

2012 “Dermo” Report

Eastern Oyster (*Crassostrea virginica*) samples were collected from 30 sites along the North Carolina coast during 2012 for analysis of *Perkinsus marinus*, the protozoan responsible for “Dermo” disease in *C. virginica*, infection levels. Individual locations, along with environmental and infection data, are listed in Table 1. The mean statewide temperature and salinity, as calculated from data collected from all sample sites, were 26.5°C and 20.6‰. It should be noted that these values represent data collected only at the time of sampling, and therefore may not be representative of the entire year for the state as a whole.

During the 2012 year, 30 samples were collected and analyzed from the 30 collection sites. Oyster samples were gathered from coastal waters of North Carolina from Brunswick County to Dare County. Methods of collection were hand harvest, hand tongs, and oyster dredge. Samples were then shipped to DMF Morehead City for analysis. Oysters were opened, the meat condition graded (good, fair, or poor), and a section of the rectum removed. Using the process described by Ray (1952), the excised tissue was placed in a thioglycollate media for incubation. After 72 to 96 hours the tissue was removed from the media, stained with Lugoll’s solution, and read under a microscope at 40x magnification. A total of 5 fields of view were examined. Infection intensity was determined based on the following criteria:

- 0 visible *P. Marinus* cells per field = No infection
- 1 – 100 visible cells per field = Light infection
- 100’s of cells visible per field = Medium infection
- 1000’s of cells visible per field = Heavy Infection

The Weighted Incidence (WI) is a measure of the infection intensity for a given sample. To obtain the value for the WI, infected oysters are assigned values as follows:

$$\#L \times 1, \#M \times 3, \text{ and } \#H \times 5.$$

The following formula is then applied:

$$(L + M + H)/\#\text{oysters in sample} = \text{WI}.$$

The WI value is an indicator of the expected mortality at a given site. The following scale illustrates the significance of the WI value:

WI = 0.00 – 1.50	negligible mortality
1.51 – 2.50	moderate mortality
2.51 – 5.00	serious mortality

The mean statewide “Dermo” infection level calculated from the entire 2012 data set (fall sample dates) (Table 2) indicated that 35.4% of the sampled oysters had no infection, 47.7% had a Light Infection (L), 11.5% had a Moderate Infection (M), 5.4% a Heavy Infection (H). The average statewide Weighted Incidence (WI) was 1.07.

2012 DERMO Data for NC

WI= **0.00 - 1.50 = Negligible Mortality**
 1.51 - 2.50 = Moderate Mortality
 2.51 - 5.00 = Serious Mortality

Table 1

Page 1 of 6

Brunswick

SHALLOTTE RIVER	September 12 , 2012	25.30°C	30.30 PPT
	No Infection	20.00 %	6
	Low	43.33 %	13
	Medium	16.67 %	5
	High	20.00 %	6
35° 55.4360' 78° 22.2190'	# of Oysters sampled = 30		WI= 1.93

GALLOWAY FLATS	September 11 , 2012	25.90°C	26.30 PPT
	No Infection	27.59 %	8
	Low	51.72 %	15
	Medium	13.79 %	4
	High	6.90 %	2
35° 55.7870' 78° 13.1560'	# of Oysters sampled = 29		WI= 1.28

DUTCHMAN CREEK	September 11 , 2012	28.00°C	24.50 PPT
	No Infection	11.54 %	3
	Low	69.23 %	18
	Medium	15.38 %	4
	High	3.85 %	1
33° 55.7120' 78° 03.5730'	# of Oysters sampled = 26		WI= 1.17

WI Average for Brunswick 1.48

Table 1

Page 2 of 6

Carteret

SOUTH RIVER	09-015	<u>August 30 , 2012</u>		27.60°C	14.70 PPT	
		No Infection	23.33 %			7
		Low	53.33 %			16
		Medium	13.33 %			4
		High	10.00 %			3
34° 56.8590'	76° 34.4560'	# of Oysters sampled = 30		WI= 1.43		
NORTH BAY	10-009	<u>August 31 , 2012</u>		26.90°C	25.00 PPT	
		No Infection	31.03 %			9
		Low	37.93 %			11
		Medium	24.14 %			7
		High	6.90 %			2
35° 01.1400'	76° 19.7370'	# of Oysters sampled = 29		WI= 1.28		
NEWPORT RIVER	10-012	<u>August 31 , 2012</u>		27.00°C	26.50 PPT	
		No Infection	40.00 %			12
		Low	36.67 %			11
		Medium	10.00 %			3
		High	13.33 %			4
34° 46.3040'	76° 43.0380'	# of Oysters sampled = 30		WI= 1.33		
NORTH RIVER	10-013	<u>August 31 , 2012</u>		27.70°C	26.10 PPT	
		No Infection	63.33 %			19
		Low	36.67 %			11
34° 46.5390'	76° 36.3490'	# of Oysters sampled = 30		WI= 0.37		
LONG BAY	06-022	<u>August 30 , 2012</u>		27.70°C	19.50 PPT	
		No Infection	40.00 %			12
		Low	36.67 %			11
		Medium	20.00 %			6
		High	3.33 %			1
34° 57.9080'	76° 26.7740'	# of Oysters sampled = 30		WI= 1.13		

