

**Water Withdrawal Reporting Program
2005-2006 Annual Report**

**to the
Joint Standing Committee on Natural Resources
of the
123rd Maine Legislature,
First Regular Session**

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**Submitted by
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Introduction and Highlights of the Past Year

This is the fourth annual report of the Water Withdrawal Reporting Program. Maine's Water Withdrawal Reporting Program, which is found at Title 38, Sections 470-A through 470-H, requires water users who withdraw quantities in excess of the thresholds contained in the statute to provide information about their annual water withdrawals from public water resources. September 30, 2006, marked the end of the fourth "water year" subject to reporting under the Water Withdrawal Reporting Program. Reports of withdrawals made from October 1, 2005 to September 30, 2006 were to be submitted to DEP or the Department of Agriculture, Food and Rural Resources by December 1, 2006.

Watersheds at Risk

In 2006, data from the Water Use Reporting Program was used by the Maine Geological Survey as part of a statistical analysis of watersheds-at-risk from water use statewide. As part of its efforts to review the regulation of groundwater in response to LD 1643/Public Law chapter 452, the Maine Geological Survey conducted a preliminary analysis of watersheds at risk from water use. This instructive analysis was made possible by public investments over the past decade in important datasets and analyses including a statewide digital compilation of watersheds, analysis by the U.S. Geological Survey (USGS) of typical annual and monthly stream flows in Maine, and the data collected through the Water Use Reporting Program.

In-stream Flow and Water Level Standards

In November of 2006 the Board of Environmental Protection provisionally adopted Chapter 587, In-stream Flow and Water Level Standards. As a major substantive rule, Chapter 587 will be presented to the Legislature for review this winter (2006-2007). After legislative review the rule would then go back to the BEP for final approval. Major substantive rules usually become effective 30 days after the final rule is filed with the Secretary of State's Office. These rules are being proposed in response to the statutory requirements of Title 38, sections 470-H. This section provides that the rules must *"establish water use standards for maintaining in-stream flows and GPA lake or pond water levels that are protective of aquatic life and other uses and that establish criteria for designating watersheds most at risk from cumulative water use. Standards adopted ... must be based on the natural variation of flows and water levels, allowing variances if use will still be protective of water quality within that classification."*

Sustainable Agricultural Water Source Development Grant Program

In its fifth year of operation, the Sustainable Agricultural Water Source Development Grant Program (SAWSDG) continues to assist farmers. The legislature passed an additional 1 million dollar bond issue in June, 2006. The Department of Agriculture conducted two grant solicitations, adding another 24 projects to the growing list of farmers seeking alternative sources of water. Seven (7) of the projects were directly related to removing pipes from surface water sources and creating new ponds or wells. More projects were funded for potato farmers and blueberry farmers than in the past. To date, \$2.95 Million dollars have been spent on 117 projects protecting 7,900 acres of cropland and greenhouses, and 13.9 million dollars of crop value. All but 31 projects have been completed. The Governor's office has continued to support the program and intends to submit another bond request this legislative session.

Goals for the Coming Year

Implement Chapter 587

In 2007 the DEP will be implementing the provisionally adopted Chapter 587, In-stream Flow and Water Level Standards. A major effort will be applied to getting the word about the new program out to all potentially affected water users. DEP staff will partner with other agency staff as appropriate to coordinate with community public water suppliers and agricultural water users. Specific activities will include:

- Preparation of public information documents explaining the new program, targeted to general audiences, and also to specific user groups including community public water supply, agriculture, etc.
- Direct outreach to all affected water user groups via mailing to individuals and associations
- DEP staff available to meet with water users in the field to assess water sources, flows and water levels
- Preparation of self-explanatory forms for filing flow and water level plans, and community public water supply certifications.
- Meetings with trade associations
- Press releases

Watersheds at Risk

The DEP will continue to work with the Maine Geological Survey to apply the data collected through the Water Withdrawal Reporting Program to study water use patterns in Maine. The Departments will be exploring options for expanding on the recent statistical analysis of watersheds-at-risk from water use. The DEP will continue to provide partial support for a geologist position at MGS for this and other tasks relating to the Water Withdrawal Reporting Program.

