GROWING AREA ER

Point of Maine, Machiasport to Cape Wash, Cutler

Sanitary Survey Report
2009-2021

Erick Schaefer Scientist I

Sanitary Survey Officer signature: David W. Miller **Date:** 9/8/22

Contents

Executive Summary

This is a sanitary survey report for growing area ER written in compliance with the requirements of the 2017 Model Ordinance and the National Shellfish Sanitation Program (NSSP). This report includes a water quality review, based on water quality data collected through 2021, as well as an evaluation of all pollution sources identified between 2009 and 2021, and a re-evaluation of major pollution sources located within the boundaries of the area. A portion of CA1 was upgraded in 2021 because of this Sanitary Survey. One station ER 10 was deactivated because of loss of access. There were no new actual or potential pollution sources found during this survey. Water quality has remained consistent overall with some improvement in water quality shown. Triennial reviews were conducted in 2014, 2017, and 2020 with the last Sanitary Survey done in 2009. The next sanitary survey is due in 2033 and the next triennial in 2024.

Description of Growing Area

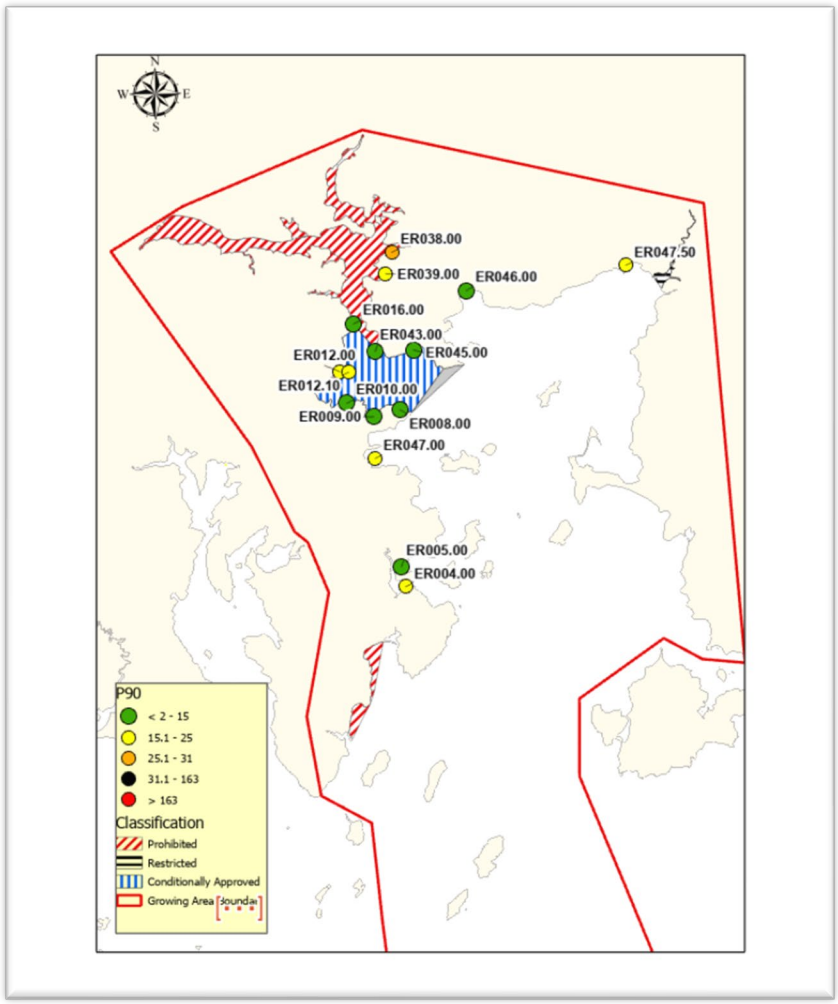
Growing Area ER encompasses approximately 80 square miles and is in Washington County, Maine. The villages of Machia's pop- 2060, Machiasportpop-1081, East Machia's pop- 1296, Whiting pop- 481, and Cutler pop-505 have the largest population concentrations (2010-2020 Census data). Development along these shores is spotty with clusters of homes separated by undeveloped land. Heavier development is found at the mouth of the Machias and East Machias Rivers in Machias and East Machias. All dwellings within 150 feet of the shore, water conduits-ditches, or streams or pollution sources were surveyed. There is one licensed group overboard discharges (OBD's), one WWTP discharge in the town of Machias, four finfish aquaculture discharges, one process water discharge from the Naval Base in Cutler, and three process water discharges from food processing for blueberries and shellfish processing. One WWTP discharge at the Downeast Correctional Facility was deactivated and all discharge pipes were made inactive.

The growing area includes the near sub-tidal waters, intertidal flats, and a zone of shore property that extends inland to a definite up-land boundary. The shoreline included in this report stretches from Starboard Creek, Point of Maine, Machiasport to Cape Wash, Cutler. Machias Bay is about nine miles long and generally about three miles wide. Several uninhabited islands break their exposure to the Bay of Fundy; the western shore is generally of bluff ledge broken by several narrow coves and the eastern shore is of lower profile with broad expanses of the soft-sediment intertidal area. Islands are bold granite topped with softwood forest. The Machias River enters tidal water at the head of a narrow five-mile-long estuary emptying into Machias Bay from the northwest. The upland boundary starts at Starboard Creek, Machiasport, goes inland to a point west of Bucks Harbor; then northwest to Machias; then northeast to where US Route 1 crosses the East Machias River; then southeast to the head of Holmes Bay; then south to Cape Wash; and then follows the northern and western shores of Cross Island.

