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# Water management by local governments

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*by Nick Houtman, Water Resources Research Program, University of Maine*

While reauthorization of the federal Clean Water Act is taking center stage in water policy circles, local governments (defined here to include water and wastewater treatment districts) are not just waiting in the wings. Towns, cities and districts may be near the bottom of the pyramid of government institutions, but they ultimately determine the effectiveness of national water management programs. Consider:

- The 1972 Clean Water Act called for the elimination of all effluent discharges to surface waters by 1985. Since 1972, Maine and the federal government have invested more than \$648 million in new sewage treatment facilities in Maine. As a result, water quality has improved dramatically.
- It is estimated that twenty Maine communities still discharge untreated sewage to the state's waters. Excess levels of nutrients and bacteria are also discharged from sources such as combined sewer overflows, residential subdivisions and farms. During storms, such problems force the closing of beaches and shellfish flats along Maine's coast. An estimated 1,017 miles of Maine's rivers do not meet water quality standards for their designated uses.
- To meet the *current* requirements of the Safe Drinking Water Act and the Clean Water Act, it has been estimated that local governments (nationwide) will need to spend \$1.5 billion by the year 2000. Additional funds will be needed to monitor groundwater near landfills and to protect surface and ground-waters from contamination by sand and salt piles.
- Local governments have broad authority to regulate water quality related land uses, to withdraw water for delivery to homes and businesses, and to provide wastewater treatment. For example, land use can be managed through home rule authority, subdivision and shoreland zoning ordinances and comprehensive planning. Water districts operate under state charters and may exercise eminent domain to obtain supplies and extend distribution lines.

These examples emphasize an old precept, that despite its global context, water management is a local problem. National and state legislators may set standards, initiate new programs and provide funding, but town councils and water district boards often make the ultimate decisions to impose new regulations, to locate new facilities and to pay the bills. In complying with regulations handed down from above, they often have limited choices. Still, their actions determine the availability and quality of water at the tap, the purity of water at the local beach and a community's vulnerability to natural hazards such as floods.

It would be naive to suggest that local governments are the only significant water managers or that their decisions are made freely and easily. Public supplies account for only thirteen percent of all withdrawals in Maine (USGS National Water Summary, p. 285). Surface water flows on which many local governments depend are regulated by state and federal agencies for

hydropower, waste assimilation, and in-stream purposes such as recreation and fisheries. Compliance with state and federal mandates forces shifts in local spending priorities.

Mandates have raised the ante for local interest in water management. Nevertheless, local government has been concerned for many years with providing reliable and adequate supplies, with insuring acceptable water quality for local and downstream uses and with reducing vulnerability to floods.

These three areas of interest, water supply, water quality, and flood protection, form the critical elements of local water management efforts. Since they are not administered in a cohesive fashion, they reflect the disjointed and cumbersome nature of water management in general. Indeed, each functional area has corresponding state and federal institutions to which local organizations must answer. With some notable exceptions, this vertical arrangement of responsibilities has tended to isolate water managers from each other. Here we explore some major issues in local water management and highlight cases that demonstrate emerging trends.

### **Challenges for water management**

Water management is implicit in local government programs. Road systems change the direction and intensity of stormwater flows, contribute pollutants to ground and surface water and increase water supply demands by fostering development. Plumbing and subdivision regulations directly affect water quality at the tap, in groundwater aquifers and even in outstanding river segments. The Growth Management Act recognizes a municipal responsibility to "protect the *quality* and manage the *quantity* of the State's water resources." (Italics added.)

Indeed, water management means more than drilling wells and treating wastewater. It involves protecting public health and regulating economic growth. For example, after cigarettes, radon is estimated to be the most serious cause of lung cancer. In general, groundwater contributes a relatively small portion of the radon in homes, schools, and businesses. Nevertheless, proposed federal rules would drastically lower the acceptable level of waterborne radon from 20,000 picocuries per liter to 300 picocuries per liter. Most of Maine's public groundwater supplies may have to be treated to meet this standard.

Flood protection ordinances can affect a community's economic growth. In the past, mills and surrounding buildings were built in floodplains to take advantage of water power. Although Maine is not dependent on that form of power today, floodplains still provide level areas for new buildings and access to rivers for water dependent businesses. In 1987, the state learned that floodplain development can be expensive. The April Fool's Day Flood caused more than \$100 million in damages along the Kennebec, Androscoggin, Penobscot, and other rivers. Today, local ordinances often restrict development in floodplains.

