



GROWING AREA EI

Great Head, Bar Harbor to Schoodic Point, Winter Harbor

Sanitary Survey Report

2008 - 2016

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Executive Summary

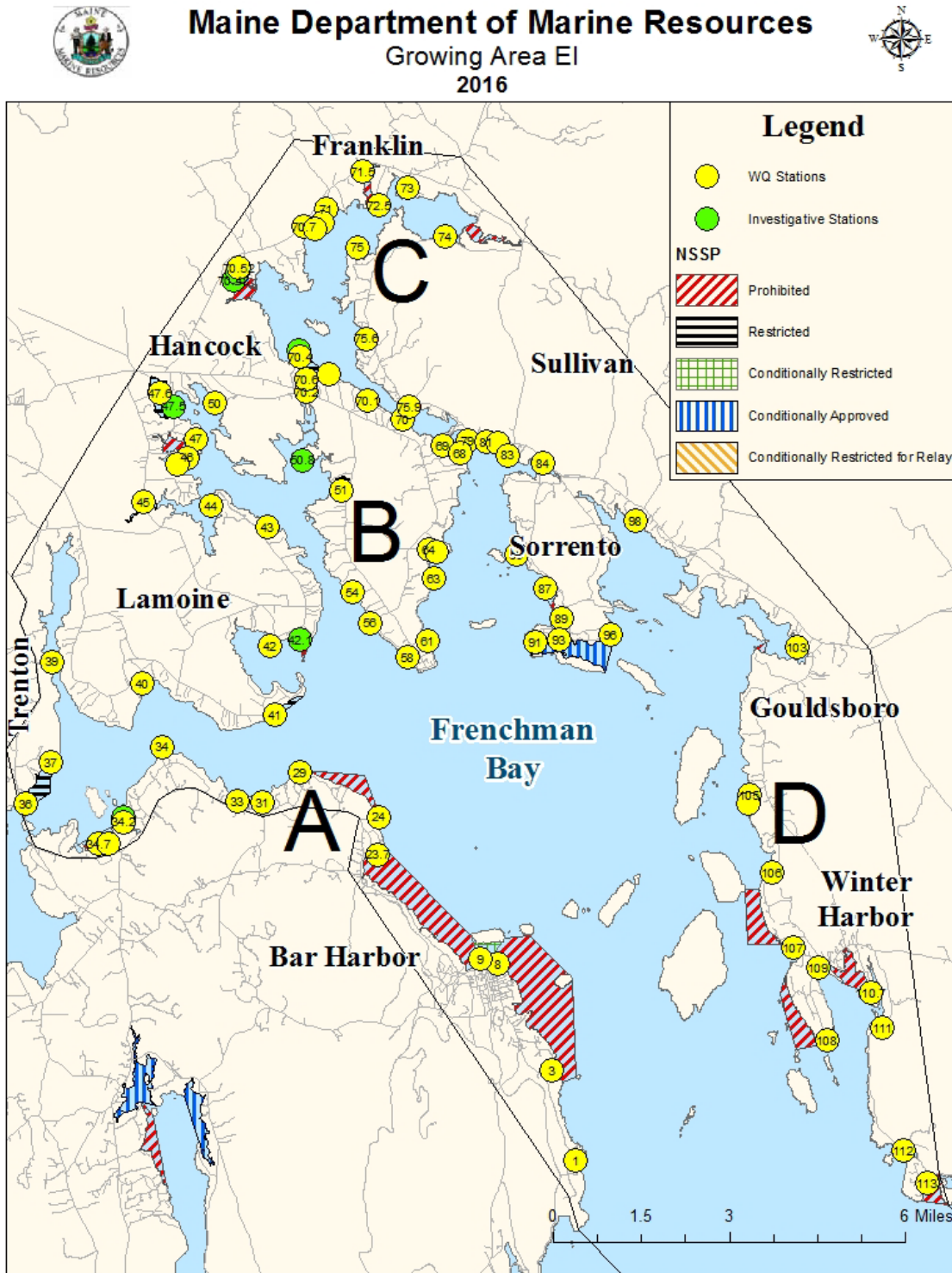
This is a Sanitary Survey report for Growing Area EI in Hancock County written in compliance with the requirements of the 2015 Model Ordinance and the National Shellfish Sanitation Program. Five pollution areas in Growing Area EI will be reviewed for a possible upgrade in 2017; Kilkenney Cove (Lamoine/Hancock), Mud Creek (Lamoine), Martin Cove (Lamoine), Bunker Cove (Gouldsboro), and Taft Point (Gouldsboro). One investigative station (EI34.1) now has the required 30 samples and can be changed to an Active Water Quality Station. There were 15 new actual or potential pollution sources found resulting in four new Prohibited Areas. Access was denied at 22 properties. Two new investigatory stations were created during the review year, EI42.1 and EI50.8. Three water quality stations were deactivated during the review year, EI50.2, EI50.4, and EI50.6. Water quality has remained consistent overall with some improvement in water quality shown in the western part of the Growing Area. The next sanitary survey is due in 2028 and the next Triennial in 2019.

Growing Area EI encompasses 176 square miles and is centered on Frenchman Bay and Taunton Bay in Hancock County, Maine. The shoreline included in this growing area stretches from Great Head in Bar Harbor to Schoodic Point in Gouldsboro and includes the towns of Bar Harbor (pop. 5,235), Trenton (pop. 1,481), Lamoine (pop. 1,602), Hancock (pop. 2,394), Franklin (pop. 1,483), Sullivan (pop. 1,236), Sorrento (pop. 274), Gouldsboro (pop. 1,737), and Winter Harbor (pop. 516) (2010 Census). The largest population concentrations are in Bar Harbor and Winter Harbor, both with a large number of seasonal residents (June-September). Development along the shoreline is spotty with clusters of homes separated by undeveloped land. Pollution areas are based on Waste Water Treatment Plant (WWTP) dilution zones, residential licensed overboard discharges, failing residential septic systems, seasonal boat moorings, and water quality sampling stations affected by nonpoint source pollution. There are four WWTPs located at Bar Harbor, Sorrento, Winter Harbor, and at the National Park Facility on Schoodic Point. There are 10 licensed overboard discharges (OBD's), one OBD was removed during the 2016 season on Grindstone Neck, Winter Harbor.

Shellfish Growing Area EI includes all of the shores, flats, and coves stretching from Great Head, Bar Harbor to Schoodic Point, Winter Harbor. The upland cover is primarily deciduous, some evergreens and wetland forest with minimal development. Freshwater influence along these shores is predominately from numerous brooks and small streams throughout the Growing Area. There are no large rivers or lakes impacting the area. Wildlife in the area includes migrating birds, various rodents, deer, harbor seals, etcetera. Great numbers of rafted ducks are seen in the fall. Areas most likely to contain significant populations of soft and hard shell clams and mussels include Bar Island Bar, Jordan River, Skillings River, Taunton Bay, Flanders Bay, and South Gouldsboro.



Figure 1. Growing Area EI Overview Map with Active Water Stations





History of Growing Area Classification

2008

3/21/08- Pollution Area 52, combined the closures between Schoodic Point and Corea that included Arey Cove.

4/17/08- Pollution Area 47, amended a Restricted area surrounding the Trenton Airport seaplane ramp due to poor water quality.

4/23/08- Pollution Area 49B, repealed a Restricted area on the western shore of the Skillings River after the removal of a non-point pollution source and improved water quality.

4/23/08- Pollution Area 49B, enlarged the Eagle Point Restricted area due to poor water quality.

5/1/08- Pollution Area 50, Sorrento marina Conditional area closed to harvesting.

5/1/08- Pollution Area 47, Thomas Bay seasonal Conditional area closed to harvesting.

2009

2/19/09- Area No. 49-B, Skillings River, Lamoine-Hancock; the area at Carrying Place, Hancock was reclassified from "prohibited" to "restricted" and increases the size of the "restricted" area, due to water quality exceeding approved criteria at the "approved"/"prohibited" boundary line.

2010

4/29/10- The closures in Area No. 50-B, Mill Brook, Springer Creek and West Brook, West Franklin, Area No. 50-C, Johnny's Brook and Card Mill Stream (Franklin), Area No. 50-D, Evergreen Point (Sullivan) and Area No. 50-E, Egypt Bay (Hancock - Franklin) were combined into a single regulation. The amendment changed the title of the rule for Area No. 50-B and increased the size of the prohibited area at Johnny's Brook and Card Mill Stream to adequately dilute elevated bacterial levels at EI 73.7. The new boundary station is EI 74.

6/22/10- Area No. 49-B, Skillings River (part 2) (Lamoine-Hancock); The amendment reduced the size of the restricted area due to water quality meeting the approved standard at station EI 47 (Eagle Point).

2011

1/4/11 – Pollution Area No. 49-B, reclassified the area of the Skillings River north of Seal Point from "Approved" to "Restricted" to now include Weir, Martin and Kilkenny Coves due to water quality not meeting approved criteria.

1/19/11 – Pollution Area No. 47, created a restricted area at the mouth of Northeast Creek (Bar Harbor) due to intermittent bacterial pollution impacting water quality, and redefines the Thomas Bay conditionally approved area and Bar Island conditionally restricted area.



5/25/11 – Pollution Area No. 1002, This amendment explains that suspended aquaculture activity may take place in all lobster pounds that otherwise meet the standards for permitted activity, and have been fallow (no longer used to contain lobsters) for the preceding 12 months.

6/30/11 – Pollution Area No. 50-A, US Route 1 Bridge ("Singing Bridge"), West Sullivan and Long Cove, Sullivan. Following a recent survey, it has been determined that there are no pollution sources, and water quality meets the approved standard.

9/2/11 – Pollution Area No. 47, reduced the size of the restricted area at the Trenton Airport due to water quality meeting the approved standard at the seaplane ramp and at the southwestern margin of the closure. However, a smaller restricted closure must remain in effect due to a pollution source southwest of the seaplane ramp.

12/2/11 – Pollution Area No. 50-B, changed the title of the rule for Area No. 50-B and reclassifies the Evergreen Point area from "Restricted" to "Approved" due to water quality meeting approved standards.

12/22/11 – Pollution Area No. 49-B, reclassified the area of the Skillings River north of Seal Point from "Restricted" to "Approved", with the exception of Kilkenny Cove and Mud Creek, due to water quality meeting approved standard. This amendment also reclassifies Martin and Weirs Cove from "Restricted" to "Prohibited", due to point source pollution; and reclassifies Mill Pond Cove from "Approved" to "Restricted" due to water quality not meeting approved standards.

2012

1/26/12 - Pollution Area No. 50 Part C, Sullivan Harbor. Sullivan Harbor was reclassified as "Conditionally Approved" from "Approved" due to seasonal nonpoint source pollution.

1/26/12 - Pollution Area No. 50 Part 1(A), Sorrento. Administrative wording change clarified the description of the Sorrento Harbor closure and re-designated it Area No. 50 Part B.

1/26/12 - Pollution Area No. 50 Part 1(B), Sorrento. Administrative wording change clarified the description of the Back Cove closure and re-designated it Area No. 50 Part A.

8/6/12 - Station EI 81 was reclassified from "Conditionally Approved" to "Approved" to match the classification of waters at this boundary station.

10/17/12 - Station EI 70.2 was reclassified from "Approved" to "Restricted" to match the classification inside this boundary station.

2013

2/8/13 – Pollution Area 47, Thomas Bay seasonal conditional area closure date was extended from September 30 to October 31st based on the 2012 data indicating the area no longer met during that time period and the campground extending its open period to October.



2014

3/18/14 – Station EI 70.41 was reclassified from "Approved" to investigative to comply with controlling authority policy.

5/5/14 – Pollution Area No. 47, An administrative wording changed the name of Pollution Area No. 47 to Area No. 47.

5/5/14 - Pollution Area No. 47, Part A, Administrative wording changes clarified the description at Thrumcap (A.1), Hulls Cove (A.2), Sand Point and Levi Point (A.3) and Salisbury cove (A.4).

5/5/14 - Pollution Area No. 47, Part B, Administrative wording changes clarified the description of the Conditionally Restricted area and renumbered it from Part D in the preceding legal notice.

5/5/14 - Pollution Area No. 47, Part C, Two sets of administrative wording changes clarified the description and expanded the Restricted Area at Trenton Airport (Trenton)(C.1) and clarified the description at Thomas Bay, Bar Harbor (C.2).

5/5/14 - Pollution Area No. 47, Part D, Administrative wording changes clarified the description of the Conditionally Approved area and renumbered it from Part C in the preceding legal notice.

9/23/14 - Pollution Area No. 47, Part C, The Restricted Area at Trenton Airport (Trenton)(C.1) was reduced in size.

9/20/14 - Station EI 37 was reclassified from "Restricted" to "Approved" to match the change at Area No. 47, Part C (Bar Harbor).

2015

3/27/15 - The Restricted area in Area 47 (B.1), behind the Bar Harbor Airport, Trenton, was expanded based on water quality (WQ) scores not meeting approved standards.

3/27/15 - New Restricted areas were created in Area 47 (B.3), Emery Cove, Bar Harbor, and 47 (B.4), Lamoine Beach, Lamoine, reclassifying the area from Approved to Restricted based on WQ scores not meeting approved standards.

5/29/15 - The Prohibited area in Deep Cove, Winter Harbor (formerly 51 (B)) was reclassified from Prohibited to Approved, based on WQ scores meeting the approved standard. This change led to the creation of 51 (A.2), Summer Harbor, Winter Harbor, and 51 (A.3), Grindstone Neck, Winter Harbor, as the Deep Cove reclassification split the former Prohibited area 51 (B).

6/3/15 - The Prohibited area in Mill Brook, Franklin (formerly 50-B (A.3)) was reclassified to Approved due to the removal of a known pollution source and WQ scores meeting approved standards.



9/16/15 - A portion of Pollution Area No. 49-B (B.2), Kilkenny Cove, Lamoine/Hancock, was reclassified from Restricted to Approved due to the completion of a contaminants analysis and a risk assessment and WQ scores meeting approved standards.

2016

4/11/16 Pollution Area 49-B Weir Cove reclassified from Prohibited to Approved due to water quality meeting the Approved Standard at investigatory station.

5/3/16 Pollution Area 47 Northeast Creek in Thomas Bay reclassified from Restricted to Approved due to water quality meeting the Approved standard.

5/16/16 Pollution Area 50 Sullivan Harbor was reclassified from seasonally Conditionally Approved to Approved due to water quality meeting the Approved standard year-round.

