State of Maine

Department of Environmental Protection

2004 Integrated Water Quality Monitoring and Assessment Report

Document Number DEPLW0665

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Notice to Readers: Anti-SPAM Measure

It is no secret that recent trends in junk e-mail (a.k.a. SPAM) indicate that these nuisance solicitations are finding their way into e-mail accounts with ever increasing frequency. Studies indicate that one of the leading ways spammers obtain legitimate e-mail addresses is through the use of "spam-bots", which are specialized computer programs that automatically search, ferret out, harvest and amass e-mail addresses from web pages and other documents that are posted online (just like this report). Once a valid e-mail address has been located, generally it will be added to a spammer's list and/or sold to other spammers, which is sure to dramatically increase the amount of spam received by that e-mail address.

With this report, a measure has been taken to help protect those individuals whose e-mail addresses are listed inside from having their legitimate e-mail addresses discovered and automatically spammed. Basically, the text "SPAM-ZAP" (without quotation marks) will be inserted directly after the "@" symbol in each e-mail address found in this report – an example of this format follows: steve.harmon@SPAM-ZAPmaine.gov. Inserting this "SPAM-ZAP" text creates a bogus e-mail address that will cause any automatically generated SPAM e-mail to be sent to the bogus, invalid address instead of to the real e-mail address. Ultimately, any e-mail messages that are sent to that bogus address will not make it through to the intended recipient – this is true of both legitimate messages as well as SPAM.

Instructions for readers who wish to e-mail a contributor to this report:

1) Click on the desired e-mail address or copy the address into a new message inside your e-mail client.

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3) Write your message and send it out as you normally would.

Thank you for your understanding of this issue and for your willingness to work with any minor inconveniences associated with our use of this anti-spam method. We hope that readers will support our efforts towards eliminating this document as an inadvertent source of e-mail addresses that could be used by spammers, while still providing a means by which to contact individual contributors to this report.

Sincerely,

Steve Harmon

Chapter 1 INTRODUCTION

Contact: Steve Harmon, DEP BLWQ, Division of Environmental Assessment (DEA)

Tel: (207) 287-4971 email: Steve.Harmon@SPAM-ZAPmaine.gov

The following report is submitted to simultaneously fulfill requirements of the Clean Water Act (CWA) particularly the Section 305(b) Report, Section 303(d) List, and information requested under Section 314, and, also to serve as a biennial report to the Maine Legislature as required under 38 MRSA Section 464.3.A. The Maine Department of Environmental Protection (DEP) assembles these reports with input from many sources and recognizes that the Section 305(b) Report and Section 303(d) List are important ways of regularly communicating information on the health, current status and trends of the State's waters. Prior versions of the 305(b) Report and 303(d) List (compiled and published before 2002) were submitted as separate documents. However, Maine's 2002 CWA/MRSA submission was a significant departure from that earlier format, in that the various requirements from Sections 305(b), 303(d) and 314 were combined into a single document and submitted as an integrated report. Another change in the 2002 report format resulted in the removal of much of the narrative sections on specific program areas and/or recent projects. Likewise, the format of this 2004 integrated report is also somewhat different from either style of previous submissions, in that this current report utilizes the integrated format from the 2002 report, but it also includes updated narrative sections that are similar to those found in pre-2002 305(b) Reports.

Specifically, this 2004 Integrated Report provides:

- Delineation of water quality assessment units (AUs) based on the National Hydrography Dataset (NHD), identified by their 10-digit HUC (Hydrologic Unit Code),
- Water quality attainment status for every Assessment Unit,
- Status of and progress toward achieving comprehensive assessment of all waters,
- Basis for the water quality standard attainment determinations for each Assessment Unit,
- Schedules for additional monitoring planned for certain Assessment Units,
- Identification of Assessment Units requiring Total maximum Daily Load (TMDL) determinations and establishes a schedule (priority) for those waters,
- An updated narrative on many of the state's water-related programs areas. The narrative includes a consolidated public health section along with many revised descriptions (e.g. the state atlas, watershed management for stormwater programs and landfills),
- New sections on invasive aquatic organisms, finished waters, the DEP quality management system, among others.

As in 2002, a vital feature of this report is the continued utilization of the five main assessment categories that were first established in the 2002 report (see the section on listing methods for details). These new assessment categories required attainment determinations that were different from previous reports and thus may not be readily comparable to pre-2002 reports. In particular, impaired waters that were previously combined into a single 303d list are now separated into a number of lists and sub-lists under categories 4 and 5 in the 2002 and 2004 integrated reports. Although a few of the sub-categories have changed slightly, it is still the case that only those waters that are currently listed under category 5 will require development and submission of Total Maximum Daily Load (TMDL) assessment reports.

Assessment information contained in this report will also be submitted to the USEPA for inclusion into their Assessment Database (ADB). The ADB contains information on Assessment Unit and segment descriptions (dimensions, designated uses, etc.), assessment date, monitoring dates, types of information used in the assessment, and if use impairment is determined, the probable causes and sources. However, the current ADB version does not list the assessment category that is provided in the appendices of this report. When fully functional, the ADB will allow for the construction a number of 'reports' that summarize information contained in the database. Although, these 'reports' provide the basis for a number of the summary tables that are in the different chapters, the tables in this report were created from DEP-generated or DEP-acquired datasets.

One result of the ongoing conversion to the ADB, the adoption of Assessment Units based on the 10 digit HUC, and a general transition to higher quality data with better spatial resolution (e.g. the 1:24,000 scale NHD) is an apparent instability in the totals of assessed waters from report to report. An example of this phenomenon is that river and stream mile totals used in this report deviates slightly from those used in previous reports (31,199 miles in 2004, 31,171 miles in 2002 and 31,672 miles in 2000 and before). In addition to changes in the total numbers of assessed miles, some individual segment lengths have also changed slightly based on the improved coverage. Another example of slightly shifting totals for assessed waters would be the numbers of lakes and lake acres. Changes to these lake figures are contained in this report (e.g. 5,782 currently vs. 5,785 assessed lakes in 2002). Staff in the DEP Lakes Unit expects to see additional refinements in the 2006 report, as the Department completes its migration from a purely tabular database into a spatially oriented database via updated GIS layers. These new GIS datasets will allow for improved management of both locational information and morphometric data, and should greatly assist in stabilizing lake-related spatial calculations.

Current guidance for the Integrated Report does not require that the State to provide information on ground water or wetland resources, as has been the case in previous years. However, Maine has included information on assessment of these resources for many years in previous reports using the 1998 305b guidance document (see Parts V and VI). Updates on progress made towards developing improved assessments of these resources have been included wherever available.

Section 1-1 DATA SOURCES AND ACKNOWLEDGEMENTS

Sources of River and Stream Assessment Data

The Department generates much of the data for the assessment through the various monitoring programs it conducts, notably the Biomonitoring Program, Surface Water Ambient Toxics Monitoring Program, the Dioxin Monitoring Program, and the Atlantic Salmon Recovery Plan. Additionally, data is provided from a variety of professional and volunteer monitoring groups. These include other state agencies and resources (Department of Inland Fisheries and Wildlife, Atlantic Salmon Commission, Department of Human Services, University of Maine System), federal agencies (U.S. Environmental Protection Agency, U.S. Geological Survey, National Park Service), other governmental agencies (Saco River Corridor Commission, St. Croix International Waterway Commission), tribes (Penobscot Indian Nation, Houlton Band of Maliseets)

and a number of volunteer watershed groups / conservation organizations that are working cooperatively with DEP staff and that employ approved monitoring practices (Watershed councils of the Dennys, East Machias, Machias, Pleasant, Narraguagus, Ducktrap and Sheepscot Rivers, Presumpscot River Watch, Friends of the Royal River, Sheepscot Valley Conservation Association, The Nature Conservancy).

Sources of Lake Assessment Data

The Department's Lake Assessment Section manages much of the data collected from lakes within the state. A strong partnership with the Maine Volunteer Lakes Monitoring Program (VLMP, Inc.) assures the quality and comparability of the data collected through numerous regional entities and local lake associations. Regional entities include Cobbossee Watershed District, Lakes Environmental Association, St. Croix International Waterway Commission, Allagash Wilderness Waterway, Penobscot Indian Nation, Portland Water District, Auburn Water District, Acadia National Park, and Rangeley Lakes Heritage Trust. Data has also been acquired from private consultants (such as Lake and Watershed Resource Management Assoc., Biodiversity Research Institute, Florida Power and Light as part of regulatory requirements) and water utilities that belong to the Maine Association of Water Districts. Additional data is acquired through the Maine Department of Inland Fisheries & Wildlife (DIF&W) and through cooperative projects with the University of Maine System, Colby College, Unity College, Soil and Water Conservation Districts and similar entities.

Sources of Marine Assessment Data

The Maine Department of Environmental Protection (DEP), the Department of Marine Resources (DMR), the Casco Bay Estuary Project (CBEP) and a variety of volunteer monitoring groups monitor Maine's coastal waters. DMR monitors for indicators of human pathogens (fecal coliforms) and biotoxins (Paralytic Shellfish Poisoning). The purpose of the DMR monitoring is to protect human health by managing shellfish harvest areas. DEP monitors toxic contaminants in tissues and assesses water quality using data collected by DEP, especially the Surface Water Ambient Toxics program, and others. DEP participates in the Gulf of Maine Council's Gulfwatch Project that surveys toxic contamination in mussel tissue in the Gulf of Maine. The Maine State Planning Office, the University of Maine Cooperative Extension / Sea Grant, DMR and DEP collaborate in the Maine Shore Stewards Program to provide training, community support, information, grants and education for volunteer groups. The University of Maine Cooperative Extension runs the Clean Water/Partners in Monitoring program, the Marine Phytoplankton Monitoring Program and, with the participating state agencies, the marine Healthy Beaches program. DMR runs the Shellfish Sanitation Program Water Quality Volunteers program that is specifically focused on shellfish growing areas. Friends of Casco Bay monitors water quality in Casco Bay. The Casco Bay Estuary Project (CBEP), funded by EPA's National Estuary Program, also monitors and supports monitoring in Casco Bay and coordinates the National Coastal Assessment for the entire Maine coast.

Chapter 2 EXECUTIVE SUMMARY AND RESPONSE TO COMMENTS

Section 2-1 EXECUTIVE SUMMARY

Surface Waters

This report continues to base assessments of streams & rivers, lakes & ponds, and marine & estuarine waters on the five main listing categories that were initially established for these waters in the 2002 305b Report. These five main assessment categories are as follows:

Category 1: Attaining all designated uses and water quality standards, and no use is threatened.

Category 2: Attains some of the designated uses; no use is threatened; and insufficient data or no data and information is available to determine if the remaining uses are attained or threatened (with presumption that all uses are attained).

Category 3: Insufficient data and information to determine if designated uses are attained (with presumption that one or more uses may be impaired).

Category 4: Impaired or threatened for one or more designated uses, but does not require development of a TMDL (Total Maximum Daily Load) report.

Category 5: Waters impaired or threatened for one or more designated uses by a pollutant(s), and a TMDL report is required.

> (Please look to Section 4-1 on Assessment Methodology to find more detailed information on the listing categories and sub-categories.)

Because waters in these new assessment categories were determined based on attainment requirements that are different from pre-2002 305b Reports, they cannot be readily compared to results from those earlier reports. However, the results from the 2002 and 2004 reports can be compared directly in order to observe changes in the amounts of waters in each category. This is precisely the information that is displayed in Table 2-1.

Table 2-1 indicates that most of the change over this reporting period for rivers and streams came from reassigning the water quality with 3,256 miles of these waters (most of the total change) going from category 2 into category 1. This period also saw small gains in category 3 and 4 waters along with a slight reduction in the number of miles of rivers / streams in category 5, which is the category with most documented impairments.

This table also reveals that the lakes and ponds of Maine were relatively stable (as a percent of total assessed waters) with respect to their listing categories during the 2002 to 2004 time frame. This period saw reductions in categories 3, 4 and 5 and an increase in category 2 waters – overall these waters look to be improving.

Marine and estuarine waters showed the most volatility. These changes were due in large part to more thorough and extensive data collection from the Department of Marine Resources. This improved dataset allowed the DEP to more accurately assign coastal waters into the five listing categories. Overall, this table reinforces the idea that monitoring of these marine waters shows large areas of attainment and that

uncertainty of the data created the previous Category 3 listing. Most of the waters were moved from category 3 into category 2. However, a significant fraction of these waters have been moved into category 5, where they will require additional resources to attain better water quality.

Table 2-1 Summary of Changes to Surface Water Assessment Categories - 2002 to 2004

Rivers and Streams						
31,171 = Total Miles Assessed in 2002						
31,199 = Total Miles Assessed in 2004						
	2002 Miles in Category	**% of Total 2002 Assessed Miles**	**2004 Miles in Category**	**% of Total 2004 Assessed Miles**	**% Change '04 - '02**	**Change in Miles '04 - '02**
Category 1	1,072	3.44	4,328	13.87	10.43	3,256
Category 2	28,686	92.03	25,414	81.46	-10.57	-3,272
Category 3	250	0.80	269	0.86	0.06	19
Category 4	420	1.35	440	1.41	0.06	20
Category 5	741	2.38	737	2.36	-0.01	-4
Lakes						
987,172 = Total Acres Assessed in 2002						
987,172 = Total Acres Assessed in 2004						
	2002 Acres in Category	**% of Total 2002 Assessed Acres**	**2004 Acres in Category**	**% of Total 2004 Assessed Acres**	**% Change '04 - '02**	**Change in Acres '04 - '02**
Category 1	285,023	28.87	285,023	28.87	0.00	0
Category 2	556,277	56.35	569,540	57.69	1.34	13,263
Category 3	32,610	3.30	26,788	2.71	-0.59	-5,822
Category 4	90,344	9.15	89,102	9.02	-0.14	-1,242
Category 5	22,918	2.32	16,719	1.69	-0.63	-6,199
Marine Waters (Acres)						
1,821,433.6 = Total Acres Assessed in 2002						
1,821,433.6 = Total Acres Assessed in 2004						
	2002 Acres in Category	**% of Total 2002 Assessed Acres**	**2004 Acres in Category**	**% of Total 2004 Assessed Acres**	**% Change '04 - '02**	**Change in Acres '04 - '02**
Category 1	0.00	0.00	0.00	0.00	0.00	0.00
Category 2	1,502,336.00	82.48	1,722,079.30	94.55	12.06	219,743.30
Category 3	305,664.00	16.78	3,986.00	0.22	-16.56	-301,678.00
Category 4	10,745.60	0.59	697.00	0.04	-0.55	-10,048.60
Category 5	2,688.00	0.15	94,671.30	5.20	5.05	91,983.30
Marine Waters (Square Miles)						
2,846.0 = Total Square Miles Assessed in 2002						
2,846.0 = Total Square Miles Assessed in 2004						
	2002 Square Miles in Category	**% of Total 2002 Assessed Square Miles**	**2004 Square Miles in Category**	**% of Total 2004 Assessed Square Miles**	**% Change '04 - '02**	**Change in Square Miles '04 - '02**
Category 1	0.00	0.00	0.0	0.00	0.00	0.00
Category 2	2,347.40	82.48	2,690.75	94.55	12.06	343.35
Category 3	477.60	16.78	6.23	0.22	-16.56	-471.37
Category 4	16.80	0.59	1.09	0.04	-0.55	-15.70
Category 5	4.20	0.15	147.92	5.20	5.05	143.72

Two important listing changes should be noted in this 2004 report. Waters that are listed in non-attainment, caused solely by Combined Sewer Overflows (CSOs), have been moved from Category 5 to Category 4. The CSO Master Plans and associated enforcement controls provide the same mechanisms for control that could be gained through a Total Maximum Daily Load (TMDL) assessment and these waters are thus more appropriately listed in Category 4. Secondly, waters previously listed in Category 5 for non-attainment due to mercury have been moved to Category 4. The State has already taken aggressive action, as cited in the report, to reduce sources of mercury within the State's jurisdiction. Further mercury reductions will be required from sources outside the State's boundaries to provide the desired reduction of mercury in Maine's waters. Such reductions cannot be achieved through a state-directed TMDL process.

Wetlands

Maine DEP began development of a biological monitoring and assessment program for freshwater wetlands in 1998 as part of the biomonitoring program. The Biological Monitoring Program provides water quality information for a wide array of programs, and includes ambient monitoring, evaluation of water quality classification attainment, and assessment of risks and impacts.

The wetlands initiative currently focuses on aquatic macroinvertebrates as indicators of wetland ecological integrity, and plans to build capacity to assess multiple biological assemblages including algae (needed for development of nutrient criteria) and plant communities. Key wetland related activities include (1) ambient monitoring and assessment of wetland condition, (2) development of biological criteria for wetlands, (3) inclusion of wetlands in comprehensive State water quality monitoring strategy, (4) development of Internet Mapping Project to provide public access to biomonitoring data, and (5) development of landscape-level assessment tool to predict threats to wetlands.

Ground Water

Responsibility for groundwater resource assessment and protection is shared among the Department of Environmental Protection, the Department of Human Services' Division of Health Engineering, and the Maine Geological Survey in the Department of Conservation. Several other agencies, particularly the Department of Transportation, Department of Agriculture, and State Planning Office may investigate groundwater contamination problems in certain areas and they also contribute to groundwater protection through development of ordinances and management practices that are designed to reduce the risk of impacting groundwater quality.

A significant portion of Maine's groundwater may be threatened by contamination, particularly in unforested areas, which comprise approximately 11% of the State. Drinking water quality, including private and public well supplies, is an issue that carries significant public concern. Public interest in groundwater is primarily focused on its use as a drinking water supply (provides 60% of all human demand and 75% of livestock demand statewide) and on its use as a source of process water for industry. Numerous wells in Maine have been made unpotable by pollution from specific point sources and also from nonpoint source pollution. Important sources of groundwater contamination in Maine include disposal activities such as landfills and septic systems, leaking storage facilities, agriculture, and at sites contaminated with spilled hazardous materials or by previously unregulated activities.

