



**GROWING AREA WZ**  
**Towns of**  
**North Haven and Vinalhaven**  
  
**Triennial Report for 2006-2008**

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Figure 1. Growing Area WZ, North Haven and Vinalhaven

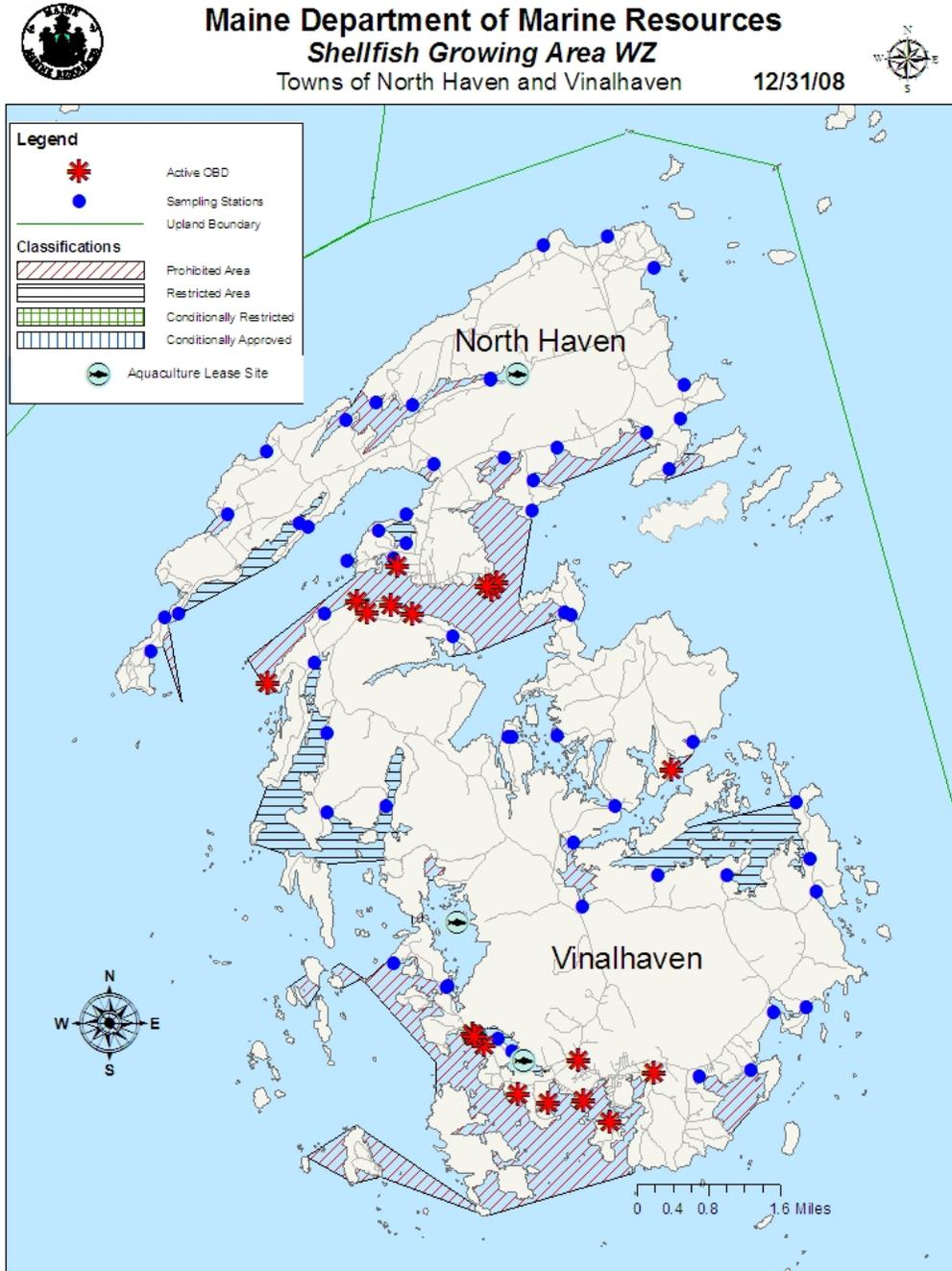




Figure 2. North Haven Sample Station Locations

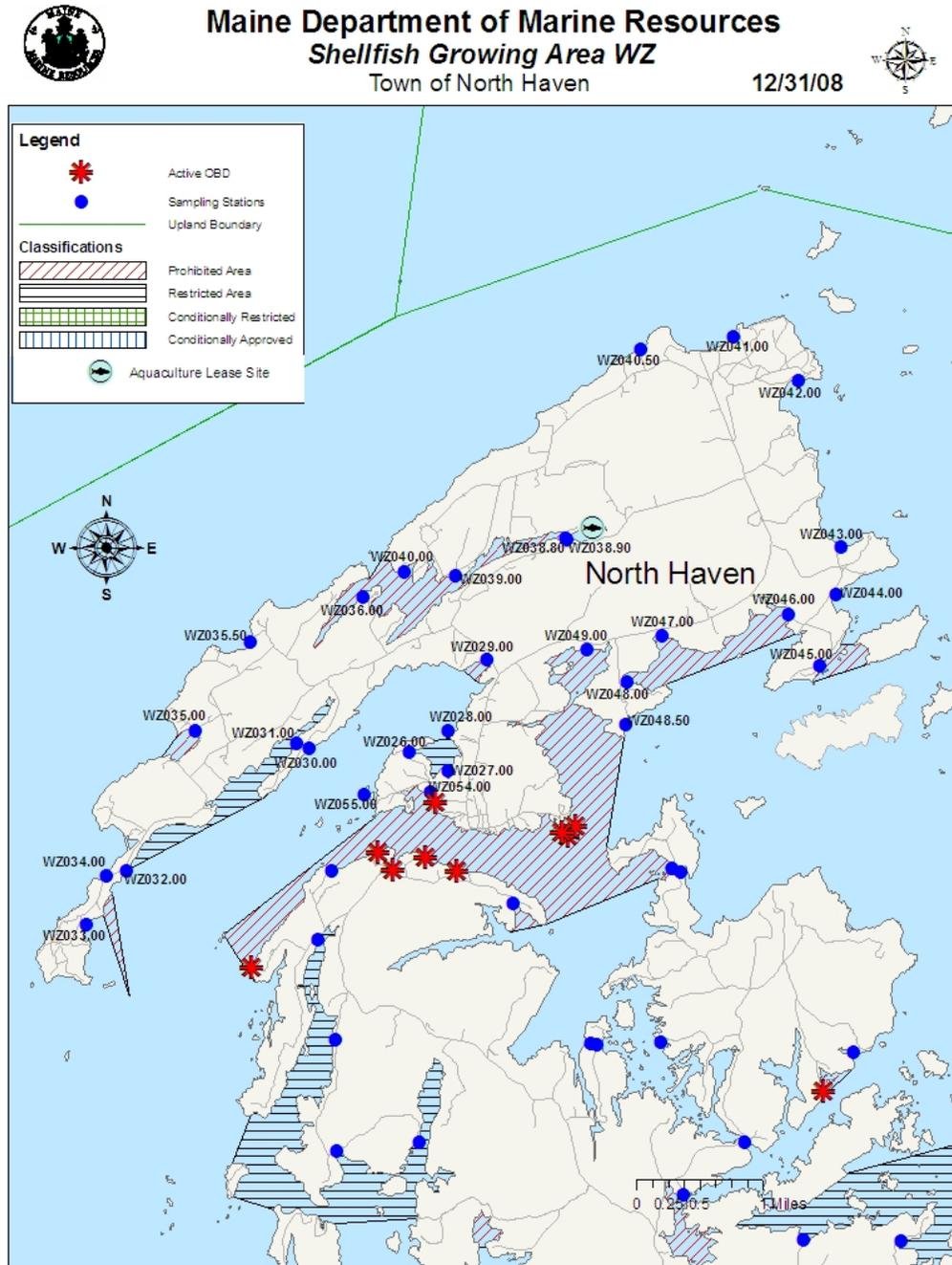
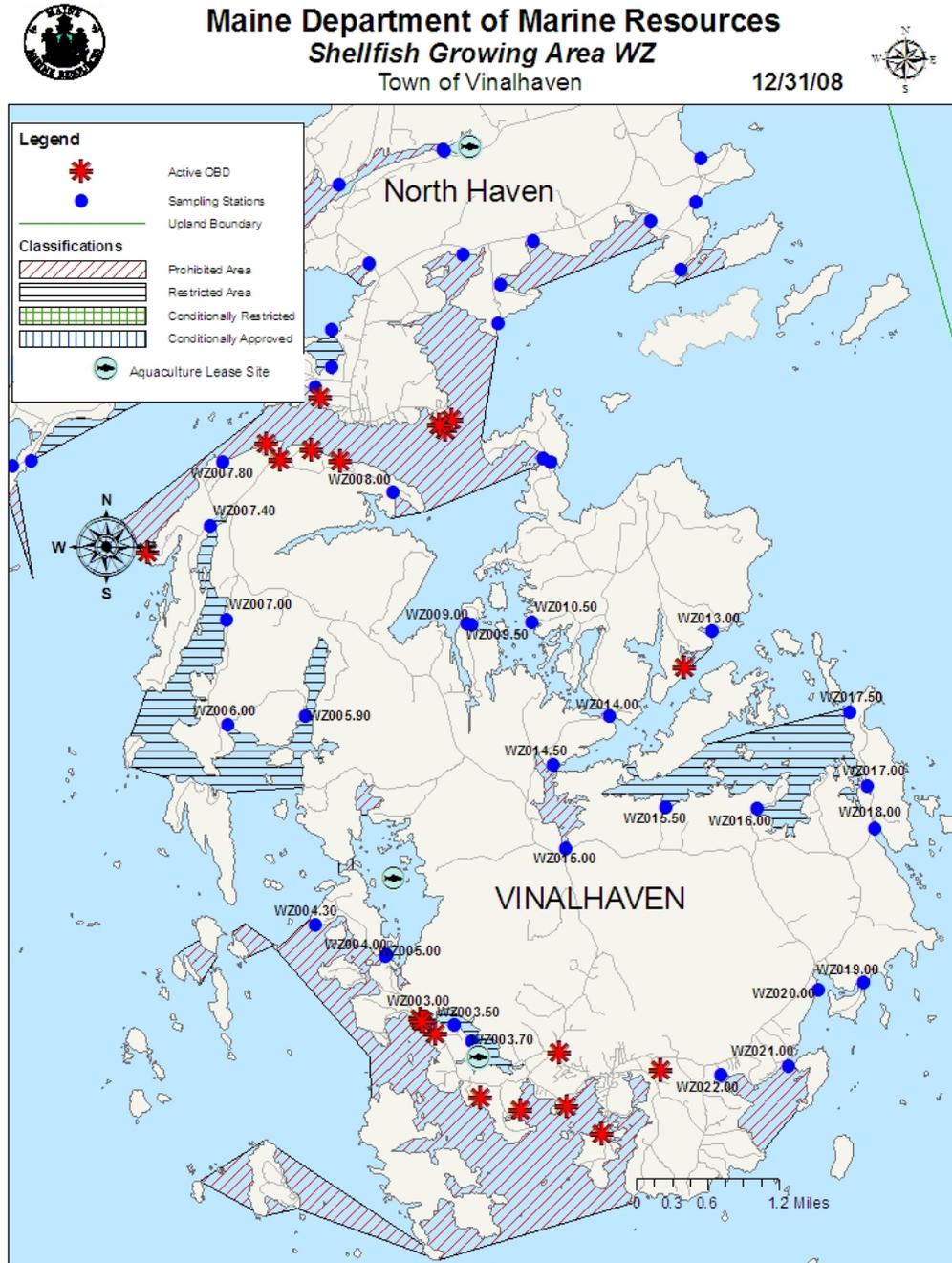




Figure 3. Vinalhaven Station Locations





## Executive Summary

This is a triennial report for growing area WZ (2006-2008) written in compliance with the requirements of the 2007 Model Ordinance and the National Shellfish Sanitation Program. This report includes a water quality review, as well as an evaluation of all new pollution sources identified between 2006 and 2008, and a re-evaluation of previously identified pollution sources. Pollution sources reviewed in this report include domestic waste, including private in-ground systems and over board discharges (OBDs), marinas, recreational areas, agricultural activities, domestic animal and wildlife areas, storm water, and non-point pollution transported by streams.

Shellfish Growing Area WZ includes the islands of North Haven and Vinalhaven and several smaller islands. This growing area is located in the middle of Penobscot Bay in the area between Rockland, on the mainland and the island of Isle Au Haut to the east. Based on this review, no classification changes are required. During the review period two active OBDs were removed on North Haven (2008). Vinalhaven had six new stations created (2007) during the review period and North Haven had one new station created (2005).

The next sanitary survey for the Vinalhaven portion of growing area WZ is due in 2010. The next sanitary survey for the North Haven portion of growing area WZ is due in 2011.

## Growing Area Description

The islands of North Haven and Vinalhaven are located in the mouth of Penobscot Bay (Figures 1-3). 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 1,275 individuals. North Haven has a year round population of 380 and a summer population of 2,000 (United States Census Bureau). 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 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 were drawn to include all of the islands within the study area of Growing Area WZ. Therefore, the boundary lines follow a series of navigational aides around all of the islands that are included in shellfish growing area WZ.



## Current Classification(s)

At the end of the 2008 review year, growing area WZ was classified as:

### North Haven – 29 stations total, Pollution Area No. 30-I

There is one new station (WZ 48.5) on North Haven (with < 30 data points); this station is not evaluated against a classification standard. This station is located within the boundaries of a prohibited area. It was created to monitor the end of a closure line.

The North Haven portion of growing area WZ currently has areas classified as:

**Approved** – 13 stations are classified as approved: WZ 28, 30, 32, 33, 34, 35.5, 38.9, 40.5, 41, 42, 43, 44, and 55.

**Conditionally Approved** - No stations are classified as conditionally approved

**Restricted** – 3 stations are classified as restricted: WZ 26, 27, and 31, due to non-point source pollution.

**Prohibited** – 12 stations are classified as prohibited: WZ 54 due to the presence of an active OBD; Pulpit Harbor stations WZ 39 and 40 due to boating activity; stations WZ 29, 36, 38.8, 46, 47, 48, due to non-point source pollution; and stations WZ36, 45, and 49 due to identified pollution sources.

### Vinalhaven – 30 stations total, Pollution Area 30-D

There are six new stations on Vinalhaven (<30 data points); these stations are not evaluated against a classification standard:

:

WZ 3.7, located in restricted area, created to monitor aquaculture site

WZ 4.3, located in prohibited area, created to monitor closure line

WZ 7.4, located in restricted area, created to monitor the head of Crockett Cove

WZ 10.5, located in approved area, created to monitor area with no station (Mill River)

WZ 14.5, located in prohibited area, created to monitor area with no station (head of Winter Harbor)

WZ 17.5, located in restricted area, created to monitor closure line

The Vinalhaven portion of growing area WZ currently has areas classified as:

**Approved** - 9 stations are classified as approved: WZ 5, 9, 9.5, 12, 13, 14, 18, 19, and 20.

**Conditionally Approved** - No stations are classified as conditionally approved.

**Restricted** - 6 stations are classified as restricted; Long Cove and Crockett Cove stations WZ 5.9, 6, and 7; due to non-point pollution; and Seal Bay stations WZ 15.5, 16, and 17 due to non-point pollution.



**Prohibited** - 9 stations are classified as prohibited: Old Harbor station WZ3, due to active OBDs and Old Harbor Pond station 3.5 due to non-point pollution; WZ4, due to potential pollution source; WZ 7.8, and 8, due to non-point pollution and potential boating impact; WZ 11 due to non-point pollution; WZ 15 in Vinal Cove due to non-point pollution from salt pond; and WZ 21 and 22, due to non-point pollution.

**Matinicus Island and Ragged Island, no sampling stations, Pollution Area No. 29-B**

Please visit the DMR website to view legal notices 29B, 30I and 30D:

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

**Activity during Review Period (2006-2008)**

The following classification changes occurred during the review period:

**North Haven**

**2006:**

On June 6, 2006, the north shore (station WZ40.5) of North Haven was reclassified as approved.

On June 6, 2006, a portion of the shore at Ames Point (station WZ55) was reclassified as approved due to the removal of a licensed overboard discharge.

On November 14, 2006, the salt pond (station WZ38.9) on North Haven was reclassified as approved for shellfish harvest.

