



GROWING AREA WT
Towns of Friendship and Cushing

Triennial Report for 2006-2008

Report Date: April 6, 2010

Fran Pierce

APPROVAL

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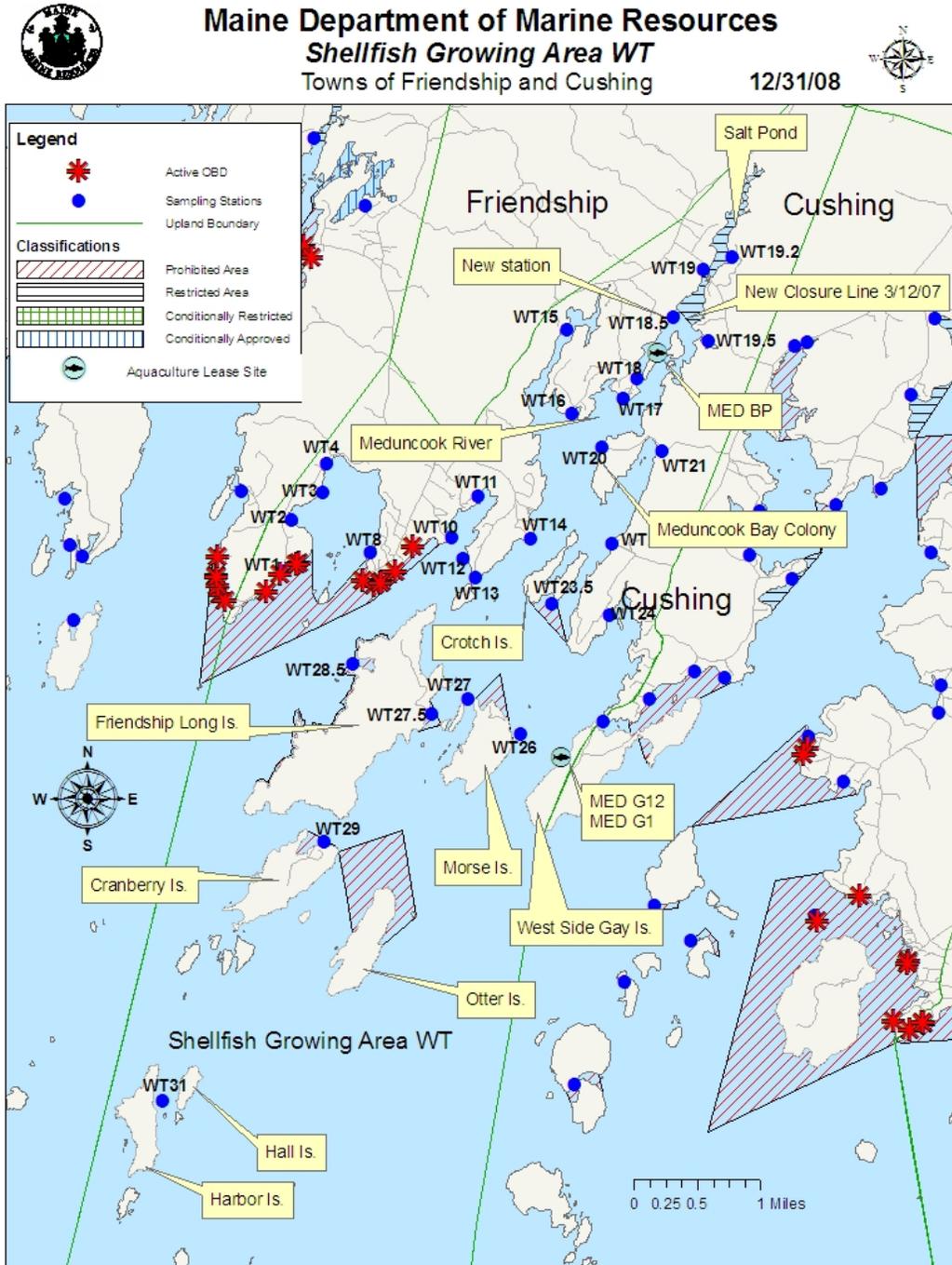
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Figure 1. Shellfish Growing Area WT, With Sample Stations and Licensed Overboard Discharges





Executive Summary

This is a triennial report written in compliance with the requirements of the 2007 Model Ordinance and the National Shellfish Sanitation Program. A new shoreline survey of Shellfish Growing Area WT will be completed in 2009. A new sanitary survey report will be written following the completion of the shoreline survey of the growing area.

This triennial review covers the years from 2006-2008. On June 20, 2007 the upper portion of Meduncook River was reclassified from approved to restricted. The water quality at sampling station WT19 no longer met approved standards. A new sampling station (WT18.5) was established at the site of the new closure line. All of the remaining stations continued to meet their NSSP classification standard. Otter Island was reclassified from approved to prohibited on December 31, 2008, due to an expired shoreline survey; this area will be surveyed in 2009. There are no sampling stations on the shores of Otter Island. There were no other station classification changes during the review period.

Several stations are showing an upward trend in water quality scores (deteriorating water quality). These stations include station WT 10, 11, 19.5, and 21. All of these stations continue to meet the approved standard and are not required to be reclassified at this time. These sites will be visited during the 2009 shoreline survey of the growing area.

Growing Area Description

Growing Area WT is located within the area between the southern tip of Martin Point Friendship and the southern tip of Gay Island Cushing (Figure 1). This growing area also contains numerous small islands. Islands with dwellings on them include: Harbor, Hall, Cranberry, Otter, Friendship, Morse, Gay, Garrison and Crotch. A detailed boundary description for growing area WT can be located in DMR central files.

The entire region is very rural. There are no municipal treatment facilities, marinas or industries in or near shellfish growing area WT. The dwellings in this area utilize private in-ground septic systems or licensed overboard discharge systems; several outhouses can still be found in this growing area. Shellfish Growing Area WT has a total of 10 OBDs. All of these OBDs are located in Hatchet Cove and Friendship Harbor. This growing area has a housing development on Bradford Point, Cushing consisting of 5 developed lots. All of the dwellings in the development utilize private in ground septic systems.

