

Maine Department of Marine Resources Public Health Division Shellfish Classification Program: Water Quality Monitoring Volunteer Guidance Document

The Importance of a DMR Volunteer Program

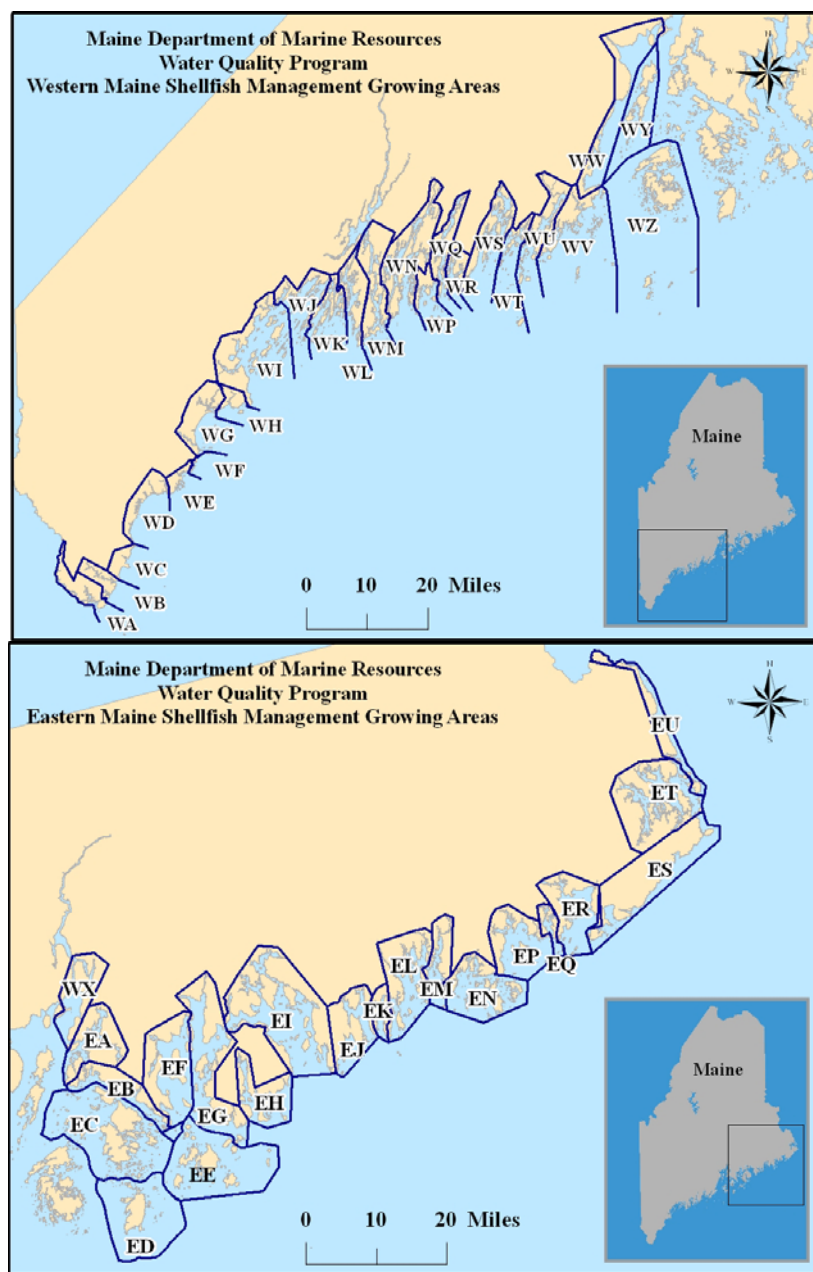
Volunteer participation benefits the Department of Marine Resources (DMR) in many ways. It provides us with an incredible resource of willing and able workers who donate their time because they are interested in what we are doing and want to actively contribute to the protection of Maine's coastal resources. These relationships also provide us with an excellent opportunity to educate citizens and their communities about the ecological and economic importance of these resources, and to expose them to the wide range of research being conducted by DMR.