Major impediments to effective ground water protection in Maine include; the absence of a complete ground water quality database to assess the extent of degradation, the lack of data to quantify the impact of some nonpoint pollution sources, and general public unfamiliarity with key ground water concepts and issues. Public misconception about ground water is probably the major factor contributing to degradation of this resource. Recent development of a comprehensive and accessible database for groundwater data (EGAD) will increase public understanding of the state's resource and improve operations at the agencies responsible for groundwater protection and assessment. Principle uses of this database are to (1) help design clean-up strategies in areas of known contamination; (2) plan future development that better provides for protection of public health and safety; (3) assist in prioritizing protection of sensitive ground water and surface water bodies, wetlands, and other resources; (4) enhance understanding of the spatial relationships between water resources and population as they relate to potential or known pollution sources; and (5) assess the flow and transport interrelationships between surface and ground water quality, in order to evaluate groundwater impacts on surface water bodies and on groundwater-dependent habitat.

Section 2-2 RESPONSE TO COMMENTS

Process to Solicit Public Comments

The following subsections detail the actions taken by the Department of Environmental Protection to promote the public's knowledge of the existence and availability of the draft version of the 2004 Integrated Water Quality Monitoring and Assessment Report (commonly known as the 305b Report). This process was undertaken in order to gain comments from the public on the contents and conclusions of the draft report. The official period of time that the Report was available for public comment was from Wednesday, June 23rd to the close of business on Monday, July 26th, 2004.

In addition to the public comment process outlined below, the draft version of the 2004 305b Report was reviewed internally by Department staff as well as by Federal EPA staff in order to produce the final version of the Report. Comments and edits from these sources all helped to produce this, the final version of the document.

Report Posting on the Department's Website:

On June 22nd, 2004 the Department posted the draft 2004 305b Report as three digital files in the popular Adobe® Portable Document Format (PDF) on the public comments section of its Bureau of Land and Water Quality website. Hardcopies of the draft report would be made available to anyone who requested the Report in that format.

Postal Mailing to the Agency Rulemaking Subscription Service List:

The Department offers a subscription service that provides notification of both rulemaking changes and rule adoption for all department rules. Subscribers to this service include both individual citizens and representatives of organizations that wish to be contacted when the DEP releases rulemaking information. During the week of June 20th, 2004 the Department mailed out approximately 150 letters to people and entities on the Agency Rulemaking Subscription Service List, including all other

natural resource agencies within state government. The text of that letter follows and is italicized in order to differentiate it from other text contained in this Report.

Maine's 2004 Integrated Water Quality Monitoring and Assessment Report

Available for Public Comment until July 26, 2004

The Department of Environmental Protection has prepared a draft 2004 Integrated Water Quality Monitoring and Assessment Report for submission to the U.S. Environmental Protection Agency as required of Sections 305(b) and 303(d) of the Clean Water Act, and in fulfillment of the reporting requirements of 38 M.R.S.A. Section 464.3.A of the State of Maine's Water Classification Program.

This report is available for public comment until July 26, 2004. Reviewers of the document should pay particular attention to the categories and listing methods required by the USEPA for the surface water assessments in this report. These methods are described in Chapter 4. Specific surface waterbody attainment and impairment assignments can be found in the Appendices. The appendices are broken into three waterbody types: rivers/streams, lakes, and estuarine/marine waters. Categories 1-3 are for waters that are not impaired, categories 4 and 5 are for water segments that are impaired for one or more use.

In addition to the attainment/impairment listings, please take note of two recommended proposals on the exclusion of Total Maximum Daily Load (TMDL) requirements for certain impaired waters by listing them in Category 4-B of the report. The Department, following the work of a regional innovation seminar facilitated by Region 1 EPA, is proposing to move two types of impaired waterbodies from Category 5 to Category 4-B. These two types are waterbodies impaired by bacteria from municipal combined sewer overflows (CSOs), and all freshwaters that are only impaired as a result of mercury. Category 4-B is reserved for waters impaired or threatened for one or more designated uses, but does not require the development of a TMDL because other pollution control requirements are reasonably expected to result in attainment of water quality standards.

The department's work with municipalities to create CSO master plans with specific and enforceable deadlines will eliminate sub-standard bacterial discharges to these waters. A TMDL is not a better tool to meet standards than these master plans, which have already been completed and approved.

Similarly, the region's work to significantly reduce mercury emissions in the last six years has shown that there are existing statutory and regulatory controls in place that will reduce Maine and New England's local sources to very low levels. Controlling out-of-state sources of mercury deposition is the remaining task to remove our fish advisories. A state-directed TMDL will not accomplish that, but further action on national mercury policy by Maine and the Region can.

See Chapter 4, section 4-1 (Relisting Impaired Waters Categories) for the detailed justification of the CSO 4-B proposal and the mercury 4-B proposal. The Department is confident that these two proposals will allow us to best focus resources on work that will produce direct environmental benefits.

The draft documents (pdf files) can be found on the Department's website at:
http://www.state.me.us/dep/blwq/comment.htm

We encourage you to review the document and provide comment on this year's report. Comments should be sent to:

David Courtemanch
Maine Department of Environmental Protection
State House #17
Augusta, ME 04333

by fax: 207-287-7191
by email: Dave.L.Courtemanch@maine.gov

Legal Notice:

During the week of June 20th, 2004 the Department prepared a legal notice that ran in four daily newspapers located around the state. Those newspapers (and current weekday circulations) were as follows: The Bangor Daily News (62,730), The Kennebec Journal (14,877), The Lewiston Sun Journal (34,278), and The Portland Press Herald (75,577). The text of that legal notice follows and is italicized in order to differentiate it from other text contained in this Report.

Legal Notice

Maine Department of Environmental Protection

Notice of Public Comment for the "2004 Integrated Water Quality Monitoring and Assessment Report"

The Department of Environmental Protection has prepared the "2004 Integrated Water Quality Monitoring and Assessment Report" for submission to the U.S. Environmental Protection Agency as required of Sections 303(d) and 305(b) of the Clean Water Act, and in fulfillment of the reporting requirements of 38 M.R.S.A. Section 464.3.A of the State of Maine's Water Classification Program. This report is available for public comment until close of business July 26, 2004. Reviewers of the document should pay particular attention to the listing methods required by the USEPA for surface water assessments for this report. These methods are described in Chapter 4 of the document. Specific waterbody attainment and impairment assignments can be found in the Appendices. The report (pdf files) may be found on the Department's website at: http://www.state.me.us/dep/blwq/comment.htm

Comments should be sent to:
David Courtemanch
Maine Department of Environmental Protection
State House #17
Augusta, ME 04333

by fax: 207-287-7191
by email: Dave.L.Courtemanch@maine.gov

Press Release:

On July 8th, 2004 the Department of Environmental Protection issued a press release designed to inform the public of the availability of the draft 2004 305b Report. This release also described how the DEP was seeking public comment on water quality listings in the Report. Between fifteen and eighteen radio, television and print outlets around the state would have received the press release and it was also linked to a news headline on the Department's homepage. The release also went to the Associated Press, which places the release on its "wire" for other media outlets to pick up on and run, if they so choose. The text of that press release follows and is italicized in order to differentiate it from other text contained in this Report.

July 8, 2004

Contact: David Courtemanch
(207) 287-3901

REPORT CARD ASSESSES STATE WATER QUALITY; DEP SEEKS PUBLIC COMMENT FOR FUTURE IMPROVEMENTS

*(AUGUSTA)—The State wants feedback on its latest review of the health of Maine's lakes, streams, rivers, estuaries and coastal waters. The ratings contained in the final version of the 2004 Integrated Water Quality Monitoring and Assessment Report will determine planning and funding priorities for water quality improvements. DEP is asking the public to comment on the draft now posted on the web (*www.maine.gov/dep/blwq/comment.htm*). The comment deadline is July 26.*

"Feedback from the public on the accuracy of our evaluations is important to this process, " says Dr. David Courtemanch, director of the DEP's Division of Environmental Assessment. "Because these assessments drive decisions as to how particular public waters will be managed into the future, we encourage citizens to review the ratings."

The report (also known as the "305b Report", a requirement of the federal Clean Water Act) is a water quality snapshot. Because it is prepared every two years, the public can look back to see if and how the assessment of their favorite lake or stream has changed. One section of particular note to many is a listing of waters considered to be "impaired".

"An 'impaired' listing can set into motion specific management activities designed to bring a water body back into full-use compliance," notes Courtemanch. "Those activities can range from more vigilant monitoring to complete abatement of a pollutant."

Courtemanch offers examples to illustrate his point:

"Kennedy Brook was on the state's 2002 impaired waters list, prompting action to treat urban runoff. A stormwater diversion project completed by the Augusta Sanitary District has paid off, and we have been able to take Kennedy Brook off the list."

(more)

Similarly, Estes Lake in York County has improved. Recent upgrades to a municipal wastewater treatment in Sanford resulted in a decrease of the algae blooms that had caused the lake to be on the impaired list in years past.

At the same time, says Courtemanch, new impairments have been discovered.
These include Sewall Pond in Arrowsic, which is listed in 2004 because of increasing nutrients and algae.

The 2004 Integrated Water Quality Monitoring and Assessment Report is based on information gathered by the DEP along with other state, federal, tribal and local agencies, non-government organizations and volunteer monitoring groups. DEP analyzes the data to assess the capacity of Maine waters to support drinking, fishing, recreation (such as swimming) and the ability to sustain aquatic life as defined in Maine's water classification laws. The report also provides extensive information on the status of Maine's ground water and wetland resources.

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Summary of Public Comments and Responses

The Department received public comments from New England Organics, Stephen R. Sutter, FPL Energy Maine Hydro LLC, Kennebunk Sewer District, and the Natural Resources Council of Maine. Issues raised by comments from these organizations or individuals are either quoted or paraphrased and are presented in italic typeface. The DEP response to that comment will follow the comment and may address how the issue was dealt with in the final draft of the report (if the text does not indicate that any changes were made to the body of report, then none were made).

New England Organics

The following section contains DEPs response to a July 26th, 2004 letter from Mr. James W. Ecker, General Manager of New England Organics.

NEO: *"New England Organics has been involved in an investigation of groundwater impacts at our Hawk Ridge Facility site for many years…[f]rom these investigations it is clear that nitrate exceeding state standards existed in the groundwater prior to our facility being built, and was likely due to the property's previous life as an active dairy farm…"*

DEP: This comment addresses draft text that has been edited out of the final version of this report.

NEO: *NEO has requested that "the bullet point referencing the groundwater nitrate at Hawk Ridge Compost Facility be removed from the 305b report…In the event that you decide not to remove this paragraph, we have prepared a revision that we believe more accurately describes the groundwater study at Hawk Ridge Compost Facility, and provides at least minimal context for the single data point that the Department chose to highlight…At the Hawk Ridge Compost Facility, Unity Township, a recently installed monitoring well (supplementing the existing network of monitoring wells) has shown a single groundwater nitrate level in excess of 200 ppm, at one location, as a result of an apparent leak from the biofilter. Although the exact source of nitrate has not been determined, the biofilter leak has been repaired to address that potential source. Historically, groundwater nitrate levels at this site, which was previously an active dairy and poultry farm for over 75 years, have fluctuated, but currently range from 1 to 50 ppm. No other significant groundwater issues have been observed."*

DEP: This comment addresses draft text that has been edited out of the final version of this report.

NEO: *The Leeds project is a demonstration project done in concert with a DEP approved monitoring program to determine the actual costs, benefits and extent of impacts associated with an [sic] one time reclamation program. The applicants of this demonstration project have expended a tremendous amount of resources, including extensive background monitoring work, to assess the impacts from this experimental study. There has been nitrate detected in a downgradient monitoring well that exceeds the state standards. However, the impact has been extremely limited, both in magnitude and distance.*

DEP: This comment addresses draft text that has been edited out of the final version of this report.

Mr. Stephen R. Sutter

The following section contains DEPs response to a July 8th, 2004 e-mail from Mr. Stephen R. Sutter (Mr. Sutter works for the University of California Cooperative

Extension as an Area Personnel Management Farm Advisor for Fresno, Kings, Madera, and Tulare Counties).

SUTTER: *"Please consider mentioning that 258 mining operations were licensed (1970-93) under the Site Law. I feel this would give the reader a somewhat better perspective on how much mining is going on. (And makes at least one reader wonder if the post-1993 program is in any way more stringent.)"*

DEP: Mr. Sutter's comments refer to a section of the 305b report on gravel pits, which has been revised in response to his suggestions. Specifically, Department staff added language to clarify the number of pits licensed under the Performance Standards and the Site Location Law. In addition to the above clarification, overall compliance rates were also included in the narrative. With these changes in place, DEP staff believes that Mr. Sutter's comment has been addressed.

FPL Energy Maine Hydro LLC

The following section contains DEP's response to a July 26, 2004 letter from Mr. F. Alan Wiley, Director, Business and Regulatory Affairs for FPL Energy Maine Hydro LLC.

FPL: *FPL objects to the use of DEP Chapter 581 as a reference to criteria used to assess wetted habitat and attainment of aquatic life use.*

DEP: The department agrees in part with this comment. Chapter 581 is specific to rivers and streams and is deleted from reference for lakes and ponds in this draft. In as much as the rule is intended to provide zone of passage limits caused by pollutants (quality limitations), the desired outcome of that rule is to provide an adequate corridor of passage for aquatic organisms and thus the department also requires provision for sufficient quantity of water for passage as well. Both conditions need to be provided for use attainment to be protected. The department uses the 75% criteria when determining if a sufficient quantity of cross-sectional and areal habitat is available.

FPL: *FPL objects to the use of "hydromodification" as a source category for impairment for lakes (Table 4-11) and that this term creates an inconsistency since hydropower is a designated use for many Maine waters.*

DEP: The "hydromodification" source category comes from the USEPA (Category 7000 found in Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates, USEPA, 1997). The DEP finds that the listed lakes have impairment of aquatic life use, and that management of these lakes for hydroelectric purposes is the source of that impairment. While hydroelectric generation is a designated use for Maine lakes and ponds, management for the benefit of one use cannot cause another designated use to be impaired.

FPL: *FPL objects to Category 4 non-attainment aquatic life use designation due to hydromodification.*

DEP: Maine statute (38 M.R.S.A. Sections 464.9 and 465-A) clearly establishes aquatic life as a designated use for Class GPA waters and establishes applicable standards by which aquatic life use can be evaluated, including standards specific to "hydropower impoundments managed as great ponds". Where no pollutant is involved with the listings that are affected by hydromodification, it is appropriate that these waters be included in Category 4.

Kennebunk Sewer District

The following section contains DEPs response to a July 26th, 2004 letter from Mr. Willis T. Emmons, District Manager for the Kennebunk Sewer District.

KSD: *Appendix III, Category 5-A, page 88 - The KSD feels that the table is inaccurate because the source was listed as solely a "Municipal Point Source". The KSD noted that the low dissolved oxygen is due to a number of sources including years of industrial use upstream from the KSD facility.*

DEP: The table was amended to include nonpoint source pollution and sediment oxygen demand as sources. The waterfall and riffles upstream of KSD's outfall indicate that there is adequate dissolved oxygen to meet water quality standards in that segment of the river. (Note: Appendix III as referred to in KSDs comment is now Appendix IV in this revised draft.)

KSD: *Appendix III, Category 5-B-1, page 89 - KSD feels that the table is misleading.*

DEP: This line in the table has been combined with Category 5-A (above) and no longer appears in Category 5-B-1. The Department of Marine Resources (DMR) has sampled the estuary at the Route 9 bridge and found elevated counts of fecal coliform bacteria. The source(s) of fecal coliform bacteria in the estuary remains undetermined. Upstream of the Route 9 bridge is an extensive marsh that is a wildlife preserve and there is also one overboard discharge upstream of the bridge that is inspected by DEP. Fecal coliform bacteria data are available from the DMR and they are the agency that determines sampling locations and compliance. However, even if fecal coliform bacteria counts are not elevated, the DMR may choose to close areas that it feels might be influenced by a sewage treatment plant discharge. (Note: Appendix III as referred to in KSDs comment is now Appendix IV in this revised draft.)

Natural Resources Council of Maine

The following section contains DEP's response to a July 26, 2004 e-mail from Mr. Nick Bennett, Staff Scientist, for the Natural Resources Council of Maine.

NRCM: *NRCM expresses concern that Category 4 (requiring no TMDL) creates an opportunity for impaired waters to be exempted from a TMDL requirement.*

DEP: Categories 4 and 5 are used to assign impaired waters, the difference being that those listed in Category 5 are required to have the state prepare a TMDL analysis. Waters are placed in Category 4 when a TMDL is not needed (e.g. other regulatory mechanisms are already in place such as specific legislation addressing the problem with appropriate timetables for attainment, new licenses, or other actions expected to bring a waterbody into attainment; or where pollutant loads are not the source of non-attainment). It is important that the DEP does not overburden its resources for TMDL work by assigning all impaired waters to Category 5 where it can be shown that the TMDL process is either an unnecessary, inappropriate or inefficient management tool, and would delay the process of bringing a waterbody back into attainment. The DEP is fully committed to bringing all impaired waters into attainment using the most efficient means, but finds that it is important for states to be able to discriminate how they manage their impaired waters by employing the TMDL approach where it is most suited. The DEP presently does not list waters, in either Category 4 or 5, that do not meet water quality criteria solely due to natural conditions (38 M.R.S.A. Section 464.4.C). Therefore it is not possible for a discharger to avoid a TMDL by arguing that attainment is due entirely to background conditions. It is possible that a TMDL analysis will determine that a discharger has an inconsequential effect on non-attainment conditions (Togus Stream is an example of this situation), but it did not preclude the TMDL process from being conducted.

