

MASSACHUSETTS  
CAMPAIGN FOR  
CLEAR WATER

*The Imperfect Storm*

IS THE FIRST IN A NEW  
SERIES OF PUBLIC  
ADVISORIES PREPARED  
FOR THE MASSACHUSETTS  
CAMPAIGN FOR CLEAN  
WATER BY THE  
MASSACHUSETTS CLEAN  
WATER COUNCIL.  
THE SERIES IS INTENDED  
TO EXPLAIN THREATS TO  
THE WATER SUPPLY AND  
SPUR BUSINESSES AND  
COMMUNITIES TO ACTION.

What your community *must* do to control the impacts of stormy weather

# THE IMPERFECT STORM

## Did you know?

Stormwater runoff is the single largest source of pollution to the rivers, lakes, ponds, and marine waters of Massachusetts.

New federal rules taking effect this fall require communities and businesses in Massachusetts to take new steps to address this stormwater challenge.

### **INSIDE:**

- 4 What do you need to know?
- 4 Why do you need to act?
- 4 How are other community leaders responding?



Initiatives for a  
Competitive Massachusetts

## 5 Facts You Need to Know

**4** **Polluted stormwater runoff** is the single largest source of pollution to the commonwealth's rivers, lakes, ponds, and marine waters.

**4** **Floods, drought conditions, and loss of drinking water supplies** are the most immediate threats to residents in your community from storm-related conditions.

**4** **The stormwater-handling systems** in your community are most likely not sufficient to solve today's stormwater challenges.

**4** **Businesses and communities** are being required by the federal government to take new steps as of November 1999.

**4** **Gaining public support** for the new investments required by the law will be a major challenge for state and local leaders.



The Massachusetts Campaign for Clean Water is a project of the Massachusetts Clean Water Council, together with a range of community, business, and environmental partners.

### **Themes of the Campaign:**

- Safe drinking water and clean water bodies are fundamental to maintaining the quality of life and competitive business environment in Massachusetts.
- Water resources are at risk; they need public and policy-maker understanding and attention and increased state, federal, local and business investment.
- An educated public is the best way to insure adequate resources for water protection.

### **Charter Campaign Partners**

#### **Massachusetts Clean Water Council**

##### *Chair:*

Vincent Mannering, Executive Director,  
*Boston Water and Sewer Commission*

##### *Vice Chairs:*

Edward M. Lambert, *Mayor of Fall River*  
James A. Rurak, *Mayor of Haverhill*

Charles River Watershed Association

The Massachusetts Association  
of Regional Planning Agencies

The Massachusetts Municipal Association

Merrimack River Watershed Council

Utility Contractors' Association of New England

#### **Government Partners**

Robert Durand, *Massachusetts Secretary  
of Environmental Affairs*

Shannon O'Brien, *Treasurer of the  
Commonwealth of Massachusetts*

*The Massachusetts Campaign for Clean Water gratefully acknowledges the contribution of the Massachusetts Department of Environmental Protection in the preparation of this report.*

# 1 The Problem

## Storms are now our most critical clean water challenge

To understand why storms hurt water quality, picture walking around your own neighborhood in the middle of a heavy rain.

Especially if you live at the bottom of a hill, the impact of water flowing over pavement is clear. The water builds in speed and volume as it travels down the sides of the road, picking up all of the litter in its path—oil grease, sand, silt, Styrofoam—and carries it along until it reaches the storm drain. There most of it disappears... directly into the nearest river.

If the storm drain becomes blocked or overwhelmed by the volume, the water spills over onto sidewalks and private property; in the worst case it flows into the basement of your house.

Obviously stormwater is not a new problem. But *what we understand about the nature of the problem and ways to correct its most negative effects are new.* Storm drains were a simple solution constructed to take care of a nuisance and safety hazard. They do very well what they were designed to do: get the water off the roads as quickly as possible so that it doesn't impede traffic or freeze in winter.