The water quality program has relied on volunteers for more than fifteen years to help with its field data collection. On average over 40% of all water samples are collected by volunteers. In accepting assistance from volunteers, the Department needs to provide adequate support, guidance and training to volunteers so that their participation is mutually beneficial. It is also important to outline the role of volunteers in the program to define their expectations to get the job done efficiently while meeting the program goals. This guidance document outlines these expectations and should be used in combination with the DMR Standard Operating Procedures (Appendix I) for a complete understanding of the DMR Water Quality Program.

Problem Definition/Background

The water quality program follows federal guidelines in establishing and implementing a shellfish program in Maine (see SOP and Nssp document at www.issc.org for full description). The mission of this program is to protect the public health by properly classifying shellfish growing areas based upon environmental data and other observations. All shellfish areas in Maine are reviewed under this program and classifications are based upon uniform and consistent criteria. The objective of this classification system is to prevent shellfish from being harvested from areas that show evidence of bacterial or biotoxic contamination as both types of contamination may cause illness or even death in human consumers.

To properly classify shellfish growing areas, the DMR must collect routine water samples from its established >1400 sites a minimum of six times a year from the Canadian to New Hampshire border. Staff must also conduct shoreline surveys to search for potential sources of pollution to coastal flats and waters, institute special investigatory studies and must use data from all of these to write annual reports of varying length for each of the 45 shellfish growing areas (figures 1a and 1b). Additionally, the DMR administers and provides enforcement for the current classification system for all growing areas.

