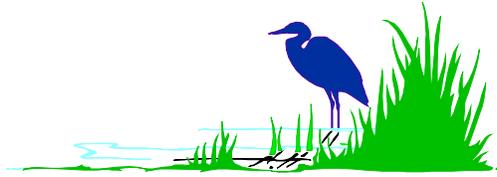


Final Report on the Oakland Bay On-Site Marine Recovery Area Project



7/15/09
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Funded through Consolidated Contract # C14956

Task 1: Coordination and Updates of Implementation Work

During the time frame of the On-Site Marine Recovery Area grant Mason County Public Health (MCPH) provided coordination, facilitation and support for Oakland Bay Clean Water District Advisory Committee meetings. MCPH held 15 monthly Oakland Bay Clean Water District Advisory Committee meetings. In addition to meetings, one advisory committee field trip was organized for insight into persistent fecal coliform problems in certain areas of the bay.

MCPH updated the Oakland Bay Action Plan Strategy at the end of 2008 based on written and verbal updates from the agencies involved in the tasks. In June 2009 another update was started. When the most recent update is completed a revised Action Plan Strategy will be posted to the Oakland Bay Clean Water District website.

In addition to general coordination of Oakland Bay Clean Water District activities, MCPH is involved in a number of on-the-ground water quality improvement projects. Monthly verbal updates on MCPH activities are provided at each advisory committee meeting. Each quarter a report summarizing MCPH Water Quality sampling activities is posted to the Oakland Bay Clean Water District web site. Sampling, sanitary survey and dye trace activities are discussed further in Task 3. Since March 2009 the MCPH On-Site Program provides a monthly report of complaints and repairs in the Oakland Bay area to the advisory committee. As parts of separate grants Mason County oversees a septic retrofit rebate program and a septic system operation & maintenance (O & M) program. Updates on those projects have been provided regularly to the committee.

A matrix for tracking sanitary surveys/dye trace progress in the Uncle John Creek and upper Oakland Bay focus areas was customized to report on items that are important to the area. It was presented to the advisory committee in spring 2008. An update of the report was presented to the group in spring 2009.

MCPH staff assisted the Department of Ecology in identifying and contacting stakeholders for the Oakland Bay Sediment Characterization Study. In addition, staff and management attended Ecology's sediment study meetings. Ecology's Toxics Cleanup Program collected the initial data for this study. The Oakland Bay Sediment Characterization Study report is projected to be released to the public in late fall of this year.

MCPH staff or management attended Squaxin Island Tribe's Western Estuary Initiative project meetings. As part of the social marketing research in the Oakland Bay watershed, MCPH provided input on septic system survey questions. MCPH also reports to that group on the progress of a septic riser and effluent filter rebate program developed for the Oakland Bay area.

MCPH attended a sampling coordination meeting with Squaxin Island Tribe and the Department of Health Office of Shellfish and Water Protection. We also met

with Department of Health for a review of activities in downgraded commercial shellfish growing areas.

MCPH staff attended Mason County Public Work's mycoremediation project meetings. MCPH participated in writing a grant application to address unmet mycoremediation research needs. The grant application was not selected to receive funding.

MCPH staff or management attended stormwater project coordination meetings regularly. MCPH, Mason County Public Works, Mason County Utilities and Waste Management and Mason Conservation District are working together to insure their stormwater implementation projects complement each other, to avoid overlaps and to identify gaps in implementation.

Grant coordination was a regular part of Oakland Bay Advisory Committee meetings. The advisory committee discussed grant opportunities and areas of the Oakland Bay Action Plan Strategy that needed additional funding.

Advisory committee meeting notes, quarterly reports of sampling results, updates to the Oakland Bay Action Plan and additional reports or updates are posted to the Oakland Bay Clean Water District website.

http://www.co.mason.wa.us/oakland_bay/index.php

Task 2: District Development

The Mason County Board of Commissioners created the Oakland Bay Clean Water District Board and established the Oakland Bay Clean Water District Advisory Committee as advisors to the board, replacing the Oakland Bay Closure Response Committee. By-laws developed by MCPH for the new advisory committee were finalized and approved by the committee. At the request of the committee, MCPH revisited the by-law after approval and made some revisions. MCPH staff worked to procure applications for board members. A public notice was placed in the Shelton Journal to fill the citizen positions in the committee. MCPH also established alternates for committee members resulting in a comprehensive roster of members.

