



**GROWING AREA WZ**  
**Towns Of**  
**North Haven and Vinalhaven**  
**ANNUAL REVIEW for 2009**  
**Report Date: June 22, 2010**

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**APPROVAL**

Division Director:

\_\_\_\_\_ Date: \_\_\_\_\_  
Print name signature



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Figure 1. Growing Area WZ, with Active Water Stations

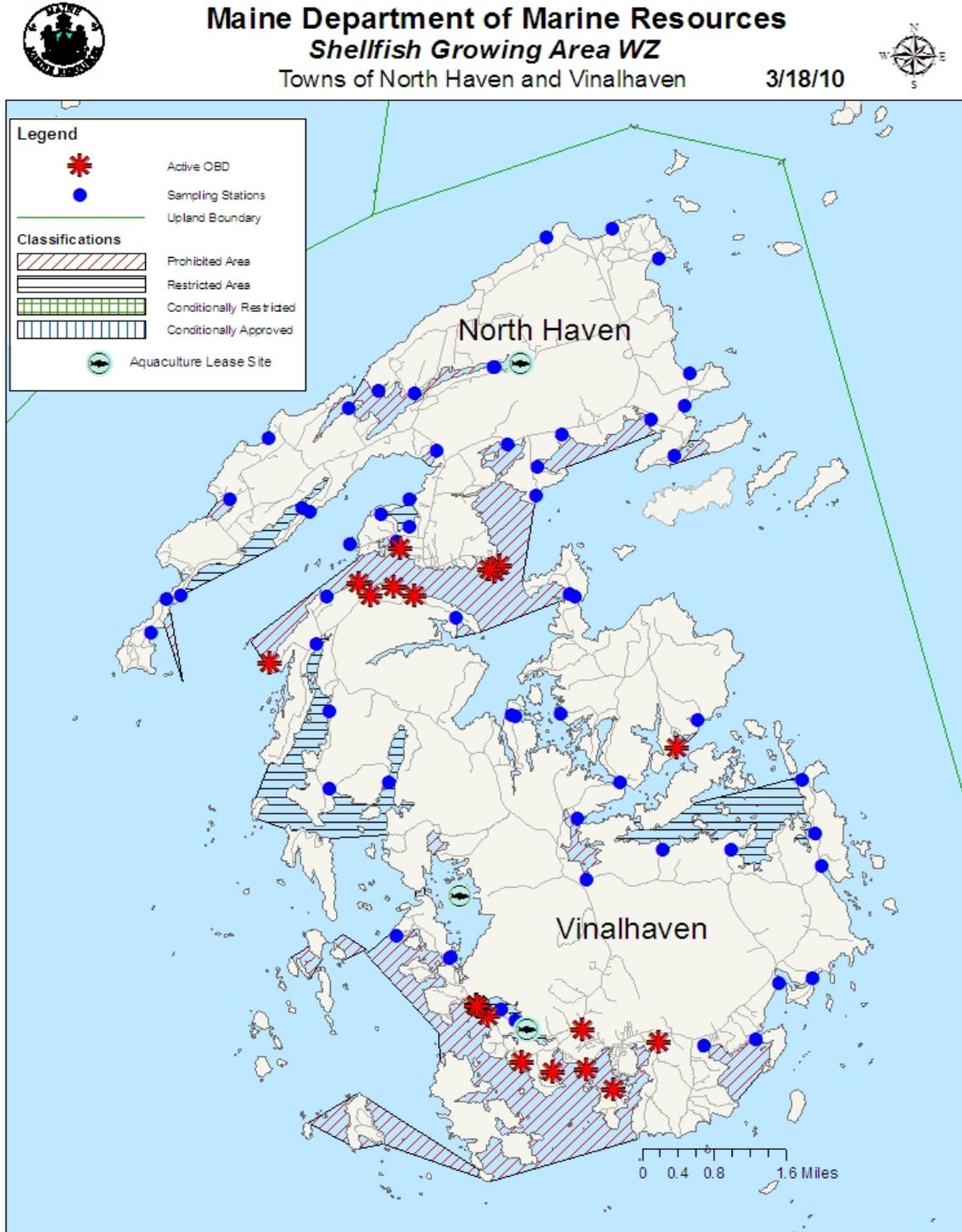




Figure 2. Growing Area WZ Vinalhaven Sampling Stations

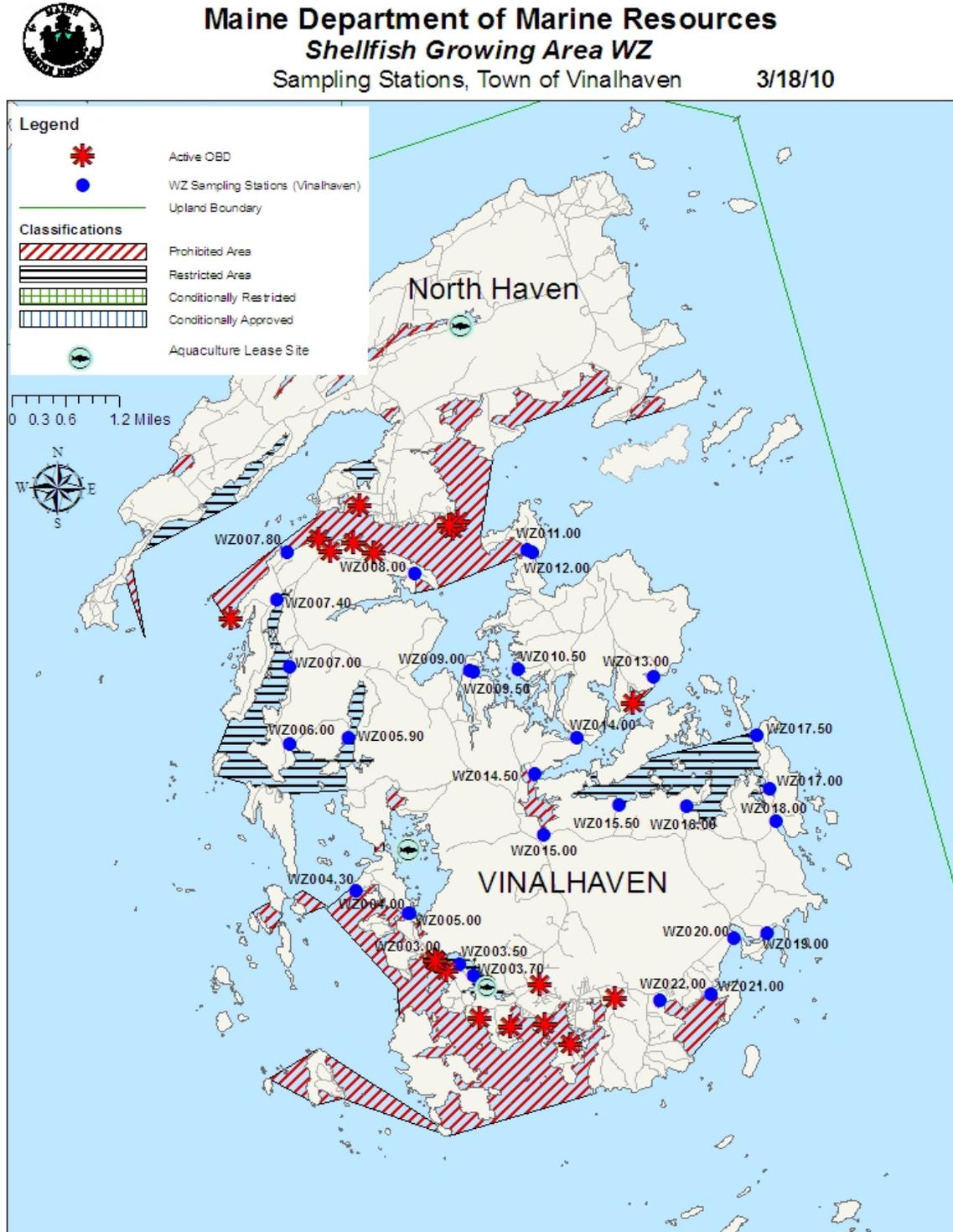
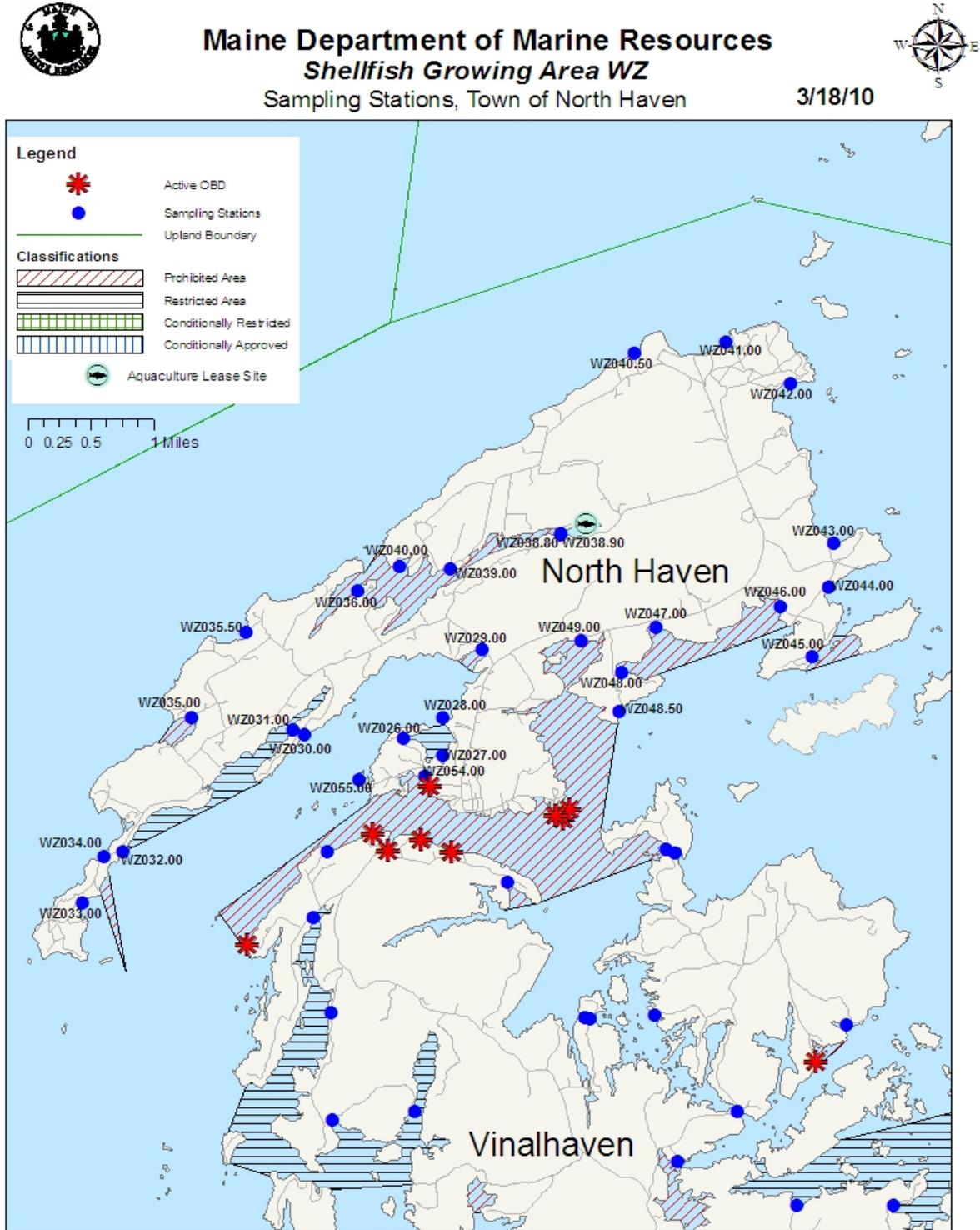




Figure 3. Growing Area WZ North Haven Sampling Stations





## Executive Summary

This is an annual report for growing area WZ written in compliance with the requirements of the 2007 Model Ordinance and the National Shellfish Sanitation Program. The next triennial report is due in 2013; the next sanitary survey report is due in 2010 for Vinalhaven and 2011 for North Haven.

During the 2009 review year, no water quality stations were created or deactivated. One OBD was removed on Vinalhaven during 2009. At the end of the 2009 review year, all WZ stations were meeting their NSSP standard and no downgrades in classification are required. As a result of this annual review, three areas are being proposed for an upgrade in classification: inner Pulpit Harbor is proposed for an upgrade from prohibited to conditionally approved based on season, the closure at Zeke Point, Vinalhaven is proposed for an upgrade from prohibited to approved due to a new septic system being installed and improved water quality and a small closure on Crabtree Point is proposed to be repealed due to a malfunctioning septic system that has been confirmed fixed (North Haven final inspection December 2008).

