



Belmont Citizens Forum

Stormwater Forum Details Flooding, Pollution

By Sumner Brown

In 2010, the Environmental Protection Agency released a draft of stormwater regulations which would impose new and difficult requirements on towns. They are stringent enough that I wonder if any town with a development history similar to Belmont's could meet them

On September 10, The Belmont Citizens Forum hosted a stormwater forum titled "Water Trouble" featuring panelists familiar with the proposed regulations. They were Ralph Jones, managing director of Cadmus consultants; Wayne Chouinard, Arlington town engineer, and Matthew Shuman, Watertown town engineer; Julie Dyer Wood, director of projects at the Charles River Watershed Association; Patrick Herron, deputy director of the Mystic River Watershed Association; and John C. Swallow, founder of Environmental Sciences, Pine & Swallow Environmental.

The new regulations are rumored to become law next year. But of all the panelists, only Ralph Jones talked directly about the implications of the coming EPA regulations.

Ralph Jones, former Belmont Selectman, is an environmental engineer. Jones said that Belmont needs to completely rebuild its sanitary sewer system because sewage leaks out of old, broken sewer pipes, polluting stormwater. Both the sewer lines that run under most Belmont roads and the laterals that run from individual houses to the street sewer lines need repair. Belmont has about 78 miles of street sewer lines, but there may be more miles of laterals than of sewer lines.

Most of the pipes can be fixed by relining with cure-in-place epoxy technology that can be applied via existing manholes, so no excavation is needed (see "How do Sewers Get Relined?" Belmont Citizens Forum *Newsletter*, July/August

2007.) Smaller pipes cost about \$250,000 per mile to reline, and larger pipes cost more. Some pipes have already been relined, but there are many more to go.

Fixing our sewer pipes will cost tens of millions of dollars. If the town were to finance this sewer work the same way we finance roads or schools, we would need to have Town Meeting approve borrowing, and we would need a tax override to pay the principal and interest.



Attendees talk to community group representatives at the Water Trouble forum.

EMILY WOODS

However, the town pays for water and sewer service with a self-financing Enterprise Fund which can borrow money without Town Meeting approval. This approach would protect the town's credit rating. The costs would be paid by

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increasing water rates instead of taxes. It is still our money, and it is still expensive, but we could avoid politicizing stormwater management.

Wayne Chouinard, Arlington town engineer, and Matthew Shuman, Watertown town engineer, both know the challenges of old water infrastructure. Shuman described Watertown's phosphorus problem. Watertown's stormwater drains into the Charles River, as does water in Belmont's Beaver Brook. The new EPA stormwater regulations will contain phosphorus limits for any water that goes into the Charles.

Shuman also described how the water in culverted streams smells like sewage when it

Belmont Citizens Forum

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Belmont Citizens Forum Inc. is a not-for-profit organization that strives to maintain the small-town atmosphere of Belmont, Massachusetts, by preserving its natural and historical resources, limiting traffic growth, and enhancing pedestrian safety. We do this by keeping residents informed about planning and zoning issues, by participating actively in public hearings, and by organizing forums. Our *Newsletter* is published six times a year, in January, March, May, July, September, and November. Published material represents the views of the authors and not necessarily those of the Belmont Citizens Forum.

Letters to the editor may be sent to P. O. Box 609, Belmont MA 02478 or to info@belmontcitizensforum.org.



EMILY WOODS

Audience at Water Trouble forum.

emerges from the culvert. This is certainly the case with Wellington Brook at Common Street. (See “Daylighting Streams Improves Water, Life,” Belmont Citizens Forum *Newsletter*, May/June 2013.)

Julie Dyer Wood, Director of Projects at the Charles River Watershed Association, agreed that culverted streams are sick and crippled, unable to smooth flows, ease flooding during storms, or sustain flow during dry weather the way natural streams do. Boston’s ongoing Muddy River Restoration Project is a “daylighting” project, uncovering a formerly-culverted stream that is also Charles River tributary. The Muddy River was placed in a culvert to make a parking lot for the former Sears store near Fenway Park in the 1950’s.

Both Wood and Patrick Herron described how rain gardens can improve water quality and provide visual appeal. The Mystic River Watershed Association and the Belmont Stormwater Working Group have identified potential rain garden locations at Belmont High School and the Belmont Library to help with the parking lot stormwater runoff.

The sixth panelist was John C. Swallow, an urban soil infiltration consultant. Swallow specializes in technical aspects of landscape design, managing stormwater for containment and infiltration. Rain gardens and bio-infiltration swales are commonly used to control stormwater. Swallow clearly showed his engineering perspective at the forum. He pointed out that anything we build will break, and the designer should think through that part of the life cycle. His studies, and those of others, find that rain gardens are very effective at managing stormwater, and retain 90% of the water that enters them. However, porous pavements are not as useful as you may imagine. They lose their porosity if not properly maintained by regular vacuuming, because the suspended solids in stormwater will clog them. Perhaps the less-engineered approach is best.

For more information, see the Stormwater tab on the Belmont Citizens Forum web site, www.belmontcitizensforum.org

Sumner Brown is a Director of the Belmont Citizens Forum.

EPA Proposes Expanded Stormwater Permit

by Nancy Hammett

Belmont, like other urban communities throughout the country, must obtain a “permit” under the Federal Clean Water Act in order to discharge water from its storm drains into local streams and ponds. This permit (the “Municipal Separate Storm Sewer System” or “MS4” permit) imposes a number of responsibilities on the town. These requirements have been in effect in Massachusetts since 2003 and a new version of the permit is in the offing.

The federal Environmental Protection Agency (EPA) expects to issue the new regulations by the end of this year, and they will take effect six months later. The town will then have 90 days to submit a permit application including a description of how it will comply with the permit requirements. Belmont will have a year to prepare a detailed Stormwater Management Plan.

Stormwater pollution comes from many sources. Rainwater and melting snow pick up a variety of harmful substances as the water flows over land and through the storm drain system including trash, pet waste, oil and grease, leaf litter, detergents, pesticides, and fertilizers. That pollution ends up in local rivers, ponds, lakes, and streams.

Sewage also can get mixed with stormwater through leaky pipes or illegal connections of sewer pipes to storm drains or of sump pumps to sewer lines. Some people dump toxic materials into the storm drains—old paint, used oil, and the like—mistakenly thinking that the contents will be treated somewhere down the line. In fact, Belmont’s stormwater is not treated. Instead, it is discharged directly into Wellington Brook, Winn Brook, and other local waterways. Ultimately, Belmont’s stormwater will drain to the Mystic

River and the Charles River. Pollutants are only removed from stormwater when stormwater is filtered by clean soil before the liquid arrives at a stream or pond.

Given these ubiquitous sources of stormwater pollution, successfully controlling the problem requires action by many parties: the town itself, businesses and other property owners, and residents. Under the MS4 permit, the town is responsible for promoting improvements in developer, business and resident practices as well as controlling the impact of town activities.