NRCM: *NRCM disagrees with the listing proposal for mercury to Category 4 (requiring no state TMDL) and requests clarity of what is meant by a "regional TMDL".*

DEP: Further elaboration is made in the final draft document supporting the "off-ramp" of mercury-only listings to Category 4 (see Section 4-1). In brief, the DEP's recommendation is that non-attainment listings that solely involve mercury cannot be resolved by a TMDL conducted by Maine and that other approaches be used (e.g. the so-called Alternative Regulatory Pathway proposal recommended by MA DEP). Sources of mercury are varied and diffuse and, to a very great extent, occur outside the state. What Maine has accomplished in recent years is to pass comprehensive legislation and rules that remove or control all significant sources within the State (cited in the text). The department concludes that these actions constitute the requirements by the USEPA for enforceable controls on sources that allow a listing to be moved from Category 5 to Category 4. The Maine DEP, along with several other states, recommends that any TMDL approach be conducted at a much larger scale than state boundaries. This recommendation is supported by the Environmental Committee of the Conference of New England Governors and Eastern Canadian Premiers, the Association of State and Interstate Water Pollution Control Administrators, and the New England Interstate Water Pollution Control Commission.

NRCM: *NRCM disagrees with the use of the proposed above-below test for dioxin.*

DEP: The decision to use a "preponderance of evidence" approach (POE) for the above-below dioxin test was made by the DEP using an independent peer review body to guide the department's decision, and also considering comments from the Surface Water Ambient Toxics (SWAT) advisory committee of which Mr. Bennett is a member. Arguments can be made for the selection of either the POE approach or an "independent applicability" approach that was favored by NRCM. In selecting a final test, the department weighed information about each of the tests that were tried. The department considered all the same information provided in NRCM's e-mail in reaching its decision.

NRCM: *NRCM disagrees that there is no "identifiable and controllable load for dioxin" related to lobster advisories.*

DEP: While sources of dioxin can be readily identified in Maine's inland waters, it is the DEP's assessment that dioxin contamination in marine organisms cannot be linked directly to these sources. In the marine environment, these sources become blended with each other, with other sources in the Gulf of Maine outside the state, with nonpoint sources, and with atmospheric sources. The migratory nature of the organism further obscures any link between contamination and source. It should be noted that while Maine has tracked a decline in dioxin discharge from the primary sources (pulp and paper industry), and a decline of dioxin in freshwater fish associated with these discharges, there has been no comparable decline in dioxin found in Maine lobster tomalley that would link the contamination in these organisms with known sources. Data does indicate higher concentrations in estuaries with known upstream sources, however, dioxin discharge from these sources is already controlled by statute (38 M.R.S.A. Section 420), the same regulatory provision that allows freshwater rivers contaminated by dioxin to be listed in Category 4.

NRCM: *NRCM disagrees that impoundments cause the non-attainment problems on the Androscoggin and Sebasticook rivers.*

DEP: The DEP will correct the report to reflect that impairment on these waters is caused by pollution loads. Impaired listings for these waters (ME0103000309 and ME0104000208) in the Appendix identify pollutant loads as sources.

Chapter 3 BACKGROUND

Section 3-1 STATE ATLAS AND WATER QUALITY STANDARDS

Contact: Steve Harmon, DEP BLWQ, Division of Environmental Assessment (DEA)

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The introduction to this report referenced the fact that many state agencies and other organizations are in the (ongoing) process of acquiring spatial data with much better resolutions than was previously available. This is a time of rapid change in GIS-compatible datasets, not only in the resolutions and types of spatial data that are becoming available, but also of a great reduction in the relative costs and speed of data acquisition, particularly in the areas of digital aerial photography and satellite imagery. The introduction also pointed out that these improving sources of data do cause slight changes and shifts in figures that are reported for the lengths or areas of total waters that are assessed during a reporting cycle. This is likely to continue and perhaps accelerate at times into the foreseeable future.

The reader should be aware that although available sources of spatial data used to construct this atlas are improving, none of them are completely accurate at every location. For example, the 2004 Report Atlas (Table 3-1) land cover category areas were determined from a Maine GAP (Gap Analysis Program) Land Cover and Vegetation Dataset primarily derived in the early 1990s (for more information on GAP visit www.gap.uidaho.edu). The smallest unit area used in this dataset covers 900 square meters (or a 30-meter square). This means a unit area that contains many different types of land cover (e.g. roughly half water and half land) could be misclassified as one or the other cover type rather than both. In the spring of 2005, the state will receive similar land cover type dataset with a unit area of 25 square meters (a square five meters to a side), based on data collected as recently as 2004. In this case, changes between these datasets will come from a difference in the resolution of the data and from the fact that these data were collected over ten years apart from one another, reflecting human-induced changes in land use. So while the following figures are useful in visualizing the composition of the State of Maine, these values should only be considered approximations. The atlas (Table 3-2) from the 2000 305(b) has been reproduced in this report to allow the reader to directly compare some of the changing figures described above and below.

The State of Maine has a total surface area of over 35,000 square miles – with dry land comprising almost 31,000 square miles and the larger surface waters occupying the remaining 4,500 square miles. With an estimated population of approximately 1.3 million people, Maine is the largest but least densely populated state in New England. However, since most of the population is concentrated in the southern and coastal portions of the State and into a broad band on either side of Interstate 95, regional population densities may vary considerably from the state's average population density.

From elsewhere in the report, Maine's 5,782 lakes and ponds cover 987,172 acres, an area that is somewhat larger than the State of Rhode Island. There are over 7,000 perennial brooks, streams and rivers in Maine, ranging in length from less than two miles to nearly 200 miles, with an estimated total length of 31,199 miles. These water resources are reported in slightly varying numbers in the 2004 atlas.

Recently there has been increasing interest in both international and state borders. The St. Croix, St. John, St. Francis, Southwest Branch of the St. John and other rivers, lakes and coastal waters make up almost half (~279 miles) of the ~609 mile-long U.S./Canada boundary. Also, the Salmon Falls, Piscataqua and other rivers, lakes and coastal waters lie on the Maine/New Hampshire line and account for nearly one-third (~60 miles) of the ~189 mile long boundary.

Although there are definitely no complete inventories of inland and coastal wetlands and marshes in Maine, the conservative estimates in this year's atlas approach a total area of almost 3,200,000 acres. This number does not include over 7,500 smaller, but known wetlands that are less than 3 acres in size (individually). Also noteworthy, is that at least 1,241 square miles of the state are underlain by significant sand and gravel aquifers.

When queried, the current version of the Geographic Information System (GIS) boundary data layer returns a value of 5,261 miles of coastline. As with many of the other data sets, this value differs slightly from earlier reports. The year 2000 atlas reported 5,296 coastal miles of shoreline (also based on 1:24,000 USGS maps data provided by the Maine Office of Geographic Information Services (MeGIS). This year's estimate was still higher, yet slightly closer to the number of coastline miles (5,249 miles) that were reported in the 1998 305b report.

Over 400 river and stream systems, ranging in size from a few hundred acres to over 1,850 square miles, empty into Maine's estuarine and near shore waters. For most reporting purposes, Maine is divided into 6 major drainage basins. Two of these (the Western Coastal Basin and Eastern Coastal Basin) are, in fact, made up of dozens of smaller basins that empty into the Atlantic Ocean. Large portions of 4 river basins extend out beyond Maine and are located in New Hampshire, Quebec and New Brunswick.

Please note: As was described to in both the Introduction and earlier in this section of the report, sources of data used in developing this report are currently and almost constantly evolving. The number of lakes, reservoirs and ponds, and the acres of lakes, reservoirs and ponds used in this report are taken from the Maine Department of Inland Fisheries and Wildlife (DIFW) Lake Index file rather than from USEPA RF3/DLG estimates. The Maine DEP believes that the DIFW Lake Index file (determined from 15' USGS topographic maps; 1:62,500 scale) provides a more accurate estimate of lake numbers and acres than the USEPA RF3/DLG estimates (based on maps having 1:100,000 scale). In addition, all of our lake data is referenced by a lake identification number, as is the DIFW database containing lake acreages. It would be a substantial task to link the USEPA RF3/DLG acreage estimates to our database, and this could potentially introduce error due to map scale differences. (However, the base data used to generate lake figures is currently undergoing a change from the DIFW Lake Index to a GIS-based system – DEP Lakes Unit staff utilized only DIFW data for the 2004 report, but expects to be completely transitioned to the new dataset by the 2006 reporting cycle.)

Table 3-1 The 2004 305(b) Report State of Maine Atlas

Population or Natural Resource Category	Value	Percent
State Population (July 1, 2003 Estimate) *	**1,305,728.0**	**100%**
Total State Surface Area (square miles) *	**35,384.7**	**100%**
State Area – Dry Land (square miles) * [1]	30,861.6	87%
State Area – Surface Water (square miles) * [2]	4,523.1	13%
Total State Area (square miles) [3]	**29,699.2**	**100.0%**
Total Fields (square miles) [3]	**2,297.9**	**7.7%**
Abandoned Field	72.7	0.2%
Blueberry Field	50.7	0.2%
Grasslands (hayfield, pastures)	1,768.9	6.0%
Crops/Ground (includes plowed ground)	405.5	1.4%
Total Forest (square miles) [3]	**26,519.8**	**89.3%**
Clear-cut	448.7	1.5%
Early Regeneration	2,017.6	6.8%
Late Regeneration	1,114.1	3.8%
Light Partial Cut	430.0	1.4%
Heavy Partial Cut	577.5	1.9%
Deciduous Forest	4,934.4	16.6%
Deciduous/coniferous Forest	5,139.9	17.3%
Coniferous/deciduous Forest	6,783.7	22.8%
Coniferous Forest	2,960.1	10.0%
Deciduous Forested	392.5	1.3%
Coniferous Forested	1,706.4	5.7%
Dead-forest	14.8	0.0%
Total Scrub-Shrub (square miles) [3]	**725.4**	**2.4%**
Deciduous Scrub-shrub	653.3	2.2%
Coniferous Scrub-shrub	71.7	0.2%
Dead Scrub-shrub	0.4	0.0%
Total Freshwater Wetlands (square miles) [3]	**600.2**	**2.0%**
Fresh Aquatic Bed	0.6	0.0%
Fresh Emergent	326.9	1.1%
Peatland	191.4	0.6%
Wet Meadow	81.2	0.3%
Total Saltwater Wetlands (square miles) [3]	**116.4**	**0.4%**
Salt Aquatic Bed	82.9	0.3%
Salt Emergent	33.5	0.1%
Total Earth-Material Shorelines (square miles) [3]	**152.0**	**0.5%**
Mudflat	93.2	0.3%
Sand Shore	12.6	0.0%
Gravel Shore	17.0	0.1%
Rock Shore	29.2	0.1%
Total Freshwater Surface Area (square miles) [3]	**1,849.6**	**6.2%**
Shallow Water	89.7	0.3%
Open Water	1,759.9	5.9%
Total Saltwater Surface Area (square miles) [3]	**2,273.4**	**7.7%**

Total Residential/Urban/Industrial/Paved Ways (square miles) [3]					**404.4**	**1.4%**
Sparse Residential					261.2	0.9%
Dense Residential					134.5	0.5%
Urban/Industrial					5.7	0.0%
Highways/Runways					3.0	0.0%
Total Alpine Tundra (square miles) [3]					**8.0**	**0.0%**
Total Exposed Rock / Talus (square miles) [3]					**17.2**	**0.1%**
Total Miles of Coastline (including tidal rivers & shorelines of islands) [4]					**5261.0**	N/A
Total Miles of Border Coast, Lakes & Rivers Shared with CA and NH [4]					**338.9**	**100%**
Maine – Canadian Border (coastal water miles out to the "3 mile" limit)					39.4	12%
Maine – Canadian Border (lake miles)					33.0	10%
Maine – Canadian Border (river miles)					206.2	61%
Maine – Canadian Border (total water miles) [4]					**278.6**	**82%**
Maine – Canadian Border (total land and water miles)					*608.7*	*N/A*
Maine – New Hampshire Border (coastal water miles out to the "3 mile" limit)					17.3	5%
Maine – New Hampshire Border (lake miles)					17.7	5%
Maine – New Hampshire Border (river miles)					25.4	7%
Maine – New Hampshire Border (total water miles) [4]					**60.3**	**18%**
Maine – New Hampshire Border (total land and water miles)					*188.8*	*N/A*
Total Miles of Rivers and Streams in Maine [4]					**45,149.0**	**100%**
Miles of perennial streams (subset)					25,617.1	57%
Miles of intermittent [nonperennial] streams (subset)					13,461.3	30%
Miles of rivers (subset)					6,070.6	13%
Miles of Rivers, Streams and Wetland Flowpaths by Stream Order [5]						
Stream Order	*Flowing*	*Intermittent*	*Perennial*	*Wetland Flowpath*	*Total*	*N/A*
1	24,779.08	11,291.27	13,009.22	546.79	27,965.8	100%
2	9,838.34	1,823.24	7,828.66	212.58	12,285.8	44%
3	4,338.84	355.31	3,928.60	65.23	6,986.1	25%
4	1,059.94	68.87	975.64	16.44	3,722.5	13%
5	154.89	12.11	141.55	1.30	1,882.8	7%
6	15.87	2.22	13.70	0.02	1,010.6	4%
7	0.76	0.00	0.76	0.00	246.2	1%
8	0.00	0.00	0.00	0.00	34.1	< 1%
Totals:	*40,187.72*	*13,553.02*	*25,898.13*	*842.36*	*54,133.9*	*N/A*
Miles of Rivers and Streams by Water Class [4]						
Water Class	*Streams*	*(% of Stream Miles)*	*Rivers*	*(% of River Miles)*	*Class Totals*	*N/A*
Class AA	1,369	3.47%	1,274	20.99%	2,643.0	6%
Class A	17,549	44.44%	2,540	41.85%	20,089.0	44%
Class B	20,026	50.72%	1,782	29.36%	21,808.0	48%
Class C	542	1.37%	474	7.81%	1,016.0	2%
Totals	*39,486*	*100%*	*6,070*	*100%*	**45,556.0**	**100%**
Number of Lake, Pond and Reservoir Features in DEP's GIS Datalayer [4]					33,065	100%
Number of Above Waterbodies assigned a MIDAS ID Number (subset) [4]					6,027	18%
Number of Significant Publicly Owned Waterbodies (subset) [4]					2,314	7%

Total Areas of the Waterbodies Described Below:	Square Miles	Acres
Lake, Pond & Reservoir Features the Maine DEP's GIS Datalayer [4]	1,563.3	1,000,527.2
Lakes, Ponds & Reservoirs with an assigned MIDAS Number (subset) [4]	1,518.6	971,885.6
Significant Publicly Owned Lakes, Ponds & Reservoirs (subset) [4]	1,477.4	945,506.2
Total Area of Bays, Estuaries, Harbors and Tidal Rivers [4]	**2,846.1**	**1,821,473.9**
Total Area of Bays, Estuaries and Harbors	2,717.3	1,739,051.0
Total Area of Tidal Rivers	128.8	82,422.9
Total Area of Bays, Estuaries, Harbors and Tidal Rivers by Water Class [4]	Square Miles	Acres
SeaClass A	211.0	135,009.0
SeaClass B	2,606.3	1,668,047.8
SeaClass C	28.8	18,417.1
Total Area of Wetlands [6]	**4,972.8**	**3,182,563.4**
Estuarine	239.8	153,462.2
Marine	164.5	105,277.1
Total Area of Saltwater Wetlands [6]	**404.3**	**258,739.3**
Lacustrine	1,466.6	938,621.7
Palustrine	2,954.0	1,890,553.6
Riverine	147.9	94,648.8
Total Area of Freshwater Wetlands [6]	**4,568.5**	**2,923,824.1**
Total Area of Mapped Sand and Gravel Aquifers [4]	**1,241.6**	**794,624.0**

* These figures were obtained from 2000 census data, unless otherwise noted.

1. Dry land and land temporarily or partially covered by water, such as marshland, swamps, etc.; streams and canals under one-eighth statute mile wide; and lakes, reservoirs, and ponds under 40 acres.

2. Permanent inland water surface, such as lakes, reservoirs, and ponds having an area of 40 acres or more; streams, sloughs, estuaries, and canals one-eighth statute mile or more in width; deeply indented embayments and sounds, and other coastal waters behind or sheltered by headlands or islands separated by less than 1 nautical mile of water, and islands under 40 acres in area. Excludes areas of oceans, bays, sounds, etc. lying within U.S. jurisdiction but not defined as inland water.

3. As derived from the Maine GAP Landcover Analysis Dataset.

4. As derived from MeDEP's GIS hydrography, geology and state boundary related datasets (Source: Digitized 1:24,000 USGS 7.5" Quadrangle Sheets and Digital Raster Graphics).

5. Draft stream order dataset - as derived from the Maine Office of GIS (MeGIS) 1:24,000 National Hydrography Dataset (NHD).

6. As derived from the National Wetland Inventory (NWI) dataset – based on polygon features only, figures do not include the NWI point dataset that indicates the location of small wetlands.