7/13/16 Pollution Area 47 a section near Old Point in Raccoon Cove, Lamoine was reclassified from Approved to Prohibited due to the presence of a pollution point source found during regular SLS.

7/15/16 Pollution Area 51 a section on the eastern side of Grindstone Neck, Winter Harbor was reclassified from Approved to Prohibited due to the presence of a pollution point source found during regular SLS.

7/22/16 Pollution Area 51-C Taft Point reclassified from Approved to Restricted due to the presence of a pollution point source found during regular SLS.

12/28/16 Conditional Area at Thomas Bay was downgraded to Prohibited due to the presence of a pollution point source.

Current Classification(s)

At the end of the 2016 review year, shellfish growing area EI had areas classified as:

Approved: 49 stations: EI 1, 24, 29, 34, 34.2, 37, 39, 40, 42, 43, 44, 45.5, 47, 50, 54, 56, 58, 61, 63, 65, 68, 69, 70, 70.1, 70.15, 70.82, 70.9, 71, 73, 74, 75, 75.6, 75.9, 79, 81, 82, 83, 84, 86, 87, 98, 103, 105.1, 106, 107, 109, 110.7, 111, and 112.

Restricted: 9 stations: EI 33, 36, 41, 45, 47.6, 51, 70.2, 70.4, and 70.6.

Prohibited: 16 stations: EI 3, 8, 23.7, 31, 34.3, 34.7, 46, 64, 70.52, 70.7, 71.5, 72.5, 89, 105, 108, and 113.

Conditionally Approved: 3 stations: EI 91, 93, and 96.

Conditionally Restricted: 1 station: EI 9

Investigatory: 10 stations: EI 34.1, 42.1, 47.5, 50.2, 50.4, 50.6, 50.8, 70.41, 70.48, and 70.49.



Activity during Review Period

In 2008 a new water quality sampling station was created at Springer Brook (Franklin) to further evaluate that Prohibited area and one Overboard Discharge (OBD) was removed (DEP ID 2304).

In 2009 fourteen water quality sampling stations located in prohibited areas were deactivated and one OBD located at Point Lookout (Bar Harbor) removed.

In 2010 a gray water release from a cruise ship at the Bar Harbor wharf was reported, but the area was already closed. A small boat sunk at the mouth of the Jordan River, but no closure was necessary. There were two reported CSO events at the Hulls Cove Pump Station (Bar Harbor) resulting in DEP assessing a fine to the Town and requiring upgrades to the system. This area is Prohibited so no closure was necessary. One OBD (DEP ID 3251) was removed.

In 2011 there were multiple investigations of potential pollution sources in areas around Frenchman Bay. USDA was questioned regarding a horse farm on a stream running into the Skillings River. Areas along the shore in upper Taunton Bay (Hog Bay), Skillings River and Northeast Creek were evaluated using hot spot surveys and water samples collected in streams, ditches and various marine locations. No definitive pollution source identification resulted from these activities. Three failing septic systems in Franklin and one in Trenton were investigated and identified and appropriate actions were taken.

In 2012 one new investigative water quality sampling station was established (EI70.41).

Starting in 2013 the water quality sampling locations in the Skillings River are being collected by boat. Nine new Investigative water quality sampling stations were established (EI 34.4, 34.10, 45.5, 47.5, 50.2, 50.4, 50.6, 70.48 and 70.49). A hot spot survey to evaluate a pre-existing septic problem in Trenton was conducted and the problem has not been remediated. A hot spot survey was conducted in Egypt Bay (Hancock/Franklin) and it was determined there may be pollution from a manure pile. The Maine Department of Agriculture was notified of the situation. A hot spot survey in the Carrying Place Cove area (Hancock) was conducted and a potential holding tank and leach field breakout were discovered. Problem forms were completed and sent to the Town. Hot spot surveys were also conducted at Weir and Martin Cove and no point sources identified. A follow-up hot spot survey was conducted at Springer Creek and it was determined the point sources there had not been remediated. A hot spot survey was conducted at Bunkers Cove (Gouldsboro) and two potential point sources discovered. Problem forms for these locations were filed with the Town. Various meetings and correspondence with the Frenchman Bay shellfish group (610 project) were held.

In 2014, water quality sampling stations EI 38, 42.8, 52 and 54 were deactivated. Later in the year, stations EI 38 and 54 were reactivated. A hot spot survey was conducted at a horse farm at the head of Martin Cove (Hancock). Manure disposal issues were noted, and a Problem Form was submitted to Maine Department of Agriculture. One OBD was removed (DEP ID 6292). Various meetings and correspondence with the Frenchman Bay shellfish group (610 project) were held.

In 2015 work was initiated with DEP to test soft shell clams for heavy metals from Kilkenny Cove (Hancock). A hot spot survey of Lamoine Beach was conducted. Various meetings and correspondence with the Frenchman Bay shellfish group (610 project) were held.



In 2016 there were several discussions with industry members regarding harvesting shellfish in the Trenton Ramp restricted area. Water quality sampling stations EI52.20, 50.40 and 50.60 were deactivated. New investigatory water quality sampling stations were implemented at EI50.80 and 42.10. One OBD was removed (DEP ID 2773). Town officials indicated the potential pollution sources identified at Bunker Cove and Taft Point (Gouldsboro) had either been remediated or were not a point source. A potential malfunctioning private pump station on a property adjacent to Thomas Bay was identified during routine water quality sample collection. Various meetings and correspondence with the Frenchman Bay shellfish group (610 project) were held.