**2007:**

On May 10, 2007, the southwest corner of Pulpit Harbor (station WZ36) was downgraded to restricted due to poor water quality scores.

On May 10, 2007, the cove west of Amesbury Point (station WZ31) was downgraded to restricted due to poor water quality scores.

On August 21, 2007, the salt pond was reclassified as restricted due to a mid-season review of the water quality scores revealing that sampling station WZ 38.9 was just over the approved standard.

On December 14, 2007, the salt pond was reclassified as approved for shellfish harvest. When all of the sampling was completed for 2007, sampling station 38.9 once again had a P90 score that met approved standards.

On December 19, 2007, the cove south of Y-Knot boatyard (stations 26 and 27) was reclassified as restricted due to water quality scores not meeting the approved standard.

**2008:**

No classification changes took place in 2008.



## Vinalhaven

### 2006:

On June 5, 2006, Long Cove (station WZ5.9) was reclassified as prohibited due to water quality not meeting the approved standard.

On June 5, 2006, Seal Bay (station WZ15.5) was reclassified as prohibited due to water quality not meeting the approved standard.

On June 5, 2006, the section of shore north of Fish Head (station WZ7.8) was reclassified as prohibited due to water quality not meeting the approved standard.

### 2007:

On May 10, 2007, the entire section of shore from Long Cove to Crockett Cove was reclassified as restricted due to poor water quality (stations WZ5.9, WZ6, and WZ7).

On May 10, 2007 the prohibited area in Seal Bay became reclassified as restricted and was enlarged to include Smith Cove and the shore at Coombs Hill (stations WZ15.5, WZ16, and WZ17). This change was due to deteriorating water quality scores.

### 2008:

No classification changes took place in 2008.

During the review period, the following station changes took place:

On May 24, 2007, new stations were created to better monitor the water quality in their respective areas. These new stations include: station WZ7.4 sampled at the head of Crockett Cove; station WZ10.5 sampled in Mill River; station WZ14.5 sampled just north of Vinal Cove; station WZ17.5 sampled at the end of Coombs Neck Road, created to monitor the end of the new closure line; and station WZ4.3, located on Barton Island, created to monitor the end of a closure line.

On November 28, 2007, station WZ3.7, located in Old Harbor Pond, was created to monitor water quality at aquaculture lease site.

## Current Management Plan(s) for Conditional Areas

There are no conditional areas in growing area WZ.

## Documentation of Pollution Sources

The following sections include information on pollution sources which do or may impact water quality in growing area WZ. 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, 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**

On June 25<sup>th</sup>, 2008 staff members from DEP and DMR surveyed Old Harbor Pond, Vinalhaven. This area was last surveyed in September of 2004. The 2008 survey was conducted to evaluate if any new sources of pollution that may be attributing to the elevated scores at station WZ 3.5 could be identified. Old Harbor Pond is currently classified as restricted for shellfish harvest. The pond contains an oyster lease site that is located on the south shore of the pond. A total of thirty properties were inspected during the shoreline survey. There are no developed lots on the north shore of the pond. This side of the pond consists of two very large parcels of land. One of these parcels is owned by the Maine Coast Heritage Trust; the other parcel is privately owned.

The pollution sources noted in the Old Harbor Pond survey are broken down into two categories actual pollution sources (Table 1) and potential pollution sources (Table 2). A potential pollution source is any system that shows the potential for being a problem in the future, but at the time of the inspection was not malfunctioning. Any pollution source that is determined to be an actual source was found to be malfunctioning at the time of the inspection and may impact the water quality in the surrounding area.

The only system that was determined to directly impact the water quality in the pond is actual pollution source #1. The old granite cesspool systems noted in the potential pollution source table were located away from the shore and streams and were not pooling at the time of the inspection.

**Table 1. Old Harbor Pond, Actual Pollution Sources, 2008 Survey**

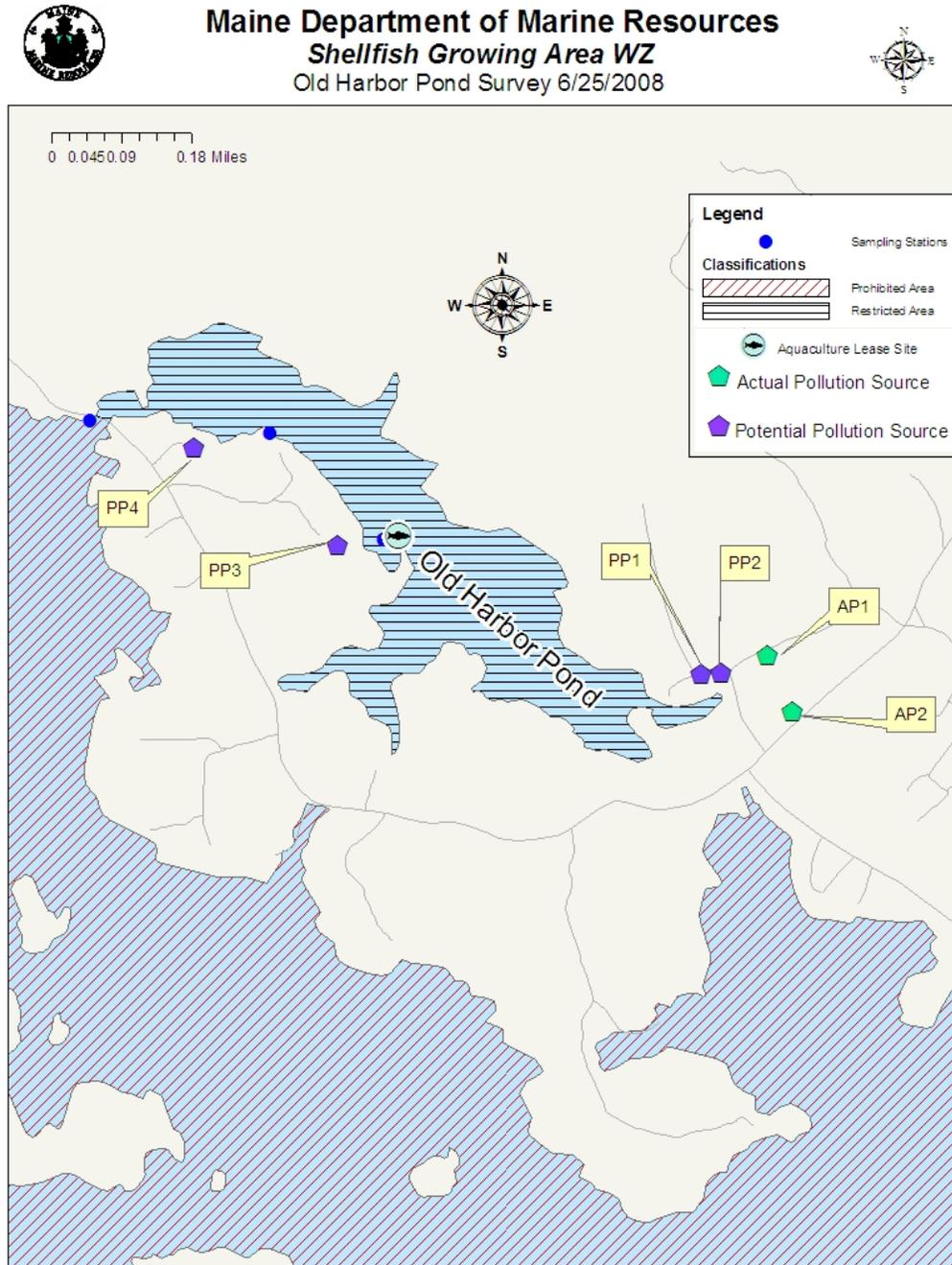
Source #	Description	Comments
AP1	old round tank with septic overflow to pond to right of small dock at pond	slight odor
AP2	Tank with septic overflow to wooded area behind house - pooling	very little chance of reaching shore

**Table 2. Old Harbor Pond, Potential Pollution Sources, 2008 Survey**

Source #	Description	Comments
PP1	1000G tank in small lawn, small leach field or septic overflow slight odor in 2004 no odor in 2008	180' from shore
PP2	Old cut granite tank/cess pool with wet area below in gardens , no pooling	very little chance of reaching shore
PP4	Fairly new system, leach field wet but odorless on sloping side	revisit occasionally
PP5	tank found leach field unknown, slight odor by large brush pile on edge of pond	will call owner to ask about leach field



Figure 4. Old Harbor Pond Pollution Sources, 2008





### Re-Evaluation of Existing Pollution Sources

The following section of this Sanitary Survey Report provides detailed descriptions of various pollution sources that were identified during the most recent sanitary survey field work. In each sub-section, a particular type of a pollution source is listed, described and evaluated, and where applicable, is accompanied by maps and tables. The sources of pollution that are described in this report include: domestic waste, including private inground systems and OBDs, municipal waste water treatment facilities, marinas and mooring fields, non-point source pollution from streams, agricultural and domestic animal activity, wildlife and conservation/recreation areas.

The most recent shoreline survey of North Haven was completed in 2001. A new shoreline survey of this area will be initiated in 2010. Following the 2001 shoreline survey, survey updates have consisted of visits to properties on the shoreline survey pollution source list and inspections of dwellings with suspected problems. Streams on North Haven were sampled on November 17, 2008. No pollution sources on Vinalhaven were revisited in 2008 because the shore of Vinalhaven is scheduled to be surveyed in 2009. Drive through surveys were done during dates of sample collection and streams (on Vinalhaven) were sampled on November 4, 2008.

#### Domestic Waste

The town of North Haven has been very helpful in assisting with the tracking of all septic and plumbing upgrades during the years from 2003 to 2008 by keeping a table of the annual septic upgrades. Table 3 shows only the upgrades that took place during the triennial review period (2006-2008). The locations of properties noted in Table 3 are shown in Figure 4, with the exception of a few properties that were unable to be located on the tax map. Each property is identified on the map by the permit number, cross referenced to Table 3. This information will be augmented by a door to door survey of all dwellings within 500 feet of the shore in 2010. The town categorizes septic upgrades by code for the various upgrades. New septic systems are noted as SS, a replacement system is noted as RS, a new tank is noted with a T, a hookup to the town sewer is noted with TS and an indoor plumbing upgrade is noted with PL. All systems that are located within the shoreland zone (SLZ, within 250 feet of the shore) are noted with a Y.

**Table 3. North Haven Septic Upgrades 2006-2008**

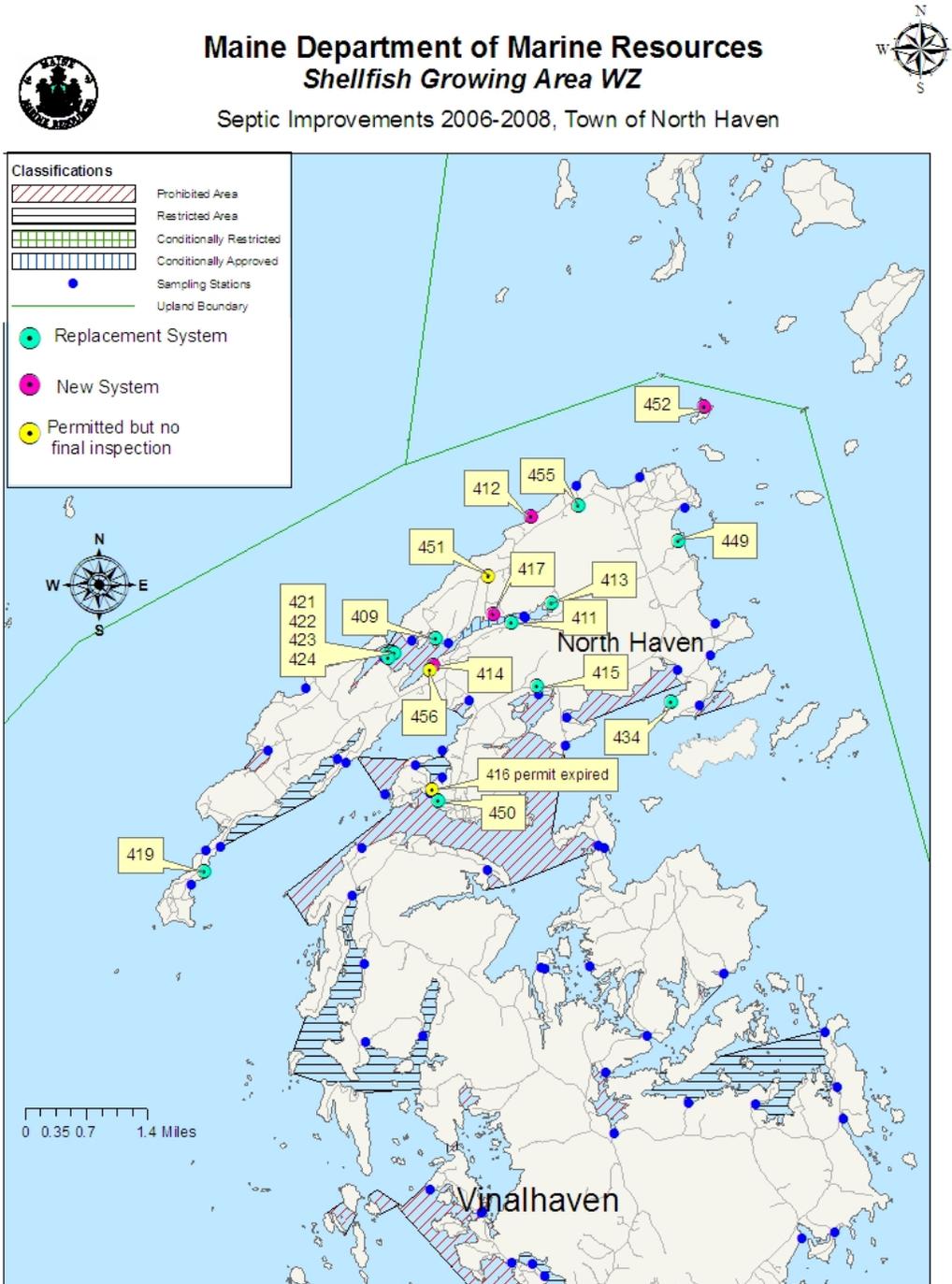
Permit #	Date	Street Address	Tax Map #	Tax Lot#	SLZ Y/N	CODE	Comments
409	03/30/06	Pulpit Harbor Rd.	25	15	Y	RS	Final Inspection 06/07
411	06/03/06	Middle Rd.	20	4	Y	RS	Final Inspection 06/07
412	06/05/06	North Shore Rd.	27	2	Y	SS	Final Inspection 09/08
413	06/14/06	Middle Rd.	20	8	N	RS	Final Inspection 06/07
414	07/12/06	Crabtree Pt. Rd.	19	28-A	Y	SS	Final Inspection 04/07
415	07/12/06	South Shore Rd.	11	5	N	RS	Final Inspection 06/07
417	08/09/06	Ridge Rd.	26	5-B	Y	SS	Final Inspection 04/07



Permit #	Date	Street Address	Tax Map #	Tax Lot#	SLZ Y/N	CODE	Comments
419	10/16/06	Crabtree Point Rd.	15	3	Y	RS	Final Inspection 12/08
421	06/29/07	Cabotville Road	24	3	Y	RS	Final Inspection 07/08
422	06/29/07	Cabotville Road	24	3	Y	RS	Final Inspection 07/08
423	06/29/07	Cabotville Road	24	3	Y	RS	Final Inspection 07/08
424	06/29/07	Cabotville Road	24	3	Y	RS	Final Inspection 07/08
434	11/05/07	Indian Point Rd.	6	1	Y	RS	Final Inspection 07/08
449	03/06/08	Barclay Rd.	22	5	N	RS	Final Inspection 10/08
450	05/03/08	Dole Rd.	31	7	Y	RS	Final Inspection 07/08
451	05/03/08	Ridge Rd.	26	5-D	N	RS	
452	05/19/08	Oak Island	29	1	Y	SS	Resource Protection
455	10/01/08	North Shore Rd.	27	8-A	N	RS	Final Inpection 10/08
456	10/21/08	Crabtree Point Rd.	19	28-B	Y	RS	
<b>Codes: SS=</b> New septic system, <b>T =</b> New Tank, <b>RS =</b> Replacement System, <b>PL =</b> Inside Plumbing							
<b>TS =</b> Town sewer, <b>C =</b> Hookup to existing SS, <b>SLZ =</b> Shoreland zone Y= yes, N = no, <b>COA =</b> Cert. of Approval							



Figure 5. Septic Improvements, Town Of North Haven



The shoreline of North Haven was surveyed in 2000 and 2001. The North Haven shoreline survey is scheduled to be resurveyed in 2010, with the findings being presented in the next sanitary survey report, to be written after the 2010 field season is completed.