Table 3-2 The 2000 305(b) Report State of Maine Atlas

State of Maine: Population and Natural Resource Statistics

Population (Mid-1990 estimate)	**1,227,928**		
State Surface Area	**33,265**	**Mi ^{2}**	**100.00%**
Forested Upland	21,262	Mi ^{2}	63.92%
Forested Wetland	4,688	Mi ^{2}	14.09%
Other Fresh Wetland	3,190	Mi ^{2}	9.59%
Brackish/Saline Wetland	246	Mi ^{2}	0.74%
Cropland	924	Mi ^{2}	2.78%
Pasture	216	Mi ^{2}	0.65%
All Lakes and Ponds (5,788 / 987,283 acres)	1,543	Mi ^{2}	4.64%
Significant Lakes and Ponds (2,314 / 959,193 acres)			
Other land	1,499	Mi ^{2}	4.51%
Area Underlain by Significant Sand/Gravel Aquifers	**1,315**	**Mi ^{2}**	
Total Area of Estuarine/Marine Waters	**2,851.6**	**Mi ^{2}**	
Linear miles of Ocean Coast	**5,296**	**Mi ^{2}**	
Number of Major Drainage Basins	**6**		
Total lengths of rivers, streams, etc.	**31,672**	**Miles**	
Total length of rivers	3,704	Miles	
Total length of streams	3,909	Miles	
Total length of brooks	22,829	Miles	
Total length of creeks, etc.	1,230	Miles	
Names and mileages of inland border waters (total miles = 272)			
Monument Brook (U.S. - Canada)	11	Miles	
Saint Croix R. (U.S. - Canada)	52	Miles	
Saint Francis R. (U.S. - Canada)	27	Miles	
Saint John R. (U.S. - Canada)	45	Miles	
SW. Branch of the St. John R. (U.S. - Canada)	50	Miles	
Salmon Falls R. (ME - NH)	30	Miles	
North Lake, Grand Lake, Mud Lake, Spruce Mountain Lake, Spednik Lake, Grand Falls Flowage and Woodland Lake (U.S. - Canada)	42	Miles	
Umbagog Lake, Lower Kimball Pond, Province Lake, Stump Pond, Balch Pond, Great East Lake, Horn Pond, Northeast Pond, Milton Pond and Spaulding Pond (ME - NH)	15	Miles	

Water Quality Standards Program

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Related Website: www.maine.gov/dep/blwq/docmonitoring/classification/index.htm

The water quality of Maine is described in terms of physical, chemical and biological characteristics associated with the state's water classification program. As established in Maine statute (38 MRSA Sections 464-470), the classification program consists of designated uses (e.g. drinking water supply, recreation in and on the water, habitat for fish and other aquatic life), criteria (e.g. bacteria, dissolved oxygen and aquatic life), and characteristics (e.g. natural, free flowing) that specify levels of water quality necessary to maintain the designated uses. All State waters have a classification assignment (Lakes: GPA. Rivers and streams: AA, A, B, C. Marine and estuarine: SA, SB, SC).

In some cases, specific limitations are established on certain activities that can occur within a classification, such as types of discharges. Maine's classification system is goal based, that is, it may not necessarily reflect current water quality conditions but rather establishes the level of quality directed by the State to achieve. Maine's classification system should be characterized as more risk-based than quality-based. In a risk-based classification system the difference in water quality between the various classes is not large, however, different restrictions placed on activities associated with each class establishes varying levels of risk that water quality could be degraded and designated uses threatened by allowed activities.

In addition to the Maine water quality classification system, the requirements of the Federal Clean Water Act (CWA) establish national goals (designated uses) and interim goals of swimmable-fishable ("wherever attainable ... of ... the protection and propagation of fish, shellfish and wildlife ... [and] recreation in and on the water"). All waters that attain State standards also attain the interim goals of the Clean Water Act.

The assessment listing provided in this report gives the attainment status of the water quality goals established in the classification program. Thus, some waters may be listed as impaired even though they have relatively good water quality. Such waters do not attain the quality goals established for their class (e.g. a Class A river may be listed because it does not fully attain the standards of that class but may be of sufficiently good quality to attain Class B or C, and Clean Water Act goals).

The classification program is reviewed every three years by the Department and the Board of Environmental Protection (Board). The Board may, after opportunity for public review and hearing, make recommendations to the Legislature for changes in standards or reclassification of selected waters. The most recent revisions to the classification program were completed in 2002-2003 when changes were made to the provisions for measurement of dissolved oxygen in impoundments. The Legislature also made classification upgrades to 75 river, stream and coastal segments totaling over 800 miles of waters. The Board also completed promulgation of a rule (Chapter 579) that establishes numerical biological criteria for the assessment of rivers and streams. Some of these program changes are discussed in subsequent sections of the report.

Section 3-2 Effectiveness of Point Source Pollution Control Programs

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Related Website: www.maine.gov/dep/blwq/docstand/wastepage.htm

Maine uses multiple approaches to ensure that point source discharges of wastes receive adequate treatment prior to their release to waters of the State. Maine law prohibits any discharge of wastes to waters of the State without a license, and to receive a license an applicant has to demonstrate the ability to provide the appropriate level of treatment. All of the larger municipal and commercial sources of wastewater in the state are licensed and treated, or conveyed to licensed facilities for treatment. A number of financial assistance programs support new facility construction, as well as upgrades or additions to existing facilities.

Many communities in Maine are characterized by low population densities and depend on individual subsurface disposal systems to provide sewage treatment. For areas not served by community collection systems, the Maine Subsurface Wastewater Disposal Rules require that property owners provide adequate means of treating their own wastewater, in accordance with specifications established by the rules. The rules are enforced at the municipal level and administered at the State level by the Department of Human Services.

Most sources of all types of wastewater in Maine, including communities, industrial or commercial businesses, and residences either have installed treatment facilities or discharge their wastes to facilities managed by other owners. The traditional regulatory approach with dischargers is license compliance inspections coupled with technical assistance in operations and maintenance, enforcement where necessary, and periodic re-licensing.

Pollution Prevention Assistance Program

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Industrial Pollution Prevention:

The Maine Water Pollution Prevention program (MWPP) provides technical assistance to pulp and paper mills. Over the years the unit has helped mills reduce their biochemical oxygen demand (BOD) discharge, use of ammonia, phosphoric acid, and the emission of chloroform.

Municipal Pollution Prevention:

Results from annual self-assessments of wastewater treatment facilities conducted under the MWPP program provided DEP and municipal officials with information about effluent quality trends, facility design capabilities, chemical and energy use, and the financial condition of those facilities. The objective of the program is to assist in long-

term planning and to reduce the potential for effluent violations. The MWPP program helped target technical assistance, establish benchmarks and measure municipal pollution prevention efforts.

Construction of Wastewater Treatment Facilities

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Since the passage of the Clean Water Act, considerable amounts of grant and loan money have supported a very successful effort to clean up Maine's surface waters. Despite this success, there are still significant needs for continued clean-up efforts. These efforts are directed toward upgrading existing treatment facilities, control of combined sewer overflows, and construction of individual on-site treatment facilities. To coordinate activities in each of these areas, the DEP administers multiple programs through its Division of Engineering, Compliance, and Technical Assistance.

In some communities, existing treatment facilities are not adequately treating sewage, due to age of the facility, design deficiencies or operational problems. Excess ground water or surface water entering sewage collection systems causes sewer overflows, ineffective treatment and/or unnecessary treatment and maintenance costs.

Although most of the larger communities in Maine are served by publicly owned sewage treatment facilities, there are still some areas where domestic sewage is inadequately treated or not treated at all. Such areas may include entire towns, as well as homes, businesses and seasonal dwellings. These communities may also have areas with malfunctioning septic systems and untreated straight-pipe discharges.

State Revolving Loan Program: Federal and State funds for the construction of municipally-owned sewage treatment facilities are administered in conjunction with the Maine Municipal Bond Bank in accordance with the requirements of the Federal Clean Water Act and State law, Title 38 MRSA, Sections 411 and 412. The program is designed to distribute loan funds to communities with sewage treatment problems.

State Revolving Fund: SRF program monies are used to provide low-interest loans (2% below market rates) to communities and sanitary districts to upgrade treatment facilities. The program depends on a yearly Federal Capitalization Grant which must be matched with a 20% State Grant. In 2001, voters approved $2.5 million as the State match for SRF funds. Thirty-two SRF projects were initiated during FY2000 and FY2001 by borrowing over $56 million from these funding sources.

The DEP Municipal Priority Point System: This system is the mechanism used to rate individual projects. The system incorporates five priority categories listed in descending order of relative priority as follows:

1) water supply protection,

2) lakes protection,

3) shell-fishery protection,

4) water quality concerns, and

5) other facility needs

Within each of these priority categories, points are assigned depending on whether the severity of the overall problem is assessed as low, medium or high. The DEP Municipal Priority Point System is described in more detail in the "State of Maine Municipal Wastewater Construction Program," published annually by the Division of Engineering, Compliance and Technical Assistance. In addition to describing the administrative aspects of the Municipal Wastewater Facilities Construction Program, the above-mentioned document includes the "Multi-year SRF Project list" and the "Additional Needs Project list." The Multi-year SRF Project list includes all projects likely to need upgrades, whether major or minor. The Additional Needs Project list is primarily for areas that presently do not have treatment facilities.

Maine still has a need to make state grants to communities that would have an unusually high annual user charge even with the subsidized interest rate offered through the SRF program. These projects may also receive grants and loan funds from United States Department of Agriculture Rural Development program as well as grants from the Maine State Department of Economic and Community Development. The bond issues that provided the State match for Federal revolving fund capitalization included additional grant funds dedicated for various projects. These projects included funds for new wastewater treatment facilities in the towns of Corinna, Vinalhaven, and Van Buren.

Maine Combined Sewer Overflow Program

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Forty-two Maine communities are served by combined sewer systems, which convey a combination of sanitary and storm water flows to wastewater treatment facilities. During dry weather, all of the sewage in a combined system is conveyed to the treatment plant for adequate treatment. However, during rainstorms or snow-melt periods, stormwater mixes with the sanitary sewage, causing flows that exceed the capacity of the sewer system. This results in combined sewer overflows (CSOs), which vary extensively in pollutant types, concentrations and loads, as well as in volume of overflow and severity of impact to the receiving waterbodies.

Maine has established an aggressive program, coordinated with EPA's CSO program, to assist communities in evaluating the design, condition, activity and effects of combined sewer systems and overflows. As of September 2003, the Combined Sewer Overflow (CSO) Program has provided 25% grants totaling $4,703,297 to support development of forty-two CSO Master Plans or sewer system studies. This represents a total CSO planning effort to date of approximately $18,813,188.

Through these CSO Master Plans, communities conduct studies to determine:

1) the quantity and pollutant loads of CSOs,

2) the impact of CSOs on receiving waters,

3) sensitive areas, where uses are of higher priority, and

4) analysis and recommendation of technologies that will provide a high level of CSO control at a cost those communities can afford

However, it has become clear that the level of CSO control necessary for full attainment of current water quality standards will be very expensive and lengthy to complete. Indeed, several Maine communities have determined through studies of their sewer systems that complete CSO control would cause significant social and economic hardship. Also, most CSO control programs will require terms of up to 15-20 years to complete. Even if a community's recommended plan was to eventually eliminate all CSO problems, water quality standards and designated uses would continue to be violated until the program was complete. This would place the CSO communities in a dilemma. They would be doing all they were financially capable of doing, yet still be violating current water quality requirements. This would leave them open to potential lawsuits by people not in agreement with the recommended CSO Master Plans. Finally, communities need a clear sense of direction and assurance that the actions they take are appropriate and are in full compliance with the law.

EPA has recognized that most States with CSOs have water quality standards that do not adequately address wet weather impacts to the CSO systems and on the receiving waters. EPA's CSO Control Policy of April, 1994, recommends "review and revision, as appropriate, of water quality standards and their implementation procedures when developing CSO control plans to reflect the site-specific wet weather impacts of CSOs".

In response, the Maine DEP proposed changes to Maine's water quality standards and designated uses to allow Maine CSO communities to request from the Board of Environmental Protection temporary CSO subcategories. The new wet weather standards language was signed into law in June of 1995 and became effective in October of 1995. These site-specific CSO subcategories will remove designated uses for short periods of time after rainstorms and snow melt in areas affected by existing CSOs. This will allow communities to continue to make progress in solving the CSO pollution problems without undue financial hardship, and meet state water quality standards. Regulations allowing the implementation of this law became effective on February 5, 2000.

In this report, Maine is proposing to change the listing of CSO-only affected waters from Category 5 to Category 4. See discussion in listing Methodology Section.

Small Community Facilities Program

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In 1981, the Maine Legislature enacted a law designed to allow the State to help finance small wastewater treatment projects. The law authorizes the Department of Environmental Protection to award grants to help fund the construction of small wastewater treatment facilities, including individual septic systems. In the case of individual septic systems, DEP can pay from 25% to 100% of the construction costs. The maximum project cost funded by the program is $100,000 per year for each town. Projects are reviewed for their priority under a system very similar to the Municipal Priority List and then selected from the resulting list in descending numerical order. Funds for this program are usually provided from bond issues approved by Maine

voters. The Small Community Facilities Program was last funded for the 2004 construction season by a $500,000 bond issue that was approved in November, 2003.

This program fills a need which is largely unmet by the State Revolving Fund Program. It allows the Department to clean up scattered small-scale problems by funding installation of individual or cluster treatment systems in a very cost-effective manner. During the twenty four year period the Small Community Facilities Program has been in existence, grants totaling $23 million have been authorized for funding under this program, allowing the replacement of systems in over 300 communities. As a result of these efforts, significant benefits have accrued, including the elimination of public health threats and the reopening of a number of shellfish growing areas to harvest.

Licensing of Wastewater Discharges

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Related Website: www.maine.gov/dep/blwq/docstand/wastepage.htm

The Division of Water Resource Regulation is responsible for the licensing and re-licensing of all surface wastewater discharges, whether industrial, commercial, municipal or residential. In Maine, the vast majority of wastewater discharge sources have previously been licensed. Therefore, the licensing program is focused largely upon renewal of existing licenses, rather than development of new licenses. As of 12/31/03 there are 202 non-POTW (Publicly Owed Treatment Works) licensees (includes industrial, commercial, cooling water and misc. sources), 169 POTW licensees, and 1,658 Overboard Discharge licenses or conditional permits for sanitary discharges from residential and commercial sources.

As described below under *New Program Areas: NPDES Authorization and Emerging Issues,* Maine was authorized to implement the NPDES program in January of 2001 and has made tremendous progress in issuing permits.

Wastewater discharge limits in the State are based upon two criteria: 1) a standard of performance of technology or level of treatment provided for a specific wastewater or pollutant, or, 2) the level of treatment required to provide protection for the water quality standards of the receiving water. When developing license limits, the more stringent of these criteria is used in the license. Most effluent standards and criteria are the same as those under the Clean Water Act (CWA).

The Clean Water Act established national "standards of performance" for the control of pollutant discharges from all sources. Section 301 of the CWA required that, by 1977, all point source discharges of "conventional" pollutants be treated by the application of best practicable control technology. The Code of Federal Regulations, in Title 40, establishes these technology-based effluent limitations, which serve as the minimum licensing standards for point source discharges.

Municipal and industrial dischargers of wastewater containing toxic or hazardous pollutants are required to apply "best available control technology" in order to achieve effluent limitations established pursuant to Sections 301 and 307 of the CWA. The EPA Administrator publishes additional guidance as effluent limitations and standards of treatment efficiency for the control of specific pollutants from various source categories. Effluent limitations for toxic and hazardous pollutants are included in

Maine Pollutant Discharge Elimination System (MEPDES) permits for industrial or municipal dischargers as needed. In early 1995, the Department began implementing the requirements of Maine's Surface Waters Toxics Control Program, which requires effluent testing for whole effluent toxicity (WET) and priority pollutants from many industrial and municipal treatment plants. The program is set forth in Chapter 530.5 of Departmental Rules, which may be accessed at the following URL: www.maine.gov/sos/cec/rcn/apa/06/chaps06.htm

Municipal Wastewater Treatment: The CWA requires that discharges from municipal treatment systems receive secondary treatment (providing 85% removal of conventional pollutants), except where water quality concerns require more stringent limits. The only exception to this requirement is a variance under Section 301(h) of the CWA, allowing primary treatment where the dilution ratio and depth of the water allows rapid mixing of the effluent into the receiving water. Maine has twelve municipal facilities discharging under primary variances; all discharge into the ocean or into waters with high-volume tidal flows.

Municipal licenses include requirements to disinfect at least seasonally due to the possibility of discharging pathogenic micro-organisms. Because most municipal dischargers use chlorine in some form to disinfect, limits for total residual chlorine are included in many municipal licenses. Municipal licenses also include requirements to monitor CSO activity and to develop plans for control of these overflows. Many municipalities accept wastewater from industrial or commercial facilities either with or without pre-treatment. Appropriate pretreatment requirements are included in the municipal license where an industrial source contributes 10 percent of the flow to the municipal facility and discharges a pollutant that has a categorical standard.

Industrial Wastewater Treatment: A wide variety of industries in Maine use processes that result in the generation of contaminated wastewater. The chemical and biological constituents of wastewater from Maine's industrial point sources are as varied as the industries themselves and include everything from wood fiber to shrimp wastes to metallic compounds.

Industrial dischargers in Maine are regulated in two ways: 1) the industry discharges to a municipal sewage collection system, or 2) the industry discharges directly to a receiving waterbody. Industries which discharge wastewater to publicly-owned sewage treatment facilities are required to pre-treat wastes which would otherwise interfere with the operation of those treatment facilities, or which would not be adequately treated by the municipal treatment process. The pretreatment program is administered by the DEP, which conducts pretreatment inspections and provides assistance to municipalities in understanding pretreatment issues and in developing local limits on wastes to be discharged.