MCPH and other advisory committee members attended two Board of Oakland Bay Clean Water District meetings with updated progress reports for both. An update on the Oakland Bay Action Plan Strategy was also given. MCPH, Mason County Public Works and Mason County Utilities and Waste Management have been meeting regularly to discuss stable funding options for the district. Funding discussions have become focused on the development of a storm and surface water management district that will include MCPH, Mason County Public Works, Mason County Utilities and Waste Management, Washington State University Extension and Mason Conservation District. The current timeline for district development has a Memorandum of Understanding for roles and responsibilities within the district was due to be signed in June 2009,

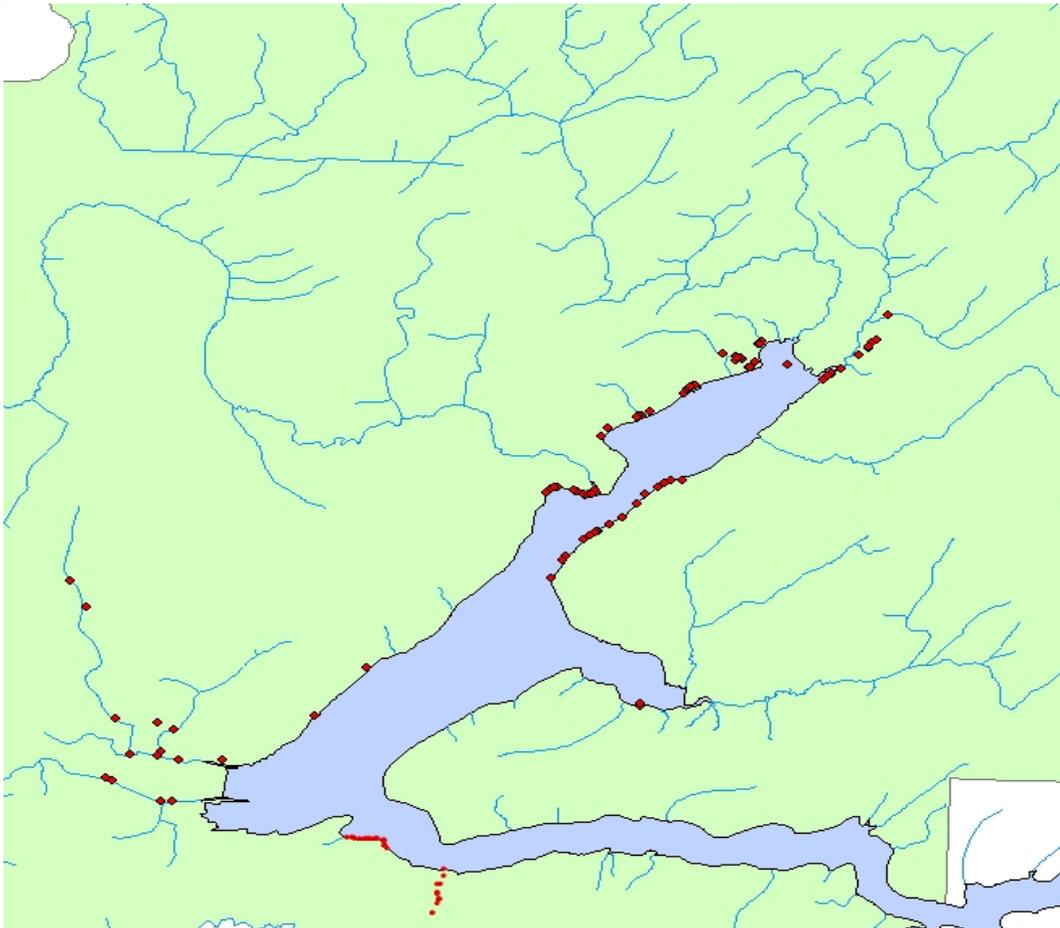
the district boundaries to be established by December 2009 and a stable funding source to be established by 2011.