Current Classification(s)

Shellfish growing area WT currently has areas classified as:

Approved

- 20 Approved stations



Conditionally Approved

- There are no conditionally approved stations in growing area WT

Restricted

- Area No. 26B, Back River, Friendship and Cushing- two restricted stations WT 19 and WT19.2, water quality scores do not meet approved standards, no point sources of pollution were identified in the immediate area

Prohibited

- Area No. 26B, Friendship and Cushing, six prohibited stations, due to licensed OBDs, and potential pollution sources at island sites

Please visit the DMR website to view legal notices:

http://www.maine.gov/dmr/rm/public_health/closures/closedarea.htm#T

Activity during Review Period (2006-2008)

On June 20, 2007 the upper portion of Meduncook River was reclassified from approved to restricted. The water quality at sampling station WT19 no longer met approved standards. A new sampling station (WT18.5) was established at the site of the new closure line.

Otter Island was reclassified from approved to prohibited on December 31, 2008 due to an expired shoreline survey. This area will be surveyed in 2009.

There has been very little change in the growing area in the past three years. On June 20, 2007 the upper portion of Meduncook River was reclassified from approved to restricted. The water quality at sampling station WT19 no longer met approved standards. A new sampling station (WT18.5) was established at the site of the new closure line. Otter Island was reclassified as prohibited on December 31, 2008 due to an expired shoreline survey. This area will be surveyed in 2009. In 2007 it was noted that a new housing development was observed along the Meduncook River in the town of Cushing. The development (Meduncook Bay Colony) covers a large area of approximately 180 acres and is divided into three development "communities". In 2008 lots in the Meduncook Bay Colony that had not been sold were foreclosed on and are now owned by the bank. At the present time, five dwellings have been built in the Meduncook Bay Colony and two have been built in the Hornbarn Cove portion with a third dwelling under construction. All of these dwellings utilize private in ground septic systems. Due to the minimal development, no new sampling stations are needed at this time.

Current Management Plan for Conditional Areas

There are no conditional areas in shellfish growing area WT.



Documentation of Pollution Sources

The following sections include information on pollution sources which do or may impact water quality in growing area WT. The section includes information on new pollution sources identified over the past three review years, as well as updated reviews of existing pollution sources in this growing area. Pollution sources that are reviewed in this section include domestic waste, including both private inground systems and over board discharges (OBDs), marinas and mooring fields, stormwater and pollution from non-point sources (streams), farms and other agricultural activities, domestic animals and wildlife areas, and recreational areas.

Evaluation of New Pollution Sources

No new pollution sources were identified during the review period 2006-2008.

Re-Evaluation of Existing Pollution Sources

No dwelling inspections were done as part of the triennial review of shellfish growing area WT because a new shoreline survey of the growing area is scheduled for 2009. No upward changes in classification are being proposed until the survey is completed and all pollution sources have been documented.

Licensed Overboard Discharges

An overboard discharge (OBD) is the discharge of wastewater from residential, commercial, and publicly owned facilities to Maine's streams, rivers lakes, and the ocean. Commercial and residential discharges of sanitary waste have been regulated since the mid-1970's when most direct discharges of untreated waste were banned. Between 1974 and 1987 most of the "straight pipes" were connected to publicly-owned treatment works or replaced with standard septic systems. Overboard discharge treatment systems were installed for those facilities that were unable to connect to publicly-owned treatment works or unable to install a septic system because of poor soil conditions or small lot sizes.

All overboard discharge systems include a process to clarify the wastewater and disinfect it prior to discharge. There are two general types of treatment systems; mechanical package plants and sand filters. Sand filter systems consist of a septic tank and a sand filter. In such systems, the wastewater is first directed to a holding tank where the wastewater solids are settled out and undergo partial microbial digestion. The partially treated wastewater then flows from the tank into a sand filter, consisting of distribution pipes, layers of stone and filter sand, and collection pipes within a plastic liner. The wastewater is biologically treated as it filters down through the sand, and is then collected and discharged to a disinfection unit. Mechanical package plants consist of a tank, where waste is mechanically broken up, mixed and aerated; mechanical systems require electric power, and must have an operating alarm on a separate electrical circuit that will activate if the treatment unit malfunctions due to a power failure. The aerated treated wastewater is held in a calm condition for a time, allowing for solids to settle and for the waste to be partially digested by naturally occurring bacteria. The clarified water from the tank is then pumped off the top into a disinfection unit. There are two types of disinfection units, UV and chlorinators (most common). In a chlorinator, the treated water contacts chlorine tablets and



remains in a tank for at least 20 minutes where bacteria and other pathogens are killed. The treated and disinfected water is discharged from the disinfection unit to below the low water mark of the receiving water body (the ocean, a river, or a stream) via an outfall pipe.

OBDs are licensed and inspected by the Maine Department of Environmental Protection. The DEP license standards for OBDs are presented in Appendix A. At each inspection, DEP looks for tags on each treatment unit identifying the service contractor and the last date of service. If an OBD is not properly maintained, or if the OBD malfunctions, it has the potential to directly discharge untreated wastewater to the shore; therefore, preventative closures are implemented surrounding every OBD. The size of each closure is determined based on a dilution, using on the permitted flow rate of the OBD, and the depth of the receiving water that each OBD discharges to; the fecal concentration used for this dilution calculation is 1.4×10^5 FC/100 ml.

Friendship has 10 active licensed OBDs, located in Hatchet Cove and Friendship Harbor (Table 1 and Figure 2); the required closure size for each OBD is provided in Table 1. The size of the entire closure area surrounding the OBDs in Hatchet Cove and Friendship Harbor is 380 acres. This large closure area is of adequate size to protect public health.