Elimination of Licensed Overboard Discharges

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From the inception of its wastewater discharge licensing program, Maine has issued licenses to individual homeowners or businesses, or to small cluster-type treatment systems, where existing lots were unsuitable for subsurface disposal and no municipal

system was available. This ultimately led a large number of licensees (more than 2900 in 1987), which made it impossible for DEP to adequately monitor compliance or evaluate re-licensing applications. Also, the large number of small overboard discharges (OBDs) eventually led to closures of a significant number of shellfish growing and harvesting areas.

Due to concern over the effects of the burgeoning number of licensed small point source discharges, the Maine Legislature passed an act (the "Overboard Discharge Law") in 1987, which prohibited new discharges of non-municipal sanitary wastewater. In 1989, substantial changes were made to the Overboard Discharge Law. These changes prohibited new discharges and expansions of existing, licensed discharges, required DEP to inspect all OBDs each year, established an inspection fee to fund the inspection effort, and established the OBD Removal Grant Program. The priorities of the grant program are to eliminate discharges that either causes the closure of shellfishing areas or that cause a public nuisance.

The Overboard Discharge Laws were amended again in 2003. These new changes require the removal of all overboard discharges if a technologically proven alternative can be found. The grant funding mechanism was also changed to allow grants of 25% to 100% of system costs, with the grant percentage dependent on income. Newer technologies have made it possible to install non-discharging systems on difficult sites, and it is anticipated that ultimately 50 percent of the approximately 1,658 licensed overboard discharges in the state (at the end of calendar year 2003) will eventually be removed.

The OBD grant program has helped open over 16,000 acres of closed coastal waters since 1991 by removing over 300 discharges at a cost of under $6 million. These opened areas contain fish and shellfish with a potential retail value estimated to be $40 million, if they were fully utilized. This figure comes only from these potential harvests of fish and shellfish and does not take into account the many other benefits of cleaner, healthier waters.

Compliance Evaluation

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Related Website: www.maine.gov/dep/blwq/docstand/wastepage.htm

The Department uses a three-part program to evaluate the compliance of wastewater treatment facilities. The compliance evaluation program involves on-site inspections of wastewater treatment facilities, occasional sampling of their effluent quality on a selective basis, and monthly evaluation of the licensees' self-monitoring reports. Discharge licenses also require immediate reporting of any major malfunctions, bypasses or exceedences of license limits to DEP inspectors.

The intent of the inspection program is to foster voluntary self-compliance and to encourage licensees to be aggressive in attaining optimal operation and maintenance of their treatment facilities. During a NPDES compliance inspection that utilizes EPA Form 3560-3 (known within DEP as a "3560 inspection") or other types of thorough inspections, all major areas of the treatment facility are inspected to ensure proper operation and maintenance, including treatment equipment, pumping systems, self-monitoring records, process control and laboratory testing procedures. In addition,

several routine state inspections are done between the more thorough "3560" type inspections to insure that proper operation is continuing. These state inspections are usually less intense than the "3560" type of inspection and focus on specific plant problems, operator assistance projects and other compliance follow-up activities. Unlike the "3560" type of inspection, these routine state inspections are usually not announced so that a better idea of a plant's normal day-to-day operation can be ascertained. Effluent samples are sometimes collected for analysis by the DEP to ensure that the self-monitoring efforts by the licensees, accurately represents the typical condition of the effluent.

An important part of the inspection and compliance program is monthly Non-Compliance Review (NCR) meetings held by the DWRR. At these meetings, representatives of all regional DEP offices, the licensing section, the enforcement section and DECTA discuss specific compliance problems at licensed treatment facilities and decide upon specific courses of action. Possible responses to compliance problems range from monitoring the situation to providing technical assistance, providing engineering design reviews, funding upgrades to treatment facilities, up to formal enforcement action. The NCR process has improved consistency in addressing compliance problems, has helped foster voluntary compliance, and has facilitated the referral of appropriate violations to the enforcement section. In addition to monthly NCR meetings, Quarterly Noncompliance Review (QNCR) meetings are held with EPA to discuss and coordinate actions regarding waste water treatment problems.

The Department provides an inspector to serve as a Pretreatment Coordinator. The pretreatment program is administered by the DEP, which conducts pretreatment inspections and provides assistance to municipalities in understanding pretreatment issues and in developing local limits on the wastes to be discharged.

The DEP also provides inspector coordination and laboratory problem resolution for the annual EPA Discharge Monitoring Report (DMR) Quality Assurance Studies. In these studies licensed facilities are required to analyze QA control samples for their discharge parameters to determine if their ongoing self-monitoring testing data reported on their Discharge Monitoring Reports is accurate. Inspectors work with the licensees or their contract labs to correct any unacceptable results.

Technical assistance is also provided to the operators of wastewater treatment facilities. In addition to responding to requests for assistance with specific problems such as sludge bulking and odor control, programs are conducted which take a more systematic approach to improving wastewater treatment operations by examining all aspects of treatment plant design and operation.

Operations Management Evaluations (OMEs) are done to diagnose license compliance problems and to provide on-site operator training. OMEs are focused on operation and maintenance problems including process control, personnel and financial management. OMEs result in recommendations for procedural changes as well as follow-up operator training targeted towards improving wastewater treatment. DEP conducts six OMEs per year on a "worst-first" priority basis.

Maine requires that chief wastewater treatment plant operators be certified by the DEP through a certification process that consists of qualifying examinations for five levels of certification for biological facilities and three levels of certification for physical/chemical facilities. The smaller municipal facilities can have a Grade I operator in responsible

charge, while the larger and/or more complex facilities must have a Grade V operator in responsible charge.

Investigation of Citizen Complaints: During the past two years, the DEP Bureau of Land and Water Quality have investigated numerous citizen complaints concerning discharges to the waters of the State. Many of these cases required field investigations and extensive follow-up work to achieve eventual compliance with discharge laws. A number of these complaint investigations have led to enforcement actions.

Enforcement of Water Quality Laws

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The general philosophy of the DEP, Bureau of Land and Water Quality (BLWQ) is to gain compliance and resolve problems at the least formal level that is appropriate, and to maximize the spirit of cooperation between the DEP and the regulated community. By fostering voluntary compliance with Maine's water pollution control laws, the overall effectiveness of the enforcement program is maximized and unnecessary litigation is avoided.

Formal enforcement actions become necessary when violations of environmental laws are severe enough to warrant action regardless of the remediation effort, or when the violator is not responsive in preventing violations or refuses to cooperate with the DEP. Formal enforcement actions originate both from license or permit violations, and from detection of unlicensed activities through complaint investigation or other fieldwork. The Department's enforcement priorities have generally been based on the size of the violations, the potential for environmental harm, the recurrence of violations and the precedents involved.

The Division of Water Resource Regulation is responsible for all formal enforcement actions regarding wastewater discharges that are taken by the Bureau of Land and Water Quality. The divisions of Water Resources Regulation and Land Resource Regulation in the BLWQ share enforcement of nonpoint source pollution regulations. Other agencies such as the Land Use Regulation Commission in the Department of Conservation and local code enforcement officers also are able to address land use problems which lead to nonpoint source pollution. Time is also dedicated to sanitary surveys and remedial actions needed to identify and remove discharge sources that are contributing to the closure of shellfish harvesting areas or that are otherwise impairing water quality. Finally, considerable effort is put into assuring that compliance schedules and programs resulting from enforcement actions are properly implemented.

New Program Areas: NPDES Authorization and Emerging Issues

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Related Website: www.maine.gov/dep/blwq/docstand/wastepage.htm

NPDES Authorization: On January 12, 2001, Maine received partial authorization from the Environmental Protection Agency (EPA) to implement the National Pollutant Discharge Elimination System (NPDES) Program. EPA withheld its decision on contested areas of the state in the upper Penobscot River watershed and certain areas in the St. Croix River watershed. On October 31, 2003, EPA granted authorization in these contested areas with the exception of two tribal facilities with discharges. EPA will retain the authority for the NPDES permits for these facilities. With this limited exception, the Department is now the primary authority for administering the Clean Water Act in Maine. It is noted that this final EPA decision has been appealed by both the Maine Tribes and the Maine Office of the Attorney General. The program is referred to as the Maine Pollutant Discharge Elimination System (MEPDES) program.

As part of the authorization process, Maine adopted rules (Chapters 520-529) that became effective upon authorization of the NPDES program. These rules cover all aspects of the permitting program and are available at the following URL: www.maine.gov/sos/cec/rcn/apa/06/chaps06.htm

Due to historic understaffing in the Department's waste discharge licensing program, a backlog of expired license applications developed, resulting in numerous dischargers operating under expired discharge licenses. As part of the NPDES authorization process, licensing staff was increased (current number of staff is 4). An aggressive schedule was established in 2000 to eliminate the expired license backlog. In calendar year 2003, the Department completed 101 licensing actions that reduced the expired license backlog to 16 % of all licensed facilities. The current goal is to reduce the expired license backlog to no more that 5 % of all licensed dischargers by the end of calendar year 2004.

Emerging Issues: Since NPDES authorization in January of 2001, the water permits program has been involved in a number of emerging issues including development of a General Permit, site specific permits, a permit for eradication of invasive plants and a compliance program for finfish aquaculture facilities. The permit program expects that in the near future it will be involved in the following emerging issues: calcium enhancement of Downeast Rivers for Atlantic Salmon restoration, West Nile virus control, radionuclides in drinking water plant effluent, and increased inclusion of nutrient limits (N and P) in permits due to the development of ambient nutrient criteria.

Section 3-3 Nature & Extent of Nonpoint Sources of Pollutants and Program Recommendations

The Maine NPS Water Pollution Control Program

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In 1991, the Maine Legislature enacted a Nonpoint Source (NPS) Water Pollution Management Program statute (38 M.R.S.A. §410-I) to help restore and protect water resources from NPS pollution. The basic objective of the NPS program is to promote the use of State Agency-defined "best management practice guidelines" (BMPs) to prevent water pollution.

The DEP administers the Maine NPS Program in coordination with other state, federal, and local governmental agencies as well as non-governmental stakeholder organizations. State agencies that share responsibility for coordinating and implementing NPS programs include: the Department of Agriculture; Department of Conservation, Maine Forest Service; Department of Transportation; Economic and Community Development; Department of Human Services, Division of Health Engineering; Department of Marine Resources, and the State Planning Office.

In 1999, the DEP and the State Planning Office (SPO) coordinated development of a strategic plan for the NPS Program that was entitled, "Maine NPS Control Program: Program Upgrade and 15 Year Strategy."

The overall aims of the NPS Water Pollution Control Program are:

(1) Clean Water

Prevent, control, or abate water pollution caused by nonpoint sources so that beneficial uses of water resources are maintained or restored and so those waters meet or exceed their classification standards.

(2) Using Best Management Practices

Ensure that Best Management Practices are widely used in all of Maine's watersheds to minimize transport of pollutants or excessive runoff from surrounding land into surface or ground waters.

(3) Locally Supported Watershed Stewardship

Local community awareness results in commitment to maintaining or improving the condition of local water resources through citizen action. Watershed stewardship meets community needs and maintains beneficial uses of local water resources.

(4) Compliance with Applicable Laws

Confirm that regulated activities are in compliance with existing State and Federal laws and rules that relate to nonpoint source pollution abatement.

Maine's lead NPS agencies have the responsibility to conduct programs that:

(1) Implement a variety of enforceable authorities (State laws, rules and municipal ordinances, governing specific land use activities or locations that require people to comply with certain performance standards that protect water quality), and

(2) Encourage the voluntary implementation and utilization of BMPs

These lead NPS agencies in State government have formal and informal working arrangements with other State and federal agencies, municipalities, non-governmental organizations, and business sector associations that address the abatement of nonpoint sources of water pollution.

DEP and other State and regional agencies deliver a wide array of NPS-related services. These services include regulatory (permitting, compliance assistance and enforcement), technical assistance, financial assistance, NPS technology transfer, and NPS pollution awareness outreach. All of these either promote or require usage of appropriate BMPs to prevent or minimize nonpoint sources of pollutants or water resource degradation.

Statewide regulatory programs that operate to implement laws controlling potential sources of NPS pollution, include: the Stormwater Management Law, the Site Location of Development Law, Subdivision Laws, Erosion and Sedimentation Control Law, the State Subsurface Wastewater Disposal Rules, the Natural Resources Protection Act, Land Use Regulation in Unorganized Territories, Pesticide Control laws, the Mandatory Shoreland Zoning Law, The Nutrient Management Act, and Forest Practices Act.

The State's lead NPS agencies also encourage voluntary actions by government, organizations, industry, and individuals that prevent or minimize the discharge of NPS pollutants. Program resources were assigned to support efforts either statewide and in specific watersheds that improve and protect waters that are either threatened by, or impaired due to, NPS pollution. These lead NPS agencies provide direct technical assistance and information about BMPs to agencies, municipalities, businesses, and individuals. The NPS Training and Resource Center at DEP provides information and technical training on usage of BMPs. DEP also administers an NPS Grants program to help fund NPS Pollution Control Projects that are designed to prevent, control or abate water pollution caused by nonpoint sources, so that water resources are maintained or restored. Grant funding for this program is derived from Section 319(h) of the Clean Water Act.

The Maine NPS Program has developed and will continue to develop Best Management Practice guidance manuals in order to provide information on practical methods to help protect Maine's streams, lakes, coastal waters and ground water. The following is a partial list of guidance manuals developed by the NPS Program.

"Strategy for Managing Nonpoint Source Pollution from Agricultural Sources and Best Management System Guidelines," Maine Dept of Agriculture, Food and Rural Resources, October, 1991. (This BMP is currently out of print.)

"Phosphorus Control in Lake Watersheds: A Technical Guide to Evaluating New Development", MDEP, revised 1992.

"Maine Best Management Practices for Storm Water Quality and Quantity Control", MDEP, November, 1995.

"Best Management Practices for Erosion and Sediment Control", Maine Department of Transportation, September, 1997. +

"BMPs for Marinas and Boatyards: Controlling Nonpoint Pollution in Maine, an Environmental Guide for Marinas & Boatyards", MDEP/ SPO, March, 1999.

"Camp Road Maintenance Manual: A Guide for Landowners", MDEP and the Kennebec County Soil & Water District, 2nd edition, 2000. *

"BMPs for the Handling of Wastes & Hazardous Materials at Construction Sites", MDEP November, 2001.

"Maine Erosion & Sediment Control Best Management Practices", MDEP, March, 2003. *

"Best Management Practices for Forestry: Protecting Maine's Water Quality," Maine Forest Service, Maine Department of Conservation, 2004. **

+ A revised version of this BMP guidance manual is available from the following URL: www.maine.gov/mdot/environmental-office-homepage/surface-water-resources.php

* Online versions of these BMP guidance manuals can be obtained at the following URL: www.maine.gov/dep/blwq/docstand/lwpubbmp.htm

** An online version of this BMP guidance manual can be obtained at the following URL: www.state.me.us/doc/mfs/pubs.htm

Traditional hardcopies of many of these BMPs are available from the Nonpoint Source Training and Resource Center. Contact Bill Laflamme at (207) 287-7726 or at William.N.Laflamme@SPAM-ZAPmaine.gov to request publications.

Priority Waterbodies

Tables 3-3 through 3-5 presents lists of "priority waterbodies", as amended in 1998, for marine waters, rivers/streams and lakes (respectively) for which the Department will focus the Nonpoint Source Program (Source: Maine Nonpoint Source Management Plan). Priority waters are selected based on NPS impairment or threat status, value of the waters, and feasibility for success of restoration or protection efforts. The NPS Management Plan and the list of priority waters provide a basis for structuring 319 implementation projects and other NPS projects that help turn BMP planning and development ideas into effective on-the-ground pollution controls.

Table 3-3 Maine NPS Priority Waters List - Marine Waters

(17 total; listed geographically, west to east)

Piscataqua estuary	Royal River estuary	St. George River estuary
Spruce Creek	Cousins River estuary	Weskeag River
York River	Harraseeket River estuary	Rockland Harbor
Ogunquit River estuary	Maquoit Bay	Union River estuary
Webhannet River estuary	New Meadows River estuary	Machias River estuary
Scarborough River estuary	Medomak River estuary	

Note: The above list is duplicated in the Estuarine / Ocean Section (4.6) of this chapter, under the subsection title of: "Coastal Nonpoint Source Priority Watersheds". That section also includes a list of salmon river watersheds that are given a priority status under the Clean Water Act, Section 319-funded Nonpoint Source Program and the Shore Stewards Program.