MCPH also attended one meeting to explore options for creating a non-governmental organization. The organization would raise funds for water quality improvement activities that can't be funded by government.

Task 3 Identify On-Site Septic System Sources

MCPH identified on-site septic systems that were sources of pollution using shoreline surveys and septic system maintenance reports. The original focus of this task was to identify sources through shoreline survey and sampling and also through segmenting creeks in areas with water quality issues. We were to sample at least a third of the shoreline twice yearly. In the year and a half of the grant we have met that goal, covering roughly half of the shoreline and segmenting a number of creeks in the area. See Figure 1. Sample sites are marked in red. The sample locations in one area, Uncle John Creek, do not appear on this map. A TOPO map of Uncle John Creek site locations is in Appendix I.

Figure 1 All sample sites



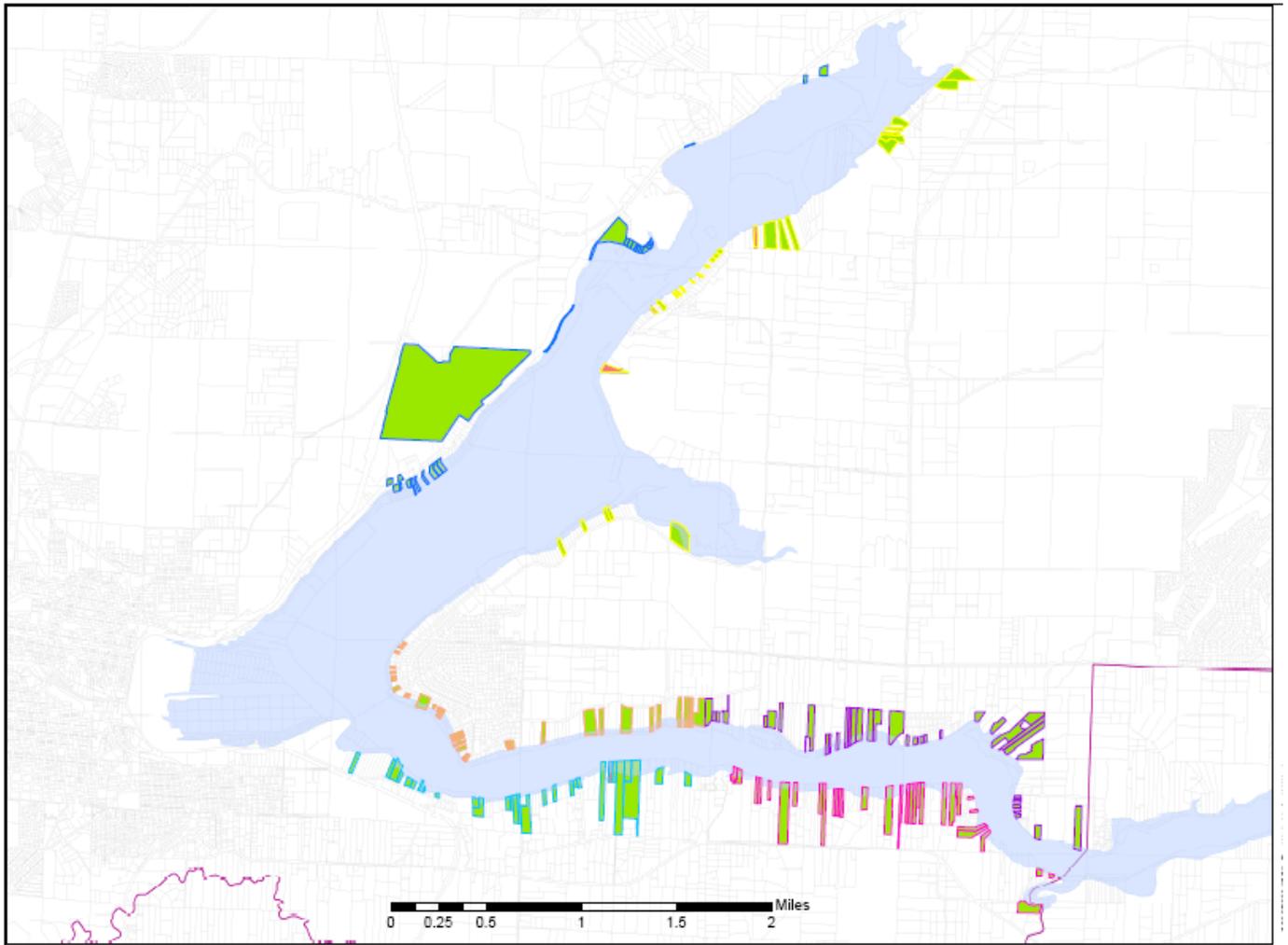
When a shoreline survey sample result is at or above 100 fecal coliform /100 ml of water (FC/ml) this is considered a high result and a confirmation sample is taken. If the confirmation sample is also above 100 FC/ml permission to do a sanitary survey of the upland area is sought. This protocol was established in the Oakland Bay On-Site Septic System Marine Recovery Area Project Quality Assurance Project Plan submitted to DOH April 17, 2008.

