



GROWING AREA WF
Timber Island to East Point, Biddeford
Sanitary Survey Report
2013

Melissa D. Smith, MR Scientist I

APPROVAL

Growing Area Supervisor:

_____ Date: _____
Print name signature

Bureau Director:

_____ Date: _____
Print name signature



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Executive Summary

This is a Sanitary Survey report for Growing Area WF written in compliance with the requirements of the 2011 Model Ordinance and the National Shellfish Sanitation Program. No changes in classification are needed at the time of this review. The next sanitary survey is due in 2025 and the next Triennial in 2016.

Growing Area WF lies within 500 feet of Timber Point to East Point, Biddeford (Figure 1). The growing area includes several coves (Curtis Cove, New Barn Cove, Horseshoe Cove, Fortunes Rocks Cove) leading up to Fortunes Rocks Beach. A complete boundary description can be found in DMR central files.

Fortunes Rocks Beach is a 2 mile stretch of sandy beach located between Fortunes Rocks and South Point at Biddeford Pool, also known as Fletchers Neck. It is a high energy beach with direct exposure to open ocean and there are no river systems entering the area. During storm activity surf clams and ocean quahogs are washed ashore and stranded in intertidal areas. Due to the steep beach slope, most shellfish remain near or at low tide range. Fortunes Rocks Beach is classified approved and the rest of Area WF is classified prohibited due to the presence of licensed overboard discharges.

Growing Area WF contains numerous houses along the shore. Most of the homes have in ground septic systems, but there are still five licensed overboard discharges in this area.