## Growing Area Description

The islands of North Haven and Vinalhaven are located in the mouth of Penobscot Bay. Both islands contain year round populations that more than double during the summer months from June through August. Vinalhaven is the larger of the two islands. According to Vinalhaven's 2004 Comprehensive Plan, the year round population is 1275 individuals. North Haven has a year round population of 381 and a summer population of 2000 (United States Census Bureau 2000). Both islands have municipal treatment facilities that serve their town centers. There are no large industries on either island. Most residents earn their living lobstering or caretaking the many seasonal dwellings on both islands. There are no marinas on either of the islands but there are areas that contain moorings which are utilized by both cruising and work boats. There are also has several coves that are suitable for anchoring.

Matinicus and Ragged Islands are permanently classified as prohibited for all shellfish harvesting. The Matinicus and Ragged Island closure is an administrative closure due to the islands being too far from shore for staff to easily access and manage on a routine basis.

There is no upland boundary for Shellfish Growing Area WZ because this growing area includes only islands. The growing area boundary lines follow a series of navigational aides and were drawn to include all of the islands within the study area of Growing Area WZ (Figures 1, 2 and 3).

## Current Classification(s)

Vinalhaven shellfish classifications are described on Area No. 30-D  
Vinalhaven stations include stations WZ3 to WZ22

North Haven shellfish classifications are described on Area No. 30-I  
North Haven stations include stations WZ26 to WZ55



Shellfish growing area WZ currently has areas classified as:

**Approved** (22 stations):

- Area No. 30-D (Vinalhaven):
  - WZ 5, 9, 9.5, 12, 13, 14, 18, 19 and 20
- Area No. 30-I (North Haven):
  - WZ 28, 30, 32, 33, 34, 35.50, 38.90, 40.50, 41, 42, 43, 44, and 55

**Restricted** (9 stations):

- Area No. 30-D (Vinalhaven):
  - Crockett Cove and Long Cove; WZ 5.9, 6 and 7, due to non-point pollution
  - Old Harbor Pond; WZ 3.5 due to non-point pollution
  - Seal Bay; WZ 16 and 17, due to variability caused by non-point pollution
- Area No. 30-I (North Haven):
  - Southern Harbor, Cox Cove; WZ 26, due to variability caused by non-point pollution
  - , WZ 27, due to non-point pollution.
  - Ames Creek, WZ 31 due to variability caused by non-point pollution

**Prohibited** (20 stations):

- Area No. 30-D (Vinalhaven):
  - Old Harbor Pond causeway; WZ 3, due to licensed OBDs
  - The Basin Causeway; WZ4, due to former point source in the area and variability in water quality scores
  - Fish Head; WZ7.8, due to variability caused by non-point pollution
  - Perry Creek; WZ8, due to variability caused by non-point pollution
  - Zeke Point; WZ11, due to former OBD and outdated survey
  - Vinal Cove; WZ 15; due to identified actual pollution sources
  - Southeast of Penobscot Island; WZ15.5, due to non-point pollution
  - Roberts Harbor; WZ 21 and WZ22, due to lack of current survey and water quality not meeting the approved standard
  - Unnamed cove in Winter Harbor, 500 yards northeast of Starboard Rock; due to an active OBD
- Area No. 30-I (North Haven):
  - Southern Harbor across the mouth of Seaview Cemetery Cove; WZ 29 due to non-point pollution
  - Small closure with no stations, 1000 yards northeast of Crabtree Point, due to an identified actual pollution source
  - Bartlett Harbor; WZ 35, due to potential malfunction 10 feet from shore
  - Pulpit Harbor and Mill Stream; WZ 36, due to non-point pollution
  - Inner Pulpit Harbor; WZ 38.80, due to variability caused by non-point pollution



- Pulpit Harbor; WZ39 and 40, due to potential pollution from boats
- Between Indian Point and Burnt Island; WZ 45, due to an identified actual pollution source
- Kent Cove; WZ 46, 47, and 48, due to non-point pollution
- Thorofare Closure from Browns Head, Vinalhaven to the Sugar Loaves, continuing to Zeke Point, Vinalhaven north to the Cubby Hole, North Haven; WZ 49 and 54; due to active OBDs, boating traffic and the North Haven treatment plant outfall

The following seven stations have less than 30 data points, and are considered “new” stations: on Vinalhaven: WZ3.7, 4.3, 7.4, 10.5, 14.5, and 17.5; on North Haven: WZ48.5

Please visit the DMR website to view legal notices for Area No. 30-D and Area No. 30-I:

[http://www.maine.gov/dmr/rm/public\\_health/closures/closedarea.htm#Z](http://www.maine.gov/dmr/rm/public_health/closures/closedarea.htm#Z)

## Activity during Review Period

No changes in classification occurred in 2009 in shellfish growing area WZ.

## Water Quality Review and Discussion

Table 1 lists all active approved, restricted and prohibited stations in Growing Area WZ, with their respective Geomean and P90 scores for 2009. Please refer to Appendix A for a key to interpreting the headers on the columns of Table 1. The approved and restricted standards for each station are also displayed in Table 1. These standards will fluctuate yearly as a result of the DMR transition from a most probable number (MPN) fecal coliform test method to a membrane filtration (MF) method and are dependent on the number of sample 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 number of data points analyzed by MF is 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 central files.

All approved and restricted stations met their respective NSSP classification standards at the end of 2009 (Table 1). The water quality at station WZ5 is at the approved standard limit. This area was surveyed in 2009 and no pollution sources were found. There are no dwellings on the shore in the immediate area. This area is open for public use and is a popular site for picnics and launching kayaks. Sea birds also frequent the area. This station will be closely monitored during the 2010 sampling season. If the score exceeds the approved standard, this area will be downgraded in classification. Some prohibited and restricted stations met the approved standards at the end of 2009, and will be reviewed for a possible upgrade in classification when the shoreline surveys of Vinalhaven and North Haven have been completed. These stations include WZ 4, 7.8, 16, 17, 21, 26, 35, and 48.5.



**Table 1. Area WZ Geomean and P90 Scores**

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WZ003.00	P	30	20	9	0.65	240	61.5	36	199	7/21/2005
WZ003.50	R	30	19	10.4	0.75	240	95.6	36	203	6/20/2005
WZ003.70	NEW	12	12	9.6	0.65	72	68.4	31	163	5/20/2008
WZ004.00	P	30	19	4.4	0.48	158	18.5	36	203	4/25/2005
WZ004.30	NEW	18	18	3.9	0.61	132	24.3	31	163	5/16/2007
WZ005.00	A	30	19	4.7	0.68	1200	36.2	36	203	4/25/2005
WZ005.90	R	30	18	12.5	0.88	1500	170.2	37	208	9/15/2004
WZ006.00	R	30	19	7	0.6	93	41.7	36	203	4/25/2005
WZ007.00	R	30	19	6.9	0.77	1100	67.8	36	203	4/25/2005
WZ007.40	NEW	18	18	4.5	0.6	140	27.5	31	163	5/16/2007
WZ007.80	P	30	19	3.7	0.49	260	16.3	36	203	4/25/2005
WZ008.00	P	30	19	5.5	0.61	240	33.6	36	203	4/25/2005
WZ009.00	A	30	19	4.2	0.4	96	13.9	36	203	4/25/2005
WZ009.50	A	30	19	3.5	0.45	93	13.6	36	203	4/25/2005
WZ010.50	NEW	18	18	2.2	0.18	8	3.7	31	163	5/16/2007
WZ011.00	P	30	19	4.3	0.54	93	21.5	36	203	10/6/2004
WZ012.00	A	30	19	5.3	0.61	240	32.6	36	203	9/15/2004
WZ013.00	A	30	20	3.1	0.35	38	9.1	36	199	4/25/2005
WZ014.00	A	30	20	2.5	0.18	9.1	4.3	36	199	4/25/2005
WZ014.50	NEW	18	18	2.9	0.28	13	6.8	31	163	5/16/2007
WZ015.00	P	30	19	6.6	0.53	280	31.7	36	203	4/25/2005
WZ015.50	P	30	19	10.3	0.65	220	71.9	36	203	4/25/2005
WZ016.00	R	30	20	5.1	0.54	88	25.3	36	199	4/25/2005
WZ017.00	R	30	20	4.5	0.62	1100	28.6	36	199	4/25/2005
WZ017.50	NEW	18	18	3.4	0.46	72	13.4	31	163	5/16/2007
WZ018.00	A	30	20	6.3	0.55	460	32.3	36	199	4/25/2005
WZ019.00	A	30	20	3.2	0.41	93	10.8	36	199	4/25/2005
WZ020.00	A	30	20	4.1	0.37	43	12.4	36	199	4/25/2005
WZ021.00	P	30	20	4.1	0.36	23	11.9	36	199	4/25/2005
WZ022.00	P	30	21	19.4	0.74	750	175.1	35	195	4/25/2005
WZ026.00	R	30	20	4.3	0.53	160	21.1	36	199	4/21/2005
WZ027.00	R	30	20	8.8	0.69	600	69.1	36	199	4/21/2005
WZ028.00	A	30	20	3.3	0.33	43	9	36	199	4/21/2005
WZ029.00	P	30	20	9.9	0.7	500	80.4	36	199	4/21/2005
WZ030.00	A	30	20	3.6	0.5	240	16.1	36	199	4/21/2005
WZ031.00	R	30	20	4.8	0.66	480	34.1	36	199	4/21/2005
WZ032.00	A	30	20	2.6	0.19	12	4.6	36	199	4/21/2005
WZ033.00	A	30	20	3	0.41	240	10.2	36	199	5/9/2005
WZ034.00	A	30	20	2.5	0.34	142	7.1	36	199	4/21/2005



Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WZ035.00	P	30	20	2.4	0.17	9.1	4.2	36	199	4/21/2005
WZ035.50	A	30	20	2.8	0.24	15	5.9	36	199	4/21/2005
WZ036.00	P	30	20	5.9	0.72	1100	49.6	36	199	4/21/2005
WZ038.80	P	30	30	5.8	0.56	92	30.5	31	163	5/21/2007
WZ038.90	A	30	30	4.1	0.5	160	18.2	31	163	10/23/2007
WZ039.00	P	30	20	3.4	0.33	23	9.1	36	199	4/21/2005
WZ040.00	P	30	20	3.2	0.34	36	9	36	199	4/21/2005
WZ040.50	A	30	20	2.4	0.23	23	4.9	36	199	4/21/2005
WZ041.00	A	30	20	3.4	0.44	210	12.9	36	199	4/21/2005
WZ042.00	A	30	20	2.7	0.35	134	7.7	36	199	4/21/2005
WZ043.00	A	30	20	4.2	0.66	740	30	36	199	4/21/2005
WZ044.00	A	30	20	4.2	0.53	240	20.7	36	199	4/21/2005
WZ045.00	P	30	20	6.4	0.6	98	37.8	36	199	4/21/2005
WZ046.00	P	30	21	12.5	0.78	1100	125.7	35	195	4/21/2005
WZ047.00	P	30	21	6.3	0.62	240	39.5	35	195	4/21/2005
WZ048.00	P	30	21	8.2	0.69	240	64	35	195	4/21/2005
WZ048.50	NEW	23	21	3.1	0.42	68	11.1	32	171	8/9/2006
WZ049.00	P	30	21	6.7	0.67	240	48.5	35	195	4/21/2005
WZ054.00	P	30	21	6.5	0.7	680	52.3	35	195	4/21/2005
WZ055.00	A	30	20	2.9	0.28	18	6.7	36	199	4/21/2005

All active stations were sampled at least six times following the systematic random sampling (SRS) (Table 2 and Appendix B). Flood sampling occurred at sampling stations WZ 38.9 and 55 during adverse conditions. The fecal coliform counts obtained under these conditions were not used to calculate P90 scores for these stations.