A number of streams were chosen for additional pollution source investigation. They include: Shelton Creek; Goldborough Creek; Uncle John Creek; an unnamed creek at Walker Park; an unnamed creek at Ecler Rd and a number of small drainages at the upper end of Oakland Bay.

As the shoreline survey work progressed bacteria results were mostly low. This limited the amount of sanitary survey and dye trace work that could be done. In response, we started to work on activities that can prevent septic failure as a more proactive additional step to shoreline sampling. A Septic System O & M query list was developed for all the shoreline homes in the Oakland Bay Marine Recovery Area. This allowed us to quickly follow up on shoreline septic system O & M reports. MCPH follow up on unsatisfactory septic maintenance events. No parcels on the shoreline were found with unresolved unsatisfactory maintenance events. MCPH also sent a reminder notice to all the septic systems that were overdue for O & M in the district. Around 900 reminders were sent.

Oakland Bay was separated into color-coded segments in order to facilitate sampling work. Each section has 30-40 residential properties on the shoreline and most can be walked in one sampling day. See Figure 2. Highlights of the work in each section are discussed below. Appendix I contains detailed site location maps. Complete results have been placed in Appendix II.

Figure 2 Color Coded Shoreline Sections



Yellow Section

1st Quarter 2008

Uncle John Creek was segmented four times this quarter. Last year a number of on-site and agricultural pollution sources were found and corrected. Through this grant the area will be sampled regularly to verify that water quality has improved.

2nd Quarter 2008

Shoreline survey work was started. Work in this section will mostly take place during the summer because there are a number of vacation residences along the shoreline. In addition to the survey work, contact was made with a member of the Cedar Grove Home Owners Association. The member gave us information on vacation home use.

Uncle John Creek was segmented once.

3rd Quarter 08

Sampling was done in the Beaver Lane area. Several high results were found but only one with a high confirmation sample near development.

Uncle John Creek was segmented twice this quarter.

4th Quarter 2008

Shoreline survey was wrapped up this quarter in the northeast section between Gosser Rd. and Beaver Avenue. One vacation cabin was selected for a dye trace due to high fecal coliform counts. The owners agreed to allow a dye trace and one was scheduled for the last part of December. Unfortunately bad weather prevented us from proceeding. We were forced to wait until the next time the family is using the cabin for an extended period in order to have a valid dye trace result.

Uncle John Creek was segmented once this quarter.

1st Quarter 2009

Shoreline sampling for most of the yellow section was wrapped up in 2008. At the request of the Squaxin Island Tribe and DOH, additional sampling along Gosser Road will be done monthly through the summer. Sampling at a mycoremediation site on the south shore of Chapman Cove commenced through another grant.

Uncle John Creek was segmented twice this quarter.

2nd Quarter 2009

Monthly sampling to support the Squaxin/DOH project continued.

This quarter the dye trace originally scheduled to start last December was done. Site investigation reveals that the drainage originates from a natural spring-fed wetland. Segmenting up to the wetland showed high results in the wetland area. The drainage has been routed via a combination of natural contour trenching and under ground 6 inch and 8 inch corrugated black plastic pipe.