The 2003 permit established six broad requirements:

1. Public Outreach & Education: Educate the public about the impacts of stormwater discharges and about steps the public can take to reduce impacts.
2. Public Participation: Provide opportunities for the public to provide input on the stormwater program and to participate in various ways.
3. Illicit Discharge Detection & Elimination (IDDE): Find and correct illicit discharges of pollutants via stormwater. This task includes



Mystic Valley Parkway rotary flooding, 2010.

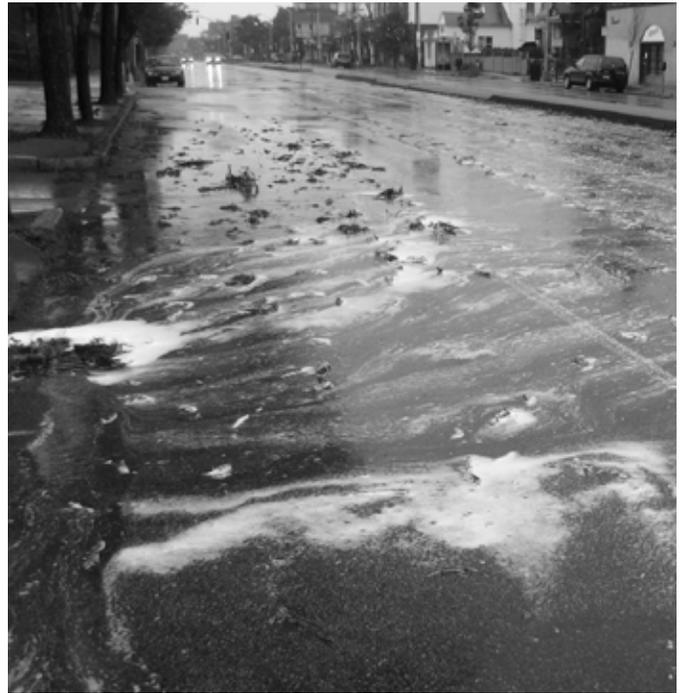
MYRAW

both mapping the storm drain system and regular monitoring for pollution at outfalls where the storm drain system discharges water to local streams or ponds. When bacteria or other pollutants are found, the town must systematically investigate the drain system to locate the sources of the contamination, and take steps to correct the problems.

4. Construction Site Runoff Control: The town must prevent erosion and runoff of pollutants from construction activities that disturb more than one acre of land, through a bylaw or other mechanism.
5. Post-Construction Stormwater Management Requirements: The town must establish requirements for stormwater management in new development and redevelopment where sites disturb more than one acre.
6. Municipal Pollution Prevention and Good Housekeeping: The town must reduce stormwater impacts from its own operations, including operations & maintenance plans for parks, vehicles, buildings, roads, and the stormwater system, and conduct employee training.

The town's MS4 5-year permit formally expired in 2008, but has continued in effect as the EPA has worked to issue finalize regulations. A proposed new permit was published in 2010. A second proposal was released in September 2014, with some changes in response to the numerous comments received on the 2010 proposal. (See http://www.epa.gov/region1/npdes/stormwater/MS4_MA.html for information about the proposed permit.) Until a new permit is adopted, the 2003 permit is still in effect.

Given the broad scope of the 2003 permit, it is not surprising that many Massachusetts cities and towns have struggled to meet its requirements. The proposed new permit includes more explicit deadlines, some additional requirements, and expanded reporting requirements. At the same time, it attempts to preserve flexibility in planning and priorities. In addition, the proposed permit includes extended deadlines for some of the more difficult requirements.



MYRWA

Flooding in North Cambridge, 2010.

The 2014 version of the permit includes some new or expanded requirements; a few are listed below. You can find a more complete description of the continuing and new requirements at the web link cited above.

1. More public outreach and education, requiring targeted messages for four audiences (residential, industrial, commercial/business, and construction/development) and evaluation of the education program's effectiveness.
2. More detailed requirements and deadlines for the IDDE program, including detailed mapping of the system (catch basins, manholes, pipes and sensitive water resource areas), written protocols for assessing and prioritizing areas for investigation, and deadlines for addressing problem areas. The proposed permit also requires an inventory of sanitary sewer overflows (SSOs).
3. A comprehensive construction site program including pre-construction review of construction sites, site inspection and enforcement, and opportunities for public input.
4. Enhanced requirements for new development and redevelopment including a bylaw requiring sites to hold and infiltrate a specific quantity of rainfall onsite. Where



Mystic Valley Parkway flooding, Arlington.

that infiltration is not feasible, sites must treat that rainfall before discharging it to the storm drain system.

5. The town must assess its street and parking lot design standards and regulations to identify impediments to Low Impact Development and green infrastructure approaches.
6. The town must calculate and track changes in the areas that are impervious areas (sidewalks, roads, parking lots and roofs that prevent water from soaking in to the soil) and that run off directly into the town's storm system. The town must also evaluate opportunities on town-owned properties to reduce these directly-connected impervious areas.
7. The town must also develop specific plans for dealing with pollutants that cause local waters to fail the state's water quality standards for those pollutants. For some pollutants (e.g. bacteria), plans will involve earlier deadlines for the general permit requirements. In other cases (e.g.

phosphorus), broader efforts will be required to control the impact of land uses.

Extended deadlines are provided for these challenging requirements. However, it's important that the town prevent any increases in pollution from new development, starting now, to avoid making it harder to comply with these requirements in the future.

There is no doubt that Belmont will need to step up its efforts to comply with the new permit requirements. Other communities face the same challenge. Municipalities are looking for cost-effective ways to comply with the permit including promoting Green Infrastructure approaches (see "Green Infrastructure Grant to Reduce Pollution," *BCF Newsletter* September/October 2013) and finding new ways to fund expanded programs such as by establishing a dedicated stormwater fee. Some Massachusetts communities are also forming regional groups to save costs by sharing resources and information.

Belmont residents can expect to hear a lot more about stormwater issues in the next few years. The town will be expanding efforts to educate homeowners, businesses, and other property owners about how their activities contribute to polluted stormwater and about the wide range of steps they can take to reduce their impacts on local waters.

What's at stake? Stormwater pollution is the most common cause for Massachusetts streams and lakes failing to meet water quality standards. In many places, including Belmont, stormwater is the last major source of pollution standing in the way of clean and healthy local streams, lakes, ponds, and rivers.

If all communities simultaneously make serious efforts to control their stormwater pollution, we have a chance to finally make shared local streams and lakes swimmable, boatable, and healthy homes for wildlife. That is the goal of the proposed MS4 permit.

Nancy Hammett is a consultant and a member of Watertown's Stormwater Advisory Committee. She serves on the Board of the Massachusetts Rivers Alliance.