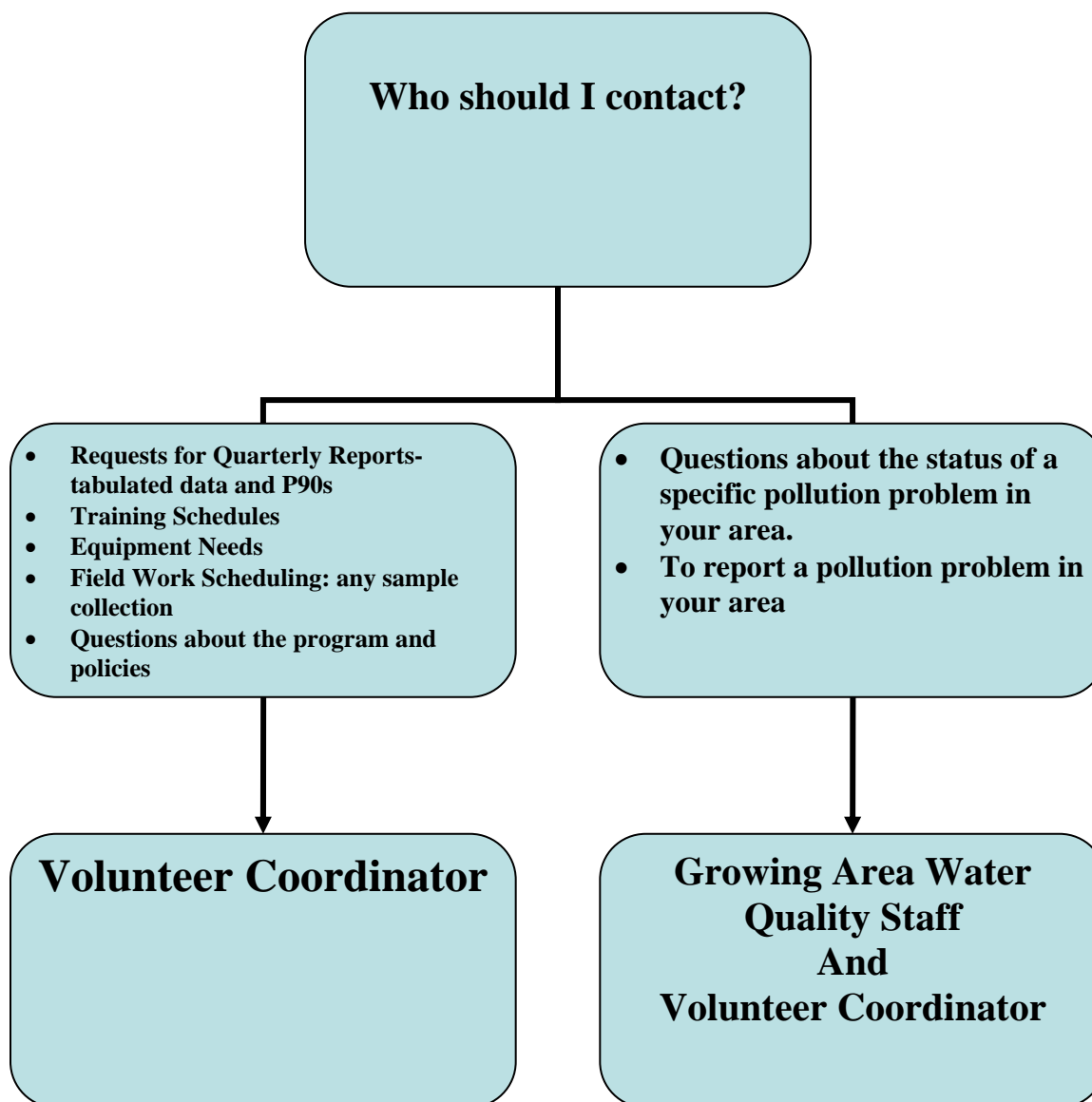


Project Staff/ Organizational Chart

Major responsibilities and organizational chart for all water quality personnel are outlined in the Water Quality Program SOP attached as Appendix I to this document. The primary contact for volunteers is the volunteer coordinator. She/he will be responsible for scheduling, training, equipment needs and all questions regarding policies for the Water Quality Program. Field staff cannot direct volunteer work assignments or sampling efforts. If a volunteer would like to do additional work related to water sampling i.e. pollution source sampling, assist with shoreline survey work, rainfall data collection or any other special study for an area, the volunteer coordinator will set up a meeting with the staff member responsible for that area to discuss these possibilities. This will be done based on the reporting schedule for that area. and after appropriate approval has been given.

Most volunteer are interested in sampling to better understand the issues affecting their watershed and shellfish industry. Because of the many staff working in the Water Quality Program it can be confusing to

know who to talk to about what issues. The following chart outlines the pathway for information exchange between volunteers and the Water Quality Program. See chart below.



Project/Task Description

From January through June each year the Department of Marine Resources will conduct a mandatory two part volunteer training for all Water Quality Program volunteers. The first part of the training will occur from January through April, the second field training will occur simultaneously from January through June. Additional QC in the field will occur from July through September and retraining sessions will be implemented throughout the year if needed. Recruitment for new volunteers in priority areas and under the guidance of DMR staff will occur from October through December for the upcoming sampling season.

Based on the systematic random sample schedule, bimonthly (6 x a year) sampling of water and water temperature will occur at each active water quality station. In order to better characterize the data, additional critical information will be taken including observed adversities and wind direction.

Volunteer samples will be picked up from secure locations determined by the DMR or brought to the lab and then analyzed by DMR lab staff using membrane filtration method. Results will then be entered into a

DMR database. Interim quarterly reports will be produced and posted by the volunteer coordinator on the DMR website, www.maine.gov/dmr. A final year end report that will support current classification for each growing area will be produced and updated on the Maine DMR website, www.maine.gov/dmr throughout February, March and April. Reports are prepared by the Water Quality staff and go through an internal review process. It is the aim of the program to complete final reports by the end of April, however due to heavy workloads there may be some delay in this timeline. Below is the annual timeline major tasks are accomplished in association with volunteers and the Shellfish Growing Area Classification Program.

Major Tasks During Calendar Year	J	F	M	A	M	J	J	A	S	O	N	D
Volunteer Recruitment	X									X	X	X
Volunteer Training: Aseptic Technique	X	X	X	X								
Volunteer Training: Site Certification	X	X	X	X	X	X						
QC Checks							X	X	X			
Data Reports: Tabulated Data			X			X			X			X
Annual Classification Reports		X	X	X								
Final Maps and Directions Sent Out for Sampling Season	X	X										

Annual Volunteer Training Requirements

Training Part I: Program Overview and Aseptic Technique: Maine DMR water quality volunteers will participate in a mandatory classroom and field course that includes a ½ day of retraining or one full day of training about the program and will visit field sites. Topics covered will include the DMR Water Quality SOP, field techniques and QAQC. Other topics covered will include filling out datasheets and interpreting report results. At the end of this training day volunteers will need to take a proficiency test to evaluate their understanding of expectations and tasks to be performed as part of participating in the program. Volunteers will also be expected to update any and all contact information for the DMR including a volunteer application and agreement which will be completed at the training.

