GROWING AREA EB

Cape Rosier, Brooksville to Naskeag Point, Brooklin

Annual Report for 2009

Final Report Date: June 24, 2010

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APPROVAL

Division Director:

_____ _____ Date: _____
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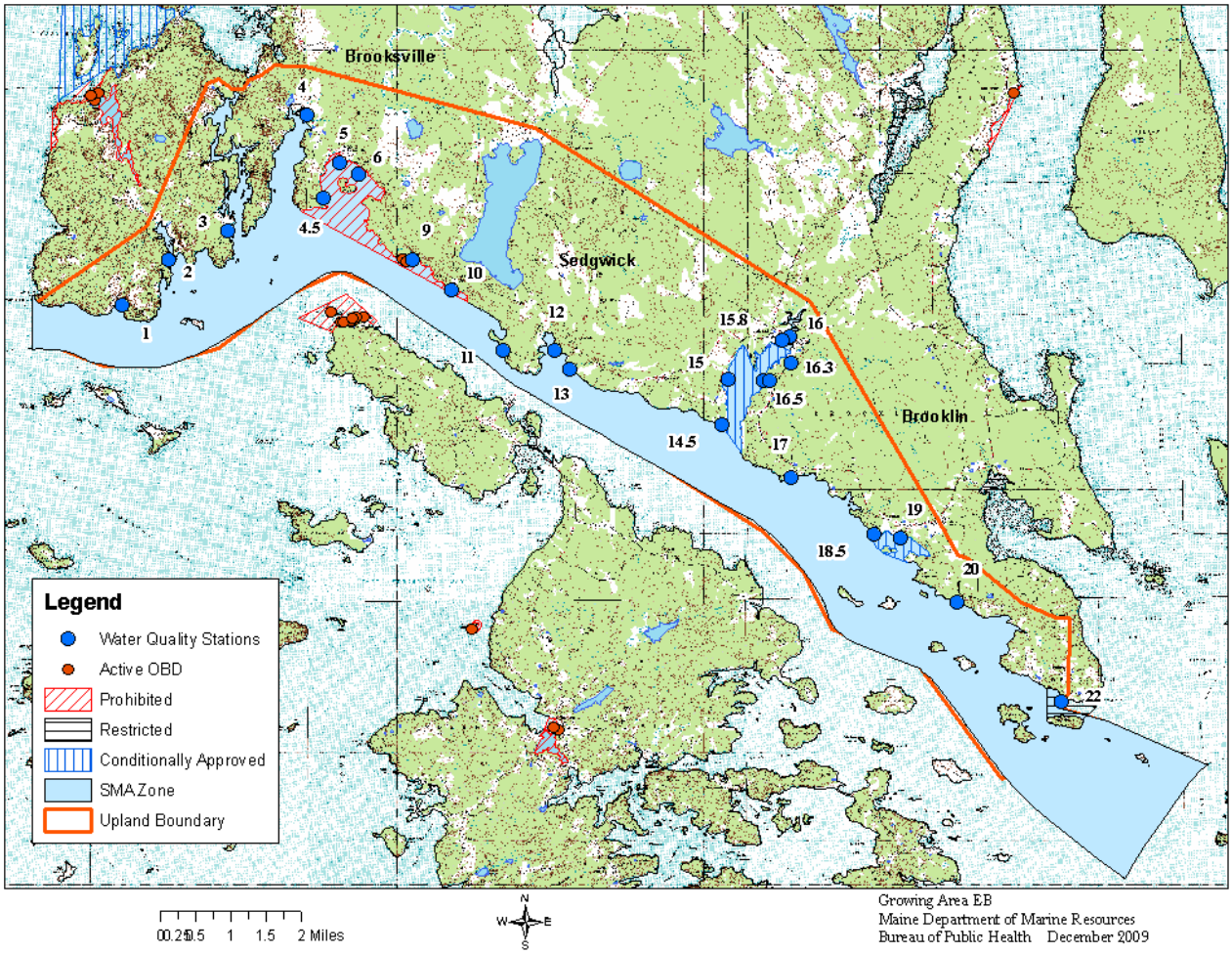


Executive Summary

This is an annual report for growing area EB written in compliance with the requirements of the 2007 Model Ordinance and the National Shellfish Sanitation Program (NSSP). The next triennial report is due in 2011. The next sanitary survey report is due in 2019.

Area EB has one prohibited area (boat moorings and licensed overboard discharges), two conditionally approved areas (seasonal boats) and two restricted areas (poor water quality). At the end of the review year, all approved and restricted water quality sampling stations had P90 scores that met their NSSP standard. All conditionally approved sampling stations had P90 scores that met their NSSP standards and management plan criteria during their open status. All active stations were sampled six times following the systematic random sampling (SRS) schedule and conditional stations were sampled the required number of times while in the open status. No water sample stations were added, removed, activated or deactivated during this review period. Two stations on the boundary of Pollution Area 37 were reclassified from prohibited to approved to correct a classification error. Sample station EB 4 is at risk of being reclassified downward. Station EB 22 water quality has shown improvement after a pollution source was remediated by the Town of Brooklin. As a result, an upward classification change for Naskeag Harbor (Brooklin) is proposed. Local area surveys were completed near Orcutt Harbor (Brooksville) due to potential impacts from animal pastures, Eaton Brook (Brooklin) due to concerns about a local in-ground septic system and Naskeag Point (Brooklin) due to dogs on the beach.

Growing Area Description

The growing area is located in the southwestern section of Hancock County. Figure 1 shows the growing area with active water sampling sites and current shellfish classification areas. The shoreline included in this report extends from Head of Cape Rosier, Brooksville to Naskeag Point, Brooklin. The growing area encompasses 44.4 square miles and includes the near sub-tidal waters, inter-tidal flats and a zone of shore property that extends inland to a defined upland boundary. The upland land cover is predominately deciduous, with some evergreens, and a wetland forest with minimal development. Blueberry and grass fields are scattered through Brooksville and Sedgwick. Fresh water influence along these shores is predominately from numerous small streams throughout the growing area. There are no large rivers or lakes impacting the area. The villages of Brooksville (population 940), Sedgwick (population 1,119) and Brooklin (population 864) have the largest population concentrations (2007-2008 Maine Municipal Directory). Many homes are seasonal (June-September). Development along these shores is spotty with clusters of homes separated by undeveloped land. Agricultural operations are small with less than 10 animals per operation. Seasonal boat mooring areas are occupied in summer months only. Two licensed overboard discharges are adjacent to Buck Harbor, Brooksville (DEP2748, DEP6435). Review of DEP inspection reports showed both complied with their licenses during this review period. There are no wastewater treatment facilities in the area. There are no aquaculture leases or wet storage activities in this growing area. Areas most likely to contain significant populations of soft and hard shell clams and mussels include: Weir Cove, Orcutt Harbor, Bucks Harbor, Benjamin River, Center Harbor and Naskeag Point.