But now we understand that stormwater is polluted. It fouls our rivers and streams and threatens our drinking water. This information calls for a whole new management plan. The environmental goal of modern stormwater management is to clear the streets of water *and* to abate the pollution that results from stormy weather. Communities and businesses will be required to devise, implement,

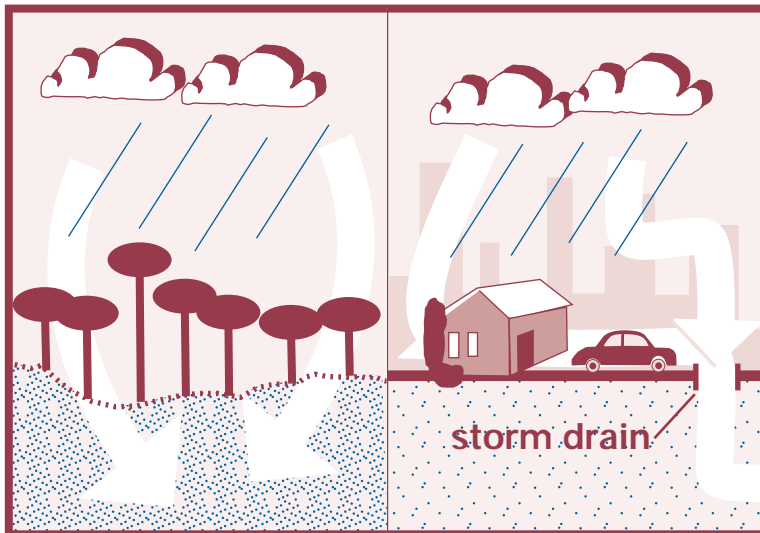
and pay for ways to turn rainstorms from an environmental liability back to an environmental benefit.

## "Progress" has altered the natural cycle

Why are rainstorms an environmental liability? The problem comes with where the rain falls. Heavy rain in a forest is helpful because the conditions exist for the natural water cycle to work. The rain either percolates into the soil, is taken up by plants, or runs off the surface gradually to rivers and streams. Both underground sources of drinking water (aquifers) and surface water bodies (reservoirs, ponds, etc.) are replenished. Receiving waters like lakes, rivers and coastal waters are gradually refilled. As the water makes its way underground, pollutants are filtered out of the water supply.

## From Environmental Benefit to Liability:

How Streets and Storm Drains Make Rainstorms a Problem



to the sea

An urban environment changes the natural water cycle. Rain that would seep into groundwater on undeveloped land instead rushes over asphalt into storm drains and away to rivers and the ocean.

Storms in population centers, where so much of the ground is covered with structures and asphalt, have exactly the opposite effect. Rather than improving the water supply, storms increase polluted runoff.

### More rain can mean less water

Ironically, stormy weather not only hurts water quality; it also diminishes water quantity. We are all too familiar with storms producing devastating floods, but in today's urban landscape, **heavy rain can also mean less water in lakes, rivers and streams.** If water flows too quickly over and off the impervious roads, parking lots, and rooftops in our cities and towns, it is gone before it gets a chance to seep into the ground. Less groundwater means less water flowing into rivers and streams from under-

ground (base flow), exacerbating drought conditions during dry periods and reducing the ability of normal river flow to dilute pollution.

By damaging the quality of the water that feeds public drinking water supplies, both flood and drought conditions endanger drinking water. Where pollution of public water supplies cannot be prevented or managed, the threat to public health is real, and the cost of drinking water filtration systems is enormous.