Table 2. WZ Sampling Effort for 2009

Station	Class	Adverse	Extra	Random		Total
		Closed	Open	Closed	Open	
WZ003.00	P			6		6
WZ003.50	R			6		6
WZ003.70	R				6	6
WZ004.00	P			6		6
WZ004.30	P			6		6
WZ005.00	A				6	6
WZ005.90	R				6	6
WZ006.00	R				6	6
WZ007.00	R				6	6
WZ007.40	R				6	6
WZ007.80	P			6		6
WZ008.00	P			6		6
WZ009.00	A				6	6
WZ009.50	A				6	6



Station	Class	Adverse	Extra	Random		Total
		Closed	Open	Closed	Open	
WZ010.50	A				6	6
WZ011.00	P			6		6
WZ012.00	A				6	6
WZ013.00	A				6	6
WZ014.00	A				6	6
WZ014.50	P			6		6
WZ015.00	P			6		6
WZ015.50	P			6		6
WZ016.00	R				6	6
WZ017.00	R				6	6
WZ017.50	R				6	6
WZ018.00	A				6	6
WZ019.00	A				6	6
WZ020.00	A				6	6
WZ021.00	P			6		6
WZ022.00	P			6		6
WZ026.00	R				6	6
WZ027.00	R				6	6
WZ028.00	A				6	6
WZ029.00	P			6		6
WZ030.00	A				6	6
WZ031.00	R				6	6
WZ032.00	A				6	6
WZ033.00	A				6	6
WZ034.00	A				6	6
WZ035.00	P			6		6
WZ035.50	A				6	6
WZ036.00	P			6		6
WZ038.80	P	1		6		7
WZ038.90	A	9	1	1	6	17
WZ039.00	P			6		6
WZ040.00	P			6		6
WZ040.50	A				6	6
WZ041.00	A				6	6
WZ042.00	A				6	6
WZ043.00	A				6	6
WZ044.00	A				6	6
WZ045.00	P			6		6
WZ046.00	P			6		6
WZ047.00	P			6		6
WZ048.00	P			6		6
WZ048.50	P			6		6
WZ049.00	P			6		6
WZ054.00	P			6		6



Station	Class	Adverse	Extra	Random		Total
		Closed	Open	Closed	Open	
WZ055.00	A	7			6	13

Figure 4 shows the P90 scores, expressed as a percent of the approved standard, for all approved stations on Vinalhaven in growing area WZ. Figure 5 shows the approved stations on North Haven. 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 standard; any station showing the 2009 column on or above 100 percent does not meet its classification standard. At the end of 2009, several stations showed upward P90 trends, indicating a decline in water quality. Overall, water quality remained stable, with slight increases in P90s (deteriorating water quality) at several stations. The increases in P90 scores can most likely be attributed to the extremely rainy summer. Elevated rainfall amounts can flush pollutants into an area by way of run-off to the streams and from there, to the surrounding water body. Station WZ 5, is at the upper limit of the approved standard (Figure 5). There is only one dwelling in the immediate vicinity of station WZ 5; this property was inspected in 2009 and no pollution sources were found. The area will be revisited during the 2010 sampling season to see if anything was overlooked. If the upward trend in P90 scores continues, WZ 5 will have to be reclassified downward, pending further review. The water quality at station WZ12 is also starting to deteriorate; there is no dwelling anywhere near this site and it is not clear what the cause of the elevated scores might be.

All restricted stations in Growing Area WZ met the restricted standard (Figure 6 and Figure 7). Water quality at the restricted stations on Vinalhaven remained largely stable, with few increases over the previous year (Figure 6). Again, this is most likely due to the wet summer. The three restricted stations on North Haven all showed significant decreases in P90 (improving water quality scores in 2009 (Figure 7).

There are several prohibited stations that have P90 scores that meet the approved standard (Tables 8 and 9). On Vinalhaven (Table 8), these stations include WZ 4, WZ 7.8, WZ 11, WZ 15, and WZ 21). Station WZ 11 is being proposed for an upward classification to approved. The remaining stations will be reviewed upon completion of the shoreline survey in 2010. Station WZ 11 is being proposed for an upward reclassification at this time because there are no dwellings near the station that could impact the water quality. On North Haven (Table 9), three prohibited stations have scores that meet approved standards (WZ 35, WZ 39 and, WZ 40). Bartlet Harbor (station WZ 35), has a potential pollution source located very close to the shore and this site will be re-assessed during the 2010 shoreline survey of the area. Sampling station WZ 39 is located at the town dock in Pulpit Harbor which is just west of the Pulpit Harbor Bridge. If station WZ 38.8 becomes a seasonally approved site, the Pulpit Harbor Bridge will become the new closure line dividing the seasonally approved area and the prohibited area. Sampling station WZ 40 is also located in Pulpit Harbor on the north shore of Pulpit Harbor, near a small bridge. Although this site meets approved standards, the area cannot be opened on a year round basis due to the number of cruising boats that frequent the harbor during the summer months. The area cannot be reclassified until an assessment has been done on the potential impact to the water quality from the mooring field.



Figure 4. Growing Area WZ P90 Scores for Approved Stations (Vinalhaven), expressed as a percent of approved standard, 2007-2009

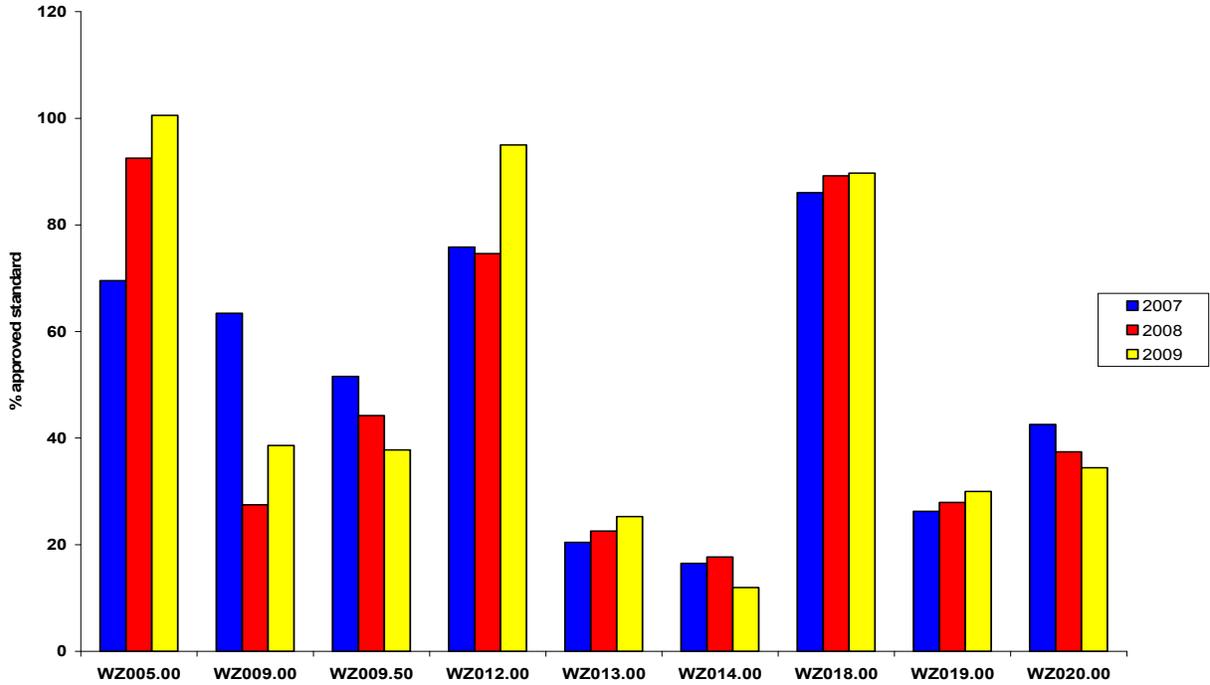


Figure 5. Growing Area WZ P90 Scores for Approved Stations (North Haven), expressed as a percent of approved standard, 2007-2009

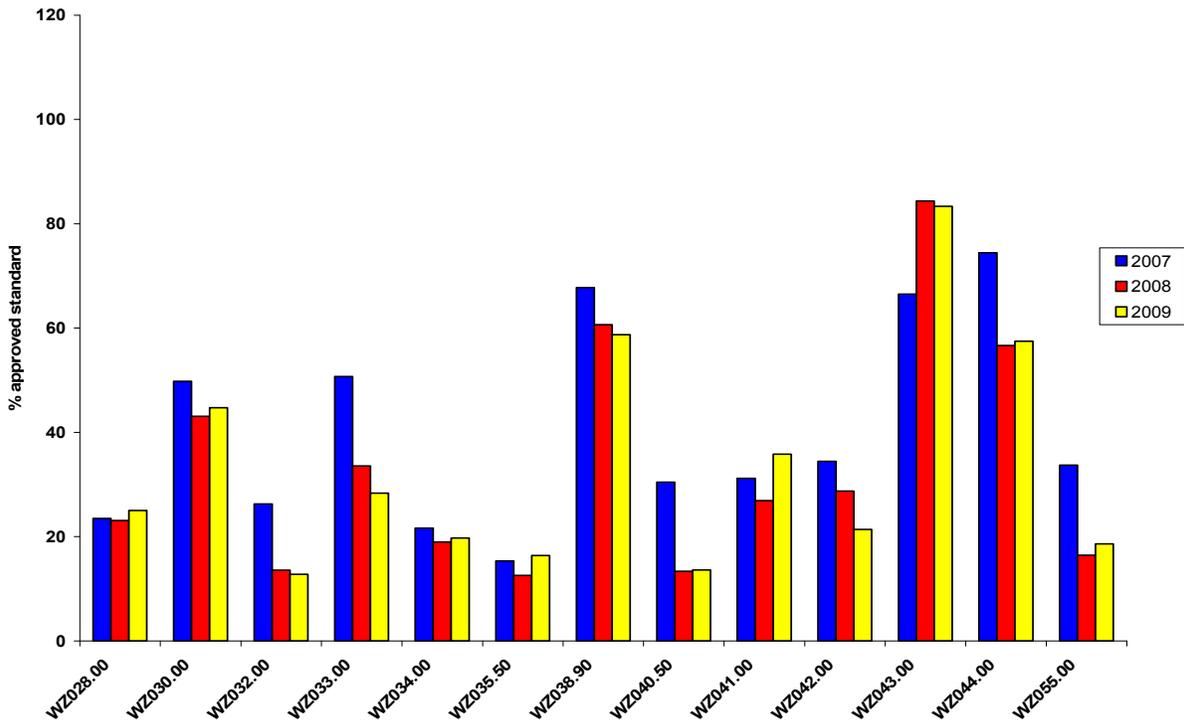




Figure 6. Growing Area WZ P90 Scores for Restricted Stations (Vinalhaven), expressed as a percent of restricted standard, 2007-2009

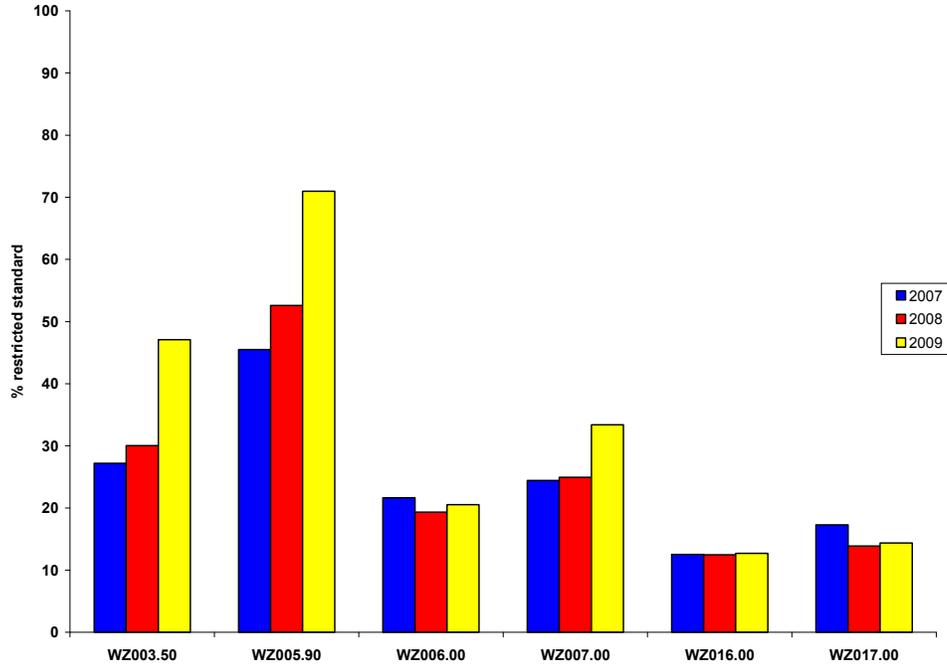


Figure 7. Growing Area WZ P90 Scores for Restricted Stations (North Haven), expressed as a percent of restricted standard, 2007-2009

