

2009-2010 ANNUAL SANITARY SURVEY REPORT

An aerial photograph of Humboldt Bay, California, showing the coastline, surrounding land, and the bay itself. The text is overlaid on the image.

SHELLFISH GROWING AREA CLASSIFICATION FOR HUMBOLDT BAY

**California Department of Public Health
Division of Drinking Water and Environmental Management
Environmental Management Branch
Environmental Health Services Section
Preharvest Shellfish Unit**

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II. INTRODUCTION

This report is the annual sanitary survey update for the commercial shellfish growing areas located within the northern-most area of Humboldt Bay known as Arcata Bay. The annual update report is required pursuant to the National Shellfish Sanitation Program (NSSP) Model Ordinance, Chapter IV (2007). The purposes of the annual survey is to reevaluate existing pollution sources, evaluate any newly identified actual or potential pollution sources, and to analyze bacteriological sampling results to determine if the current sanitary survey data and the resulting classification are correct. This annual sanitary survey update is based on the data for primary water quality stations monitored monthly under the systematic random sampling (SRS) strategy. In addition, monthly NPDES monitoring reports submitted by the Cities of Arcata and Eureka were evaluated for changes that could impact the shellfish growing areas. This annual update report covers the period from May 2009 through April 2010, and includes water quality sampling data from the preceding 36 months.

All existing certified Humboldt Bay shellfish growing areas are located in the “North Bay”, also known as “Arcata Bay”, which is the prominent northern arm of Humboldt Bay. Four commercial shellfish harvesters are certified to commercially harvest shellfish from their leases in Arcata Bay: Coast Seafoods Company (CSC), Aqua Rodeo Farms (ARF), Humboldt Bay Oyster Company (HBOC) and North Bay Shellfish Company (NBSC). All shellfish growing areas in Arcata Bay are classified as *Conditionally Approved*. Commercial shellfish production in the Arcata Bay is primarily Pacific oysters (*Crassostrea gigas*). There are 17 primary water quality-monitoring stations that are sampled monthly under the SRS strategy as detailed in the NSSP Model Ordinance, Chapter IV (2007). Mussel samples from Indian Island and the United States Coast Guard Station dock are submitted weekly by CSC to the California Department of Public Health (CDPH) Laboratory in Richmond for paralytic shellfish poisoning (PSP) toxin assay.

III. SUMMARY

A. POLLUTION SOURCES

CDPH conducted site visits during the past year to actual and potential pollution sources within the Humboldt Bay watershed and each was evaluated for its impact on water quality in Humboldt Bay. No significant changes have occurred in the meteorological characteristics for the shellfish growing areas in Arcata Bay.

A significant change in hydrology and potential pollution sources will occur in the Arcata Bay that can impact the shellfish growing areas. The City of Arcata, the California Department of Fish and Game, and the California Coastal Conservancy are in the process of restoring tidal wetland functions to 205 acres of former tidal salt/brackish marsh and freshwater wetlands adjacent to Arcata Bay at the lower end of Janes Creek on McDaniel Slough. Objectives of the McDaniel Slough Wetland Enhancement Project include the breach of the bay front levee, removal of the tide gates that restrict bay water from entering Janes Creek and relocation of the City of Arcata Waste Water Treatment Plant’s waste water discharge outfall.

A change in the original scope of the McDaniel Slough project has been proposed by the City

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of Arcata that will increase the previously described original project area by 45.5 acres. Hydrology changes that will result from this additional project include reconfiguring the western levee to create an additional 12 acres of tidal habitat, creating 10 acres of brackish habitat in an area adjacent to the existing bay-front levee by lowering the ground surface an average of 18 inches to access the muted tidal regime within the existing bay-front levee ditch and excavating a 23 acre area adjacent to the western levee to a depth of approximately 12 inches.