There are no shellfish Limited Purpose Aquaculture (LPAs) permits or shellfish aquaculture leases in this growing area.

Below is the map with Pollution Area boundaries and growing area boundaries. Closures within the growing area can be found in legal notices in DMR central files on the DMR website.

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



History of Growing Area Classification

Reclassification addendums to the sanitary survey report are in the DMR central files.

Pollution Sources Survey

Summary of Sources and Location

The growing area shoreline is divided into 2-mile segments that are identified using unique Growing Area Shoreline Survey Identification (GASSID) numbers. All properties and potential pollution sources within 250 feet of the shoreline are identified and inspected. The inspection includes a property description, physical address, location of the septic system, and any other relevant potential or actual pollution sources. A GPS point to identify the source location(s) and the data are entered electronically in the field and stored in DMR central files.

Figure 2. Growing Area ER, Pollution Map A

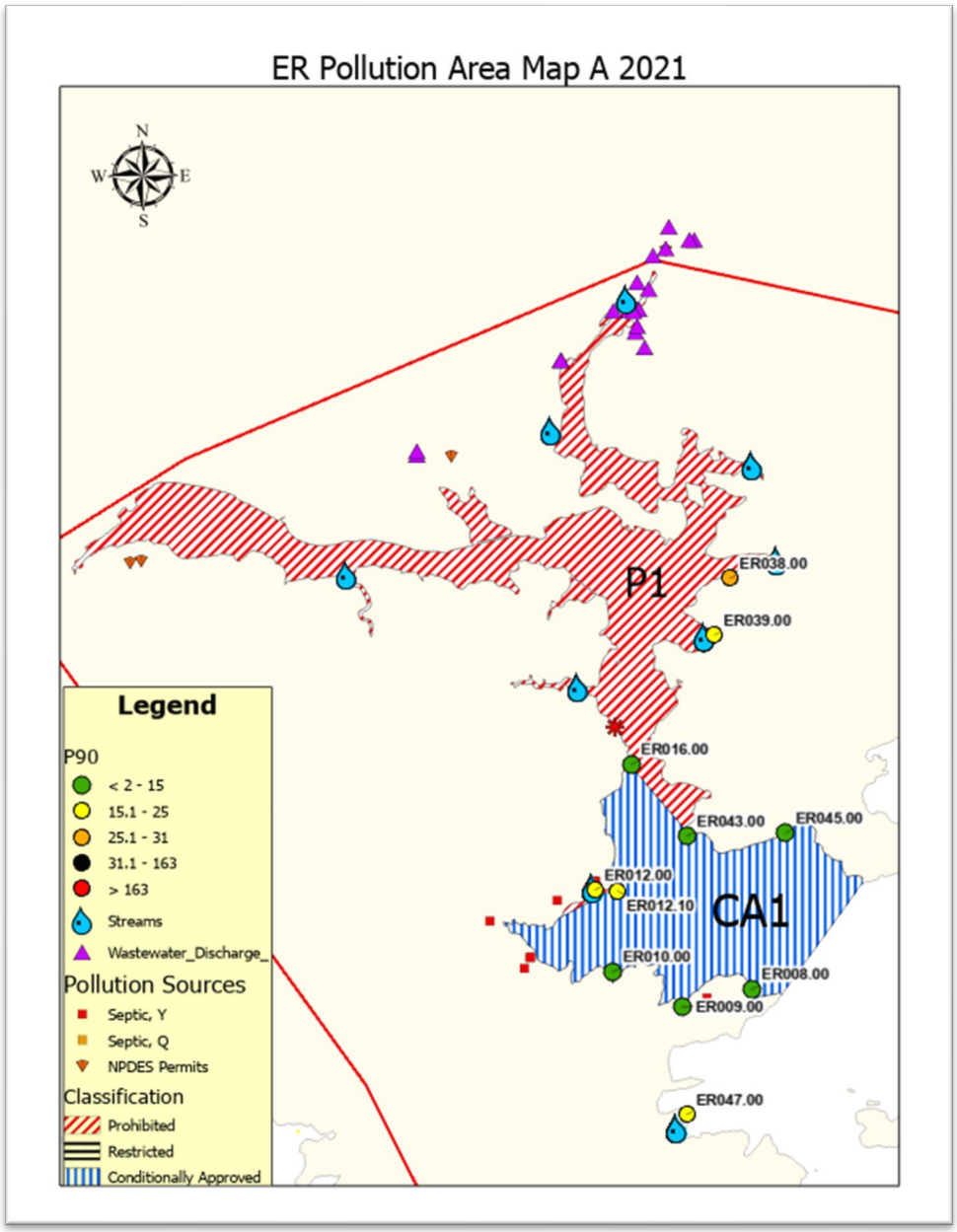


Figure 3. Growing Area ER, Pollution Map B

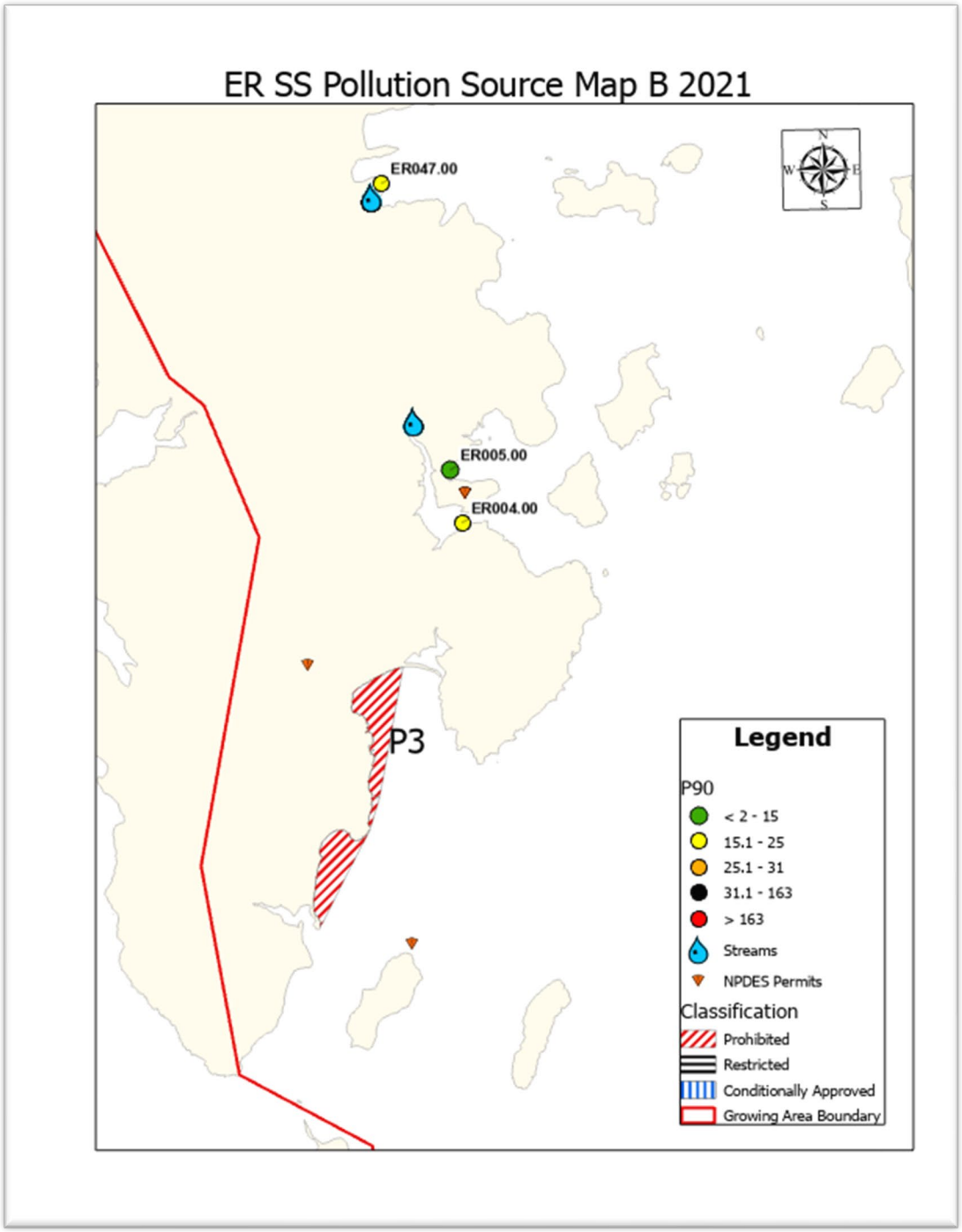
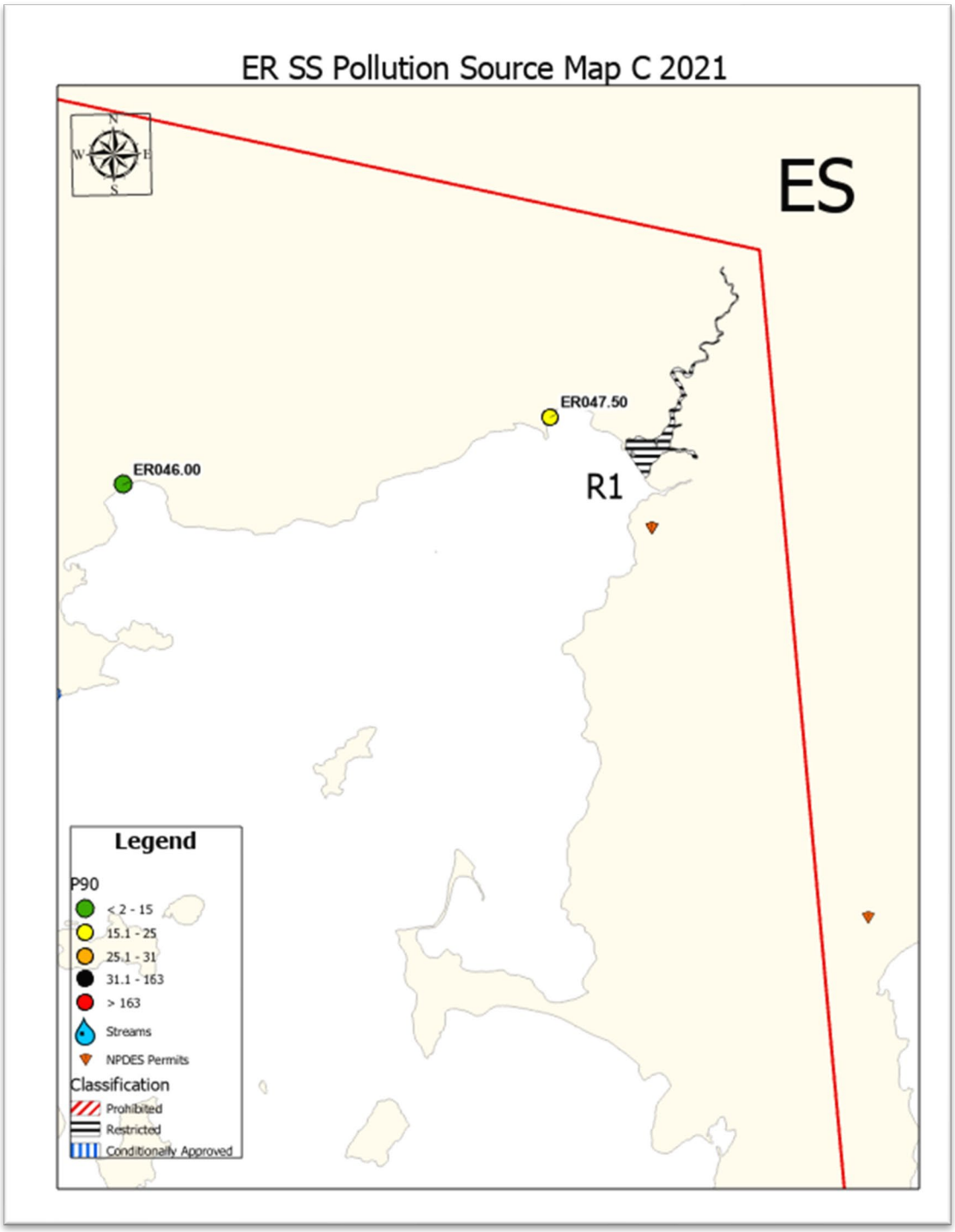