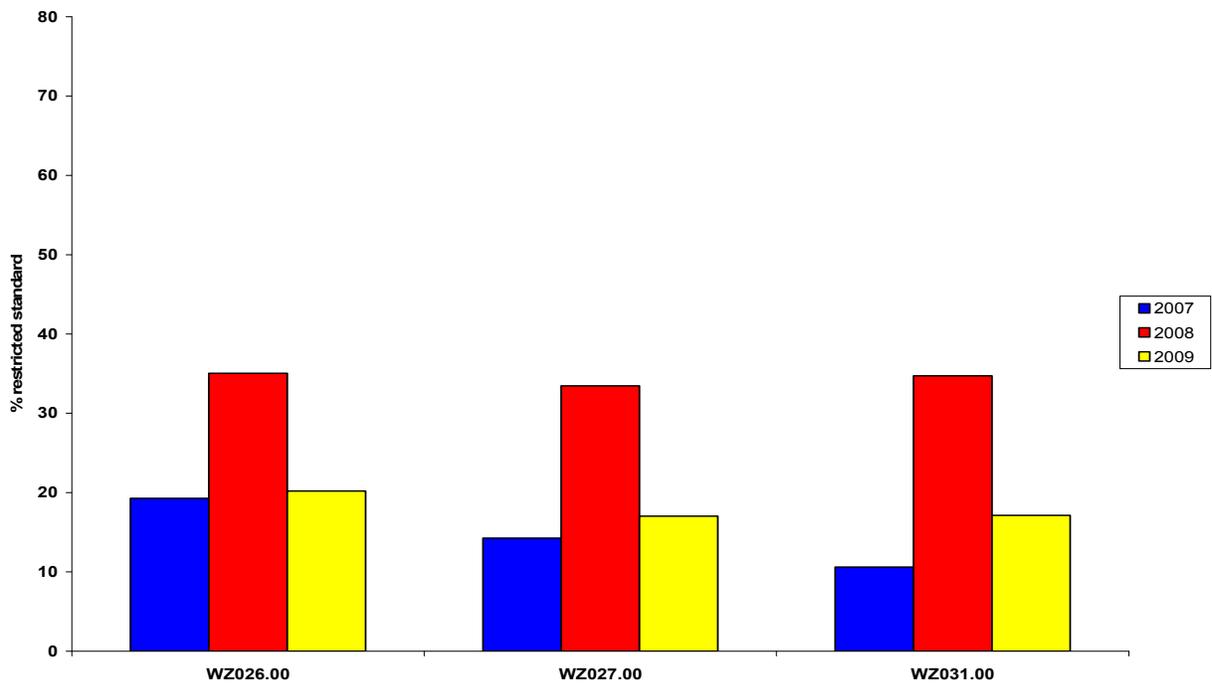




Figure 8. Growing Area WZ P90 Scores for Prohibited Stations (Vinalhaven), expressed as a percent of approved standard, 2007-2009

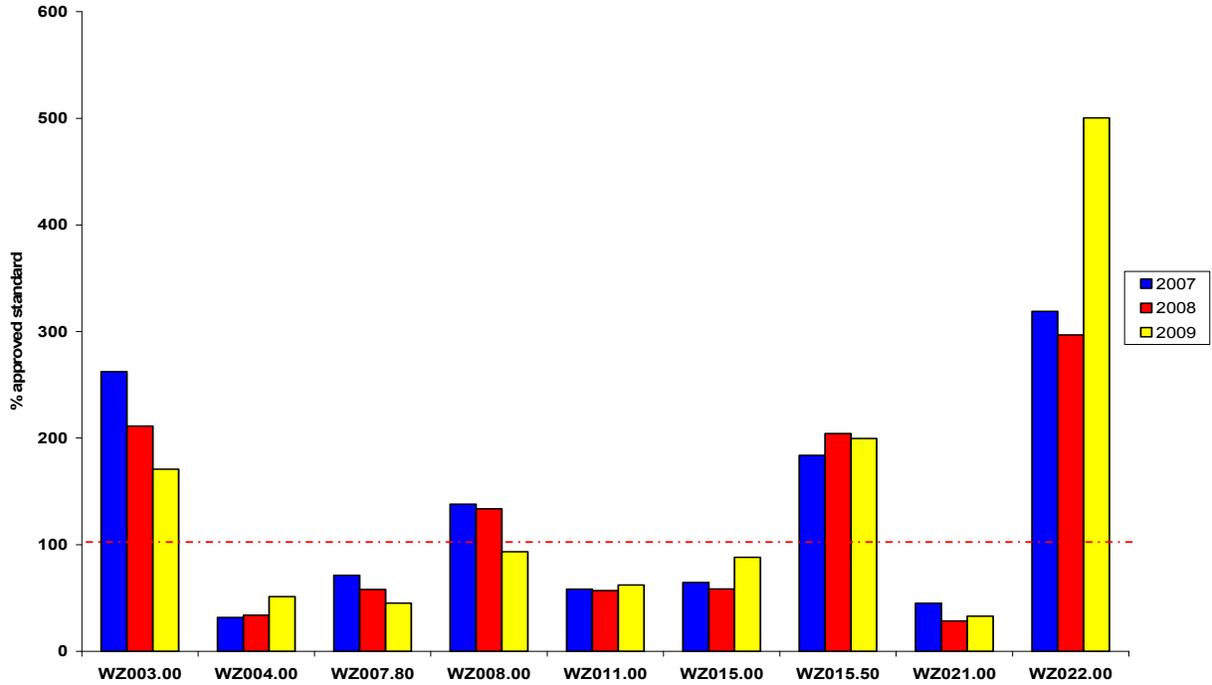
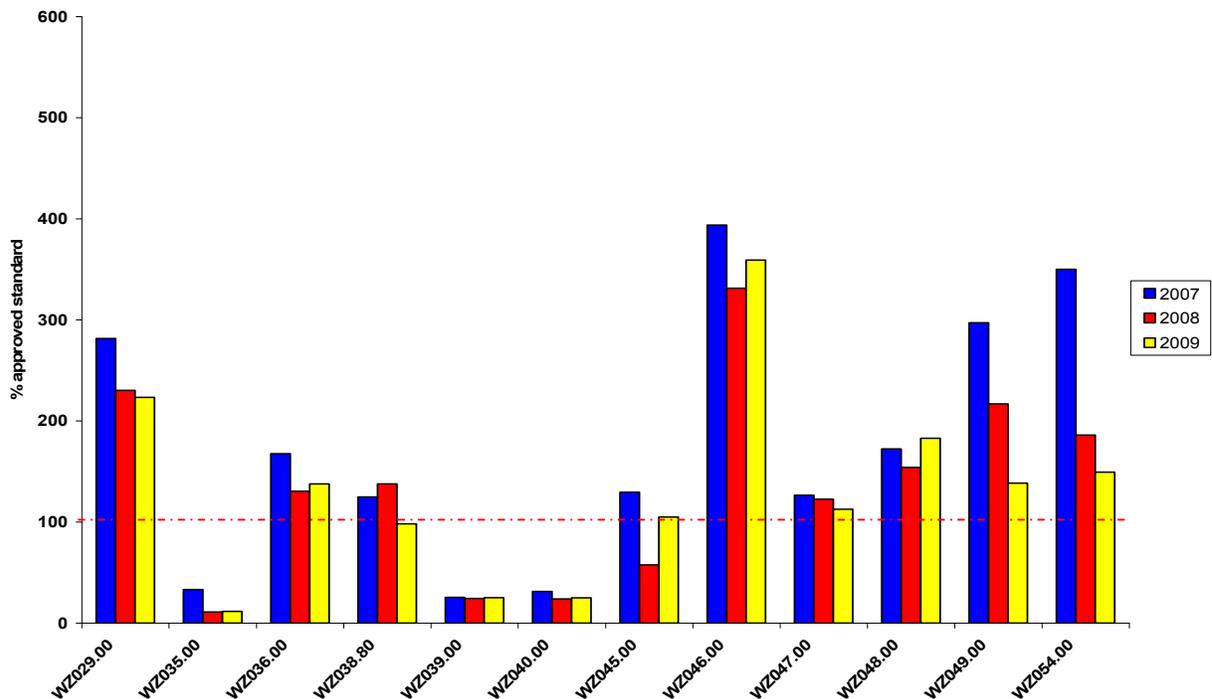


Figure 9. Growing Area WZ P90 Scores for Prohibited Stations (North Haven), expressed as a percent of approved standard, 2007-2009





## Recommendations for Upward Classification

### Shipwreck Cove

Station WZ 11 is located on a large marsh at the eastern end of Shipwreck Cove on Vinalhaven (Figure 2). There are no dwellings or point sources in the vicinity. The closest dwelling is approximately a half a mile away from the sample site at the southern tip of Zeke's Point. An overboard discharge was removed from this property in 2004 and replaced with an in-ground septic system. The P90 scores for WZ 11 have remained below the approved standard from 2007 through 2009 (Figure 8). The rainfall and season impact table (Table 3) shows a seasonal impact during the summer months in 2005 and 2006. Three scores of 93 occurred during the months of July and August. One of the scores occurred following 1.7 inches of rainfall. The data for the months of July and August from 2007 to 2009 is hi-lighted in green. These scores are quite low (less than or equal to 6 FC/100ML). All of the data from September 2006 to the present is low with the most elevated score being a 20 (FC/100ML). It is proposed that WZ 11 be upgraded from prohibited to approved. The new closure line should be drawn from the tip of Hopkins Point to the northwest tip of Zeke Point and extending northeast to the southern tip of Fish Point, North Haven.

The tidal assessment for station WZ11 (Table 4) shows no adverse impact at ebb or flood tide stages.

**Table 3. Seasonal and Rainfall assessment of P90 scores for Station WZ 11, 2003-2009**

Rain Range	Date	Rainfall 72 Hours + Date of Sample	Tide	Salin %	Strat	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Incomplete*	26-Jul-06	1.7	F	28	R							93					
	15-Aug-06	0.33	F	29	R								93				
	19-Oct-09	0.85	H	30	R										13		
00-Jan-00	17-Apr-03	0	H	27	R				2.9								
	20-Apr-04	0	HF	31	R				2.9								
	15-Sep-04	0	HF	30	R									2.9			
	21-Jul-05	0	H	30	R							93					
	26-Jun-07	0	E	30	R						1.9						
	29-Aug-07	0	HF	32	R								6				
	03-Oct-07	0	F	31	R										20		
	29-Jan-08	0	F	31	R	1.9											
	20-May-08	0	HE	28	R					1.9							
	16-Jul-08	0	E	30	R							1.9					
	02-Sep-08	0	H	32	R									1.9			
	03-Nov-08	0	F	32	R											1.9	
	26-May-09	0	H	30	R					2							
	21-Sep-09	0	F	32	R										2		
.01-.50	06-Oct-04	0.1	LE	30	R										2.9		
	22-Sep-05	0.13	F	30	R									3.6			



Rain Range	Date	Rainfall 72 Hours + Date of Sample	Tide	Salin %	Strat	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	13-Aug-03	0.14	F	31	R								9.1				
	06-Aug-07	0.18	F	30	R								1.9				
	13-Sep-06	0.2	F	31	R									1.9			
	24-Apr-06	0.21	E	30	R				2.9								
	25-Sep-03	0.25	HE	30	R									15			
	15-Jul-03	0.29	F	30	R								2.9				
	20-Jul-09	0.41	E	28	R								2				
.51-1.00	04-Oct-06	0.53	E	30	R										7.3		
	20-Jun-05	0.54	HE	30	R						2.9						
	12-May-09	0.54	HF	29	R					1.9							
	16-May-07	0.56	H	28	R					1.9							
	03-Aug-09	0.73	E	28	R								2				
	29-May-03	0.76	H	30	R					2.9							
	19-Jul-04	0.96	F	32	R								7.3				
1.0-1.50	17-Aug-04	1.07	HF	31	R								2.9				
	27-Jun-06	1.12	H	28	R						23						
	16-Jun-03	1.14	F	31	R						2.9						
	24-May-04	1.14	F	30	R					3.6							
	18-Jun-08	1.18	HF	30	R						1.9						
1.51-2.00	31-Aug-05	1.54	HE	30	R								3.6				
	25-Apr-05	1.57	H	25	R				3.6								
3.01-3.50	25-May-05	3.11	F	30	R					2.9							

\* indicates less than 72 hours worth of rainfall data

**Table 4. Tidal Assessment of P90 scores for Station WZ 11, 2003-2009**

Station	Class	Ebb Tide						
		Count	MFCCount	GM	SDV	MAX	P90	Appd_Std
WZ011.00	P	11	6	3.1	0.28	15	7.3	38
		Flood Tide						
		Count	MFCCount	GM	SDV	MAX	P90	Appd_Std
		30	13	4.8	0.52	93	22.9	40

An additional assessment was completed to determine the effect of precipitation (cumulative rainfall of 0.5 inches or more within 3 days of collection and on sample day, excluding flood events) on the geometric mean and P90 scores (Table 5). For this assessment, all SRS data were considered. Using data from 2003 through 2009, station WZ11 met the geometric mean standard using data collected after >0.5 inches of cumulative rainfall. This station also met the geometric mean standard when using data collected after >1.0 inches of cumulative rainfall (Table 7). This assessment was repeated using a more limited dataset, restricted to more recent data collected over the past five years (2005-2009), which corresponds to the period used for classification (last 30 data points); the same rainfall parameters were used (Tables 6 and 8). Using a dataset restricted to more recent fecal scores, station WZ 11 met both the geometric



mean and the P90 standards for greater than or equal to 0.5 inches of rainfall; but exceeded the P90 standard for greater than or equal to 1.0 inches of rainfall (Table 8). Although station WZ 11 exceeded the P90 standard in this dataset it did not exceed the geometric mean. This dataset contained the least amount of samples of all of the datasets.