Low-Flow Studies

The DEP will continue to support the USGS Southern Maine low-flow study which will develop regression equations to estimate flow statistics, including August median stream flow, at any unengaged, unregulated small drainage basin in Southern Maine. This study will address a serious gap in our ability to estimate low flows on a regional basis across the state.

Agricultural Water Management Board

The Department of Agriculture will begin working with a new Agricultural Water Management Board to address agricultural water use issues. The new Board, established by legislation passed in 2006 and enacted at Title 7, M.R.S.A section 352, outlines the duties of the new Board as follows:

- The board, working in conjunction with the Department of Environmental Protection, will:
- A. Oversee and coordinate the environmentally sound and affordable development of water sources for agricultural use;
 - B. Make recommendations for improvements to federal and state permitting processes for the development of farm ponds and other water sources for agricultural use;
 - C. Work to secure funding for the construction of environmentally sound, efficient and affordable water sources for agricultural use;
 - D. Use data generated by water withdrawal reports under Title 38, section 470-D and other

available information to prioritize watersheds needing alternative water sources for agricultural use and the allocation of funding; and
E. Facilitate the implementation of the sustainable agricultural water source program under section 353.

Lessons Learned from Water Withdrawal Reporting Data Water Use and Availability

The data obtained in the first four years of the Water Withdrawal Reporting Program has played an important role in expanding our understanding of water use and availability in Maine. Most recently, the Maine Geological Survey used the data in a statistical analysis of watersheds-at-risk from water use statewide. The summary of this work was originally published in the *LD 1643/Public Law chapter 452 Work Group – Review of Ground Water Regulations 2005-2006 Report to the Maine Land and Water Resources Council*, January 10, 2007, and subsequently submitted to the legislature as a part of the *Review and Recommendations Regarding Ground Water Regulations*, January 10, 2007, submitted to the legislature by the Land and Water Resources Council.

Before the inception of the Water Withdrawal Reporting Program, the history of water withdrawal issues in Maine suggested that Maine's larger water bodies were not facing any immediate threat. Maine's large rivers and lakes generally provide abundant water for the demands placed upon them. Experience suggested that it was on relatively small water bodies in relatively small watersheds with one or two significant withdrawals where the greater potential for conflict existed. Particularly during low-flow periods a single water user could have a significant impact on a small river or lake.

In past years data from the Water Withdrawal Program has been used to test these observations. Early efforts focused on the impact of individual water withdrawals on the affected watersheds. In 2004 DEP began to use the data from the first year of the water withdrawal reporting program and other sources to analyze specific water uses and availability. USGS regression equations were used to estimate the monthly median flows which are being considered for use in the draft rule and compare these medians with actual flow for specific withdrawal sites on rivers and streams. These statistics were also used to assess water availability for filling storage ponds.

In 2005, this work was expanded to look at watersheds with multiple withdrawals. The statutory reporting requirements included thresholds which screen out withdrawals which are small relative to the size of the source water body. Working with the data that makes it through this screening process, the MGS conducted a review of smaller watersheds with multiple significant withdrawals. That review identified three watersheds, the Prestile Stream in Aroostook County, the Kenduskeag Stream in Penobscot County, and Schoodic Lake in Washington county. The analysis of these watersheds was summarized in last year's annual report. The latest work of MGS summarized above expands the scope of these studies to all watersheds statewide.

In related efforts, the DEP provided financial assistance to the Department of Agriculture to assist in conducting a water availability analysis of current agricultural water users. The Department of Agriculture issued a report in conjunction with the 2004 annual report which summarized this analysis. The DHHS Drinking Water Program has conducted a similar analysis for public water supplies. DEP has also worked with the Ski Maine Association to conduct an assessment of ski areas, and has conducted a survey of golf courses comparing water use with availability which was reported in the 2006 annual report. This work of comparing water use and sustainability is ongoing, with future efforts to expand on the most recent work of MGS in identifying watersheds at risk from water use.