Figure 4. Growing Area ER, Pollution Map C



State and Federal Licensed Waste Discharge Permits

Overboard Discharges (OBDs)

There are 2 overboard discharges (OBDs) that discharge their treated effluent into the waters of Growing Area ER. A group OBD discharges into the waters of the East Machias River in East Machias, ER P1, (Figure 2), one OBD discharges into the Machias River in Machiasport, ER P1 (Figure 2).

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-1970s 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 before 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 EL (Table 1). The size of each closure is determined based on dilution, using on the permitted flow rate of the OBD (in gallons per day, GPD), and the mid-tide depth of the receiving water that each OBD discharges to; the fecal concentration used for this dilution calculation is $1.4X10^5$ FC /100 ml. All current closures are of adequate size to protect public health.

Table 1. Overboard Discharges (OBDs).

Pollution Area	OBD #	Location	Receiving Waterbody	Flow (gpd)	Acres Needed	Current Prohibited area
ER P1	ME0102 156	East Machias	East Machias River	25855	77	1183 combined with WWTP dilution zone
ER P1	1863	Machias port	Machias River	300	0.7	1183 combined with WWTP dilution zone

National Pollutant Discharge Elimination System (NPDES)

Table 2. NPDES Permitted Discharges

Pollution Area	Permit ID	Type	Facility	Waterbody
ER P1	ME0100323	WWTP	Machias WWTP	Machias River
ER Approved area	MEG130001	aquaculture	Cookes Aquaculture	Bucks Harbor
ER Approved area	MEG130017	aquaculture	Cookes Aquaculture	Machias Bay
ER Approved area	MEG130025	aquaculture	Cookes Aquaculture	Machias Bay
ER Approved area	MEG130027	aquaculture	Cookes Aquaculture	Machias Bay
ER Approved area	ME0002097	cooling water	US Navy	Thornton Point
ER P1	ME0110523	fish hatchery	Downeast Salmon Federation	East Machias River
ER Approved	ME0036978	Seafood processing	True North Maine, Inc.	Bucks Harbor
ER Approved area	ME0037486	food processing	Looks Gourmet Foods	Machias Bay
ER P1	MEU508253	food processing	Maine Wild Blueberry	Machias River
ER P1	ME0023051	Non-contact cooling water	Maine Wild Blueberry	Machias River

WWTP

There is one wastewater treatment plant (WWTP/WWTF) in the growing area ER. Since 2017 the WWTP inspection reports have been available in DMR central files. The facility is in Machias and discharges into Prohibited Area ER P1. This area is larger than the calculated dilution zone for the effluent (Table 3). One WWTP facility at the Downeast Correctional Facility was decommissioned and all discharges were disconnected and made inactive. The current prohibited area ER P2 will be looked at for a possible upgrade based on this closing of the plant.

Machias WWTP: The Machias WWTP MEPDES permit issued in 2016 allows for an average daily flow of .90 mgd as well as the discharge of an unspecified quantity of excess combined sanitary and storm water during wet weather events from two (2) combined sewer overflow (CSO) outfalls to the Machias River, Class SB, in Machias, Maine. The WWTP outfall discharges into 14 feet of water at mean low water. In 2017 a plant effluent study was conducted. During this study, the following numbers were used for the dilution. A 0.352 MGD flow (90th percentile 5-year monthly average flow), 194,000 FC/100ml in effluent before chlorination (90th percentile from the effluent study in 2017), and an average depth of 14 feet of receiving water; this results in 987 acres needed for dilution. The current zone is 1183 acres. The University of Maine modeled effluent dilution characteristics for both the east Machias and Machias WWTP's and the results of this study became available in January of 2021. This information will be evaluated and used to consider new classification boundaries.

The regulation Prohibited closure size exceeds the computed effluent dilution zone (dilution calculation=987 acres / closure size= 1183 acres).