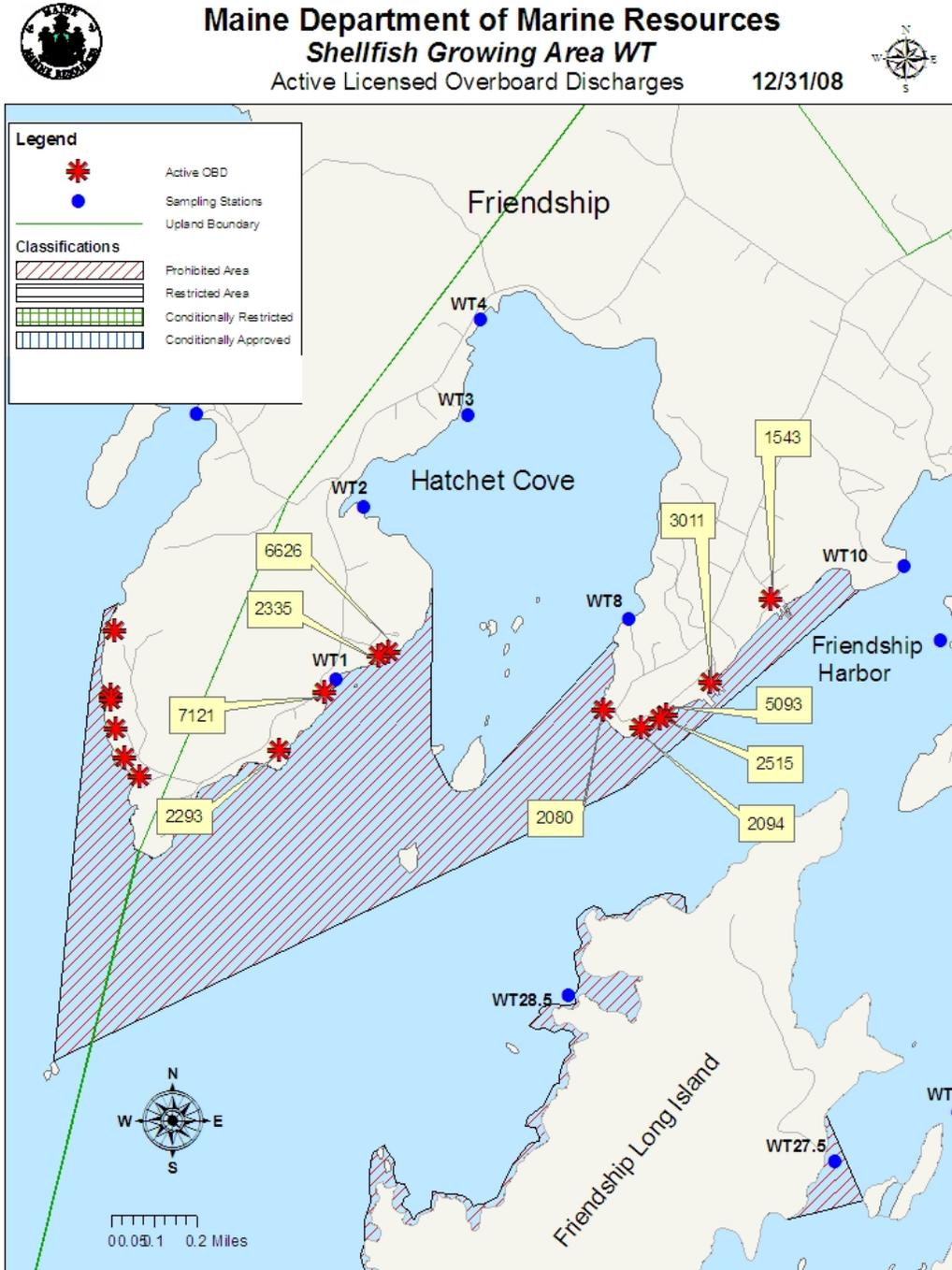
Table 1. Licensed Overboard Discharges, Design and Closure Size Information

Location	DEP_ID	Flow (gpd)	Required Closure Size (Acres)	Actual Closure Size (Acres)	Treatment*	Receiving Waters
Friendship	3011	300	1.02	380	M	FRIENDSHOP HARBOR
	6626	300	0.61		S	MUSCONGUS BAY
	2293	500	1.28		M	MUSCONGUS BAY
	2094	1100	2.41		S	FRIENDSHIP HARBOR
	1543	300	1.15		S	FRIENDSHIP HARBOR
	5093	150	0.38		S	FRIENDSHIP HARBOR
	7121	360	0.74		S	HATCHET COVE
	2080	540	2.76		M	HATCHET COVE
	2335	300	0.61		M	MUSCONGUS BAY
	2515	300	0.77		S	FRIENDSHIP HARBOR

* M= Mechanic, S= Sand filter



Figure 2. Shellfish Growing Area WT, Active Licensed Overboard Discharges





Farming Operations

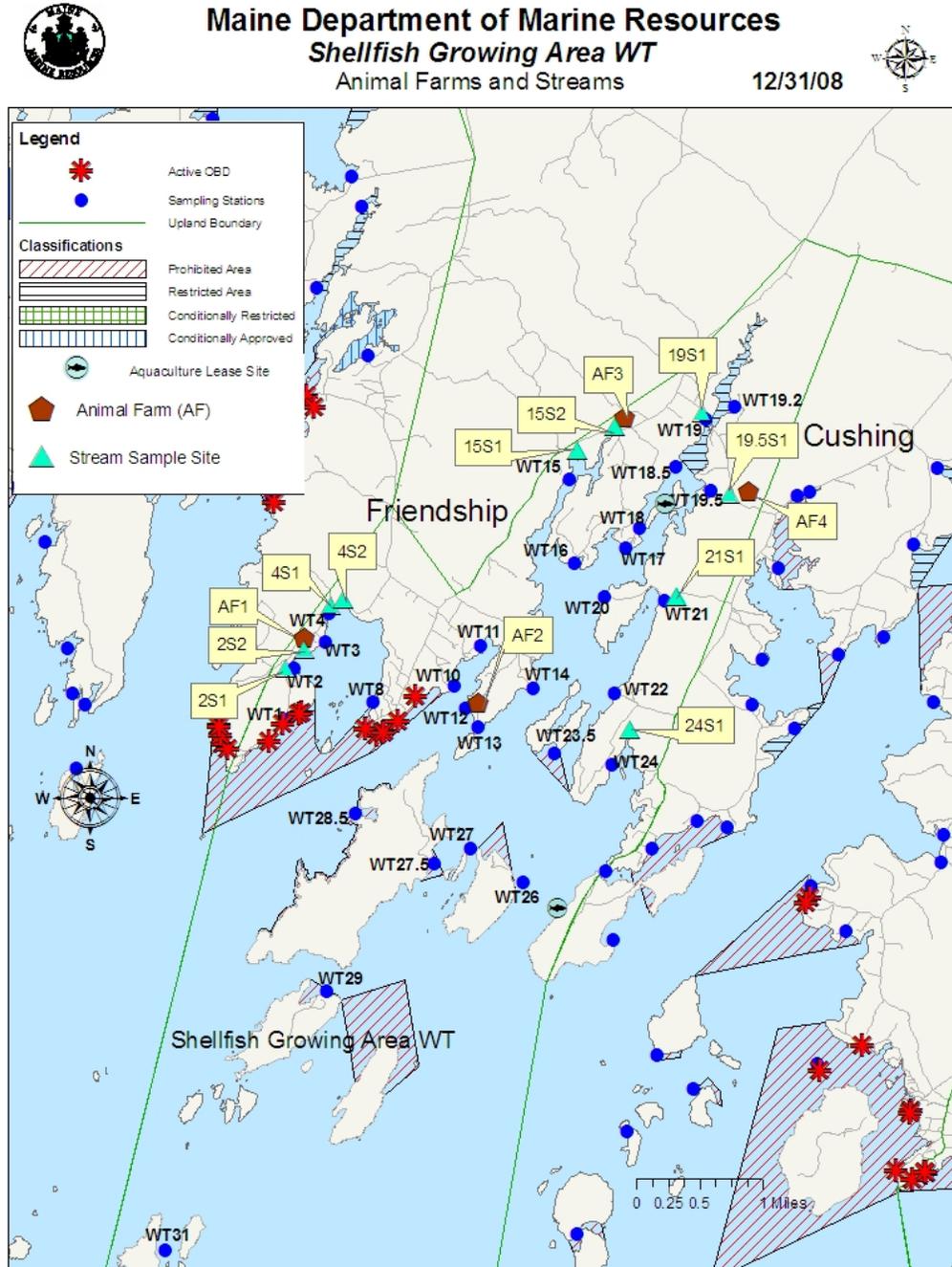
Shellfish Growing Area WT has very few farming operations near the shore (Figure 3). The farms consist of small back yard paddocks consisting of one or more horses, some chickens, sheep or a few goats. All of these sites have been visited and the importance of utilizing best farm practices has been explained to each property owner. An explanation of the number and types of animals at each farming operation and the distance from the shore is shown in Table 2. Nearby streams are also noted in Table 2; each stream was sampled twice in 2008, and results from these streams are presented in Table 3. The stream in the vicinity of animal farm 2 (AF2) is extremely small and only flows after a heavy rainfall. This site was not sampled during the 2008 sample collections.