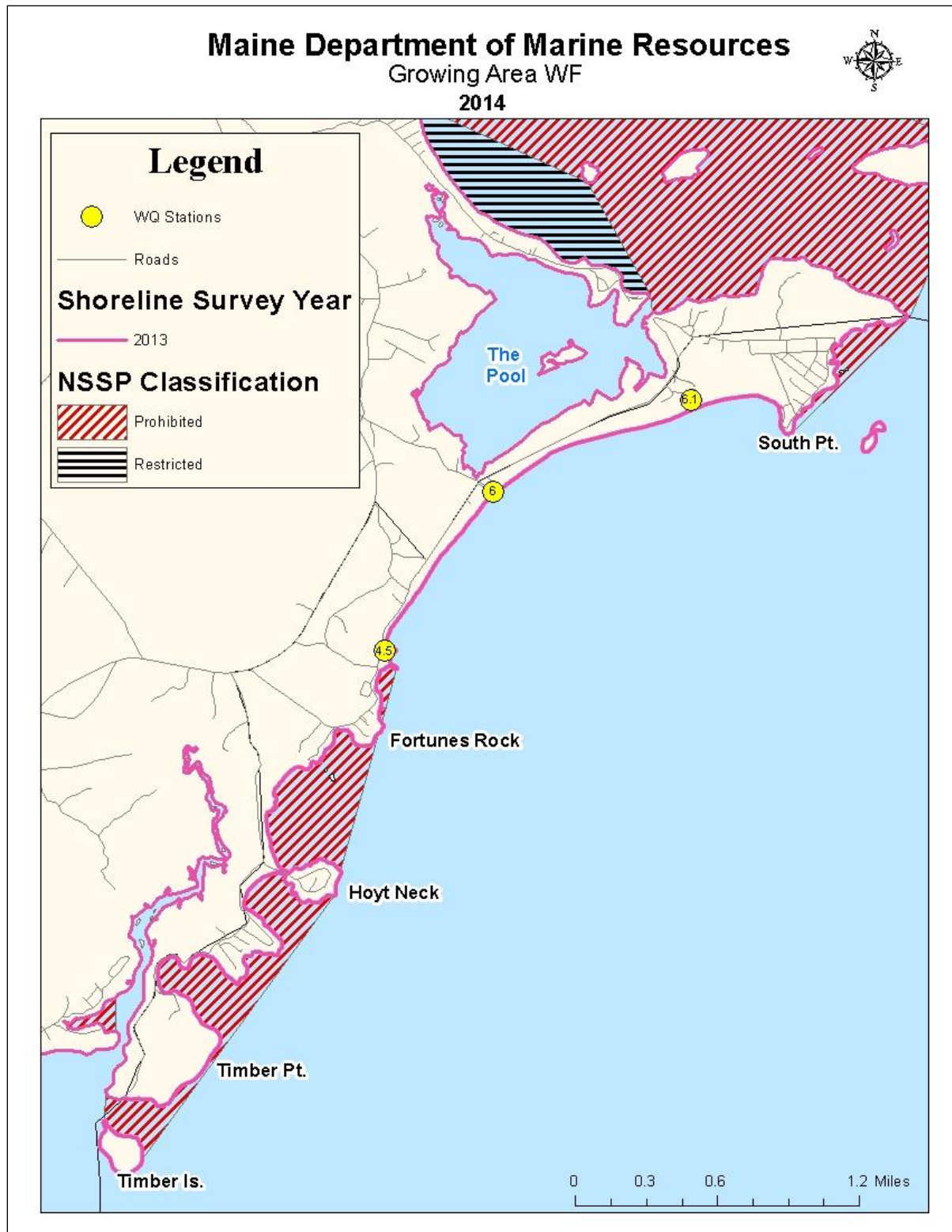


Figure 1: Growing area WF overview map.