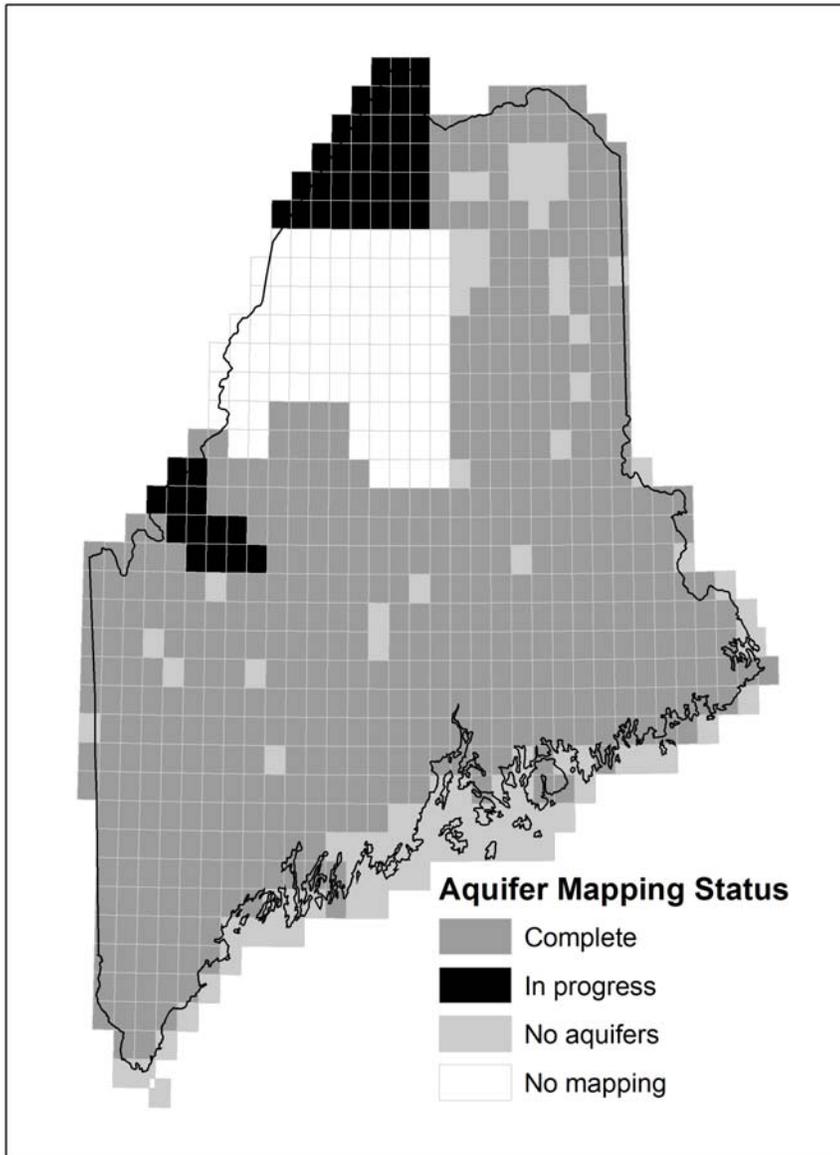
Water Availability Data

There are a number of on-going efforts to provide water availability data in Maine. The U.S. Geological Survey (USGS), together with the National Weather Service and the Maine Geological Survey, tracks precipitation, snow pack, groundwater levels, and stream flow conditions at a limited number of sites throughout the State. A summary of this information of this information is presented below.

The USGS, in cooperation with State agencies, also continues to work to provide better tools to estimate site-specific water availability on rivers and streams. To better estimate stream flows in ungaged streams, the USGS has used data from sites where they have operated stream gages for many years to develop regression equations that can be used to estimate the monthly median flow at an ungaged site based on the area of the drainage basin above the point on the river or stream, the mean annual rainfall, how much sand and gravel aquifer is present in the drainage basin, and other factors. These equations are now available for large drainage basins throughout the state, and for small drainage basins in Aroostook County and Downeast. In 2006 DEP partnered with USGS to launch a low-flow study for small drainage basins in Southern Maine to address this important data gap.