Training Part II: Site Certification: The second day of training will take place in the field at or before the volunteers first sample date is scheduled. The guidelines for site certifications are attached to this document as Appendix II. Annual site certifications are mandatory for all volunteers. Volunteers are not allowed to train other volunteers. An evaluation of each volunteer will be completed by staff at the time of the site certification and reviewed after the site certification is completed by the volunteer coordinator. The volunteer coordinator will send a copy of the results to the volunteer for their records. DMR staff will make the effort to do these site certifications as early in the year as possible. Because of this, winter sampling protocols will be in place and will need to be adhered to when in the field. Additional information about winter sampling can be found in the SOP, Appendix I.

Volunteers should expect to be out for the full day during a site certification and will be required to visit every station in the run. During this training staff will identify the stations where this might be an issue. Prior to each date the volunteer coordinator and staff doing the site certification will meet briefly and discuss which site this will be and any other specifics that will be covered that day with the volunteer.

Documentation and Records

Each time a volunteer takes a sample a datasheet must be completed on site for that sample. It is important that the original datasheet be the only record for that day i.e. do not use a scrap to write down sample

information and then transcribe, this is considered a quality assurance problem. Example of how to fill out a datasheet can be found in the attached SOP (Appendix 1). Below is a table of the datasheets volunteers will use for different sampling events.

Random/Adverse/Accelerated Water and Shellfish Samples	Appendix III: Form a
Pollution Source/Stream Samples	Appendix III: Form b

If possible before handing in your datasheet for the day make a copy of each field sheet and keep a copy for your records. The original is returned to the Maine DMR office along with all samples. Field sheets are archived with the DMR field staff Supervisor for at least five years. Hard copies of all data as well as computer generated copies are maintained by the DMR.

Sampling Design

The sample design is outlined in the DMR PHD Shellfish Classification SOP in Appendix I, all samples collected by volunteers are considered random and consist of active stations along the coast within each growing area. All stations are grouped into “runs” and each run is numbered geographically from most western to most eastern stations along the coast. Each DMR Water Quality lab has a similarly named run numbering system distinguishable by an E for east (Lamoine Lab) or W for west (Boothbay Lab) in front of each station number and should be designated as such on datasheets and sample bags.

Random Run Collection Criteria

A sample run can consist of 20 to 32 sample stations. The DMR has determined that breaking runs down into smaller groupings puts an undo burden on the WQ program. The Department has created the current sample runs in order to be most effective and efficient with resources.

Volunteers coming into the growing area program must be prepared to commit to doing a full sampling run as determined by the Department which can consist of up to 32 stations spanning numerous towns. In the past having too many different volunteers responsible for one sample run created many quality control/quality assurance problems. If a volunteer would like to pull in another volunteer to cover half that run both need to complete the annual training and will also need to be able to assume responsibility for the other part of that run if the other volunteer cannot sample on a given scheduled date during the year. A volunteer or volunteer group who are assigned a complete run for the season can expect to spend a minimum of two hours and up to eight hours in the field on a scheduled random run sample day.

New groups can volunteer but consistency in sampling technique is critical for the data. Along with committing to sampling annually volunteers will be required to commit to a minimum of 4 dates during the year (see table 1). We also encourage sampling in pairs if groups are involved thus the ability to cover one another if scheduling becomes an issue. A group leader needs to be assigned as the primary contact for the volunteer coordinator and he/she will be responsible for keeping other group member information up to date, will need to be on every scheduled run and take the lead to ensure group members who do not fulfill the criteria for participation complete the sampling correctly.

Table 1. Criteria for volunteer involvement in the Shellfish Growing Area Classification Program.