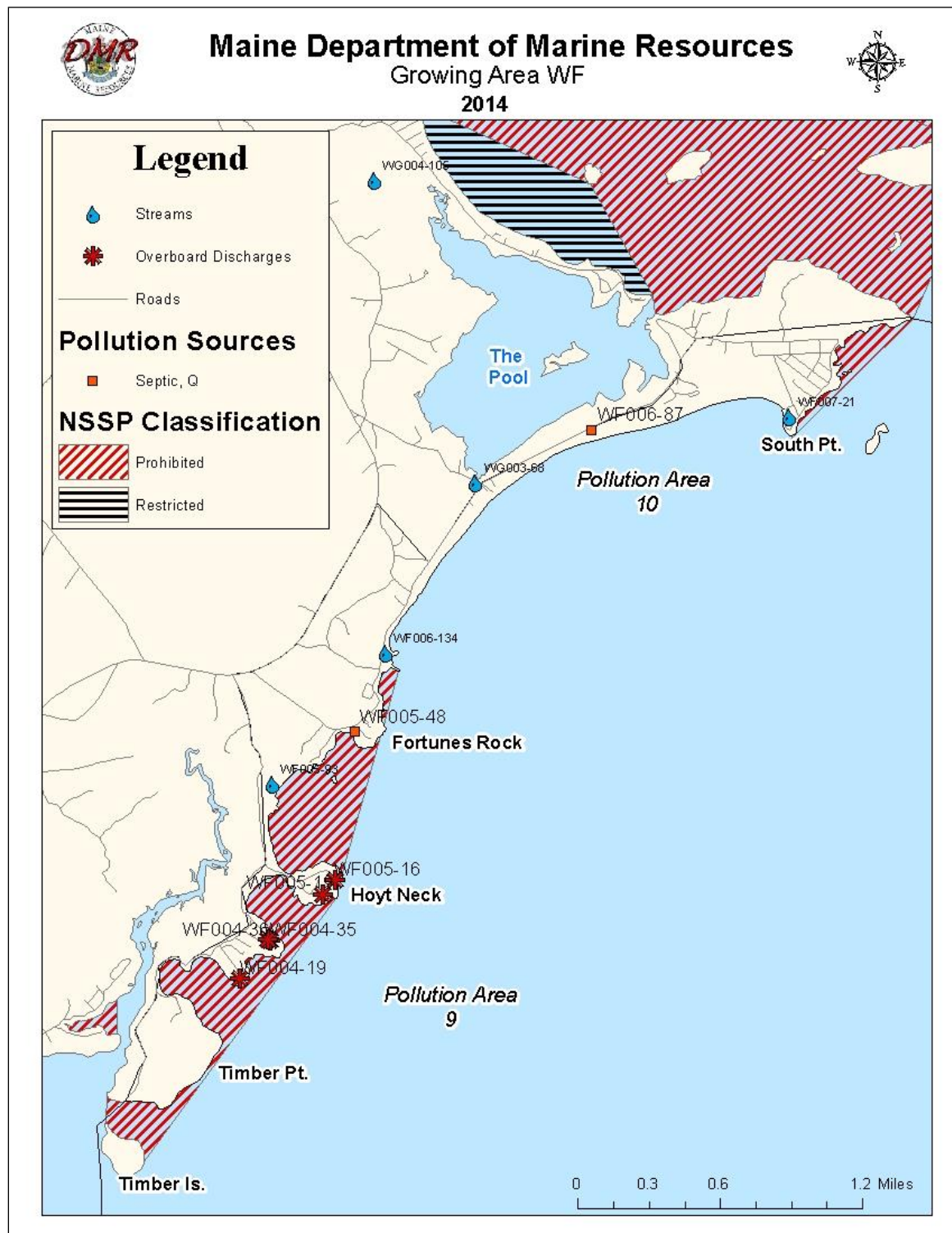


Figure 2: Growing area WF contains partial Pollution Areas of 9 and 10. WF was surveyed completely in 2013.



History of Growing Area Classification

There has been no activity from Pollution Area 9 and 10 pertaining to Growing Area WF inclusive from 2002 through to 2013.

Current Classification(s)

Pollution Area 9 shares portions of Growing Area WE and WF while Pollution Area 10 shares portions of Growing Area WF and WG. The following legal notice describes the shellfish classification boundaries in Shellfish Growing Area WF and can be found on the DMR website at:

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

- Area 9: Sampson Cove to Fortunes Rocks (Kennebunkport and Biddeford)
- Area 10: Cape Arundel to Cape Porpoise (Kennebunkport)

At the end of the 2013 review year, shellfish growing area WF had areas classified as:

Approved: 3 stations: WF 4.5, 6, 6.1

Prohibited: No active stations.

Activity during Review Period (Shoreline Survey)

There was no shoreline survey activity within Growing Area WF inclusive from 2002 through to 2008. Overboard discharge (DEP #4261) was successfully removed but no removal date is on record. This removal would have occurred during the review period.

2008: Overboard discharges (DEP #6000 and #7969) were removed on January 22 and May 6, respectively.

2009: A drive through survey of area WF was conducted on July 30, 2009. The survey started at the boundary of WE/WF at Little River (Kennebunkport/Biddeford) and continued to the boundary of WF/WG. There is a new 3 story house going in on Bayberry Road, Biddeford on the west side of the street; Bayberry Road is on the southwestern shore of New Barn Cove. The survey continued down Fortune's Rocks Road, Old King's Highway, Seal Lane, Neptune Lane, Fortunes Rocks Road out to Mile Stretch Road in Biddeford Pool.

2010: Due to lack of public access to, and shellfish resource in, Curtis Cove, New Barn Cove, Horseshoe Cove and Fortunes Rocks Cove, sample stations WF 1, 2, 3 and 4 were deactivated.

2011: Overboard discharge (DEP #1651) was removed on November 17.

2012: Drive through surveys were conducted on 2/28/12 and 9/11/12.

2013: In an effort to create a more uniform and comprehensive understanding of pollution sources impacting areas along the Maine coastline, DMR has implemented a protocol for surveying an entire



growing area when due for a sanitary survey. To that end, the entirety of growing area WF within 500ft of shore was surveyed in 2013.

The area surveyed in 2013 reached from Timber Island to North Point, Biddeford. A total of 222 properties were surveyed in 2013 within area WF, each being an in ground system. Over these 222 properties, DMR inspected 201 in ground septic systems, two holding tanks, fourteen unknown drain pipes (non-septic) and five DEP verified OBD's. There were two problem forms submitted for two questionable properties.

Pollution Sources Survey

The following sections include information on pollution sources which do or may impact water quality in growing area WF (Table 1). Pollution sources that are reviewed in this section include domestic waste, including both private inground systems and over board discharges (OBDs), marinas and mooring fields, stormwater and pollution from non-point sources (streams), farms and other agricultural activities, domestic animals and wildlife areas, and recreational areas.

Table 1: Overview of pollution areas in Growing Area WF.

Pollution Area	Classification	Major Impact Type	Year Implemented
9 A.1	P	Septic	Before 2011
10 B.1	R	Non-point source	2014

Domestic Waste (*IG Systems and OBDs*)

In Ground Systems

The majority of Growing Area WF consists of in ground systems as the dominant method of waste disposal. To date, there are two outstanding documented problems that required further investigation by the LPI concerning in ground septic systems over the review period, documented on 5/21/2013 and 6/6/2013 in Biddeford (see Figure 2). DMR has sent a problem form and follow up letter to the town LPI in 2013 and is awaiting confirmation of remediation.