The cumulative impact of this project will present a significant change in hydrology and pose potential pollution sources to the bay that can impact shellfish growing areas. Of particular concern is immediate water quality impacts to the shellfish growing areas located on Sand Island which is closely located to the project site. It is not known at this time what impact the planned change in outfall location and associated prohibited area adjacent to the outfall will have on the commercial shellfish growing areas. Shellfish harvest restrictions, closures or increased bacterial sampling representing the certified growing areas may be necessary until the water quality impacts to the certified growing areas are understood.

The State Coastal Conservancy (SCC) together with the U.S. Fish and Wildlife Services and the U.S. Department of Interior-Bureau of Land Management propose to implement public access improvements to the Ma-le'l Dunes Cooperative Management Area. Installation of a kayak and canoe ramp at the Ma-le'l North parking and picnic area along the Mad River Slough was part of the initial proposal until concerns related to potential water quality impacts to the shellfish growing area in the Mad River Slough caused removal of the ramp from the project.

During the past year twenty two reported sanitary sewage overflows and three hazardous material incidents were reported to CDPH that occurred in the Humboldt Bay Watershed. Three of these incidents resulted in closures or partial closures of the shellfish growing areas. The closures were based on exceedence of the established sewage upset threshold volumes to close shellfish growing waters to harvesting activities for the City of Arcata, Eureka and Humboldt Community Services District waterways. The sewage upset thresholds are protective of public health and are included in the Management Plan for Commercial Shellfishing in Humboldt Bay. All of the shellfish growers were responsive to the closures and subsequently followed the water sampling protocol to demonstrate acceptable water quality was achieved in their respective shellfish growing areas prior to resuming harvesting activities.

All *Conditionally Approved* shellfish growing areas in Arcata Bay were closed to commercial harvesting on August 5, 2009 in response to a reported overflow of 800-900 gallons of raw sewage into the bay at Woodley Island due to a failed sewage lift station. By August 7, 2009 all commercial shellfish growing areas were open for harvesting after all water quality stations in the bay were sampled and analyzed for the presence of fecal coliforms and laboratory confirmation was received by CDPH that water quality met the criteria for a *Conditionally Approved area*.

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The second closure of *Conditionally Approved* shellfish growing areas in Arcata Bay occurred on January 1, 2010 in response to a report of a sanitary sewage overflow of 1,875 gallons that originated at the Pickwick Apartments in Arcata that impacted Gannon Slough. Most of the affected shellfish growing areas were reopened to commercial harvesting by January 7, 2010 after all water quality stations in the bay were sampled and analyzed for the presence of fecal coliforms and laboratory confirmation was received by CDPH that water quality met the criteria for a *Conditionally Approved* area. Extensive rainfall closures caused delay in reopening some growing areas until early February 2010.

Another closure occurred on March 9, 2010 after an estimated 40 gallon sanitary sewage release into Eureka Slough was reported by City of Eureka personnel. The east bay beds (Sand Island and Gunther Island) represented by WQ stations # 51,34,52,33 & 45 were closed to commercial harvesting. This closure only affected CSC growing areas. By March 11, 2010 the affected growing areas were reopened for commercial harvest after all impacted water quality stations were sampled and analyzed for the presence of fecal coliforms and laboratory confirmation was received by CDPH that water quality met the criteria for a *Conditionally Approved* area.

B. CLOSURES

CSC, HBOC, NBSC and ARF complied with all closures for the reporting year. A harvest records review was conducted by CDPH in August 2009.

C. SELF-MONITORING

Each certified grower was in compliance with the conditions of their respective self-monitoring program for monthly water quality sampling. Sanitary sewage overflows, rainfall closures, sampling errors and laboratory requests accounted for months when samples were collected on dates other than the predetermined days of the month established in the sampling plan. There are currently 17 primary water quality-monitoring stations that are sampled monthly under the systematic random sampling (SRS) strategy as specified in the NSSP Model Ordinance, Chapter IV (2007). Sampling results from the 17 primary sample sites are summarized in Table 1. The monthly SRS samples for the last 30 sampling events were used to calculate the geometric mean and the 90th percentile.