Table 3-4 Maine NPS Priority Waters List – Rivers and Streams

(55 total; listed alphabetically by waterway and county; boldfaced entries are highest priority)

Allagash River, Aroostook	**Fish Brook, Somerset**	**Piscataqua River, Cumberland**
Bond Brook, Kennebec	**Frost Gully Stream, Cumberland**	Pleasant River, Cumberland
Branch Brook, York*	**Great Works River, York**	**Pleasant River, Washington**
Capisic Brook, Cumberland	**Kenduskeag Stream, Penobscot**	**Presque Isle Stream. (includes North Brook), Aroostook***
Caribou Stream, Aroostook	Kennebunk River, York	**Prestile Stream, Aroostook**
Carrabassett River, Franklin	Limestone Stream, Aroostook*	**Presumpscot River, Cumberland**
Chandler Brook, Cumberland	Little Androscoggin River, Oxford	Royal River, Cumberland
Chapman Brook, Oxford*	Little Ossipee River, York	Salmon Brook, Aroostook
Cobboseecontee Stream, Kennebec	**Little Madawaska River, Aroostook***	Salmon Falls River, York*
Cold River, Oxford	**Long Creek, Cumberland**	**Sebasticook River, Somerset**
Collyer Brook, Cumberland	**Machias River, Washington**	**Sheepscot River (includes West Branch), Lincoln**
Crooked River, Oxford	Medomak River, Lincoln	Soudabscook Stream, Penobscot
Daigle Brook, Aroostook	**Meduxnekeag River, Aroostook**	St. George River, Knox
Denny's River, Washington	Mousam River, York	Stroudwater River, Cumberland
Dickey Brook, Aroostook	**Narraguagus River, Washington**	**Sunday River, Oxford**
Ducktrap River, Waldo	Nezinscot River, Oxford	Togus Stream, Kennebec
East Machias River, Washington	Nonesuch River, Cumberland	Union River, Hancock
East Branch Piscataqua River, Cumberland	Ossipee River, Cumberland	**Wesserunsett Stream, Somerset**
	Perley Brook, Aroostook	

* denotes community public drinking water supply

Table 3-5 Maine NPS Priority Waters List - Lakes

(181 total; listed alphabetically; boldfaced entries are highest priority; town names are included only to identify general pond locations)

Adams Pond, Boothbay*	Estes Lake, Sanford	**Middle Range Pond, Poland**
Alamoosook Lake, Orland	Flying Pond, Vienna	Mirror Lake, Rockport*
Alford Lake, Hope	Folly Pond, Kittery*	Moose Hill Pd., Livermore Falls*
Allen Pond, Greene	Folly Pond, Vinalhaven*	Moose Pond, Sweden
Anasagunticook Lake, Canton*	Forest Lake, Windham	Mount Blue Pond, Avon*
Androscoggin Lake, Leeds	Fresh Pond, North Haven*	**Mousam Lake, Shapleigh**
Annabessacook Lake, Winthrop	Grassy Pond, Rockport*	**Nequasset Lake, Woolwich***
Bauneg Beg Pond, Sanford	Great Moose Lake, Hartland	Nokomis Pond, Newport*
Bay of Naples, Naples	Great Pond, Belgrade	No Name Pond, Lewiston
Beach Hill Pond, Otis	Green Lake, Ellsworth	North Pond, Norway
Bear Pond, Hartford	Haley Pond, Rangeley	North Pond, Smithfield
Bear Pond, Waterford	Halls Pond, Hebron*	North Pond, Sumner*
Beaver Pond, Bridgton	Hancock Pond, Embden*	North Pond, Warren
Berry Pond, Winthrop	Hancock Pond, Denmark	Norton Pond, Lincolnville
Big Indian Pond, St. Albans	Hermon Pond, Hermon	Notched Pond, Raymond
Big Wood Pond, Jackman*	Highland Lake, Windham	Otter Pond, Bridgton
Biscay Pond, Damariscotta	Highland Lake, Bridgton	Panther Pond, Raymond
Bonny Eagle Lake, Buxton	Hogan Pond, Oxford	Paradise Pond, Damariscotta
Boulter Pond, York*	Holland Pond, Limerick	Parker Pond, Casco
Branch Lake, Ellsworth*	Horne Pond, Limington	Parker Pond, Vienna
Branch Pond, China	Hosmer Pond, Camden	Parker Pond, Jay*
Brettuns Pond, Livermore	Ingalls Pond, Bridgton	Pattee Pond, Winslow
Buker Pond, Litchfield	Island Pond, Waterford	Peabody Pond, Sebago
Bunganut Pond, Lyman	Kennebunk Pond, Lyman	Pemaquid Pond, Waldoboro
Caribou, Egg, Long Pd, Lincoln	Keoka Lake, Waterford	**Pennesseewassee Lake,**
Carlton Pond, Winthrop*	Knickerbocker Pond, Boothbay	**Norway**
Center Pond, Lincoln	Lake Auburn, Auburn*	Phillips Lake, Dedham
Chases Pond, York*	Little Cobbosseecontee Lake	Pleasant Lake, Otisfield
Chickawaukie Pond, Rockport	Winthrop	**Pleasant Pond, Richmond**
China Lake, China*	Little Ossipee, Waterboro	Pleasant Pond, Turner
Clary Lake, Whitefield	Little Pennesseewassee, Norway	Pleasant Pond, T4 R3 WELS
Cobbosseecontee Lake,	Little Pond, Damariscotta*	Pocasset Lake, Wayne
Winthrop*	Little Sebago, Windham	**Pushaw Lake, Orono**
Cochnewagon Lake, Monmouth	Little Wilson Pond, Turner	Quimby Pond, Rangeley
Coffee Pond, Casco	Long Lake, Bridgton	Raymond Pond, Raymond
Cold Stream Pond, Enfield	Long Lake, T17 R4 WELS	Roberts Wadley Pond, Lyman
Coleman Pond, Lincolnville	Long Pond, Belgrade & Rome	Round Pond (Little), Lincoln
Crawford Pond, Warren	Long Pond, Bucksport	**Sabattus Pond, Sabattus**
Crescent Pond, Raymond	Long Pond, Southwest Harbor*	**Sabbathday L, New Gloucester**
Crooked Pond, Lincoln	Long Pond, Waterford	Saint Froid Lake, Eagle Lake*
Cross Lake, T17R5	Lovejoy Pond, Wayne	Saint George Lake, Liberty
Crystal Lake, Gray	Lower Narrows Pond, Winthrop	Salmon Lake, Belgrade
Damariscotta Lake, Jefferson*	**Lower Range Pond, Poland**	Salmon Pond, Dover-Foxcroft*
Dexter Pond, Winthrop	**Madawaska Lake, Westmanland**	Sand Pond, Monmouth
Dodge Pond, Rangeley	**Maranacook Lake, Winthrop**	Sand Pond, Denmark
Duckpuddle Pond, Waldoboro	Mattanawcook Pond, Lincoln	**Sebago Lake, Sebago***
Dyer Long Pond, Jefferson	McGrath Pond, Oakland	**Sebasticook Lake, Newport**
East Pond, Smithfield	Meduxnekeag Lake, Oakfield	Sennebec Pond, Union
Echo Lake, Presque Isle	**Megunticook Lake, Lincolnville**	Seven Tree Pond, Warren
Echo Lake, Readfield	**Messalonskee Lake, Sidney**	Shaker Pond, Alfred
Ellis Pond, Roxbury	Middle Pond, Kittery*	Silver Lake, Bucksport*

Table 3-5 Maine NPS Priority Waters List - Lakes (continued)

South Pond, Warren	Togus Pond, Augusta	Watchic Pond, Standish
Spectacle Pond, Vassalboro	Torsey Pond, Mt. Vernon & Readfield	**Webber Pond, Vassalboro**
Square Pond, Acton		West Harbor Pond, Boothbay Harbor
Starbird Pond, Hartland*	**Trickey Pond, Naples**	
Swan Lake, Swanville	Tripp Pond, Poland	Whitney Pond, Oxford
Swan Pond, Lyman	**Unity Pond, Unity**	Wilson Lake, Acton
Taylor Pond, Auburn	**Upper Narrows Pd, Winthrop***	Wilson Pond, Wilton
Thomas Pond, Casco	**Upper Range Pond, Poland**	Wilson Pond, Wayne
Thompson Lake, Oxford	Varnum Pond, Wilton*	Wood Pond, Bridgton
Threecornered Pond, Augusta	Ward Pond, Sidney	Woodbury Pond, Monmouth
Threemile Pond, Windsor	Wassookeag Lake, Dexter*	Young Lake, Mars Hill*

* denotes a community public drinking water supply

Watershed Management for Stormwater Programs

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Related Website: www.maine.gov/dep/blwq/docstand/stormwater/index.htm

Stormwater management has become a topic of increasing concern in Maine, both environmentally and politically. As progress has been made in cleaning up our State's waters from "end-of-pipe" wastewater discharges, the DEP is now finding that some of the most significant remaining water quality problems are not from these discharges, but from the cumulative effect of a number of activities ranging from agriculture to development to household management. Pollutants from these activities include toxins, bacteria, sediment and nutrients, which are often conveyed to lakes, rivers, streams and coastal waters via stormwater runoff.

The Department has been working on stormwater management issues for many years. Much has been learned about the effectiveness of different stormwater treatment practices, known as Best Management Practices (BMPs), through both in-state and national studies. This field continues to expand and the Department continues to support research through its Nonpoint Source (NPS) Program, funded through Section 319 of the Federal Clean Water Act. The NPS Program has also allowed the Department to invest in the identification and elimination of pollution sources, as well as to conduct education and outreach activities.

The Department has also been managing stormwater through regulatory programs. Controlling erosion and sedimentation from land use activities as well as control of stormwater have all been provisions of the Site Location Law since the early 1970's. However, standards to treat the quality of stormwater, not just the quantity, did not exist until the passage of the Stormwater Management Law in 1996, and the subsequent rules were adopted in 1997.

The Stormwater Management Law requires the Department to "establish by rule a list of watersheds of bodies of water most at risk from new development." This law also obligates the Department to develop a list of sensitive or threatened regions or watersheds that include "the watersheds of surface waters that are susceptible to degradation of water quality or fisheries because of the cumulative effect of reasonably foreseeable levels of development activity within the watershed of the

affected surface waters." The Department must also adopt rules specifying quantity and quality standards for stormwater to apply in those watersheds.

In 1997, the Department did develop lists of "most at risk" lakes, coastal waters and streams with public water supplies, and sensitive or threatened watersheds for lakes, and rivers with public water supplies. Quantity and quality standards were also established. However complete lists of "most at risk" and "sensitive or threatened" rivers and streams were not established due to lack of needed data to support which waters should be included on the lists. Although suitable data became available in 2002, the Department held off on rulemaking because of the desire from many interested parties to have the Department's proposal reviewed through a stakeholder process.

In addition to the State Stormwater Law, in 2003, new federal requirements went into effect under the Maine Pollutant Discharge Elimination System (MEPDES) stormwater program. The Department issued general permits to regulate construction activities disturbing one acre or more of land, and to regulate municipal separate storm sewer systems (MS4s) that are in 28 municipalities or in 10 "nested" state or federal MS4 entities.

The Department's experience administering the Stormwater Law, coupled with the added responsibility of administering the federal program requirements, has led Department staff to conclude that changes are needed to improve both the effectiveness and the efficiency of Maine's stormwater program. In the winter of 2004, following an extensive stakeholder process, the Department issued a report to the Maine Legislature, which included recommended changes to the Maine Stormwater Law in order to:

- align it better with the MEPDES program by using a 1 acre disturbance threshold,
- allow the Department to apply stormwater quality standards to all jurisdictional activities, and
- allow the Department to designate "significant existing sources" of stormwater pollution

The Department has developed draft rules which would replace existing quantity and quality standards with a new set of standards designed to provide both quantity and quality protection. Under the proposal, the new standards would apply to all watersheds, except where a more restrictive phosphorus standard would still apply in "most at risk" lake watersheds (the "most at risk" and "sensitive or threatened" designations would no longer be used outside of lake watersheds). Additional standards would also apply to projects in stream watersheds impaired due to urban runoff. To minimize confusion, these "impaired streams" do not appear as a separate listing or category; these stream watersheds are a subset of those streams on the 303(d) list where urban runoff has been identified as a principal source of pollution. Developers in these watersheds would be required to either pay a compensation fee or provide additional mitigation.

The Department is also encouraging municipalities to collectively address stormwater from existing sources through the development of watershed management plans. Where such plans are being implemented, the proposed additional regulatory requirements for new development in impaired watersheds would be reduced or even eliminated.

The Maine Legislature deferred action on the proposed statutory changes in 2004, but gave the DEP authority to proceed with rule making in 2004. The Department is

required to report back to the Legislature on January 2nd, 2005 with provisionally adopted rules and recommended changes to the statute.

Land Use and Growth Management

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Related Websites: Site Law www.maine.gov/dep/blwq/docstand/sitelawpage.htm

NRPA www.maine.gov/dep/blwq/docstand/nrpapage.htm

Shoreland Zoning Act www.maine.gov/dep/blwq/docstand/szpage.htm

It has long been recognized that land use practices have direct impacts on water quality. The State of Maine has several programs in place to regulate land use activities that have potentially adverse environmental effects. The Site Location of Development Law (Site Law) requires developers of large projects to obtain permits from the Department of Environmental Protection before beginning construction. Under the Natural Resources Protection Act (NRPA), a permit from the DEP is required for any activity in, on or adjacent to a protected natural resource, including rivers, streams, brooks, great ponds, coastal wetlands, freshwater wetlands, sand dunes and fragile mountain areas.

The Mandatory Shoreland Zoning Act requires towns to control building sites, land uses, and placement of structures within their shoreland areas in order to protect water quality, habitat and fishing industries, and to conserve shore cover, public access, natural beauty and open space. Also important to environmental protection is the Growth Management Act, which was enacted in 1988. The foundations for this program are based on comprehensive planning and greater cooperation between state and local governments.

Section 3-4 EDUCATION AND OUTREACH

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Related Website: www.maine.gov/dep/education/index.htm

Since much of the degradation to the environment comes from individual actions, public education is vital to the mission of the Maine DEP. The Department has a responsibility to educate the public about the environment, requirements of environmental laws, and how to protect Maine's natural resources. To accomplish these goals, the DEP must encourage behaviors and social norms that reduce human impact on water quality. In short, the Department must help to foster and encourage greater stewardship. This responsibility is shared among many different components of the Department, all with the common vision of conducting outreach that covers the many different types of water resources, particularly lakes, rivers, streams, wetlands, and ground water.

Each year the DEP is engaged in many different outreach efforts. In order to be more effective, some program areas are adopting social marketing principles including: focusing on behavior change, gathering research data on target audiences, and assessing the effectiveness of campaigns. In particular, social marketing strategies

have been included in the Stormwater Phase II Program, the LakeSmart Campaign, the Invasive Prevention Program, and the Soil Erosion Prevention Campaign. In addition, starting with the 2005 RFP cycle, grant proposals to be funded with CWA Section 319 monies will be required to start applying basic social marketing principles to any proposed outreach efforts.

Finally, the Department is also focused on partnering with other agencies and organizations wherever possible to create synergy through combined efforts towards accomplishing a common goal. For example, the DEP is embarking on a statewide mass media Stormwater Awareness Campaign in concert with the 38 regulated MS4 (Municipal Separate Storm Sewer System) entities.

Section 3-5 The Environmental Impact and Economic & Social Costs/Benefits of Effective Water Quality Programs

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The environmental impact of effective water quality programs should be clear. By definition, effective programs should have a positive impact on the quality of waters that they protect as well as on the larger ecosystem that contains those improved waters. However, assessment of the many types of costs and benefits associated with water quality changes is typically a very difficult task. Although often complex, calculating the direct economic cost of environmental regulation is largely possible by determining financial outlays and using those figures as a "cost-proxy." Quite the opposite is often true when the benefits of these water quality programs are studied. While it is usually possible to determine that an improvement has been gained and to show quantitatively the benefits, usually there is no easy way to directly correlate these improvements as positive impacts in terms of human health or the environment.

When the indirect economic and social costs/benefits of water quality protection, such as jobs lost or gained, positive or negative effects on competitiveness, worker productivity and satisfaction, etc., are considered and included in an analysis, the layers of complexity that they bring to the computations can be overwhelming. When they are addressed, these indirect costs and benefits of environmental improvements are often based on assumptions, subjective evaluations and qualitative data that are not easily distinguished (unequivocally) from other economic and social costs/benefits.

The different classes and categories of benefits of water quality protection are often difficult to compare with economic costs and are essentially impossible to compare with the extremely vague category of social costs. Figures in dollar values cannot be assigned to many of the benefits, so water quality and the environment would nearly always loose if the cost versus benefit comparison were limited to only economic aspects and the social aspects were ignored. In fact, such a superficial analysis of water quality protection efforts would undoubtedly have deterred much of the environmental progress Maine has made since the early 1970's. Consider this: tourism is an important component of Maine's economy; water quality undeniably is one component of Maine's attraction to tourists, but what part of Maine's economic increase has resulted from the efforts to protect and improve the state's waters? This is not a question that is answered easily.

Despite the fact that calculating benefits is a difficult task, waterbodies that were once heavily and visibly polluted are now supporting their designated uses of swimming, fishing, wildlife habitat, and recreation. One common example of a direct benefit that has been cited in the past, are the results from construction of wastewater treatment plants for industrial and municipal facilities. In this example, these benefits are not either economic or social; they are both. This inseparability of economic and social costs and benefits is probably true in most cases, although in some scenarios one type of benefit may be in the clear majority. In another example, more and more Maine towns are currently charging premium taxes for riverfront properties that, only 25 years ago, no one wanted. Again, this provides both economic benefits from an increased tax base along with the many social benefits associated with clean rivers that all who choose to use them for recreation may enjoy them.

Another stage in environmental management is emerging, wherever cleaning up the severe pollution (much from point sources) has been very successful. Now the focus is shifting to sources and contaminants that are not as easy to clearly identify and that were previously masked by the severe and large-scale problems. In many areas of environmental study, methods and tools have already been developed to deal with past issues - these methods provide a guide or framework in which to tackle emerging issues. For many of the reasons stated in the above paragraphs, the economic tools that would be so useful in helping to estimate the costs and benefits of improvement in water quality have never been fully developed. As future environmental problems grow in complexity (and in cost) and as public budgets tighten into the foreseeable future, justifying the expense or demonstrating the true benefit of water quality related programs are likely to be one of the main causes for delay of support for continued improvement of water resources. The time to begin developing basic economic tools for environmental projects has already passed; the time when more sophisticated economic methods will be an essential part of "doing business" is rapidly approaching.