On North Haven several formerly malfunctioning systems were replaced with new systems in 2008. In the area locally known as Cabotville (in Pulpit Harbor) three licensed overboard discharge systems were replaced with four inground systems in July 2008. These systems are shown in Figure 5 (permit numbers 421-424). On Crabtree Point, a system that was found to consist of a tank with no leach field had a new leach field installed (Figure 5, permit 419).

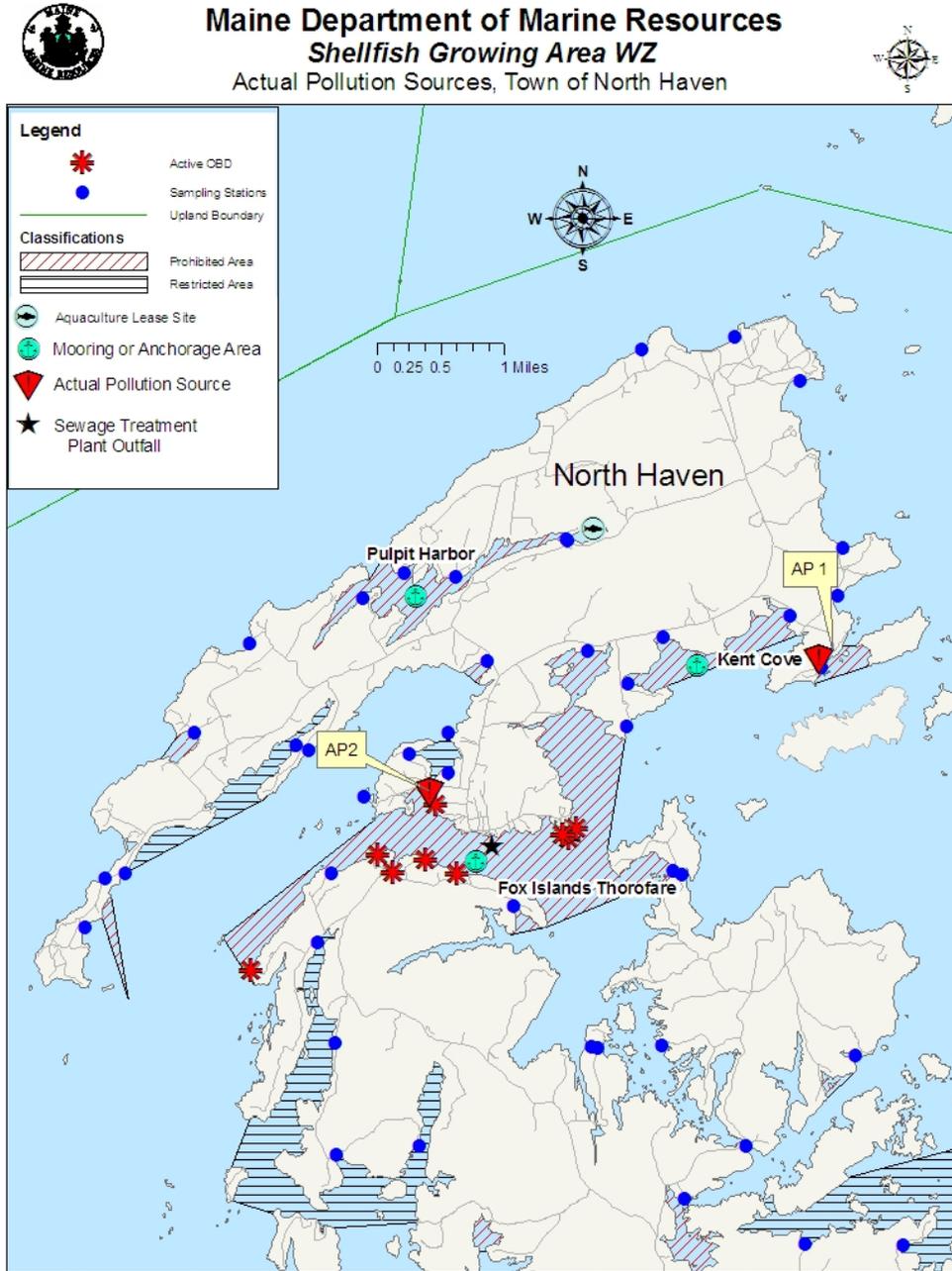
There are two actual pollution sources that were identified during past shoreline surveys that have not been fixed (Table 4). Both of these malfunctions are located in areas that are classified as prohibited.

**Table 4. Previously Identified Actual Pollution Problems, Area WZ**

Town	Pollution ID	Actual / Potential	Direct / Indirect	Pollution Description / Remediation Action
North Haven	AP1	A	D	Old rusted out tank leaking into stream; <b>located in Prohibited Area; No Change</b>
	AP2	A	D	Old Tank, Plywood Cover, Septic overflow; <b>located in Prohibited Area; No Change</b>



Figure 6. Actual Pollution Sources Town of North Haven





### **Licensed Overboard Discharges**

There are 20 active licensed overboard discharges (OBDs) in growing area WZ (Figures 7 and 8). 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.

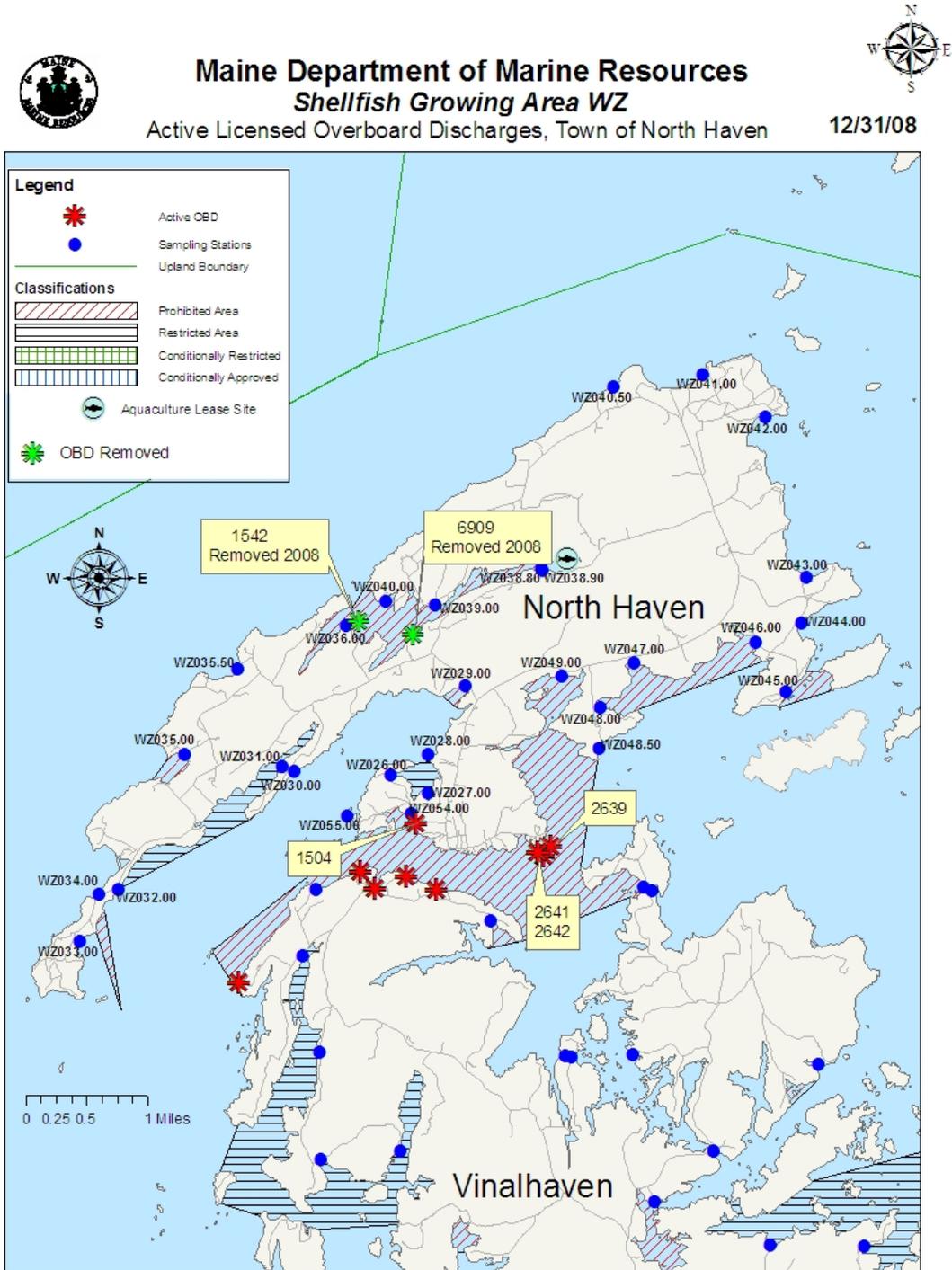
All overboard discharge systems include a process to clarify the wastewater and disinfect it prior to discharge. There are two general types of treatment systems; mechanical package plants and sand filters. Sand filter systems consist of a septic tank and a sand filter. In such systems, the wastewater 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 waterbody (the ocean, a river, or a stream) via an outfall pipe.

OBDs are licensed and inspected by the Maine Department of Environmental Protection. 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 located in growing area WZ. The required size of each closure is based on a dilution calculation, which is based 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  $1.4 \times 10^5$  fc/100 ml. All OBDs in growing area WZ, are surrounded by closures that are larger than the required closures based on the dilution calculation (Table 5). The actual closure size measurement in table 3 was calculated using the measuring tool in ArcMap.

Two OBDs were removed on North Haven in Pulpit Harbor (2008). The remaining four OBDs on North Haven are on the priority list for removal. Eight out of the sixteen remaining OBDs on Vinalhaven are on the priority list for removal.



Figure 7. Licensed Overboard Discharges, North Haven







**Table 5. Active Licensed Overboard Discharges, towns of North Haven and Vinalhaven**

DEP ID	TOWN	FLOW (GPD)	Receiving Water Body	Depth of Receiving Water (ft)	PRIORITY REMOVAL	Required Closure (acres)	Actual Closure (acres)
2641	North Haven	500	Fox Is. Thorofare	9	Y	1.2	>659
2642		500	Fox Is. Thorofare	9	Y	1.2	
2639		300	Fox Is. Thorofare	9	Y	0.7	
1504		500	Fox Is. Thorofare	5	Y	2.2	
3255	Vinalhaven	300	Fox Is. Thorofare	12	N	.5	>75
2489		450	Fox Is. Thorofare	9	Y	1.1	>659
2103		500	Fox Is. Thorofare	6	Y	1.8	
2135		500	Fox Is. Thorofare	18	N	0.6	
3277		500	Fox Is. Thorofare	18	N	0.6	
2535		300	Indian Creek	5	N	1.3	>665
1905		300	Lane Island	5	N	1.3	
2081		300	Carvers Pond	5	N	1.3	
2285		650	Carvers Harbor	8	N	1.8	
6038		300	Sand Cove	6	Y	1.1	
7036		300	The Reach	9	Y	0.7	
2447		450	Old Harbor	7	Y	1.4	
1035		300	Old Harbor	7	Y	0.9	
6877		300	Old Harbor	7	N	0.9	
3229		810	Old Harbor	7	Y	2.5	
6870		300	Winter Harbor	5	Y	1.3	13.7

**Municipal WWTP**

There are two municipal waste water treatment plants in Growing Area WZ. North Haven has a small municipal, primary treatment facility that serves a total of 200 sewer connections in the center of town. This plant is designed for a flow of 40,000 gallons per day. The average daily flow is approximately 37,300 gpd and the average wet weather flow is 38,600 gpd (2008 data). The outfall is located in the Thorofare, in approximately 18 feet of water. Assuming an equal mix of effluent with seawater, in order to achieve a 1000:1 viral dilution surrounding the outfall, a closure of 6.6 acres is required; the required bacterial dilution (10,000:1) is 66 acres. There is currently a closure area of approximately 1,000 acres around the outfall.

Vinalhaven has a new UV treatment Facility that serves 350 dwellings in and around the center of town in Carvers Harbor. The facility became operational in 2003. The facility has a Maine Pollutant Discharge Elimination System (MEPDES) permit and waste discharge license for the discharge of up to 129,000 gallons per day of secondary treated wastewater to the Atlantic Ocean, off Vinalhaven Maine. The outfall for this facility enters Carvers Harbor just south of the Maine State Ferry Terminal, in Grimes Park. The outfall extends 250 feet out into the harbor,



with three diffusers located along its length. The depth of the outfall at low tide is 25 feet. The average daily flow is approximately 25,718 gpd and the average wet weather flow is 30,000 gpd (2008 data). Assuming an equal mix of effluent with seawater, in order to achieve a 1000:1 viral dilution surrounding the outfall, a closure of 3.7 acres is required; the required bacterial dilution (10,000:1) is 36.8 acres. There is currently a closure zone of over 1,000 acres around this outfall. The closest open area to the outfall is located west of Greens Island in an area of open ocean.

**Industrial Pollution**

There are no industrial discharges located on North Haven and Vinalhaven islands.

**Marinas**

There are no marinas on North Haven or Vinalhaven. However, both islands do have areas frequented by cruising boats in the summer months. On North Haven, Pulpit Harbor, portions of the Fox Island Thorofare and Kent Cove are popular sites for cruising boats to anchor. Moorings are available in Pulpit Harbor and the Thorofare. On Vinalhaven, Long Cove, Perry Creek, Seal Cove, Winter Harbor and Seal Bay are all popular anchorages. None of these areas have moorings available for overnight use. All of these areas have limited space available due to the depth of the water and the configuration of the surrounding shore. Pulpit Harbor and the Thorofare have the most space available; both of these areas are classified as prohibited. Carvers Harbor, Vinalhaven has a large mooring area that is used mainly by commercial fishing boats. Cruising boats will occasionally go into Carvers Harbor to purchase groceries or visit the town center but there is limited space available and they are not encouraged to anchor or moor in the harbor. The shellfish classifications for each of these areas is shown in Table 6. Perry Creek, Seal Cove and Winter Harbor have limited space available due to the water depth and the configuration of the coves. It is unlikely that there would be a concentration of over ten cruising boats in any of these coves. At the present time these areas are classified appropriately.

**Table 6. Shellfish Classifications in Popular Anchorage Areas, Shellfish Growing Area WZ**

Town	Anchorage Area	Shellfish Classification
North Haven	Pulpit Harbor	Prohibited
	Thorofare	Prohibited
	Kent Cove	Prohibited
Vinalhaven	Long Cove	Restricted
	Perry Creek	Approved and Prohibited
	Seal Cove	Approved
	Winter Harbor	Approved
	Seal Bay	Restricted
	Carvers Harbor	Prohibited



### ***Stormwater***

There are no structural stormwater management systems in the towns of North Haven and Vinalhaven. Stormwater in these areas would either percolate through the soil, or flow overland directly into streams, gullies and coastal waters. Any pollution associated with stormwater drainage in areas where no structural facilities exist is monitored by growing area WZ water quality monitoring stations, as well as by collecting samples from selected streams after adverse weather conditions.

### ***Non-Point Pollution Sources***

Streams are a source of fresh water to the watershed, and carry stormwater, snowmelt and groundwater into the coastal estuaries. Waste, including that containing fecal matter, which is deposited on land, may be carried by streams to shellfish growing areas, contributing to elevated fecal counts in waters that are filtered by shellfish. In 2008, fifteen streams were selected for sampling on North Haven and nine were sampled on Vinalhaven (Figures 9 and 10). A heavy rainfall of greater than 1 inch of rain fell two days before the stream samples were collected on North Haven. No stream flow rates were measured.