Table 2. Animal Farms and Nearby Streams, Shellfish Growing Area WT

Farm Site #	# & Type of Animals	Distance from Shore (ft)	Location	Stream Nearby?	Stream Site ID	Fecal Score 9/8/08 FC/100 ml	Fecal Score 10/8/08 FC/100 ml
AF 1	1 Horse	300	Hatchet Cove	Yes	2S2	Not sampled	2
AF2	40 Chickens	30	Johnson Cove	Yes, but very small	Stream was not sampled in 2008		
	2 Goats	45					
AF 3	19 Sheep	450	Back River	Yes	15S2	160	29
	22 Goats	100					
	75 Chickens	80					
	Rabbits	caged					
AF 4	1 Horse	60 (distance from stream)	Meduncook River	Yes	19.5S1	320	15



Figure 3. Animal Farms and Streams, Shellfish Growing Area WT





Non-Point Source Pollution from Streams

In the 2007 Annual report for this area it was noted that stations WT 19.5, 21 and 24 all had deteriorating water quality that might be associated with nearby streams. Multiple streams were sampled on September 8, 2008 and again on October 8, 2008 (Figure 3, Table 3). On September 7, 2008 the growing area was closed due to a flood closure of > four inches of rain in a twenty-four hour period. The stream scores for the sites sampled on September 8th are far more elevated than the scores for the same streams sampled on October 8th suggesting that the extreme amount of rainfall on September 7th had flushed pollutants into the area. No flow rates are available for the stream samples because the flow meter was broken at the time of sample collection.

Table 3. Growing Area WT Stream Results

Stream Site	Date Sampled	Fecal Score FC/ 100ml	Comments
2S1	9/8/08	60	
	10/8/08	3.6	
2S2	10/8/08	2	Flows through horse pasture
4S1	9/8/08	134	
	10/8/08	7.3	
4S2	9/8/08	1280	
	10/8/08	2	
15S1	9/8/08	200	
	10/8/08	12	
15S2	9/8/08	160	Nearby farm (AF3)
	10/8/08	29	
19S1	9/8/08	80	
19.5S1	9/8/08	320	Flows past horse enclosure
	10/8/08	15	
21S1	9/8/08	720	
	10/8/08	68	
24S1	10/8/08	29	

Industrial Pollution

There are no industrial discharges in shellfish growing area WT.

Municipal WWTP

There are no municipal wastewater treatment facilities in shellfish growing Area WT. All of the dwellings in this growing area utilize private in ground systems, licensed overboard discharges or outhouse systems.



Marinas

There are no marinas in shellfish growing area WT.

Stormwater

There are no stormwater collection systems in shellfish growing area WT. The largest area of development is located in and around Friendship Harbor. There are a few small streams that flow to the shore in this area, however the entire shore of Friendship Harbor is classified as prohibited.

Agricultural Activities

The only agricultural activity in this growing area is a blueberry field which is located on a ridge above the Meduncook River (directly above station WT18.5). The blueberry field is located more than 500 feet from the shore.

Conservation and Recreation Areas

There are no public conservation areas in shellfish growing area WT.

Review of Water Quality and Discussion

Table 4 shows all active stations in Growing Area WT, with their respective geometric mean and P90 calculations for 2008. A key to header titles can be found in Appendix A. The approved and restricted standards for each station area also displayed in this table. These standards will fluctuate yearly as a result of the DMR transition from an MPN fecal coliform test method to a membrane filtration (MF) method and area dependent on the number of samples analyzed by MPN versus MF. The total number of data points used in the calculations is displayed in the COUNT column and includes both MPN and MF values. The numbers of data points analyzed by MF are displayed in the MFCNT column. This fluctuating standard will cease when all 30 data points have been analyzed by the MF method. A more detailed explanation of this transition can be found in Appendix B.

All stations in shellfish growing area WT are currently meeting their NSSP classification standard. Growing area WT data for 2008 can be found in Appendix C.