Current Classification(s)

Shellfish growing area EB currently has areas classified as:

Approved
13 stations (EB1.0, 2.0, 3.0, 4.0, 4.5, 10.0, 11.0, 12.0, 13.0, 14.5, 17.0, 18.5, 20.0)

Conditionally Approved
Area No. 39A (part B), Benjamin River, Sedgwick-Brooklin; (May 29, 2009); 3 stations, (EB 15, 15, 16.5); marina conditional area (seasonal boats with heads)
Area No. 39A (part C), Center Harbor, Brooklin; (May 29, 2009); 1 station, (EB 19); marina conditional area (seasonal boats with heads)

Restricted
Area No. 39A (part A1), Benjamin River, Sedgwick-Brooklin; (May 29, 2009); 1 station, (EB 16)
Area No. 39A (part A2), Naskeag Harbor, Brooklin; (May 29, 2009); 2 stations, (EB 22, EF1)

Prohibited
Area No. 37, Condon Point, Brooksville to The Herricks, Brooksville; (September 10, 1996); 2 stations, (EB 6, 9)

Detailed text and maps of these closures can be accessed at the web site:

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

Activity during Review Period

In May 2009 it was noted that the mooring field in Center Harbor had been enlarged and the conditionally approved area no long enclosed the moored boats. The conditional area was enlarged on May 29th to encompass the dilution zone for the additional boats.

Current Management Plans for Conditional Areas

Conditionally Approved- Area No. 39A (part B), Benjamin River (Sedgwick-Brooklin); conditional on boat occupancy, 3 stations (EB 15, 15.8 16.5), open November 1 through April 30.

Conditionally Approved- Area No. 39A (part C), Center Harbor (Brooklin); conditional on boat occupancy, 1 station (EB 19), open November 1 through April 30.

Both management plans were updated in 2009 and can be found in DMR's central files.

Current Annual Review of Management Plans

Areas No. 39A (parts A and B) are marina conditionally approved areas requiring three (3) samples during the open status but is sampled monthly to increase the number of data points for all seasons. Samples were collected 6 times from each of the water quality monitoring sites during the open status

(January 5, February 2, March 9, April 6, November 2, December 1). The marina areas in the Benjamin River and Center Harbor were inspected on April 6, 2009, previous to the harvest area closure date of April 30 and confirmed that there were less than 10 boats. Inspections were completed on October 26, 2009, previous to the harvest area opening date of November 1, to confirm that there were less than 10 boats with live-aboard crews. The mooring areas annually have peak occupancy periods of Memorial Day thru Labor Day. The harbor masters confirmed the lack of live-aboards most of the time, with random transient boaters using moorings in the peak cruising months. It is unlikely boats are occupied after September or before May. Both areas met closing and opening criteria. Water quality meets the standard for approved classification during the open status. Compliance inspections are done during scheduled sampling of the conditional areas during their open and closed status. In May, 2009 it was noted that the mooring field in Center Harbor had been enlarged and the conditionally approved area no longer enclosed the moored boats. The area was enlarged on May 29th. More detailed annual reviews are provided in Appendices A and B.

Water Quality Review and Discussion

Table 1 lists all active approved restricted and prohibited stations in Growing Area EB, with their respective Geomean and P90 calculations for 2009. Please refer to Appendix C for a key to interpreting the headers on the columns of Table 1. The approved and restricted standards for each station are also displayed in Table 1. These standards will fluctuate yearly as a result of the DMR transition from a most probable number (MPN) fecal coliform test method to a membrane filtration (MF) method and are dependent on the number of sample analyzed by MPN verses MF. The total number of data points used in the calculations is displayed in the Count column and includes both MPN and MF values. The number of data points analyzed by MF is displayed in the MFCNT column. This fluctuating standard will cease when all 30 data points have been analyzed by the MF method. A more detailed explanation of this transition can be found in DMR central files.

All approved and restricted stations met their respective NSSP classification during the 2009 review year. An explanation for each of the stations hi-lighted gray in Table1 is listed below.

1. Stations EB 4.5 and EB 10, on the margins of Pollution Area No. 37, were reclassified from prohibited to approved due to a classification error.

2. Stations EB 6 and EB 9 meet approved classification standards but are near to known point pollution sources.

3. Station EB 22, which is currently classified as restricted, now meets the approved standard. A recommendation for an upward classification for this station is presented later in this report.

Table 1. Geomean and P90 Scores, Growing Area EB

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std
EB001.00	A	30	21	3.1	0.36	43	9.4	35	195
EB002.00	A	30	20	3.2	0.39	150	10.5	36	199
EB003.00	A	30	20	3.7	0.45	100	14.3	36	199
EB004.00	A	30	20	4.8	0.62	560	30.2	36	199
EB004.50	A	30	20	2.4	0.18	15	4.2	36	199
EB006.00	P	30	20	2.9	0.33	43	7.9	36	199
EB009.00	P	30	20	3.7	0.53	118	18	36	199

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std
EB010.00	A	30	20	3.3	0.38	43	10.2	36	199
EB011.00	A	30	20	2.7	0.24	15	5.6	36	199
EB012.00	A	30	20	3.2	0.36	42	9.4	36	199
EB013.00	A	30	21	4.1	0.51	240	18.6	35	195
EB014.50	A	30	20	3	0.37	81	9.2	36	199
EB016.00	R	30	30	6.1	0.59	106	35.4	31	163
EB017.00	A	30	20	2.9	0.36	43	8.6	36	199
EB018.50	A	30	20	3	0.37	62	8.9	36	199
EB020.00	A	30	21	2.3	0.11	4	3.2	35	195
EB022.00	R	30	30	2.8	0.5	340	12.6	31	163

Table 2 lists all conditionally approved stations in the Benjamin River and Center Harbor marina conditionally approved areas with their respective Geomean and P90 calculations for 2009. Data for conditionally approved stations reflects only the open status. All stations met the approved standard during open status. Stations EB15.8 and EB 16.50 are new stations established to defend the line between the restricted area and conditionally approved at the head of the Benjamin River (Area No. 39A (part A1)).