**Table 5. Cumulative Rain of  $\geq 0.5$ " 2003-2009**

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WZ011.00	P	17	6	4.6	0.45	93	17.7	41	241	5/29/2003

**Table 6. Cumulative Rain of  $\geq 0.50$ " 2005-2009**

Rainfall within 1-4 Days										
Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WZ011.00	P	12	6	5	0.53	93	24.8	38	221	4/25/2005

**Table 7. Cumulative Rain of  $\geq 1.0$ " 2003-2009**

Rainfall Within 1-4 Days										
Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WZ011.00	P	9	1	5.5	0.55	93	29.1	46	280	6/16/2003

**Table 8. Cumulative Rain of  $\geq 1.0$ " 2005-2009**

Rainfall within 1-4 Days										
Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WZ011.00	P	6	1	7.3	0.65	93	53.1	45	270	4/25/2005

The proposed closure line for the Zeke's Point area should go from the tip of Hopkins Point, Vinalhaven to the northern tip of Zeke's Point, Vinalhaven and continue to the southern tip of Fish Point, North Haven (Figure 10). The line is drawn this way to provide plenty of room for the closure zone around the licensed overboard discharges on Iron Point, North Haven (required closure zone of 3.4 acres for all three OBDs). The proposed closure zone area would be 2,384 acres which covers both shores of the Fox Islands Thorofare and Waterman Cove (west of Fish Point).

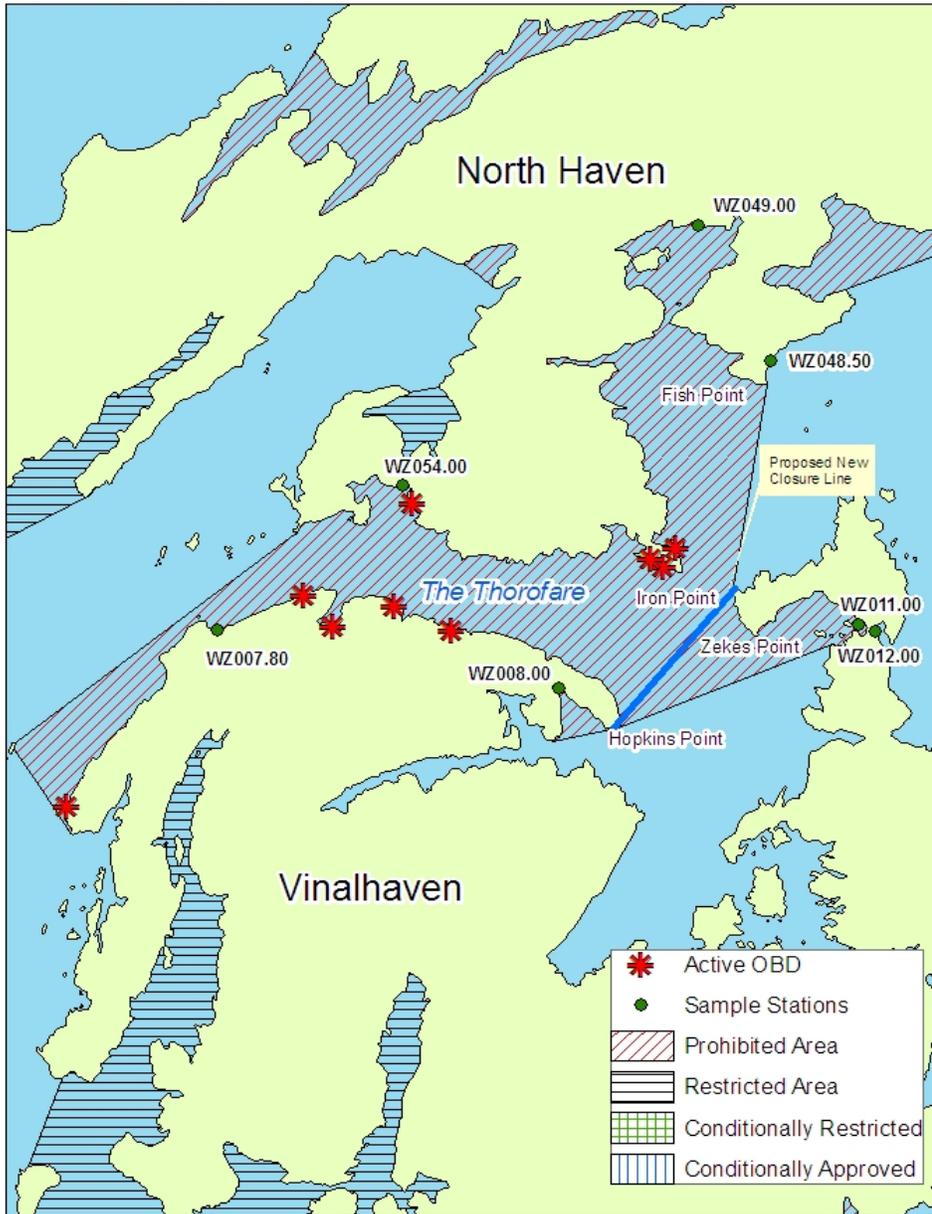


Figure 10. Proposed New Closure Line in Pollution Area 30-I



Maine Department of Marine Resources  
*Proposed New Closure Line*

4/29/10





**Pulpit Harbor, North Haven**

Station WZ 38.80 is located at the eastern end of Pulpit Harbor in North Haven. Due to the remediation of three malfunctioning septic systems, (two in 2006 and one in 2004), WZ 38.80 is no longer in the vicinity of any known pollution sources. A rainfall and seasonal assessment has shown that Station WZ 38.80 meets the approved standard between December and May (Table 9). P90 scores during the period for 2007 through 2009 meet the approved standard (Figure 11). Water quality is impacted within the summer and fall months (June to November). Some of these elevated scores may be attributed to the malfunctioning septic systems that weren't fixed until 2004 and 2006. There is a score in August of 2009 that is due to unknown causes (54 FC/100ML) and a score of 92 FC/100ML in November of 2008 that was taken following 1.88 inches of rain. It is recommended that the area starting at WZ 38.80 and westward to the Pulpit Harbor Bridge (WZ 39) be reclassified from prohibited to conditionally approved based on season, with an open season from December 1<sup>st</sup> to May 31<sup>st</sup>. The proposed upward classification would not take effect until December 2010, after the shoreline survey of the immediate area has been updated to confirm that no actual pollutions are present in the area. Although WZ 39 meets the approved standard (Figure 9), it is not being recommended for upward classification. This station is located on the southwest side of the Pulpit Harbor Bridge, which is being used as a natural boundary for the closure line.

**Table 9. Seasonal and Rainfall Assessment for Station WZ 38.80; Proposed Closed Status is Shaded in Gray**

Rain Range	Rain 72 Hours + Date of Sample	Date Sampled	SAL %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
No Data	No Data	22-Jun-01	30						23						
		30-May-06	25					7.3							
		09-Aug-06	22									93			
		11-Dec-07	18												1.9
0	0	19-Sep-01	30									43			
	0	28-May-02	17					3.6							
	0	30-Jun-03	31						43						
	0	21-Apr-05	30				43								
	0	31-Jan-07	28	1.9											
	0	27-Mar-07	2			1.9									
	0	25-Sep-07	30									40			
	0	26-Nov-07	20											13	
	0	30-Jan-08	6	1.9											
	0	09-Apr-08	22				1.9								
	0	19-May-08	25					1.9							
	0	03-Sep-08	31									2			
	0	03-Nov-08	30											2	
	0	26-May-09	22					1.9							
0	22-Sep-09	28									16				
0.01-0.50	0.02	03-Aug-04	30								9.1				
	0.02	27-Sep-04	28									43			



Rain Range	Rain 72 Hours + Date of Sample	Date Sampled	SAL %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	
0.03-0.46	0.03	27-Aug-03	30								240					
	0.03	07-Jul-05	30							2.9						
	0.03	11-Jun-08	29						8							
	0.04	05-Aug-09	14								54					
	0.14	22-Aug-05	30								23					
	0.18	21-Jan-01	31	2.9												
	0.18	23-May-01	30					2.9								
	0.2	22-Jul-02	30								3.6					
	0.2	30-Aug-04	26									43				
	0.2	06-Jun-05	28							2.9						
	0.2	26-Mar-08	12			1.9										
	0.22	08-Oct-08	18											14		
	0.24	14-Nov-07	14												14	
	0.26	17-Jan-01	26	23												
	0.29	21-Aug-01	30									43				
	0.29	29-Jul-03	31								2.9					
	0.3	23-Jul-01	30								93					
	0.31	27-Aug-02	32									3.6				
	0.32	24-Jun-02	22							93						
	0.33	15-Aug-06	26									3.6				
0.34	23-Apr-03	30						9.1								
0.41	20-Jul-09	22								4						
0.42	09-Mar-09	6			1.9											
0.46	21-Jul-08	28								8						
0.51-1.00	0.53	18-Jul-07	31							2						
	0.54	12-May-09	18					1.9								
	0.56	04-Feb-01	15		3.6											
	0.57	07-Jan-01	16	3.6												
	0.63	10-Sep-07	32									11				
	0.63	09-Oct-07	32										25			
	0.64	06-Apr-04	12				2.9									
	0.65	20-Sep-06	28									102				
	0.78	28-Apr-03	21				3.6									
	0.83	06-Aug-08	28								1.9					
0.84	27-Feb-08	8		1.9									20			
0.86	23-Oct-07	30										2.9				
0.88	29-Sep-05	31														
0.9	15-Jul-04	30								6.2						
1.01-1.50	1.05	02-Jan-01	4	3.6												
	1.05	03-Jan-01	5	2.9												
	1.12	27-Jun-06	18						43							
	1.12	01-Dec-08	20												72	



Rain Range	Rain 72 Hours + Date of Sample	Date Sampled	SAL %	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
	1.26	07-Feb-01	21		2.9										
	1.26	06-May-04	30					2.9							
	1.38	09-Dec-03	31												3.6
	1.38	29-Sep-03	31									43			
	1.39	12-Mar-08	4			2									
	1.39	21-May-07	10					6							
1.51-2.00	1.65	16-Jan-08	1	2											
	1.7	26-Jul-06	15							43					
	1.72	29-Apr-02	30				2.9								
	1.75	27-May-03	25					43							
	1.85	09-May-05	27					2.9							
	1.88	17-Nov-08	24											92	
	1.96	19-Sep-02	30									43			

The P90 score for this station was calculated based on a proposed open period of December 1 – May 31 for the years 2000-2009 (Table 10). The years 2000-2009 were used to assure that there were thirty samples during the proposed open period.

**Table 10. Station WZ 38.8, Proposed Open Status, December 1 through May 31, 2001-2009**

Station WZ 38.8 P90 2000-2009 December 1- May31										
Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WZ038.80	P	30	15	3.6	0.42	72	12.9	38	221	1/21/2001

Rainfall assessments were completed to determine the effect of precipitation (cumulative rainfall of 0.5 inches or more within 3 days of collection and on sample day, (excluding flood events) on the geometric mean and P90 scores (Table 10). For this assessment, all SRS, and extra data, (excluding flood data) from samples specifically scheduled to target precipitation events during the proposed open period (December 1 – May 31) were considered. Using data from 2000 through 2009, station WZ38.8 met the geometric mean standard using data collected after >0.5 inches of cumulative rainfall. This station also met the geometric mean standard when using data collected after >1.0 inches of cumulative rainfall (Table 11). This assessment was repeated using a more limited dataset, restricted to more recent data collected over the past five years (2005-2009). The same rainfall parameters were used (Tables 12 and 13). Using a dataset restricted to more recent fecal scores, station WZ 38.8 met both the geometric mean and the P90 standards for  $\geq 0.5$  inches of rainfall and for  $\geq 1.0$  inches of rainfall.

**Table 11. Rainfall Assessment Station WZ 38.8  $\geq 0.5$ " rain 2000-2009**

.5" Rain_P90 1-4 days 12/1-5/31 2000-2009										
Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WZ038.80	P	20	7	4.4	0.47	72	18.1	41	242	12/20/2000



**Table 12. Rainfall Assessment Station WZ 38.8  $\geq$  1.0" Rainfall 2000-2009**

1.0"Rain_P90 1-4 days 12/1-5/31 2000-2009										
Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WZ038.80	P	14	5	5.3	0.54	72	27.5	41	241	12/20/2000

**Table 13. Rainfall Assessment Station WZ 38.8  $\geq$  .5" Rain 2005-2009**

.5" Rain_P90 1-4 days 12/1-5/31 2005-2009										
Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WZ038.80	P	8	7	3.6	0.54	72	19.3	32	175	5/9/2005

**Table 14. Rainfall Assessment Station WZ 38.8  $\geq$  1.0" Rain 2005-2009**

1.0"Rain_P90 1-4 days 12/1-5/31 2005-2009										
Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WZ038.80	P	6	5	4.6	0.61	72	29.4	33	180	5/9/2005

The tidal assessments for station WZ38.8 (tables 15 and 16) show no tidal impact on the P90 score during the proposed open period at ebb or flood tide stages for the years 2000–2009 (table 15) and 2005-2009 (table 16).