Homeowners Can Reduce Yard Runoff

By Fred and Anne Paulsen

We have lived for a long time with a cracked concrete driveway complete with weeds growing through the cracks. To the rear of our house, the driveway widens to include a large impervious parking area.

As part of the Stormwater Working Group's (SWG) efforts to reduce the pollution of runoff from streets and parking lots, all townspeople are urged to allow much of their rainwater and snow melt to infiltrate into the ground. Frank Frazier, a SWG member, wrote a handout for the Belmont Building Department with instructions for porous repaving and relevant web sites. That handout is available at www.belmont-ma.gov/sites/belmontma/files/u146/stormwaterbrochure_final.pdf.

When we showed interest in reducing stormwater runoff, Radha Iyengar, a SWG member and representative of the Belmont Citizens Forum, visited our property, made suggestions, and referred us to the Somerville Action Committee. They had lots of useful information.

We went to the True Value by Ideal Hardware store in Waltham. They had a large number of sample pavers, gave us cost figures, and recommended contractors. We chose the type, color, and size of pavers.

Using that information, and with the assistance of Nancy Leask from Ray Dunetz Landscape Architecture Inc. and John Capello from Ieraci Landscaping Inc. and a lot of discussion, measuring, and rethinking, we settled on a final plan.

One option was to construct two concrete strips with grass between, but our final solution was to use pavers from the sidewalk to the far end of the portecochere. The drive then continues with fully porous turf pavers to the front of the barn where a grate will be installed with drains to keep the water on site but away from the edge of the barn.

There is a somewhat steep ascent at the beginning of the driveway. We have been advised that porous pavers will not

be effective here so the contractor will pitch the driveway to allow the rain and snow to drain onto the grass and prevent any stormwater from draining onto School Street.

While we have been warned that turf pavers may be difficult to maintain, we think that they will be manageable because we generally park under the carport and use the barn mostly in bad weather. The combination turf pavers and new lawn expand considerably the grass area in the backyard. We will also have the walkways in the backyard extended and a new clothes reel installed so we can continue to air dry our laundry.

At the conclusion of a SWG meeting, Ara Yogurtian, Belmont's assistant town engineer and speaker for that evening, gave us some informal advice about the drainage near the barn and we appreciate his observations.

We look forward to the construction that will commence on September 25 and appreciate the help and support from the SWG, the Citizens Forum, and Sustainable Belmont.

Fred and Anne Paulsen are long time Belmont residents. Anne served as Belmont's state representative for many years.



Winn Brook neighborhood flooding.

MYRWA

How to Measure Belmont's Stormwater

By Sumner Brown

Stormwater can be troublesome. Those drops of water add up, causing floods, overflowing sewers, and reduced water quality. Belmont is striving to remedy its stormwater problems, and we need to monitor the effects and measure the results.

Water Flow in Alewife Brook

Rain falls on the ground and finds its way into streams. We can measure the overflow from rainstorms by placing flow gauges where major streams leave Belmont. So far Belmont has only one such stream flow gauge, in Alewife Brook. The gauge is operated by the US Geologic Survey. It is shared with Arlington, Somerville and Cambridge and located in Arlington on the north (downstream) side of the Broadway Street bridge over Alewife Brook, close to the Somerville border.

In operation the gauge simply measures the height of the water, using electronics similar to those that automatically focus cameras. The water height is associated with measured flow through an initial calibration, by manually measuring water velocity at multiple locations and rates of flow across the stream. Data has been collected at this site since 2005 and is available at waterdata.usgs.gov/nwis/uv/?site_no=01103025.

Will Brownsberger, who was instrumental in getting the current gauge in 2007, remembers the cost was about \$20,000. However, maintaining the gauge is expensive because it requires periodic recalibration; for example, whenever debris like a shopping cart gets thrown into the stream in the vicinity of the gauge.

Figure 1 shows data from the Alewife Brook gauge for the period May 22 – June 10, 2015. The flow was nearly constant, at 6 cubic feet of water per second, until May 31, when Figure 2 shows there were three days of rain.

To put water flow into familiar terms, in Belmont each person uses about 64 gallons of tap water per day, down from 70 gallons in 2008. (Check your water bill to compare your own use.)

The Massachusetts Water Resource Authority (MWRA) counted 24,537 people in Belmont

connected to their sewer system in 2013. Hence Alewife Brook's normal water flow of 6 cubic feet per second, as measured, equals about 158 gallons per day per Belmont resident, or about double the average resident water consumption that is discarded as sanitary sewer flow.

By measuring stream flow over a few years, we could compare the flows after similar storms, and together with rainfall data, can judge whether our stormwater efforts are working, especially in respect to the new developments at the Belmont Uplands.

How much rainwater falls on Belmont? Put an empty can outside and you have a rain gauge. If you place the gauge away from trees and buildings and automatically record rainfall every hour, then you have a great gauge.

Figure 2 shows data from the rain gauge at Logan Airport. No surprise, when it rains, the flow in Alewife Brook increases. (Local thunderstorms may make Belmont rainfall different from Boston, 8 miles away.) Data from the Logan gauge is available at www.ncdc.noaa.gov/IPS/lcd/lcd.html;jsessionid=8AAA8C78DC388699ACCAE027B68F4921?_page=1&state=MA&stationID=14739&_target2=Next+%3E.

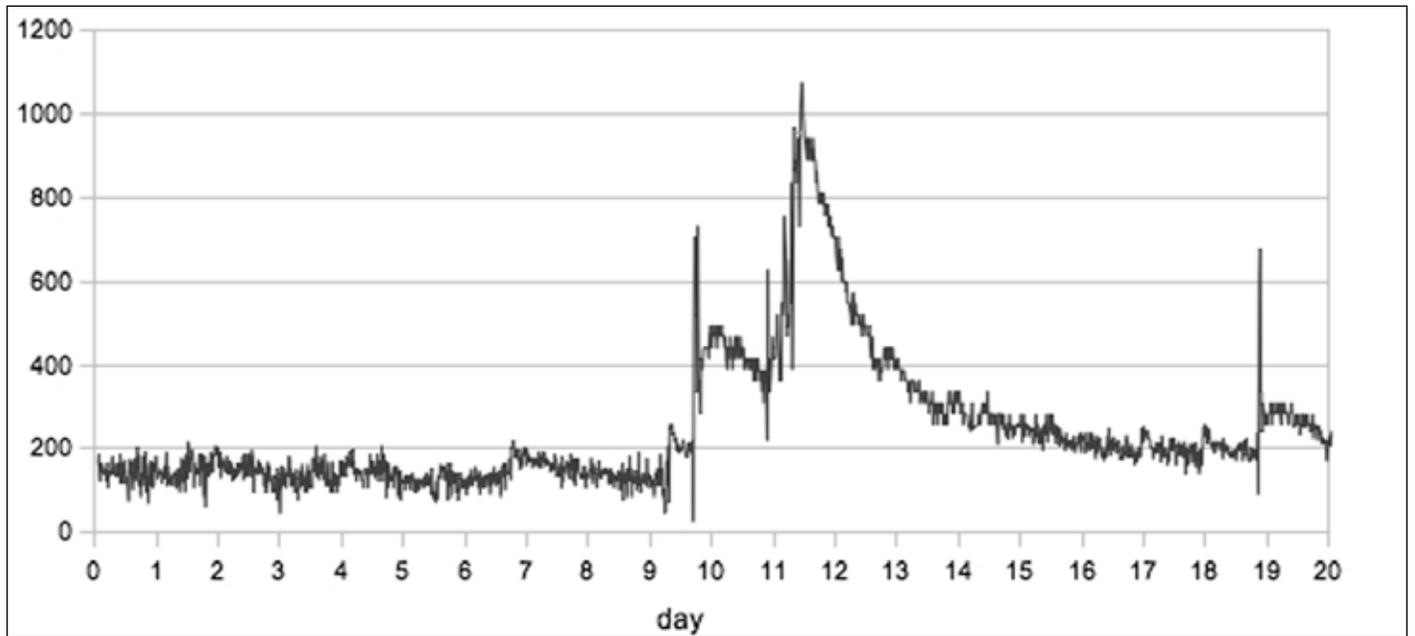
Notice that there is not much delay between rain and Alewife Brook flow. This fast response is largely man-made, and potentially damaging. Belmont and Arlington have built houses in an area that 17th-century colonists called "The Great Swamp." Our paved roads send water rapidly via storm drains into the streams. While swamps are now known as wetlands, and environmental laws prohibit developing swamps, the urban development remains.