Table 2. Benjamin River and Center Harbor Conditional Area, Open Status

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std
EB015.00	CA	30	24	3.7	0.64	1160	25.3	33	184
EB015.80	new	14	14	2.8	0.65	558	20.6	31	163
EB016.50	new	13	13	3	0.42	52	10.6	31	163
EB019.00	CA	30	23	3.3	0.43	74	11.8	34	187

All approved, restricted and prohibited stations that were active at the beginning of 2009 were sampled at least 6 times following the systematic random sampling (SRS) schedule (Table 3 and Appendix D). At stations EB 16 and EB 22, extra samples were collected to more closely monitor two restricted areas for possible reclassification. Both stations were sampled routinely in the monthly conditional area sample run. The Benjamin River and Center Harbor conditionally approved stations were sampled 6 times in the open status with the exception of EB 15.8, which was collected 7 times because of a make-up sample done during the open status of the conditional area.

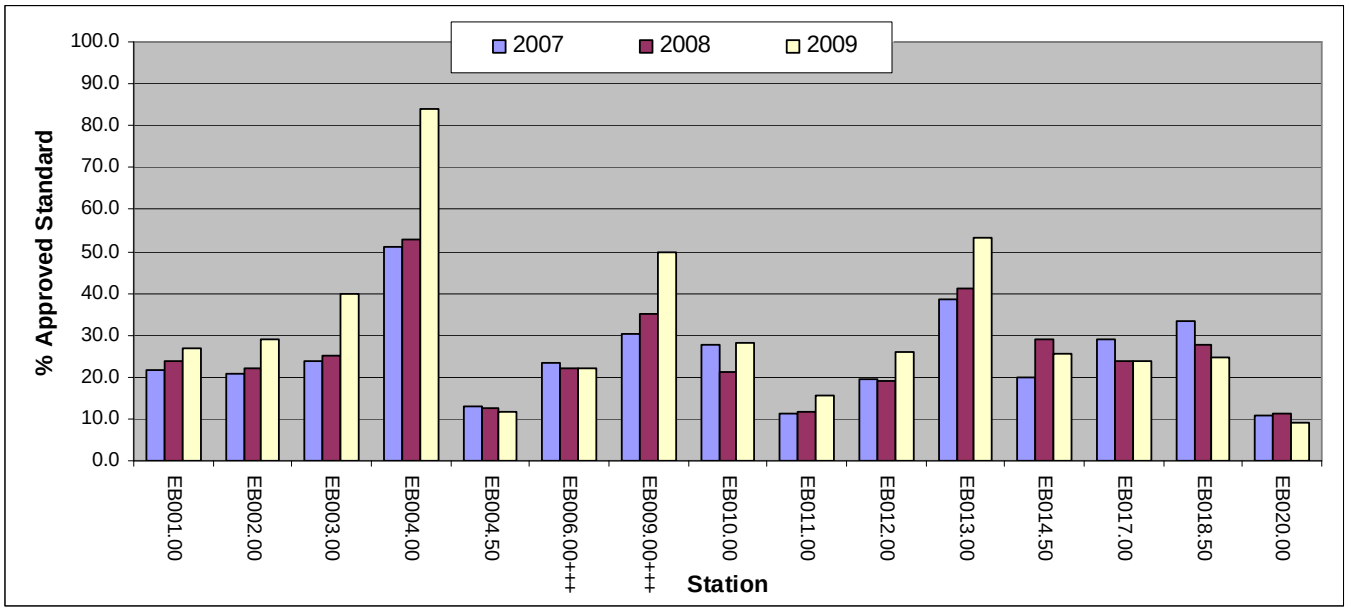
Table 3. Area EB Samples Collected in 2009

Station	Class	Extra	Random		Grand Total	Comments
		Open	Closed	Open		
EB001.00	A			6	6	
EB002.00	A			6	6	
EB003.00	A			6	6	
EB004.00	A			6	6	
EB004.50	A			6	6	
EB006.00	P		6		6	
EB009.00	P		6		6	
EB010.00	A			5	5	Classification error

Station	Class	Extra	Random		Grand Total	Comments
		Open	Closed	Open		
	P		1		1	corrected
EB011.00	A			6	6	
EB012.00	A			6	6	
EB013.00	A			6	6	
EB014.50	A			6	6	
EB015.00	CA		5	7	12	
EB015.80	CA		4	8	12	Make-up done during open status
EB016.00	R	1		12	13	Sampled during CA1 conditional run
EB016.50	CA		5	7	12	
EB017.00	A			6	6	
EB018.50	A			6	6	
EB019.00	CA		5	7	12	
EB020.00	A			7	7	
EB022.00	R	1		11	12	Sampled during CA1 conditional run

