Trying to keep a step ahead: How Framingham is preparing for the new MS4 requirements

A car surrounded by flood waters on Route 9 in Framingham – Sep 30, 2015
(Image Credit: Alastair)

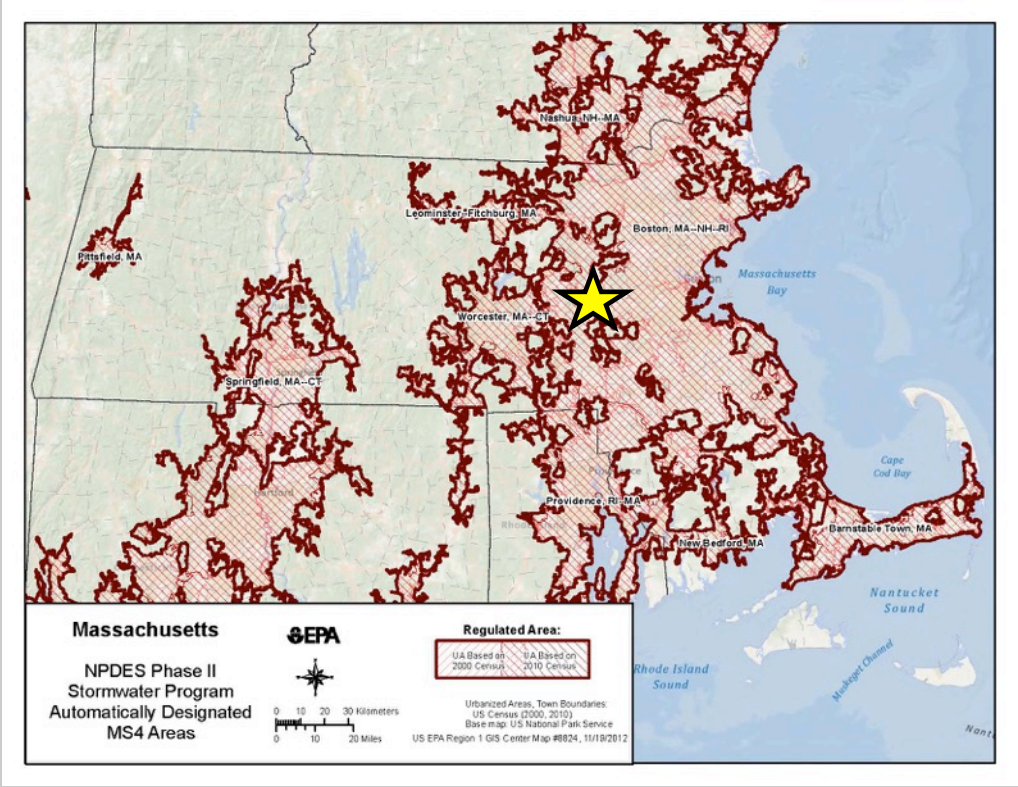
NEWEA Annual Conference
January 2016

Framingham Department of Public Works
Kerry Reed, PE – Senior Stormwater Engineer
Eric Johnson, PE – Town Engineer

Snapshot of Framingham

Largest Town in Massachusetts

- 26.5 square miles
- 68,000 residents



Very Diverse Community

- Suburb bedroom community but with significant employment base
- Large areas of rural, suburban, urban and industrial uses
- Developed largely in two phases, 1880-1920 and 1955-1975
- Infrastructure dating to industrial revolution
- Non-municipal infrastructure challenges