Rain gardens reduce rapid runoff, as does permeable pavement that lets water flow into the ground below. Both increase desirable groundwater levels; they reduce peak flows in streams and hence reduce flooding, while increasing dry weather flow (see "Rain Gardens Turn Stormwater Into Flowers," Belmont Citizens Forum *Newsletter*, May/June 2011.)

Stormwater Quality

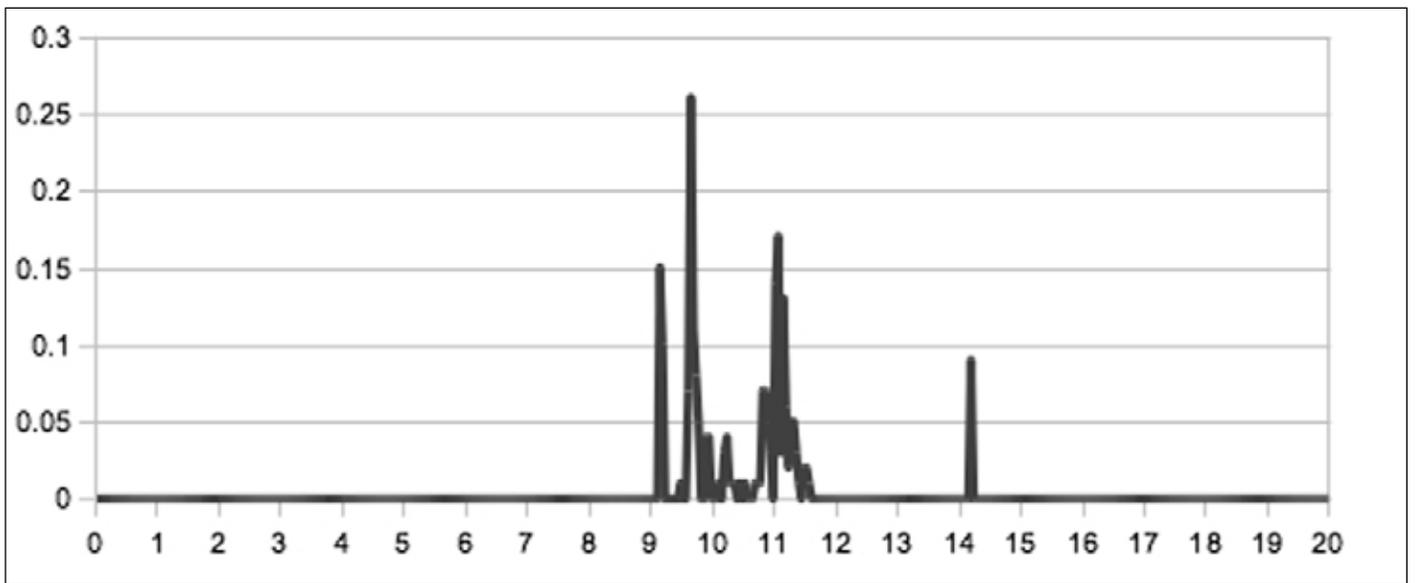
Stormwater quality measurements mostly focus on avoiding the types of bacteria found

Figure 1: Alewife Brook flow gauge measurements in gallons per Belmont resident per day May 22—June 15 2015



SUMNER BROWN

Figure 2: Rain at Logan Airport, inches per hour, May 22—June 15 2015



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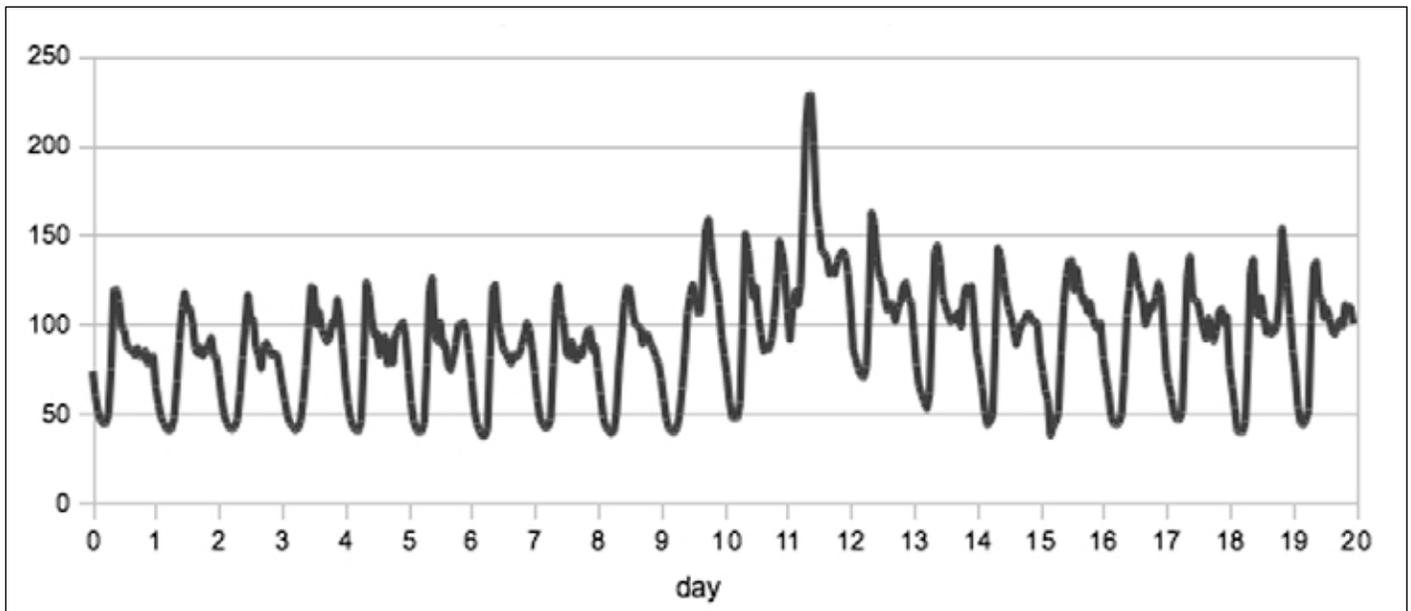
in sewage. The state sets bacteria-based water quality requirements for domestic water supply systems, for swimming, and for recreation such as boating. Water quality in streams and ponds is measured by taking water samples, which are sent to a laboratory for analysis.