D. PARALYTIC SHELLFISH POISONING (PSP) AND DOMOIC ACID MONITORING.

CSC submitted weekly mussel samples to the CDPH Microbial Diseases Laboratory for paralytic shellfish poisoning (PSP) toxin assay.

CSC was in compliance with the required weekly submittal of shellfish samples for PSP toxin assay. The remaining growers are only required to submit samples upon request. CSC has been especially helpful in collecting plankton samples and additional mussel samples from the U. S. Coast Guard Station dock near the mouth of Humboldt Bay. These additional

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samples assisted CDPH efforts to provide early detection of potential toxic algal blooms that could lead to elevated levels of biotoxins that would impact the growing areas in Arcata Bay.

E. PROTOCOL FOR WASTEWATER UPSETS

Accidental sanitary sewage overflows from wastewater collection systems operated by the City of Arcata, the City of Eureka, or by HCSD occurs periodically and may adversely affect the water quality in shellfish growing areas. The potential for these sewage “upsets” to adversely impact shellfish growing waters is related to the estimated volume of the discharge, the location of the discharge with respect to the growing areas, and the timing of the discharge with respect to rainfall closures of the growing areas. Determination of the threshold volumes of sewage that would necessitate the closing of the shellfish growing areas was based on an initial fecal coliform concentration in raw sewage of 1×10^8 MPN/100 mL.

IV. CLASSIFICATION REEVALUATION

The fecal coliform standard for a *Conditionally Approved* area include a 90th percentile not to exceed 43 MPN and a geometric mean not to exceed 14 MPN. The past 30 samples for each primary water quality station in Humboldt Bay collected during open harvest periods under the Systematic Random Sampling System continue to meet NSSP standards for classification as *Conditionally Approved* classification (Table 1).

A *Conditionally Approved* area is one that meets the NSSP water quality standards for an *Approved* area (an area from which shellfish may be harvested for direct marketing for human consumption), except during relatively short periods of time when it does not meet the standards due to water quality impacts and is closed to harvesting. Direct marketing means the sale of shellfish harvested without undergoing purification (relaying or depuration). The factors determining closed periods must be known, predictable, and not excessively complex. The purpose of the *Conditionally Approved* classification is to provide a mechanism for the declaration of harvest closures when the growing areas do not meet the *Approved* area standards. The current fecal coliform sampling results support the rainfall closure rules established in the Management Plan for Commercial Shellfishing in Humboldt Bay, California, January 2010.

V. RECOMMENDATIONS

A. CLASSIFICATION

Continue with the *Conditionally Approved* classification of the certified shellfish growing areas as specified in the *Management Plan for Commercial Shellfishing in Humboldt Bay, California, January 2010*.