Despite these broad powers and responsibilities, water management is not usually perceived as a high priority for local government. Other functions such as public safety, economic development and solid waste compete for the attention of town councils. And, as a water rich state, Maine has not had to endure the severe droughts common in the west. Planners know that some vocal citizens are "concerned about every puddle," but those views do not translate into a strong local

constituency for water management. Unless a significant perceived threat arises, such as a proposed landfill, a major highway, or a new boat landing, citizens appear to be reluctant to attend public meetings or to pay for new measures to manage water resources. In 1988, the Maine Legislature gave voters the power to create special watershed districts. Traditionally suspicious of new bureaucracies, the public has not used that authority. A referendum to create a Long Lake Watershed District was defeated in 1990.

Water resources may be too complex to be managed in a cohesive way without some restructuring of local government. The term "management" implies control and direction. Water management would require control over the amounts and locations of withdrawals, uses and discharges as well as control over land use activities that affect water quality. Among local entities, municipal government comes closest to having the relevant authority, but control over water resources must be shared with special districts that supply water at the tap and treat it before discharge. In addition, Soil and Water Conservation Districts provide technical expertise to review development proposals and to recommend water quality protection measures. Regional planning councils conduct water related studies and educate municipal staff in water management issues. Each entity works in a narrowly defined functional area. In short, there are no omnipotent water managers and no comprehensive set of rules.

To complicate matters further, laws and water supply systems vary significantly among the state's 489 towns, cities and plantations. Maine has 438 state chartered or regulated water suppliers (Water Resources Management Board 1990) and 119 wastewater treatment entities. Most operate outside direct municipal controls. Altogether, there are an estimated 3,200 groundwater dependent "public water systems," defined as any system that has at least fifteen service connections or supplies at least twenty-five individuals. Two-thirds are non-community systems which supply transient or seasonal users such as summer camps and motels (Josephson 1990).

Water supply and wastewater treatment districts have the most obvious water management role. They provide about 900,000 people with drinking water and treat millions of gallons of wastewater daily. However, in their multi-purpose function, municipalities affect both the operation of the districts and the quality of the water. Municipal governments maintain 13,664 miles of roads (DOT, personal communication), under which run miles of water and sewer pipes, and regulate land uses that affect many of the state's lakes, streams, estuaries and aquifers.

Cooperation among municipalities and districts is not generally perceived as a problem, but conflicts do occur in both day-to-day operation and policy decisions. For example, water testing labs operated by districts could be used for purposes other than monitoring drinking water supplies. Some districts are working to protect supplies as required by the federal Safe Drinking Water Act, but municipalities will need to exercise their zoning powers and will possibly need to allow districts to review development proposals.

As noted earlier, no single structure exists for this kind of cooperation. One exception is the Cobbossee Watershed District in the Belgrade Lakes region. That organization was created in 1971 to protect twenty-eight lakes in a 217-square-mile watershed. Since then, the district has conducted monitoring programs, treated lakes to reduce algae blooms and contracted with

member towns to provide code enforcement services. The district also serves as an arena for cooperation among local governments that do not often work together. Several water districts have representation on the district's board of directors, which is composed mostly of town officials.

The Cobbossee model, however, has not been repeated in Maine. Local governments are rapidly forming regional associations to manage solid wastes, but the same strategy has generally been resisted for water. Unlike solid wastes, which in the past have been handled largely by local government and private business, water has been managed by a vertical arrangement of local, state, and federal agencies. Municipalities deal with the state Department of Economic and Community Development in developing their growth management plans, but wastewater operators work with the Department of Environmental Protection. Nevertheless, planned water supply and wastewater facilities must accommodate projected growth. Facilities built for growth that never occurs end up raising sewer rates unnecessarily. Conversely, facilities built too small to serve growing populations may have to be rebuilt at great expense.

Addressing these problems requires coordination, but our current institutional structure fosters disjointed management. Local and state organizations answer not to each other but to corresponding federal agencies. Land use related issues such as flood protection and wetlands are the U.S. Army Corps of Engineers' specialty. Different offices of the U.S. Environmental Protection Agency regulate drinking water and wastewater treatment. As a result, local water managers often operate independently of each other. Their policies and programs respond to regulations administered by separate state and federal agencies for different but related purposes.

Not surprisingly, this structure responds with difficulty to conflicts among competing water managers. Such conflicts can take many forms. Government agencies may pit one public interest against another, such as when a water district wants to restrict recreation on a lake managed as a productive fishery or as a favorite water skiing spot. Public bodies may conflict with private interests when proposed subdivisions near lakes are turned down under a phosphorus allocation ordinance. Private interests may compete with each other if lakeshore property owners object to water level changes imposed by the operator of a dam.

The complexity of Maine's water resources and Maine's system of riparian water law make a state-level dispute resolution system impractical. Both water quality and available quantities vary from one watershed to another. The legal system does not establish priorities among competing users or give municipalities any special water rights. However, many water districts operate under legislative charters that grant access to great ponds or that grant the right to withdraw water from surface and groundwater supplies. In a 1950 ruling, the Maine Supreme Court determined that these charters do not grant exclusive or proprietary rights to the water in question.