Table 4. Geomean and P90 Calculations for Growing Area WT, 2004-2008

Station	Class	Count	MFCOUNT	GM	SDV	MAX	P90	Appd_Std	Restr_Std
WT001.00	P	30	14	3.7	0.43	43	13.7	39	225
WT002.00	A	30	14	3.9	0.51	240	17.9	39	225
WT003.00	A	30	14	3.3	0.4	93	11.1	39	225
WT004.00	A	30	14	3.9	0.48	460	16.4	39	225
WT008.00	A	30	14	4	0.6	1100	23.6	39	225
WT010.00	A	30	14	5.4	0.54	156	27.2	39	225



Station	Class	Count	MFCOUNT	GM	SDV	MAX	P90	Appd_Std	Restr_Std
WT011.00	A	30	14	4.4	0.53	460	21.3	39	225
WT012.00	A	30	14	4.3	0.45	240	16.6	39	225
WT013.00	A	30	14	3.6	0.38	58	11.4	39	225
WT014.00	A	30	14	3.1	0.29	43	7.3	39	225
WT015.00	A	30	14	3.7	0.52	1100	17.6	39	225
WT016.00	A	30	14	3.5	0.3	23	8.6	39	225
WT017.00	A	30	14	3	0.27	24	6.8	39	225
WT018.00	A	30	14	3.6	0.49	1100	15.8	39	225
WT018.50	NEW	9	9	2.4	0.22	8	4.7	31	163
WT019.00	R	30	14	6.7	0.55	240	34	39	225
WT019.20	R	30	14	6.3	0.66	460	45.1	39	225
WT019.50	A	30	14	4.9	0.54	290	24.6	39	225
WT020.00	A	29	14	3.1	0.44	240	11.7	39	223
WT021.00	A	30	14	5.5	0.58	150	31.5	39	225
WT022.00	A	30	14	3	0.38	240	9.4	39	225
WT023.50	P	30	15	2.3	0.1	3.6	3.2	38	221
WT024.00	A	30	14	4.4	0.59	711	25.9	39	225
WT026.00	P	30	15	2.5	0.2	23	4.5	38	221
WT027.00	A	30	15	2.4	0.11	3.6	3.4	38	221
WT027.50	P	30	15	2.6	0.24	43	5.5	38	221
WT028.50	P	30	15	2.5	0.16	9.1	4.1	38	221
WT029.00	P	30	15	2.6	0.2	9.1	4.8	38	221
WT031.00	A	30	15	2.6	0.19	9.1	4.7	38	221

All of the stations in shellfish growing area WT were sampled a minimum of six times following the systematic random sampling strategy (SRS) (Table 5). Several stations were sampled under adverse conditions in the closed status following flood closures. Stations WT 15, 18 and 21 are routinely sampled during flood closures to determine when the area can reopen.

Table 5. Sampling Effort for 2008, Shellfish Growing Area WT

Station	Class	Adverse Closed	Random Closed	Random Open	Total
WT001.00	P		6		6
WT002.00	A			6	6
WT003.00	A	6		6	12
WT004.00	A			6	6
WT008.00	A			6	6
WT010.00	A			6	6
WT011.00	A			6	6
WT012.00	A			6	6
WT013.00	A			6	6
WT014.00	A			6	6
WT015.00	A	9		6	15
WT016.00	A			6	6
WT017.00	A			6	6
WT018.00	A	15		6	21

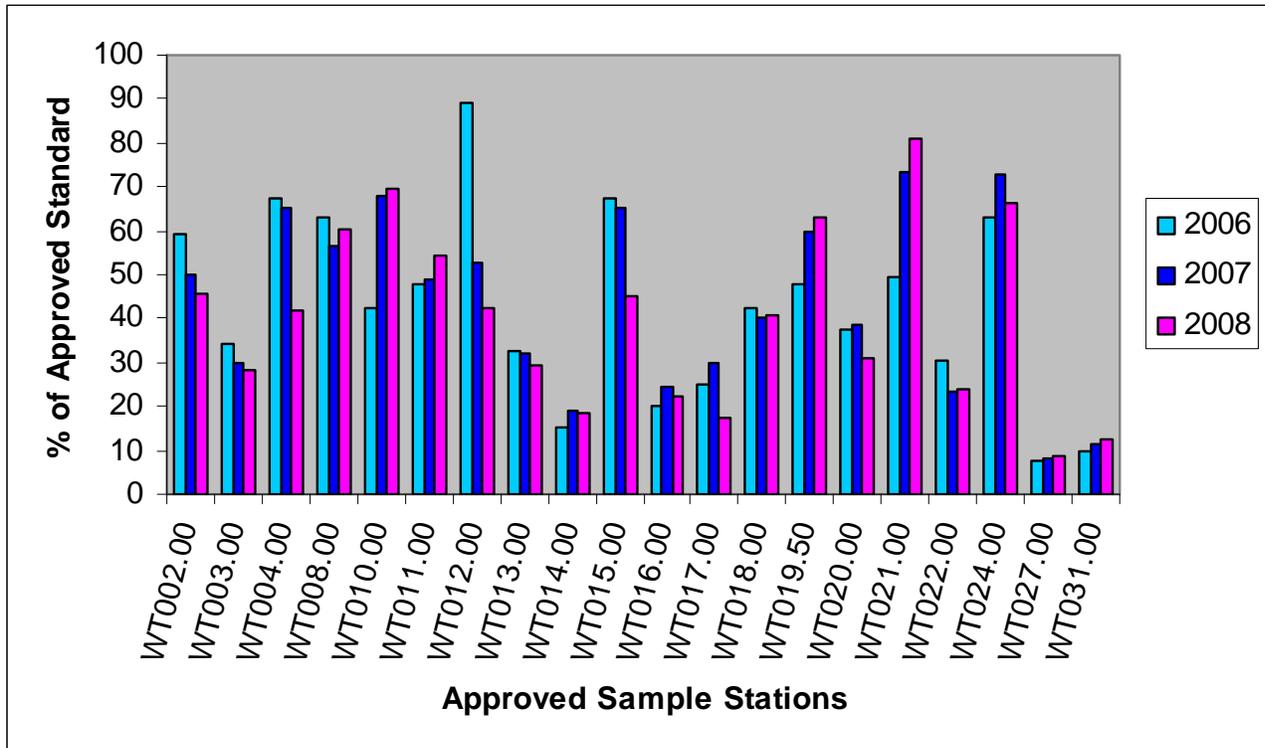


Station	Class	Adverse Closed	Random Closed	Random Open	Total
WT018.50	R			6	6
WT019.00	R			6	6
WT019.20	R			7	7
WT019.50	A			6	6
WT020.00	A			6	6
WT021.00	A	9		6	15
WT022.00	A			6	6
WT023.50	P		6		6
WT024.00	A			6	6
WT026.00	P		6		6
WT027.00	A			6	6
WT027.50	P		6		6
WT028.50	P		6		6
WT029.00	P		6		6
WT031.00	A			6	6

Figure 4 shows the P90 trends over the past three years, for all approved stations in growing area WT. During the transition from MPN to MF analysis method, the approved standard will decrease every year, until all samples have been analyzed by the MF method. In order to show the trend of the P90 value over the years, the calculated P90 scores are expressed as a percentage of the approved standard; any station showing the 2008 column on or above 100 percent does not meet the NSSP standard for classification. At the end of 2008, all approved stations in WT were meeting the approved standard. Stations WT 10, WT11, WT19.5, and WT21 have shown an upward trend over the past three years. Stations WT 19.5 and WT 21 both have large streams flowing into the area at the sample site. A seasonal and rainfall assessment will be done of these stations after the shoreline survey of the area has been completed in 2009.