Table 3. Machias WWTP dilution calculation

WWTF	
FC/100ml	**194,000**
Discharge Rate (gallons per hour)	**13542**
Time of Discharge (hr)	**24**
water depth (ft)	**14**
width of dilution area (ft)	**2**
FC per hour	9.95E+10
FC per **6** hr	2.39E+12
ml to dilute to 14FC/100ml	1.71E+13
ft^3 to dilute to 14FC/100ml	6.02E+08
area needed to dilute to 14 (ft^2)	43011453.6
length of dilution area (ft)	**21505726.8**
Acres	987.4139404

Residential

All residential pollution sources are reported to the local plumbing inspector (LPI). Once the system has been documented as being fixed, staff members from DMR can re-assess the water quality data and shoreline survey information to determine if the area is safe for shellfish harvest. There were 7 identified residential problems at the start of this survey. During the survey 6 of the 7 problems were found to be remediated. Only one was still an issue ER12-409 (in the Sanborn Cove upgrade addendum the problem is listed as ER12-384). This was once again reported to the local LPI. A follow-up survey was conducted on 10/28/2021 and it was observed that the problem was corrected and no longer an issue. The current closure, ER P2, will be written up for a reclass to be approved based on this information and water quality meeting approved standards. There are no current residential septic problems in Growing Area ER.

Table 4. Residential Problems

Pollution Area	Location ID	Date Surveyed	Direct or Indirect	Problem	Description	Town
ER P2	ER012-409	10/28/21	Indirect	Yes	breakout	Machiasport

Industrial Pollution

There are no major industrial pollution sites in growing area ER such as chemical plants, steel mills, shipyards, or refineries. There are two discharges from blueberry processing plants and one discharge from Looks Gourmet Seafood Plant. Two of the blueberry discharges are in current prohibited areas due to either OBD's or WWTP outfalls. The Looks Seafood process water discharge discharges to an open and approved area. All the shellfish areas adjacent to the businesses meet their present area classifications.

Small individual storage tanks for gasoline and diesel were noted at several 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

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.

The largest mooring field is in Bucks Harbor, Machiasport. This mooring field contains workboats only (lobster boats, trawling vessels). Because these types of workboats are day use, are not lived on, and are unlikely to have marine sanitation devices ("heads") they are not considered a health risk of discharged septic waste so no marina closure area is necessary.

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). Also, most major stormwater discharges are considered point sources and require coverage under an NPDES permit. In 1990, under the 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, EPA has delegated its authority to the Maine DEP to administer the Phase II Small MS4 General Permit. Under the Small MS4 GP, 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 stormwater runoff control, (5) Post-construction stormwater management, and (6) Pollution prevention/good housekeeping. The permit requires each city or town to develop a draft Storm Water Management Plan that establishes measurable goals for each of the Minimum Control Measures. The City or Town must document the implementation of the Plan, and provide annual reports to the Maine DEP. Currently, the discharge of stormwater from 30 Maine municipalities is regulated under the Phase II Small MS4 General Permit however, no municipalities located within the boundaries of growing area EL fall under these regulations. Additionally, the Maine Storm Water Management Law provides stormwater standards for projects located in organized areas that include one acre or more of disturbed areas (Maine DEP 2009).

The only stormwater collection system in Growing Area ER is in the downtown Machias area. This area is located within Prohibited Area ER P1.

Non-Point Pollution Sources

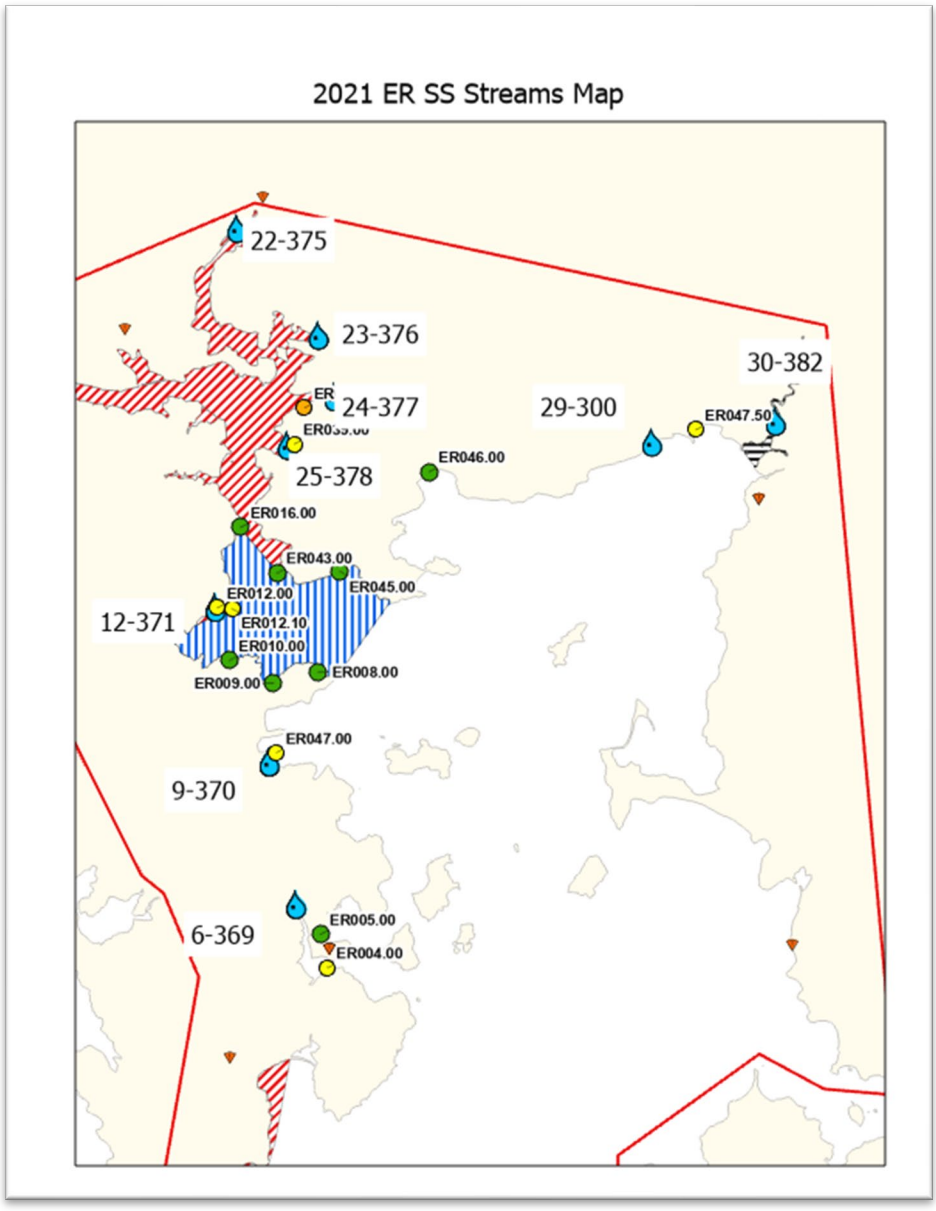
Non-point source (NPS) pollution is water pollution affecting a water body from diffuse sources, such as polluted runoff from agricultural areas draining into a river, significant rainfall, high river flows, or astronomical high tides. Nonpoint source pollution can be contrasted with point source pollution, where discharges occur to a body of water at a sole location, such as discharges from a chemical factory, urban runoff from a roadway storm drain, or ships at sea. NPS may derive from various sources with no specific solution to rectify the problem, making it difficult to regulate. Freshwater streams, drainage from rainstorm runoff, and tidal creeks are the major source of non-point discharge into Growing Area ER. A total of 39 samples were taken from freshwater streams during the review period. (Table 5, Figure 7).