Figure 9. Streams Sampled on North Haven

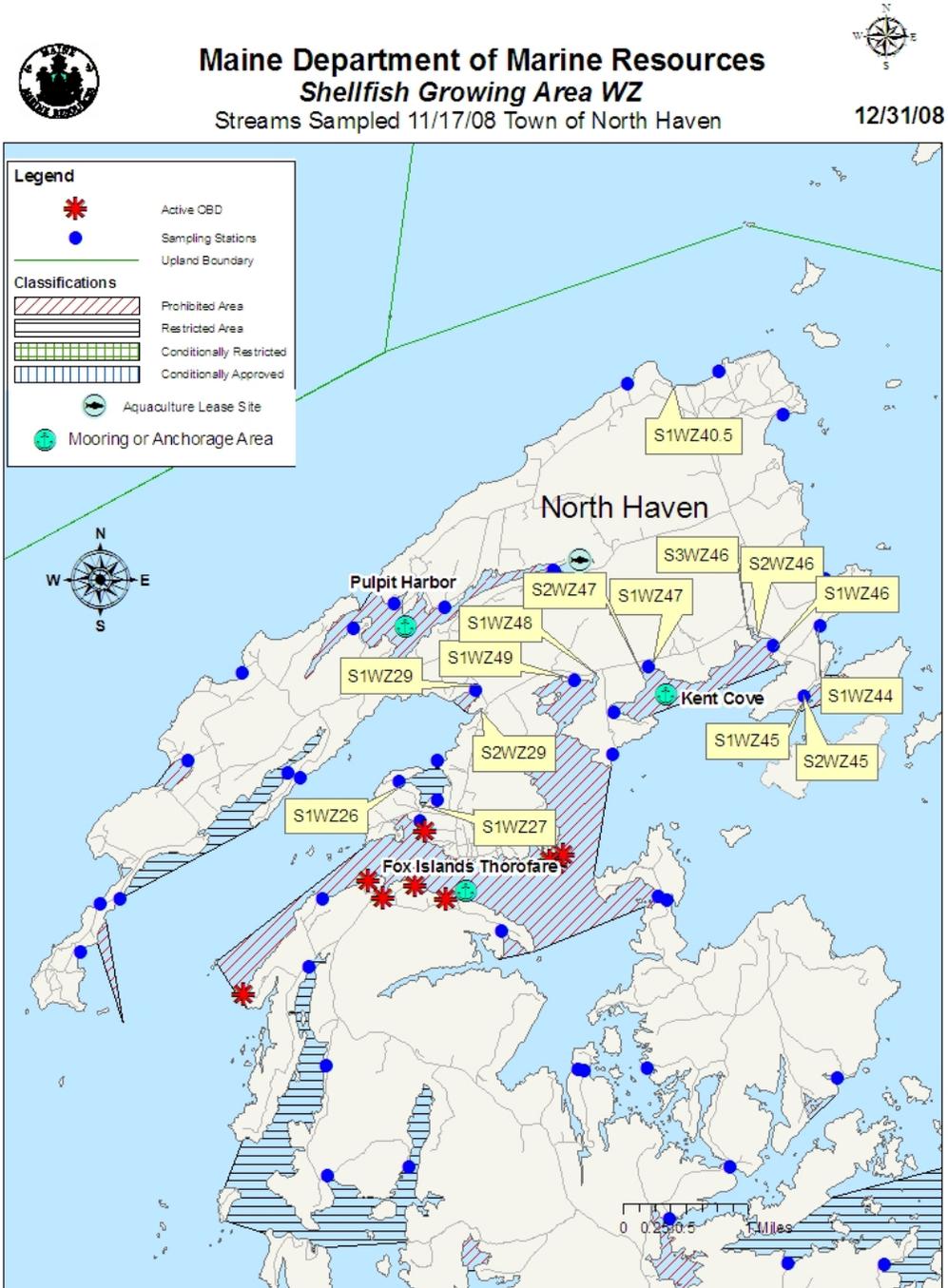
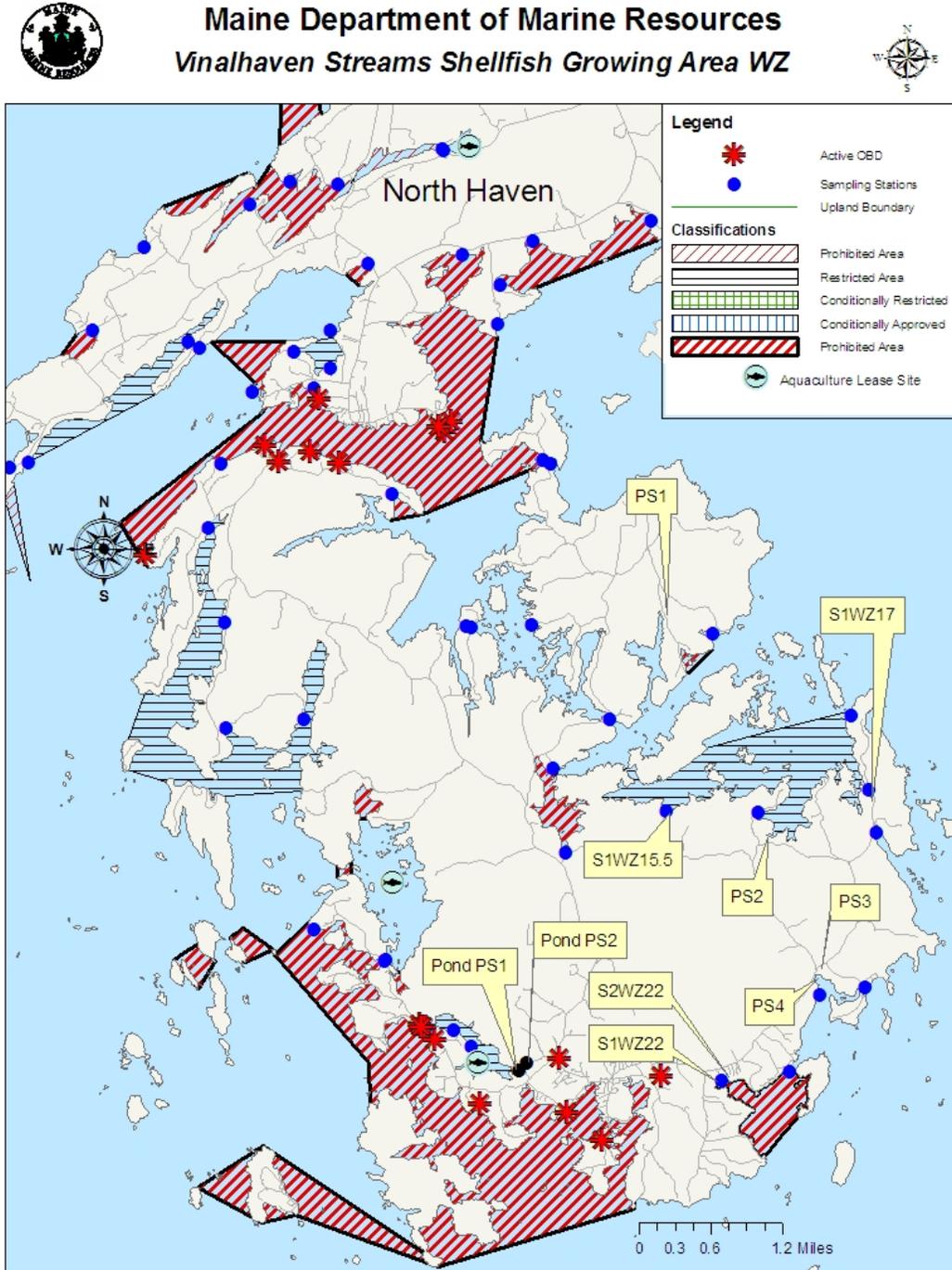




Figure 10. Streams Sampled on Vinalhaven





North Haven stream site S1WZ26 was sampled adjacent to the salt water sample site WZ26, located on a broad mudflat on the southeast corner of Southern Harbor, North Haven. There are no dwellings within 1500' of this site; however the stream flows from a small pond (500' from sample site) that is frequented by deer and occasionally free range chickens. The stream (S1WZ26) is often dry during the summer months. Sampling station WZ26 was downgraded to restricted on December 19, 2007 after water quality no longer met approved standards.

Stream site S1WZ27 is located in the same cove as stream site S1WZ26. Site S1WZ27 is a larger perennial stream. This site is frequented by deer and they can often be seen in the field as you approach station WZ27. There are no dwellings within 1000 feet of this site; however a shorefront lot is being cleared to be developed 80 feet from the sample site WZ27. This area is classified as restricted. Stream site S1WZ29 is located in a small cove at the head of Southern Harbor. This stream has continued to receive elevated scores when it is sampled. An old pump station is located almost in the stream bed. DMR mentioned the elevated scores to the LPI for the town of North Haven who dye tested the pump station and no dye showed up in the stream. The stream flows under the road and between two dwellings. No pollution sources were identified at the time of the last survey. This area is classified as prohibited. The area will be surveyed in 2010.

Stream site S2WZ29 is located south of site S1WZ29 in a narrow cove. There is also a pump station nearby this site. The closest dwelling is approximately 400 feet away. No pollution sources were identified at the time of the last survey. Stream site S1WZ40.5 is sampled from a culvert alongside of the road. This stream drains a wet area on the opposite side of the road. Stream S1WZ40.5 flows most of the year and is likely frequented by deer. Site S1WZ44 is a small seasonal stream that flows onto the shore at sample site WZ44 in Mullen Head Park. There are no dwellings anywhere near this site. This stream dries up during the summer months. Sites S1WZ45 and S2WZ45 flow onto the shore either side of sampling station WZ45 on Indian Point, North Haven. No pollution sources were identified nearby site S1WZ45; however there is a malfunctioning septic system that drains down a slope into stream site S2WZ45. Both of these streams are small and dry up during the summer months. This area is classified as prohibited.

Stream sites S1WZ46, S2WZ46 and S3WZ46 all flow into the northeast end of Kent Cove. All of these streams received elevated scores. The flow from these streams is very low or dries up entirely during the summer months. This area has been surveyed and resurveyed to try to locate the source of the elevated scores at sample station WZ46. During one of these surveys a walk along the shore revealed a long stretch of shore with piles of animal waste (deer?) mixed in at the seaweed wrack line. The animal waste was in the area between sites S1WZ46 and S2WZ46. This area is classified as prohibited. Stream sites S1WZ47 and S2WZ47 are located on the west side of Kent Cove. This area has also received elevated sample scores (stations WZ47 and WZ48) of unknown origin. The stream scores in this area weren't as elevated. There is very limited development in this portion of the cove. No pollution sources were identified during the last survey of the area. This area is classified as prohibited.

Stream sites S1WZ48 and S1WZ49 are sampled in the Cubby Hole. Stream S1WZ48 is the larger of the two streams and it flows into the Cubby Hole at the northeast corner. Stream



S1WZ49 is a very small stream that meanders through a hay pasture to the shore. Site S1WZ49 dries up during the summer months. No pollution sources were identified nearby site S1WZ48. Above site S1WZ49 a malfunctioning septic system was identified during the last survey (350' from shore on slope). This property now has a new (2008) in ground system.

The majority of the streams sampled on North Haven flow into areas classified as prohibited or restricted. These streams were sampled to see if they might be contributing to the elevated water quality in the immediate area. The streams in the vicinity of sampling stations WZ27, WZ29, WZ45, and WZ46 all received dirty scores (Table 7). All of these areas have had poor water quality of unknown origin in recent years. The stream flowing onto the shore nearby sampling station WZ44 also received an elevated score. There are no dwellings within two miles of this site. It is likely that the elevated scores at these streams are caused by wildlife. Deer and raccoons can often be seen along the shore and fecal waste from these animals has also been observed in the seaweed wrack line in Kent Cove.

**Table 7. North Haven Stream Results November 17, 2008**

Stream ID	Date	Nearest Station	Class	Score FC/100ml
S1WZ26	11/17/08	WZ26	R	64
S1WZ27		WZ27	R	118
S1WZ29		WZ29	P	440
S2WZ29		WZ29	P	200
S1WZ40.5		WZ40.5	A	82
S1WZ44		WZ44	A	136
S1WZ45		WZ45	P	320
S2WZ45		WZ45	P	420
S1WZ46		WZ46	P	320
S2WZ46		WZ46	P	500
S3WZ46		WZ46	P	114
S1WZ47		WZ47	P	54
S2WZ47		WZ47	P	48
S1WZ48		WZ48	P	46
S1WZ49		WZ49	P	14

On Vinalhaven Island, two streams were sampled on 6/25/08 in the vicinity of the Old Harbor Pond survey area (Table 8). Both of these streams are located at the eastern end of the pond nearby the area of greatest development. One stream, (Pond PS1) received a score of 54 and the other (Pond PS2) received a score of 700. Stream Pond PS2 is located below the pond area that AP1 is located on. Several people that were interviewed mentioned that the area was frequented by beaver, deer and ducks.

Vinalhaven stream site PS1 is not located nearby any of our routine sample sites. This stream is north of Starboard Rock in an almost enclosed cove that is classified as approved. There are four small summer camps nearby. None of the camps were considered pollution sources when the area was surveyed. The stream flows through a wooded area. The score at this site was a 4 FC/100ml. Stream site S1WZ15.5 flows into Seal Bay at water sampling station WZ15.5. This stream drains a wooded marsh. There is one small camp nearby that was not considered a



pollution source when the area was surveyed. This site received a score of 2 FC/100ml. Seal Bay is now classified as restricted because the water quality scores have deteriorated to the point that the area no longer meets approved standards. This area is frequented by cruising boats that may be impacting the water quality. Stream site PS2 is not located nearby a water sampling station. This stream also flows into Seal Bay and drains through an undeveloped wooded area. There is an old farmhouse 150 feet from the stream sample site that was not considered a pollution source at the time of survey. This site received a score of 2 FC/100ml. This area is classified as restricted; however the water quality now meets approved standards.

Stream site S1WZ17 flows into Seal Bay nearby Coombs Hill. There are no dwellings nearby. This is a very small stream that dries up during the summer months. This area is classified as restricted; however the water quality now meets approved standards. This site received a score of 160 FC/100ml. This site may be impacted by wildlife. Stream sites PS3 and PS4 flow into Arey Cove which is classified as approved. Both of these streams received clean scores. Stream sites S1WZ22 and S2WZ22 flow into Roberts Harbor. Both of these streams received good scores. This area is classified as prohibited because the area formerly had licensed overboard discharges and the water quality has continued to be poor. No pollution sources were identified at the time of the survey.

The elevated score at Pond PS2 could be caused by the nearby malfunction or wildlife. This area is classified as restricted. Stream S1WZ17 also received an elevated score (16FC/100ML). There are no dwellings nearby this site. The stream is quite small and only flows intermittently and dries up during the summer months. The remaining streams received clean water quality scores.

**Table 8. Vinalhaven Streams 2008**

Stream ID	Date	Nearest Station	Class	Score FC/100ml	
Pond PS1	6/25/08	No station nearby	R	54	
Pond PS2		No station nearby	R	700	
PS1	11/4/08	No station nearby	A	4	
S1WZ15.5		WZ15.5	P	2	
PS2		WZ16	R	2	
S1WZ17		WZ17	R	160	
PS3		WZ20	A	<2	
PS4		WZ20	A	8	
S1WZ22		WZ22	P	8	
S2WZ22		WZ22	P	18	
S1WZ17		11/20/08	WZ17	R	25

***Agricultural Activities***

There are no large scale agricultural facilities on or near the shoreline of growing area WZ. However, there are several small farms that have the potential to impact water quality along the shoreline of this growing area. Animal farms on North Haven and Vinalhaven consist of small family run farms of one to ten animals. Many of these “farm sites” are actually nothing more than



fields used for pasturing animals such as sheep. Often the fields are not owned by the animal owners but permission has been obtained to allow the animals to graze in the field. On both islands, the animal grazing locations and the number and type of animals can change from year to year.

On North Haven, six areas were noted as having grazing farm animals in 2008 (Figure 11). None of these farm sites had manure piles. At farm site 1 (AF1) six cows were grazing in a field west of Amesbury Point Road. This is a large pasture area with a wooded buffer along the shore. No manure pile was visible. At farm sites two and three (AF2 and AF3) ten sheep graze in pastures located on either side of Crabtree Point Road. The sheep are held in one pasture until the field has been grazed short and then they are moved across the road to the other pasture. Again, this is a large pasture area with a wooded buffer along the shore. No manure pile was visible. The Pulpit Harbor side of Crabtree Point Road is classified as prohibited the Southern Harbor side of the road is approved.