Overboard Discharge

There are five overboard discharges (OBDs) that discharge their treated effluent into the waters of the area WF (Figure 2). Four OBDs were removed from 2002-2011 in the lower portion of Growing Area WF. Two were located on the north side of Hoyt Neck, one on the south shore of Timber Point and the other at the mouth of Curtis Cove.

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. At each inspection, DEP looks for tags on each treatment unit identifying the service contractor and the last date of service. If an OBD is not properly maintained, or if the OBD malfunctions, it has the potential to directly discharge untreated wastewater to the shore; therefore, preventative closures are implemented surrounding every OBD located in growing area WF (Table 2). The size of each closure is determined based on a dilution, using on the permitted flow rate of the OBD (in gallons per day, GPD), and the depth of the receiving water that each OBD discharges to; the fecal concentration used for this dilution calculation is 1.4×10^5 FC /100 ml. All current closures are of adequate size to protect public health.

Table 2. Current (2013) licensed overboard discharges located within growing area WF.

Pollution Area	DEP Permit ID	TOWN	FLOW (GPD)	Receiving Water Body	Impact	Depth of Receiving Water (ft)	PRIORITY REMOVAL
9	1452	Biddeford	360	Atlantic Ocean	AD	10	N
9	1628	Biddeford	300	New Barn Cove	AD	10	N
9	3564	Biddeford	300	New Barn Cove	AD	10	N
9	3768	Biddeford	300	Atlantic Ocean	AD	10	N
9	6275	Biddeford	300	Atlantic Ocean	AD	10	N

Municipal WWTP

There are no municipal wastewater treatment plants within the boundaries of growing area WF.

Industrial Pollution

There are no permitted industrial discharges in area WF.



Marinas and Mooring Fields

There are no marinas in the area WF.

Stormwater

Stormwater runoff is generated when precipitation from rain and snowmelt events flows over land or impervious surfaces and does not percolate into the ground. As the runoff flows over the land or impervious surfaces (paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment or other pollutants that could adversely affect water quality if the runoff is discharged untreated (US EPA 2009). Thus, stormwater pollution is caused by the daily activities of people within the watershed. Currently, polluted stormwater is the largest source of water quality problems in the United States.

The primary method to control stormwater discharges is the use of best management practices (BMPs). In addition, most major stormwater discharges are considered point sources and require coverage under an NPDES permit. In 1990, under authority of the Clean Water Act, the U.S. EPA promulgated Phase I of its stormwater management program, requiring permitting through the National Pollution Discharge Elimination System (NPDES). The Phase I program covered three categories of discharges: (1) “medium” and “large” Municipal Separate Storm Sewer Systems (MS4s) generally serving populations over 100,000, (2) construction activity disturbing 5 acres of land or greater, and (3) ten categories of industrial activity. In 1999, US EPA issued Phase II of the stormwater management program, expanding the Phase I program to include all urbanized areas and smaller construction sites.

Although it is a federal program, in the state of Maine, the Phase II Stormwater permit is issued and regulated by the Maine DEP (Chapter 500 and 502). Under the MS4 regulations, each municipality must implement the following six Minimum Control Measures: (1) Public education and outreach, (2) Public participation, (3) Illicit discharge detection and elimination, (4) Construction site storm water runoff control, (5) Post-construction stormwater management, and (6) Pollution prevention/good housekeeping. The permit required each city or town to develop a draft Stormwater Management Plan by September 3, 2003 that will establish measurable goals for each of the Minimum Control Measures. The Town must document the implementation of the Plan, and provide annual reports to the Maine DEP. Currently the discharge of stormwater from 28 Maine municipalities is regulated under the Phase II permit requirements, however, no municipalities located within the boundaries of growing area WF fall under these regulations. Additionally, the Maine Stormwater Management Law provides stormwater standards for projects located in organized areas that include one acre or more of disturbed area (Maine DEP 2009).

Non-Point Pollution Sources (*streams, etc*)

Three streams empty into area WF and were evaluated for bacteria impact between 2002 and 2009. Fecal Coliform scores are shown below as CFU/100ml for a single sample (Table 3).



Table 3. Stream scores (Fecal Coliform, CFU/100ml) for growing area WF.