Table 5. Stream Samples in Growing Area ER 2016-2021; Scores > 163 CFU/100ml are highlighted in yellow.

Pollution Area	Stream ID	Sample Date	Pollution Type	Score
	ER006-369	20-Jun-17	Stream	124
	ER006-369	01-Aug-17	Stream	540
	ER006-369	14-Aug-17	Stream	126
	ER006-369	17-Jun-20	Stream	54
	ER009-370	01-Aug-17	Stream	64
	ER009-370	14-Aug-17	Stream	40
	ER009-370	31-Aug-21	Stream	180
	ER009-370	31-Aug-21	Stream	308
	ER012-371	20-Jun-17	Stream	76
	ER012-371	01-Aug-17	Stream	200
	ER012-371	14-Aug-17	Stream	1700
	ER012-371	17-Jun-20	Stream	35
	ER012-371	31-Aug-21	Stream	48
	ER012-371	31-Aug-21	Stream	70
	ER022-375	20-Jun-17	Stream	16
	ER022-375	01-Aug-17	Stream	1700
	ER022-375	31-Aug-21	Stream	33
	ER022-375	31-Aug-21	Stream	49
	ER023-376	20-Jun-17	Stream	24
	ER023-376	01-Aug-17	Stream	15
	ER023-376	09-Jun-20	Stream	52
	ER024-377	20-Jun-17	Stream	60
	ER024-377	01-Aug-17	Stream	680

Pollution Area	Stream ID	Sample Date	Pollution Type	Score
	ER024-377	09-Jun-20	Stream	260
	ER024-377	31-Aug-21	Stream	345
	ER024-377	31-Aug-21	Stream	540
	ER025-378	20-Jun-17	Stream	88
	ER025-378	01-Aug-17	Stream	72
	ER025-378	09-Jun-20	Stream	1.9
	ER025-378	31-Aug-21	Stream	132
	ER025-378	31-Aug-21	Stream	179
	ER028-379	09-Jun-20	Stream	80
	ER029-380	06-Jun-16	Stream	1700
	ER029-380	22-Jun-16	Stream	48
	ER029-380	11-Jul-16	Stream	400
	ER029-380	17-Aug-16	Stream	1700
	ER029-380	09-Jun-20	Stream	68
	ER030-382	06-Jun-16	Stream	740
	ER030-382	22-Jun-16	Stream	58

Figure 5. ER Stream Map



Agricultural Activities

There are no large-scale agriculture activities in Growing Area ER. Pollution from small agriculture operations can be introduced into the growing area as nonpoint source pollution if transported by runoff from large rainfall or snowmelt events. Smaller farms are encouraged to follow best management practices to help avoid the effects animal waste and agricultural pollutants can have on water quality. No small farm activity is impacting shellfish harvest areas in Growing Area ER.

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 to the growing area water quality, such occurrences are very difficult to document.

Recreation Areas (beaches, trails, campgrounds, 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 ER is primarily a rural area with recreation areas limited to small-town parks with no septic facilities. 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. Recreation areas in ER are not considered to be impacting shellfish harvest areas.

Hydrographic and Meteorological Assessment

Tides

Coastal Maine experiences a mixed, semi-diurnal tide, with diurnal inequalities that are more pronounced on spring tides. Except for very few isolated areas with extensive saltwater marshes, tides are not considered to be contributors to fecal contamination. The National Oceanic and Atmospheric Administration data for a station at Eastport indicate a mean tidal range of 18.35 ft. The mean tidal

range for most of Maine is 9 feet to 13 feet. Unlike areas with small diurnal tides, this extreme volume exchange results in significant bacterial dilutions. Currents in the area are predominantly driven by the tides.