In recent years, federal law, water conflicts and local concerns over water quality have begun to spur a greater level of activity by towns and more cooperation among districts and municipalities. The Town of Lincoln has imposed a wellhead protection ordinance developed by the Lincoln Water District. The Town of Dexter regulates phosphorus runoff in its subdivision ordinance. The Town of Brunswick has adopted a coastal zone protection ordinance to control

stormwater impacts to Maquoit Bay. In 1988, the state recognized the need for more comprehensive measures and established a temporary Water Resources Management Board. That body recommended that local water basin management plans be developed to provide basic knowledge about sustainable water yields, to project demands fostered by future growth and to set priorities among local uses.

Other examples of local programs could be cited, particularly the Portland Water District's effort to control land use around Sebago Lake. That project uses geographic information system technology to identify sensitive lands. The district conducts a public education program, reviews development proposals and uses wardens to monitor land use. In recognition of Maine's rural nature, we will focus on the three cases and the Water Resources Management Board report mentioned above.

### **Aquifer protection in Lincoln**

The Lincoln Water District serves 1300 customers in Lincoln (population 5,587) and 600 in Howland from four wells. The aquifer they tap contains water that meets all federal standards for quality, including the new EPA proposed limit for radon. Flow rates are more than adequate to support current and projected demand. Nevertheless, in the spring of 1990, the Lincoln Town Board added an aquifer protection section to its land use ordinance. The new language affects land uses in three zones (explained below) around the four wells. For example, solid waste facilities are not permitted in any of the aquifer protection zones. Mobile home parks and land application of sludges are prohibited in zones one and two.

The town council's action was possible because the district had done its homework. It conducted a \$140,000 hydrologic study of the aquifers and hired a legal consultant to research and draft the ordinance. Focusing first on the aquifer for a new well, the consultant calculated the volume of the aquifer, flow direction, and rates. In the second phase, he studied the other three existing wells. Throughout the studies, twenty-seven monitoring wells were sunk. The pumping station wells were pumped continuously for nine days at a time to study drawdown characteristics of the monitoring wells. Records were also kept on streamflows, rainfall, wetlands, and water quality. Private wells in the area were not monitored.

As a result of the careful knowledge gained about the well recharge areas, the water district was able to specify sensitive zones around each well. Land overlying the aquifer itself is designated as zone one and includes an area in which a contaminant might reach the aquifer within 200 days. Zone two surrounds zone one and incorporates an area in which contamination would take 2,500 days to reach a well. Zone three encompasses the entire watershed outside the other two zones. Rather than depend entirely on ordinances or easements, the district chose to buy about 500 acres around the wells. The Lincoln town ordinance protects another 300 acres. According to District Superintendent Ron Gray, there was no opposition because the areas are sparsely settled. Moreover, there was little impact on the current residents.

It was not until the proposed ordinance was submitted to the town planning board and then to the town council that other municipal officials became involved. The district developed a slide show to explain to the planning board and council exactly what the ordinance was meant to do. The

council passed the ordinance without any changes. The whole process, from the start of the hydrologic studies to passage of the ordinance, took about ten months.

The town planning board and the code enforcement officer are in charge of enforcing the ordinance. Since it was passed, it has not been used in any enforcement actions. The district did buy an additional twenty-one acres from a developer who was planning to develop eleven residential lots within the 200-day time of travel zone of one well.

It may be too early to call the ordinance a success since it has not been tested. Nevertheless, District Superintendent Gray feels that the benefits will become apparent as Lincoln grows. Simply put, says Gray, "Lincoln's water quality is good and we want to keep it that way."

### **Phosphorus control in Dexter**

In the fall of 1989, Dexter incorporated phosphorus runoff standards into its subdivision ordinance. It is currently working on incorporating them into its shoreland zoning ordinance. The ordinance requires developers to calculate phosphorus concentrations according to the Department of Environmental Protection's methodology, which it references.

Excessive levels of phosphorus in runoff have caused algal blooms in at least thirty-five Maine lakes, and many more lakes are considered threatened by watershed development. The DEP considers both Puffers Pond and Lake Wassookeag in Dexter to be "highly vulnerable" to non-point pollution impacts. The Dexter ordinance requires phosphorus calculations to be made whenever development is proposed for the watershed of either lake. Lake Wassookeag is the water source for the Dexter Water District. According to Dexter Code Enforcement Officer Dave Pearson, the district did not participate in development of the ordinance, although it has supported the effort. At the District's urging, the town council recently approved restrictions on ice shanties and automobiles on Lake Wassookeag.