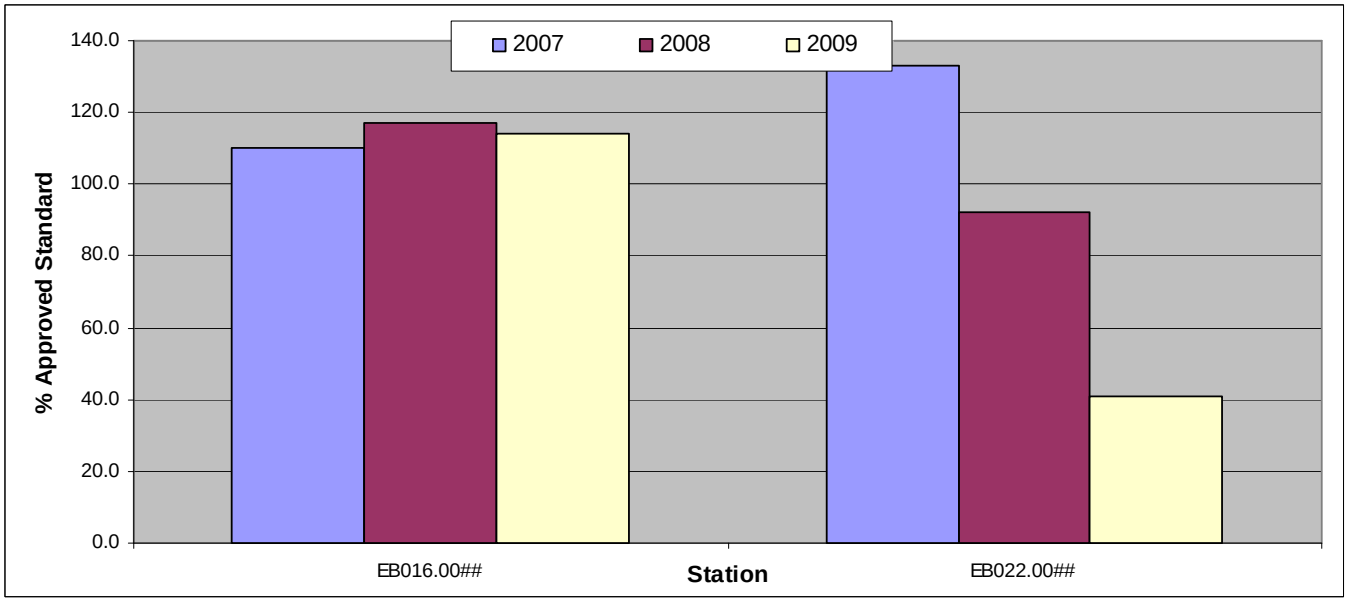
Figure 2, 3 and 4 are trend graphs of the approved and prohibited, restricted and conditionally approved sample stations in the growing area. Station P90 scores are expressed as percents of the approved standard. Conditionally approved values are during the open status only. Overall, 2009 water quality has improved or remained level compared with 2007-2008 percentages. Exceptions have been increases in percentages, indicating declining water quality over the previous two years, at approved classified stations EB 3, EB 4 and EB 13 and conditionally approved stations EB 15, 15.8, 16.5 and 19. Station EB 4 has a new upland horse pasture that may be a pollution source with runoff from rain or snowmelt. EB 3 and EB 13 had no identified pollution sources at survey. Station EB 15 is a parking area and boat launch/wharf area popular for dog walking. The site is signed informing people of the threat to water quality from dog waste; however there appears to still be a problem. Reasons for the sharp increase of the percentages in the remainder of the Benjamin River and Center Harbor for 2009 have not been determined. These stations will be more closely monitored in 2010. In 2007, EB 16 was classified conditionally approved and failed classification criteria in the open status. It was reclassified restricted. Its percentage has remained constant at >100% of the approved standard for 2007-2009 with a current P90 of 35.4 and restricted standard of 163. Station EB 22 water quality has improved after signage by the Town of Brooklin warned of a threat to water quality from domestic dog feces pollution on the shore. Station EB 22 now has a P90 score of 12.6, with an approved standard of 31. A reclassification proposal of EB 22 is presented later in this report. Stations that are approved or conditionally approved in the open status over 90% are at risk of downward classification and require further assessment. No sample stations in the growing area are at risk at this time, although EB 4 has made a rapid percentage rise from 50% in 2007-2008 to 83.9% in 2009 and may be at risk of downward classification in the future. Closure Area 37, Condon Point to “The Herricks” (Brooksville) is a prohibited area that meets approved standards at EB 6 and EB 9 but can not be reclassified approved because of DEP licensed overboard point source discharges No. 2478 and 6435 nearby.

Figure 2. Area EB P90 Score Trends for Approved and Prohibited Stations (expressed as the percent of the approved standard), 2007-2009



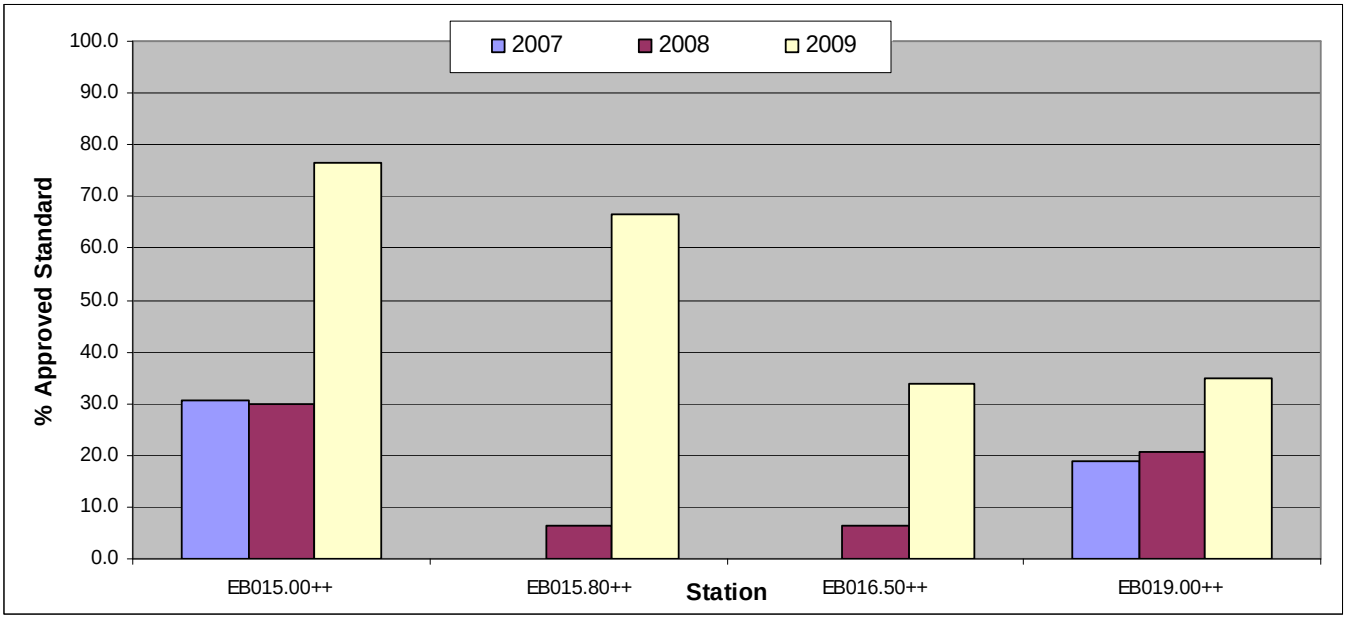
+++ = Prohibited stations

Figure 3. Area EB P90 Score Trends for Restricted Stations (expressed as the percent of the approved standard), 2007-2009



= Restricted stations

Figure 4. Area EB P90 Score Trends for Conditionally Approved Stations (expressed as the percent of the approved standard), 2007-2009



++ = Conditional stations

Recommendations for Upward Classification

The recommendation is to reclassify Area No. 39A (part A2), Naskeag Harbor (Brooklin) from restricted to approved due to water quality meeting approved criteria, on-going remediation of non-point pollution and a history of improved sample scores in 2008 and 2009 at station EB 22. Figure 3 shows a marked improvement in water quality over the past two review years. There has been a history of local individuals walking their dogs several times a day on the beach and in the parking lot at Naskeag Point. Town officials, dock-launch ramp users and marine patrol officers had reported dog feces in the area. Failing water quality resulted in a reclassification of the area from approved to restricted on September 26, 2007. Complaints, loss of shell fishing resources and degraded water quality brought the problem to the attention of the town and signs warning of domestic pet pollution on the shore resulted in a dog control ordinance in 2008. The marine patrol officer assigned to the area states that dog waste problem has diminished. The last sanitary survey was done in 2008 and no other pollution problems were identified at that time.