Figure 4. Area WT P90 Scores for Approved Stations (expressed as the percent of the approved standard), 2006-2008



Shoreline Survey Activity

Area WT was last surveyed in 1998. A new shoreline survey of this area will be completed in 2009. Drive through assessment surveys were conducted when the area was being sampled. In 2008, stream samples were taken near stations that had shown deteriorating water quality in 2007. No new door to door survey work was conducted during the review period; the entire growing area will be re-surveyed in 2009.

Aquaculture/Wet Storage Activity

There are currently three aquaculture lease sites in this growing area. There is no wet storage in shellfish growing area WT. Information on these lease sites is shown below.

Gay Island Oysters Inc.

MED BP

Description: North of Bradford Point Meduncook River Cushing Knox County

Acreage: 0.12

Species Cultivated: oyster eastern / american (*Crassostrea virginica*)

Cultivation Technique(s): Suspended



Gay Island Oysters Inc.

MED GI

MED GI2

Species Cultivated: oyster eastern / american (*Crassostrea virginica*)

Cultivation Technique(s): Suspended

Description: West side of Gay Island Meduncook River Cushing Knox County

For more information, please go the lease inventory website shown below.

<http://www.maine.gov/dmr/aquaculture/leaseinventory/muscongusbay.htm>

Summary

At the end of the 2008 review year, all of the stations in shellfish growing area WT were meeting their classification standard. Several stations have shown deteriorating water quality trends for the past three years, but are still meeting their classification standard. No changes in classification are being recommended at this time. A more complete water quality assessment will be completed for these sites following the completion of the shoreline survey.

The shoreline survey of the growing area will be conducted in 2009 by DMR and DEP staff. If time permits the 2009 survey will include surveying islands with dwellings in the growing area.



Appendix A. Key to Water Quality Table Headers

Station = water quality monitoring station

Class = classification assigned to the station; prohibited (P), restricted (R), conditionally restricted (CR), conditionally approved (CA) and approved (A).

Count = the number of samples evaluated for classification, must be a minimum of 30.

MFCNT = the number of samples evaluated with the MTec method (included in the total Count column)

Geo_Mean = means the antilog (base 10) of the arithmetic mean of the sample result logarithm (base 10).

SDV = standard deviation

Max = maximum score of the 30 data points in the count column

P90 = 90th percentile

APPD_STD = the 90th percentile, at or below which the station would meet approved criteria in the absence of pollution sources or poisonous and deleterious substances.

RESTR_STD = the 90th percentile, at or below which the station would meet restricted criteria.



Appendix B. Transitioning to Membrane Filtration for Seawater and Pollution Source Samples

The Maine Department of Marine Resources has switched to a Membrane Filtration (MF) method for Fecal Coliforms using mTEC agar with a two hour resuscitation step. The geometric mean and the 90th percentile are calculated on 30 data points extending over a five year period. During the transition from MPN to MF, we will be accumulating MF data points. The statistical calculations will be a combination of MPN and MF data points. During the transition the P90 standard for approved and restricted classification will migrate from the MPN standard to The FDA has determined that the best way to handle the data is to perform the calculations as always for the data set, but to compare the data set to a hybrid weighted 90th percentile. This hybrid standard is calculated by weighting the relative contributions of each method to the database. This will mean that as the number of MPN data points reduce and the number of MF data points increase the 90th percentile standard that the sample site is compared to will change over time. Once all 30 data points are analyzed using MF, the 90th percentile for approved classification will be 31 and for restricted (for depuration) will be 163. The geomean approved standard of 14 fecal coliforms per 100 ml and geomean restricted standard of 88 fecal coliforms per 100 ml will remain the same for both methods.

Reports that display 90th percentiles will show the number of data points derived from MF analysis and will show the appropriate 90th percentile standard for that MPN/MF combination for approved and restricted classifications. It must be remembered that this weighted standard is only used for data sets encompassing data from the two different test methods, MF and MPN (3 tube/3 dilution). If decisions are to be made on a single test result analyzed by the MF method or a multiple number of test results all exclusively analyzed by the MF method, the 90th percentile standard is 31 fecal coliforms per 100 ml.

This was the first year the water quality program documented, in the database, the inability to collect a sample based on the following parameters: if the tide stage was too low to collect the sample, there was a safety issue with collecting the sample, the location was inaccessible or "other" which was accompanied by a comment on the data sheet. Stations that were unable to be sampled due to any of these parameters show 999 in the salinity column and have no data recorded in any of the columns except the time which is recorded so the actual tide stage can be computed. Stations that were missed due to the above parameters were required to be made up to assure that each station would receive the required six samples during the sampling season.