Pollution Sources Survey

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



Figure 2. Growing Area EI, Pollution Map A

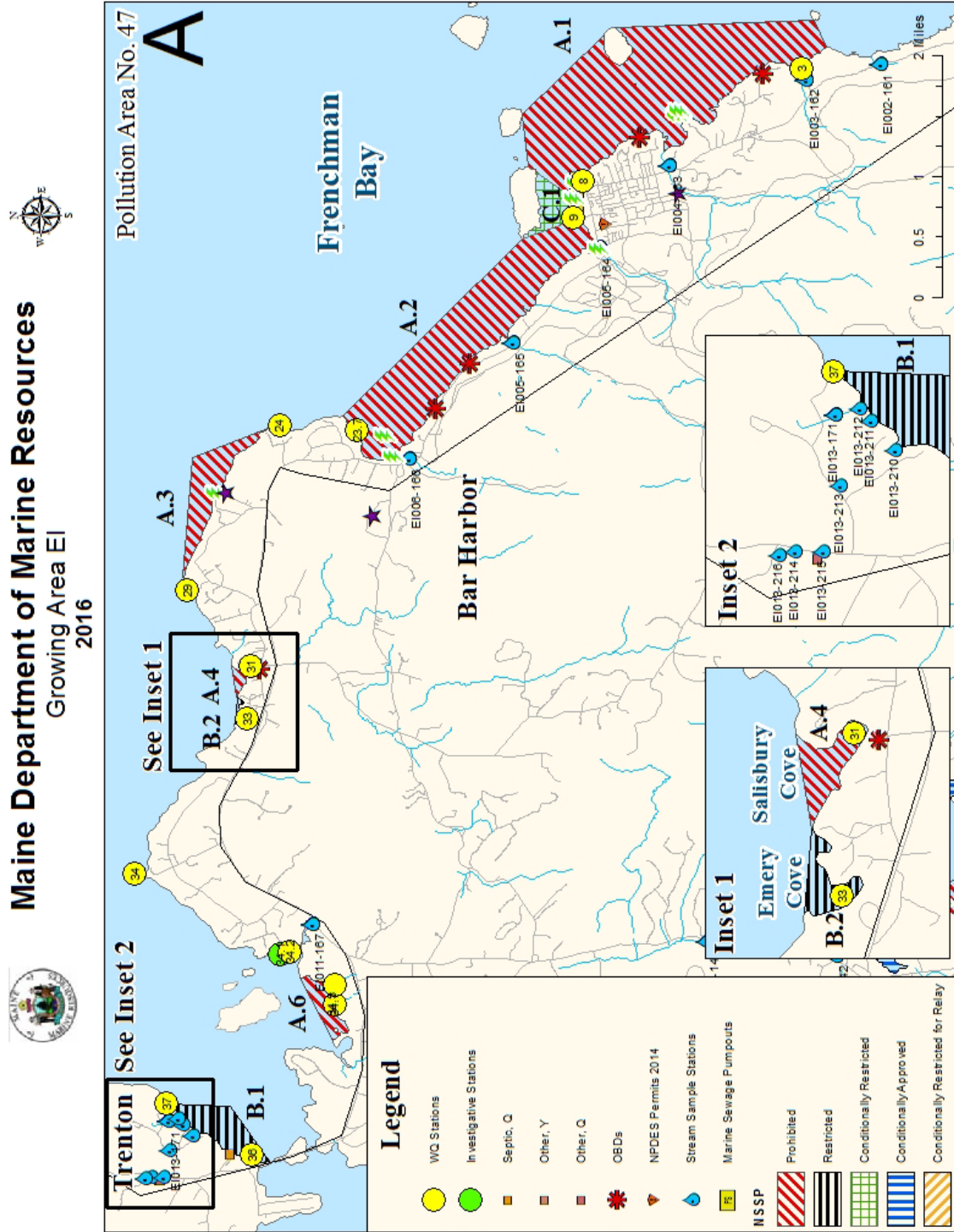




Figure 3. Growing Area EI, Pollution Map B

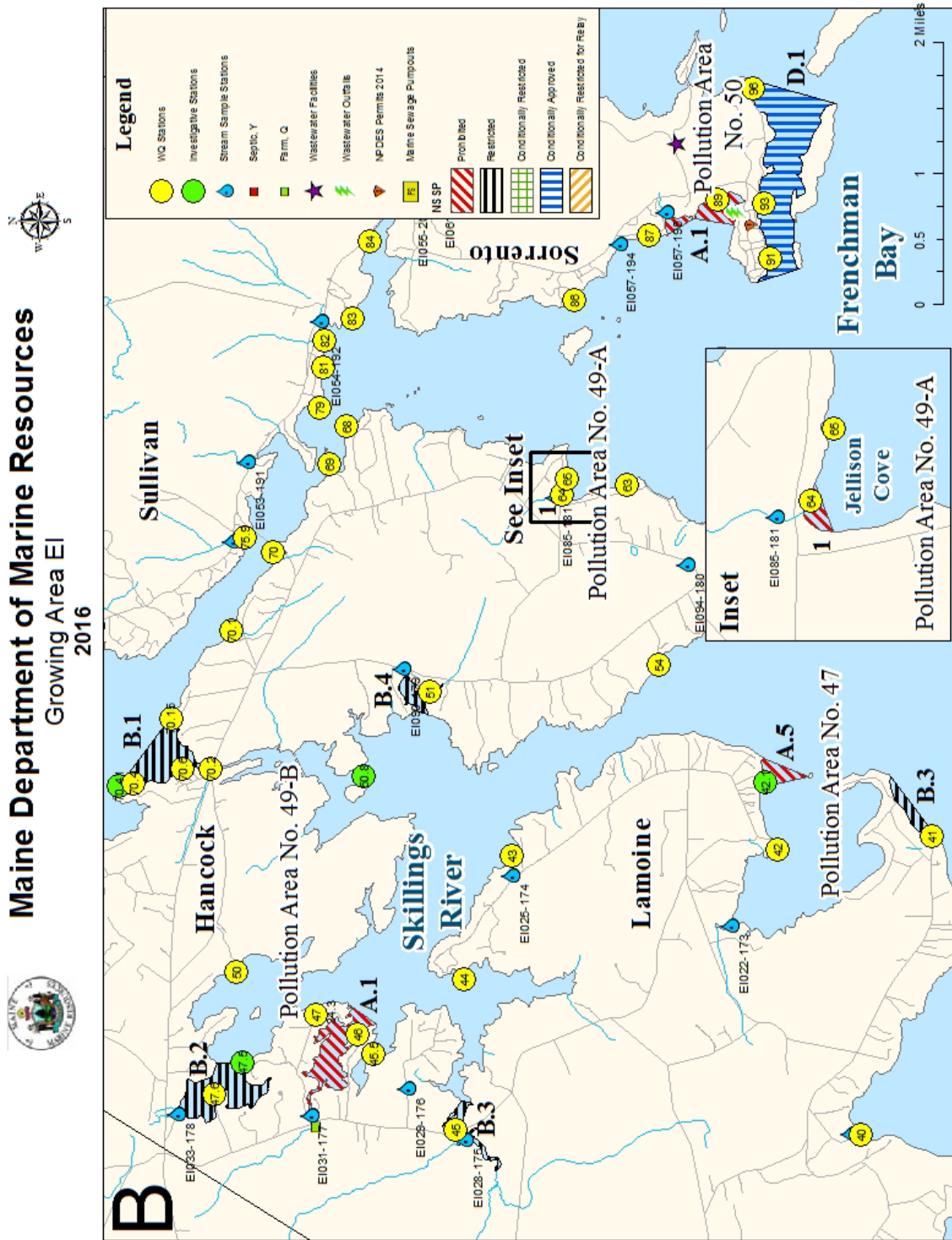




Figure 4. Growing Area EI, Pollution Map C

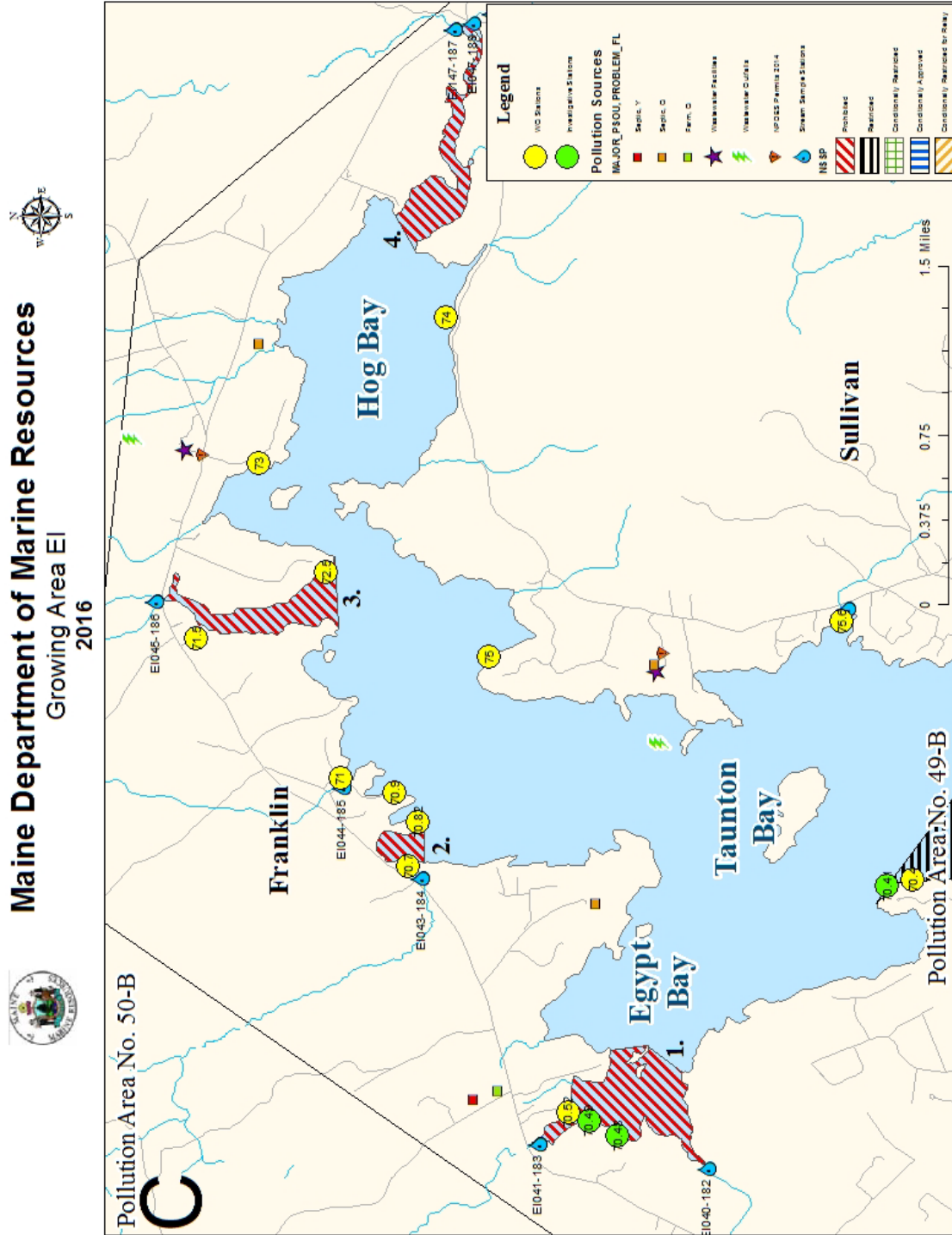
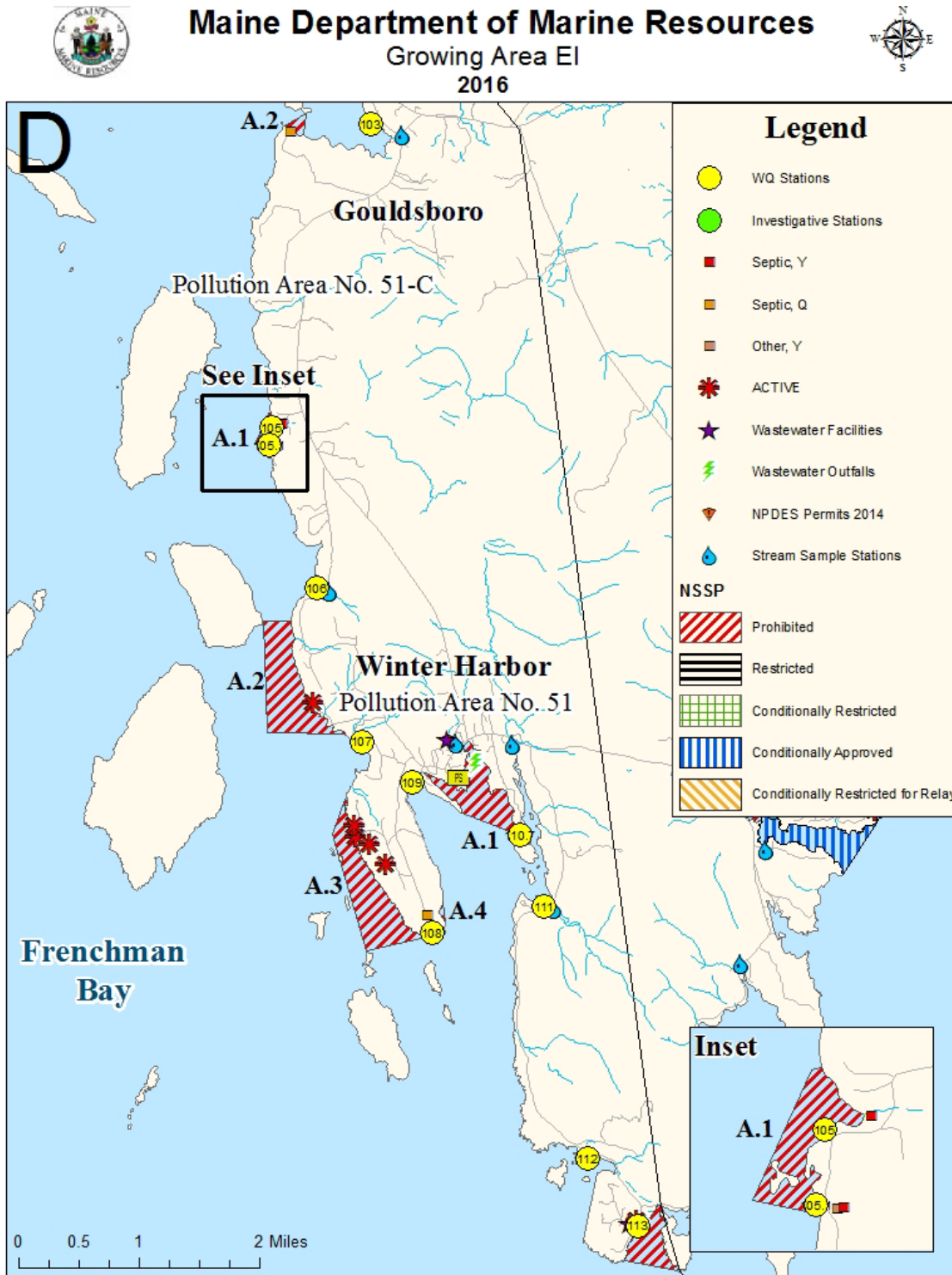




Figure 5. Growing Area EI, Pollution Map D





Domestic Waste

Growing Area EI consists of 91 GASS IDs (2 mile segments), all within the towns of Bar Harbor, Trenton, Lamoine, Hancock, Franklin, Sullivan, Sorrento, Gouldsboro, and Winter Harbor. All domestic waste systems were inspected during the 2016 Shoreline Sanitary Survey. Fourteen problem forms were filed with the towns during the 2016 survey and five of these resulted in pollution area closures. There were eight questionable residential systems, two unknown systems, two failing private pump up systems, and two failing alternative toilets. From previous surveys there are still seven problem forms out for one illegal septic system, two questionable pipes, and four failing residential systems.

There are 10 overboard discharges (OBDs) that discharge their treated effluent into the waters of Growing Area EI. Four OBDs discharge into the waters of Bar Harbor, one OBD discharges into Salsbury Cove (Figure 2), four OBDs discharge into the waters of Grindstone Neck, and one OBD discharges into Arey Cove (Figure 5). One OBD was removed from Grindstone Neck in 2016, and a total of three OBDs have been removed over the past eight review years.

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 EI (Table 1). 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 1. Overboard Discharges

| DEP ID | Town | Licensed Flow GPD | Impact | Treatment Type | Receiving Water Body | Dilution Acres | Receiving Water Closure Acres |
|--------|---------------|-------------------|--------|----------------|----------------------|----------------|-------------------------------|
| 6263 | Bar Harbor | 300 | AD | S | Frenchman Bay | 0.2 | PA 47(A.1) |
| 4010 | Bar Harbor | 529 | AD | S | | 0.7 | 1099 acres |
| 3227 | Bar Harbor | 300 | AD | M | Hulls Cove | 0.4 | PA 47(A.2) |
| 2371 | Bar Harbor | 450 | AD | S | | 1.1 | 719 acres |
| 1507 | Bar Harbor | 600 | AD | S | Salsbury Cove | 4.6 | PA 47(A.4) 14 acres |
| 6907 | Winter Harbor | 300 | AD | S | Jordan Harbor | 0.7 | PA 51(A.2) 194 acres |
| 2777 | Winter Harbor | 300 | AD | S | Grindstone Neck | 0.5 | PA 51(A.3) 194 acres |
| 1666 | Winter Harbor | 360 | AD | M | | 1.1 | |
| 2436 | Winter Harbor | 450 | AD | M | | 0.8 | |
| 2773 | Winter Harbor | Removed 5/31/16 | | | | N/A | |
| 3610 | Winter Harbor | 45000 | AD | M | Arey Cove | 60.2 | PA 52(A.1) 77 acres |

(Treatment Type: S-sand filter, M-mechanical)

Table 2. Potential or Actual pollution problems associated with domestic waste

| Location ID | Town | Year PS Found | Pollution Source | Problem Flag | Description |
|-------------|------------|---------------|------------------|--------------|--|
| EI008-2 | Bar Harbor | 2016 | IG | Q | LF to left of house. Possible breakout marked by metal rod and grass clippings |
| EI011-175 | Bar Harbor | 2016 | PS | Y | Pump station overflowing. Water running out of PS cover and down to shore |
| EI013-1 | Trenton | 2013 | DR | Q | Sample from black culvert, high fecal score |
| EI013-175 | Trenton | 2016 | IG | Y | Overflow pipe far corner of LF |
| EI013-198 | Trenton | 2016 | IG | Q | White pipe exiting bank questionable |
| EI013-2 | Trenton | 2013 | DR | Y | Green pipe discharging, questionable subsurface septic drain |
| EI013-3 | Trenton | 2013 | DR | Q | White pipe discharging from small house into brook |
| EI018-12 | Lamoine | 2016 | UK | Q | Unknown system possible grey water discharge to beach |
| EI018-9 | Lamoine | 2016 | AT | Y | Alternative toilet far side of property, 5- |



| Location ID | Town | Year PS Found | Pollution Source | Problem Flag | Description |
|-------------|---------------|---------------|------------------|--------------|---|
| | | | | | gallon bucket; Possible gray water discharge onto beach, white 1.5" pvc pipe |
| EI019-197 | Lamoine | 2016 | UK | Q | Unknown system |
| EI020-2 | Lamoine | 2016 | OH | Y | Outhouse, Feces and toilet paper around OH, tank nearly full with strong odor |
| EI022-180 | Lamoine | 2016 | AT | Q | Small Cabin with out-building with composting toilet, pipe exiting under toilet |
| EI023-26 | Lamoine | 2016 | UK | Q | Two houses on lot, Cast Iron Pipes exiting houses, could not find HT or LF |
| EI023-4 | Lamoine | 2016 | IG | Q | Pump up to Leach field back of house. Pump up system recently replaced, muddy sport front of house with high fecal scores |
| EI031-186 | Lamoine | 2014 | AW | Q | Animal waste piled on bank above stream |
| EI041-194 | Franklin | 2013 | IG | Y | Confirmed malfunctioning system, breakout below LF |
| EI041-197 | Franklin | 2013 | AW | Q | Farm with livestock, fence goes to pond |
| EI051-202 | Franklin | 2016 | IG | Q | Possible breakout from LF |
| EI067-2 | Gouldsboro | 2016 | IG | Q | Potential Straight pipe found back right side of house |
| EI072-1 | Winter Harbor | 2016 | IG | Q | Tank side of house leach field; possible breakout on right side of leach field |
| EI083-22 | Hancock | 2016 | HT | Q | Potential HT malfunction, water running over side of bank |
| EI084-16 | Hancock | 2016 | UK | Q | Unknown system, pipe seen exiting back of house to stream |
| EI085-192 | Hancock | 2016 | UK | Q | Unknown system, owner states it is connected to an old mine shaft |

Municipal WWTP

There are eight wastewater treatment plants/facilities (WWTP/WWTF) in growing area EI. They are located in Bar Harbor (Bar Harbor Village, Hulls Cove, and DeGregorie Park), Sorrento, Franklin, Winter Harbor, and the National Park Training Center on Schoodic Point. These facilities with the exception of the Agvest facility (Franklin) and University of Maine Center (Franklin) discharge into Prohibited Areas that are larger in area than the calculated dilution zones for the effluent (Table 4).

Bar Harbor, Main Plant-

The plant is a secondary treatment system that discharges into Cromwell Cove (Class SB-1). Influent is domestic and commercial waste water with no significant industrial users contributing to the flow. Licensed monthly average flow is 2.0 million gallons per day (MGD). The plant can accept up to 4000 GPD of liquid wastewater from pump-out contractors. This facility also periodically receives and treats



septic and aerated sludge wastes from the Southwest Harbor and Mount Desert WWTFs through sludge digestion and dewatering.

The waste water treatment facility provides secondary treatment via an extended aeration activated sludge system. Treatment consists of de-gritting, six (6) aeration basins with fine bubble aerators, two (2) secondary clarifiers and seasonal chlorination in a chlorine contact chamber. Three of the basins are taken off line in the winter due to a significant decrease in influent flows. Seasonal disinfection is with sodium hypo-chloride and de-chlorination with sodium bisulfate. The plant has standby power that allows operation of the entire treatment process (diesel powered generators). Regular maintenance is done with daily checks/repairs. The plant is licensed to chlorinate and de-chlorinate between May 15 and September 30. There is 17.9 miles of collection system piping with seven (7) pump stations. Effluent is discharged mainly through an 18” diameter plastic pipe that runs 150’ offshore into the ocean tidewaters of Compass Harbor at 10’ depth at low water. During high flows, it may also discharge through a 24” diameter pipe that runs 1340’ offshore into Cromwell Cove at 28’ depth at low water. Sludge is treated using an aerated digester basin, de-watered and sent to a composting facility off site.

The regulation Prohibited closure size exceeds the computed effluent dilution zone (dilution calculation=446 acres / closure size= 460 acres). Eddy Brook, Cromwell Cove and Rodick Street pump stations have wet weather combined sewer overflows (CSO) (Table 3). CSO discharges are likely due to heavy rainfall combined with increased summer seasonal population.