The phosphorus control ordinance was developed by Pearson and the town planning board. It was adopted by the council without amendment. Unlike the Lincoln aquifer protection law, the Dexter ordinance has been used to deny some subdivisions and modify others. Modifications have included reductions in numbers of developed lots and the use of stormwater management strategies such as infiltration areas for roof runoff.

### **Coastal protection in Brunswick**

The Town of Brunswick approved a coastal zone protection ordinance September 9, 1991. The ordinance regulates land uses in a coastal zone, as defined by roadways, other zones and town boundaries. Permitted uses include farms, golf courses, single and multiple family dwellings, greenhouses, and grocery stores. Other uses are not permitted unless specifically listed in the ordinance. Residential density is restricted to five acres or more per unit, and no more than five percent of the area can be impervious. Stormwater management plans and nutrient loading calculations are required of all new development.

The ordinance also regulates the storage and spreading of manures and fertilizers and the placement and operation of septic systems. For example, no manure or commercial fertilizer can be spread between November 1 and March 31. Setbacks from the high water mark of streams and drainage channels must be observed for storage and application of fertilizers and manures. Only slow release fertilizers can be used for residential and recreational lawns, and application rates cannot exceed specified levels.

Passage of the ordinance followed three years of studies, public hearings and technical committee work coordinated by the Brunswick Planning Office. Concerns stem from a massive shellfish die-off in Maquoit Bay in 1988 and periodical bans on shellfish harvesting in the bay because of high fecal coliform counts. The shellfishing industry generates an estimated \$2 million in yearly income to area residents. Work by Bowdoin College researchers demonstrated that surface runoff carries bacteria and nutrients into the bay. About two-thirds of the bay's nutrient inputs can be attributed to septic systems and the spreading of domestic and agricultural fertilizers.

Support for an ordinance came from a diverse group, including area land-owners and the water and wastewater treatment districts. However, opposition has been expressed by some developers and farmers, who object to the town's attempt to control uses of private land.

### **Water Resources Management Board report**

In 1989, the legislature created a temporary Water Resources Management Board to investigate problems with the state's water resource management structure and to recommend legislative remedies. Issued in January 1991, the board's final report pulls together subcommittee reports on legal and operational issues, supply, use and demand, and dispute resolution. Among its many suggestions is that a new state level water resources board be established. It would be comprised of citizens and would have a technical support staff. Among its many duties, it would identify areas in which water supplies are inadequate for future growth. It would develop or review local water management plans and issue permits for large diversions. Perhaps most importantly, it would provide a forum for addressing conflicts among competing water users.

As a means of developing water use priorities where supplies may be inadequate, the board suggests that local water basin management plans be developed. The report does not recommend that such plans be developed for the entire state. It emphasizes that Maine is not facing a statewide water shortage. Instead, the board recommends a tactical approach. Planning should be conducted in areas where a lack of water may reduce economic growth or lead to conflicts.

Local water basin units would be delineated on the basis of watersheds, although accommodations would be made to reflect existing jurisdictional boundaries and the number of interested parties. The board did not reach a consensus on how or when to delineate such units. They could be defined by the legislature in one act or identified only as the need arises. In addition, it did not specify who should develop basin plans. Presumably, a local water basin management board would be created. Water suppliers, municipalities, and regional planning bodies would be likely candidates, but wastewater treatment facilities, citizen lake associations

and soil and water conservation districts might also be represented. Such a board would be limited to data collection and development of plans.

Budget concerns and the trend toward agency consolidation make the formation of such entities unlikely in the near future. Nevertheless, the needs identified by the board do exist, and not addressing them may have an impact on the state's growth. In addition, Maine water has been targeted in the past for out-of-state use. Other states' laws which have attempted to restrict interstate water transport, whether by pipeline or by bottle, have been ruled unconstitutional.

## **Conclusions**

The local water management structure is complex and slow to respond to conflicts. Coordination is difficult to achieve among local groups that share pieces of the water management pie. Nevertheless, local organizations are working together to reach common objectives. Several examples have been presented here. These examples are characterized by several attributes:

- the presence of a committed party to promote shared management goals and objectives;
- cooperation among local agencies with water management responsibilities;
- data collection to support management strategies;
- varying levels of public participation or communication to appropriate decision-makers; and
- the use of management tools that fit into the existing institutional structure.

The Water Resources Management Board's report suggests a reasonable direction for state and local policies, but in the current political atmosphere, the recommendations have an uncertain future at best. If water resource planning is perceived as having a high priority, it may be specifically recognized as a function of any new natural resource agency. However, recent cutbacks in other related areas suggest that new programs will not be enacted.

The cost of not achieving coordinated water management at the local level may be increased conflicts in some areas and an inability to accommodate growth in others. Maine citizens take their water for granted, but the state's own need for economic growth and its proximity to the densely populated areas of southern New England suggest that they do so at their peril.

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