Table 4 shows the 30 most recent datapoints collected at station EB 22. Cumulative rainfall amounts within 72 hours are noted; samples that exceeded the geometric mean standard of 14 are highlighted in yellow. Approximately 70% (21/30) of the samples were taken after a snow, runoff or precipitation event. Samples taken on July 31, 2007, September 25, 2007 and September 2, 2008 had elevated fecal coliform scores and no adversity or rainfall was associated with the samples. Samples collected after rainfall had low bacterial scores. Table 5 compares geometric mean and P90 scores for station EB 22, calculated from three different datasets (last 30 samples, using only dry weather data and using data collected after 0.5 inches of cumulative precipitation). Both the geometric mean and the P90 score met the approved classification standard for each of the three datasets. The tides are predominately evenly divided between ebbing (9), flooding (5) and high (7) stages with the remainder being low (1) tide. The

three elevated fecal samples were at high tide stages and during July and September; however other high tide and July and September samples were negative for bacteria. Water temperatures range from 0-20^{o}C. No specific rainfall amounts, season, wind, salinity or water temperature had consistently elevated fecal scores impacting water quality. Figure 5 shows the proposed classification change.

Table 4. Data for EB 22, Naskeag Point

Station	Class	Date	Tide	Wind	Temp^{0}C	Salinity	Rainfall inch / 72 hrs	Col Score
EB022.00	A	1/30/07	E	SW	0	30		<2
EB022.00	A	4/10/07	F	NW	2	30		<2
EB022.00	A	5/30/07	E	N	10	31	0.04	<2
EB022.00	A	7/31/07	H	NW	20	32		340
EB022.00	R	9/25/07	HE	CL	12	32		25
EB022.00	R	11/15/07	HF	S	8	32	0.16	<2
EB022.00	R	11/27/07	E	NW	5	30	1.19	14
EB022.00	R	2/5/08	E	S	0	30	0.75	<2
EB022.00	R	3/4/08	E	S	2	31		<2
EB022.00	R	4/1/08	E	S	4	31	0.23	<2
EB022.00	R	5/6/08	F	CL	9	30	0.81	<2
EB022.00	R	6/2/08	E	W	8	30	1.34	<2
EB022.00	R	6/24/08	H	SW	11	31	0.65	<2
EB022.00	R	7/1/08	E	SW	13	31	0.33	<2
EB022.00	R	8/5/08	F	NW	18	30	0.53	<2
EB022.00	R	9/2/08	H	NE	13	30		25
EB022.00	R	11/4/08	F	S	7	30		<2
EB022.00	R	12/1/08	H	SW	4	31	0.83	<2
EB022.00	R	1/5/09	L	CL	3	30		<2
EB022.00	R	2/2/09	F	CL	0	31		<2
EB022.00	R	3/9/09	HF	N	0	30	0.49	<2
EB022.00	R	4/6/09	E	CL	4	30	1.58	<2
EB022.00	R	5/4/09	E	SW	9	30	0.05	<2
EB022.00	R	6/1/09	E	W	10	30	1.07	<2
EB022.00	R	7/8/09	E	NE	8	30	0.68	<2
EB022.00	R	8/3/09	HF	CL	20	30	0.55	2
EB022.00	R	10/5/09	F	NW	12	31	1.90	<2
EB022.00	R	11/2/09	H	NW	8	30	0.15	<2
EB022.00	R	11/23/09	HE	E	4	30	0.35	<2
EB022.00	R	12/1/09	E	W	3	31	0.20	<2

Table 5. All Samples, Dry Weather and Wet Weather P90 Scores for Station EB 22

Station	Class	Count	MFCnt	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
All samples										
EB022.00	R	30	30	2.8	0.5	340	12.6	31	163	1/30/2007
No rain within previous 3 days										
EB022.00	R	30	11	4.4	0.6	460	26.5	41	239	10/24/2000

Station	Class	Count	MFCnt	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
0.5-2.0 inches rain in 3 days										
EB022.00	R	13	13	2.3	0.24	14	4.9	31	163	11/27/2007

Figure 5. Naskeag Harbor Proposed Classification Change

Shoreline Survey Activity

A drive through survey was conducted during routine sampling runs. The issues listed below were noted and addressed immediately or at a later date.

May- During routine sampling, it was noted that the mooring field in Center Harbor had increased in size and required an enlargement of the conditional area. The enlargement of the conditionally approved area took place on May 29, 2009 to provide an adequate dilution zone for the boats present during the closed status. Details of this change are discussed in the current management of the conditional area in the central files.

Orcutt Harbor was a complaint of animal pastures near the shore. No problem was identified or any direct impact on station EB 4. Intermittently elevated routine testing scores keep the P90 value elevated.

Eaton Brook was sampled on May 27, June 25 and September 22 in response to the question of any impact from a nearby questionable septic system. The house is seasonally occupied and no problem was identified. All the stream samples taken were ≤ 13 FC/100 ml.

Ongoing--Naskeag Point has a history of dog waste control on the beach that has required monitoring. The town of Brooklin has signed the area and water quality has improved and now meets approved criteria.

Conditionally approved areas in the Benjamin River and Center Harbor were inspected on April 6 before their closing dates and October 26 before their opening dates during this review period.

Aquaculture/Wet Storage Activity

There are no aquaculture leases or wet storage activity in the growing area.

Classification Changes

A recommendation is to reclassify Area No. 39A (part A2), Naskeag Harbor (Brooklin) from restricted to approved is proposed in this report.

Summary

Water quality in the growing area supports the current classification under the NSSP criteria. All approved or restricted water quality sampling stations have P90 values less than their classification standard. All conditionally approved sampling stations had P90 values that met their NSSP standards and management plan criteria during their open status. All active stations were sampled 6 times following the systematic random sampling (SRS) schedule and conditional stations were sampled the required number of times while in the open status. The sampling schedule will remain the same in 2010. Overall, 2009 water quality in Area EB has remained constant compared with 2008. Plans for 2010 include additional surveying and sampling adjacent to EB 4 and within the Benjamin River. This report includes a recommendation to reclassify Naskeag Point upward from restricted to approved after the area was signed to limit dog walking and the water quality met approved classification standards.

Recommendation for Future Work

1. Sample EB 4, 15.8, 16, 16.5, 22 after rainfall to increase database under rainfall conditions.
2. Sample streams in area for 2011 triennial report.

References

Maine Department of Environmental Protection Licensed Overboard Discharge data base.