The septic system being dye traced is located near this area, though only the septic tank and sand filter (not open bottom) are near the wetland area. The drainfield is on the opposite side of the house from the wetland area. The property directly above the wetland contains a covered picnic area with sink for the Cedar Grove Community Club at the top of the bank near the road access. Drainage from the upland side of Beaver Avenue is contained and does not cross the road. Initial dye trace results are negative.

Uncle John Creek was segmented twice this quarter.

Cobalt Section

1st Quarter 2008

One septic system dye test was completed this quarter upland from the unnamed creek at Ecler Rd. The test was dye negative. The property has been referred to the Mason Conservation District for an assessment of animal waste management. Stream segmentation and dye traces occurred in the past in this area. One additional septic system on a property adjacent to the stream has passed dye traces.

3rd Quarter 2008

Shoreline survey work was started this quarter in the cobalt section. This section is mostly along Hwy 3. Sample results were high at the mouth of the unnamed creek at Ecler (OBC-08 and OBC-04) and upstream OBC-032. A mycoinstallation has been placed at the mouth of this creek. Results were also high at OBC-009. The property above was dye traced in the past and also has a farm plan. More follow up work can be pursued.

4th Quarter 2008

More potential stormwater and residential sources were surveyed and sampled in this area. Elevated fecal coliform levels were found off of a farm with a large amount of poultry (OBC-13, 44,45 & 46). Mason Conservation District has since worked with them on an improved manure management plan.

1st Quarter 2009

The Bayshore area was sampled. One result was above 100 FC/ml. A confirmation sample for site OBC-038 will be taken next quarter. One septic failure was found in the Bayshore area. No high sample results were found at the beach below the failure. Repairs are in process. A project sampling some smaller flows in the northern end of the bay monthly for the Squaxin/DOH sediment study commenced in March.

2nd Quarter 2009

The culverts along Hwy 3 were sampled a couple of times this quarter. Results were low. Three attempts to follow up on one high count at OBC-038 were unsuccessful. The site was dry. The work related to sediment sampling continued.

Shelton Section

1st Quarter 2009

MCPH and City of Shelton met this quarter to determine the City's sampling needs. The City has no budget for sampling work, but would like to determine the water quality of Goldborough and Shelton Creek. The city has worked to improve inflow/ infiltration issues in some of the sewer basins. A sample plan was agreed upon. MCPH will sample twelve sites along Goldborough and Shelton Creeks approximately monthly. Sampling began this quarter.

2nd Quarter 2009

Monthly sampling continued.

Blue Section

2nd Quarter 2008

An unnamed creek at Walker Park is the focus of an on going water quality investigation due to poor water quality in the creek. Staff segmented the creek twice. Results were high throughout the drainage, which is the usual summer pattern for this stream. One property received a sanitary survey. The property owner has agreed to make changes in how they manage their pet waste. They have also agree to a dye trace of their septic system, which will take place next fall/winter during the dye trace season.

3rd Quarter 2008

The Walker Park creek was segmented once this quarter. Results were higher at the mouth than in the upper waterway. One dye trace is scheduled for next quarter.

4th Quarter 2008

The dye trace in Walker Park area was delayed due to inclement weather.

1st Quarter 2009

Staff segmented the unnamed creek at Walker Park once No results are above the 100 FC/mL limit set in the QAPP.

One dye trace was started in the Walker Park creek area this quarter.

2nd Quarter 2009

The Walker Park creek area dye trace was concluded. The septic system passed, no dye was found. The creek was segmented once this quarter. Results were high throughout the drainage. This is the usual pattern in summertime.

Shoreline survey work began this quarter. There were a number of high sample results. The drainage at one site was segmented. Follow up in this section will be done after the conclusion of this grant. An alternative funding source is available.

Other projects related to Oakland Bay

Stormwater-

Through a separate funding source MCPH has also has assisted Mason County Public Works in developing stormwater sampling procedures to be used in Oakland Bay and other areas of the county. Staff has also provided Mason

Conservation District, Mason County Utilities and Waste Management and Mason County Public Works assistance on other minor stormwater water sampling projects.