WI Average for Carteret 1.11

Table 1

Page 3 of 6

Dare

CEDAR BUSH BAY	95-995	<u>September 11 , 2012</u>		24.90°C	11.40 PPT	
		No Infection	27.59 %			8
		Low	51.72 %			15
		Medium	10.34 %			3
		High	10.34 %			3
35° 49.1540'	75° 39.0530'	# of Oysters sampled = 29		WI= 1.34		
CRAB HOLE		<u>September 11 , 2012</u>		24.20°C	10.90 PPT	
		No Infection	25.00 %			7
		Low	67.86 %			19
		Medium	7.14 %			2
		# of Oysters sampled = 28				WI= 0.83
CRAB HOLE		<u>September 10 , 2012</u>		24.20°C	10.90 PPT	
		No Infection	7.14 %			2
		Low	35.71 %			10
		Medium	42.86 %			12
		High	14.29 %			4
35° 43.2270'	78° 38.2320'	# of Oysters sampled = 28		WI= 2.36		
BROAD CREEK		<u>September 10 , 2012</u>		23.00°C	9.20 PPT	
		No Infection	10.34 %			3
		Low	72.41 %			21
		Medium	10.34 %			3
		High	6.90 %			2
35° 50.6750'	75° 37.0680'	# of Oysters sampled = 29		WI= 1.38		

WI Average for Dare 1.48

Table 1

Page 4 of 6

Hyde

CAFFEE BAY	08-006	September 5 , 2012	28.10°C	17.30 PPT
		No Infection 24.14 %		7
		Low 55.17 %		16
		Medium 13.79 %		4
		High 6.90 %		2
35° 21.9580'	76° 18.7820'	# of Oysters sampled =	29	WI= 1.27
OCRACOKE ISLAND	10-006	August 30 , 2012	26.90°C	25.00 PPT
		No Infection 51.72 %		15
		Low 44.83 %		13
		Medium 3.45 %		1
35° 07.6620'	75° 57.4700'	# of Oysters sampled =	29	WI= 0.55
CRAB SLOUGH		September 10 , 2012	22.20°C	30.80 PPT
		No Infection 50.00 %		15
		Low 40.00 %		12
		Medium 3.33 %		1
		High 6.67 %		2
35° 44.9650'	75° 34.3880'	# of Oysters sampled =	30	WI= 0.83
LONE TREE CREEK		September 11 , 2012	25.90°C	20.50 PPT
		No Infection 10.00 %		3
		Low 66.67 %		20
		Medium 6.67 %		2
		High 16.67 %		5
35° 23.7050'	76° 01.7530'	# of Oysters sampled =	30	WI= 1.70
ABEL BAY	99-174	September 5 , 2012	27.70°C	14.10 PPT
		No Infection 26.67 %		8
		Low 53.33 %		16
		Medium 16.67 %		5
		High 3.33 %		1
35° 29.6120'	76° 30.7220'	# of Oysters sampled =	30	WI= 1.20
PAMLICO RIVER		September 5 , 2012	28.00°C	15.10 PPT
		No Infection 27.59 %		8
		Low 65.52 %		19
		Medium 6.90 %		2
35° 20.4930'	76° 28.0370'	# of Oysters sampled =	29	WI= 0.83

WI Average for Hyde 1.07**New Hanover**

WRIGHTSVILLE CHANNEL		September 11 , 2012	24.40°C	29.50 PPT
		No Infection 50.00 %		14
		Low 42.86 %		12
		Medium 7.14 %		2
34° 12.1500'	77° 48.4110'	# of Oysters sampled =	28	WI= 0.60
FIGURE EIGHT ISLAND MA		September 11 , 2012	25.90°C	33.00 PPT
		No Infection 66.67 %		20
		Low 26.67 %		8
		Medium 3.33 %		1
		High 3.33 %		1
34° 16.2140'	77° 45.1290'	# of Oysters sampled =	30	WI= 0.53

WI Average for New Hanover 0.56

Table 1

Page 5 of 6

Onslow

COURTHOUSE BAY		September 12 , 2012	28.30°C	27.00 PPT
		No Infection	31.03 %	9
		Low	55.17 %	16
		Medium	13.79 %	4
34° 35.1570'	77° 22.5090'	# of Oysters sampled = 29		WI= 0.93
LITTLE CREEK		September 12 , 2012	25.10°C	13.20 PPT
		No Infection	73.33 %	22
		Low	26.67 %	8
34° 37.1340'	77° 23.1800'	# of Oysters sampled = 30		WI= 0.27
ALLIGATOR BAY		September 12 , 2012	24.60°C	23.70 PPT
	07-029	No Infection	53.57 %	15
		Low	32.14 %	9
		Medium	14.29 %	4
34° 30.0590'	77° 24.9610'	# of Oysters sampled = 28		WI= 0.70