An important component of predicting water availability is knowledge of groundwater resources. Significant sand and gravel aquifers are capable of yielding 10 gallons per minute or more of water to a well. In many parts of the state they are drawn on heavily for municipal and industrial water supplies. Where they are available in agricultural areas, they are used for irrigation. Furthermore, the percentage of a watershed that is underlain with sand and gravel aquifers is a significant factor in determining low-flow conditions in streams. Because of their value as water resources and concerns for maintaining water quality, the Maine Geological Survey has been directed to map these aquifers statewide. This mapping effort provides a valuable basic data layer for analysis of numerous water resource issues.

In 2004, the Maine Geological Survey completed mapping of significant sand and gravel aquifers for all organized towns in Maine. In 2005, MGS began mapping significant sand and gravel aquifers in Maine's unorganized towns in western Aroostook and northern Piscataquis Counties. The primary mapping area was west of the towns of Ashland/Portage, in the areas around the St John's and Allagash River watersheds. In 2006, the area that was mapped included the region west of the Kennebec River between Flagstaff Lake and Jackman. The plan is to continue mapping these sand and gravel aquifers within Maine's unorganized areas, until full aquifer coverage is obtained for the state. (See aquifer mapping status next page.)

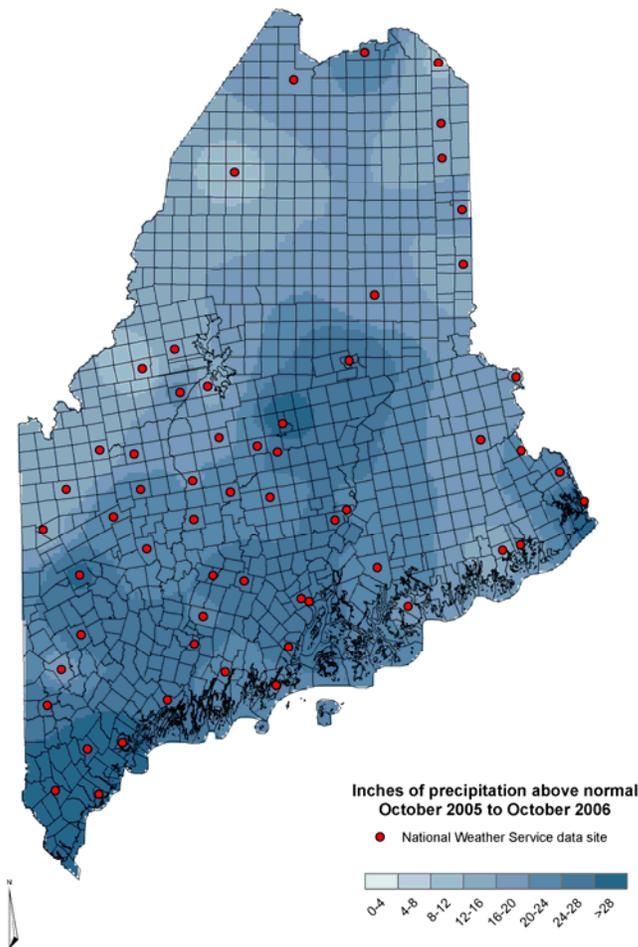


Summary of Water Resources Conditions: October 2005 - October 2006

The wet conditions that persisted throughout 2005 continued through 2006, with precipitation above normal everywhere in the state (see figure below). Precipitation ranged from less than 8 inches above normal along the Maine-Quebec border to over 30 inches above normal in York County and portions of south-central and central Maine.

Precipitation levels provide an over-all measure of water availability, and this second year of record precipitation translated into continued high water levels in rivers, streams and lakes, and recharged groundwater levels.

For a brief period in the last 2 weeks of March and the first week of April, coastal sections of State experienced abnormally dry conditions. This was short lived, however. The month of May saw over a foot of rainfall over most of York County, with 14.4 inches in Kennebunkport, 15.5 inches in Sanford, 16.5 inches in South Berwick, 19.4 inches at the Rachel Carson National Wildlife Reserve in Wells, and 20.2 inches at Cape Neddick in York. This rainfall produced widespread flooding of rivers and streams throughout the county, and prompted the Governor to request and receive a disaster declaration from the Federal Emergency Management Agency.