At animal farm four (AF4) eight sheep graze in a large pasture greater than 500 feet from the shore. This site is on the opposite side of the road from the shore and there is a broad buffer of land between the shore and the pasture area. Animal farm five (AF5) is again a large pasture area on the opposite side of the road from the shore. At this site, the animals are not always present. When the animals are there, the site usually has up to six sheep and occasionally two cows. There is a stream (S3WZ46) that flows from the general direction of this pasture into Kent Cove. When this site was sampled in 2008 it received a score of 115 FC/100ML. The shore in this area is classified as prohibited. Animal farm six (AF6) is a small intermittently used pasture that is located nearby sampling station WZ45. Four sheep occasionally graze at this site. The pasture area at this site is on the shore side of the road and borders on a prohibited area.

In addition to domestic animals, wildlife can also have an adverse impact on water quality. While wildlife, especially wildfowl, can be occasionally observed in small numbers throughout the entire growing area, wildlife has been frequently noted in the area surrounding water quality stations WZ 27 WZ 46 and WZ 47; station WZ 27 is classified as restricted and WZ 46 and WZ 47 are classified as prohibited. The Cubby Hole (station WZ 49) is a shorebird and wading bird habitat. The Cubby Hole is classified as prohibited.

On Vinalhaven there are five farm sites where animals can be seen grazing (Figure 12). Animal farm site AF1 is the largest of the farm sites on Vinalhaven. This site is at least 900 feet from the shore above Long Cove. Animals at this site consist of 65 sheep, 15 chickens, 16 turkeys, 15 guinea hens, and 1 cow. There are two uncovered manure piles and two man-made ponds. The manure piles are away from any drainage and the animal pasture areas are very large and well buffered by trees. The shore of Long Cove is classified as restricted. At animal farm site AF2 there were two pigs in a small enclosed area approximately 30 feet from the shore. A cow was grazing on the lawn of a house that is located across the road from the pigs (75 feet from shore). The lawn area was small; no manure pile was visible. Chickens roamed freely all over the property. This site was messy and the pig pen could be smelled from the road. There is a 13 acre prohibited area on the shore in this area.

At animal farm site AF3 two horses were grazing in a large pasture area. This site is used for grazing purposes only. There are no barns or manure piles at this site and the horses are not always present from year to year. At animal farm site AF4 three horses graze in a pasture area



300 feet from the shore. No manure pile was visible. The shore in this area is classified as approved. Animal farm site AF5 is located on Narrows Island. An unknown number of sheep graze on the island. Sample station WZ21 is located on the Vinalhaven shore directly across from Narrows Island. Occasionally sheep can be seen grazing on the island when the sample is collected. The west side of Narrows Island (facing sample station WZ21) is classified as prohibited; the east side is classified as approved. Water quality scores at station WZ21 meet approved standards with a current P90 score of 11.1 FC/100ML.

At the present time, the shore adjacent to the animal farms noted above is classified appropriately. Animal farm 1 on Vinalhaven is the largest of all of the farms. The animal farm on this property is located more than 900 feet from the shore and the shore is classified as restricted for shellfish harvest. No changes in classification are necessary around the animal farm sites in shellfish growing area WZ.



Figure 11. Farming Operations on North Haven

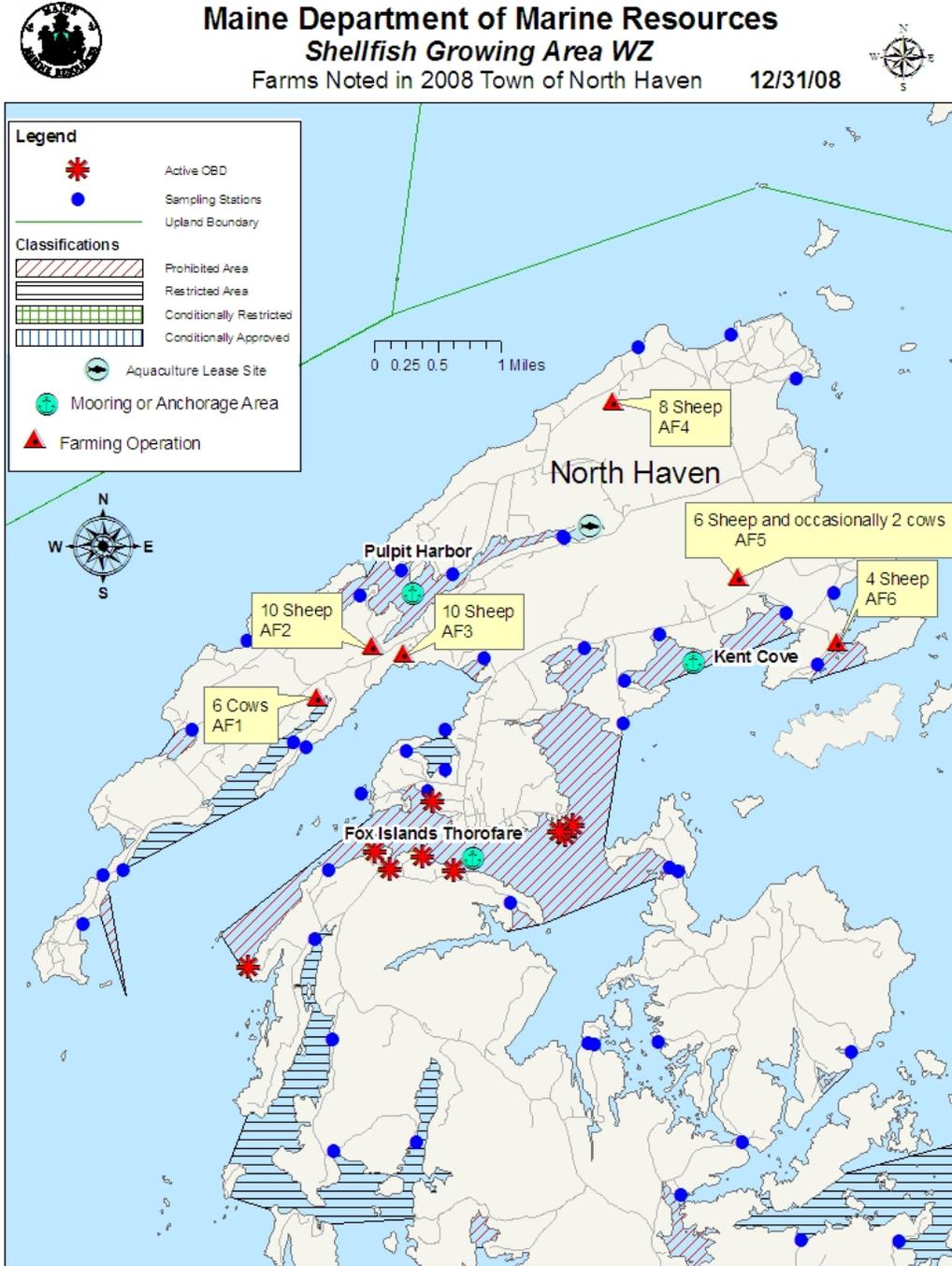
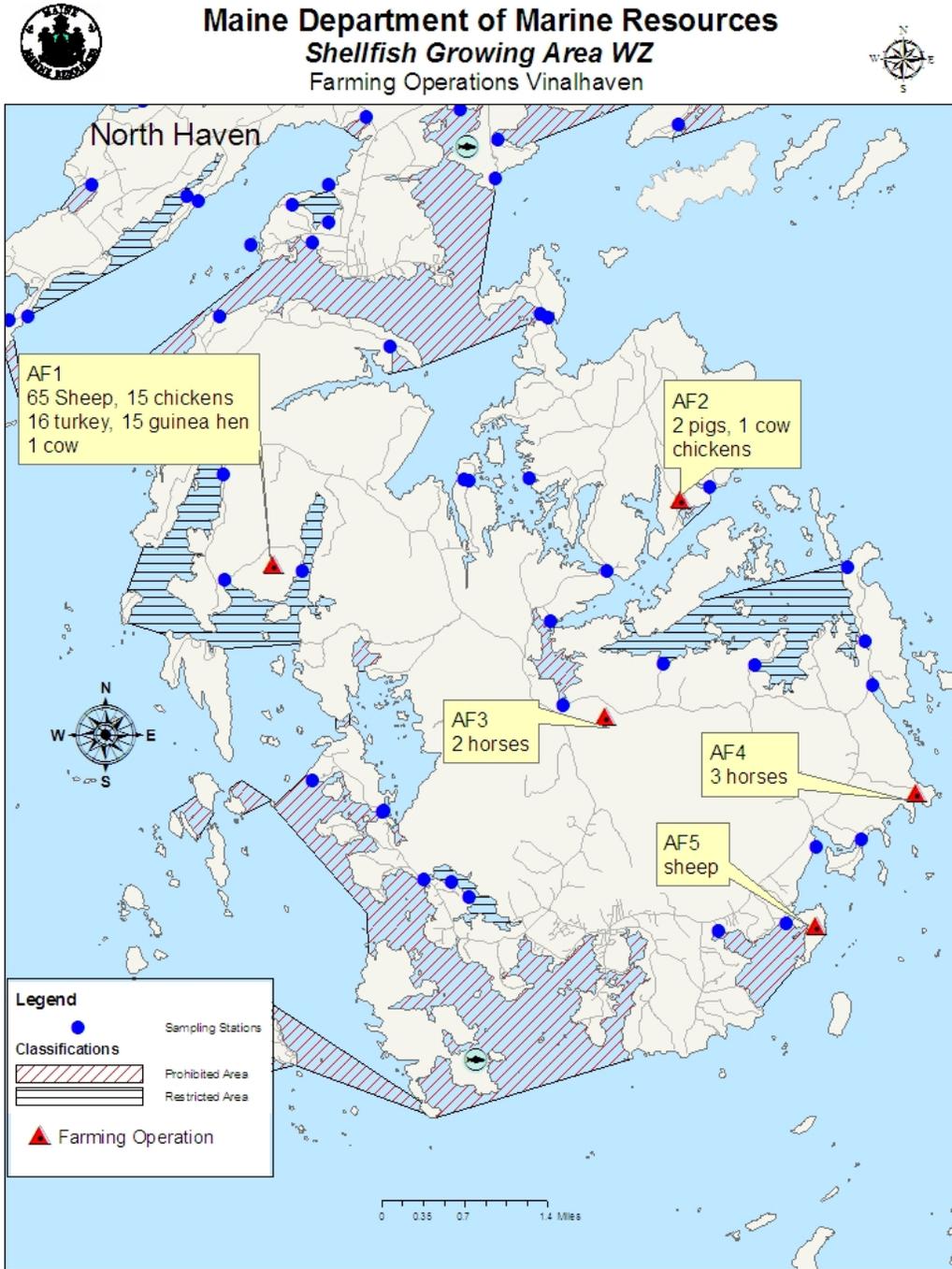




Figure 12. Farming Operations on Vinalhaven





### Conservation/Recreation Areas

Both islands in shellfish growing area WZ have large tracts of land set aside for public use. On North Haven, Mullen's Head Park encompasses all of Mullen Head on the east side of the island. This park is open to the public for daytime use only. No camping is allowed. The park consists of large beach areas and grassy trails. Outhouses are available at several locations around the park. The DMR has two sample sites at Mullen Head Park (WZ 43 and WZ44). Both of these sites have P90 scores that meet approved standards. There are also some smaller public areas that are open for daytime use consisting of trails and public beaches. These sites do not have outhouses available because they do not get the same volume of traffic as the Mullen Head Park.

On Vinalhaven there are at least ten town parks or nature preserves. None of the public lands on Vinalhaven have outhouse facilities and camping is not allowed at any of them. All of the town parks and nature preserves are open for daytime use only. Town parks are located in the following areas: Perry Creek, The Basin, Indian Creek, Lanes Island, Seal Bay, Arey Neck, Isle au Haut Mountain, Booths Quarry Road, Middle Mountain, Browns Head Lighthouse, Zekes Point Road and on at least one un-named island at the mouth of Long Cove. The Vinalhaven Land Trust has done a good job of acquiring land for public use and it is possible that additional land has been added to this list. No adverse impact has been observed at any of the public land areas on Vinalhaven.

### Water Quality Review and Discussion

Table 9 lists all active approved, restricted and prohibited stations in Growing Area WZ, with their respective Geomean and P90 calculations for 2008. Please refer to Appendix A for a key to interpreting the headers on the columns of Table 9. The approved and restricted standards for each station are also displayed. 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 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 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 DMR central files.

At the end of the review year, all of the stations in shellfish growing area WZ met their NSSP classification standards.

**Table 9. Water Quality in Growing Area WZ**

Station	Class	Count	MFCcount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WZ003.00	P	30	14	11.8	0.65	240	82.4	39	225	7/19/2004
WZ003.50	R	30	13	8.7	0.7	240	69.1	40	230	6/23/2004
WZ003.70	NEW	6	6	5.3	0.61	66	34.4	31	163	5/20/2008
WZ004.00	P	30	13	4.2	0.39	43	13.6	40	230	4/20/2004



Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WZ004.30	NEW	12	12	2.3	0.31	24	6	31	163	5/16/2007
WZ005.00	A	30	13	4.9	0.68	1200	37	40	230	4/20/2004
WZ005.90	R	30	12	10.6	0.8	1500	114.8	40	235	11/24/2003
WZ006.00	R	30	13	8	0.58	93	44.5	40	230	4/20/2004
WZ007.00	R	30	13	6.4	0.74	1100	57.4	40	230	4/20/2004
WZ007.40	NEW	12	12	3.6	0.5	86	16.6	31	163	5/16/2007
WZ007.80	P	30	13	4.5	0.55	460	23.2	40	230	4/20/2004
WZ008.00	P	30	13	7.3	0.67	460	53.5	40	230	4/20/2004
WZ009.00	A	30	13	4.1	0.32	23	11	40	230	4/20/2004
WZ009.50	A	30	13	4	0.5	93	17.7	40	230	4/20/2004
WZ010.50	NEW	12	12	1.9	0	2	1.9	31	163	5/16/2007
WZ011.00	P	30	13	4.8	0.53	93	23	40	230	9/25/2003
WZ012.00	A	30	13	5.4	0.59	240	30.7	40	230	9/25/2003
WZ013.00	A	30	14	3.3	0.32	38	8.8	39	225	4/20/2004
WZ014.00	A	30	14	3	0.28	43	6.9	39	225	4/20/2004
WZ014.50	NEW	12	12	2.7	0.3	13	6.8	31	163	5/16/2007
WZ015.00	P	30	13	5.9	0.46	43	23.4	40	230	4/20/2004
WZ015.50	R	30	13	11.9	0.65	220	81.7	40	230	4/20/2004
WZ016.00	R	30	14	5.4	0.55	240	28.1	39	225	4/20/2004
WZ017.00	R	30	14	5.1	0.61	1100	31.2	39	225	4/20/2004
WZ017.50	NEW	12	12	3.8	0.5	72	17.4	31	163	5/16/2007
WZ018.00	A	30	14	6.6	0.56	460	34.8	39	225	4/20/2004
WZ019.00	A	30	14	3.3	0.4	93	10.9	39	225	4/20/2004
WZ020.00	A	30	14	4.7	0.38	43	14.6	39	225	4/20/2004
WZ021.00	P	30	14	4.1	0.33	23	11.1	39	225	4/20/2004
WZ022.00	P	30	15	16.3	0.65	332	112.8	38	221	4/20/2004
WZ026.00	R	30	14	5.6	0.59	160	32.1	39	225	4/6/2004
WZ027.00	R	30	14	10.6	0.66	600	75.3	39	225	4/6/2004
WZ028.00	A	30	14	3.5	0.32	43	9	39	225	4/6/2004
WZ029.00	P	30	14	10.6	0.72	500	89.8	39	225	4/6/2004
WZ030.00	A	30	14	3.9	0.49	240	16.8	39	225	4/6/2004
WZ031.00	R	30	14	5.3	0.66	480	38.3	39	225	4/6/2004
WZ032.00	A	30	14	2.8	0.2	12	5.3	39	225	4/6/2004
WZ033.00	A	30	14	3.6	0.43	240	13.1	39	225	4/6/2004
WZ034.00	A	30	14	2.7	0.33	142	7.4	39	225	4/6/2004
WZ035.00	P	30	14	2.6	0.17	9.1	4.3	39	225	4/6/2004
WZ035.50	A	30	14	2.7	0.2	15	4.9	39	225	4/6/2004
WZ036.00	P	30	14	6.5	0.69	1100	50.9	39	225	4/6/2004
WZ038.80	P	30	27	6.9	0.62	102	44.1	32	173	7/26/2006
WZ038.90	A	30	30	4.1	0.51	160	18.8	31	163	1/31/2007



Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WZ039.00	P	30	14	3.7	0.31	23	9.5	39	225	5/6/2004
WZ040.00	P	30	14	3.4	0.33	36	9.3	39	225	4/6/2004
WZ040.50	A	30	14	2.6	0.22	23	5.2	39	225	4/6/2004
WZ041.00	A	30	14	3.2	0.39	210	10.5	39	225	4/6/2004
WZ042.00	A	30	14	3.1	0.43	134	11.2	39	225	4/6/2004
WZ043.00	A	30	14	4.8	0.64	740	32.9	39	225	5/6/2004
WZ044.00	A	30	14	4.8	0.51	240	22.1	39	225	5/6/2004
WZ045.00	P	30	14	5.1	0.5	93	22.5	39	225	4/6/2004
WZ046.00	P	30	15	13.2	0.76	1100	125.9	38	221	4/6/2004
WZ047.00	P	30	15	7.4	0.62	240	46.6	38	221	4/6/2004
WZ048.00	P	30	15	8.1	0.67	240	58.6	38	221	4/6/2004
WZ048.50	NEW	17	15	3.7	0.47	68	15.4	32	175	8/9/2006
WZ049.00	P	30	15	9	0.74	1200	82.4	38	221	4/6/2004
WZ054.00	P	30	15	8	0.73	680	70.7	38	221	4/6/2004
WZ055.00	A	30	14	3.1	0.24	18	6.4	39	225	4/6/2004

Table 10 shows the sampling effort for shellfish growing area WZ in 2008. All of the stations were sampled a minimum of six times following the systematic random sampling strategy (SRS) over the course of the sampling season. Several new stations are noted in this table with an explanation for why they were created in the comments column. The classification of the water body that each of these new stations is located in is shown in the "Class" column. Stations WZ38.8 and WZ38.9 received extra sampling in 2008 to determine if either of these stations showed a seasonal impact. The seasonal impact on these stations will be addressed in the 2009 growing area WZ annual report; this will allow for additional data to be collected in 2009. SRS sampling effort for 2008 is presented in Appendix C.