Appendix A. Annual Review of Conditional Area Management Plan Area No. 39-A (Part C)

Area No. 39-A (Part C), Center Harbor (Brooklin)

Scope

A portion of Growing Area EB, Center Harbor, Brooklin, is conditionally approved based on the presence or absence of 10 or more boats with heads, which may discharge into Center Harbor. The area is monitored by station EB 19. The area was classified conditionally approved in December 2004. DMR evaluated the data, made observations of the moorings, interviewed the harbormaster in regard to usage in month/year, and made the assessment that fewer than 10 boats are in the harbor from November 1 through April 30. Annually, the mooring area has a peak occupancy period from Memorial Day thru Labor Day. The harbor master confirmed the lack of live-aboards with the exception of transient boaters using moorings overnight in the peak cruising months. Few boats are occupied after October or before May. The water quality met approved standards from November 1 through April 30.

In May, 2009 it was noted that the mooring field in Center Harbor had been enlarged and the conditionally approved area no long enclosed the moored boats. The conditional area was enlarged on May 29, 2009 to encompass the boats and to provide an adequate dilution zone for the number of boats present during the closed status.

Compliance with management plan

In 2009, the seasonal conditional area closed on May 1 and reopened on November 1. The area was visited by the DMR on October 26, 2009 and there were fewer than 10 boats with heads in the area. It was also visited on April 6, 2009 to confirm there were fewer than 10 boats with heads in the water. The seasonal closure is enforced by DMR Marine Patrol.

Adequacy of reporting and cooperation of involved persons

This management plan requires seasonal checks on boat activity in the harbor. These checks are performed prior to the reopening of the area and at the time of closure to ensure the proper open shellfish season.

Compliance with Approved growing area criteria

All stations within the conditional area meet conditionally approved standards during the open status (Table 1).

Table 1. Center Harbor Marina Area, Open Status

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std
EB019.00	CA	30	23	3.3	0.43	74	11.8	34	187

Field inspection of critical pollution sources

The potential for pollution in Center Harbor comes from boats with heads that are moored in the harbor. Visual observations are made of the area at the end of October and prior to the closure on April 30 to ensure that there are fewer than 10 boats with heads in the area.

Water sampling compliance history

Due to the conditional management plan being based on the absence of pollution from marinas/moorings for certain times of the year, the NSSP does not require monthly water samples when the growing area is in the open status of its conditional classification provided that at least three of the water samples collected to satisfy the bacteriological standard for the open status are collected when the growing area is in the open status. The station that monitors Center Harbor (EB 19) was collected monthly in the open status for a total of six in 2009 (Table 2).

Table 2. Stations EB 19, 2009 Data

Station	Date	Temp_C	Strategy	Adversity	Class	Open_Closed	Salinity	Col Score
EB019.00	1/5/2009	3	R		CA	O	30	<2
EB019.00	2/2/2009	0	R		CA	O	30	<2
EB019.00	3/9/2009	0	R		CA	O	30	<2
EB019.00	4/6/2009	4	R	P	CA	O	29	2
EB019.00	11/2/2009	8	R	O	CA	O	30	<2
EB019.00	12/1/2009	4	R	P	CA	O	31	2

Summary

It is the DMR policy to observe marina areas before closing and reopening to ensure compliance with the management plan. Center Harbor was observed at the end of October for the reopening on November 1. Fewer than 10 boats with heads were in the water. This marina area continues to meet the conditionally approved classification criteria based on boating activity. The open period start date (11/1) and closure date (4/30) continue to be valid. The conditional area encompasses the calculated dilution zone for the moored boats. No recommendations for changes to the current management plan or conditional area classification open status are needed at this time.

Appendix B. Annual Review of Conditional Area Management Plan Area No. 39-A (Part B)

Area No. 39-A (Part B), Benjamin River (Sedgwick-Brooklin)

Scope

A portion of Growing Area EB, Benjamin River, Sedgwick-Brooklin, is conditionally approved based on the presence or absence of 10 or more boats with heads, which may discharge into the Benjamin River. The area is monitored by stations EB 15, 15.8 and 16.5. The area was classified conditionally approved in November 1993. DMR evaluated the data, made observations of the moorings, interviewed the harbormaster in regard to usage in month/year, and made the assessment that fewer than 10 boats are in the harbor from November 1 through April 30. Annually, the mooring area has a peak occupancy period from Memorial Day thru Labor Day. The harbor master confirmed the lack of live-aboards with the exception of transient boaters using moorings overnight in the peak cruising months. Few boats are occupied after October or before May. The water quality met approved standards from November 1 through April 30.

Compliance with management plan

In 2009, the seasonal conditional area closed on May 1 and reopened on November 1. The area was visited by the DMR on October 26, 2009 and there were fewer than 10 boats with heads in the area. It was also visited on April 6, 2009 to confirm there were fewer than 10 boats with heads in the water. The seasonal closure is enforced by DMR Marine Patrol.

Adequacy of reporting and cooperation of involved persons

This management plan requires seasonal checks on boat activity in the harbor. These checks are performed prior to the reopening of the area and at the time of closure to ensure the proper open shellfish season.

Compliance with Approved growing area criteria

All stations within the conditional area meet conditionally approved standards during the open status (Table 1).

Table 1. Benjamin River Marina Area, Open Status

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std
EB015.00	CA	30	24	3.7	0.64	1160	25.3	33	184
EB015.80	new	14	14	2.8	0.65	558	20.6	31	163
EB016.50	new	13	13	3	0.42	52	10.6	31	163

Field inspection of critical pollution sources

The potential for pollution in the Benjamin River comes from boats with heads that are moored in the harbor. Visual observations are made of the area at the end of October and prior to the closure on April 30 to ensure that there are fewer than 10 boats with heads in the area.

Water sampling compliance history

Due to the conditional management plan being based on the absence of pollution from marinas/moorings for certain times of the year, the NSSP does not require monthly water samples when the growing area is in the open status of its conditional classification provided that at least three of the water samples collected to satisfy the bacteriological standard for the open status are collected when the growing area is in the open status. The stations that monitor the Benjamin River (EB 15, 15.8 and 16.5) were collected monthly in the open status for a total of six for EB 15 and 16.5 and seven for EB 15.8 in 2009 (Table 2).