**Table 15. Tidal Assessment of P90 scores for Station WZ 38.80, 2000-2009**

Station	Class	Ebb Tide 12/1-5/31						
		Count	MFCCount	GM	SDV	MAX	P90	Appd_Std
WZ038.80	P	20	7	4	0.43	43	14.9	41
		Flood Tide 12/1-5/31						
		Count	MFCCount	GM	SDV	MAX	P90	Appd_Std
		18	8	4.4	0.48	72	18.6	39

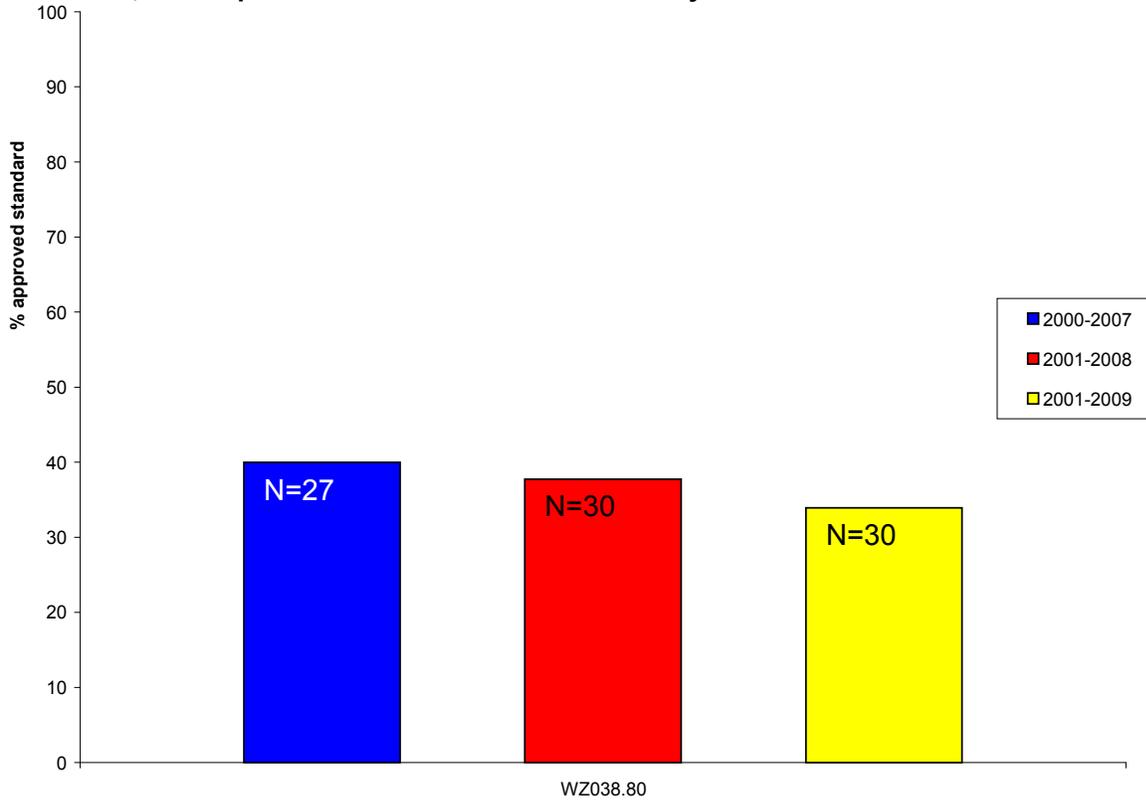
**Table 16. Tidal Assessment of P90 scores for Station WZ 38.80, 2005-2009**

Station	Class	Ebb Tide 12/1-5/31						
		Count	MFCCount	GM	SDV	MAX	P90	Appd_Std
WZ038.80	P	8	7	2.8	0.47	43	11.9	32
		Flood Tide 12/1-5/31						
		Count	MFCCount	GM	SDV	MAX	P90	Appd_Std
		10	8	3.6	0.5	72	16.8	33

A P90 trend chart was completed for the proposed open period (December 1- May 31) using data from the years 2000-2009. The number of samples collected during the proposed open period for each year is shown in the column for each of the last three years. The trend chart shows declining scores (improving water quality) for the last two years. In 2007, this site was under 50% of the approved standard.



Figure 11. P90 trends for Station WZ 38.80, expressed as a percentage of approved standard, 2000-2009, for the period between December 1 and May 31



### Crabtree Point, North Haven

The small prohibited area northeast of Crabtree Point (North Haven) is located in Pollution Area 30-I (Figure 11). This area is recommended for reclassification from prohibited to approved, due to the remediation of a malfunctioning septic system. The system was identified during the 2003 shoreline survey and was fixed in 2008. There are no active water sampling stations in the prohibited area. The nearest station is WZ 33 to the south, which is an approved station and currently meeting the approved standard. WZ 33 has shown good water quality from 2007 to 2009 (Figure 12). With the correction of the malfunction and sustained water quality at WZ 33, it is recommended that the prohibited classification be upgraded to approved.



Figure 12. P90 Trend for Station WZ33, expressed as a percentage of the approved standard, 2007-2009

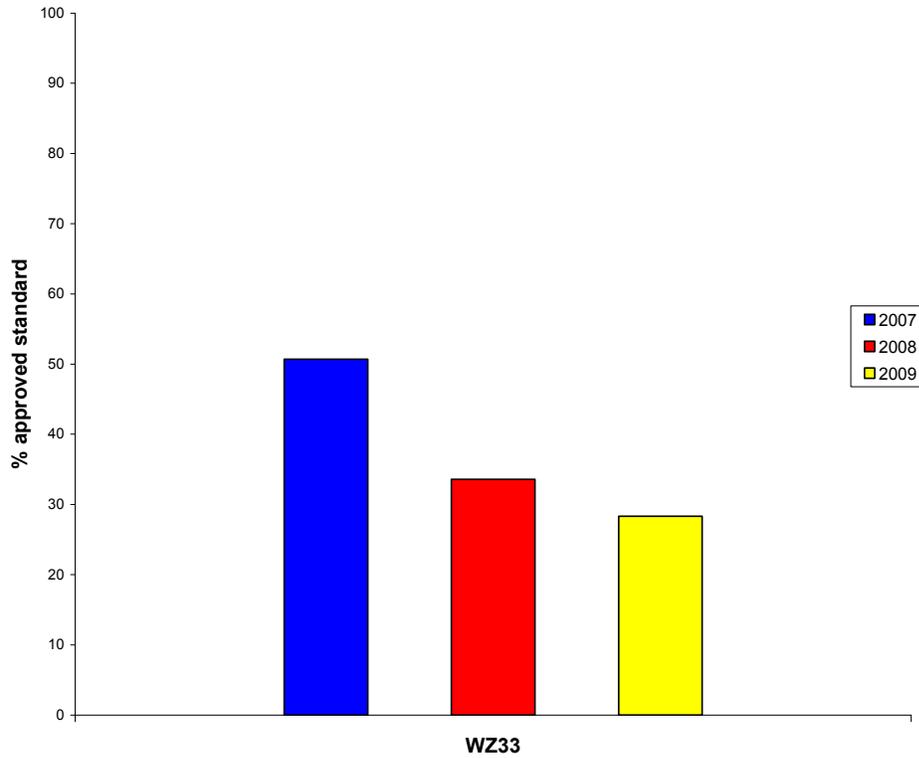




Figure 13. Pollution Area 30-I, with Proposed Classification Change



### Maine Department of Marine Resources

#### Pollution Area 30-I (North Haven)

Proposed Classification Upgrade To Approved

4/8/10





## Shoreline Survey Activity

Shoreline survey work on Vinalhaven island was started in 2009. A summary of the Vinalhaven work completed to date is shown in Table 17. In Table 17 # actual refers to the number of actual pollution sources identified and # questionable refers to the number of questionable systems identified. An actual pollution source is any system that is determined capable of degrading the water quality in the immediate area. A questionable system is a system that appeared to be functioning at the time of the survey but could malfunction in the near future due to its age or design. Survey work for the entire island will be completed in 2010, and a new sanitary survey report will be written following the completion of the 2010 survey. On North Haven shoreline survey activity was limited to a drive through survey on May 12, 2009. Additionally, discussions with staff members from the North Haven town office resulted in the office providing, an updated listing of all septic improvements from 2003-2009; these upgrades will be discussed in the next Sanitary Survey report for area WZ.

**Table 17. Vinalhaven 2009 Shoreline Survey Activity**

Area	Date Surveyed	# Properties Surveyed	# Vacant	# Actual	# Questionable
Perry Creek	9/15/2009	45	17		
Mill River	9/16/2009	43	16		1
Mill River	9/17/2009	26	5		
Carver Cove	9/18/2009	49	20	1	1
Vinal Cove	9/22/2009	38	12	1	2
Seal Bay	9/24/2009	32	14		1
Arey Cove	9/25/2009	31	8		
The Basin	10/1/2009	17	8		
Browns Head Rd.	10/20/2009	10	2		1
	<b>Total</b>	<b>291</b>	<b>90</b>	<b>2</b>	<b>6</b>

## Aquaculture/Wet Storage Activity

There are no wet storage facilities in shellfish growing area WZ.

Aquaculture activity in Growing Area WZ for 2009 consists of three active lease sites. Two of these leases are located on Vinalhaven, and are for raising eastern oysters (*Crassostrea virginica*) using the suspended method. These leases will expire in 2017.

The other lease site is located on North Haven and is also used to cultivate *Crassostrea virginica* on the bottom and suspended. This lease expires in 2013.

Additional information on these lease sites/LPAs can be found at the DMR website:

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



## Classification Changes

Three areas in Growing Area WZ are recommended for upward classification:

Station WZ 11 will be upgraded from prohibited to approved, and the closure line will be redrawn to reflect this change. The new line should be drawn from the tip of Hopkins Point to the northwest tip of Zeke Point and extending northeast to WZ 48.5, located on Fish Point, North Haven.

The area starting at WZ 38.80 and westward to the Pulpit Harbor Bridge (WZ 39) should be reclassified from prohibited to conditionally approved in the open status from December 1<sup>st</sup> to May 31<sup>st</sup>. The proposed upward classification will not take effect until December 2010, after the shoreline survey of the immediate area has been updated.

The pollution area in legal description 30-I North Haven Island, (Section C) described as "inside of a line beginning at a red post located 1000 yards northeast of Crabtree Point, extending south to Red Nun #24, then extending north to a red post 1300 yards northeast of Crabtree Point" (Figure 11) is recommended for reclassification from prohibited to approved, due to the remediation of a malfunctioning septic system.

No areas in WZ require a downgrade in classification at this time.

## Summary

Water quality in Growing Area WZ has shown some variability over the past few years. Both islands had deteriorating water quality (stations classified as approved) at five approved sites and improving water quality at three approved sites in 2009. On North Haven, four sites had little or no change in water quality while Vinalhaven had one approved station with little or no change in water quality. Overall, Vinalhaven has shown greater variability in water quality scores over the past few years. It is likely that the wet weather and increased run-off from the land during the months of June and July contributed to some of this variability. Improved water quality and the remediation of pollution sources led to the recommendation for upward classification of three areas in WZ. Continued improvements in water quality and pollution source remediation may lead to further upgrades. The shoreline survey of Vinalhaven, which started in 2009, will be completed in 2010. A new survey of North Haven will be started in 2010.

## Recommendation for Future Work

During the 2010 review period, shoreline survey work will continue, focusing on finishing the Vinalhaven survey and beginning on North Haven. Stream sampling will also be done during the 2010 surveys of both islands.



## References

U.S. Census Bureau. (2000) *Population Finder*. Retrieved April 5, 2009, from <http://www.census.gov/>



## 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 = 90<sup>th</sup> percentile

APPD\_STD = the 90<sup>th</sup> 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 90<sup>th</sup> percentile, at or below which the station would meet restricted criteria.

Min\_Date= Date of least recent score used for calculating the geometric mean and P90.