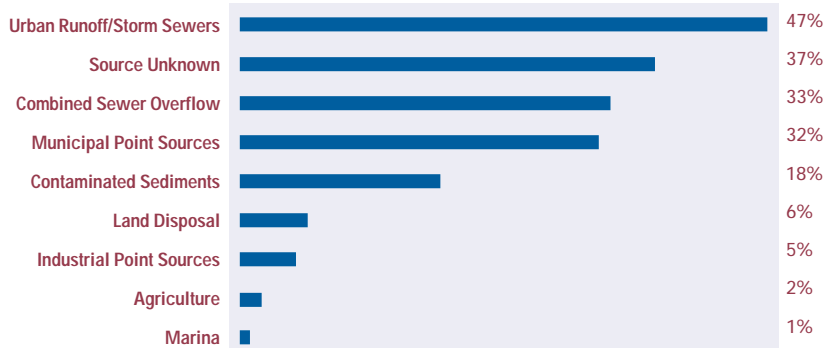
ABOVE: After particularly heavy storms, several Massachusetts communities reported dangerous levels of bacteria in their drinking water this year and urged their citizens to boil all water intended for human consumption.

LEFT & BELOW LEFT: Drought conditions made worse by springtime storms forced communities across the state to decree water bans this summer.

BELOW RIGHT: Inadequate stormwater management also helps produce flooded parklands – including Boston's Muddy River, to be dredged at a cost of \$70 million.

## Sources of Water Pollution

Percent of Assessed Mass. Marine Waters (271 sq. miles)



Nearly half of assessed Massachusetts marine waters show negative impacts from urban runoff/storm sewers – the highest percentage of any source.

source: Mass. Department of Environmental Protection

**Water bans lifted but problems persist**

*Wenham eyes yearly ban while Hamilton invests in improvements*

**By Jo Fisher**  
CONVALL COMMUNITY  
 The water bans in Hamilton and Wenham have been completely lifted. Wenham rescinded the ban on Sept. 23, just over three months after a began. Hamilton's ban was lifted on Oct. 17, exactly four months after the town's first voluntary water ban was established.

According to the Water Department in each town, the bans were lifted in cooperation from the weather which recently provided at least one good rain across a week and a day in water range with the changing of the seasons. In addition, the Ipswich River retained a normal level, and well levels have risen on the rise.

**A fresh start to unlogging the Muddy**

*River dredging is part of \$70m plan*

**By Brett Alan**  
CLARK STAFF

The islands appear after big storms as if by magic in the ponds along the Muddy River, great piles of mud and, eroded soil, and other gunk that wash out of storm drains and empties into this unfortunate stream along Boston's border with Brookline. Though gone and gulls love to hang out on the accidental land forms, they are a symptom of a disease that is killing the most neglected stretch of the Toward Hamilton of parks along Boston: over the decades, much of the

## 2 The New Rules

### FEDERAL REQUIREMENTS (Taking Effect November, 1999)

#### Phase I: Boston, Worcester

Since 1992, cities with a population greater than 100,000 have had to develop and implement stormwater plans under the Environmental Protection Agency's Phase I stormwater regulations.

#### Phase II: All Communities With Populations Greater Than 10,000

As of November, 1999, all towns with more than 10,000 residents will be required to obtain permits for their stormwater pipes. By 2003 cities and towns will need to submit a permit application listing the best management practices they will use, and the measurable goals they will achieve in six program areas:

- **Public Education and Outreach**  
Informing the public about the impacts of polluted stormwater runoff.
- **Public Participation/Involvement**  
Involving the public in the solutions—everything from citizen representatives on a stormwater panel to scout troops stenciling signs on catch basins.
- **Illicit Discharge Detection and Elimination**  
Finding and eliminating all illegal discharges to the storm sewer system.
- **Construction Site Runoff Control**  
Enforcing erosion control for construction sites of an acre or more.
- **Post-Construction Runoff Control**  
Ensuring runoff control after development is complete. Controls could include buffer zones of porous materials or storage basins that release the water slowly.
- **Pollution Prevention**  
Getting your own house in order. Municipal operations must include staff training and special measures to prevent pollution such as regular street sweeping, catch-basin cleaning, and reductions in the use of pesticides and salt.