Mycoremediation-

2nd Quarter, 2008

Staff worked on a mycoremediation project this quarter. Mycoremediation uses mushroom mycelium to reduce fecal coliform in stormwater drainages. This is an experimental technology that Mason County is exploring with the inventor. One sites in the Oakland Bay area was identified as good candidates for mycoremediation, the Ecler Road creek at the north end of the bay. Staff developed a sampling plan and tested the installations multiple times. Results were very promising, testing the null hypothesis that there was no difference above and below the mycoremediation resulted in a p value of less than 1 %. Using the Wilcoxon matched pair test, a nonparametric equivalent of a t-test. In other words, the probability that the numbers show an actual reduction, not just random variation of bacteria is about 99%.

4th Quarter 2008

Two additional sites received mycoremediation installations this quarter bringing the total up to three for Oakland Bay. Staff sampled above and below the new installations to verify that some reduction was occurring. More extensive sampling will occur after a Mason County Public Works project Quality Assurance Project Plan is approved by Ecology

1st and 2nd Quarter, 2009

Through the Mason County Public Works Grant MCPH sampled two mycoremediation installations in Oakland Bay to assess their effectiveness in reducing fecal coliform. Reductions were not found to be significant. It is not known at this point why results were so different from the previous year.

Project Completion and Staffing

Task 1- 100% Complete. All the coordination and update tasks in the Oakland Bay Action Plan matrix were met. Meeting notes and Mason County Public Health sampling results, and other study results and information are now available to the public online as a further step in making information about Oakland Bay Action Plan activities easily available.

Task 2- 100% Complete. Subcommittees have been developed when needed and additional stakeholders sought.

Task 3- 100% Complete. The correct amount of area was covered. The number of samples and dye traces taken was lower than projected in the contract, however the contract was estimated somewhat high to ensure that sampling funds did not run out before the project was complete. Since most of the sample results were low, limiting the amount of testing for septic failure that could be

done, additional work to encourage septic system maintenance in the area was done. The overall numbers of samples taken in the Oakland Bay area was 487, 111 of these samples were billed through other funding sources. Quality control statistics are: 10.8 % lab duplicates; 5.2% field replicates and 6.6 % field blanks.

Staffing

Two water quality personnel staffed this project. Stephanie Kenny started project work in March 08 and Seth Book came on at the end of the second quarter. Seth was laid off during the 3rd Quarter and Christine Clark was trained in shoreline and sanitary survey techniques with the idea that she would be primarily responsible for the fieldwork portion of the grant. Christine Clark was let go at the end of 4th quarter due to department budget constraints. The Mason County Water lab was closed at the end of January. We no longer take outside samples but still analyze our own samples. Without a dedicated lab person water quality staff are now responsible for doing all lab work associated with sampling. In February 2009 Carol Spaulding, formerly our lab specialist was trained to do field work for this project. In April Amanda Reynolds assumed some of the water quality sampling duties to better distribute workload.

Task 4 Education

To promote public involvement and provide the public with background on water quality issues in Oakland Bay MCPH developed displays and posters for public events. The displays were updated and varied according to the focus of the event. Mason County provided Oakland Bay information at six events including Oysterfest. Oysterfest is the region's largest annual shellfish event, drawing thousands of visitors a year.

MCPH attended 11 education subcommittee meetings and contributed education material for the Oakland Bay website.

MCPH sent reminder notices containing educational material to around 900 homeowners in the Oakland Bay Clean Water District that were overdue for septic system maintenance. The language used in the material represented MCPH first attempt to use social marketing.

2nd Quarterly Report (April 09 – June 09) for WSU

Submitted by Emily Sanford

PARTNER – Agrees to:

- a. Provide to MCPH on a quarterly basis an invoice for their share of salary and benefits contribution.**
- b. Provide to MCPH on a quarterly basis task reports on quarter progress. These reports will be due March 2009, June 2009, September 2009 and December 2009.**