The presence of bacteria in stormwater indicates problems with sewer lines and sewer laterals, which are the pipes that link homes to city-owned sewer lines. Leaking sewer pipes cause stormwater contamination that permeable driveways and rain gardens will not fix.

The municipality maintains the sewer lines, but laterals are the responsibility of homeowners. Fixing a lateral may cost \$5,000 if only relining is needed. Or it could cost twice that or more if digging is involved. Such costs will not be popular with homeowners, but requiring homeowners to inspect and repair their laterals as part of real estate sales may seem more reasonable. Newton Aldermen Ruthanne Fuller and Deb Crossley are working to make fixing laterals a state requirement.

Figure 3: Belmont sanitary sewer flows, gallons per Belmont resident per day, May 22—June 15 2015. Spikes in flow on days 10 and 11 are due to inflow; the sustained increase from day 12 onward is due to infiltration.

SUMNER BROWN



The Environmental Protection Agency (EPA) may choose to specify other measures of stormwater quality. The EPA’s 2010 draft stormwater regulations, not yet in force, would make Belmont responsible for limiting phosphorus in streams flowing into the Charles River. Phosphorus sources include fertilizer-laden stormwater runoff from golf courses and homes that grow beautiful grass. Such runoff can be mitigated; for example, the constructed wetlands at Alewife are designed to remove phosphorous and other nutrients from stormwater runoff by letting the stormwater flow (slowly) through plant roots. Sewage processing plants remove phosphorus by using microbes to transform dissolved phosphorous into biological solids. Those solids precipitate out of solution, fall to the bottom of a tank, and are collected and removed.

Stormwater in Sanitary Sewers

During big storms, an influx of stormwater into sanitary sewers can cause sewer overflow into basements, and sometimes onto streets. Since the Winn Brook neighborhood system with sewage holding tanks came online in April, 2011, there have been no basement floods in Winn Brook. However, other sanitary sewers have overflowed along the route between Belmont to Deer Island.

Stormwater gets into sanitary sewers by two routes. As groundwater it enters through leaks in the sewer pipes. This is called infiltration. Fixing laterals may be needed to substantially reduce this component. Stormwater also gets in because of illegal sewer use, or sump pumps and rain gutter down spouts that should not be connected to sanitary sewers. This is called inflow. Such connections are illegal, but Belmont does not vigorously enforce this. The Massachusetts Water Resource Authority (MWRA) estimates that in 2013 Belmont’s infiltration was 30% of average total flow and inflow was another 11%.

The MWRA estimates our inflow and infiltration by measuring the flow at the two locations where Belmont’s sewer lines enter the MWRA system. Figure 3 shows Belmont’s sanitary sewer flow data for the period May 22–June 10, 2015. In 2013 Belmont’s average sewer flow was 2.7 million gallons per day, or 110 gallons per day per person. If you cannot imagine using that much water, you are right. We average about 64 gallons per day of water. The rest is inflow and infiltration.

Figure 3 data until May 31 shows that normal sewage flow follows a regular daily pattern. At 4AM very little water is used, while by 6 AM people are getting ready for work and school. This regularity allows the MWRA to estimate the amount of stormwater in our sewers.

When there is no rain for weeks, both inflow and infiltration go down in the absence of stormwater being pumped into the sewers, and there isn't as much groundwater to flow in.

When it rains, inflow will increase and decrease more rapidly than infiltration because inflow doesn't have to flow through earth to get into sanitary sewers. Inflow rushes straight in from illegal storm sewer connections; infiltration has to seep in through pipe cracks.

Of the 43 towns in the MWRA sewage treatment community, 41 send sewage to the

Deer Island processing plant. Belmont's inflow and infiltration problems are typical. No town has solved this problem despite millions of dollars being spent to try to reduce inflow and infiltration.

For 2014 the total rainfall at Logan was 47 inches. Belmont is 4.6 square miles and has a total population of about 25,000. So Belmont received about 3.8 billion gallons of rain, or 415 gallons per person per day. Household use is about 64 gallons of water per person per day from the Quabbin Reservoir (besides irrigation and swimming pools). Belmont's inflow and infiltration averaged 45 gallons per person per day, or about 0.4 billion gallons in 2013.

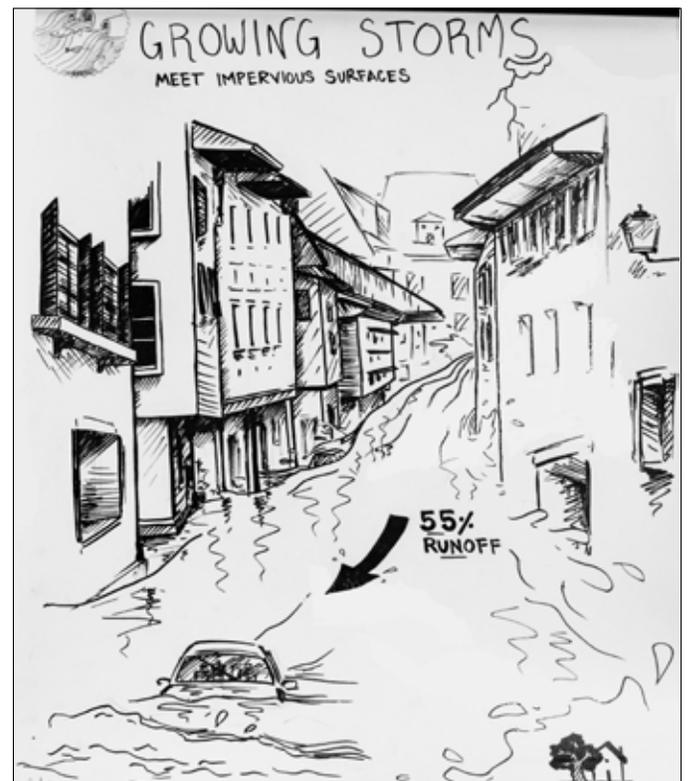
The gauge on Alewife Brook at Broadway in Arlington recorded roughly 1.7 billion gallons of flow in 2014. We have other streams such as Beaver Brook, which drains part of Lexington and Waltham. Some water transpires from tree leaves near streams, and some evaporates without being used by plants, people, sewers, or anything else. But where the rest goes is up to us.