Criteria for Volunteer Water Quality Runs	Minimum # of days* per volunteer	Minimum # of stations per volunteer	Annual Site Cert Required	Annual Training Day Required	CA Sample Collection criteria
Individual Volunteer	≥ 4 dates	Each volunteer will collect ≥ 12 or ½ the complete run	Yes	Yes	≥ 8 stations for volunteers to sample
Two Volunteers	≥ 4 dates		Yes	Yes	
≥ Three Volunteers Required: Group Leader	≥ 4 dates for each volunteer		Yes, all volunteers	Yes, all volunteers	

*These do not include the two training days scheduled annually. If a random run is rescheduled due to an emergency flood or other condition the volunteer will be expected to do the makeup date provided enough time for planning with that volunteer can be established

Each volunteer/volunteer group will start sampling when they know there will be a minimum of 18" at each site. This means on a given sample day a volunteer(s) will need to time their run when they know they will be able to get the most amount of stations. However stations some stations will still be missed and on days when low tide sampling takes place it is expected that for those stations missed, volunteers will do their best to go back to those stations on that same day within the eight hour window allotted for sampling and collect those stations at another tide stage. This will reduce the amount of time DMR staff must spend collecting missed stations.

Criteria for sampling conditional area, boat runs and other

The DMR also is required to sample conditional areas in the open status which can mean additional sampling dates in the calendar year for some stations/areas. If a volunteer random run contains ≥ 8 conditional stations then volunteers will be asked to sample those additional sample dates. On specific occasions volunteers will be asked to sample a smaller number of stations than the required criteria. The following scenarios are these exceptions: **a.** when a station can only be collected by boat, **b.** because staff is under constraint from a flood closure or **c.** to reopen a conditional area.

The following chart outlines all possible scenarios of sampling that a trained volunteer could be asked to complete for the DMR water quality program.

Random Run Samples	Up to 32 stations in a day
Random Conditional Run Samples	Has to be an area with ≥8 stations
Make Up Runs Due to Schedule Change	Yes
Make Up Stations Missed on a Run*	No, these will be completed by staff within as soon as the schedule and staff availability allows
Adverse Samples/Stream Samples	Additional training and approval needed from DMR staff
Accelerated Sampling	Approval needed from DMR staff
Shellfish Samples	Permit needed, additional training and approval needed from DMR staff

*Staff will do all make up station sampling unless the stations can only be collected by boat at which time a volunteer can do the samples with DMR staff approval.

Winter Sampling

When sampling in the winter, all attempts should be made to use safe practices. It is recommended that crampons be used if it is icy, snowshoes if it is necessary to walk long distances in deep snow, carry cell phones for emergency calling and use 4-wheel drive vehicles if sampling runs are in remote areas or on back roads. Walking out on ice-covered coves is discouraged. Sampling runs will be cancelled when state offices are closed due to inclement weather otherwise on a case by case basis. In the event of a missed run due to hazardous conditions, the missed run will be handled as described under the make-up sampling section in the Growing Area SOP (Appendix I)

Aside from safety issues, there are water sample integrity issues with cold weather sampling. Samples with ice or ice slurry cannot be analyzed for fecal coliforms. Bacterial cells tend to burst when subjected to freezing; any freezing that occurs once the sample has been collected will alter the original concentration of fecal coliforms in that sample. If the sample is collected where ice is present, every effort should be made to exclude ice from the sample collection. If ice slurry is present, the slurry must be expelled before closing the bag. The sample must be protected from freezing and ice formation from sample collection site to eventual delivery to the laboratory. This may mean carrying the sample in a pocket from sample site to the cooler in the vehicle. It may mean keeping the cooler inside the vehicle during the sample collection trip and transport to the laboratory; the coolers are not designed to protect from freezing if they are subjected to freezing temperatures and wind chill conditions. Freezing wind chill conditions can develop on a cold day in the bed of an open pick up truck during transport.

Sample Scheduling and Materials

By the end of February all volunteers will receive via email and/or hard copy, an updated map of the volunteer run they will be collecting with all active stations, current directions with lat/lon coordinates, and the dates that each run should be completed for the year. Also if a volunteer(s) will be doing conditional area sampling those additional dates will be noted and an additional list of conditional stations outlined. Because of the dynamic nature of the water quality program stations can be activated, deactivated and/or made inactivate throughout the year which can change the number of stations in a run. If this occurs after the annual trainings, the volunteer coordinator will send updated information to that volunteer and field staff will be required to fulfill any field training obligations to ensure quality samples are collected.