Table 2. Stations EB 15, 15.8 and 16.5, 2009 Data

Station	Date	Temp_C	Strategy	Adversity	Class	Open_Closed	Salinity	Col Score
EB015.00	1/5/2009	3	R		CA	O	30	<2
EB015.00	2/2/2009	0	R		CA	O	30	<2
EB015.00	3/9/2009	0	R		CA	O	29	<2
EB015.00	4/6/2009	4	R	P	CA	O	18	<2
EB015.00	11/2/2009	8	R	O	CA	O	30	1160
EB015.00	12/1/2009	4	R	P	CA	O	31	2
EB015.80	2/2/2009	0	R		CA	O	28	<2
EB015.80	2/25/2009	0	R		CA	O	30	<2
EB015.80	3/9/2009	0	R		CA	O	30	<2
EB015.80	4/6/2009	4	R	P	CA	O	18	<2
EB015.80	11/2/2009	8	R	O	CA	O	30	558
EB015.80	11/23/2009	4	R	O	CA	O	30	<2
EB015.80	12/1/2009	4	R	P	CA	O	31	<2
EB016.50	1/5/2009	2	R		CA	O	22	2
EB016.50	2/2/2009	0	R		CA	O	12	7.3
EB016.50	3/9/2009	0	R		CA	O	28	2
EB016.50	4/6/2009	4	R	P	CA	O	24	<2
EB016.50	11/2/2009	9	R	O	CA	O	30	<2
EB016.50	12/1/2009	3	R	P	CA	O	27	6

Summary

It is the DMR policy to observe marina areas before closing and reopening to ensure compliance with the management plan. The Benjamin River was observed at the end of October for the reopening on November 1. Fewer than 10 boats with heads were in the water. This marina area continues to meet the conditionally approved classification criteria based on boating activity. The open period start date (11/1) and closure date (4/30) continue to be valid. The conditional area encompasses the calculated dilution zone for the moored boats. No recommendations for changes to the current management plan or conditional area classification open status are needed at this time.

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.

Appendix D. Area EB 2009 Tabulated Data

Station	Date	Strategy	Open Closed	Class	Adversity	Temp ^{0}C	Salinity ppt	Tide	Wind	Col Score
EB001.00	3/24/2009	R	O	A		2	31	H	N	<2
	5/12/2009	R	O	A		10	28	F	S	<2
	7/8/2009	R	O	A	P	8	25	HF	CL	8
	8/11/2009	R	O	A	P	15	26	F	NW	<2
	9/22/2009	R	O	A		11	32	F	S	<2
	11/17/2009	R	O	A		5	31	H	CL	<2
EB002.00	3/24/2009	R	O	A		2	31	H	N	<2
	5/12/2009	R	O	A		10	28	F	S	<2
	7/8/2009	R	O	A	P	8	25	HF	CL	29
	8/11/2009	R	O	A	P	15	28	F	NW	2
	9/22/2009	R	O	A		11	32	F	S	2
	11/17/2009	R	O	A		5	31	H	N	<2
EB003.00	3/24/2009	R	O	A		2	30	H	N	<2
	5/12/2009	R	O	A		10	28	F	S	<2
	7/8/2009	R	O	A	P	8	22	HF	CL	100
	8/11/2009	R	O	A	P	15	28	F	NW	<2
	9/22/2009	R	O	A		10	31	F	SE	<2
	11/17/2009	R	O	A		6	30	H	N	<2
EB004.00	3/24/2009	R	O	A		2	30	H	N	<2
	5/12/2009	R	O	A		10	28	F	S	<2
	7/8/2009	R	O	A	P	9	26	HF	SE	560
	8/11/2009	R	O	A	P	16	28	F	NW	<2
	9/22/2009	R	O	A		11	31	F	S	<2
	11/17/2009	R	O	A		6	31	HE	N	<2
EB004.50	5/6/2009	R	O	A	P	8	27	E	NE	<2
	5/12/2009	R	O	A		10	27	F	S	<2
	7/8/2009	R	O	A	P	9	26	HF	SE	2
	8/11/2009	R	O	A	P	15	28	F	NW	<2
	9/22/2009	R	O	A		11	32	F	SE	<2
	11/17/2009	R	O	A		5	31	HE	N	<2
EB006.00	3/24/2009	R	C	P		2	30	H	N	<2
	5/12/2009	R	C	P		9	28	F	S	<2
	7/8/2009	R	C	P	P	9	26	H	SE	14
	8/11/2009	R	C	P	P	15	28	F	NW	<2
	9/22/2009	R	C	P		11	31	F	S	<2
	11/17/2009	R	C	P		5	31	HE	CL	<2
EB009.00	5/6/2009	R	C	P	P	7	27	E	S	<2
	5/12/2009	R	C	P		9	28	F	S	<2
	7/8/2009	R	C	P	P	9	26	HE	SE	64
	8/11/2009	R	C	P	P	15	28	F	NW	6
	9/22/2009	R	C	P		11	32	F	S	<2
	11/17/2009	R	C	P		6	32	HE	CL	<2

Station	Date	Strategy	Open Closed	Class	Adversity	Temp ^{0}C	Salinity ppt	Tide	Wind	Col Score
EB010.00	3/24/2009	R	C	P		2	30	HE	N	<2
	5/12/2009	R	O	A		10	28	F	S	<2
	7/8/2009	R	O	A	P	7	29	HE	SE	<2
	8/11/2009	R	O	A	P	14	26	F	NW	<2
	9/22/2009	R	O	A		11	32	F	S	33
	11/17/2009	R	O	A		6	32	E	N	<2
EB011.00	3/24/2009	R	O	A		2	30	HE	N	2
	5/12/2009	R	O	A		9	27	F	S	<2
	7/8/2009	R	O	A	P	7	29	HE	CL	7.3
	8/11/2009	R	O	A	P	14	26	F	NW	12
	9/22/2009	R	O	A		12	32	HF	S	<2
	11/17/2009	R	O	A		6	31	E	W	<2
EB012.00	3/24/2009	R	O	A		1	30	E	N	<2
	5/12/2009	R	O	A		11	28	F	S	<2
	7/8/2009	R	O	A	P	9	28	E	CL	8
	8/11/2009	R	O	A	P	14	24	LF	NW	2
	9/22/2009	R	O	A		11	32	F	S	24
	11/17/2009	R	O	A		6	31	E	CL	<2
EB013.00	3/24/2009	R	O	A		1	30	E	N	<2
	5/12/2009	R	O	A		11	29	F	S	<2
	7/8/2009	R	O	A	P	8	30	E	CL	56
	8/11/2009	R	O	A	P	15	18	LF	NW	8
	9/22/2009	R	O	A		12	31	F	S	4
	11/17/2009	R	O	A		6	32	E	W	4
EB014.50	3/24/2009	R	O	A		2	30	E	N	<2
	5/12/2009	R	O	A		11	29	F	S	<2
	7/8/2009	R	O	A	P	8	28	E	CL	6
	8/11/2009	R	O	A	P	14	29	LF	NW	<2
	9/22/2009	R	O	A		12	32	F	S	<2
	11/17/2009	R	O	A		6	31	E	N	<2
EB015.00	1/5/2009	R	O	CA		3	30	L	CL	<2
	2/2/2009	R	O	CA		0	30	F	CL	<2
	3/9/2009	R	O	CA		0	29	H	N	<2
	4/6/2009	R	O	CA	P	4	18	E	CL	<2
	5/4/2009	R	C	CA		9	28	E	SW	<2
	6/1/2009	R	C	CA	P	10	30	E	W	<2
	7/8/2009	R	C	CA	P	8	28	E	CL	33
	8/3/2009	R	C	CA	P	19	27	HF	CL	13
	9/9/2009	R	C	CA		16	30	H	NW	<2
	10/5/2009	R	C	CA	P	11	30	F	NW	14
	11/2/2009	R	O	CA		8	30	H	NW	1160
	12/1/2009	R	O	CA	P	4	31	E	CL	2
EB015.80	2/2/2009	R	O	CA		0	28	F	CL	<2
	2/25/2009	R	O	CA		0	30	HE	CL	<2