Table 3. Historical yearly CSO discharge frequencies and volumes; Values include Bar Harbor Main Plant and Hulls Cove Plant CSOs

| Year | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---------------------------|------------|------------|-----------|-----------|-----------|---------|-----------|-----------|---------|
| No. of events | 27 | 28 | 19 | 6 | 13 | 6 | 17 | 5 | 2 |
| Total Gallons for Year | 12,601,889 | 11,935,337 | 6,930,405 | 2,563,669 | 3,776,092 | 407,010 | 1,561,139 | 2,335,692 | 277,000 |
| Average Discharge Volumes | 466,737 | 426,262 | 364,758 | 427,278 | 290,469 | 67,835 | 91,832 | 467,138 | 138,500 |

Bar Harbor, Hulls Cove-

The plant is a secondary treatment system that discharges into Hulls Cove (Class SB). Influent is domestic and commercial. There is no significant industrial flow to the facility. Licensed monthly average flow is 0.15 million gallons per day (MGD). The facility cannot accept wastewater from pump-out contractors.

The waste water treatment facility provides secondary treatment via a conventional activated sludge system. Treatment consists of de-gritting, oxidation ditches with two (2) rotor aerators, two (2) secondary clarifiers and a chlorine contact chamber. Disinfection is seasonal with sodium hypo-chloride and de-chlorination with sodium bisulfate. The plant has standby power that allows operation of the entire treatment process (diesel powered generators). Regular maintenance is done with daily checks/repairs. The plant is licensed to chlorinate and de-chlorinate between May 15 and September 30. There is 1.2 miles of collection system piping with one (1) pump station. This pump station (Route 3/Beaver Dam Rd) has a wet weather combined sewer overflow (CSO). Effluent is discharged approximately 1240’ offshore in an 8” plastic pipe into the ocean tidewaters of Hulls Cove. The end of the pipe is submerged 8.75 feet



at low water. Sludge is sent to the Main Plant for processing. The regulation Prohibited closure size exceeds the computed effluent dilution zone (dilution calculation = 136 acres / closure size = 189 acres).

Bar Harbor, DeGregoire Park-

The plant is a secondary treatment system that discharges into Frenchman Bay (Class SB). Influent is domestic. There is no industrial flow to the facility. Licensed monthly average flow is 0.012 million gallons per day (MGD). The facility cannot accept wastewater from pump-out contractors.

The waste water treatment facility provides secondary treatment via an extended aeration activated sludge package treatment. Treatment consists of two (2) rectangular basins. One basin serves as an aerator and the second as a clarifier. Following clarification, the flow goes to a chlorine contact chamber. Seasonal disinfection is with sodium hypo-chloride and de-chlorination with sodium bisulfate. The plant is licensed to chlorinate and de-chlorinate between May 15 and September 30. The plant has standby power that allows operation of the entire treatment process (diesel powered generators). Regular maintenance is done with daily checks/repairs. Sludge is sent to the Main Plant for processing. There is 0.78 miles of collection system piping with one (1) pump station. There are no combined sewer overflows. The pump station has an emergency bypass in the event of electrical or mechanical failure. Effluent is discharged 240' offshore through a 6" diameter plastic pipe into the ocean tidewaters of Frenchman Bay at Parker Point. The end of the pipe is submerged three (3) feet at low water. The regulation Prohibited closure size exceeds the computed effluent dilution zone (dilution calculation = 14 acres / closure size 131 acres).

Sorrento-

The system is a cluster of individual collection tanks connected to 10 sand filters with a common outfall into Back Cove. There are 12 buildings on the system and 6 of these are seasonal. Five of these homes also have on-site septic systems. Disinfection is with chlorine tablets. Permit flow limit is 3,420 gallons per day and it discharges into Back Cove at 5.81' low tide depth through an 18" pipe that was replaced during a substantial upgrade project in 2014. The facility has experienced ongoing problems with the system due to intermittent low flows, and during the 2014 upgrade a dechlorination manhole designed to aid in compliance with Total Residual Chlorine Limitations. DEP has been working with licensee to pursue possibility of removing this discharge and constructing a land treatment system in place. The regulation Prohibited closure size exceeds the computed effluent dilution zone (dilution calculation = 21 acres / closure size = 48 acres).

Agvest, Inc-

The system is lagoon system with spray irrigation land application for blueberry and cranberry process water. There is no outfall to marine waters.

University of Maine Center for Cooperative Extension

This system discharges 1.27 MGD of fish hatchery and rearing waste water from CCAR's marine research facility into Taunton Bay. Influent is well water and seawater. Wastewater includes uneaten fish food, fish wastes, overflow seawater from reservoirs and well water. Solids are captured in a setting tank and trucked offsite for disposal. Wastewater is filtered using a 40-micron or 60-micron drum filter and treated with UV radiation to disinfect the water. This effluent does not pose a health risk and does not require a closure.

Winter Harbor-



The plant is a secondary treatment-reed bed system that discharges into Henry Cove (Class SB). Licensed monthly flow is 0.125 MGD. Influent is from approximately 280 domestic and commercial users. There is no significant industrial flow to the facility. The plant can accept up to 1,250 GPD of liquid wastewater from pump-out contractors.

The waste water treatment facility provides secondary treatment via an extended aeration activated sludge system that consists of de-gritting, three aeration basins with mechanical surface aerators, two secondary clarifiers and a chlorine contact chamber. The plant has standby power that allows operation of the entire treatment process (diesel powered generators). Regular maintenance is done with daily checks\repairs. Seasonal disinfection is with sodium hypo-chloride. The plant is licensed to chlorinate and de-chlorinate between May10 and September 30; however, the reed bed treatment process is so complete that the license limits for nutrients and bacteria can be met without chlorination. The waste sludge is periodically conveyed to an on-site reed bed system for final disposal. The vegetative portions of the reeds are cut back annually. Leachate from the reed bed system is conveyed back to the plant's head-works. Effluent is discharged 1250' offshore through a 18" outfall pipe into the ocean tidewaters of Winter Harbor at Henry Cove. The end of the pipe is submerged eight (8) feet at low water. There are separate wastewater and storm drains. Sewers gravity drain to waterfront pumps and then influent is pumped to the treatment plant. The reed bed is cleaned out +/- every 10 years. The sludge volume is approximately 25 cubic yards annually. Federal requirements require sludge testing done for cadmium, copper, chromium, mercury, nickel, lead, zinc, and chemical pollutants (pesticides, petroleum, radio isotopes) MeDEP toxins testing. The regulation Prohibited closure size exceeds the computed effluent dilution zone (dilution calculation= 87 acres / closure size= 126.5 acres).

Acadia National Park Training Facility-

The plant is located at the southern tip of Schoodic Point (Big Moose Island) and the sanitary waste waters are generated from The Schoodic Institute. It is a secondary plant containing a comminutor, RBC x2, and settling tank licensed to discharge 45,000 gallons per day. The treatment plant discharges into the ocean waters of Arey Cove (SB waters) through an 8" cast iron pipe without diffuser. The end of the pipe is submerged five (5) feet at low water. Emergency equipment includes propane-powered electrical generators; light and horn alarms monitored by security police and dual pumps at each pump location. Sludge is exempt from MeDEP toxins testing and is spread on site. The site was evaluated by a Licensed Site Evaluator in May of 2003 who determined that installation of a subsurface wastewater system is practicable on land owned or controlled by the applicant. The regulation Prohibited closure size exceeds the computed effluent dilution zone if facility was operating at full capacity (dilution calculation= 35 acres / closure size= 83.6 acres).

Table 4. Growing area EI WWTF Dilution Calculations

| | Bar Harbor Main Plant | Bar Harbor Hulls Cove | Bar Harbor DeGregoire Park | Sorrento | Winter Harbor | Acadia National Park |
|-------------------------------|------------------------------|------------------------------|-----------------------------------|-----------------|----------------------|-----------------------------|
| FC/100ml | 140,000 | 140,000 | 140,000 | 140,000 | 140,000 | 140,000 |
| Discharge Rate (gallons/hour) | 83333.33 | 6250 | 500 | 142.5 | 5208.33 | 1875 |
| Time of Discharge (hr) | 12 | 12 | 12 | 12 | 12 | 12 |
| Mean water depth (ft) | 68 | 17 | 13 | 5 | 22 | 20 |
| FC per hour | 4.42E+11 | 3.31E+10 | 2.65E+09 | 7.55E+08 | 2.76E+10 | 9.94E+09 |
| FC per 12 hr | 5.30E+12 | 3.98E+11 | 3.18E+10 | 1.81E+10 | 3.31E+11 | 1.19E+11 |



| | | | | | | |
|---|----------|----------|----------|----------|----------|----------|
| ml to dilute to 14FC/100ml | 3.79E+13 | 2.84E+12 | 2.27E+11 | 1.29E+11 | 2.37E+12 | 8.52E+11 |
| ft ³ to dilute to 14FC/100ml | 1.34E+09 | 1.00E+08 | 8.02E+06 | 4.57E+06 | 8.36E+07 | 3.01E+07 |
| Acres | 446 | 136 | 14 | 10 | 87 | 35 |

Table 5. NPDES Permitted Discharges

| Licensee | Town | Watershed | NPDES License # | Impact | Category | Notes |
|--|------------|------------------|-----------------|--------|-----------------------------|---------------------------|
| Bar Harbor Main WWTP (Degregoire Park) | Bar Harbor | Frenchman Bay | ME0101214 | AD | POTW-Major | 0.0120 MGD |
| Bar Harbor Main WWTP (Hulls Cove) | Bar Harbor | Hulls Cove | ME0102466 | AD | POTW-Major | 0.15 MGD |
| Bar Harbor Main WWTP (Main Plant) | Bar Harbor | Cromwell Cove | ME0101214 | AD | POTW-Major | 2.0 MGD |
| MDI Biological Laboratory | Bar Harbor | Salsbury Cove | ME0001635 | AD | Research Tanks- Minor | Circulating System |
| Bar Harbor Main WWTP-Main Street Pump Station | Bar Harbor | Frenchman Bay | ME0101214004 | AD | CSO | Variable discharge volume |
| Bar Harbor Main WWTP- Rodick Street Pump Station | Bar Harbor | Frenchman Bay | ME0101214006 | AD | CSO | Variable discharge volume |
| Bar Harbor Hulls Cove- Hulls Cove Pump Station | Bar Harbor | Frenchman Bay | ME0102466008 | AD | CSO | Variable discharge volume |
| Bar Harbor Main WWTP-West Street Pump Station | Bar Harbor | Frenchman Bay | ME0101214007 | AD | CSO | Variable discharge volume |
| Town of Bar Harbor | Bar Harbor | Town Wharf | ME0036331 | PD | Minor | Snow Dump |
| Agvest, INC. | Franklin | Land Application | MEU507755 | PI | Process Water- Minor | 0.01 MGD, Lagoon System |
| Center for Cooperative Aquaculture Research | Franklin | Taunton Bay | ME0110183 | PD | Fish Hatchery- Minor | 0.288 MGD |
| Eastern Maine Mussel Corp. | Hancock | Taunton Bay | ME0037036 | PD | Process Water- Minor | 0.0245 MGD |
| Great Bay Aquaculture of Maine, LLC | Sorrento | Frenchman Bay | ME0036960 | PD | Fin Fish Aquaculture- Minor | Fin Fish Aquaculture |
| Town of Sorrento | Sorrento | Back Cove | ME0102130 | AD | POTW-Minor | 0.003 MGD, |



| | | | | | | Cluster System |
|----------------------------------|---------------|------------|-----------|----|------------|----------------|
| US National Park Service | Winter Harbor | Arey Cove | ME0090051 | AD | POTW-Minor | 0.045 MGD |
| Winter Harbor Utilities District | Winter Harbor | Henry Cove | ME0100731 | AD | POTW-Minor | 0.125 MGD |

Industrial Pollution

There are no major industrial pollution sites in growing area EI such as chemical plants, steel mills, ship yards, or refineries. None of the small industries (small boat builders and boat storage yards, an inactive international ferry wharf, and wildlife nature boat tour businesses) were identified as pollution sources during the 2016 survey. All of the shellfish areas adjacent to the businesses meet their present area classifications.

Hancock County-Bar Harbor Airport is located in Trenton adjacent to Bar Harbor Narrows. The airport provides services for commercial connector airlines, general air and air shipping companies. Aircraft maintenance and servicing is available. The airport is a Class III facility and must comply under the FAA Part 139, Class III airport operational and safety requirements. These include A recordkeeping system and new personnel training (per §139.303), Safety areas (per §139.309), Snow and ice control plan (per §139.313), Aircraft rescue and firefighting response, HAZMAT handling/storage (per §139.321), Airport Emergency Plan, Self-inspections (per §139.327), Wildlife hazard management (per §139.337) and Airport condition reporting (per §139.339). No pollution source has been identified impacting adjacent water quality stations (EI 36, 37 or 39)

Small individual storage tanks for gasoline and diesel were noted at five locations in the growing area. These tanks are near the shore. Tanks have containment walls and booms in the event of an accidental leak in a tank or spillage when unloading. The oil response team from the Maine DEP contacts Maine Marine Resources when a spill occurs and a decision will be made whether a shellfish closure is necessary.

Marinas and Mooring Fields

The marina community in Maine only operates for a portion of the year due to adverse winter weather conditions. The management of marinas in Maine allows for shellfish growing areas to be available to harvesters, for at least a portion of the year, to direct market harvest by utilizing conditional area management plans. Small mooring fields are scattered throughout the growing area with the largest number (groups of 10 or more moorings) of boats in Bar Harbor, Lamoine, Hancock, Sullivan, Sorrento, and Winter Harbor. There is a boat pump out facility at the Whale Watcher on West Street in Bar Harbor, at the Bar Harbor Town Pier, and at Winter Harbor Marine on Sargent Street in Winter Harbor.

Mooring fields in Lamoine, Hancock, and Sullivan are almost exclusively work boats (lobster boats, trawling vessels) without heads and 2-4 pleasure boats. These are not common overnight stopping areas for recreational boaters and not identified as pollution risks due to the number of boats and types of usage. Sorrento is a popular cruising destination and has a marina Conditionally Approved management plan that



opens the area to shellfish harvesting from October 1 through April 30. Water quality samples sites in the mooring area meets Approved classification criteria when in the open status. Marinas with wharfs, fuel, slips, etc. are located in Bar Harbor, Gouldsboro, and Winter Harbor. All are within Prohibited areas. Based on the numbers of live-aboard boats, areas classified Conditionally Approved or Prohibited are classified correctly to protect public health.