Appendix C. Growing Area WT Data for 2008

Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WT001.00	01/14/08	EXT	LF	0	30	R	P	C	P	<2.0	NE
	03/11/08	FP	F	0	29	R	P	C	P	<2.0	CL
	05/12/08	EXT	F	11	30	R	-	C	P	<2.0	E
	07/07/08	LL	F	18	30	R	-	C	P	<2.0	CL
	08/25/08	MLP	E	15	31	R	-	C	P	<2.0	CL
	10/20/08	EXT	F	10	32	R	-	C	P	2	NE
WT002.00	01/14/08	EXT	F	0	20	R	P	O	A	2	NE
	03/11/08	FP	F	1	29	R	P	O	A	<2.0	CL
	05/12/08	EXT	F	15	28	R	-	O	A	4	E
	07/07/08	LL	F	20	30	R	-	O	A	2	CL
	08/25/08	MLP	E	16	31	R	-	O	A	<2.0	CL
	10/20/08	EXT	F	10	30	R	-	O	A	<2.0	NE
WT003.00	01/14/08	EXT	F	0	30	R	P	O	A	<2.0	NE
	03/11/08	FP	F	0	30	R	P	O	A	<2.0	CL
	05/12/08	EXT	F	12	30	R	-	O	A	<2.0	E
	07/07/08	LL	F	18	31	R	-	O	A	2	CL
	08/25/08	MLP	E	16	32	R	-	O	A	2	CL
	10/20/08	EXT	LF	9	32	R	-	O	A	<2.0	NE
WT004.00	01/14/08	EXT	F	0	30	R	P	O	A	<2.0	NE
	03/11/08	FP	F	0	30	R	P	O	A	<2.0	CL
	05/12/08	EXT	F	15	28	R	-	O	A	<2.0	E
	07/07/08	LL	F	23	31	R	-	O	A	<2.0	CL
	08/25/08	MLP	E	16	31	R	-	O	A	<2.0	S
	10/20/08	EXT	F	10	32	R	-	O	A	5.5	CL
WT008.00	01/28/08	EXT	LF	-4	32	R	-	O	A	6	N
	03/11/08	FP	F	-1	29	R	P	O	A	<2.0	NW
	05/12/08	EXT	F	12	30	R	-	O	A	<2.0	CL
	07/07/08	LL	F	20	30	R	-	O	A	4	SW
	08/25/08	MLP	E	16	31	R	-	O	A	4	CL
	10/20/08	EXT	F	9	32	R	-	O	A	2	NE
WT010.00	01/28/08	EXT	LF	-3	32	R	-	O	A	<2.0	N
	03/11/08	FP	F	0	30	R	P	O	A	<2.0	CL
	05/12/08	EXT	F	11	30	R	-	O	A	<2.0	E
	07/07/08	LL	F	18	31	R	-	O	A	2	CL
	08/25/08	MLP	E	15	32	R	-	O	A	13	SW
	10/20/08	EXT	F	10	32	R	-	O	A	<2.0	NE
WT011.00	01/28/08	EXT	HF	-3	32	R	-	O	A	<2.0	N
	03/11/08	FP	F	0	30	R	P	O	A	<2.0	CL
	05/12/08	EXT	F	17	30	R	-	O	A	<2.0	E
	07/07/08	LL	F	21	30	R	-	O	A	6	CL
	08/25/08	MLP	E	16	31	R	-	O	A	<2.0	CL
	10/20/08	EXT	F	10	32	R	-	O	A	6	CL



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WT012.00	01/28/08	EXT	LF	-3	32	R	-	O	A	<2.0	N
	03/11/08	FP	F	0	30	R	PW	O	A	<2.0	NW
	05/12/08	EXT	F	9	30	R	-	O	A	<2.0	CL
	07/07/08	LL	F	17	30	R	-	O	A	7.3	CL
	08/25/08	MLP	E	16	32	R	-	O	A	<2.0	CL
	10/20/08	EXT	F	10	32	R	-	O	A	<2.0	NE
WT013.00	01/28/08	EXT	LF	-3	32	R	-	O	A	<2.0	N
	03/11/08	FP	F	0	30	R	P	O	A	<2.0	CL
	05/12/08	EXT	F	9	28	R	-	O	A	<2.0	SE
	07/07/08	LL	F	19	30	R	-	O	A	<2.0	CL
	08/25/08	MLP	E	15	32	R	-	O	A	16	CL
	10/20/08	EXT	F	11	32	R	-	O	A	2	CL
WT014.00	01/28/08	EXT	F	-4	32	R	-	O	A	<2.0	N
	03/11/08	FP	HF	0	30	R	P	O	A	<2.0	CL
	05/12/08	EXT	F	8	30	R	-	O	A	<2.0	SE
	07/07/08	LL	F	17	30	R	-	O	A	<2.0	CL
	08/25/08	MLP	E	15	32	R	W	O	A	2	SW
	10/20/08	EXT	F	10	32	R	-	O	A	<2.0	NE
WT015.00	01/28/08	EXT	F	-3	29	R	-	O	A	<2.0	N
	03/11/08	FP	HF	0	28	R	P	O	A	<2.0	W
	05/12/08	EXT	F	13	28	R	-	O	A	<2.0	CL
	07/07/08	LL	F	19	30	R	-	O	A	2	SW
	08/25/08	MLP	E	17	32	R	-	O	A	<2.0	SW
	10/20/08	EXT	F	9	31	R	-	O	A	2	NE
WT016.00	01/28/08	EXT	F	-4	31	R	-	O	A	<2.0	N
	03/11/08	FP	HF	0	28	R	P	O	A	<2.0	W
	05/12/08	EXT	F	9	28	R	-	O	A	<2.0	SE
	07/07/08	LL	F	22	30	R	-	O	A	8	CL
	08/25/08	MLP	E	16	32	R	-	O	A	<2.0	SW
	10/20/08	EXT	F	11	32	R	-	O	A	<2.0	CL
WT017.00	01/28/08	EXT	F	-4	32	R	-	O	A	<2.0	N
	03/11/08	FP	HF	1	26	R	P	O	A	<2.0	W
	05/12/08	EXT	F	13	28	R	-	O	A	<2.0	CL
	07/07/08	LL	F	21	32	R	-	O	A	2	CL
	10/20/08	EXT	F	12	31	R	-	O	A	<2.0	CL
	11/05/08	MLP	F	9	32	R	-	O	A	<2.0	SW
WT018.00	01/28/08	EXT	F	-4	31	R	-	O	A	4	N
	03/11/08	FP	HF	1	28	R	P	O	A	<2.0	CL
	05/12/08	EXT	F	12	28	R	-	O	A	<2.0	SE
	07/07/08	LL	F	20	31	R	-	O	A	2	CL
	10/20/08	EXT	F	10	31	R	-	O	A	4	NE
	11/05/08	MLP	HF	7	31	R	-	O	A	<2.0	CL
WT018.50	01/28/08	EXT	F	-3	30	R	-	O	R	<2.0	N
	03/11/08	FP	HF	1	26	R	P	O	R	<2.0	CL