Station	Date	Strategy	Open Closed	Class	Adversity	Temp ^{0}C	Salinity ppt	Tide	Wind	Col Score
	3/9/2009	R	O	CA		0	30	H	N	<2
	4/6/2009	R	O	CA	P	4	18	E	CL	<2
	5/4/2009	R	C	CA		9	25	E	SW	<2
	7/8/2009	R	C	CA	P	8	27	E	CL	58
	8/3/2009	R	C	CA	P	20	26	HF	CL	33
	9/9/2009	R	C	CA		14	30	H	NW	2
	10/5/2009	R	C	CA	P	12	26	F	NW	50
	11/2/2009	R	O	CA		8	30	H	NW	558
	11/23/2009	R	O	CA		4	30	H	E	<2
	12/1/2009	R	O	CA	P	4	31	E	CL	<2
EB016.00	1/5/2009	R	O	R		3	13	L	CL	8
	2/2/2009	R	O	R		0	12	F	CL	6
	2/25/2009	E	O	R		0	30	E	CL	<2
	3/9/2009	R	O	R		0	30	H	N	<2
	4/6/2009	R	O	R	P	4	28	E	CL	<2
	5/4/2009	R	O	R		9	26	E	SW	2
	6/1/2009	R	O	R	P	11	20	E	W	<2
	7/8/2009	R	O	R	P	9	18	E	CL	74
	8/3/2009	R	O	R	P	20	25	HF	CL	24
	9/9/2009	R	O	R		14	30	H	NW	<2
	10/5/2009	R	O	R	P	12	27	F	NW	56
	11/2/2009	R	O	R		9	30	H	NW	<2
	12/1/2009	R	O	R	P	3	30	E	CL	106
EB016.50	1/5/2009	R	O	CA		2	22	L	CL	2
	2/2/2009	R	O	CA		0	12	F	CL	7.3
	3/9/2009	R	O	CA		0	28	H	N	2
	4/6/2009	R	O	CA	P	4	24	E	CL	<2
	5/4/2009	R	C	CA		10	28	E	SW	<2
	6/1/2009	R	C	CA	P	10	20	E	W	24
	7/8/2009	R	C	CA	P	8	28	E	CL	4
	8/3/2009	R	C	CA	P	20	27	HF	CL	4
	9/9/2009	R	C	CA	W	14	30	H	NW	2
	10/5/2009	R	C	CA	P	12	29	F	NW	38
	11/2/2009	R	O	CA		9	30	H	NW	<2
	12/1/2009	R	O	CA	P	3	27	E	NW	6
EB017.00	3/24/2009	R	O	A		2	30	E	N	<2
	5/12/2009	R	O	A		11	28	HF	S	<2
	7/8/2009	R	O	A	P	8	30	E	NE	<2
	8/11/2009	R	O	A	P	15	30	LF	NW	<2
	9/22/2009	R	O	A		12	32	HF	SE	<2
	11/17/2009	R	O	A		6	32	E	W	<2
EB018.50	3/24/2009	R	O	A		2	30	E	N	<2
	5/12/2009	R	O	A		11	29	HF	S	<2
	7/8/2009	R	O	A	P	8	29	E	NE	4

Station	Date	Strategy	Open Closed	Class	Adversity	Temp ^{0}C	Salinity ppt	Tide	Wind	Col Score
	8/11/2009	R	O	A	P	15	29	LF	NW	2
	9/22/2009	R	O	A		12	32	HF	S	<2
	11/17/2009	R	O	A		6	32	E	W	2
	1/5/2009	R	O	CA		3	30	L	CL	<2
	2/2/2009	R	O	CA		0	30	F	CL	<2
	3/9/2009	R	O	CA		0	30	H	N	<2
	4/6/2009	R	O	CA	P	4	29	E	CL	2
	5/4/2009	R	C	CA		10	28	E	SW	<2
EB019.00	6/1/2009	R	C	CA	P	10	30	E	W	4
	7/8/2009	R	C	CA	P	8	29	E	E	240
	8/3/2009	R	C	CA	P	19	29	HF	CL	24
	9/9/2009	R	C	CA		12	30	H	CL	<2
	10/5/2009	R	C	CA	P	11	28	F	NW	25
	11/2/2009	R	O	CA		8	30	H	NW	<2
	12/1/2009	R	O	CA	P	4	31	E	W	2
	3/24/2009	R	O	A		2	30	E	N	<2
	5/12/2009	R	O	A		11	28	HF	S	<2
EB020.00	7/8/2009	R	O	A	P	7	30	E	CL	<2
	8/11/2009	R	O	A	P	15	29	LF	NW	2
	8/11/2009	R	O	A	P	16	30	HF	NW	4
	9/22/2009	R	O	A		12	32	HF	S	3.6
	11/17/2009	R	O	A		6	32	E	W	<2
	1/5/2009	R	O	R		3	30	L	CL	<2
	2/2/2009	R	O	R		0	31	F	CL	<2
	3/9/2009	R	O	R		0	30	HF	N	<2
	4/6/2009	R	O	R	P	4	30	E	CL	<2
	5/4/2009	R	O	R		9	30	E	SW	<2
EB022.00	6/1/2009	R	O	R	P	10	30	E	W	<2
	7/8/2009	R	O	R	P	8	30	E	NE	<2
	8/3/2009	E	O	R	P	20	30	HF	CL	2
	10/5/2009	R	O	R	P	12	31	F	NW	<2
	11/2/2009	R	O	R		8	30	H	NW	<2
	11/23/2009	R	O	R		4	30	HE	E	<2
	12/1/2009	R	O	R	P	3	31	E	W	<2