**Table 10. Sampling Effort for Growing Area WZ**

Station	Class	Extra		Random		Total	Comments
		Closed	Open	Closed	Open		
WZ003.00	P			6		6	
WZ003.50	P			6		6	
WZ003.70	NEW-R				6	6	Created to monitor aquaculture site
WZ004.00	P			6		6	
WZ004.30	NEW-P			6		6	Created to monitor closure line
WZ005.00	A				6	6	
WZ005.90	R				6	6	
WZ006.00	R				6	6	
WZ007.00	R				6	6	
WZ007.40	NEW-R				6	6	Created to monitor



Station	Class	Extra		Random		Total	Comments
		Closed	Open	Closed	Open		
							head of cove
WZ007.80	P			6		6	
WZ008.00	P			6		6	
WZ009.00	A				6	6	
WZ009.50	A				6	6	
WZ010.50	NEW-A				6	6	Created to monitor area with no station
WZ011.00	P			6		6	
WZ012.00	A				6	6	
WZ013.00	A				6	6	
WZ014.00	A				6	6	
WZ014.50	NEW-P			6		6	Created to monitor area with no station
WZ015.00	P			6		6	
WZ015.50	R			6		6	
WZ016.00	R				6	6	
WZ017.00	R				6	6	
WZ017.50	NEW-R				6	6	Created to monitor closure line
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	



Station	Class	Extra		Random		Total	Comments
		Closed	Open	Closed	Open		
WZ038.80	P	7		8		15	Extra samples collected to evaluate seasonal impact
WZ038.90	A		10		9	19	Extra samples collected to evaluate seasonal impact
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	NEW-P			6		6	Created to monitor closure line
WZ049.00	P			6		6	
WZ054.00	P			6		6	
WZ055.00	A				6	6	

Figures 13 through 16 show the P90 trends during the open status over the past three years, for all approved and restricted stations in growing area WZ. 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 or restricted standard; any station showing the 2008 column on or above 100 percent does not meet the standard for the classification. On Vinalhaven, approved stations WZ5, WZ12, and WZ18 have shown a decline in water quality over the past 3 years, and have continued to be over 50 percent of the approved standard each of the three years. There are no dwellings on the immediate shore at station WZ 5. This site is a popular site for picnicking and the area is also frequented by kayakers. There are no dwellings at station WZ 12. The area is fairly remote; however it is a popular spot for shellfish harvesters to park when they are clamming in the nearby cove. Garbage has been found along the shore and in the bushes in this area. There are no bathroom facilities; however no human waste has been found on the shore. At station WZ 18, there is one dwelling that is approximately 300 feet from the sample station. There are no streams in the area and the area is not frequented by the public. The dwelling was inspected and no pollution sources were found. Stations WZ 9, WZ 9.5 and WZ 20 have shown an improving water quality



trend. The remaining stations have shown little change in the last three years (WZ 13, WZ 14 and WZ 19).

Figure 13. Vinalhaven P90 Scores Shown as Percent of Approved Standard; Approved Stations

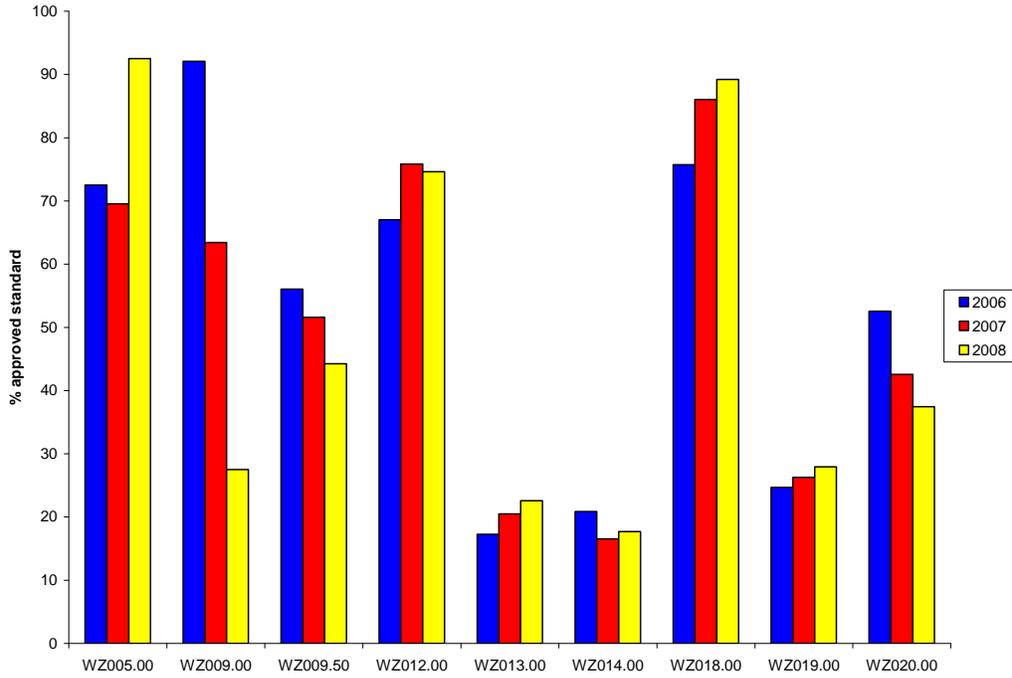




Figure 14 shows the trends for the restricted stations on Vinalhaven. The only station in this grouping that has shown deteriorating water quality is station WZ 5.9. This site has continued to deteriorate for several years. At one time, the area was classified as approved for shellfish harvest. The dwellings at this site are less than ten years old and have functioning septic systems that are located away from the shore. There is a farm (AF1) that is part of this property. The farm is located more than 1,000 feet from the shore on a steep rise. A tour of the property with the farmer revealed that although the farm has a variety of animals, they are kept away from the shore and there is a tree buffer between the shore and grazing areas. Manure piles are in areas that would drain away from the shore and are well maintained. It is unlikely that the farm is contributing to the elevated water quality in this area. The only other possibility is that the cove is frequented by cruising boats during the summer months.

Figure 14. Vinalhaven P90 Scores Shown as Percent of Restricted Standard; Restricted Stations

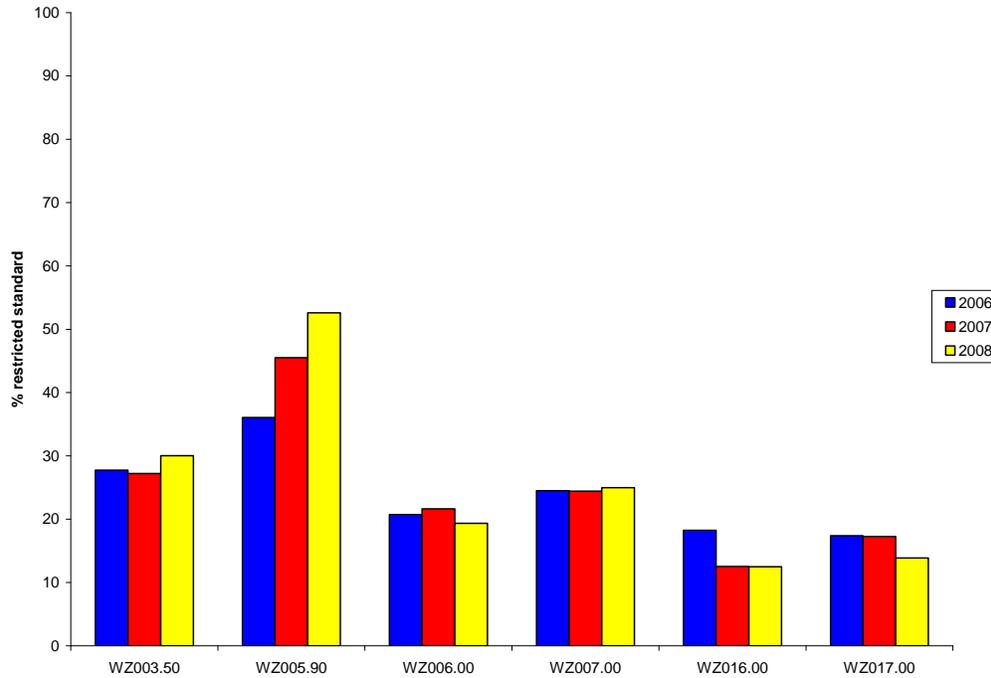




Figure 15 shows the P90 trends for approved stations located on North Haven. The majority of the stations show an improving trend. Station WZ 38.9 has a variable trend and WZ 43 has had deteriorating water quality trends for each of the last three years. Station WZ 38.9 is sampled at the salt pond at the head of Pulpit Harbor. This site is an aquaculture lease site for raising oysters. At the time of the last shoreline survey of this area, three malfunctioning septic systems were identified and replaced with new in ground systems. The properties along the shore in the vicinity of the salt pond were revisited in 2008 and no new pollution sources were found. Station WZ 43 is sampled at Mullens Head Park. There are no dwellings in this area. Outhouses are available which are located approximately 200 feet from the shore. Again, no pollution sources were found in this area.

**Figure 15. North Haven P90 Scores Shown as Percent of Approved Standard; Approved Stations**

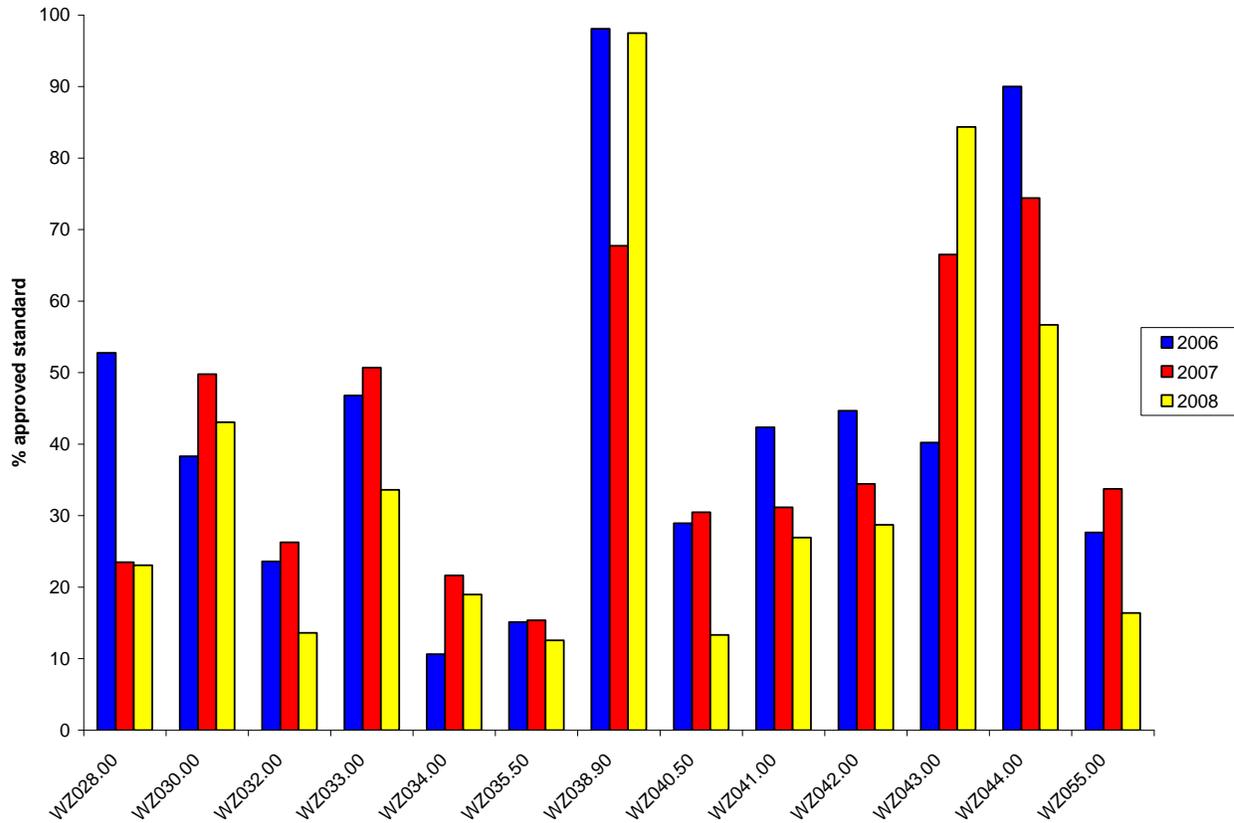
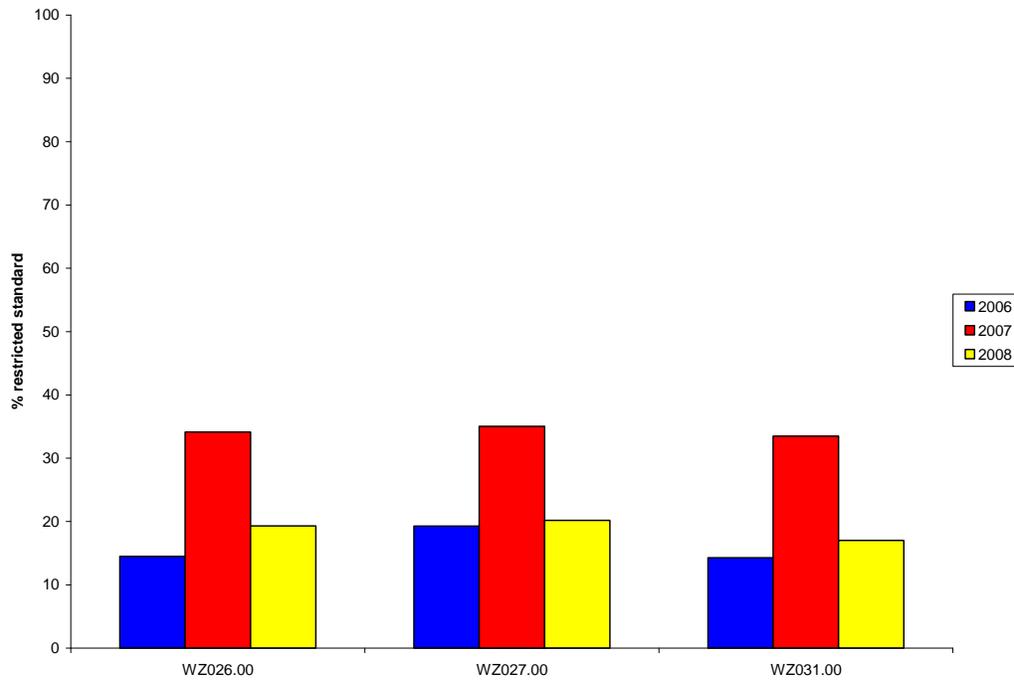




Figure 16 shows the restricted stations on North Haven. All of these stations showed deteriorating water quality in 2007 which improved in 2008. All of these stations are meeting the restricted standard.