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
	05/12/08	EXT	F	12	28	R	-	O	R	<2.0	CL
	07/07/08	LL	F	19	31	R	-	O	R	<2.0	CL
	08/25/08	MLP	E	17	31	R	-	O	R	<2.0	SW
	10/20/08	EXT	F	10	32	R	-	O	R	<2.0	CL
WT019.00	01/28/08	EXT	F	-3	25	R	-	O	R	<2.0	N
	03/11/08	FP	H	0	12	R	P	O	R	<2.0	CL
	05/12/08	EXT	F	14	20	R	-	O	R	4	SE
	07/07/08	LL	HF	25	28	R	-	O	R	<2.0	SW
	08/25/08	MLP	LE	21	24	R	-	O	R	14	SW
	10/20/08	EXT	F	12	28	R	-	O	R	<2.0	CL
WT019.20	04/23/08	EXT	H	18	7	R	-	O	R	<2.0	W
	05/12/08	EXT	F	16	21	R	-	O	R	2	SE
	05/27/08	EXT	F	20	20	R	-	O	R	<2.0	W
	07/07/08	LL	HF	27	26	R	-	O	R	2	SW
	08/25/08	MLP	LE	21	14	R	-	O	R	2	CL
	10/20/08	EXT	F	11	24	R	-	O	R	8	CL
	11/05/08	MLP	HF	9	19	R	-	O	R	<2.0	CL
WT019.50	01/28/08	EXT	F	-4	30	R	-	O	A	<2.0	CL
	03/11/08	FP	H	0	18	R	P	O	A	<2.0	CL
	05/12/08	EXT	F	16	26	R	-	O	A	<2.0	CL
	07/07/08	LL	HF	23	30	R	-	O	A	<2.0	CL
	10/20/08	EXT	F	11	31	R	-	O	A	2	CL
	11/05/08	MLP	HF	9	30	R	-	O	A	<2.0	CL
WT020.00	01/28/08	EXT	F	-4	32	R	-	O	A	<2.0	N
	03/11/08	FP	H	0	29	R	P	O	A	<2.0	S
	05/12/08	EXT	F	11	28	R	-	O	A	<2.0	CL
	07/07/08	LL	HF	18	31	R	-	O	A	<2.0	SW
	08/25/08	MLP	LE	16	31	R	-	O	A	2	CL
	10/20/08	EXT	F	10	31	R	-	O	A	<2.0	NE
WT021.00	01/28/08	EXT	F	-3	24	R	-	O	A	<2.0	CL
	03/11/08	FP	H	0	17	R	P	O	A	<2.0	S
	05/12/08	EXT	HF	12	30	R	-	O	A	<2.0	CL
	07/07/08	LL	HF	21	30	R	-	O	A	<2.0	CL
	10/20/08	EXT	HF	10	31	R	-	O	A	26	CL
	11/05/08	MLP	HF	9	28	R	-	O	A	2	CL
WT022.00	01/28/08	EXT	F	-3	32	R	-	O	A	<2.0	N
	03/11/08	FP	H	0	29	R	P	O	A	<2.0	S
	05/12/08	EXT	HF	9	29	R	-	O	A	<2.0	E
	07/07/08	LL	H	16	30	R	-	O	A	<2.0	SW
	08/25/08	MLP	LE	15	32	R	-	O	A	<2.0	CL
	10/20/08	EXT	HF	10	32	R	-	O	A	<2.0	CL
WT023.50	04/07/08	FP	E	4	31	R	-	C	P	<2.0	NE
	08/11/08	MLP	LF	14	30	R	-	C	P	2	S
	08/26/08	MLP	L	13	30	R	-	C	P	<2.0	NW



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
	10/06/08	FP	F	10	30	R	-	C	P	<2.0	N
	10/20/08	FP	F	7	32	R	-	C	P	<2.0	N
	11/03/08	FP	HF	5	31	R	-	C	P	<2.0	W
WT024.00	01/28/08	EXT	F	-2	32	R	-	O	A	<2.0	N
	03/11/08	FP	HE	0	30	R	P	O	A	2	S
	05/12/08	EXT	HF	12	28	R	-	O	A	<2.0	E
	07/07/08	LL	H	19	30	R	-	O	A	<2.0	CL
	08/25/08	MLP	L		32	R	-	O	A	<2.0	-
	10/20/08	EXT	HF	10	32	R	-	O	A	<2.0	CL
WT026.00	04/07/08	FP	E	4	30	R	-	C	P	<2.0	NE
	08/11/08	MLP	LF	14	29	R	-	C	P	<2.0	S
	08/26/08	MLP	L	13	30	R	-	C	P	<2.0	NW
	10/06/08	FP	F	9	30	R	-	C	P	<2.0	N
	10/20/08	FP	F	6	32	R	-	C	P	2	N
	11/03/08	FP	HF	5	31	R	-	C	P	<2.0	W
WT027.00	04/07/08	FP	E	4	31	R	-	O	A	<2.0	NE
	08/11/08	MLP	LF	14	30	R	-	O	A	<2.0	S
	08/26/08	MLP	L	14	30	R	-	O	A	<2.0	NW
	10/06/08	FP	F	9	30	R	-	O	A	<2.0	N
	10/20/08	FP	F	6	32	R	-	O	A	<2.0	N
	11/03/08	FP	HF	4	31	R	-	O	A	<2.0	W
WT027.50	04/07/08	FP	E	4	30	R	-	C	P	<2.0	NE
	08/11/08	MLP	LF	13	30	R	-	C	P	<2.0	S
	08/26/08	MLP	L	14	30	R	-	C	P	2	NW
	10/06/08	FP	F	10	30	R	-	C	P	<2.0	N
	10/20/08	FP	F	6	32	R	-	C	P	<2.0	N
	11/03/08	FP	HF	4	31	R	-	C	P	<2.0	W
WT028.50	04/07/08	FP	E	4	32	R	-	C	P	<2.0	CL
	08/11/08	MLP	LF	13	30	R	-	C	P	<2.0	S
	08/26/08	MLP	L	13	30	R	-	C	P	<2.0	NW
	10/06/08	FP	F	10	30	R	-	C	P	<2.0	N
	10/20/08	FP	F	6	32	R	-	C	P	<2.0	N
	11/03/08	FP	HF	5	31	R	-	C	P	<2.0	W
WT029.00	04/07/08	FP	H	4	30	R	-	C	P	<2.0	NE
	08/11/08	MLP	LE	14	28	R	-	C	P	<2.0	E
	08/26/08	MLP	E	12	30	R	-	C	P	<2.0	NW
	10/06/08	FP	LF	9	30	R	-	C	P	<2.0	N
	10/20/08	FP	LF	6	32	R	-	C	P	<2.0	N
	11/03/08	FP	F	5	31	R	-	C	P	<2.0	S
WT031.00	04/07/08	FP	H	4	30	R	-	O	A	<2.0	NE
	08/11/08	MLP	LE	15	28	R	B	O	A	<2.0	CL
	08/26/08	MLP	E	11	30	R	B	O	A	<2.0	NW
	10/06/08	FP	LF	9	31	R	-	O	A	<2.0	N
	10/20/08	FP	F	7	32	R	-	O	A	<2.0	N



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
	11/03/08	FP	F	5	31	R	-	O	A	<2.0	SW