WI Average for Onslow 0.63**Pamlico**

BONNER BAY		September 5 , 2012	29.40°C	16.00 PPT
	07-011	No Infection	57.14 %	16
		Low	35.71 %	10
		Medium	3.57 %	1
		High	3.57 %	1
35° 09.8380'	76° 35.1750'	# of Oysters sampled = 28		WI= 0.63
JONES BAY		September 5 , 2012	29.10°C	17.60 PPT
	09-007	No Infection	63.33 %	19
		Low	26.67 %	8
		Medium	10.00 %	3
35° 13.2020'	76° 30.7940'	# of Oysters sampled = 30		WI= 0.47
BIG PORPOISE BAY		September 5 , 2012	28.80°C	13.80 PPT
	02-253	No Infection	16.67 %	5
		Low	70.00 %	21
		Medium	13.33 %	4
35° 16.0180'	76° 28.9110'	# of Oysters sampled = 30		WI= 1.10
ROCK HOLE BAY		September 5 , 2012	29.10°C	17.60 PPT
	04-021	No Infection	10.00 %	3
		Low	73.33 %	22
		Medium	13.33 %	4
		High	3.33 %	1
35° 11.5910'	76° 32.7190'	# of Oysters sampled = 30		WI= 1.30
MIDDLE PRONG		September 5 , 2012	25.90°C	13.70 PPT
	08-009	No Infection	27.59 %	8
		Low	44.83 %	13
		Medium	13.79 %	4
		High	13.79 %	4
35° 18.2230'	76° 31.7410'	# of Oysters sampled = 29		WI= 1.55

WI Average for Pamlico 1.01

Table 1

Page 6 of 6

Pender

VIRGINIA CREEK		September 11 , 2012	25.70°C	27.10 PPT
		No Infection	67.86 %	19
		Low	28.57 %	8
		Medium	3.57 %	1
35° 25.0400'	77° 35.5540'	# of Oysters sampled =		28 WI= 0.37
SEASIDE AREAS		September 11 , 2012	26.50°C	27.60 PPT
		No Infection	26.67 %	8
		Low	50.00 %	15
		Medium	16.67 %	5
		High	6.67 %	2
35° 25.8330'	77° 32.7890'	# of Oysters sampled =		30 WI= 1.33

WI Average for Pender 0.87**WI Average for the whole State 1.07**

Table 2
Dermo Intensity

Year	No. of Oysters Sampled	No Infection Intensity = 0		Light Infection Intensity = 1		Moderate Infection Intensity = 2		High Infection Intensity = 3	
		No. of Oysters	%	No. of Oysters	%	No. of Oysters	%	No. of Oysters	%
1991	4,097	1,061	25.90 %	1,602	39.10 %	904	22.06 %	530	12.94 %
1992	2,782	695	24.98 %	1,300	46.73 %	588	21.14 %	199	7.15 %
1993	2,077	1,123	54.07 %	729	35.10 %	174	8.38 %	51	2.46 %
1994	1,794	661	36.85 %	709	39.52 %	308	17.17 %	116	6.47 %
1995	1,926	618	32.09 %	889	46.16 %	335	17.39 %	83	4.31 %
1996	2,392	958	40.05 %	1,007	42.10 %	367	15.34 %	60	2.51 %
1997	1,965	839	42.70 %	759	38.63 %	300	15.27 %	67	3.41 %
1998	2,901	1,606	55.36 %	929	32.02 %	227	7.82 %	139	4.79 %
1999	3,915	2,083	53.21 %	1,145	29.25 %	404	10.32 %	283	7.23 %
2000	4,044	1,354	33.48 %	2,001	49.48 %	477	11.80 %	212	5.24 %
2001	3,228	1,231	38.14 %	1,642	50.87 %	190	5.89 %	165	5.11 %
2002	3,006	549	18.26 %	1,871	62.24 %	291	9.68 %	295	9.81 %
2003	2,969	1,620	54.56 %	1,200	40.42 %	96	3.23 %	53	1.79 %
2004	2,863	1,238	43.24 %	1,472	51.41 %	100	3.49 %	53	1.85 %
2005	1,486	392	26.38 %	919	61.84 %	101	6.80 %	74	4.98 %
2006	1,543	227	14.71 %	1,029	66.69 %	180	11.67 %	107	6.93 %
2007	1,650	287	17.39 %	1,150	69.70 %	135	8.18 %	78	4.73 %
2008	1,514	301	19.88 %	1,099	72.59 %	96	6.34 %	18	1.19 %
2009	1,439	273	18.97 %	1,033	71.79 %	96	6.67 %	37	2.57 %
2010	1,460	316	21.64 %	813	55.68 %	212	14.52 %	119	8.15 %
2011	872	138	15.83 %	642	73.62 %	77	8.83 %	15	1.72 %
2012	875	310	35.43 %	417	47.66 %	101	11.54 %	47	5.37 %