B. SELF-MONITORING PROGRAM

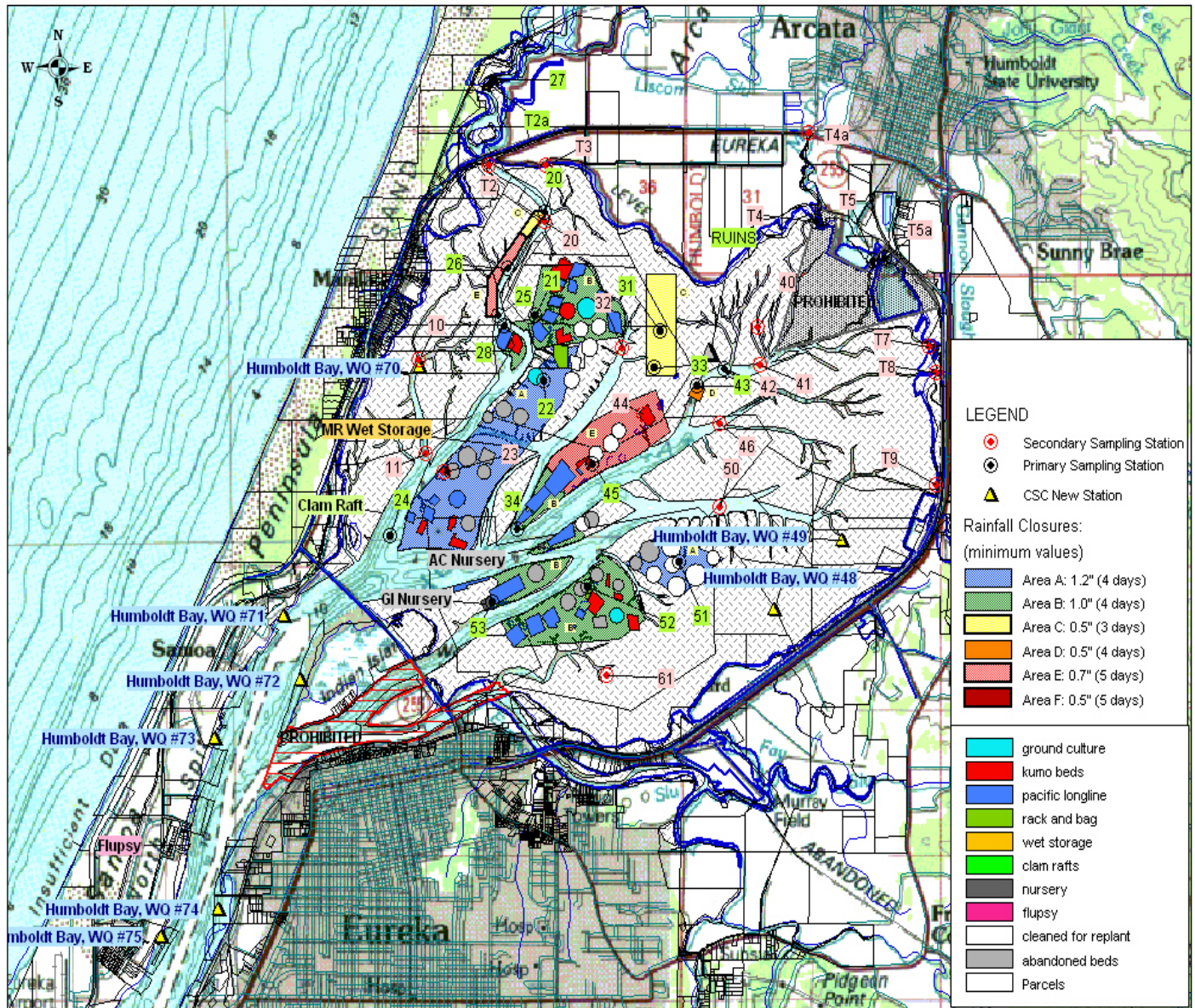
Continue with the self-monitoring program for water quality with oversight and guidance by the

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CDPH Preharvest Shellfish Unit. Table 3 indicates the sampling dates for sampling at the primary sites in 2010 and the first two months of 2011. If an area is in a “Closed” status or if the conditions are unsafe for sampling, then the sampling date shall be the earliest possible date that the area is in an “Open” status, or when conditions are safe for sampling.

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Figure 1. Arcata Bay (North Humboldt Bay), California, shellfish growing area classifications, rainfall closure designations, and closure zones.



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Table 1. Summary of fecal coliform compliance monitoring data from 10/01/2007 to 4/19/2010, for certified shellfish growing areas in Humboldt Bay.

Company	Growing Area	Sample Station	Number of Samples	Geometric Mean ¹	90 th Percentile ²
Coast Seafood Company	A	22	30	3.38	11.90
	A	24	30	4.28	13.01
	A	51	30	3.04	8.58
	B	21	30	2.66	5.16
	B	28	30	3.07	8.42
	B	34	30	3.09	7.34
	B	52	30	3.78	11.79
	B	53	30	3.59	11.64
	E	45	30	4.04	13.23
Aqua Rodeo Farms; Humboldt Bay Oyster Co.	C	31	30	3.26	11.57
North Bay Shellfish Company	C	33	30	4.06	16.47
North Bay Shellfish Company	D	43	30	3.62	10.79
North Bay Shellfish Company	D	T2a	30	4.20	16.48
Humboldt Bay Oyster Company	C	20	30	2.47	4.98
Humboldt Bay Oyster Company	E	25	30	2.96	6.75
Humboldt Bay Oyster Company	E	26	30	2.61	5.00
Humboldt Bay Oyster Company	F	27	30	4.03	15.37