Pollution Area	Trip Start Date	Location ID SS	DMR GASSID	Major Pollution Source	FC Score	Adverse/ Investigative
10	3-Jun-02	WF007-21	WF007	Stream	2.9	Investigative
9	19-Jul-07	WF005-93	WF005	Stream	86	Investigative
10	19-Jul-07	WF006-134	WF006	Stream	78	Investigative
10	28-Nov-07	WF007-21	WF007	Stream	400	Investigative
10	25-Mar-09	WF007-21	WF007	Stream	1.9	Investigative

Overall there is low potential input from streams within growing area WF.

Surface runoff stemming from impervious surfaces poses another potential source of non-point pollution (1" of rain on a 1000ft² roof will yield 600 gallons of runoff). While the density of development is relatively low along the coast, residential properties tend to be larger houses on lots cleared to the water. The large surface area created by the roofs of structures on the properties, and any associated roads and driveways creates impervious surfaces with the potential for surface water to runoff directly to coastal waters.

Agricultural Activities

There is no farming activity present in Growing Area WF.

Domestic Animals and Wildlife Activity

Growing Area WF is comprised mostly of open shoreline with a few sheltered coves. There is no domestic animal activity to report. No clusters of wildlife have been observed or reported.

Conservation/Recreation Areas (beaches, trails, etc.)

The Rachel Carson Preserve includes a portion of the shore and land in and around Timber Point.

Hydrographic and Meteorological Assessment

Tides

Maine tidal fluctuations can approach in excess of 3m on southern coasts. This can create the opportunity for pollutants emanating from streams, runoff, and stormwater systems to disperse greater distances by being drawn far from the pollution source at low tides, and subsequently reintroduced to locations on the incoming tide that are dependent on the local hydrography and currents and often disparate of their source.

The most plausible areas in Growing Area WF at which tides are likely to have adverse effects on transport of pollutants is on Fortunes Rock Beach, where tides could distribute pollutants up onto the open shoreline. However, with limited fresh water discharge, no known pollution sources and high tidal energy, it would be expected that levels of potential pollution sources would dissipate quickly and not result in localized impacts.

Rainfall

There are currently no areas within area WF managed on rainfall. No river systems discharge into the local area, so rainfall impacts are negligible.



Winds

Wind direction can impact pollution transport, retention and flushing behaviors of shellfish growing areas. Area WF has few streams and limited runoff potential, because of this, the impact of prevailing wind direction is likely to be minimal. A breakdown of prevailing wind direction over the sanitary survey report period is provided in figure 3. Wind direction along the coast of Maine varies seasonally with a consistent and predictable southerly sea breeze dominating the summer and shoulder spring and fall seasons. Over the course of a full year, wind direction during sampling events is evenly distributed between calm winds and those with northerly or southerly components at about 30% of samples for each. The remaining 10% is evenly split between due west and due east wind directions. A full breakdown of wind direction is provided in figure 3.

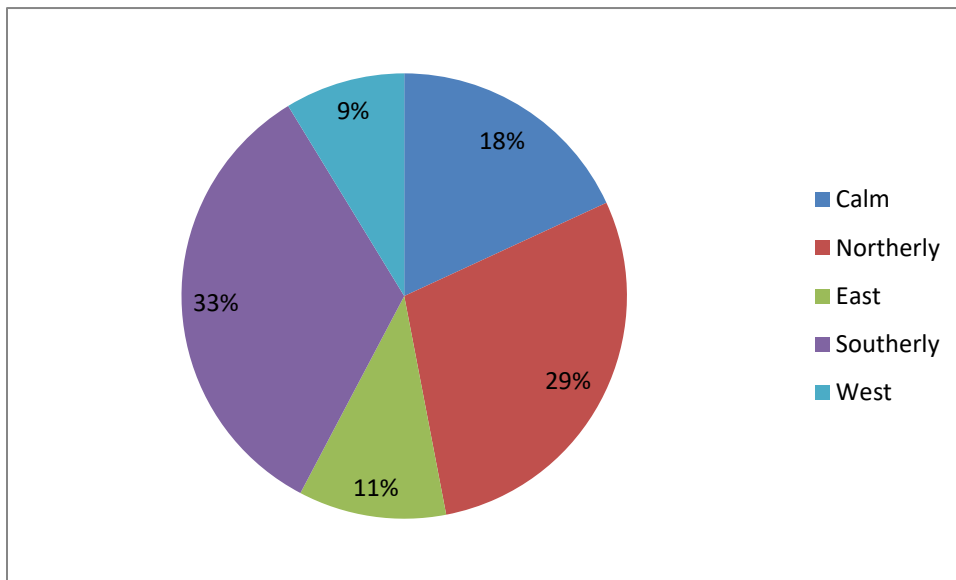


Figure 3: Generalized breakdown of prevailing wind direction during all water quality sampling events over the 12 year review period.