Costs of the State Water Quality Program

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Due to changes in the format of the 2002 305(b) Report, many of the narrative sections were dropped from that reporting cycle – including program cost information. So, as was reported in the year 2000 305(b) report "In 2000, the cost to administer water-related programs [in the Department's Bureau of Land and Water Quality (DEP BLWQ)] was approximately 11.1 million dollars." For the 2004 reporting cycle, the Bureau will report on program costs for state fiscal years (which run from July 1st to June 30th) 2001 through 2003. The briefest possible summary of DEP BLWQ program administration costs is the following; in 2001 these costs were approximately 10.8 million dollars, in 2002; approximately 13.5 million dollars and in 2003; approximately 16.4 million dollars. The following subsections and graphs will describe program costs in further detail and will also include a few specific program area highlights. In Figure 3-1, the above annual figures from fiscal year 2001 to 2003 are broken down by the funding source (federal, state or dedicated).

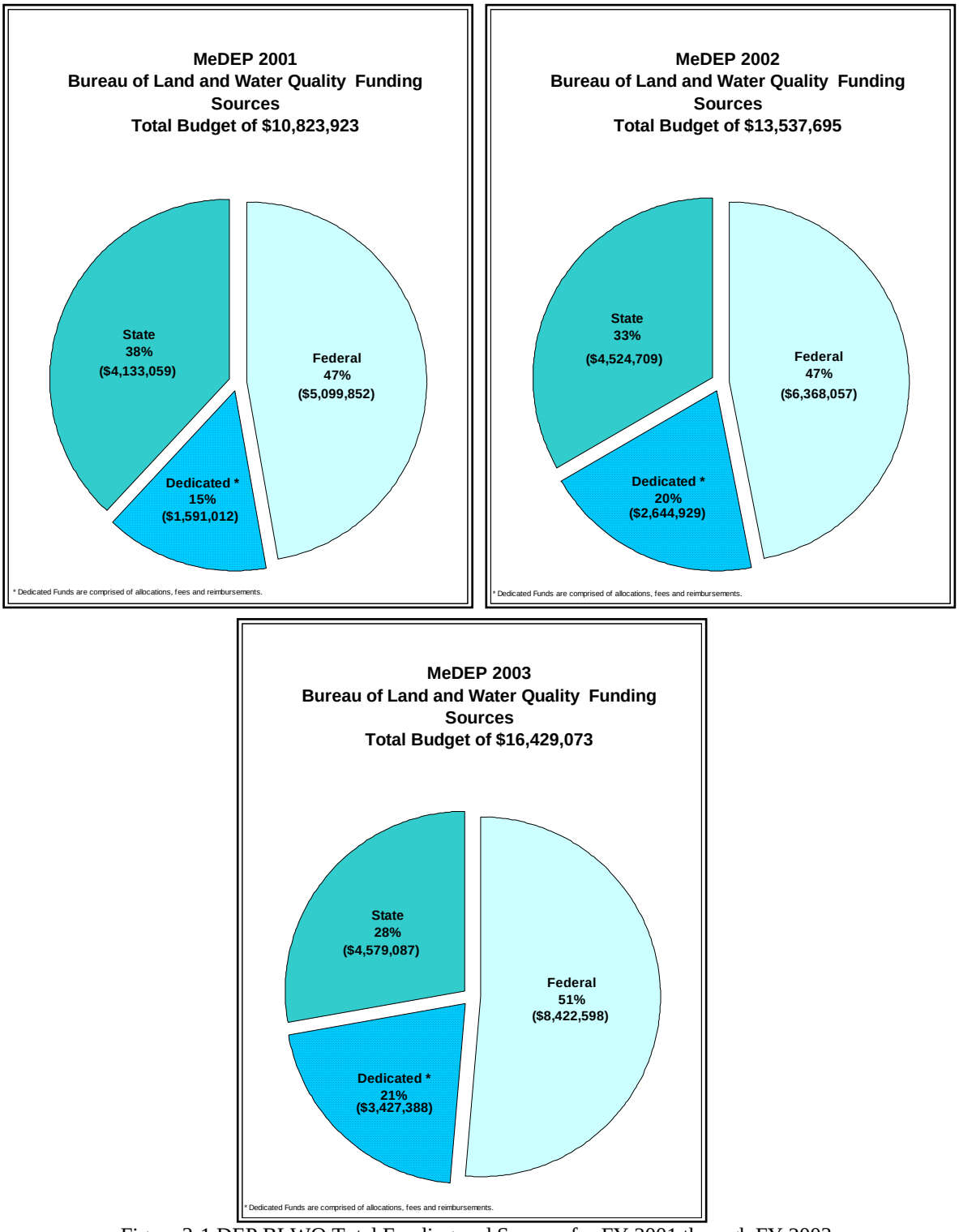
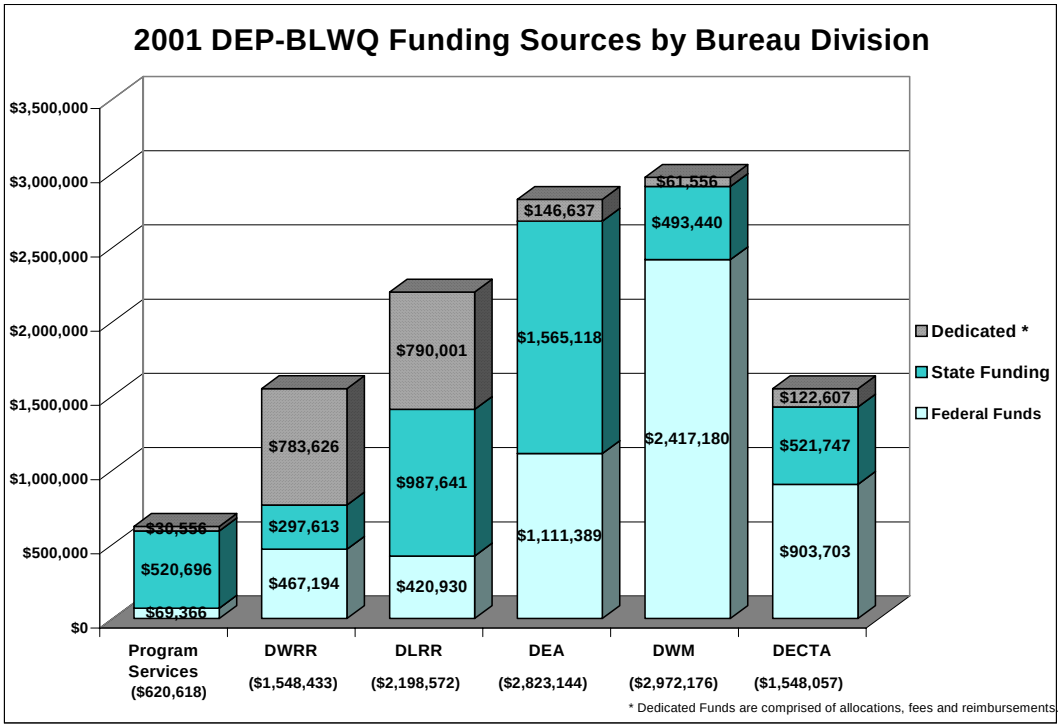
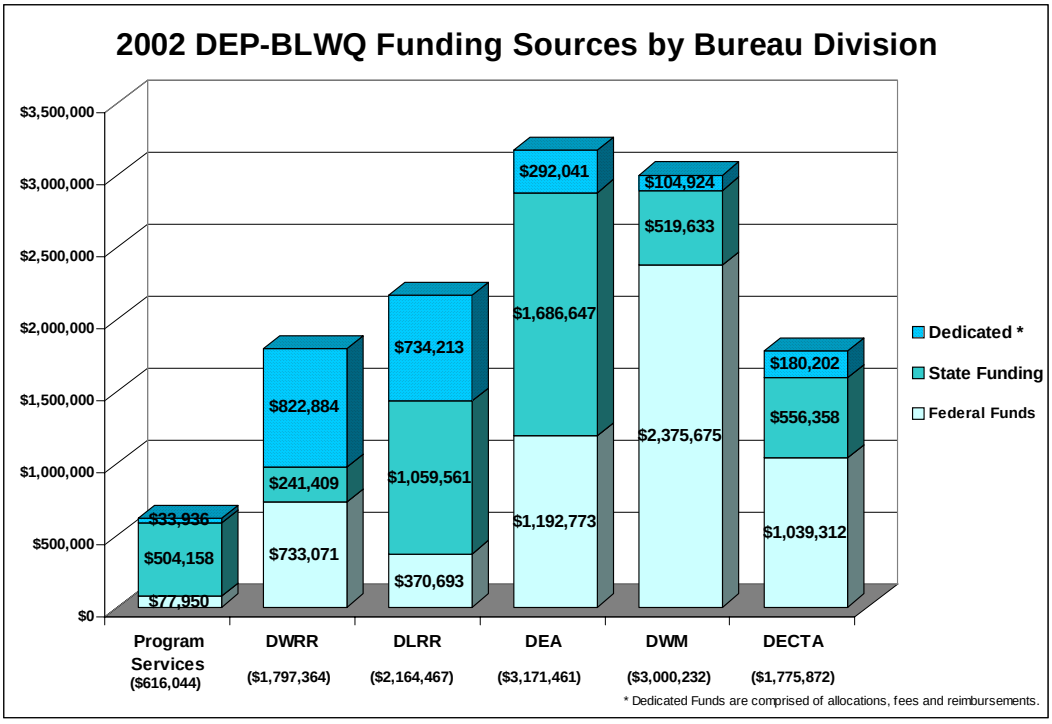


Figure 3-1 DEP BLWQ Total Funding and Sources for FY 2001 through FY 2003.

Functional program areas within the Bureau of Land and Water Quality include licensing, compliance, enforcement, technical assistance, pollution prevention, wastewater engineering, environmental assessment, lake restoration, nonpoint source control and ground water protection. It should be noted that the total annual costs cited above do include positions that are focused primarily on land use regulation. However, team members in these positions are frequently involved with issues related to water quality and it could be argued that the majority of their land use activities will ultimately have a positive impact upon the quality of adjacent and downstream waters.

Organizationally, the DEP Bureau of Land and Water Quality is comprised of five divisions and one section devoted to program services that performs administrative functions for the various divisions. A web page that details how these entities are organized can be viewed at this URL: www.maine.gov/dep/blwq/organiza.htm. The divisions are as follows: Water Resource Regulation (DWRR), Land Resource Regulation (DLRR), Environmental Assessment (DEA), Watershed Management (DWM) and Engineering, Compliance & Technical Assistance (DECTA). Figure 3-2 depicts total annual funding by division for fiscal years 2001 through 2003 and also breaks down the total funding by source (federal, state or dedicated).





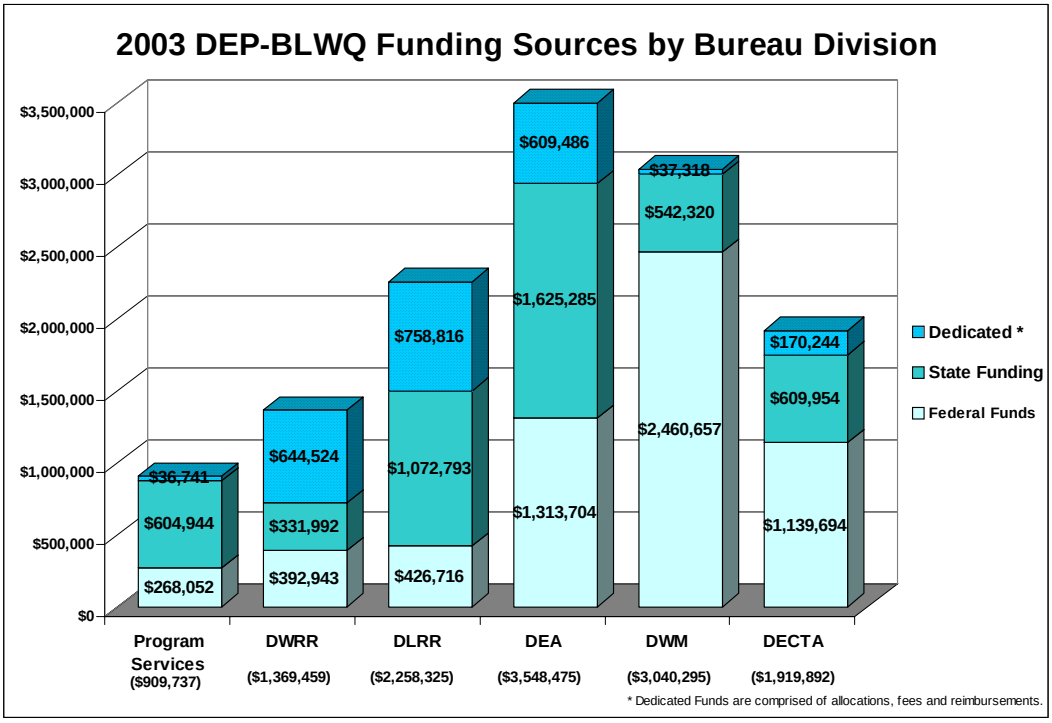


Figure 3-2 DEP BLWQ Division Funding and Sources for FY 2001 through FY 2003

The reader should be cautioned that the above figures do not provide enough detail to avoid misinterpreting the relative amounts of funding. For example, the DWM appears to receive almost double the amount of federal funding when compared to other divisions. However, the Section 319 - nonpoint source monies are the largest federal funding subcategory for this division, and it provided $2,165,571, $2,136,459 and $2,180,443 in FY 2001 through 2003, respectively. What is not explained on these

graphs is the fact that, by law, at least 40 percent of these funds must be in the form of pass-through grants to other entities (such as groups conducting watershed surveys) and is not truly utilized within the Division of Watershed Management. This would bring the actual use of these funds inside the division down to a respective maximum of $1,299,342, $1,281,875 and $1,308,265 in FY 2001 through 2003, which is similar to the level of federal funding received by other divisions.

Another subject that is not adequately defined in the above graphs and discussion is the amount of funding that is directed towards completing Total Maximum Daily Load (TMDL) studies. Teasing out the actual amount of money spent on TMDLs each year is a bit more difficult because these studies span all of the waterbody types and therefore utilize monies contained in multiple funding categories. The figures in Table 3-6 do not account for 100 percent of the costs of completing these studies and producing TMDL reports; they do include such expenditures as staff salaries and benefits, data collection and analysis, model creation, validation and various forms of contract support. So, these figures are a very close approximation of the real numbers and should provide at least a realistic sense of the level of resources that are committed to producing some of the fundamental information that is crucial to the 305(b) reporting process.

Table 3-6 Approximate TMDL Expenditures – Annual Totals and by Waterbody Type.

TMDL Expenditures				
Year	Waterbody Type			Total
	Lakes	Rivers	Streams	
2001	$202,243	$211,499	$91,140	$504,882
2002	$276,993	$216,499	$102,669	$596,161
2003	$255,243	$216,499	$117,440	$589,182

There are numerous other state programs within and outside of the DEP that control impacts to water quality (many of which are described in other sections of this report). Examples of some outside programs include; the Department of Human Service's Subsurface Waste Disposal Rules and Drinking Water Program, the Department of Agriculture's Pesticide Control Board and Manure Handling Compliance Program, the Department of Marine Resource's Shellfish Program and the Department of Conservation's Natural Areas Program, to name only a few. Currently there is no comprehensive system or effort in place to catalog all of the water quality-related State administrative costs. Beyond state-level agencies there exists a multitude of federal, county, local, volunteer and private organizations that all contribute funds towards the protection and improvement of the State's waters. Again, there is no known, recent endeavor to undertake a comprehensive listing of these organizations with the goal of estimating how many millions of dollars they spend annually to mitigate the effects of pollution in Maine's waters.

Wastewater Facility Construction

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Related Website: www.maine.gov/dep/blwq/grants.htm

In State Fiscal Years 2002 and 2003, the Maine DEP Construction Grants Program and the State Revolving Fund (SRF) funded 63 projects, some with assistance from the United States Department of Agriculture (USDA) Rural Development program grants/loans and Community Development Block Grant (CDBG) grant money. These projects included new facilities, upgrades, additions, modifications, abatement of combined sewer overflows and refinancing for a total cost of approximately $85,000,000 in State grants and SRF loans.

Small Community Grant Program

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Related Website: www.maine.gov/dep/blwq/grants.htm

From its inception in 1982, the Small Community Grant Program (SCGP) has disbursed 22 million dollars in grant monies. Although state bond issues usually fund this grant program, in the past it has also received some funding directly from state appropriations. These funds have been used to assist municipalities with the construction of individual or cluster-type wastewater treatment systems that were designed to eliminate heavily polluted discharges from either already malfunctioning systems or non-existing system ("straight pipes"). This amount of funding has resulted in the construction of new wastewater treatment facilities in over 300 communities throughout the state. Currently, the total estimated value of the facilities built with Small Community Grants is approximately 26 million dollars. Table 3-7 provides a summary of information about the program on a year-by-year basis.

Table 3-7 Yearly Summary of SCGP Activities.

Small Community Grant Program: Year-by-Year Summary				
Year	**Grant Amount Disbursed**	**Total Facility Value**	**Systems Installed**	**Wastewater Treated (Gal/Day)***
1982	$334,738	$403,299	115	31,050
1983	$945,758	$1,139,467	255	68,850
1984	$718,764	$865,981	156	42,120
1985	$1,185,070	$1,427,795	256	69,120
1986	$729,090	$878,422	177	47,790
1987	$865,771	$1,043,098	151	40,770
1988	$754,444	$908,969	111	29,970
1989	$921,980	$1,110,819	172	46,440
1990	$993,969	$1,197,553	183	49,410
1991	$1,376,411	$1,658,327	250	67,500
1992	$920,000	$1,108,434	277	74,790
1993	$944,785	$1,138,295	196	52,920
1994	$1,608,903	$1,938,437	335	90,450
1995	$1,099,043	$1,324,148	247	66,690
1996	$894,036	$1,077,152	195	52,650
1997	$910,692	$1,097,219	209	56,430
1998	$1,145,088	$1,379,624	187	50,490
1999	$769,086	$926,610	122	32,940
2000	$1,370,528	$1,651,238	251	67,770
2001	$1,142,009	$1,375,914	167	45,090
2002	$1,354,130	$1,631,482	208	56,160
2003	$1,086,265	$1,308,753	183	49,410
Totals:	**$22,070,560**	**$26,591,036**	**4,403**	**1,188,810**

* These figures are based on calculations derived from the Maine Plumbing Code.

