January 1, 2004 and May 1, 2009. Also applies to persons who have a vessel under construction in Louisiana that was at least fifty percent complete on May 1, 2009.

2009 Oyster Stock Assessment Snapshot on the Public Oyster Areas

Tanya H. Williams and Patrick D. Banks
LDWF Office of Fisheries, Marine Fisheries Division

Statewide oyster stock size in 2009 has shown a marked decrease of 46.3% compared to 2008 as approximately 1,169,764 barrels of oysters are available on the public oyster areas of Louisiana this year. This decrease represents an approximate drop in total oyster availability of over 1 million barrels of oysters over 2008 levels and the lowest statewide oyster stock assessment since 1989. Seed stocks (oysters 1" to <3") dropped approximately 30% from 798,285 barrels in 2008 to 558,916 barrels in 2009. Market-size oysters (≥ 3 ") also suffered extensive decreases in availability, dropping over 51% in 2009 as compared to 2008 levels. Although nearly 1.4 million barrels of market-size oysters were available last year, levels have plunged to only 610,848 barrels in 2009.

There are a few bright spots this season, however. Seed oyster stocks on the primary public oyster seed grounds in the Black Bay area were at a 19-year low in 2008, but have rebounded slightly in 2009. This rebound is largely due to strong levels of oyster resources in Bay Gardene and on the 2007 cultch plant near Lonesome Island, two areas which were closed during the 2008/2009 oyster season. In addition, approximately 7,000 barrels of seed oysters were estimated to be available on the Barataria Bay Public Oyster Seed Ground in the lower Barataria basin near Queen Bess Island. Although at slightly lower levels than in 2008, Calcasieu Lake continues to hold a sizeable oyster resource and accounts for over 50% of the statewide market-size oyster stocks.

As most oyster fishermen can attest, a variety of factors affect the oyster stock size on the public grounds in any given year. Natural threats to oyster survival include extreme low salinities, predation, disease, as well as harvest and construction activities. Environmental events (i.e. hurricanes) can also impact oyster reproduction and survival by increasing sedimentation on reef habitat. The Louisiana Department of Wildlife & Fisheries Oyster Management division will continue to manage the oyster resource on public grounds by setting oyster seasons, monitoring harvest levels, and cultch planting.

2009- 2010 Public Oyster Season Dates (as set by the Wildlife and Fisheries Commission on August 6, 2009)

<u>Public Oyster Area</u>	<u>Season Dates</u>
East of Mississippi River	Sept. 9 – 23 (bedding only); Oct. 28 – Apr. 1
Little Lake	Sept. 9 – 23 (bedding only) Oct. 28 – Apr. 1
Hackberry Bay (2008 Cultch Plant)	Oct. 28 – Nov. 4 (Oct. 28 – Oct. 31)
Barataria Bay	Sept. 9 – 30 (bedding only)
Sister Lake	Oct. 28 – Nov. 13 (50 sack limit per day)
Vermillion/Atchafalaya Bays	Sept. 9 – Oct. 11 (bedding only); Oct. 12 – Apr. 30
Calcasieu Lake	Oct. 15 – Apr. 30 (15 sack limit per day)
Deep Lake, Lake Chien, Lake Tambour, Lake Felicity, Lake Mechant, Bay Junop, Sabine Lake, 2009 cultch plant in Three-Mile Bay, 2009 cultch plant in Black Bay, 2009 cultch plant in Calcasieu Lake, Sabine Lake, Special Closure area in Southwest Lake Fortuna	Closed

For more information, contact LDWF Oyster Management Program at 225-765-2370 or visit the web-site at: <http://www.wlf.louisiana.gov/news/?id=1468>

Oyster Task Force

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Restoration

Open, LA Depart. of Wildlife and Fisheries

Open, Cameron Oyster Fishermen

The Louisiana Oyster Task Force was developed by the 1988 Louisiana Legislature with a directive to strengthen the oyster industry. Responsibilities include: developing markets, representing industry in legal and legislative proceedings, and administering the oyster development fund as secured from oyster tag revenue.

Interstate Shellfish Sanitation Conference (ISSC)

ISSC 2009 Biennial Meeting, October 17-23,
2009

Radisson Hotel Manchester
Manchester, New Hampshire

For hotel reservations, call toll-free 800-333-
3333, or visit www.radisson.com/manchestern

To view the 2007 ISSC Call for Proposals Memo
or the Conference Registration Form, visit
www.issc.org/biennialmeeting.aspx

Louisiana Oyster Task Force
A Louisiana Seafood Board
2021 Lakeshore Drive, Suite 300
New Orleans, La 70122
www.louisianaoysters.org