**Appendix B. Growing Area WZ, 2009 SRS data**

Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
WZ003.00	3/9/2009	AB	H	CL	1	32	R		C	P	<2
	5/12/2009	MLP	F	NE	14	27	R		C	P	2
	5/26/2009	EXT	F	NW	13	25	R		C	P	4
	7/20/2009	FP	HE	W	18	24	R		C	P	22
	8/3/2009	FP	H	CL	20	18	R		C	P	26
	9/21/2009	EXT	H	CL	16	28	R		C	P	27
WZ003.50	5/12/2009	MLP	F	NE	13	8	R		C	P	<2
	5/26/2009	EXT	F	NW	17	12	R		C	P	8
	7/20/2009	FP	HE	W	22	6	R		C	P	50
	8/3/2009	FP	H	CL	21	4	R		C	P	140
	9/21/2009	EXT	H	CL	18	16	R		C	P	90
	10/21/2009	FP	F	CL	9	9	R		C	P	27
WZ003.70	5/12/2009	MLP	F	NE	15	6	R		O	R	<2
	5/26/2009	EXT	F	NW	18	12	R		O	R	12
	7/20/2009	FP	HE	CL	24	4	R		O	R	44
	8/3/2009	FP	H	CL	22	6	R		O	R	64
	9/21/2009	EXT	HF	SW	18	15	R		O	R	72
	10/21/2009	FP	F	CL	9	12	R		O	R	6
WZ004.00	3/9/2009	AB	HE	CL	2	31	R		C	P	<2
	5/12/2009	MLP	F	NE	14	30	R		C	P	<2
	5/26/2009	EXT	F	NW	13	30	R		C	P	<2
	7/20/2009	FP	HE	W	15	28	R		C	P	8
	8/3/2009	FP	HE	CL	17	30	R		C	P	158
	9/21/2009	EXT	H	CL	16	32	R		C	P	2
WZ004.30	3/9/2009	AB	HE	S	1	31	R		C	P	<2
	5/12/2009	MLP	F	NE	9	31	R		C	P	<2
	5/26/2009	EXT	F	NW	14	30	R		C	P	<2
	7/20/2009	FP	HE	CL	15	28	R	W	C	P	29
	8/3/2009	FP	H	CL	17	30	R		C	P	132
	9/21/2009	EXT	H	CL	14	32	R		C	P	58
WZ005.00	3/9/2009	AB	HE	CL	1	31	R		O	A	<2
	5/12/2009	MLP	F	NE	12	31	R		O	A	4
	5/26/2009	EXT	F	CL	16	31	R		O	A	6
	7/20/2009	FP	HE	W	15	30	R		O	A	<2
	8/3/2009	FP	HE	S	16	31	R		O	A	6
	9/21/2009	EXT	H	CL	14	32	R		O	A	<2
WZ005.90	3/9/2009	AB	HE	CL	1	30	R		O	R	<2
	5/12/2009	MLP	F	CL	9	30	R		O	R	<2
	5/26/2009	EXT	F	CL	13	31	R		O	R	<2
	7/20/2009	FP	E	SW	17	28	R	O	O	R	72
	8/3/2009	FP	HE	S	18	30	R		O	R	400
	9/21/2009	EXT	HF	CL	16	32	R		O	R	2
WZ006.00	3/9/2009	AB	E	CL	1	31	R		O	R	<2



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	5/12/2009	MLP	F	CL	9	30	R		O	R	<2
	5/26/2009	EXT	HF	CL	14	31	R		O	R	<2
	7/20/2009	FP	E	SW	16	27	R		O	R	40
	8/3/2009	FP	HE	S	20	30	R		O	R	8
	9/21/2009	EXT	HF	CL	18	32	R		O	R	20
WZ007.00	3/9/2009	AB	E	CL	2	31	R		O	R	<2
	5/12/2009	MLP	F	NE	9	30	R		O	R	<2
	5/26/2009	EXT	HF	NW	13	30	R		O	R	<2
	7/20/2009	FP	E	SW	16	27	R		O	R	35
	8/3/2009	FP	E	S	20	25	R		O	R	46
WZ007.40	9/21/2009	EXT	HF	SW	16	32	R		O	R	13
	3/9/2009	AB	E	CL	1	25	R		O	R	<2
	5/12/2009	MLP	HF	CL	18	28	R		O	R	<2
	5/26/2009	EXT	HF	CL	17	30	R		O	R	<2
	7/20/2009	FP	E	SW	23	18	R		O	R	31
WZ007.80	8/3/2009	FP	E	CL	22	5	R		O	R	140
	9/21/2009	EXT	F	CL	19	31	R		O	R	4
	5/12/2009	MLP	F	NE	11	29	R		C	P	<2
	5/26/2009	EXT	HF	CL	16	30	R		C	P	<2
	7/20/2009	FP	E	SW	17	28	R		C	P	2
WZ008.00	8/3/2009	FP	E	CL	18	30	R		C	P	3.6
	9/21/2009	EXT	HF	CL	15	30	R		C	P	<2
	10/19/2009	FP	F	NW	7	31	R	P	C	P	260
	3/9/2009	AB	E	CL	0	30	R		C	P	<2
	5/12/2009	MLP	F	CL	12	29	R		C	P	<2
WZ009.00	5/26/2009	EXT	HF	CL	14	30	R		C	P	<2
	7/20/2009	FP	E	SW	15	28	R		C	P	<2
	8/3/2009	FP	E	CL	18	30	R		C	P	2
	9/21/2009	EXT	F	CL	16	32	R		C	P	46
	5/12/2009	MLP	F	N	14	29	R		O	A	<2
WZ009.50	5/26/2009	EXT	H	W	19	30	R		O	A	<2
	7/20/2009	FP	E	SW	25	28	R		O	A	8
	8/3/2009	FP	E	CL	24	27	R		O	A	13
	9/21/2009	EXT	F	CL	15	32	R		O	A	8
	10/19/2009	FP	HF	N	8	31	R	P	O	A	96
WZ010.50	5/12/2009	MLP	F	CL	14	29	R		O	A	<2
	5/26/2009	EXT	H	CL	14	30	R		O	A	<2
	7/20/2009	FP	E	SW	20	28	R		O	A	2
	8/3/2009	FP	E	CL	21	30	R		O	A	4
	9/21/2009	EXT	F	CL	15	32	R		O	A	<2
WZ010.50	10/19/2009	FP	HF	N	8	30	R	P	O	A	70
	5/12/2009	MLP	HF	NW	11	30	R		O	A	<2
	5/26/2009	EXT	H	W	15	29	R		O	A	6
WZ010.50	7/20/2009	FP	E	SW	17	28	R		O	A	<2
	8/4/2009	LSM	H	CL	16	30	R		O	A	<2



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	9/21/2009	EXT	F	CL	15	31	R		O	A	<2
	10/19/2009	FP	HF	NW	9	32	R	P	O	A	8
WZ011.00	5/12/2009	MLP	HF	CL	14	29	R		C	P	<2
	5/26/2009	EXT	H	W	18	30	R		C	P	2
	7/20/2009	FP	E	S	17	28	R		C	P	2
	8/3/2009	FP	E	CL	20	28	R		C	P	2
	9/21/2009	EXT	F	CL	15	32	R		C	P	2
	10/19/2009	FP	H	N	9	30	R	P	C	P	13
WZ012.00	5/12/2009	MLP	HF	CL	14	29	R		O	A	<2
	5/26/2009	EXT	H	CL	15	30	R		O	A	4
	7/20/2009	FP	E	S	17	28	R		O	A	6
	8/3/2009	FP	E	CL	18	26	R		O	A	86
	9/21/2009	EXT	F	CL	15	32	R		O	A	<2
	10/19/2009	FP	H	CL	11	32	R	P	O	A	10
WZ013.00	5/13/2009	FP	F	CL	8	29	R		O	A	<2
	5/27/2009	MLP	F	S	10	29	R		O	A	<2
	7/20/2009	FP	E	S	18	26	R		O	A	2
	8/4/2009	LSM	H	CL	16	28	R		O	A	<2
	9/22/2009	MLP	F	NE	14	31	R		O	A	<2
	10/19/2009	FP	H	CL	10	32	R	P	O	A	18
WZ014.00	5/13/2009	FP	F	CL	16	30	R		O	A	<2
	5/27/2009	MLP	F	S	12	30	R		O	A	<2
	7/21/2009	FP	H	CL	15	28	R		O	A	<2
	8/4/2009	LSM	H	CL	19	29	R		O	A	<2
	9/22/2009	MLP	F	E	17	30	R		O	A	<2
	10/19/2009	FP	H	N	10	31	R	P	O	A	8
WZ014.50	5/13/2009	FP	F	CL	9	29	R		C	P	<2
	5/27/2009	MLP	F	S	11	30	R		C	P	2
	7/21/2009	FP	H	SE	16	28	R		C	P	6
	8/4/2009	LSM	H	CL	20	30	R		C	P	2
	9/22/2009	MLP	F	E	15	30	R		C	P	6
	10/19/2009	FP	H	N	10	30	R	P	C	P	5.5
WZ015.00	5/13/2009	FP	F	CL	15	26	R		C	P	<2
	5/27/2009	MLP	F	CL	14	29	R		C	P	10
	7/21/2009	FP	H	SE	15	28	R		C	P	16
	8/4/2009	LSM	HE	CL	20	29	R		C	P	10
	9/22/2009	MLP	F	NW	16	30	R		C	P	8
	10/19/2009	FP	H	N	9	26	R	P	C	P	280
WZ015.50	5/13/2009	FP	F	CL	13	29	R		C	P	<2
	5/27/2009	MLP	F	CL	11	28	R		C	P	<2
	7/21/2009	FP	H	SE	15	22	R	W	C	P	18
	8/4/2009	LSM	HE	CL	20	28	R		C	P	10
	9/22/2009	MLP	F	CL	15	31	R		C	P	2
	10/19/2009	FP	HE	N	8	20	R	P	C	P	44
WZ016.00	5/13/2009	FP	F	CL	14	30	R		O	R	<2



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	5/27/2009	MLP	F	S	11	29	R	P	O	R	<2
	7/21/2009	FP	H	CL	15	28	R		O	R	2
	8/4/2009	LSM	HE	CL	19	30	R		O	R	26
	9/22/2009	MLP	F	CL	16	30	R		O	R	<2
	10/19/2009	FP	HE	CL	10	30	R	P	O	R	76
WZ017.00	5/13/2009	FP	F	CL	15	30	R		O	R	2
	5/27/2009	MLP	F	CL	12	29	R	P	O	R	<2
	7/21/2009	FP	HE	CL	14	28	R		O	R	10
	8/4/2009	LSM	HE	CL	18	30	R		O	R	2
	9/22/2009	MLP	F	CL	16	30	R		O	R	<2
WZ017.50	10/19/2009	FP	HE	NE	10	29	R	P	O	R	35
	5/13/2009	FP	F	CL	15	28	R		O	R	<2
	5/27/2009	MLP	F	CL	12	29	R	P	O	R	<2
	7/21/2009	FP	HE	CL	13	28	R		O	R	<2
	8/4/2009	LSM	HE	CL	16	30	R		O	R	<2
	9/22/2009	MLP	F	NW	15	30	R		O	R	2
WZ018.00	10/19/2009	FP	HE	NE	10	32	R	P	O	R	16
	5/13/2009	FP	F	SE	14	25	R		O	A	2
	5/27/2009	MLP	F	S	11	29	R	P	O	A	2
	7/21/2009	FP	HE	CL	15	24	R		O	A	16
	8/4/2009	LSM	E		22	25	R		O	A	2
	9/22/2009	MLP	F	S	17	30	R		O	A	22
WZ019.00	10/19/2009	FP	HE	N	10	32	R	P	O	A	5.5
	5/13/2009	FP	F	S	13	30	R		O	A	<2
	5/27/2009	MLP	F	CL	11	30	R	P	O	A	2
	7/21/2009	FP	HE	CL	15	28	R		O	A	10
	8/4/2009	LSM	E		16	30	R		O	A	4
	9/22/2009	MLP	F	W	16	31	R		O	A	<2
WZ020.00	10/19/2009	FP	HE	N	10	32	R	P	O	A	<2
	5/13/2009	FP	F	S	11	30	R		O	A	<2
	5/27/2009	MLP	F	S	10	30	R	P	O	A	<2
	7/21/2009	FP	HE	CL	15	28	R		O	A	6
	8/4/2009	LSM	E	CL	18	29	R		O	A	2
	9/22/2009	MLP	F	SW	15	31	R		O	A	<2
WZ021.00	10/19/2009	FP	HE	N	10	31	R	P	O	A	8
	5/13/2009	FP	HF	S	10	30	R		C	P	<2
	5/27/2009	MLP	F	S	8	30	R	P	C	P	<2
	7/21/2009	FP	HE	CL	13	28	R		C	P	8
	8/4/2009	LSM	E	CL	15	30	R		C	P	3.6
	9/22/2009	MLP	F	SW	14	31	R		C	P	<2
WZ022.00	10/19/2009	FP	E	N	10	32	R	P	C	P	8
	5/13/2009	FP	HF	CL	15	30	R		C	P	<2
	5/27/2009	MLP	HF	CL	11	30	R	P	C	P	<2
	7/21/2009	FP	HE	CL	15	28	R		C	P	68
	8/4/2009	LSM	E	CL	16	23	R		C	P	750