- c. **Tasks and Activities are to include but are not limited the following:**
- **Research-based assistance and education to residents in the form of outreach at community events in collaboration with MCPH:**
 - Staff provided an outreach booth and educational materials related to Oakland Bay at two community events during the week of April 20th (one at Shelton Civic Center and one at Olympic College. A Shoreline Living workshop for residents was held on Sunday April 26th (with a total of 19 participants). Preparation for these community events included media releases and posters which were posted on the Friends of Oakland Bay Website.
 - Three full days of environmental education activities were provided to students who live in the Oakland Bay Clean Water District at Panhandle 4-H camp (5/7: Pioneer Outdoor School; 5/15: Forest Festival Field Day and 6/4: Evergreen School Outdoor Camp). A total of ~250 children were reached.
 - Outreach was provided to the community and in particular shoreline landowners at two Taylor Shellfish Seed Sales (5/23 and 6/20) and at the Southside Children's Festival on 6/6.

 - **In collaboration with MCPH Mason County Extension will also provide a minimum of six Septic System Operation and Maintenance Workshops- in 2009.**
 - Two On-site Septic System Operation and Maintenance Workshops were conducted with Mason County Public Health during the second quarter (May 28th: Shelton Library and June 28th: NMHS) making a total of 4 workshops conducted so far in 2009. 83 people participated in the latest two workshops making for a total of 115 total participants for the 4 workshops held so far this year.
 - On-site Septic System data was compiled with the assistance of MCPH to show the number of residents whose system have had maintenance before and after attending these workshops- this data was provided to MCPH. MCPH staff also provided some baseline data as of 6/1/09 as to how many systems within the District have had recorded maintenance activities. This helps to set goals for the marketing plan.

 - **Mason County Extension will continue facilitation of the Oakland Bay Shellfish Closure Response Education and Outreach Subcommittee. Activities associated with this will include but are not limited to: organization of community events, displays, and media coverage, coordination with community partners and the incorporation of social marketing techniques into public involvement and education programming.**
 - Two Education Sub-committee meetings were held during this second quarter (May 13th and June 3rd). Both meetings focused on furthering the social marketing research conducted over the winter and formulating a marketing plan to help guide future education endeavors over the next years in this area.

- ***Mason County Extension will work with the Water Resources Education for Real Estate Professionals and the Native Plant Salvage Project based at Thurston County Extension to bring a minimum of one Shoreline workshop to this area in 2009.***
 - A Shoreline Living Workshop was held (as previously mentioned) on Sunday April 26th with Erica Guttman of the Native Plant Salvage Project presenting.

- ***Mason County Extension will compile content and coordinate with the Mason County Webmaster to expand, link, and market the Oakland Bay Clean Water District Website.***
 - Staff has coordinated with the Mason County Webmaster to add a comment box feature so that viewers of the website can ask questions and provide feedback. This is linked directly to staff email who has answered questions.
 - Staff worked with the Mason County Webmaster to design a web button which can be placed on the various organization websites involved in the Clean Water District that will link back to the Oakland Bay Website. This will help to encourage more traffic on the site. The next step is marketing the use of this web button to partner agencies within the Advisory Committee.

- ***Mason County Extension will work with the Mason County Journal to develop relevant and interesting newspaper articles to educate residents about water quality issues and what they can do. These articles may focus on local history, natural history or local economic importance.***
 - The Education Sub-committee continues to talk about how to best approach this. Planning is getting underway for the annual Oakland Bay Open House in October and may focus on local history. While the social marketing plan is completed we have held off from providing articles beyond expanded press releases announcing education activities and workshops.
 - A list of Shore Stewards Newsletters available for use has been obtained and starting in July we hope to post relevant articles on the Oakland Bay Website and incorporate them into news releases as well.

- **Additional Activities:**
 - Staff attended all monthly Clean Water District Advisory Committee Meetings (April, May and June)
 - Pacific Coast Shellfish Growers Association Focus Group on Impacts of Aquaculture in Oakland Bay (4/22/09- PUD Conference Room/Shelton)
 - 5/6/2009 South Puget Sound Science Symposium Little Creek Casino
 - South Puget Sound Core Group Meeting (5/20/09)

- 5/26/2009 Clean Water District Board of Directors Briefing (and book preparation showcasing achievements and education efforts of the past year)

WSU Extension staff also worked with consultant Heidi Keller and MCPH to help edit language in a mailing postcard reminder going out to residents in the district regarding septic maintenance.