Sumner Brown is a Director of the Belmont Citizens Forum.

10 Ways You Can Reduce Stormwater Pollution

The Mystic River Watershed Association suggests 10 ways you can do to reduce water pollution:

1. Don't litter: litter ends up in sewers, or in rivers and streams.
2. Practice organic lawn care: minimize the use of fertilizers and pesticides, especially where runoff may occur.
3. Conserve water: excess water in the sewage system can lead to sewage overflows into our waterways.
4. Always pick up pet waste, especially along riverbanks. Pet waste contains harmful bacteria that contaminate the rivers.
5. Use rain barrels to capture rainfall to use on your lawn or garden.
6. Never dump anything down storm drains—it drains directly to local waterways.
7. Use non-toxic products whenever possible. Carefully store and dispose of household cleaners, chemicals, and oils.
8. Take your car to the carwash instead of washing it in the driveway, where the suds will likely drain into a storm drain.
9. Maintain clean, well-swept driveways, sidewalks, and roads to avoid debris entering storm drains.
10. Share your knowledge with others!



Poster from the BCF's September 10 "Water Trouble" forum.

Winn's Brook Gets "F" Grade for Health

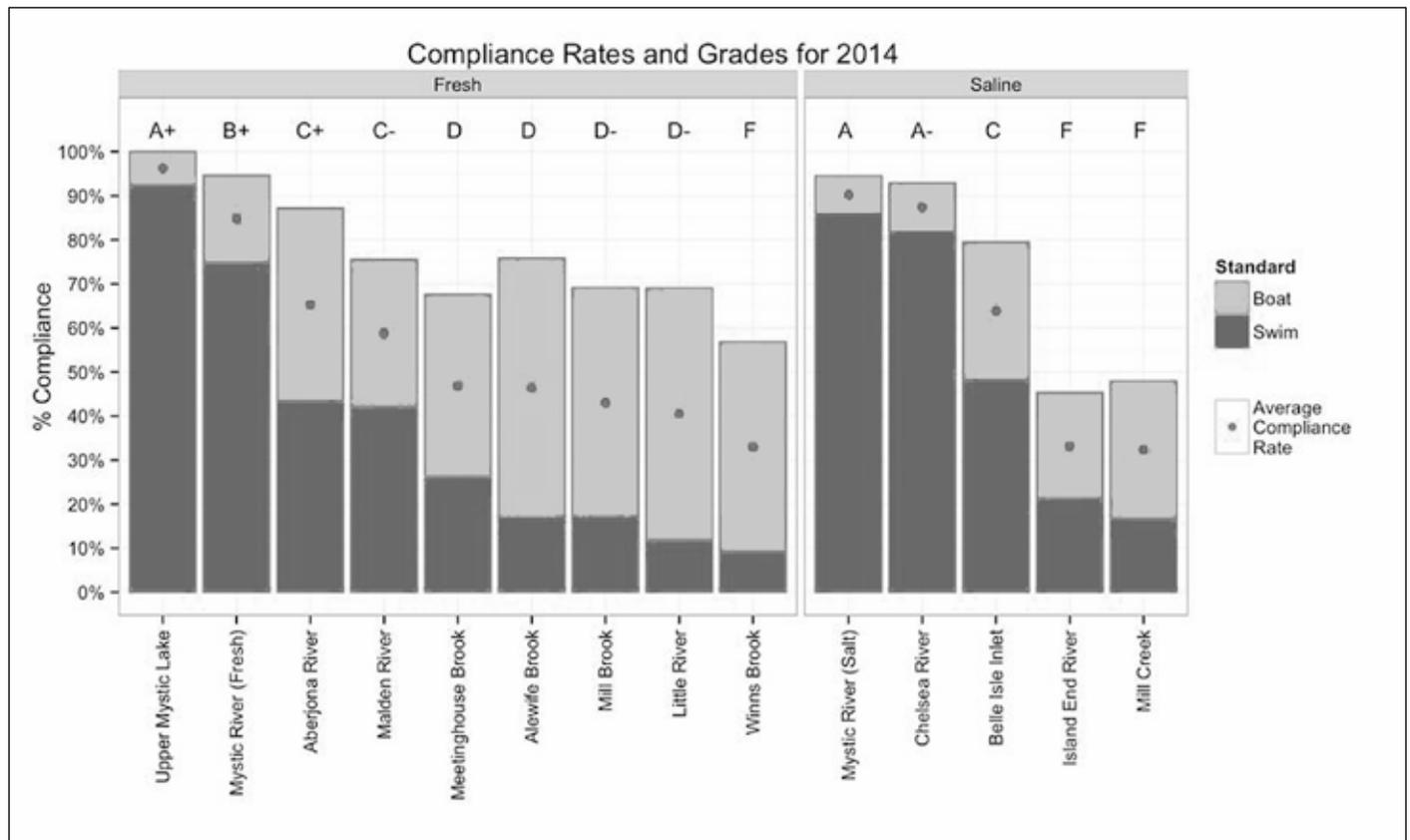
People who visit the Mystic River and its tributaries have a new, more precise way to find out how healthy the water is near them. Last summer, the Mystic River Watershed Association (MyRWA) worked with the Environmental Protection Agency (EPA) to create a new location-based "report card" for the Mystic River.

The grades are based on bacteria counts. The state has maximum allowable bacteria counts for swimming and boating. High bacteria counts result from illicit sewer discharges to storm drain systems and urban stormwater runoff. A higher grade indicates that the waterway complies with state standards; a lower grade means that there's more bacteria in the water that could make you sick.

Belmont's local waterways do not fare well in the 2014 report card. Little River and Winn's Brook earn an F for meeting state standards 40% or less of the time, while nearby Alewife Brook got a D for meeting boating standards just 46% of the time. While Belmont may have excellent schools and high-achieving residents, when it comes to water quality, Belmont is definitely an underperformer.

MyRWA grades for rate of compliance with Massachusetts water quality standards

| Grade | Water Segment | Average Compliance |
|-----------|----------------------------|--------------------|
| A+ | Upper Mystic Lake | 96% |
| A | Mystic River (Salt Water) | 90% |
| A- | Chelsea Creek | 87% |
| B+ | Mystic River (Fresh Water) | 85% |
| C+ | Aberjona River | 65% |
| C | Belle Isle Inlet | 64% |
| C- | Malden River | 59% |
| D | Meetinghouse Brook | 47% |
| D | Alewife Brook | 46% |
| D- | Mill Brook | 43% |
| D- | Little River | 40% |
| F | Winn's Brook | 33% |
| F | Island End River | 33% |
| F | Mill Creek | 32% |



Garden in Your Sidewalk “Hell Strip”

By Kate Bowen

Hell strip. There. I wrote it, but I didn't coin the phrase. That credit is given to Lauren Springer Ogden, a renowned gardener, who came up with the term “hell strip.” You know exactly what I am talking about: that evil zone between you and the road. It might be paved; it might have some weeds; it might have some tidy grass; or it might be bursting with life—a microcosm of annuals, perennials, and wildlife.