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 a 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 EI 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).

Along roadways several storm water pipes and ditches of varying diameters were identified during the course of the shoreline surveys. The towns of Bar Harbor and Winter Harbor have storm water systems that drain into large Prohibited areas that include wastewater treatment plant outfalls, licensed discharge outfalls and boat moorings. Volunteers in Bar Harbor have stenciled storm drain covers with warnings about dumping animal waste, used oils, pesticides or other polluting materials into the drains. Water sampling stations on the margins of these closures meet Approved criteria. No specific impact from the storm drains has been identified.



Non-Point Pollution Sources

Non-point source (NPS) pollution is water pollution affecting a water body from diffuse sources, such as polluted runoff from agricultural areas draining into a river, or wind-borne debris blowing out to sea. Nonpoint source pollution can be contrasted with point source pollution, where discharges occur to a body of water at a single location, such as discharges from a chemical factory, urban runoff from a roadway storm drain or from ships at sea. NPS may derive from many different sources with no specific solution to rectify the problem, making it difficult to regulate. Freshwater streams, drainages and tidal creeks are the major source of non-point discharge into Growing Area EI. A total of 169 samples were taken from freshwater streams during the review period (Table 6, Figures 2-5).

Streams in GASSID EI013 are associated with an ongoing study of pollution in the streams that drain into Pollution Area 47(B.1) at the Trenton Seaplane Ramp that began in 2014 (Figure 2). These streams (EI013-210, EI013-211, EI013-212, EI013-213, EI013-214, EI013-215, and EI013-216) are collected quarterly throughout the year to monitor pollution being transported to the growing area. Because these stream stations show consistently elevated fecal coliform scores, the area around the mouth of the streams is enclosed in a Restricted area.

Streams associated with consistently high scores are monitored to determine if they affect the water quality of growing area waters. The mouth of the stream at stream stations EI085-181 and EI031-177 is enclosed in a Prohibited area due poor water quality at water quality stations adjacent to streams (EI64 and EI46 respectively). The mouth of the stream at stream station EI013-171 is also enclosed in the Restricted area at the Trenton Seaplane Ramp.

Table 6. Stream Samples in Growing Area EI 2008-2016; Scores >100 cfu/100ml are highlighted in red.

| Date | Location ID | Score | Date | Location ID | Score | Date | Location ID | Score |
|-----------|-------------|-------|-----------|-------------|-------|-----------|-------------|-------|
| 4/8/2009 | EI013-171 | 3.6 | 6/14/2010 | EI013-171 | 32 | 6/16/2010 | EI062-203 | 14 |
| 4/8/2009 | EI031-177 | 1.9 | 6/14/2010 | EI013-171 | 240 | 6/16/2010 | EI063-205 | 22 |
| 7/1/2009 | EI014-171 | 54 | 6/14/2010 | EI013-171 | 1700 | 6/16/2010 | EI066-206 | 16 |
| 4/13/2010 | EI011-167 | 2 | 6/16/2010 | EI029-176 | 14 | 6/16/2010 | EI070-207 | 4 |
| 4/13/2010 | EI013-171 | 1700 | 6/16/2010 | EI031-177 | 42 | 6/16/2010 | EI073-208 | 14 |
| 5/5/2010 | EI011-167 | 50 | 6/16/2010 | EI033-178 | 14 | 6/16/2010 | EI074-209 | 1.9 |
| 5/5/2010 | EI013-171 | 1.9 | 6/16/2010 | EI041-183 | 20 | 6/16/2010 | EI147-187 | 20 |
| 5/5/2010 | EI013-171 | 4 | 6/16/2010 | EI043-184 | 4 | 6/23/2010 | EI005-164 | 1700 |
| 5/19/2010 | EI011-167 | 340 | 6/16/2010 | EI044-185 | 62 | 6/23/2010 | EI006-166 | 820 |
| 5/19/2010 | EI013-171 | 1700 | 6/16/2010 | EI045-186 | 16 | 6/23/2010 | EI011-167 | 220 |
| 5/19/2010 | EI013-171 | 1700 | 6/16/2010 | EI053-190 | 34 | 6/23/2010 | EI013-171 | 1400 |
| 6/14/2010 | EI011-167 | 60 | 6/16/2010 | EI053-191 | 1.9 | 6/23/2010 | EI013-171 | 1560 |
| 6/14/2010 | EI013-171 | 12 | 6/16/2010 | EI054-193 | 4 | 6/30/2010 | EI001-160 | 58 |



| Date | Location ID | Score |
|------------|-------------|-------|
| 6/30/2010 | EI002-161 | 25 |
| 6/30/2010 | EI003-162 | 72 |
| 6/30/2010 | EI004-163 | 160 |
| 6/30/2010 | EI014-169 | 760 |
| 6/30/2010 | EI019-172 | 15 |
| 6/30/2010 | EI031-177 | 380 |
| 6/30/2010 | EI051-189 | 52 |
| 6/30/2010 | EI057-194 | 9.1 |
| 6/30/2010 | EI057-195 | 10 |
| 6/30/2010 | EI085-181 | 124 |
| 7/12/2010 | EI031-177 | 108 |
| 7/27/2010 | EI011-167 | 40 |
| 10/28/2010 | EI011-167 | 104 |
| 4/5/2011 | EI147-187 | 6 |
| 4/12/2011 | EI147-187 | 1.9 |
| 4/26/2011 | EI013-171 | 120 |
| 4/26/2011 | EI031-177 | 116 |
| 5/10/2011 | EI011-167 | 12 |
| 5/10/2011 | EI031-177 | 13 |
| 5/10/2011 | EI033-178 | 46 |
| 6/13/2011 | EI045-186 | 12 |
| 6/28/2011 | EI031-177 | 148 |
| 6/28/2011 | EI033-178 | 86 |
| 6/28/2011 | EI147-187 | 18 |
| 7/27/2011 | EI013-171 | 84 |
| 7/27/2011 | EI028-175 | 14 |
| 7/27/2011 | EI028-175 | 76 |
| 7/27/2011 | EI147-187 | 14 |
| 8/31/2011 | EI028-175 | 66 |
| 8/31/2011 | EI031-177 | 100 |
| 8/31/2011 | EI045-186 | 240 |
| 8/12/2013 | EI041-194 | 96 |
| 11/4/2013 | EI001-160 | 5.5 |
| 11/4/2013 | EI002-161 | 1.9 |
| 11/4/2013 | EI003-162 | 1.9 |

| Date | Location ID | Score |
|------------|-------------|-------|
| 11/4/2013 | EI004-163 | 52 |
| 11/4/2013 | EI005-164 | 27 |
| 11/4/2013 | EI005-165 | 1.9 |
| 11/4/2013 | EI006-166 | 1.9 |
| 11/4/2013 | EI011-167 | 56 |
| 11/13/2013 | EI033-178 | 1.9 |
| 11/13/2013 | EI041-183 | 1.9 |
| 11/13/2013 | EI043-184 | 36 |
| 11/13/2013 | EI044-185 | 6 |
| 11/13/2013 | EI045-186 | 1.9 |
| 11/13/2013 | EI051-189 | 6 |
| 11/13/2013 | EI053-190 | 6 |
| 11/13/2013 | EI053-191 | 2 |
| 11/13/2013 | EI054-193 | 2 |
| 11/13/2013 | EI057-194 | 1.9 |
| 11/13/2013 | EI085-181 | 2 |
| 11/13/2013 | EI147-187 | 1.9 |
| 11/25/2013 | EI057-194 | 1.9 |
| 11/25/2013 | EI057-195 | 142 |
| 11/25/2013 | EI062-203 | 24 |
| 11/25/2013 | EI066-206 | 2 |
| 11/25/2013 | EI070-207 | 1.9 |
| 11/25/2013 | EI073-208 | 1.9 |
| 11/25/2013 | EI074-209 | 1.9 |
| 5/6/2014 | EI047-189 | 2 |
| 5/16/2014 | EI047-188 | 4 |
| 6/25/2014 | EI047-188 | 800 |
| 6/25/2014 | EI147-187 | 1700 |
| 9/18/2014 | EI147-187 | 14 |
| 9/18/2014 | EI147-187 | 14 |
| 9/25/2014 | EI013-210 | 8 |
| 9/25/2014 | EI013-211 | 48 |
| 9/25/2014 | EI013-212 | 380 |
| 9/25/2014 | EI013-213 | 46 |
| 9/25/2014 | EI013-214 | 24 |

| Date | Location ID | Score |
|------------|-------------|-------|
| 10/9/2014 | EI013-210 | 88 |
| 10/9/2014 | EI013-211 | 320 |
| 10/9/2014 | EI013-212 | 220 |
| 10/9/2014 | EI013-213 | 400 |
| 10/9/2014 | EI013-214 | 110 |
| 10/16/2014 | EI013-210 | 1180 |
| 10/16/2014 | EI013-211 | 48 |
| 10/16/2014 | EI013-212 | 360 |
| 10/16/2014 | EI013-213 | 76 |
| 10/16/2014 | EI013-214 | 12 |
| 12/16/2014 | EI147-187 | 1.9 |
| 12/16/2014 | EI147-187 | 1.9 |
| 8/20/2015 | EI047-188 | 32 |
| 8/20/2015 | EI047-189 | 160 |
| 4/26/2016 | EI085-181 | 380 |
| 5/11/2016 | EI001-160 | 2 |
| 5/11/2016 | EI005-164 | 44 |
| 5/11/2016 | EI011-167 | 4 |
| 5/11/2016 | EI013-171 | 1.9 |
| 5/23/2016 | EI013-210 | 12 |
| 5/23/2016 | EI013-211 | 44 |
| 5/23/2016 | EI013-212 | 1.9 |
| 5/23/2016 | EI013-213 | 1.9 |
| 5/23/2016 | EI013-214 | 13 |
| 6/7/2016 | EI031-177 | 500 |
| 6/29/2016 | EI031-177 | 152 |
| 6/29/2016 | EI033-178 | 66 |
| 6/29/2016 | EI043-184 | 24 |
| 6/29/2016 | EI054-192 | 50 |
| 6/29/2016 | EI054-193 | 16 |
| 6/29/2016 | EI057-194 | 76 |
| 6/29/2016 | EI062-203 | 38 |
| 6/29/2016 | EI070-207 | 104 |
| 6/29/2016 | EI074-209 | 122 |
| 6/29/2016 | EI085-181 | 1.9 |



| Date | Location ID | Score |
|-----------|-------------|-------|
| 7/25/2016 | EI013-210 | 560 |
| 7/25/2016 | EI013-211 | 300 |
| 7/25/2016 | EI013-212 | 740 |
| 7/25/2016 | EI013-213 | 1700 |
| 7/25/2016 | EI013-214 | 1700 |
| 7/25/2016 | EI013-215 | 1700 |
| 7/28/2016 | EI013-214 | 1340 |
| 7/28/2016 | EI013-215 | 1700 |
| 7/28/2016 | EI013-216 | 880 |

| Date | Location ID | Score |
|-----------|-------------|-------|
| 8/8/2016 | EI001-160 | 60 |
| 8/8/2016 | EI011-167 | 1.9 |
| 9/21/2016 | EI013-210 | 78 |
| 9/21/2016 | EI013-211 | 1700 |
| 9/21/2016 | EI013-212 | 156 |
| 9/21/2016 | EI013-213 | 640 |
| 9/21/2016 | EI013-214 | 660 |
| 9/21/2016 | EI013-215 | 580 |
| 9/21/2016 | EI013-216 | 1700 |

| Date | Location ID | Score |
|------------|-------------|-------|
| 11/30/2016 | EI013-210 | 300 |
| 11/30/2016 | EI013-211 | 76 |
| 11/30/2016 | EI013-212 | 78 |
| 11/30/2016 | EI013-213 | 240 |
| 11/30/2016 | EI013-214 | 280 |
| 11/30/2016 | EI013-215 | 140 |
| 11/30/2016 | EI013-216 | 180 |

Agricultural Activities

There are no large-scale agriculture activities in Growing Area EI. Smaller farms were noted at Northeast Creek in Bar Harbor (horse farm), Martin Cove in Lamoine (horse farm), and Egypt Bay in Franklin (two farms including horse, cows, sheep, and geese). Pollution from small agriculture operations can be introduced into the growing area as nonpoint source pollution transported by runoff from large rainfall or snowmelt events. Smaller farms are encouraged to follow best management practices to help avoid effects animal waste and agricultural pollutants can have on water quality. None of these small farms appeared to be directly impacting the growing area during the 2016 shoreline survey.

Domestic Animals and Wildlife Activity

The salt marshes and mudflats of the growing area provide valuable habitat to a variety of wildlife. Commonly observed bird species include a variety of gulls, sea and inland ducks, cormorants, geese, great blue herons, egrets, swans, and others. Mammals living within the growing area include dogs, cats, whitetail deer, muskrat, squirrels, chipmunks, rabbits, moles, mice, bats, shrews, weasels, skunks, raccoons, and others. Maine Inland Fish and Wildlife surveys indicate that migratory waterfowl numbers begin to increase in the early autumn months, and typically peak in late fall or early winter. Although large numbers of birds can, in theory, pose a threat the growing area water quality, such occurrences are very difficult to document. The Skillings River (Lamoine-Hancock) and Taunton Bay (Hancock-Franklin-Sullivan) have areas classified restricted due to non-point pollution with large populations of beaver up streams from the estuary. These areas will continue to be monitored and any possible corrective action taken through local town officials.

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

The concern for actual or potential pollution from recreational areas is because many of them allow dogs and some have bathroom facilities. Activities at the recreational areas may contribute to water quality problems by placing added pressure on the watershed. For instance, they may contribute to erosion



(trails, building footbridges, etc.), dog waste not picked up may accumulate and wash off after rainfall, new trails may be put into areas that didn't have human activity before and they may put added pressure on wildlife to congregate in other places where we may see water quality decline.

Growing area EI surrounds Taunton and Frenchman Bays. The entire growing area is heavily used by recreational users year-round. There are several day use beaches and picnic areas including Acadia National Park (Mt. Desert Island and Schoodic Point), Lamoine State Park (Lamoine), Lamoine Beach (Lamoine), Reversing Falls Park (Hancock) and Taunton Bay Conservation Areas (Hancock, Franklin, Sullivan). Dogs are allowed in these areas and signs are posted saying they are to be leashed and their feces collected and carried out. There are commercial campgrounds on Mt. Desert Island and a state campground at Lamoine State Park. These areas are monitored by routine water sampling sites. One seasonal commercial campground has shown a seasonal impact on water quality and the shore-front is classified Conditionally Approved with an open status when the campground is closed for the winter (October 1-April 30). Although there are a few gravel beaches in the area, swimming in the ocean in this area is relatively rare, as the water temperatures rarely exceed 65°F.