Sampling does occur year round for staff. Like staff, volunteers that are paid by the towns i.e. shellfish wardens or other public safety officers will be expected to collect from January through December. Other volunteers will have a choice based on comfort level and boat availability whether to sample in December, January and February but will be expected to collect samples from March through November.

Volunteers will be notified at least a week and up to a month in advance of each sample date and will need to confirm that date when contacted with the volunteer coordinator. In addition a volunteer(s) will need to confirm a drop off time with the volunteer coordinator so staff can plan pick up times for those samples. If a volunteer is unable to collect on a specific sample date they are responsible for notifying the volunteer coordinator no later than 48 hours prior to that date. The date will not be rescheduled but will be collected on that sample date by staff.

If a volunteer collects by boat there is a separate section in the SOP that should be reviewed and followed (Appendix I). All volunteers who sample by boat will be required to carry a DMR issue GPS unit with them, which they will use to document all stations where samples were collected. Specific instruction on how to use the units will be covered during the annual training session for volunteers. If a volunteer has boat problems or bad boating weather occurs on their sample date the volunteer is expected to collect all samples by land. The exception to this rule is if the stations are not on the coastal mainland or if they are designated by the DMR as "boat stations" and cannot be reasonably accessed by land.

Equipment Inspection and Acceptance Requirements, Maintenance and Calibration

DMR will provide all necessary sampling equipment to collect quality samples. It is expected that all volunteers will use only DMR issue equipment for QAQC purposes and in the ways that they are trained.

Volunteers will need to supply their own above the knee waterproof boots, transportation (vehicle or boat), first aid kit and a watch or automobile clock. If a volunteer do not have one of the required pieces of equipment listed above please get in touch with the volunteer coordinator. If DMR issue equipment breaks/is damaged during the season it is **your** responsibility to contact the volunteer coordinator for a replacement and one should not sample until this equipment is replaced.

At each annual training event volunteers will be required to bring all their sampling equipment in for inspection. At that time the volunteer coordinator and/or DMR staff will look at and confirm by checklist the quality of the equipment and replace anything that does not meet minimum requirements. Also at this training volunteers will receive a set of new thermometers for that sampling year, old thermometers will be turned in at that time.

Quality Control Requirements Assessment and Response Actions

A quality control check in the field will be completed during the months from the end of July through September for all volunteers. Each group will either receive a GPS unit and instruction to take coordinates at the place they collect water sample on that day or will be accompanied by the volunteer coordinator for part of their run. If GPS units are used they will be left with the coolers for pick up and checked by the WQ Staff for that area to confirm sampling precision.

A quality control check will also occur anytime samples are left for pick up. All samples that are picked up by staff at remote locations will be checked by DMR staff to make sure all equipment requirements are met for storing those samples. Equipment checklists will be given to all DMR staff completing pick ups and will be filled out at that time. Deficiencies such as not enough ice packs, non DMR cooler, if bags are not sitting upright or are sitting in pools of water, etc. will be documented.

Lab quality control will occur in the form of a problems list when lab staff process sample bags. This will then be given to the volunteer coordinator on a monthly basis so volunteers can be notified and corrective action enforced.

If there is a QAQC issue with a volunteer(s) performance, the volunteer coordinator will contact that individual/group leader, address the problem and figure out a course of action before they collect samples again. If the problem is due to unfamiliarity with sample locations or a misunderstanding of DMR water sampling protocol, a site certification and/or sample collection training must be done or redone before the group collects on their own again.

THANK YOU FOR YOUR HELP!

Appendix I: http://www.maine.gov/dmr/rm/public_health/FinalGrowingAreaSOP4-26-2007.pdf

Appendix II: Volunteer Site Certification Policy**Appendix III: Datasheets****Form a)** Water Quality Sampling Example**Form b)** Stream Samples/Pollution Source Sample Example