Inches of precipitation above normal
for the period
October 2005 to October 2006

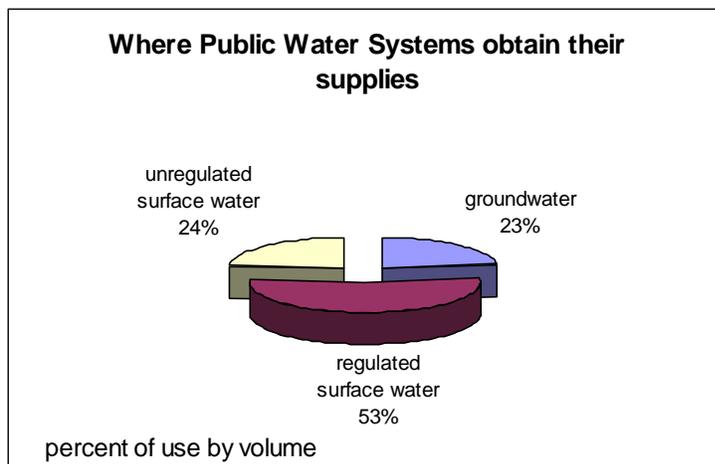
Data from National Weather Service
stations and the National Weather
Service cooperative observer network

Conditions Observed by Public Water Systems

The Department of Health and Human Services Drinking Water Program (DWP) reports that public water systems observed conditions in 2006 that continued a trend of generally normal water availability, despite above normal precipitation. A significant portion of the water use for large public water systems is for commercial and industrial uses which can represent a substantial component of local economies. An adequate supply of high quality water is important to these industries. Domestic drinking and sanitary water represent the largest portion of the use in most of the smaller systems under normal operations. Fire protection flows require significant peaking capacity during emergencies.

A number of coastal public water systems, notably the Boothbay Region Water District, Castine Water Department, Kennebunk, Kennebunkport and Wells Water District, Kittery Water District, and the York Water District annually experience late-summer demand peaks, which coincide with seasonal ground and surface water lows. Conservation continues to be required in several communities. These systems continue to work to develop supplemental sources. This is often difficult along Maine's rocky coast and often beset with complex and extensive permitting requirements. All Public Water Systems withdraw water in a manner that assures continuity of the supply. Most large systems utilize a very small fraction of the resource's potential.

About 77% of the water used by Public Water Systems is from lakes, ponds and rivers, and 23% from ground water. About ¼ of their needs from surface sources with no current water level or flow regulation (see figure, below). In all cases, the withdrawals are less than the estimated long-term yield of the water body.



The Bulk Water Transport permitting program administered by the DWP continued a high level of activity. There are fifteen existing bulk water transport permits which have been renewed by the DWP every three years. Four of these permits are new this year. In addition, there are two transporters whose operations pre-date the regulation, and are grandfathered. The permits are nearly all for the collection of spring water and transport to a bottling

plant. If the source wishes to be labeled as spring water, they are required to meet the U.S. Food and Drug Administration's definition, which includes a provision that their extraction cannot cause the spring to cease flowing or change its chemistry. Permits are reviewed by the DWP, MGS, DEP, and the Public Utilities Commission (PUC), for their compliance with applicable laws and environmental impact.

Water Withdrawal Data

The record high precipitation levels in 2006 reduced some water uses, such as irrigation which is primarily needed to supplement rainfall during dry periods. However, even with record setting precipitation overall, the winter of 2006-2006 saw relatively little snow, resulting in an increase in water use for snowmaking. Bottled water use was also substantially up, due to new production coming on-line and an increase in production from some of the larger facilities.