Hydrographic and Meteorological Assessment

Tides

Coastal Maine experiences a mixed, semi-diurnal tide, with diurnal inequalities that are more pronounced on spring tides. National Oceanic and Atmospheric Administration data for a station at Eastport indicate a mean tidal range of 18.35 ft.

Currents in the area are predominantly driven by the tides. All along the coast of eastern Maine, the tide generally floods to the north and east and ebbs to the south and west. Along the coast and in the wider bays, the current seldom exceeds 2 knots. Weather conditions affect tidal ranges and current speeds, sometimes very strongly. Strong winds may reverse the direction of currents.

Rainfall

The mean annual precipitation in growing area EI is approximately 44 inches. The precipitation is not evenly distributed throughout the year. The wettest months are November and April. August is typically the driest month. Much of the precipitation in the winter comes as snow and may affect runoff rates in spring upon melting. It is likely that after prolonged periods of dry weather, significant rainfall (>1" over 24 hours) will cause some pollution from non-point runoff. It is unclear how much of an effect major rainfall events have on water quality due to variability of ground water saturation, history of recent significant rainfall that may have washed non-point pollution sources away, hard ground or ledge, wildlife activity, or agriculture activity. No rainfall areas have been identified in growing area EI.

Winds

Migratory weather systems cause winds that frequently change in strength and direction. Gulf of Maine winds are generally westerly, but often take on a northerly component in winter and a southerly one in summer. Strongest winds are generated by lows and cold fronts in fall and winter and by fronts and



thunderstorms during spring and summer. Extreme winds are usually associated with a hurricane or severe nor'easter and can reach 125 knots. Sustained winds of 100 knots occur about every 50 years on average; gusts are usually about 30 percent higher.

Coastal winds are complex since they are influenced by the topography. Over land speeds are reduced, however, channels and headlands can redirect the wind and even increase the speed by funneling the wind. In general, winds have southerly components in summer and northerly ones in winter. In sheltered waters near Rockland, Portland, and Brunswick, there are a large percentage of calms, particularly during the morning hours. When the existing circulation is weak and there is a difference between land and water temperatures, a land-sea breeze circulation may be set up. As the land heats faster than the water, a sea breeze is established during the day; this onshore flow may reach 15 knots or more. At night, the land cools more rapidly, often resulting in a weak breeze off the land. In many locations, the sea breeze serves to reinforce the prevailing summer wind. Analysis of GOMOOS data (2001-2006) show winter winds along coastal Maine are typically from the west-northwest during clear periods and from the northeast during storms. In the spring, summer and fall, predominant winds are from the south-southwest. West, northwest and north winds are common during fall and winter. Although less frequent, winds from the northeast, north and northwest directions are typically stronger than winds from the south. In the summer, winds tend to be on shore due to heated, rising air over land and cooler ocean air flowing into the void.

River Discharge

Stream flow in Maine exhibits seasonal variation, with the highest flows occurring in the spring (due to snowmelt, spring rains, and low evapo-transpiration) and the mid-to late fall (due to fall rains and low evapo-transpiration). There are no large river discharges into growing area EI. There are many small streams that discharge into the growing area and these streams are discussed in the section about nonpoint source pollution.

Water Quality Review

There are presently 78 active water sampling sites in Growing Area EI and 10 investigative stations which do not currently have enough data to calculate a P90. They are collected from near-shore sites on Sample Runs 6, 8, 9, 10, 11, CA2, and CA3. Sample sites are established to monitor known or potential pollution sources and on the margins of established pollution areas. It is recognized that access, icing, and safety considerations prevent some stations from being sampled on scheduled dates. Currently all stations in Growing Area EI meet their current NSSP classification standard. Four water quality stations (EI 45, 46, 47.6, and 105) now have water quality that meets the standards for Approved harvest and will be evaluated for an upgrade in 2017.

Water Quality Discussion and Classification Determination

P90s for all active stations with a minimum of 30 samples were calculated and all stations meet their classification standards (Tables 7, 8). The percent change in P90 from 2015 to 2016 was calculated and only six stations showed a large increase in P90 score (Table 9). Four of the stations that showed a large percentage of increase in P90 score still have low scores and are not in danger of failing to meet their classification standards. The two remaining water quality stations that have shown a large percentage



decline in water quality (EI39 and EI74) are now close to failing to meet their classification standards. Overall the water quality in growing area EI appears to be improving or remaining constant.

Table 7. P90 calculations for stations with a minimum of 30 samples; P90s that do not meet their classification standards are highlighted in red.

| Station | Class | Count | MFCCount | GM | SDV | MAX | P90 | Appd Std | Restr Std |
|----------|-------|-------|----------|-----|------|------|------|----------|-----------|
| EI001.00 | A | 30 | 30 | 3.7 | 0.6 | 740 | 22.4 | 31 | 163 |
| EI003.00 | P | 30 | 30 | 4.6 | 0.63 | 160 | 29.9 | 31 | 163 |
| EI008.00 | P | 30 | 30 | 3.7 | 0.58 | 220 | 21 | 31 | 163 |
| EI023.70 | P | 30 | 30 | 3.6 | 0.51 | 106 | 16.6 | 31 | 163 |
| EI024.00 | A | 30 | 30 | 3 | 0.59 | 1460 | 17.4 | 31 | 163 |
| EI029.00 | A | 30 | 30 | 2.5 | 0.37 | 90 | 7.6 | 31 | 163 |
| EI031.00 | P | 30 | 30 | 4.2 | 0.65 | 380 | 29.8 | 31 | 163 |
| EI033.00 | R | 30 | 30 | 3.7 | 0.73 | 1700 | 32.4 | 31 | 163 |
| EI034.00 | A | 30 | 30 | 3.2 | 0.6 | 660 | 19.4 | 31 | 163 |
| EI034.20 | A | 30 | 30 | 3.2 | 0.4 | 58 | 10.9 | 31 | 163 |
| EI034.30 | P | 30 | 30 | 3.9 | 0.5 | 102 | 17.3 | 31 | 163 |
| EI034.70 | P | 30 | 30 | 4.1 | 0.51 | 70 | 19 | 31 | 163 |
| EI036.00 | R | 30 | 30 | 4.6 | 0.61 | 800 | 28.6 | 31 | 163 |
| EI037.00 | A | 30 | 30 | 3.7 | 0.44 | 42 | 13.9 | 31 | 163 |
| EI039.00 | A | 30 | 30 | 4.2 | 0.63 | 940 | 27.5 | 31 | 163 |
| EI040.00 | A | 30 | 30 | 3.4 | 0.4 | 28 | 11.4 | 31 | 163 |
| EI041.00 | R | 30 | 30 | 3.1 | 0.48 | 94 | 13 | 31 | 163 |
| EI042.00 | A | 30 | 30 | 2 | 0.15 | 14 | 3.3 | 31 | 163 |
| EI043.00 | A | 30 | 30 | 2.1 | 0.11 | 6 | 2.9 | 31 | 163 |
| EI044.00 | A | 30 | 30 | 2.7 | 0.25 | 10 | 5.7 | 31 | 163 |
| EI045.00 | R | 30 | 30 | 6 | 0.53 | 126 | 28.8 | 31 | 163 |
| EI046.00 | P | 30 | 30 | 3.7 | 0.53 | 142 | 18.2 | 31 | 163 |
| EI047.00 | A | 30 | 30 | 2.8 | 0.41 | 72 | 9.6 | 31 | 163 |
| EI047.60 | R | 30 | 30 | 5.1 | 0.6 | 154 | 30.2 | 31 | 163 |
| EI050.00 | A | 30 | 30 | 2.9 | 0.41 | 64 | 10.1 | 31 | 163 |
| EI051.00 | R | 30 | 30 | 4.4 | 0.71 | 1700 | 37 | 31 | 163 |
| EI054.00 | A | 30 | 30 | 2 | 0.1 | 5.5 | 2.7 | 31 | 163 |
| EI056.00 | A | 30 | 30 | 2.6 | 0.47 | 200 | 10.7 | 31 | 163 |
| EI058.00 | A | 30 | 30 | 2.2 | 0.17 | 8 | 3.7 | 31 | 163 |
| EI061.00 | A | 30 | 30 | 2 | 0.1 | 6 | 2.7 | 31 | 163 |
| EI063.00 | A | 30 | 30 | 2.6 | 0.34 | 42 | 7.4 | 31 | 163 |
| EI064.00 | P | 30 | 30 | 5.3 | 0.77 | 1700 | 52.8 | 31 | 163 |



| Station | Class | Count | MFCCount | GM | SDV | MAX | P90 | Appd Std | Restr Std |
|----------|-------|-------|----------|------|------|------|------|----------|-----------|
| EI065.00 | A | 30 | 30 | 3.3 | 0.57 | 700 | 18.2 | 31 | 163 |
| EI068.00 | A | 30 | 30 | 2.3 | 0.33 | 114 | 6.2 | 31 | 163 |
| EI069.00 | A | 30 | 30 | 2 | 0.1 | 6 | 2.7 | 31 | 163 |
| EI070.00 | A | 30 | 30 | 2.4 | 0.31 | 24 | 6.2 | 31 | 163 |
| EI070.10 | A | 30 | 30 | 2.4 | 0.25 | 18 | 5.2 | 31 | 163 |
| EI070.15 | A | 30 | 30 | 2.7 | 0.26 | 16 | 6 | 31 | 163 |
| EI070.20 | R | 30 | 30 | 3.9 | 0.5 | 220 | 17.7 | 31 | 163 |
| EI070.40 | R | 30 | 30 | 4.3 | 0.81 | 1700 | 47.3 | 31 | 163 |
| EI070.52 | P | 30 | 30 | 4.7 | 0.4 | 42 | 15.9 | 31 | 163 |
| EI070.60 | R | 30 | 30 | 2.7 | 0.31 | 44 | 6.7 | 31 | 163 |
| EI070.70 | P | 30 | 30 | 5.1 | 0.67 | 160 | 37.3 | 31 | 163 |
| EI070.82 | A | 30 | 30 | 3.2 | 0.39 | 42 | 10.4 | 31 | 163 |
| EI070.90 | A | 30 | 30 | 3.4 | 0.43 | 118 | 12.5 | 31 | 163 |
| EI071.00 | A | 30 | 30 | 3.7 | 0.46 | 120 | 14.9 | 31 | 163 |
| EI071.50 | P | 30 | 30 | 10.2 | 0.69 | 1700 | 80.2 | 31 | 163 |
| EI072.50 | P | 30 | 30 | 2.8 | 0.41 | 54 | 9.6 | 31 | 163 |
| EI073.00 | A | 30 | 30 | 3.6 | 0.52 | 106 | 17 | 31 | 163 |
| EI074.00 | A | 30 | 30 | 5.7 | 0.57 | 240 | 31 | 31 | 163 |
| EI075.00 | A | 30 | 30 | 3.1 | 0.47 | 158 | 12.5 | 31 | 163 |
| EI075.60 | A | 30 | 30 | 3.2 | 0.51 | 156 | 14.9 | 31 | 163 |
| EI075.90 | A | 30 | 30 | 2.7 | 0.5 | 620 | 12.1 | 31 | 163 |
| EI079.00 | A | 30 | 30 | 1.9 | 0 | 2 | 1.9 | 31 | 163 |
| EI081.00 | A | 30 | 30 | 2.6 | 0.33 | 27 | 7 | 31 | 163 |
| EI082.00 | A | 30 | 30 | 3.6 | 0.46 | 116 | 14.4 | 31 | 163 |
| EI083.00 | A | 30 | 30 | 3.3 | 0.56 | 300 | 17.4 | 31 | 163 |
| EI084.00 | A | 30 | 30 | 3.1 | 0.55 | 240 | 16.3 | 31 | 163 |
| EI086.00 | A | 30 | 30 | 2.2 | 0.24 | 29 | 4.5 | 31 | 163 |
| EI087.00 | A | 30 | 30 | 2.5 | 0.41 | 106 | 8.9 | 31 | 163 |
| EI089.00 | P | 30 | 30 | 2.4 | 0.26 | 16 | 5.3 | 31 | 163 |
| EI098.00 | A | 30 | 30 | 3.4 | 0.38 | 24 | 10.6 | 31 | 163 |
| EI103.00 | A | 30 | 30 | 3 | 0.32 | 20 | 8 | 31 | 163 |
| EI105.00 | P | 30 | 30 | 2.6 | 0.33 | 22 | 7 | 31 | 163 |
| EI105.10 | A | 30 | 30 | 2.4 | 0.3 | 38 | 5.9 | 31 | 163 |
| EI106.00 | A | 30 | 30 | 2.4 | 0.37 | 100 | 7.4 | 31 | 163 |
| EI107.00 | A | 30 | 30 | 2.1 | 0.23 | 29 | 4.3 | 31 | 163 |
| EI108.00 | P | 30 | 30 | 2.2 | 0.19 | 10 | 3.9 | 31 | 163 |
| EI109.00 | A | 30 | 30 | 2.9 | 0.46 | 300 | 11.4 | 31 | 163 |



| Station | Class | Count | MFCCount | GM | SDV | MAX | P90 | Appd Std | Restr Std |
|----------|-------|-------|----------|-----|------|-----|------|----------|-----------|
| EI110.70 | A | 30 | 30 | 3.1 | 0.36 | 28 | 9.1 | 31 | 163 |
| EI111.00 | A | 30 | 30 | 3.2 | 0.32 | 24 | 8.4 | 31 | 163 |
| EI112.00 | A | 30 | 30 | 3.1 | 0.44 | 60 | 11.5 | 31 | 163 |
| EI113.00 | P | 30 | 30 | 2.8 | 0.49 | 380 | 12.2 | 31 | 163 |

Table 8. P90s for Conditional Area stations calculated using data from the open phase; P90s that do not meet the classification standard in the open phase are highlighted in red.