Rainfall

The mean annual precipitation in growing area ER is approximately 44 inches and the precipitation is not evenly distributed throughout the year. The wettest months are generally April and November while 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. Flood closures are implemented when areas receive greater than two inches of rainfall in a twenty-four-hour period. Rainfall is monitored by numerous rain gauges located along the entire Maine coast and reported primarily through the Weather Underground website. Some areas of Maine have documented fecal influences resulting from rainfall of greater than one inch in a twenty-four-hour period. These areas are considered rainfall conditional areas and are Conditionally Approved based on the one-inch closure trigger. No rainfall areas have been identified in growing are ER.

Maine DMR is working collaboratively with the University of Maine on a statewide coastal project determining how various watershed characteristics influence fecal contamination of marine waters during rainfall events. This research clusters watersheds based on similar characteristics then models how rainfall and associated pollution are distributed. The model is being refined to incorporate margin watershed influences.

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. The 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. In Maine, the wind is not a contributor to fecal pollution because marine currents are primarily influenced by the size and duration of the normal tidal cycle.

River Discharge

Streamflow in Maine exhibits seasonal variation, with the highest flows occurring in the spring (due to snowmelt, spring rains, and low evapotranspiration) and the mid-to-late fall (due to fall rains and low evapotranspiration). The Machias and East Machias Rivers are the major river system in the growing area ER. According to the USGS, the Machias River drainage is approximately 458 sq miles while the East Machias drainage is approximately 251 sq miles. Many small streams discharge into the growing area and these streams are discussed in the section about nonpoint source pollution.

Hydrographic Influence

Water circulation in ER is dominated by tides and influenced by river discharge. The tidal range in Machias Bay is fourteen feet. Tides are caused by the gravitational effects of the moon and sun on the ocean; other influences are heavy rainfall, low barometric pressure, and strong onshore winds which will increase tides. Tide levels fluctuate during the month based on the positions of the sun, moon, and earth. These fluctuations and the speed and direction of the tidal currents constantly change during a tidal cycle. Tidal currents have the greatest energy when water is pushed in and out of bays and channels during the highest and lowest tide levels. Growing area ER is subject to a semidiurnal tidal cycle with two high tides and two low tides per day. The tidal cycle is 12 hours and 25 minutes long so high and low tides are 50 minutes later each day.

Water Quality Studies

Map of Sampling Stations

Most marine fecal pollution of Maine waters comes from non-point sources. DMR uses Systematic Random Sampling (SRS) to monitor this influence and uses a pre-established schedule at an adequate frequency to capture all meteorological, hydrographic, and/or other pollution events that trigger non-point pollution contribution. Using SRS will detect the intermittent and unfavorable change in water quality and the program accepts the estimated 90th percentile (P90) as the standard to measure the variance of a data set.

There are presently 15 active water sampling sites in Growing Area ER. It is recognized that access, icing, and safety considerations prevent some stations from being sampled on scheduled dates. Currently, all stations in Growing Area ER meet their current NSSP classification standard. One water quality station ER 12 now has water quality meeting approved standards and will be evaluated for an upgrade in 2022.

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 6). The percent change in P90 from 2020 to 2021 was calculated and only two stations ER 43 and 45 showed a substantial increase in the P90 score (Table 7). Overall, the water quality in the growing area ER appears to be remaining consistent.

Table 6. P90 calculations for stations with a minimum of 30 samples. Geomeans and P90s not meeting current classifications are highlighted in red. CA P90's are using open period data only

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
ER004.00	A	30	4.3	0.45	38	16.5	5/30/2017

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
ER005.00	A	30	2.7	0.23	12	5.5	4/2/2018
ER046.00	A	30	2.7	0.32	54	7.2	5/23/2017
ER047.00	A	30	4.2	0.43	86	15.6	5/23/2017
ER047.50	A	30	4.1	0.49	102	17.7	6/6/2017
ER050.00	A	30	3.1	0.57	1700	17.6	6/6/2017
ER008.00	CA	30	3.5	0.35	18	10.1	7/8/2019
ER009.00	CA	30	4.8	0.5	112	21.4	2/20/2018
ER012.10	CA	30	3.7	0.36	24	10.9	7/8/2019
ER016.00	CA	30	4.5	0.44	35	17.1	7/8/2019
ER043.00	CA	30	3.6	0.44	62	13.4	7/8/2019
ER045.00	CA	30	3.8	0.47	72	15.3	8/5/2019
ER012.00	P	30	4	0.47	78	16.5	11/2/2017
ER038.00	P	30	4.8	0.5	320	21.5	5/23/2017
ER039.00	P	30	4.8	0.49	84	20.8	5/23/2017

Table 7. Percent change in P90 2020-2021; Positive numbers show decline negative numbers indicate an improvement

Station	2021P90	2020P90	%Change
ER004.00	16.5	17.3	-0.04624
ER005.00	5.5	7.6	-0.27632
ER008.00	10.1	7.3	0.383562

Station	2021P90	2020P90	%Change
ER009.00	21.4	13.2	0.621212
ER012.00	16.5	18	-0.08333
ER012.10	10.9	15.1	-0.27815
ER016.00	17.1	10.6	0.613208
ER038.00	21.5	28.6	-0.24825
ER039.00	20.8	21.4	-0.02804
ER043.00	13.4	4.6	1.913043
ER045.00	15.3	6	1.55
ER046.00	7.2	9.3	-0.22581
ER047.00	15.6	21.3	-0.26761
ER047.50	17.7	18.1	-0.0221
ER050.00	17.6	17.7	-0.00565

Emergency Closures: The reports summarizing emergency closures such as flood and biotoxin closures for the entire state are in the DMR central files.