Figure 16. North Haven P90 Scores Shown as Percent of Restricted Standard; Restricted Stations





## Recommendations for Upward Classification

No areas are being recommended for classification changes at this time.

## Shoreline Survey Activity during Review Period

Shoreline survey work during the review period has consisted of a new shoreline survey of Old Harbor Pond, Vinalhaven (June 2008) which was conducted at the request of an aquaculture leaser. No pollution sources on Vinalhaven were revisited in 2008 because the shore of Vinalhaven is scheduled to be surveyed in 2009. Drive through surveys were done during dates of sample collection and streams were sampled on November 4, 2008.

The town of North Haven provided an updated listing of new and improved septic systems for the years 2003-2008. In the area locally known as Cabotville (in Pulpit Harbor) a large licensed overboard discharge system was replaced with 4 in ground systems (July 2008). On Crabtree Point a system that was found to consist of a tank with no leach field had a new leach field installed. Two known pollution sources on North Haven were revisited to document that the systems had not been fixed (July 21, 2008).

## Aquaculture/Wet Storage Activity

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

Aquaculture activity in Growing Area WZ for 2008 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

No classification changes are recommended at this time.

## Summary

Growing area WZ has several areas with elevated water quality due to unknown causes. These areas include the Cubby Hole and Kent Cove on North Haven, and Long Cove, Crockett Cove, Winter Harbor, and Seal Bay on Vinalhaven. Both islands have large deer populations and



North Haven now has a problem with raccoons. Walks along the shore at low tide in Kent Cove, North Haven revealed mounds of animal waste in the weed wrack line and raccoon tracks with signs of animal digging on the mudflat. Both islands are popular spots for cruising boats to visit however anchorage space in some of the smaller coves is limited due to the shape and depth of the coves.

Both islands will be surveyed in 2009 and 2010. A new sanitary survey report will be written following the completion of these surveys.

## 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.



### Appendix B. Growing Area WZ 2008 Data

Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
WZ003.00	29-Jan-08	EXT	L	CL	-1	25	R	X	C	P	<2
	24-Mar-08	LL	F	SE	2	22	R	X	C	P	<2
	20-May-08	FP	F	SW	10	24	R	X	C	P	24
	16-Jul-08	MLP	H	CL	18	30	R	X	C	P	<2
	02-Sep-08	MLP	F	NE	14	30	R	X	C	P	12
	03-Nov-08	MLP	F	W	5	26	R	X	C	P	20
WZ003.50	20-May-08	FP	F	NW	14	14	R	X	C	R	14
	18-Jun-08	AB	HF	CL	15	22	R	X	C	R	<2
	21-Jul-08	MLP	H	CL	24	28	R	X	C	R	<2
	02-Sep-08	MLP	F	NE	18	24	R	X	C	R	2
	03-Nov-08	MLP	HF	SW	5	22	R	X	C	R	<2
	19-Nov-08	FP	F		3	20	R	X	C	R	86
WZ003.70	20-May-08	FP	F	W	13	13	R	X	O	R	2
	18-Jun-08	AB	F	CL	15	23	R	X	O	R	2
	16-Jul-08	MLP	HF	CL	21	27	R	X	O	R	<2
	02-Sep-08	MLP	F	NE	20	24	R	X	O	R	12
	03-Nov-08	MLP	HF	S	5	22	R	X	O	R	4
	19-Nov-08	FP	F		1	18	R	X	O	R	66
WZ004.00	29-Jan-08	EXT	LF	N	-2	32	R	X	C	P	<2
	24-Mar-08	LL	F	SE	1	30	R	X	C	P	<2
	20-May-08	FP	F	SW	8	30	R	X	C	P	<2
	16-Jul-08	MLP	H	W	15	30	R	X	C	P	<2
	02-Sep-08	MLP	F	NE	14	31	R	X	C	P	6
	03-Nov-08	MLP	F	W	6	32	R	X	C	P	4
WZ004.30	29-Jan-08	EXT	LF	N	-1	32	R	X	C	P	<2
	24-Mar-08	LL	F	SE	1	30	R	X	C	P	<2
	20-May-08	FP	F	W	10	29	R	X	C	P	<2
	16-Jul-08	MLP	H	CL	15	31	R	X	C	P	<2
	02-Sep-08	MLP	F	NE	12	30	R	X	C	P	<2
	03-Nov-08	MLP	F	SW	7	32	R	X	C	P	2
WZ005.00	29-Jan-08	EXT	LF	CL	-1	32	R	X	O	A	<2
	24-Mar-08	LL	F	SE	1	30	R	X	O	A	<2
	20-May-08	FP	F	SW	8	30	R	X	O	A	2
	16-Jul-08	MLP	H	CL	15	31	R	X	O	A	<2
	02-Sep-08	MLP	F	NE	16	31	R	X	O	A	<2
	03-Nov-08	MLP	F	W	6	32	R	X	O	A	108
WZ005.90	29-Jan-08	EXT	F	CL	-1	32	R	X	O	R	<2
	24-Mar-08	LL	HF	SE	2	30	R	X	O	R	<2
	20-May-08	FP	HF	SW	10	30	R	X	O	R	<2
	16-Jul-08	MLP	HE	SW	19	30	R	X	O	R	<2
	02-Sep-08	MLP	F	CL	13	30	R	X	O	R	2
	03-Nov-08	MLP	F	SW	6	32	R	X	O	R	18



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
WZ006.00	29-Jan-08	EXT	F	CL	-1	32	R	X	O	R	<2
	24-Mar-08	LL	HF	SE	2	25	R	X	O	R	<2
	20-May-08	FP	HF	SW	11	28	R	X	O	R	<2
	16-Jul-08	MLP	HE	CL	21	30	R	X	O	R	2
	02-Sep-08	MLP	F	CL	13	31	R	X	O	R	<2
	03-Nov-08	MLP	F	CL	6	32	R	X	O	R	25
WZ007.00	29-Jan-08	EXT	F	CL	-1	32	R	X	O	R	<2
	24-Mar-08	LL	HF	SE	2	30	R	X	O	R	<2
	20-May-08	FP	HF	SW	9	29	R	X	O	R	3.6
	16-Jul-08	MLP	HE	SW	19	30	R	X	O	R	<2
	02-Sep-08	MLP	F	CL	13	30	R	X	O	R	6
	03-Nov-08	MLP	F	SW	6	32	R	X	O	R	2
WZ007.40	29-Jan-08	EXT	F	CL	-1	15	R	X	O	R	<2
	24-Mar-08	LL	HF	SE	2	22	R	X	O	R	<2
	20-May-08	FP	HF	S	14	28	R	X	O	R	4
	16-Jul-08	MLP	HE	CL	23	30	R	X	O	R	<2
	02-Sep-08	MLP	F	N	18	30	R	X	O	R	<2
	03-Nov-08	MLP	HF	SW	5	32	R	X	O	R	<2
WZ007.80	29-Jan-08	EXT	F		-2	30	R	X	C	P	<2
	24-Mar-08	LL	HF	CL	2	30	R	X	C	P	<2
	20-May-08	FP	HF	E	10	28	R	X	C	P	<2
	16-Jul-08	MLP	HE	SW	22	30	R	X	C	P	<2
	02-Sep-08	MLP	HF	NE	13	30	R	X	C	P	<2
	03-Nov-08	MLP	F	SW	6	31	R	X	C	P	<2
WZ008.00	29-Jan-08	EXT	F	CL	-2	30	R	X	C	P	<2
	24-Mar-08	LL	H	CL	2	28	R	X	C	P	<2
	20-May-08	FP	H	S	10	28	R	X	C	P	<2
	21-Jul-08	MLP	F	CL	18	31	R	X	C	P	6
	02-Sep-08	MLP	HF	CL	15	30	R	X	C	P	<2
	03-Nov-08	MLP	F	CL	6	32	R	X	C	P	<2
WZ009.00	29-Jan-08	EXT	F	CL	-2	28	R	X	O	A	<2
	20-May-08	FP	H	NW	10	28	R	X	O	A	<2
	18-Jun-08	AB	H	CL	11	30	R	X	O	A	10
	16-Jul-08	MLP	E	SW	22	30	R	X	O	A	<2
	02-Sep-08	MLP	HF	CL	18	32	R	X	O	A	12
	03-Nov-08	MLP	F	SW	7	32	R	X	O	A	<2
WZ0089.50	29-Jan-08	EXT	F	CL	-2	32	R	X	O	A	<2
	20-May-08	FP	H	NW	9	30	R	X	O	A	<2
	18-Jun-08	AB	H	CL	10	30	R	X	O	A	<2
	16-Jul-08	MLP	E	CL	20	30	R	X	O	A	<2
	02-Sep-08	MLP	HF	NE	16	32	R	X	O	A	2
	03-Nov-08	MLP	F	SW	6	32	R	X	O	A	<2
WZ010.50	29-Jan-08	EXT	F	CL	-3	30	R	X	O	A	<2
	24-Mar-08	LL	F	CL	2	29	R	X	O	A	<2



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	20-May-08	FP	H	W	8	28	R	X	O	A	<2
	16-Jul-08	MLP	E	SW	20	30	R	X	O	A	<2
	02-Sep-08	MLP	H	NE	15	32	R	X	O	A	2
	03-Nov-08	MLP	F	SW	6	32	R	X	O	A	<2
WZ011.00	29-Jan-08	FP	F	CL	0	31	R	X	C	P	<2
	20-May-08	FP	HE	W	11	28	R	X	C	P	<2
	18-Jun-08	AB	HF	CL	10	30	R	X	C	P	<2
	16-Jul-08	MLP	E	CL	20	30	R	X	C	P	<2
	02-Sep-08	MLP	H	CL	15	32	R	X	C	P	<2
03-Nov-08	MLP	F	SW	5	32	R	X	C	P	<2	
WZ012.00	29-Jan-08	FP	F	CL	3	32	R	X	O	A	<2
	20-May-08	FP	HE	W	10	30	R	X	O	A	<2
	18-Jun-08	AB	HF	CL	11	30	R	X	O	A	<2
	16-Jul-08	MLP	E	CL	18	30	R	X	O	A	2
	02-Sep-08	MLP	H	NE	15	32	R	X	O	A	<2
	03-Nov-08	MLP	F	SW	8	32	R	X	O	A	<2
WZ013.00	29-Jan-08	FP	F	CL	1	31	R	X	O	A	<2
	25-Mar-08	LL	F	SE	1	27	R	X	O	A	<2
	21-May-08	FP	F	S	6	30	R	X	O	A	<2
	21-Jul-08	MLP	F	NW	14	30	R	X	O	A	2
	03-Sep-08	LL	F	CL	14	32	R	X	O	A	<2
	04-Nov-08	FP	F	CL	7	30	R	X	O	A	6
WZ014.00	29-Jan-08	FP	F	CL	2	31	R	X	O	A	<2
	25-Mar-08	LL	F	SE	2	28	R	X	O	A	<2
	21-May-08	FP	F	CL	10	31	R	X	O	A	<2
	21-Jul-08	MLP	F	NW	19	30	R	X	O	A	2
	03-Sep-08	LL	F	CL	17	32	R	X	O	A	2
	04-Nov-08	FP	F	CL	10	31	R	X	O	A	<2
WZ014.50	29-Jan-08	FP	F	CL	1	30	R	X	C	P	<2
	25-Mar-08	LL	F	SE	2	28	R	X	C	P	<2
	21-May-08	FP	F	W	10	30	R	X	C	P	<2
	21-Jul-08	MLP	F	CL	18	30	R	X	C	P	2
	03-Sep-08	LL	F	CL	16	32	R	X	C	P	13
	04-Nov-08	FP	F	CL	7	31	R	X	C	P	2
WZ015.00	29-Jan-08	FP	LF	N	0	28	R	X	C	P	<2
	25-Mar-08	LL	F	NE	2	23	R	X	C	P	<2
	21-May-08	FP	F	S	10	30	R	X	C	P	<2
	21-Jul-08	MLP	F	N	20	30	R	X	C	P	9.1
	03-Sep-08	LL	F	NE	17	32	R	X	C	P	2
	04-Nov-08	FP	F	CL	6	28	R	X	C	P	15
WZ015.50	29-Jan-08	FP	F	CL	0	1	R	X	C	P	2
	21-May-08	FP	F	CL	9	31	R	X	C	P	<2
	18-Jun-08	AB	HE	E	10	30	R	X	C	P	<2
	21-Jul-08	MLP	F	NE	18	30	R	X	C	P	68



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	03-Sep-08	LL	F	CL	17	32	R	X	C	P	44
	04-Nov-08	FP	F	CL	7	31	R	X	C	P	<2
WZ016.00	29-Jan-08	FP	F	SE	4	30	R	X	O	R	<2
	25-Mar-08	LL	F	CL	2	28	R	X	O	R	<2
	21-May-08	FP	HF	CL	10	30	R	X	O	R	<2
	21-Jul-08	MLP	F	CL	23	30	R	X	O	R	8
	03-Sep-08	LL	F	CL	17	32	R	X	O	R	<2
	04-Nov-08	FP	F	CL	6	32	R	X	O	R	2
WZ017.00	29-Jan-08	FP	F	CL	0	31	R	X	O	R	<2
	25-Mar-08	LL	F	CL	2	28	R	X	O	R	<2
	21-May-08	FP	HF	CL	10	30	R	X	O	R	<2
	21-Jul-08	MLP	F	CL	19	30	R	X	O	R	8
	03-Sep-08	LL	F	CL	17	32	R	X	O	R	<2
	04-Nov-08	FP	F	CL	7	32	R	X	O	R	2
WZ017.50	29-Jan-08	FP	LF	N	1	31	R	X	O	R	<2
	25-Mar-08	LL	F	CL	1	30	R	X	O	R	<2
	21-May-08	FP	HF	SW	10	30	R	X	O	R	<2
	21-Jul-08	MLP	HF	CL	16	30	R	X	O	R	6
	03-Sep-08	LL	F	CL	15	32	R	X	O	R	2
	19-Nov-08	FP	LF		5	31	R	X	O	R	72
WZ018.00	29-Jan-08	FP	F	CL	1	32	R	X	O	A	<2
	25-Mar-08	LL	F	CL	1	28	R	X	O	A	<2
	21-May-08	FP	HF	S	11	29	R	X	O	A	<2
	21-Jul-08	MLP	F	CL	16	30	R	X	O	A	4
	03-Sep-08	LL	F	CL	16	32	R	X	O	A	<2
	04-Nov-08	FP	F	S	9	32	R	X	O	A	<2
WZ019.00	29-Jan-08	FP	L	N	2	32	R	X	O	A	<2
	25-Mar-08	LL	F	SE	2	30	R	X	O	A	<2
	21-May-08	FP	HF	SW	8	31	R	X	O	A	<2
	21-Jul-08	MLP	HF	CL	17	30	R	X	O	A	<2
	03-Sep-08	LL	F	NE	14	32	R	X	O	A	<2
	04-Nov-08	FP	F	S	7	32	R	X	O	A	<2
WZ020.00	29-Jan-08	FP	L	N	1	32	R	X	O	A	<2
	25-Mar-08	LL	F	CL	1	30	R	X	O	A	<2
	21-May-08	FP	H	SW	9	31	R	X	O	A	<2
	21-Jul-08	MLP	HF	CL	17	30	R	X	O	A	7.3
	03-Sep-08	LL	F	CL	15	32	R	X	O	A	<2
	03-Nov-08	MLP	H	SW	5	32	R	X	O	A	4
WZ021.00	29-Jan-08	FP	F	CL	1	32	R	X	C	P	<2
	25-Mar-08	LL	F	SE	2	30	R	X	C	P	<2
	21-May-08	FP	H	SW	6	31	R	X	C	P	<2
	21-Jul-08	MLP	HF	NE	15	30	R	X	C	P	4
	03-Sep-08	LL	F	CL	15	32	R	X	C	P	2
	03-Nov-08	MLP	H	SW	6	32	R	X	C	P	6