| Station | Class | Count | MFCCount | GM | SDV | MAX | P90 | Appd Std | Restr Std |
|----------|-------|-------|----------|-----|------|-----|-----|----------|-----------|
| EI009.00 | CR | 30 | 30 | 2.1 | 0.25 | 48 | 4.5 | 31 | 163 |
| EI091.00 | CA | 30 | 30 | 2.4 | 0.31 | 40 | 6.1 | 31 | 163 |
| EI093.00 | CA | 30 | 30 | 2.4 | 0.33 | 36 | 6.6 | 31 | 163 |
| EI096.00 | CA | 30 | 30 | 2.2 | 0.25 | 20 | 4.8 | 31 | 163 |

Table 9. P90 comparison 2015-2016, a negative percentage shows an improvement in water quality and a positive percentage shows a decline in water quality. Declines of >20% are highlighted in red.

| Station | 2015 P90 | 2016 P90 | % Change 2015-2016 |
|----------|----------|----------|--------------------|
| EI001.00 | 26.3 | 22.4 | -17% |
| EI003.00 | 99 | 29.9 | -231% |
| EI008.00 | 22.3 | 21 | -6% |
| EI023.70 | 17.8 | 16.6 | -7% |
| EI024.00 | 18.1 | 17.4 | -4% |
| EI029.00 | 9.1 | 7.6 | -20% |
| EI031.00 | 39.5 | 29.8 | -33% |
| EI033.00 | 42.3 | 32.4 | -31% |
| EI034.00 | 21.4 | 19.4 | -10% |
| EI034.20 | 17.7 | 10.9 | -62% |
| EI036.00 | 36.6 | 28.6 | -28% |
| EI037.00 | 19.5 | 13.9 | -40% |
| EI039.00 | 22.1 | 27.5 | 20% |
| EI040.00 | 15.5 | 11.4 | -36% |
| EI041.00 | 33.8 | 13 | -160% |
| EI042.00 | 4.6 | 3.3 | -39% |
| EI043.00 | 8.1 | 2.9 | -179% |
| EI044.00 | 6.1 | 5.7 | -7% |
| EI045.00 | 40.6 | 28.8 | -41% |
| EI046.00 | 40 | 18.2 | -120% |

| Station | 2015 P90 | 2016 P90 | % Change 2015-2016 |
|----------|----------|----------|--------------------|
| EI047.00 | 18.6 | 9.6 | -94% |
| EI047.60 | 49.9 | 30.2 | -65% |
| EI050.00 | 13.2 | 10.1 | -31% |
| EI051.00 | 36.2 | 37 | 2% |
| EI054.00 | 1.9 | 2.7 | 30% |
| EI056.00 | 11 | 10.7 | -3% |
| EI058.00 | 4.1 | 3.7 | -11% |
| EI061.00 | 3 | 2.7 | -11% |
| EI063.00 | 8.4 | 7.4 | -14% |
| EI064.00 | 58.6 | 52.8 | -11% |
| EI065.00 | 20.8 | 18.2 | -14% |
| EI068.00 | 2.7 | 6.2 | 56% |
| EI069.00 | 2.9 | 2.7 | -7% |
| EI070.00 | 6.2 | 6.2 | 0% |
| EI070.10 | 7.5 | 5.2 | -44% |
| EI070.15 | 5.4 | 6 | 10% |
| EI070.20 | 20.3 | 17.7 | -15% |
| EI070.40 | 52.5 | 47.3 | -11% |
| EI070.52 | 37 | 15.9 | -133% |
| EI070.60 | 15.3 | 6.7 | -128% |



| Station | 2015 P90 | 2016 P90 | % Change 2015-2016 |
|----------|----------|----------|--------------------|
| EI070.70 | 35.6 | 37.3 | 5% |
| EI070.82 | 17.7 | 10.4 | -70% |
| EI070.90 | 20.7 | 12.5 | -66% |
| EI071.00 | 20.4 | 14.9 | -37% |
| EI071.50 | 84.4 | 80.2 | -5% |
| EI072.50 | 13.7 | 9.6 | -43% |
| EI073.00 | 17.3 | 17 | -2% |
| EI074.00 | 19.7 | 31 | 36% |
| EI075.00 | 8 | 12.5 | 36% |
| EI075.60 | 13.9 | 14.9 | 7% |
| EI075.90 | 12 | 12.1 | 1% |
| EI079.00 | 5.2 | 1.9 | -174% |
| EI081.00 | 5.5 | 7 | 21% |
| EI083.00 | 20.4 | 17.4 | -17% |
| EI084.00 | 13.9 | 16.3 | 15% |

| Station | 2015 P90 | 2016 P90 | % Change 2015-2016 |
|----------|----------|----------|--------------------|
| EI086.00 | 5 | 4.5 | -11% |
| EI087.00 | 9.1 | 8.9 | -2% |
| EI089.00 | 5.3 | 5.3 | 0% |
| EI098.00 | 15.3 | 10.6 | -44% |
| EI103.00 | 10.9 | 8 | -36% |
| EI105.00 | 10.8 | 7 | -54% |
| EI105.10 | 9.2 | 5.9 | -56% |
| EI106.00 | 7.8 | 7.4 | -5% |
| EI107.00 | 3.9 | 4.3 | 9% |
| EI108.00 | 4.2 | 3.9 | -8% |
| EI109.00 | 14.5 | 11.4 | -27% |
| EI110.70 | 9.5 | 9.1 | -4% |
| EI111.00 | 9.8 | 8.4 | -17% |
| EI112.00 | 9.6 | 11.5 | 17% |
| EI113.00 | 12.3 | 12.2 | -1% |

Aquaculture/Wet Storage Activity

There are aquaculture and limited purpose aquaculture (LPA) lease sites throughout growing area EI (Figure 6). In the Jordan River there is a 2.94-acre aquaculture lease for green sea urchins. In Eastern Bay near the mouth of the Jordan River there are four LPAs for blue mussels, an 89.7-acre aquaculture lease for blue mussels and a 31.59-acre aquaculture lease for blue mussels. In Eastern Bay near Thomas Island there are eight LPAs for American/eastern oysters, two LPAs for blue mussels, and a 40.36-acre aquaculture lease for blue mussels. In Eastern Bay near Lamoine Beach there is an 8-acre aquaculture lease for blue mussels. In Taunton Bay there is a 5.06-acre aquaculture lease for American oysters, a 10.69-acre aquaculture lease for American oysters, and a 3.92-acre aquaculture lease for American oysters. Near Ingalls Island there are three LPAs for American/eastern oysters. North of Bean Island there is a 32.24-acre aquaculture lease for blue mussels. Near Preble Island there is a 35.62-acre aquaculture lease for seaweed. In Waukeag Neck there is a 14.35-acre aquaculture lease for blue mussels.

Recommendation for Future Work

Jordan River, Lamoine / Trenton, (EI39) will be under special study in the 2017 season at the request of the shellfish committee. Hog Bay, Franklin, (EI74) will also be under special study in the 2017 season. These studies will include stream sampling, 1” rainfall study, and new investigative stations to help determine pollution sources or other reasons for decline in water quality. The Jordan River study will also include the involvement of the 610 group for additional stream sampling and pollution source investigation upstream from the coastal zone. Create four new investigative stations in growing area EI for special studies; Jordan River (3), Hog Bay (1).



Water quality stations EI45 (Mud Creek), EI46 (Martin Cove), and EI47.6 (Kilkenny Cove) all meet the standard for Approved harvest at end of year 2016 and will be evaluated for a possible upgrade in 2017. No stations in growing area EI required a downgrade due to end of year 2016 P90 scores.



Figure 6. Map of Aquaculture in growing area EI

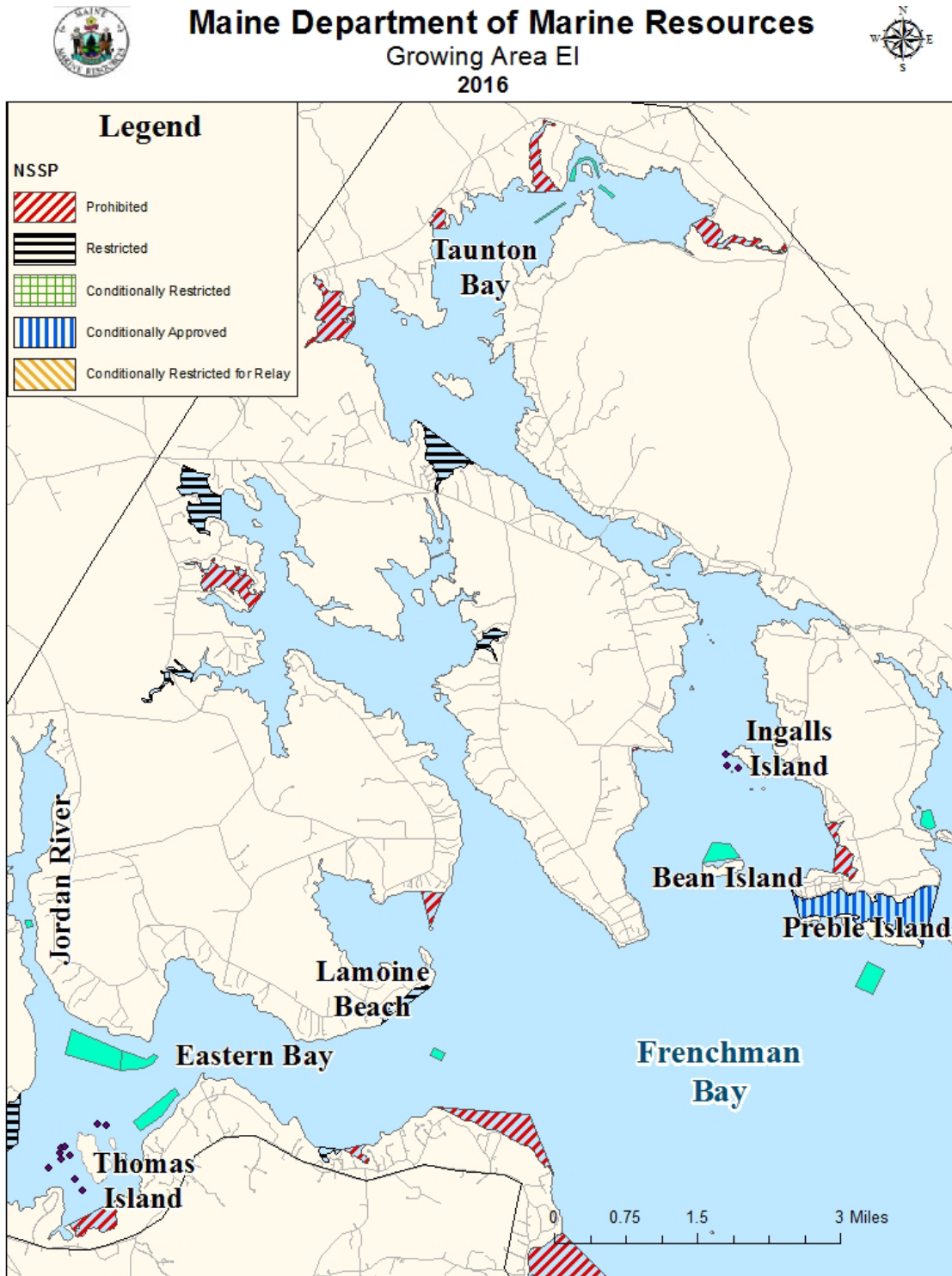




Table 10. Count table of samples collected in growing area EI during the 2016 season.

| Station | Class | Adverse | Investigatory | | Random | | Total | Comments |
|----------|-------|---------|---------------|------|--------|------|-------|---|
| | | Closed | Closed | Open | Closed | Open | | |
| EI001.00 | A | | | | | 6 | 6 | |
| EI003.00 | P | | | | 6 | | 6 | |
| EI008.00 | P | | | | 6 | | 6 | |
| EI009.00 | CR | | | | 8 | 4 | 12 | |
| EI023.70 | P | | | | 6 | | 6 | |
| EI024.00 | A | | | | | 6 | 6 | |
| EI029.00 | A | | | | | 3 | 6 | Noticed in review station falls in Approved area, Reclassified |
| | P | | | | 3 | | | |
| EI031.00 | P | | | | 6 | | 6 | |
| EI033.00 | R | | | | | 6 | 6 | |
| EI034.00 | A | 5 | | | | 6 | 11 | Flood sampling |
| EI034.20 | A | | | | | 4 | 9 | Reclassified to A 5/3/16; removed from accelerated sampling; Flood sample |
| | R | 1 | | | | 4 | | |
| EI034.30 | CA | 1 | | | 6 | 5 | 13 | Reclassified to Prohibited 12/28/16; Flood sample |
| | P | | | | 1 | | | |
| EI034.70 | CA | 1 | | | 6 | 5 | 13 | Reclassified to Prohibited 12/28/16; Flood sample |
| | P | | | | 1 | | | |
| EI036.00 | R | | | | | 6 | 6 | |
| EI037.00 | A | | | | | 6 | 6 | |
| EI039.00 | A | 3 | | | | 6 | 9 | Flood sampling |
| EI040.00 | A | 5 | | | | 6 | 11 | Flood sampling |
| EI041.00 | R | | | 2 | | 6 | 8 | Investigative rain sampling |
| EI042.00 | A | 3 | | 2 | | 6 | 11 | Flood sampling; Investigative rain sampling |
| EI043.00 | A | | | 2 | | 6 | 8 | Investigative rain sampling |
| EI044.00 | A | | | 2 | | 6 | 8 | Investigative rain sampling |
| EI045.00 | R | | | | | 6 | 6 | |
| EI045.50 | A | | | | | 6 | 6 | |
| EI046.00 | P | | 3 | | 6 | | 9 | Investigative rain sample; Concurrent land/boat samples |
| EI047.00 | A | | | 1 | | 6 | 7 | Concurrent land/boat sample |
| EI047.60 | R | | | 2 | | 6 | 8 | Concurrent land/boat samples |
| EI050.00 | A | | | | | 6 | 6 | |
| EI051.00 | R | | | | | 6 | 6 | |
| EI054.00 | A | | | | | 6 | 6 | |