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	9/22/2009	MLP	HF	CL	15	31	R		C	P	50
	10/19/2009	FP	E	N	10	30	R	P	C	P	18
WZ026.00	3/9/2009	EXT	HE	CL	-1	25	R		O	R	<2
	5/12/2009	FP	F	CL	16	28	R		O	R	<2
	5/26/2009	MLP	F	CL	15	30	R		O	R	6
	7/20/2009	EXT	HE	CL	21	29	R		O	R	2
	8/5/2009	MLP	HF	SW	22	30	R		O	R	<2
	9/22/2009	LSM	F	SW	15	30	R		O	R	<2
WZ027.00	3/9/2009	EXT	H	N	0	8	R		O	R	2
	5/12/2009	FP	F	NE	14	27	R		O	R	<2
	5/26/2009	MLP	F	CL	14	30	R		O	R	7.3
	7/20/2009	EXT	HE	CL	22	30	R		O	R	5.5
	8/5/2009	MLP	H	SW	21	30	R		O	R	<2
	9/22/2009	LSM	F	SW	15	30	R		O	R	<2
WZ028.00	3/9/2009	EXT	HE	NE	-1	28	R		O	A	3.6
	5/12/2009	FP	F	N	10	28	R		O	A	<2
	5/26/2009	MLP	F	CL	10	30	R		O	A	2
	7/20/2009	EXT	HE	CL	21	30	R		O	A	4
	8/5/2009	MLP	H	SW	20	30	R		O	A	<2
	9/22/2009	LSM	F	SW	15	31	R		O	A	<2
WZ029.00	3/9/2009	EXT	HE	CL	1	29	R		C	P	2
	5/12/2009	FP	F	CL	14	28	R		C	P	<2
	5/26/2009	MLP	HF	S	15	30	R		C	P	4
	7/20/2009	EXT	E	SW	22	28	R		C	P	<2
	8/5/2009	MLP	H	SW	23	25	R		C	P	64
	9/22/2009	LSM	F	SW	16	30	R		C	P	29
WZ030.00	3/9/2009	EXT	HE	NE	0	32	R		O	A	<2
	5/12/2009	FP	F	N	11	28	R		O	A	<2
	5/26/2009	MLP	HF	S	12	30	R		O	A	<2
	7/20/2009	EXT	E	SW	20	29	R		O	A	<2
	8/5/2009	MLP	H	SW	18	30	R	W	O	A	2
	9/22/2009	LSM	F	SW	15	31	R		O	A	<2
WZ031.00	3/9/2009	EXT	E	CL	1	32	R		O	R	<2
	5/12/2009	FP	F	CL	12	28	R		O	R	<2
	5/26/2009	MLP	HF	CL	11	30	R		O	R	<2
	7/20/2009	EXT	E	SW	22	29	R		O	R	25
	8/5/2009	MLP	H	SW	21	31	R		O	R	6
	9/22/2009	LSM	F	SW	15	31	R		O	R	<2
WZ032.00	3/9/2009	EXT	E	NE	1	33	R		O	A	<2
	5/12/2009	FP	F	NE	11	28	R		O	A	<2
	5/26/2009	MLP	HF	SW	12	30	R		O	A	<2
	7/20/2009	EXT	LE	CL	20	28	R		O	A	4
	8/5/2009	MLP	H	SW	18	30	R		O	A	<2
	9/22/2009	LSM	F	SW	15	30	R		O	A	<2
WZ033.00	3/9/2009	EXT	E	NE	1	32	R		O	A	2



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	5/12/2009	FP	F	N	10	28	R	W	O	A	<2
	5/26/2009	MLP	HF	S	12	30	R		O	A	<2
	7/20/2009	EXT	LE	SW	20	28	R		O	A	<2
	8/5/2009	MLP	H	SW	19	30	R		O	A	<2
	9/22/2009	LSM	F	SW	15	30	R		O	A	<2
WZ034.00	3/9/2009	EXT	E	CL	1	32	R		O	A	<2
	5/12/2009	FP	F	N	11	24	R		O	A	<2
	5/26/2009	MLP	HF	S	10	30	R		O	A	<2
	7/20/2009	EXT	LE	CL	21	28	R		O	A	4
	8/5/2009	MLP	H	SW	19	28	R		O	A	<2
WZ035.00	9/22/2009	LSM	F	SW	15	31	R		O	A	<2
	3/9/2009	EXT	E	CL	1	32	R		C	P	<2
	5/12/2009	FP	F	NE	10	26	R		C	P	<2
	5/26/2009	MLP	HF	SW	12	29	R		C	P	<2
	7/20/2009	EXT	LE	SW	22	24	R		C	P	2
WZ035.50	8/5/2009	MLP	HE	SW	23	27	R		C	P	4
	9/22/2009	LSM	F	SW	15	30	R		C	P	<2
	5/12/2009	FP	HF	CL	10	24	R		O	A	<2
	5/26/2009	MLP	H	SW	16	28	R		O	A	4
	7/20/2009	EXT	LE	SW	21	26	R		O	A	11
	8/5/2009	MLP	HE	SW	20	28	R		O	A	2
WZ036.00	9/22/2009	LSM	F	SW	15	30	R		O	A	3.6
	10/19/2009	EXT	H	NE	10	32	R		O	A	6
	3/9/2009	EXT	E	CL	1	30	R		C	P	<2
	5/12/2009	FP	HF	N	11	24	R		C	P	<2
	5/26/2009	MLP	H	SW	14	28	R		C	P	2
	7/20/2009	EXT	LE	CL	21	26	R		C	P	<2
WZ038.80	8/5/2009	MLP	HE	SW	21	27	R		C	P	28
	9/22/2009	LSM	HF	CL	16	30	R		C	P	<2
	3/9/2009	EXT	E	CL	1	6	R		C	P	<2
	5/12/2009	FP	HF	N	15	18	R		C	P	<2
	5/26/2009	MLP	H	W	16	22	R		C	P	<2
	7/20/2009	EXT	E	CL	24	22	R		C	P	4
WZ038.90	8/5/2009	MLP	HE	SW	27	14	R		C	P	54
	9/22/2009	LSM	HF	SW	18	28	R		C	P	16
	3/9/2009	EXT	E	CL	0	11	R		O	A	2
	5/12/2009	FP	HF	N	15	15	R		O	A	6
	5/26/2009	MLP	H	W	19	22	R		O	A	<2
	8/3/2009	MCP	E	CL	25	12	E	P	O	A	20
	8/5/2009	MLP	HE	SW	27	12	R		O	A	2
9/22/2009	LSM	HF	SW	17	26	R		O	A	3.6	
WZ039.00	10/19/2009	EXT	H	CL	9	30	R		O	A	14
	3/9/2009	EXT	E	CL	1	32	R		C	P	<2
	5/12/2009	FP	HF	CL	10	25	R		C	P	<2
	5/26/2009	MLP	H	W	11	28	R		C	P	2



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	7/20/2009	EXT	E	SW	20	26	R		C	P	<2
	8/5/2009	MLP	HE	SW	19	28	R		C	P	2
	9/22/2009	LSM	HF	SW	15	30	R	O	C	P	<2
WZ040.00	3/9/2009	EXT	E	NE	1	31	R		C	P	<2
	5/12/2009	FP	HF	N	12	26	R		C	P	<2
	5/26/2009	MLP	H	W	11	28	R		C	P	4
	7/20/2009	EXT	E	SW	21	27	R		C	P	<2
	8/5/2009	MLP	HE	SW	21	28	R		C	P	2
	9/22/2009	LSM	HF	SW	16	30	R		C	P	9.1
WZ040.50	3/9/2009	EXT	E	NE	1	32	R		O	A	<2
	5/12/2009	FP	HF	CL	10	26	R		O	A	<2
	5/26/2009	MLP	H	W	12	28	R		O	A	<2
	7/20/2009	EXT	E	CL	22	26	R		O	A	<2
	8/5/2009	MLP	E	SW	21	28	R		O	A	<2
	9/22/2009	LSM	HF	SW	15	30	R		O	A	2
WZ041.00	3/9/2009	EXT	E	NE	1	30	R		O	A	<2
	5/12/2009	FP	HF	CL	12	24	R		O	A	<2
	5/26/2009	MLP	H	SW	11	28	R		O	A	<2
	7/20/2009	EXT	E	CL	21	26	R		O	A	<2
	8/5/2009	MLP	E	SW	22	26	R		O	A	34
	9/22/2009	LSM	HF	SW	16	30	R		O	A	5.5
WZ042.00	3/9/2009	EXT	E	CL	0	32	R		O	A	<2
	5/12/2009	FP	HF	CL	7	28	R		O	A	<2
	5/26/2009	MLP	HE	SW	9	30	R		O	A	<2
	7/20/2009	EXT	E	S	18	29	R		O	A	<2
	8/5/2009	MLP	E	SW	20	28	R		O	A	<2
	9/22/2009	LSM	H	SW	15	31	R		O	A	12
WZ043.00	5/12/2009	FP	H	CL	10	26	R	W	O	A	<2
	5/26/2009	MLP	HE	SW	9	30	R		O	A	<2
	7/20/2009	EXT	E	CL	17	29	R		O	A	<2
	8/5/2009	MLP	E	SW	13	31	R	W	O	A	<2
	9/22/2009	LSM	H	SW	15	30	R		O	A	<2
	10/19/2009	EXT	HF	NE	9	32	R		O	A	<2
WZ044.00	3/9/2009	EXT	E	CL	1	30	R		O	A	<2
	5/12/2009	FP	H	CL	8	28	R		O	A	<2
	5/26/2009	MLP	HE	SW	11	29	R		O	A	<2
	7/20/2009	EXT	E	CL	19	27	R		O	A	<2
	8/5/2009	MLP	E	SW	15	30	R		O	A	<2
	9/22/2009	LSM	H	SW	15	30	R		O	A	2
WZ045.00	5/12/2009	FP	H	SE	13	28	R		C	P	13
	5/26/2009	MLP	HE	SW	12	29	R		C	P	5.5
	7/20/2009	EXT	E	CL	19	29	R		C	P	62
	8/5/2009	MLP	E	SW	19	30	R		C	P	98
	10/19/2009	EXT	HF	CL	10	32	R		C	P	36
	11/3/2009	FP	H	E	10	31	R	P	C	P	<2



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
WZ046.00	5/12/2009	FP	H	CL	10	28	R		C	P	<2
	5/26/2009	MLP	H	SW	14	30	R		C	P	<2
	7/20/2009	EXT	E	CL	21	29	R		C	P	28
	8/5/2009	MLP	E	SW	24	27	R		C	P	72
	10/19/2009	EXT	H	CL	9	32	R		C	P	13
	11/3/2009	FP	H	CL	10	30	R	P	C	P	2
WZ047.00	3/9/2009	EXT	E	CL	1	32	R		C	P	<2
	5/12/2009	FP	H	SE	11	28	R		C	P	<2
	5/26/2009	MLP	HE	SW	14	30	R		C	P	<2
	7/20/2009	EXT	E	CL	19	29	R		C	P	<2
	8/5/2009	MLP	E	SW	24	28	R		C	P	33
	10/19/2009	EXT	HF	NE	10	32	R		C	P	12
WZ048.00	5/12/2009	FP	H	SE	11	28	R		C	P	<2
	5/26/2009	MLP	HE	SW	16	30	R		C	P	2
	7/20/2009	EXT	E	CL	21	29	R		C	P	2
	8/5/2009	MLP	E	SW	22	30	R		C	P	100
	10/19/2009	EXT	HF	NE	8	31	R		C	P	50
	11/3/2009	FP	HE	CL	8	31	R	P	C	P	10
WZ048.50	3/9/2009	EXT	E	CL	1	31	R		C	P	<2
	5/12/2009	FP	H	SE	13	28	R		C	P	<2
	5/26/2009	MLP	E	SW	10	30	R		C	P	<2
	7/20/2009	EXT	E	CL	17	29	R		C	P	<2
	8/5/2009	MLP	E	SW	22	30	R		C	P	<2
	10/19/2009	EXT	HF	NE	10	32	R		C	P	<2
WZ049.00	5/12/2009	FP	H	CL	10	28	R		C	P	<2
	5/26/2009	MLP	E	SW	12	30	R		C	P	<2
	7/20/2009	EXT	E	CL	21	29	R		C	P	<2
	8/5/2009	MLP	E	SW	22	30	R		C	P	96
	10/19/2009	EXT	HF	NE	9	32	R		C	P	2.8
	11/3/2009	FP	HE	CL	9	31	R	P	C	P	<2
WZ054.00	3/9/2009	EXT	HE	CL	1	32	R		C	P	<2
	5/12/2009	FP	F	CL	11	30	R		C	P	<2
	5/26/2009	MLP	F	CL	13	30	R		C	P	<2
	7/20/2009	EXT	HE	CL	20	29	R		C	P	8
	8/5/2009	MLP	HF	SW	21	28	R		C	P	12
	9/22/2009	LSM	F	SW	15	31	R		C	P	<2
WZ055.00	3/9/2009	EXT	HE	CL	0	32	R		O	A	<2
	5/12/2009	FP	F	NE	11	28	R		O	A	<2
	5/26/2009	MLP	F	CL	12	30	R		O	A	<2
	7/20/2009	EXT	HE	CL	21	29	R		O	A	16
	8/5/2009	MLP	HF	SW	21	30	R		O	A	<2
	9/22/2009	LSM	F	SW	15	30	R		O	A	<2