Reported Water Withdrawals by Type				
Type of Use	Withdrawals Reported (millions of gallons)			
	2003	2004	2005	2006
Water Utilities	33,800	34,400	33,500	33,600
Paper Mills	70,000	66,000	63,000	57,900
Agriculture	861	719	622	510
Snow Making	590	559	606	863
Bottled Water	365	448	440	699

Public Water Supplies

There are approximately 2,000 Public Water Systems (PWS) in Maine, of these, 400 are community water systems with 25 or more users. Data for these systems, including location, source, and population served, is maintained in a GIS database by the Department of Health & Human Services, Division of Health Engineering as part of their Drinking Water Program.

Production/consumption data for 152 of the larger water utilities comes from an existing reporting program of the Public Utilities Commission (PUC). The water utilities report to the PUC on an annual (Jan. - Dec.) basis, with data due by April of the following year. The production/ withdrawal data is broken down into monthly segments, and is also further divided into source, either ground-water or surface water. For calendar year 2005, there were 152 water utilities and of those, 116 have reported to the PUC. Of those reporting, annual production for 2005 was 33.6 billion gallons, for an average of 2.8 billion gallons a month, or 92 million gallons per day. Residential consumption was 10.3 billion gallons, or 30.7% of the total. There are 50 community systems that use surface water; these systems serve the larger population centers, and therefore use the largest quantities of water. The remaining community systems, and nearly all the smaller systems, rely on groundwater for their supply.

Bottled Water

There were 32 Maine bottled water facilities, either proposed or operational, in 2005. Of these, 20 actually produced bottled water during 2005. Total water use for 2005 was 699 million gallons, or an average of 58 million gallons per month. This 59% increase over 2004 was due to new production coming on-line and an increase in production from some of the larger facilities.

Agricultural Water Use

In 2006, irrigation water use declined for the third consecutive year, due to the relatively abundant natural rainfall. The amount of water used has declined from a high of over 860 million gallons in 2003, to approximately 510 million gallons in 2006. Blueberry irrigation in Washington County is still the highest user of water in the agricultural sector. Farming in Maine was challenged by too much water in 2006. Farmers did not need to irrigate early in the season. However, some turf and cranberry farmers irrigated in the mid summer weeks to assure quality products had enough water. Potato farmers in some areas in Aroostook did the same. First year blueberry plants were irrigated in the summer. Cranberry plants were flooded for harvest and again for preventing winter injury. All in all, water use was down significantly from last year. A table shows the total water use, by county, and comparison to past years.

Agricultural Water Use Reported (gallons)				
County	2006	2005	2004	2003
Washington	458,421,704	558,124,014	549,439,022	581,965,980
Kennebec			105,136,500	27,760,122
York	32,356,000		48,455,600	77,547,100
Aroostook	10,485,516	37,542,431	8,693,100	69,615,943
Oxford		16,788,000	4,800,000	7,554,094
Cumberland	5,602,000		2,137,200	49,486,200
Franklin		584,410	683,760	377,730
Penobscot				23,004,000
Androscoggin	7,614,000	8,848,000		14,502,796
Lincoln				8,116,000
Sagadahoc				462,500
Waldo				445,350
Somerset				251,000
Hancock				128,000
Total All Counties	514,479,220	621,886,855	719,345,182	861,216,815

Commercial and Industrial Use

As noted in prior reports, many commercial and industrial facilities are exempt from the reporting requirements of the WWRP. Some are exempt because they receive their water from a public water system. Others are exempt because they are located on Maine's larger rivers, and their daily withdrawals are less than one-percent of 7Q10 (the low-flow which occurs for seven consecutive days once every ten years on average) at the point of withdrawal. This reflects the fact that availability of an abundant, dependable water supply has long been a siting criteria for some of Maine's most important industries. Other major water users, such as Maine's pulp and paper manufacturers, do not report directly to the WWRP because they report their waste water discharges to the DEP and the volume of withdrawal can be calculated from the discharge volume. Analysis of waste water discharge volumes from ten paper mills indicates that they used approximately 58 billion gallons of water in 2005-2006. This is down from approximately 63 billion gallons in 2004-2005, due largely to mill shut-downs for some part of the year. Most of this water is discharged back to the rivers after use and treatment.