Many Belmont streets have paved shoulders. The town does not formally encourage restoring paved hell strips, and open shoulders are often paved during street repaving projects. However, there are several reasons to replace a hell strip with life-bearing soil.

1) Temperature. It's a lot cooler with plants. I don't mean fashionable, I mean actually cooler. Vegetation lowers air temperature through evapotranspiration. Yes, plantings alone or in combination with shade can reduce local temperatures by two to nine degrees Fahrenheit. Mix in more shade trees and you can make a real

difference. On summer days, shaded pavement can have temperatures to 20–45°F cooler than sunny pavement.

2) Air quality. A hell strip may seem insignificant since it's only a few feet wide, but a study from the Harvard School of Public Health compared bicycle travel routes on road vs. separated routes with vegetative barriers. The separated routes had 33% less black carbon and nitrogen dioxide, common pollutants known to have negative impacts on health such as increasing asthma, impaired lung function, and heart disease, among others. More plants, please.

3) Soil. Plantings retain soil which is good for preventing it from getting washed into the storm water system and overburdening it. Deeply rooted plants and soil rich in beneficial microbes may also increase carbon retention in the soil, becoming a carbon repository known as a “carbon sink.” Agricultural practices are shifting globally to increase carbon retention, improving the atmosphere and restoring soil depleted from modern conventional farming practices.



EVANTHIA MALLIRIS

Waverley Square hell strip garden.

Replacing the pavement with soil avoids the increased temperatures from pavement in hot weather. Pavement also blurs the boundary between sidewalks and roadways. Cars often park on sidewalks, making it difficult or impossible for pedestrians to pass safely. A soil strip, better yet with plantings, makes a clear demarcation.

4) Food. You may have heard about colony collapse disorder, which is killing millions

of U.S. honey bees each year. Creating pollinator patches is a great reason to plant the hell strip. Native wildlife need more native wild plants too. Why not plant some lowbush blueberries and feed the birds too?

How to Make Pavement Green Again

If you want to restore a paved strip to green space, you must first get permission from Belmont's Community Development department. They will want you to follow Mass Department of Transportation specifications for curbing. The town prefers granite curbs, which come with a hefty price tag of ca. \$30 per linear foot. If you like to explore options, you might glance at your neighbors' molded asphalt or concrete and think there's a way around the expense of granite. Good luck. Town officials don't like asphalt because it easily falls apart when driven over in the heat or hit by a snowplow. Concrete deteriorates at varying rates depending on materials and workmanship.

Don't think about putting in boulders or other creative barriers on the hell strip. As the homeowner, you'll be liable if a car or person is injured due to your innovative markers. The town may not agree to have the pavement removed at all if it's been repaved in the last five years. You will also have to pay \$100 for a street opening permit, though technically the hell strip is not "street." Street opening permits are typically required for altering sidewalks and driveway exits. I'll be trying out this process; I'll let you know how it turns out.

What to Plant on Your Strip

There are many reasons for planting the hell strip and just as many approaches to what to plant. If you only plant grass, you will still be doing good. Consider a good mix of grasses, one that feeds the bunnies. The Massachusetts Greenscapes Coalition, which educates MA residents about preserving water quality, recommends a fescue mix to reduce watering and runoff. Cut it, leave the trimmings, feed it in the fall, and don't expect miracles on the hell strip.



EVANTHIA MALLIRIS

Waverley Square hell strip sunflowers.

If you are feeling especially brilliant, go native. These plants will endure the heat, need little maintenance, and benefit native birds and insects. It is possible to tastefully plant native wildflowers and shrubs to resemble conventional decorative landscaping. Some companies, like online retailer High Country Gardens, sell pre-planned "inferno strip" gardens that tolerate dry, hot conditions well.

Keep in mind that height is important. For safety, use low plantings less than 3 feet tall to keep smaller folks and wheelchair users visible from the street.

Likewise, cut your trees' low branches to preserve visibility. Be especially mindful at corners. The town requires the vertical zone between 3 feet and 8 feet at corners to be clear 20 feet back from the point of intersection. If you've ever found yourself in the middle of the road to make a turn, you know why this zoning bylaw exists.

If you do have the opportunity to plant a tree, call the Tree Warden. You may be able to get on the list to have the town plant a new tree. To get on the list, the Tree Warden will take down your information, investigate the existing pipes that would affect planting: gas lines, sewer, and so on. He will also be interested in knowing that you are willing to water the newly planted tree, as the town does not have the resources to tend to fragile seedlings. If you can do it, it is well worth the effort to nurture a new tree. Consider planting a tree to the west of your house to maximize the cooling benefit from its shade in hot months.

Finally, the public right of way—whether it's paved or not—is just that: a Public Right of Way. Planting in the public right of way must allow safe and easy passage. Plants will get stepped on no matter what you do and that's ok! Take a walk. There are a lot of great plants that tolerate foot traffic that you are already walking on—at Rock Meadow, Mt. Auburn Cemetery, or Pequossette Park. Next time you're walking around, notice them. Ajuga has been my stepable plant of choice, but I'm branching out this year. Hopefully, your plantings on the strip will not only allow safe passage, but encourage it.

Kate Bowen is Chair of Sustainable Belmont.



On Sunday, August 2, BCF Director Anne-Marie Lambert led a Nature Poetry Walk through Belmont's Lone Tree Hill Conservation Land.

Belmont Center Bridge Clean At Last

By Grant Monahon

After many years and the efforts of many residents and businesses, Belmont's 100 year old granite bridge has been cleaned.

The project, initiated by Angelo Firenze when he was a selectman, has been undertaken without public funds. The cleaning was accomplished with a combination of town-wide professional support and generous donations to the Belmont Citizens Forum from many residents and businesses, including the Belmont Center Business Association, The Belmont Savings Bank Foundation, and the Flett Co.



EVANTHIA MALLIRIS

The Belmont Center bridge's clean stones (left) contrast with unwashed sections (right).

The hard work of actually removing the dirt and grime has been possible through the perseverance and energy of Dante Muzzioli, as contractor, with technical advice from Lisa Harrington as a representative of the Belmont Historic District Commission. A new, bright façade on the bridge will match well with the improvements now underway in Belmont Center. Although there may still be a few hard to clean stains yet to be removed, we are now looking at the bridge through the eyes of our forefathers!