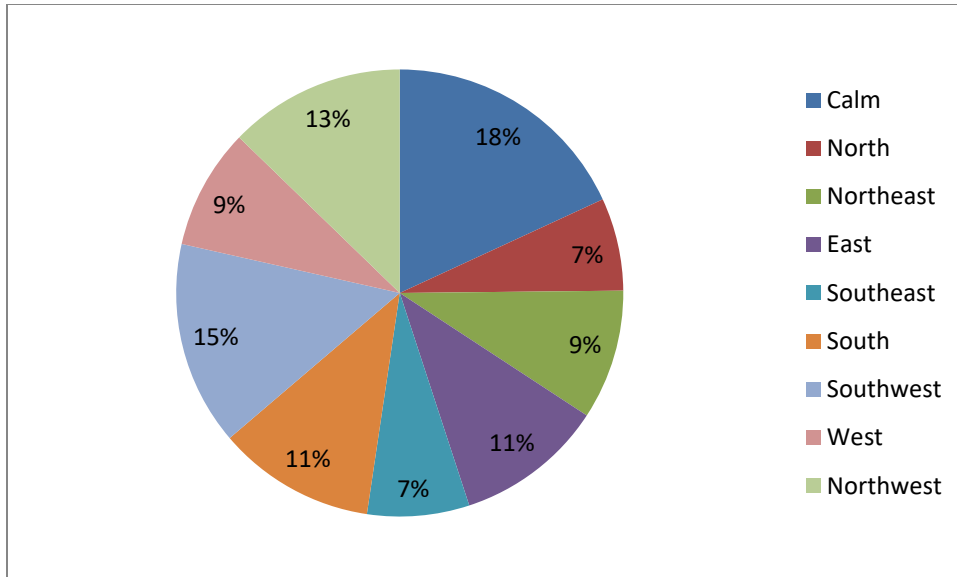


Figure 4: Detailed breakdown of prevailing wind direction during all water quality sampling events over the 12 year review period.

River Discharge

There are no rivers in Growing Area WF.

Water Quality Review

A review of water quality data for the final review year (2013) show all stations are meeting the approved standard (Table 4). There are no conditional areas within Growing Area WF, and all stations were sampled 6 times over the course of 2013 (Table 5).

Table 4. Water quality data summary for 2013. For header definitions see appendix A.

Station	Class	Count	GM	SDV	MAX	P90	Appd_Std	Restr_Std
WF004.50	A	30	4.4	0.63	1700	29.3	31	163
WF006.00	A	30	2.5	0.35	80	7.3	31	163
WF006.10	A	30	2.4	0.29	48	6	31	163

Table 5. Sample counts for water quality stations located in growing area WF for 2013.

Station	Class	Adverse		Extra		Random		Total
		Closed	Open	Closed	Open	Closed	Open	
WF004.50	A						6	6
WF006.00	A						6	6
WF006.10	A						6	6



Water Quality Discussion and Classification Determination

For year-end 2013, water quality in area WF has maintained a stable profile. With the deactivation of sample stations WF 1, 2, 3 and 4 in 2010, and knowing there are limited resources available in and around these deactivated stations, it is improbable that classification changes will occur in the short term future for Growing Area WF.

Aquaculture/Wet Storage Activity

There is no aquaculture or wet storage in area WF.

Recommendation for Future Work

Aside from the removal of the last five remaining OBDs located in the southern portion of Growing Area WF, additional sampling of the culvert outfall that drains Etherington Pond onto Fortunes Rock Beach to determine the ponds impact on water quality and possible impact on station WF 4.5 is still needed. This area has had an elevated score near the approved standard since 2010.



Appendix A. Key to Water Quality Table Headers

Station = water quality monitoring station

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

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

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

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

SDV = standard deviation

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

P90 = 90th percentile

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

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