Notes:

1. The geometric mean is the antilog of the mean of the logs of the sample fecal coliform (FC) MPN values. This value cannot exceed 14/100 ml for shellfish growing waters within the *Approved* classification.
2. The 90th percentile is the antilog of the mean of the logs of the FC values summed with the product of the FC standard deviation multiplied by 1.28. This value cannot exceed 43 for shellfish growing waters within the *Approved* or *Conditionally Approved* classification.

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Table 2. Rainfall closure rules for shellfish growing areas in Humboldt Bay, as specified in the *Management Plan for Commercial Shellfishing in Humboldt Bay, California, January 2010*.

Growing Area	Grower and Description of Area	Start Closure	24-Hour Cumulative Rainfall Threshold >	Closure Length = End of Storm plus	7-Day Cumulative Rainfall	
					If > 3.0 inches, add to closure:	If > 5.0 inches, add to closure:
A	Coast Seafood Company South Mad River growing area, Bird Island Growing area, and the east section of East Bay growing area	Six (6) hours after the 24-hour cumulative rainfall of 1.2" is exceeded	1.2 Inch	96 hrs (4 days)	24 hrs	48 hrs
B	Coast Seafood Company north Mad River growing area, western portion of East Bay growing area, Gunther Island growing area, south Sand Island Growing area, and the Arcata Channel growing area	Six (6) hours after the 24-hour cumulative rainfall of 1.0" is exceeded	1.0 Inch	96 hrs (4 days)	24 hrs	48 hrs
C	Parcel 1 North bay Shellfish, Aqua Rodeo Farms, and Humboldt Bay Oyster Company; Humboldt Bay Oyster Company, north growing area	Six (6) hours after the 24-hour cumulative rainfall of 0.5" is exceeded	0.5 Inch 0.75 Inch 1.0 Inch	72 hrs (3 days) 96 hrs (4 days) 120 hrs (5 days)	24 hrs 24 hrs 24 hrs	48 hrs 48 hrs 48 hrs
D	North Bay Shellfish, wet storage area; North Bay Shellfish, Parcel 2	The hour that the 24-hour cumulative rainfall of 0.5" is exceeded	0.5 Inch 0.75 Inch 1.0 Inch	96 hrs (4 days) 120 hrs (5 days) 144 hrs (6 days)	24 hrs 24 hrs 24 hrs	48 hrs 48 hrs 48 hrs
E	Humboldt Bay Oyster Company, south growing area; Coast Seafoods Company, north Sand Island growing area	Six hours after the 24-hour cumulative rainfall of 0.7" is exceeded	0.7 Inch	120 hrs (5 days)	24 hrs	48 hrs
F	Humboldt Bay Oyster Company, wet storage area	The hour that the 24-hour cumulative rainfall of 0.5" is exceeded	0.5 Inch 0.75 Inch 1.0 Inch	120 hrs (5 days) 144 hrs (6 days) 168 hrs (7 days)	24 hrs 24 hrs 24 hrs	48 hrs 48 hrs 48 hrs

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Table 3. Sampling Dates for Systematic Random Sampling for 2010/2011

Water quality sampling shall occur at the primary sites in Humboldt Bay on the first Tuesday of *each month* in accordance with the following schedule:

Sampling Dates:

January 5, 2010
February 2, 2010
March 2, 2010
April 6, 2010
May 4, 2010
June 1, 2010
July 6, 2010
August 3, 2010
September 7, 2010
October 5, 2010
November 2, 2010
December 7, 2010
January 4, 2011
February 1, 2011