*EPA will provide cities and towns with a menu of “best practices” from which to design an acceptable local stormwater management program.*

*The mitigation will range from simple steps like street sweeping to substantial investments to eliminate illegal discharges and develop mechanisms to hold, treat, and redistribute water from storms.*

### Current State Policy

Massachusetts also has standards for controlling stormwater from new development and redevelopment that runs off into wetland resource areas.

Water quality and quantity controls are required in the Stormwater Management Policy (1996), under the authority of the Wetlands Protection Act.

Existing stormwater discharges are addressed by watershed assessments and remedial action under the State Clean Waters Act.

The state policy is more limited in its application than the federal, but provides a higher level of protection to “critical areas,” such as public drinking water supplies, shellfish beds, swimming beaches, and cold water fisheries.

For more information contact your local Conservation Commission or the DEP's website:

[www.state.ma.us/dep](http://www.state.ma.us/dep)

The Executive Office of Environmental Affairs in Massachusetts, through Coastal Zone Management and the Strategic Envirotechnology Partnership (STEP), assesses and supports innovative stormwater runoff technologies. For further information contact Paul Richard, 617-626-1049.

# 3 Lessons Learned

## A Municipal Success Story

**B**oston received its EPA Phase I permit in September 1999, six years after submitting its permit application.

Both Boston and Worcester have received *individual* permits for large cities which are more rigorous and complicated than the *general* permits planned for Phase II communities, but there are important lessons for smaller communities on the key elements of both of these good programs.

**Lesson 1:** Boston Water and Sewer Commission reports that *mapping* is a critical first step. You need to know where the stormwater outfalls are to be able to monitor stormwater quality or enforce regulations.

**Lesson 2:** *Identifying and correcting illegal connections* is likely to be the most important, difficult, and expensive aspect of stormwater management. In 1998, 22 illegal connections were corrected in Boston at an average cost of approximately \$5,199 per correction. Those changes removed an estimated 16,730 gallons per day of wastewater from Boston Harbor and the Charles and Neponset Rivers.

**Lesson 3:** Public awareness programs should involve citizens in the solutions. Environmental groups can monitor water quality. Young people can become involved – for example, by stenciling “Don’t Dump. Drains to Neponset River” on catch basins.

For more information about either the Boston or the Worcester permit contact:

**Boston:** Amy M. Scofield  
(617) 330-9400

**Worcester:** Matthew J. Labovites  
(508) 799-1480

## How To Use This Report

- 4 Distribute to all elected and appointed public officials in your city or town.
- 4 Make copies available at all public meetings including your annual town meeting.
- 4 Establish a community task force to examine the issues and plan your response.
- 4 Use it to lobby your senators, congressmen, and state legislators for more water protection funding.

Join with other communities working to solve the problems. The Massachusetts Clean Water Campaign can help you learn from (and share) best management practices and keep you up to date on everything you need to know to comply with the law.

Contact the Campaign by calling the Massachusetts Clean Water Council at 617-722-4160, ext. 15; write to us c/o Mass Insight, 18 Tremont Street, Boston, MA 02108; or email [sdavis@massinsight.com](mailto:sdavis@massinsight.com).

## A Business Success Story

**N**ew England Development Corporation wanted to build a 900,000 square foot regional shopping mall on 70 acres of land in the Seven Mile Watershed, which contributes to the drinking water supply for the neighboring city of Attleboro. Could this be done without creating runoff that would cause flooding and damage the public drinking water supply?

To make sure their parking lots did not disrupt water quantity or degrade water quality, the engineers designed the “Cadillac” of stormwater management systems. **Wet detention ponds and constructed wetlands** are the main mechanisms for regulating flows and reducing pollutants.

Runoff is directed into detention ponds and then through a series of created wetland basins where the soils and vegetation filter out pollutants. The treated runoff is then dispersed into wooded swamps and gradually to the Seven Mile River—at drinking water quality. The project has received awards for its environmental design.

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BOSTON WATER AND SEWER COMMISSION