Although very informative, the above table does not illustrate the fact that so many communities are interested in the SCGP, that their requests far outweigh available funding. For example, in 2002, 111 communities requested funds totaling approximately 2.3 million dollars and the entire 1.4 million dollars allocated for that year were awarded. Again in 2003, the 1.1 million dollars that were allocated for that year were completely expended to fund only a portion of the approximately 2.3 million dollars applied for by 131 towns. However, the success of this program is not measured by the fact that towns compete for more funds than are available. Success is measured by the fact that, from its inception, the Small Community Grants Program is estimated to have cumulatively eliminated the discharge of 1.2 million gallons of untreated wastewater every day.

Overboard Discharge Grant Program

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The Overboard Discharge Grant Program (ODGP) commenced in 1990. At first, the program sought to license all known overboard discharge systems (OBDs), then the focus shifted towards grant funding the eventual removal of many OBDs (where technically feasible). The reason for wanting to remove as many of these systems as possible is very simple. Even though these systems do treat wastewater; it is not possible to monitor them as closely as a large, traditional municipal or industrial treatment facility, so if an OBD treatment system malfunctions, the problem may not be caught quickly enough to prevent the system from contaminating nearby waters, beaches, clam flats, etc.

For any unfamiliar with the term, an overboard discharge is the discharge of wastewater from residential, commercial, and publicly owned facilities into streams, rivers, lakes and the ocean. A licensed OBD is one that is known, regulated and required to provide treatment of wastewater before it is discharged into a receiving water. Wastewater is treated by the system before it travels from homes, buildings and other facilities into a receiving waterbody. An illicit, or unlicensed, ODB may be a "straight pipe" where wastes and wastewater still travel directly from a building into a receiving waterbody without any treatment. (These are not common, but may still exist in a few locations and should be reported immediately upon discovery.) An OBD with a treatment system is typically installed in locations where "straight pipes" had historically existed, but where poor soils or small parcel sizes prevented the installation of a traditional septic system and where connections to public wastewater systems were simply not available. It should be noted that because OBD replacement systems are usually built on sites with very limited area for disposal fields, the construction costs could be much higher that systems built under good conditions. Despite the increased expense, the value recovered is still much higher than the costs, as is detailed in the next paragraph.

To date, the Overboard Discharge Grant Program has been funded with 7 million dollars from bond issues. From 1991 through the end of 2002, 206 grants totaling 6 million dollars were made to both towns and individuals. Since the beginning of the program, approximately 4.9 million dollars have been spent in the process of removing 446 systems. A total of 78 OBD systems were removed in 2001-2002 and during this same period, 840 acres of shellfish habitat were re-opened to shellfish harvesting. As detailed in Table 3-8, the total acreage opened to shellfish harvesting since the start of the OBD Grant Program is over 16,000 acres. According to the Department of Marine Resources (DMR), opening and fully utilizing this much shellfish harvesting area has the potential to release a harvest with a retail value of over 40 million dollars.

Table 3-8 Shellfish Areas Opened from 1991 to 2003

Town	Name of Shellfish Area	1991- 1998	1999	2000	2001	2002	2003
		Acres Opened	Acres Opened	Acres Opened	Acres Opened	Acres Opened	Acres Opened
Addison	Cape Split Hrbr, Eastern Hrbr	82	53				
Bar Harbor	Indian Point	49					
Beals	Black Duck Cove, Flying Place	68	39				
Blue Hill	Bragdon Brook Cove			198			
Bremen	Greenland Cove			100			
Brooklin	Naskeag Point	10					
Brooksville	Seal Cove, Weir Cove, Orcutt Hrbr	1,468	81				
Cushing	Pleasant Point				189		
Deer Isle	Sylvester Cove, Dunham Point		241				
Eastport	Carrying Place Cove	400					
Freeport	Cousins River	87					
Friendship	Hatchet Cove		86				
Gouldsboro	Prospect Harbor		1,076				
Hancock	Jellison Cove, Hancock Point	749					
Harpswell	Quahog Bay		1,627				
Isle au Haut	Thorofare	240					
Kittery	Spruce Creek				478		
Milbridge	Pigeon Hill Bay, Back bay	9	434				
Mount Desert	Indian Pt., Mill Cove, Somes Sound	240	50	1,893			
Ogunquit	Oarweed Cove					120	
Owls Head	Otter Point	50					
Scarborough	Plummers Island			4			
Searsport	Stockton Springs		51				
Sedgwick	Billings Cove		9				
S. Thomaston	Waterman's Beach				59		
Steuben	Pigeon Hill Bay, Pinkham Bay	174	170				
Sullivan	Sullivan River	167					
Swans Island	Round Island, Mackerel Cove	44	55				
Tremont	Moose Island	965					
Trenton	MDI Narrows		69				
Vinalhaven	Arey Cove, Seal Cove	7	1,171	2,278			
W. Bath & Phippsburg	Bringham's Cove (New Meadows)						1,020
Yarmouth	Cousins River	7					
York	York River			141			
Total Acreage Opened		**4,816**	**5,212**	**4,614**	**726**	**120**	**1,020**
Cumulative Totals		**4,816**	**10,028**	**14,642**	**15,368**	**15,488**	**16,508**

Nonpoint Source Management

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Table 3-9 summarizes costs for NPS programs involving Federal grants under section 319 of the Clean Water Act in addition to non-federal matching funds. This summary does not include other State agency funding of personnel or programs conducting NPS control activities, so the following table is a summary of Section 319(h) Clean Water Act Grant Awards to Maine DEP. These figures are from the Department's Nonpoint Source Program and reflect totals for Federal Fiscal Years (FFY) 2000 through 2003.

Table 3-9 Summary of DEP Nonpoint Source Grant Totals

Grant Year (FFY)	Federal 319 Award	Base	Incremental	Non-Federal Match	Total
2000	$2,256,413	$1,110,205	$1,146,208	$1,404,276	$3,660,689
2001	$2,647,731	$1,487,139	$1,160,592	$1,765,154	$4,412,885
2002	$2,739,543	$1,489,950	$1,164,593	$1,826,362	$4,565,905
2003	$2,740,732	$1,572,554	$1,168,178	$1,827,155	$4,567,887

Pollution Prevention and Cost Benefit Information

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The Clean Water Act and subsequent guidance documents developed by EPA contain an enormous amount of information on how to construct an integrated report on surface water quality. As expected, these guidance documents also describe what information should be included in a standard 305(b) Report. An outline of the 2004 report format contained language very similar to this sample topic title (and the title of this very report section): 'Economic & Social Costs and Economic & Social Benefits of Effective Water Programs.' This title suggests that the EPA and Congress still desire to obtain information about the costs and benefits of water quality programs, particularly those programs where they provide at least partial funding. It is quite understandable that those who are providing monies for a purpose would like to have some means of learning how those funds are benefiting, in this case, improved water quality.

When the cost-benefit type of analysis (CBA) was introduced as a component of the 305(b) Report, it probably seemed like a logical and straightforward approach to measuring both the cost and benefits of many of the water quality-related programs. The EPA deserves credit for tenaciously pursuing and requesting information on the benefits of these programs, because it is unclear if they (in most cases) have ever received good, complete qualitative figures and if they have gotten reliable numbers on a regular basis (in all cases). A quick review and analysis of past 305(b) reports would likely find that most of these submissions did not adequately provide information on cost-benefit and related analyses.

Typically (as will be the case this year for Maine) the cost-benefit section of the report provides specific information on the costs of those programs that either affect, or that

are affected by, water quality. These figures on costs are accompanied with very general, if any, information on benefits provided by these very same programs. The reason for this disparity is that while it is often fairly easy to provide information on costs as spending from agency budgets, it is usually very difficult to provide an accurate dollar amount figure for something as abstract as an improvement to the quality of any given water. As is commonly known, many environmental factors fall into those areas in the economic fabric of a society where the results of market forces provide "value" as an intangible, qualitative "notion" rather than as a quantitative "figure" that can be directly derived or measured from other data. This, along with other issues, such as defining a "social benefit," makes calculating either the quantitative or the qualitative benefits of environmental improvements into a very daunting series of tasks.

As a counterpoint to this section's introduction, it does not seem as though enough information in the form of useful methods and tools to calculate benefits has been provided to the states. Based on past reporting, it would appear as though the states are ill equipped to grapple with the problem of calculating or even accurately estimating even the basic benefits of their water quality programs. Consequently, this portion of the 305(b) report has been historically neglected and not well understood.

Finally, it appears that if components of the federal government are truly interested in obtaining better and more complete assessments of the environmental benefits being derived from their funds, then they need to lead in the development of methods and tools to estimate the benefits of cleaner waters. It seems likely that the EPA, as the nation's clearinghouse of environmental studies, reports and datasets, may already have much of the information that would be needed as a foundation to build on in order to get this effort underway. For example, the study done in Maine (and reported in a previous 305(b) report) on water clarity and property values may, in concert with studies from other states, provide a completely functional tool (or a piece of a future tool) if these disparate puzzle pieces could be assembled. Or, if complete, working tools and methods do already exist, then the states may need to be made more aware of them and then shown how to implement, utilize and incorporate them almost "seamlessly" into both their accounting practices and program areas for them to be successful and sustainable.

The next subsection will introduce a program at the Maine DEP that is probably one of the most focused in the Department on providing real-world estimates of the benefits derived from it projects. The text that follows will describe the relative amount of success that this program has had in obtaining and providing that type of information.

The Pollution Prevention (P2) Program:

This program is one of the three major program areas that fall under the Department's Office of Innovation and Assistance (OIA). The two other main programs in the OIA are the Small Business Technical Assistance Program (SBTAP) and the Toxics and Hazardous Waste Reduction Program (THWRP). The following table summarizes the various ways that the Office tracks its level of service to customers and indicates that the OIA is an expanding program that is enjoying greater interaction both with businesses and with individual citizens.

Table 3-10 Office of Innovation and Assistance – Technical Assistance Efforts

Service Tracking Category	2001	2002
Hotline Calls / e-mail Inquiries	11,489	17,846
Staff Onsite Visits	445	513
Training Activity Participants	3,820	N/A
Workshop Participants	N/A	830
Individual Pieces of Mail Sent	3,680	4,855
OIA Home Page Visits	N/T	14,536
Teleconference (attendees)	124	6,346
Permits Issued	212	237

N/A means “Not Available” and N/T means “Not Tracked”

It must be noted that the above figures are totals from all program areas that make up the OIA, and that since these programs often work in close concert with each other, it can be difficult to separate out the actual contribution made by an individual program. However, to the extent possible, the balance of this section will focus on the P2 Program as a separate entity.

The Pollution Prevention (P2) Program is based on the practical notion that it is far more protective of the environment (in addition to being far more cost-effective) to eliminate or reduce pollution at its source rather than to clean up pollution that has already been released into an ecosystem. The P2 Program engages in a proactive approach that utilizes the common ideals of increased efficiency, conservation of resources, reduced waste (and costs), etc. to identify those points in a process that generate pollution. Once identified, the P2 Program also utilizes many approaches like forming good habits, purchasing new products and implementing new technologies to analyze, zero in on and help to correct those portions of a process that generate preventable pollution. Then the Program uses some or all of these tools to reduce or eliminate that source of pollution.

The P2 Program has two distinct areas where it directs its outreach efforts and consequently, has two areas where it conducts the majority of its business: these areas are "Household and Citizen Assistance" and "Business and Industry Assistance." Although significant resources and help is available for and utilized by households and citizens, due to the potential for sheer number of individual contacts, the P2 Program is really best able to attempt to track the potential economic impact of its efforts in the area of assisting business and industry. Documenting how the Program has helped other businesses in the past is a crucial part of building future relationships by being able to demonstrate how assistance from the program could benefit a business’ budget in addition to it’s compliance with environmental regulations. This means that gathering basic cost-benefit data is more likely to be considered a priority and to occur within the P2 Program when compared to other areas of the DEP.

Given these circumstances, along with repeated exposure to how much value is thought to be placed upon the bottom line by private business, one might expect to find a high incidence of figures indicating benefits of past projects. Analyzing only the

P2 Program's forty-three published case studies from 2000 (11 entries), 2001 (18 entries) and 2002 (14 entries) shows the following statistics:

- In 32 of the 43 case studies (74%), project expenses were not estimated or not reported by the business.
- Of the 11 remaining cases, 9 did report real dollar amounts, while the other two either reported a cost per unit or an estimated cost of "several million dollars."
- In 29 of the 43 case studies (67%), benefits of the project were not estimated (or not reported to P2 Program staff).
- Of the 14 remaining cases, only one failed to estimate a fairly concrete figure for the project's benefit, but it did provide a reason – variations in annual business cycles would affect the total value of savings.
- As far as non-monetary benefits are concerned, only 8 of the 43 case studies (19%) failed to either estimate or describe benefits in quantifiable terms of either a % reduction or a reduction in amount / time (e.g. lbs/year) of a pollutant, waste stream, etc.
- Finally, there were only 3 studies (7%) where the benefits were described in purely qualitative terms.

(see Table 3-11 for a complete list of summary information on the case studies used to generate these figures)

The above figures seem to support the idea that even under the best of circumstances (i.e. government agency and private business working cooperatively together); water quality programs are not likely (or sometimes able) to collect information on the benefits that they are providing to society. Once we consider other factors, for example, the occasionally contentious relationships that exist between agency and business, the chances for successfully engaging all parties and exchanging information on true costs and benefits of improving waters are reduced significantly. As far as the private sector influence is concerned on the above statistics, even the same business with different projects in different years produced variations – a business might calculate a cost and not the benefits with the opposite categories being calculated on another project. No one factor seemed to be driving consistency in reporting results.

Clearly moving the process of estimating cost and benefits from a single program up in scale to an agency, department or an entire state with multiple departments involved, non-government organizations, volunteer groups, non-profits, etc. would add layers of complexity to any proposed method of calculation. The question to answer is a seemingly very basic one "what benefits are all of these organization's activities adding to improving the environment?" The question that must be addressed first is "what tools can these organizations use to figure out and estimate the environment benefits that their activities create?" Both questions are important – neither has an easy answer.

For more information on the Maine Department of Environmental Protection P2 Program:

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Related Website: www.maine.gov/dep/oia/p2/index.htm

Table 3-11 Summary Information on P2 Program Case Studies

Year	Name	Estimated Expense ($)	Estimated Benefit ($)	Estimated Resource Savings
2000	Bangor Water District	N/E	N/E	N/E
2000	Bath Iron Works	$9,789	N/E	11,590 lbs/year of photographic waste eliminated
2000	Cattail Press	$0	N/E	N/E
2000	Friends of Casco Bay	N/E	+/- $100,000	8,600 gal/year raw sewage diverted from the bay
2000	Goodkind Pen Co	N/E	Variable - $1,000's / year	18% of packaging reused or recycled
2000	Hawk Ridge Composting	$4,500,000	N/E	N/E
2000	International Paper	over $20,000	N/E	43.2 tons/year reduction in emissions
2000	Maine Dry Cleaners	N/E	$10,000 / year	Reductions of 2,113 lbs/year (waste) and 600 gal/year (solvent)
2000	Mount Desert Island Water Quality Coalition	N/E	N/E	Reopening of clam flats, conservation of shellfish beds and the removal of a fecal-coliform source
2000	OSRAM-Sylvania	$42,850	N/E	Elimination of both hazardous cleaning chemicals and of air emissions
2000	Town of Portage	$33,000	N/E	25-77% reduction in phosphorus entering lake and a reduction of e-coli contamination at the source
2001	Auburn Educational Services	N/E	N/E	N/E
2001	Bio-Hazard Materials Working Group	N/E	N/E	Elimination of hospital-distributed mercury thermometers and a reduction in hospital waste streams
2001	Goodkind Pen Co	N/E	N/E	Multi-faceted project to acquire additional manufacturing space in the most environmental friendly way possible
2001	Guilford of Maine	N/E	N/E	Reduced total energy consumption by 10% and reduce antimony released in wastewater by 25%
2001	International Paper – Bucksport	$103,000,000	N/E	Reduced steam generation emissions by 50% (2,500 tons/year), reduced ash emissions by 45% (6,750 tons/year) and reduced SARA 313 steam generation emissions by 50% (132 tons/year) - now generates 120 - 175 mW of electricity with out increasing air emissions
2001	Maine Environmental Policy Institute	N/E	N/E	N/E
2001	OSRAM-Sylvania	N/E	$9,375 / year	Reduced the generation of waste isopropyl alcohol by 50%
2001	Portland water District	32,515	N/E	Internal/external mercury awareness/reduction campaign and sponsored a mercury collection day
2001	Z-F Lemforder	$1,580	N/E	Resold 28 tons of plastic material and recycled 3 tons of plastic bags instead of landfilling, now conserves propane at the rate of 25 gal/day
2001	Dead River Company	$0.60 / thermostat	N/E	Eliminated the sale and installation of 500 mercury thermostats per year
2001	Lincoln Pulp & Paper	Several million dollars	bleaching costs reduced, but N/E	Development of the "*envirO*$_2$^{TM}" bleaching process - elimination of detectable dioxin, phenolics, and furan from bleach plant effluent and of elemental chlorine from production process, 50% reduction in chloroform emission and a 15% reduction in the aggregate amount of toxic chemicals used to manufacture pulp