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
WZ022.00	29-Jan-08	FP	F	CL	2	31	R	X	C	P	<2
	25-Mar-08	LL	HF	CL	1	27	R	X	C	P	<2
	21-May-08	FP	H	SW	6	31	R	X	C	P	<2
	21-Jul-08	MLP	HF	NE	17	30	R	X	C	P	<2
	03-Sep-08	LL	F	CL	14	32	R	X	C	P	6
	03-Nov-08	MLP	H	SW	6	30	R	X	C	P	4
WZ026.00	30-Jan-08	EXT	F	CL	1	28	R	X	O	R	<2
	26-Mar-08	EXT	H	CL	3	31	R	P	O	R	<2
	19-May-08	LL	F	W	10	30	R	X	O	R	2
	21-Jul-08	FP	F	CL	20	30	R	P	O	R	18
	03-Sep-08	FP	F	CL	16	31	R	X	O	R	<2
	03-Nov-08	EXT	F	CL	6	32	R	X	O	R	3.6
WZ027.00	30-Jan-08	EXT	F	SW	-3	18	R	P	O	R	70
	26-Mar-08	EXT	F	CL	4	30	R	P	O	R	<2
	19-May-08	LL	F	W	10	30	R	X	O	R	<2
	21-Jul-08	FP	F	N	20	30	R	P	O	R	26
	03-Sep-08	FP	F	N	15	31	R	X	O	R	2
	03-Nov-08	EXT	F	SW	7	32	R	X	O	R	11
WZ028.00	30-Jan-08	EXT	L	NE	-2	31	R	X	O	A	<2
	26-Mar-08	EXT	F	SW	3	30	R	P	O	A	<2
	19-May-08	LL	F	W	8	28	R	X	O	A	<2
	21-Jul-08	FP	F	N	18	30	R	P	O	A	10
	03-Sep-08	FP	F	N	13	31	R	X	O	A	2
	03-Nov-08	EXT	F	SW	6	32	R	X	O	A	<2
WZ029.00	30-Jan-08	EXT	F	SW	1	18	R	X	C	P	25
	26-Mar-08	EXT	F	SW	4	30	R	P	C	P	4
	19-May-08	LL	F	W	10	28	R	X	C	P	<2
	21-Jul-08	FP	F	CL	19	30	R	P	C	P	22
	03-Sep-08	FP	F	CL	15	32	R	X	C	P	2
	03-Nov-08	EXT	F	W	5	32	R	X	C	P	54
WZ030.00	26-Mar-08	EXT	F	SW	3	30	R	P	O	A	<2
	19-May-08	LL	F	W	10	28	R	X	O	A	<2
	18-Jun-08	EXT	HF	SE	13	30	R	X	O	A	<2
	21-Jul-08	FP	F	N	17	30	R	P	O	A	<2
	03-Sep-08	FP	F	NE	13	31	R	X	O	A	<2
	03-Nov-08	EXT	F	W	8	32	R	X	O	A	10
WZ031.00	26-Mar-08	EXT	F	SW	3	30	R	P	O	R	<2
	19-May-08	LL	F	W	9	28	R	X	O	R	<2
	18-Jun-08	EXT	HF	CL	12	31	R	X	O	R	2
	21-Jul-08	FP	F	CL	14	30	R	P	O	R	31
	03-Sep-08	FP	F	CL	14	32	R	X	O	R	<2
	03-Nov-08	EXT	F	W	8	32	R	X	O	R	<2
WZ032.00	26-Mar-08	EXT	F	S	3	30	R	P	O	A	<2
	19-May-08	LL	F	SW	10	28	R	X	O	A	<2



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	18-Jun-08	EXT	HF	CL	13	31	R	X	O	A	2
	21-Jul-08	FP	F	N	17	30	R	P	O	A	4
	03-Sep-08	FP	F	CL	14	31	R	X	O	A	<2
	03-Nov-08	EXT	F	SW	9	32	R	X	O	A	2
WZ033.00	26-Mar-08	EXT	F	S	3	30	R	P	O	A	<2
	19-May-08	LL	F	SW	9	28	R	X	O	A	<2
	18-Jun-08	EXT	HF	CL	13	30	R	X	O	A	4
	21-Jul-08	FP	F	N	15	30	R	P	O	A	4
	03-Sep-08	FP	F	NE	13	31	R	X	O	A	<2
WZ034.00	03-Nov-08	EXT	F	CL	8	32	R	X	O	A	<2
	26-Mar-08	EXT	F	SW	4	30	R	P	O	A	<2
	19-May-08	LL	F	W	8	28	R	X	O	A	<2
	18-Jun-08	EXT	HF	SE	12	30	R	X	O	A	<2
	21-Jul-08	FP	HF	N	15	28	R	P	O	A	2
	03-Sep-08	FP	F	CL	14	32	R	X	O	A	<2
WZ035.00	03-Nov-08	EXT	F	SW	7	30	R	X	O	A	<2
	26-Mar-08	EXT	F	SW	3	26	R	P	C	P	<2
	19-May-08	LL	F	W	10	25	R	X	C	P	<2
	18-Jun-08	EXT	HF	CL	11	30	R	X	C	P	<2
	21-Jul-08	FP	HF	CL	15	29	R	P	C	P	8
	03-Sep-08	FP	F	E	12	31	R	X	C	P	<2
WZ035.50	03-Nov-08	EXT	F	SW	8	30	R	X	C	P	2
	26-Mar-08	EXT	F	CL	4	30	R	P	O	A	<2
	19-May-08	LL	HF	W	10	28	R	X	O	A	<2
	18-Jun-08	EXT	H	CL	12	30	R	X	O	A	2
	21-Jul-08	FP	HF	CL	15	28	R	P	O	A	<2
	03-Sep-08	FP	F	CL	13	31	R	X	O	A	<2
WZ036.00	03-Nov-08	EXT	F	SW	7	30	R	X	O	A	2
	26-Mar-08	EXT	F	SW	3	25	R	P	C	P	<2
	19-May-08	LL	HF	W	9	28	R	X	C	P	4
	18-Jun-08	EXT	H	CL	12	29	R	X	C	P	2
	21-Jul-08	FP	HF	CL	17	28	R	PB	C	P	<2
	03-Sep-08	FP	F	CL	13	31	R	X	C	P	<2
WZ038.80	03-Nov-08	EXT	F	CL	7	30	R	X	C	P	2
	16-Jan-08	MCP	E	CL	3	1	E	P	C	P	2
	30-Jan-08	EXT	L	NE	-1	6	R	X	C	P	<2
	27-Feb-08	MCP	E	CL	2	8	E	PT	C	P	<2
	12-Mar-08	MCP	E	CL	4	4	R	X	C	P	2
	26-Mar-08	EXT	F	SW	4	12	R	P	C	P	<2
	09-Apr-08	MCP	F	W	7	22	E	T	C	P	<2
	19-May-08	LL	HF	W	15	25	R	X	C	P	<2
	11-Jun-08	ACA	HE	CL	15	29	R	PW	C	P	8
	21-Jul-08	FP	HF	CL	19	28	R	P	C	P	8
06-Aug-08	MCP	F	S	23	28	E	P	C	P	<2	



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	03-Sep-08	FP	F	CL	16	31	R	X	C	P	2
	08-Oct-08	MCP	HE	CL	11	18	E	X	C	P	14
	03-Nov-08	EXT	F	SW	6	30	R	X	C	P	2
	17-Nov-08	FP	H	SW	7	24	E	X	C	P	92
	01-Dec-08	EXT	F	CL	4	20	E	P	C	P	72
WZ038.90	16-Jan-08	MCP	E	CL	3	4	E	P	O	A	6
	30-Jan-08	EXT	L	NE	-1	16	R	X	O	A	<2
	27-Feb-08	MCP	E	CL	2	0	E	PT	O	A	2
	12-Mar-08	MCP	E	CL	4	0	R	T	O	A	<2
	26-Mar-08	EXT	F	CL	4	12	R	P	O	A	<2
	09-Apr-08	MCP	F	W	9	22	E	T	O	A	<2
	23-Apr-08	MCP	L	CL	13	22	E	X	O	A	6
	07-May-08	ACA	LF	CL	12	12	E	X	O	A	13
	19-May-08	LL	HF	W	15	25	R	X	O	A	6
	11-Jun-08	ACA	HE	CL	18	28	R	P	O	A	2
	21-Jul-08	FP	HF	CL	22	28	R	P	O	A	<2
	06-Aug-08	MCP	F	S	22	29	E	P	O	A	<2
	20-Aug-08	ACA	L	NW	21	25	R	P	O	A	<2
	03-Sep-08	FP	F	CL	18	30	R	X	O	A	2
	23-Sep-08	ACA	LE		20	23	E	X	O	A	3.6
	08-Oct-08	MCP	HE	CL	10	1	E	W	O	A	2
	03-Nov-08	EXT	HF	CL	6	30	R	X	O	A	2
17-Nov-08	FP	H	SW	6	18	E	X	O	A	160	
01-Dec-08	EXT	F	CL	4	12	E	P	O	A	74	
WZ039.00	30-Jan-08	EXT	HF	SW	1	28	R	X	C	P	<2
	26-Mar-08	EXT	F	W	2	30	R	P	C	P	<2
	19-May-08	LL	HF	W	9	27	R	X	C	P	<2
	21-Jul-08	FP	HF	CL	15	28	R	P	C	P	7.3
	03-Sep-08	FP	F	CL	11	31	R	X	C	P	<2
03-Nov-08	EXT	HF	SW	7	32	R	X	C	P	<2	
WZ040.00	26-Mar-08	EXT	F	W	3	30	R	P	C	P	<2
	19-May-08	LL	HF	W	10	26	R	X	C	P	<2
	18-Jun-08	EXT	H	CL	13	29	R	X	C	P	<2
	21-Jul-08	FP	HF	CL	17	29	R	P	C	P	<2
	03-Sep-08	FP	HF	CL	13	32	R	X	C	P	<2
03-Nov-08	EXT	HF	SW	7	30	R	X	C	P	2	
WZ040.50	26-Mar-08	EXT	F	W	3	30	R	P	O	A	<2
	19-May-08	LL	HF	W	10	28	R	X	O	A	<2
	18-Jun-08	EXT	H	CL	12	29	R	X	O	A	<2
	21-Jul-08	FP	H	CL	16	28	R	P	O	A	<2
	03-Sep-08	FP	HF	CL	13	32	R	X	O	A	<2
03-Nov-08	EXT	HF	SW	8	30	R	X	O	A	<2	
WZ041.00	26-Mar-08	EXT	F	W	5	30	R	P	O	A	<2
	19-May-08	LL	H	W	12	28	R	X	O	A	<2



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	18-Jun-08	EXT	H	CL	11	30	R	X	O	A	<2
	21-Jul-08	FP	H	CL	20	28	R	P	O	A	<2
	03-Sep-08	FP	HF	SE	11	31	R	X	O	A	<2
	03-Nov-08	EXT	HF	SW	8	30	R	X	O	A	<2
WZ042.00	26-Mar-08	EXT	HF	W	3	31	R	P	O	A	<2
	19-May-08	LL	H	W	10	30	R	X	O	A	<2
	18-Jun-08	EXT	HE	CL	10	30	R	X	O	A	<2
	21-Jul-08	FP	H	CL	14	30	R	P	O	A	<2
	03-Sep-08	FP	HF	SE	12	32	R	X	O	A	<2
WZ043.00	03-Nov-08	EXT	HF	CL	8	32	R	X	O	A	<2
	19-May-08	LL	H	CL	7	30	R	X	O	A	<2
	18-Jun-08	EXT	HE	CL	10	30	R	X	O	A	<2
	21-Jul-08	FP	HE		15	30	R	P	O	A	<2
	03-Sep-08	FP	HF	CL	11	32	R	X	O	A	<2
	03-Nov-08	EXT	HF	CL	8	32	R	X	O	A	<2
WZ044.00	17-Nov-08	FP	F	CL	10	31	R	X	O	A	60
	19-May-08	LL	H	CL	9	30	R	X	O	A	<2
	18-Jun-08	EXT	HE	CL	13	29	R	X	O	A	6
	21-Jul-08	FP	H		15	30	R	P	O	A	2
	03-Nov-08	EXT	H	CL	8	32	R	X	O	A	<2
	17-Nov-08	FP	F	CL	7	29	R	X	O	A	8
WZ045.00	01-Dec-08	EXT	F	CL	5	26	R	P	O	A	20
	26-Mar-08	EXT	HF	CL	3	31	R	P	C	P	<2
	19-May-08	LL	H	W	10	30	R	X	C	P	<2
	18-Jun-08	EXT	HE	CL	14	30	R	X	C	P	4
	21-Jul-08	FP	H		18	30	R	P	C	P	<2
	03-Sep-08	FP	HF	SE	13	32	R	X	C	P	7.3
WZ046.00	03-Nov-08	EXT	H	SW	9	32	R	X	C	P	2
	26-Mar-08	EXT	HF	W	5	24	R	P	C	P	<2
	19-May-08	LL	H	W	11	28	R	X	C	P	20
	18-Jun-08	EXT	HE	CL	13	30	R	X	C	P	29
	21-Jul-08	FP	HE			30	R	P	C	P	<2
	03-Sep-08	FP	HF	CL	13	32	R	X	C	P	22
WZ047.00	03-Nov-08	EXT	H	SW	8	32	R	X	C	P	10
	26-Mar-08	EXT	HF	CL	4	25	R	P	C	P	<2
	19-May-08	LL	H	W	12	30	R	X	C	P	7.3
	18-Jun-08	EXT	HE	CL	13	31	R	X	C	P	6
	21-Jul-08	FP	HE			30	R	P	C	P	<2
	03-Sep-08	FP	H	SE	13	32	R	X	C	P	2
WZ048.00	03-Nov-08	EXT	H	SW	7	32	R	X	C	P	2
	26-Mar-08	EXT	HF	CL	4	30	R	P	C	P	<2
	19-May-08	LL	H	W	12	30	R	X	C	P	2
	18-Jun-08	EXT	HE	SE	15	30	R	X	C	P	4
	21-Jul-08	FP	HE			30	R	P	C	P	4



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	03-Sep-08	FP	H	SE	14	32	R	X	C	P	20
	03-Nov-08	EXT	H	CL	8	31	R	X	C	P	<2
WZ048.50	26-Mar-08	EXT	HF	S	3	30	R	P	C	P	<2
	18-Jun-08	EXT	E	SE	15	30	R	X	C	P	<2
	21-Jul-08	FP	HE			30	R	P	C	P	4
	03-Sep-08	FP	H	CL	12	32	R	X	C	P	<2
	03-Nov-08	EXT	H	CL	8	32	R	X	C	P	<2
	17-Nov-08	FP	HF	SW	7	32	R	X	C	P	2.6
WZ049.00	26-Mar-08	EXT	H	S	4	30	R	P	C	P	<2
	19-May-08	LL	HE	W	11	30	R	X	C	P	5.5
	18-Jun-08	EXT	E	CL	15	31	R	X	C	P	<2
	21-Jul-08	FP	HE			30	R	P	C	P	<2
	03-Sep-08	FP	H	CL	13	31	R	X	C	P	6
	03-Nov-08	EXT	H	CL	7	32	R	X	C	P	2
WZ054.00	30-Jan-08	EXT	F	SW	1	26	R	X	C	P	9.1
	26-Mar-08	EXT	F	SW	4	26	R	P	C	P	2
	19-May-08	LL	F	W	9	28	R	X	C	P	<2
	21-Jul-08	FP	F	CL	15	30	R	P	C	P	11
	03-Sep-08	FP	F	CL	14	32	R	X	C	P	<2
	03-Nov-08	EXT	F	SW	7	32	R	X	C	P	<2
WZ055.00	30-Jan-08	EXT	LF	NE	-2	30	R	P	O	A	<2
	26-Mar-08	EXT	F	SW	3	31	R	P	O	A	<2
	19-May-08	LL	F	W	8	28	R	X	O	A	<2
	21-Jul-08	FP	F	CL	18	30	R	P	O	A	2
	03-Sep-08	FP	F	CL	13	32	R	X	O	A	<2
	03-Nov-08	EXT	F	SW	7	32	R	X	O	A	<2