The Belmont Citizens Forum is pleased that so many residents have responded to its requests for support. We would like to thank the following corporate donors for their support:

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James W. Flett Company, Inc
Anonymous donor \$10000

Mark Paolillo has generously agreed to pay water fees for this project.

For a complete list of contributors to the bridge cleaning, visit www.belmontcitizensforum.org

Grant Monahon is President of the Belmont Citizens Forum.

Bike Paths Open In Somerville, Cambridge

By Meg Muckenhoupt

Two new bicycle paths opened in Somerville and Cambridge this summer: an extension of the Somerville Community Path from Cedar Street to Lowell Street; and a path through Flagstaff park in Harvard Square for bicyclists heading north on Massachusetts Avenue.

At the ribbon-cutting for the Somerville Community Path on August 18, Somerville Mayor Joe Curtatone made remarks recorded by the Friends of the Community Path:

“Somerville as a community has a certain set of values that we believe in and we planned and envisioned the future together based on those values .. and an important part of that.... means living in a community that is healthy, where you can be active, that is bikable, and that is walkable.

“We have seen impacts of making a community that is more bikable, walkable and connected to public transit. We see the impact on our environmental health, with reduced emissions, we see the positive impacts on our economic health, with active streetscapes, with more foot traffic for our local businesses, we see more connections between neighborhoods... Somerville has a goal: we want to shift 50% of all new vehicle trips to biking, walking and public transportation...

“So this is more than just an extension of a mixed use pedestrian-bike path, it is really a reflection of the community’s values. We are now the number one biking community in the northeast... we are now the seventh most walkable community in the country, and this happened because we came together and expressed our values and made the policy changes and investments in our infrastructure that reflect those values...”

The Cambridge connector, which runs through tiny Flagstaff Park alongside Mass Ave



VINCENT STANTON JR.

Somerville Community Path Extension between Cedar Street and Lowell Street, Somerville.

across from Cambridge Common, was a joint project of Cambridge and the Massachusetts Department of Transportation (MassDOT) to rehabilitate the Common and improve conditions for park users and travelers along Massachusetts Avenue.

According to Bill Deignan, transportation program manager for Cambridge’s Community Development Department, more than 10,000 cyclists and pedestrians use the area daily. The completed path includes a new crosswalk and two traffic signals to assist cyclists and pedestrians crossing Cambridge Street to reach northbound Massachusetts Avenue.

Meg Muckenhoupt is Editor of the Belmont Citizens Forum *Newsletter*.

Environmental Events

Mystic River Canoe Tour

Saturday, September 19, 9AM-noon

Join the Mystic River Watershed Association and Professor Rick Beinecke for a one-time only, educational canoe tour of the Mystic River and the Amelia Earhart Dam. Beinecke is an expert on the Mystic River and its history and author of *The Mystic River – A Natural and Human History and Recreation Guide*. MyRWA will provide all canoes, life jackets, and paddles for this free event. Free, but space is limited; registration required at mysticriver.org. *Mystic Wellington Yacht Club, 451 Fellsway, Medford.*

National Public Lands Day at Fresh Pond

Saturday, September 26, 1:30–4:30PM

Protect one of the largest parcels of publicly held land in Cambridge by spreading wood chips to help control erosion in heavily used sections of the Reservation. No experience necessary. All equipment will be provided. To register, or for more information contact Julie at (617) 349-7712 or jcoffey@cambridgema.gov. *Glacken Playground, Huron Avenue at Fountain Terrace, Cambridge.*

Friends of Spy Pond Park Work Day

Saturday, September 26, and Saturday, October 17, 1– 4PM

Volunteers of all ages are invited to help the Friends of Spy Pond Park maintain fern and

wildflower beds, eliminate invasive plants, and weed out tree saplings around Spy Pond. Register with Lallystow@yahoo.com, 781-777-2759 www.friendsofspypondpark.org. *Playground at Spy Pond Park, Arlington.*

Public Lands Day Waltham Work Party

Saturday, September 26, 9:30AM-noon

Celebrate National Public Lands Day by improving the Chester Brook Corridor of the Western Greenway trail! Three Waltham Girl Scout Cadets are working on their Silver Award, aiming to enhance the experience of trail users by installing maps, blazes, arrows, and a couple directional posts. They'll need help digging holes and drilling things, so come lend a hand. Tools and instruction will be provided. www.walthamlandtrust.org. *Meet along eastern edge (not Academy side) of Our Lady's lot, 920 Trapelo Road, Waltham.*

Women Reformers

Sunday, September 27, 1PM

Join the Belmont Historical Society for a walking tour of Mt. Auburn Cemetery to celebrate women reformers in education, politics, health care, civil rights, and social causes, including Margaret Fuller, Julia Ward Howe, and Dorothea Dix. Fee \$12. www.belmonthistoricalsociety.org. *Mount Auburn Cemetery, Watertown.*

Mowing with Goats

Saturday, October 3, 10AM-noon

Spend a morning learning about goatscaping. Habitat staff and volunteers will share how a herd of Nigerian dwarf goats help to clear meadows of invasive and unwanted plants. They will demonstrate best practices for protecting and caring for goats, as well as interacting with these personable animals to understand how their natural traits make them ideal for brush clearing. Assist in moving the goats from one meadow area to another. Sponsored by Habitat Education Center and Wildlife Sanctuary and Belmont Community Education. Fee \$15.00 Mass Audubon members, \$19 nonmembers. Registration required at www.massaudubon.org. *Habitat Education Center and Wildlife Sanctuary, 10 Juniper Road, Belmont.*

Support BCF Through Amazon

Did you know you can support us while shopping at AmazonSmile—at no cost to you? The next time you visit Amazon, go to smile.amazon.com and designate the Belmont Citizens Forum as the recipient organization of AmazonSmile's donations.

Amazon will donate 0.5% of the price of your eligible AmazonSmile purchases to BCF with no cost to you. Thanks for your support!

Beaver Brook North Greenway Hike
Saturday, October 24, 2015 8AM-10:45AM
Enjoy a fall morning hiking the trails of the Beaver Brook North Reservation in Belmont, Waltham, and Lexington. View the turning leaves while learning about the history of the property, formerly the Metropolitan State Hospital and the Middlesex County Hospital. Fee \$15.00 Mass Audubon members, \$19 nonmembers. Registration required at www.massaudubon.org. Meet at the west end of the Our Lady Comforter of the Afflicted Church parking lot, 920 Trapelo Road, Waltham.

We don't want to lose you!

If you're moving within Belmont or out of Belmont, please take a moment to let us know by emailing bcfprogramdirector@gmail.com or dropping a note to Belmont Citizens Forum, PO Box 609, Belmont.

Thanks for your help.

Thank you for your continued support.

Your contribution makes a difference!

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\$50 \$100 \$150 \$250

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BCF depends on volunteers.

Join us in helping to maintain Belmont's small-town atmosphere.

- Writing or editing for the Newsletter
- Community path work
- Newsletter mailings
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