Reclassifications: Reclassification addendums to the sanitary survey report are in the DMR central files.

CAMP Reviews, Inspection Reports, and Performance Standards

Annual Review of Area ER CA1 Machias WWTP Conditional Area Management Plan

Scope

The Machias Wastewater Treatment Facility discharges treated, year-round chlorinated effluent into the Machias River approximately 2.8 miles up-river from the Conditional area. Randell Point Flats and Sanborn Cove (ER, CA1) is managed on the bypass activity of the Machias WWTP siphon chamber and plant combined sewer overflows (CSO). The current management plan is dated 2019. The plant staff

immediately notifies the public health staff and Machiasport clam committee upon a bypass at the CSO near the treatment plant and the siphon chamber across the Machias River. The downstream Conditional areas are closed to harvesting for 21 days. A subsequent bypass event during the closed period re-sets the closed period back to 21 days. The area closed once during 2021.

The ER CA1 CA, a portion of growing area ER is Conditionally Approved based on the performance of the Machias WWTP. Water quality in this area meets approved standards during the open status, Stations ER 8, 9, 12.1, 16, 43, and 45 monitor this area.

Compliance with management plan

The WWTP Conditionally Approved area was sampled monthly while in the open status. Table 8 shows that the Geomean and P90 calculations meet approved standards during the open period. This conditional closure is enforced by DMR Marine Patrol.

Table 8. 2021 P90 open status

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
ER008.00	CA	30	3.5	0.35	18	10.1	7/8/2019
ER009.00	CA	30	4.8	0.5	112	21.4	2/20/2018
ER012.10	CA	30	3.7	0.36	24	10.9	7/8/2019
ER016.00	CA	30	4.5	0.44	35	17.1	7/8/2019
ER043.00	CA	30	3.6	0.44	62	13.4	7/8/2019
ER045.00	CA	30	3.8	0.47	72	15.3	8/5/2023

Adequacy of reporting and cooperation of involved persons-

On-going cooperation between marine patrol enforcement activity (Division II, Lamoine) and water testing (Water Quality Laboratory, Lamoine) has provided an adequate system of monitoring and prohibition of harvesting during the closed period.

Compliance with approved growing area criteria-

All stations within the Conditional Area meet approved standards during the open status based on geomean and p90 values and lack of other pollution threats.

Field inspection of critical pollution sources-

Analysis of the samples from the ER CA1 WWTP CA shows geomean and P90 scores that meet approved standards. This calculation is for the most recent thirty samples during the open period.

Analysis-recommendations-

This area continues to meet the Conditionally Approved classification criteria based on water quality scores listed above. No recommendations for changes to the current management plan or conditional area classification open status are needed now.

Recommendation for Future Work

Water quality station ER 12 meets approved standards and survey work concluded that there is no longer an issue with the septic breakout. This area ER P3 will be recommended for an upgrade to Conditionally Approved. Based on the deactivation of the Downeast Correctional Institute WWTP discharge the ER P3 area will be surveyed in 2022 to determine if it may be upgraded to approved in 2022. No stations in growing area ER required a downgrade due to the end of the year 2021 P90 scores. The addendums for each of these proposed upgrades can be found in the DMR central files.

Table 9. Count table of samples collected in growing area ER during the 2021 season.

Station	Class	Closed	Open	Samples needed	Total	Comments
ER004.00	A		7	6	7	
ER005.00	A		7	6	7	
ER008.00	CA		12	12	12	
ER009.00	CA	6	5	12	11	reclass to CA
ER012.00	P	10		6	10	
ER012.10	CA		12	12	12	
ER016.00	CA		12	12	12	
ER038.00	P	7		6	7	
ER039.00	P	7		6	7	
ER043.00	CA		12	12	12	
ER045.00	CA		12	12	12	
ER046.00	A	3	7	6	10	flood

Station	Class	Closed	Open	Samples needed	Total	Comments
ER047.00	A		7	6	7	
ER047.50	A		7	6	7	
ER050.00	A		7	6	7	

References

National Shellfish Sanitation Program: Guide for the Control of Molluscan Shellfish, 2017 Revision;

Tide and Wind data, GOMOSS Internet site, West Penobscot Bay Buoy, 2001-2003.

Climatic and hydrographic information, US Coast Guard Coastal Pilot, 2005 edition

U.S. Food and Drug Administration (2001). Applied Concepts in Sanitation Surveys of Shellfish Growing Areas: Course #FD2042 (Training Manual), Volumes I and II.

Town information, 2007-2008 Maine Municipal Directory, Maine Municipal Association, Augusta, Maine 04330

Licensed discharge information, Maine Department of Environmental Protection, Augusta, Maine

Data Layers, Maine Office of GIS, Augusta, Maine

Rainfall data, National Weather Service, Caribou, Maine

Maine Combined Sewer Overflow 2016 Status Report, Maine Department of Environmental Protection, April 2017

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), Approved (A), and Investigative (X).
Count = the number of samples evaluated for classification must be a minimum of 30.
GM = 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, the Approved standard is 31, Restricted standard is 163
Min_Date = oldest date sampled included in the calculations.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