| Station | Class | Adverse | Investigatory | | Random | | Total | Comments |
|----------|-------|---------|---------------|------|--------|------|-------|--|
| | | Closed | Closed | Open | Closed | Open | | |
| EI056.00 | A | | | | | 6 | 6 | |
| EI058.00 | A | 3 | | | | 6 | 9 | Flood sampling |
| EI061.00 | A | | | | | 6 | 6 | |
| EI063.00 | A | | | | | 6 | 6 | |
| EI064.00 | P | | | | 6 | | 6 | |
| EI065.00 | A | | | | | 6 | 6 | |
| EI068.00 | A | | | | | 6 | 6 | |
| EI069.00 | A | | | | | 6 | 6 | |
| EI070.00 | A | 3 | | | | 6 | 9 | Flood sampling |
| EI070.10 | A | | | | | 6 | 6 | |
| EI070.15 | A | | | | | 6 | 6 | |
| EI070.20 | R | | | | | 6 | 6 | |
| EI070.40 | R | | | | | 6 | 6 | |
| EI070.52 | P | | | | 6 | | 6 | |
| EI070.60 | R | | | | | 6 | 6 | |
| EI070.70 | P | | | | 5 | | 5 | Missed due to tide |
| EI070.82 | A | | | | | 6 | 6 | |
| EI070.90 | A | | | | | 6 | 6 | |
| EI071.00 | A | | | | | 6 | 6 | |
| EI071.50 | P | | | | 6 | | 6 | |
| EI072.50 | P | | | | 6 | | 6 | |
| EI073.00 | A | | | | | 6 | 6 | |
| EI074.00 | A | | | | | 6 | 6 | |
| EI075.00 | A | | | | | 6 | 6 | |
| EI075.60 | A | | | | | 6 | 6 | |
| EI075.90 | A | | | | | 6 | 6 | |
| EI079.00 | A | | | | | 6 | 6 | |
| EI081.00 | A | | | | | 6 | 6 | |
| EI082.00 | A | | | | | 3 | 9 | Flood sampling; Reclassified to Approved 5/16/16 |
| | CA | 1 | | | 1 | 4 | | |
| EI083.00 | A | | | | | 6 | 6 | |
| EI084.00 | A | | | | | 6 | 6 | |
| EI086.00 | A | | | | | 6 | 6 | |
| EI087.00 | A | | | | | 6 | 6 | |
| EI089.00 | P | | | | 6 | | 6 | |
| EI091.00 | CA | 1 | | | 5 | 7 | 13 | Flood sample |



| Station | Class | Adverse | Investigatory | | Random | | Total | Comments |
|----------|-------|---------|---------------|------|--------|------|-------|--|
| | | Closed | Closed | Open | Closed | Open | | |
| EI093.00 | CA | 1 | | | 5 | 7 | 13 | Flood sample |
| EI096.00 | CA | 1 | | | 5 | 7 | 13 | Flood sample |
| EI098.00 | A | | | | | 6 | 6 | |
| EI103.00 | A | | | | | 6 | 6 | |
| EI105.00 | P | | | | 6 | | 6 | |
| EI105.10 | A | | | | | 6 | 6 | |
| EI106.00 | A | 3 | | | | 6 | 9 | Flood sample |
| EI107.00 | A | | | | | 6 | 6 | |
| EI108.00 | A | | | | | 4 | 6 | Noticed in review station is within Prohibited area, reclass |
| | P | | | | 2 | | | |
| EI109.00 | A | | | | | 6 | 6 | |
| EI110.70 | A | | | | | 6 | 6 | |
| EI111.00 | A | | | | | 6 | 6 | |
| EI112.00 | A | 3 | | | | 6 | 9 | |
| EI113.00 | P | | | | 6 | | 6 | |

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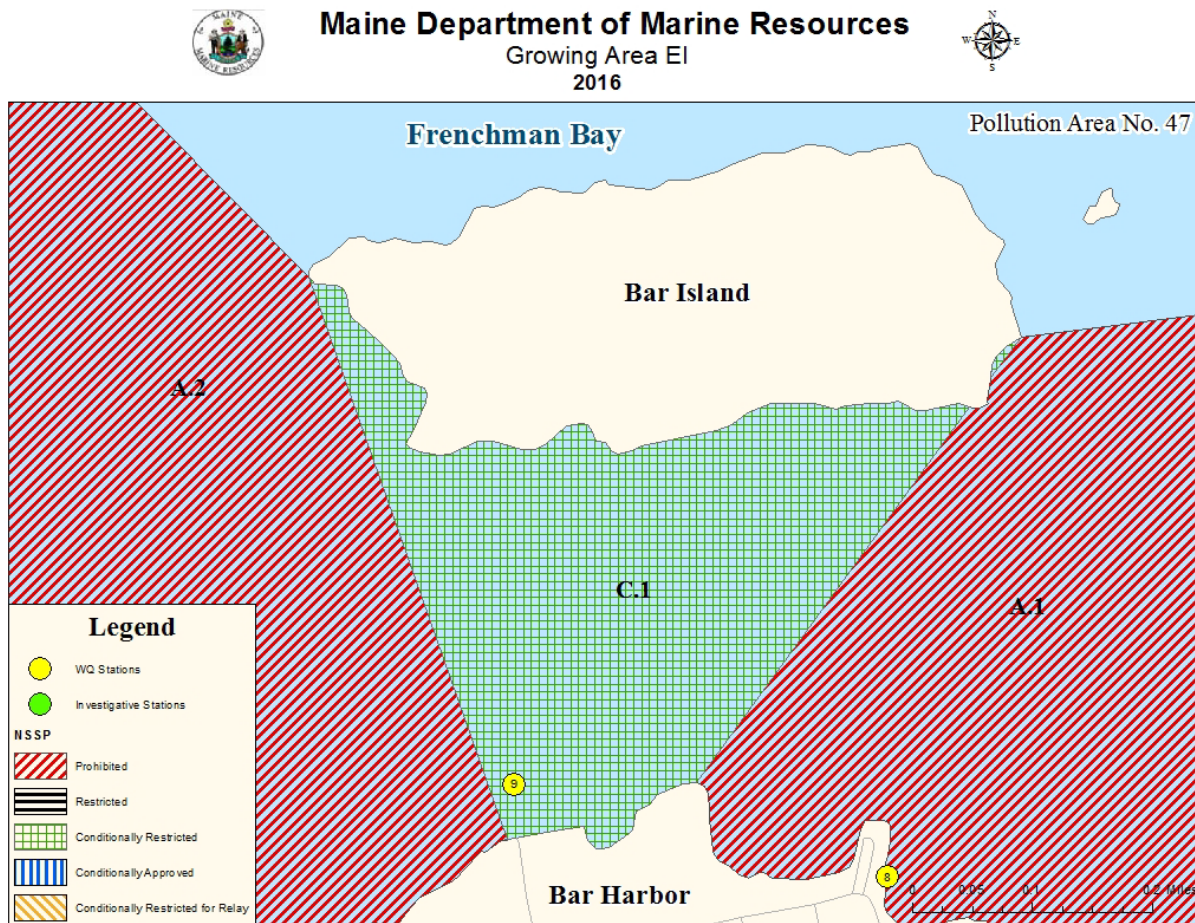


Appendix A. Annual Review of C47 Bar Island causeway, Bar Harbor Conditional Area Management Plan

Scope

Pollution Area 47(C.1) on the Bar Island causeway bar in Bar Harbor and Gouldsboro is classified as Conditionally Restricted seasonally and is in the open status for depuration harvest from March 1 to May 31 (Figure 7). This area is east of a line beginning at the seawall on the west side of Bridge Street running northwest to the western tip of Bar Island (Gouldsboro); and west of a line beginning at the northeast corner of the seawall at The Harborside Hotel and Marina property running northeast to the eastern tip of Bar Island. This area is classified as Conditionally Restricted based on season and waste water treatment plant function. This Conditional Area is monitored by water quality station EI9.

Figure 7. C47 Bar Island, Bar Harbor Conditionally Restricted area





Compliance with management plan

The Bar Island Conditional Area remains in compliance with the current conditional area management plan (CAMP). Waste water treatment facility staff adequately report all bypass events and the area is closed to harvest within the reactionary window for emergency events. See CAMP annual reviews for information on annual compliance with the current CAMP.

Adequacy of reporting and cooperation of involved persons

The town of Bar Harbor has an effective and cooperative local sewage plant operation staff. Waste water treatment facility staff report any sewage bypass events to the department immediately when an untreated sanitary waste discharge occurs at the Rodick Street and/or West Street combined sewer outfalls into the waters of Frenchman's Bay during any active harvesting period. Reporting is done through the Maine Department of Marine Resources website or through the Maine Department of Marine Resources' Pollution Event Reporting Hotline.

Compliance with restricted growing area criteria

The area continues to meet the criteria for Restricted harvest during the open phase of March 1 through May 31 based on a P90 calculation of 4.5 cfu/100ml during the open phase (Table 8) and no other known point sources of pollution.

Water sampling compliance history

Water samples are collected at least monthly during the open phase and throughout the year (Table 10). The P90 value meets the standard for Restricted harvest during the open phase (Table 8).

Analysis-Recommendations

The Bar Island Conditionally Restricted area continues to meet the standards for seasonal Restricted harvest during the open phase and remains in compliance with the CAMP. Recommend continued water quality monitoring and open communication with waste water treatment facility staff to ensure continued compliance with the CAMP.

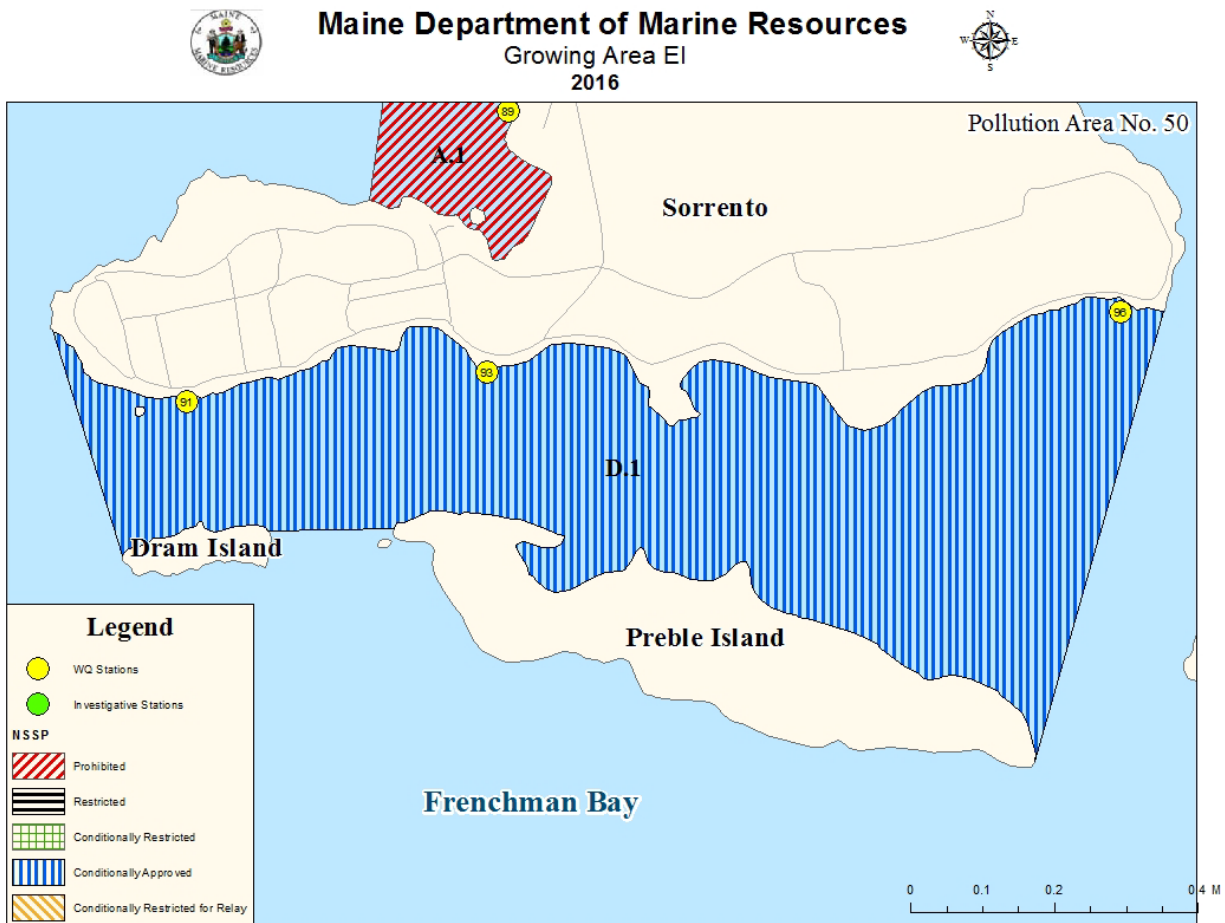


Appendix B. Annual Review of C50 Sorrento Harbor, Sorrento Conditional Area Management Plan

Scope

Pollution Area 50(D.1) Sorrento Harbor in Sorrento is classified as Conditionally Approved seasonally with the open phase for harvest from October 1 through April 30 (Figure 8). This area is west of a line beginning at a red painted post located on the shore at the eastern tip of Doans Point, running south to the eastern tip of Preble Island; and east of a line beginning at the western most tip of Bean Point, running south to the western tip of Dram Island; and north of a line beginning at the eastern tip of Dram Island, running east to the western tip of Preble Island. This area is classified as Conditionally Approved based on marina operation. This Conditional Area is monitored by water quality stations EI91, EI93, and EI96.

Figure 8. C50 Sorrento Harbor, Sorrento Conditionally Approved area





Compliance with management plan

The Sorrento Harbor Conditional Area remains in compliance with the current conditional area management plan (CAMP). The marina is not operating during the open phase and does not pose a risk to public health. See CAMP annual reviews for information on annual compliance with the current CAMP.

Adequacy of reporting and cooperation of involved persons

No reporting is required for this Conditional Area.

Compliance with restricted growing area criteria

The area continues to meet the criteria for Approved harvest during the open phase of October 1 through April 30 based on P90 calculations (EI91 at 6.1 cfu/100ml; EI93 at 6.6 cfu/100ml; EI96 at 4.8 cfu/100ml) during the open phase and no other known sources of pollution in the area.

Water sampling compliance history

Water samples are collected at least monthly during the open phase and throughout the year (Table 10). The P90 value meets the standard for Approved harvest during the open phase (Table 8).

Analysis-Recommendations

The Sorrento Harbor Conditionally Approved area continues to meet the standards for seasonal Approved harvest during the open phase and remains in compliance with the CAMP. Recommend continued water quality monitoring and open communication with the harbor master to ensure continued compliance with the CAMP.



Appendix C. 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.