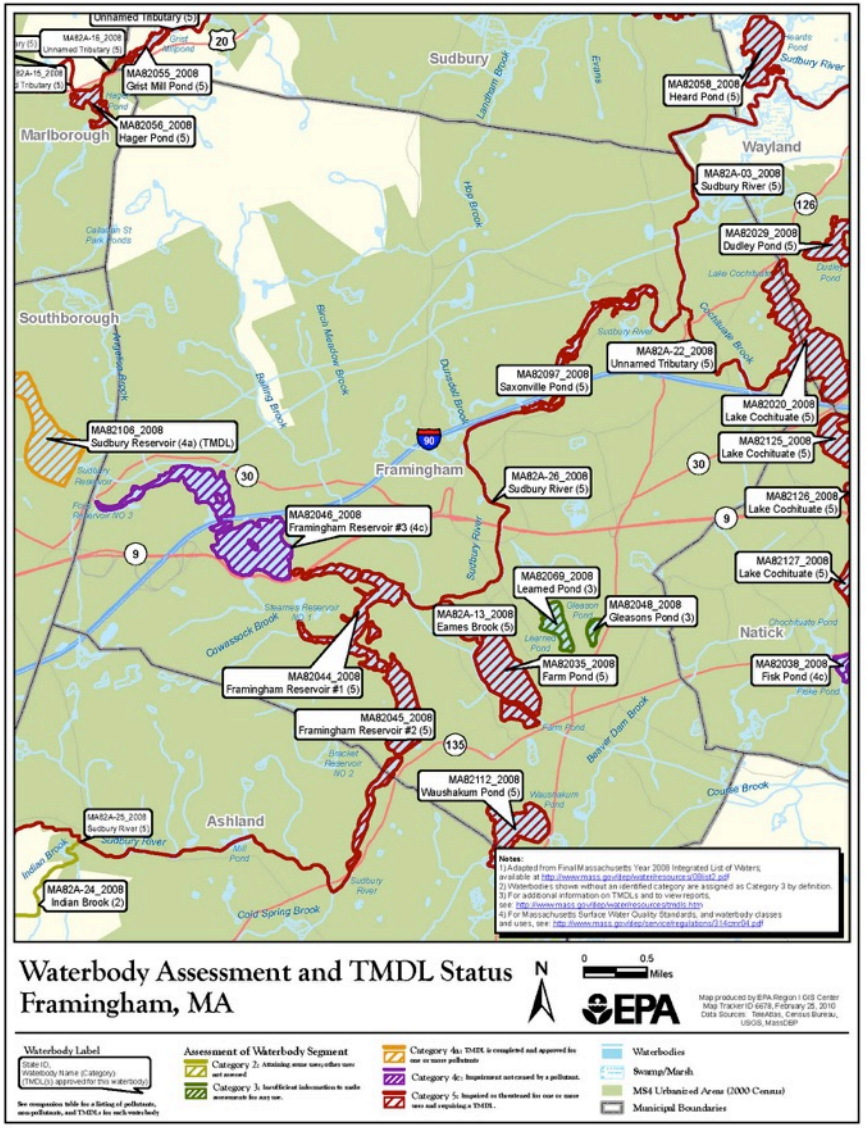
Framingham Stormwater System

- Large complex system
  - Over 200 miles of drainage pipe
  - 8,500 catch basins
  - 3,700 drainage manholes
  - 600 outfalls
  - 22 drainage sub-basins
- Aging system
  - 95% more than 25 years old
  - 34% more than 50 years old
  - 20% more than 75 years old
- Over 450 municipal properties & 50 Town owned buildings
- One Flood Damage Reduction System (aka Saxonville levee)
- One Town-owned dam

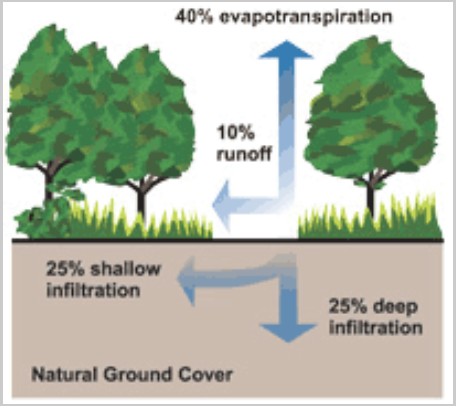
Impaired Waters

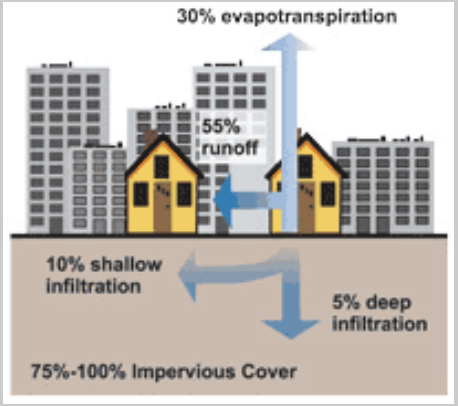
All of Framingham is within Sudbury River watershed. No TMDLs!

Framingham Water Body Impairments	
Water Body	**Impairment Cause**
Eames Brook	(Debris/Floatables/Trash*)
	(Non-Native Aquatic Plants*)
	Aquatic Macroinvertebrate Bioassessments
	Excess Algal Growth
	Taste and Odor
Farm Pond	(Eurasian Water Milfoil, Myriophyllum spicatum*)
	(Non-Native Aquatic Plants*)
	Excess Algal Growth
	Turbidity
Framingham Reservoir #1	(Eurasian Water Milfoil, Myriophyllum spicatum*)
	(Non-Native Aquatic Plants*)
	Mercury in Fish Tissue
Framingham Reservoir #2	Mercury in Fish Tissue
	Turbidity
Saxonville Pond	(Non-Native Aquatic Plants*)
	Aquatic Plants (Macrophytes)
	Mercury in Fish Tissue
Lake Cochituate North Basin	(Eurasian Water Milfoil, Myriophyllum spicatum*)
	Oxygen, Dissolved
	PCB in Fish Tissue
Sudbury River	Aquatic Macroinvertebrate Bioassessments
	Mercury in Fish Tissue
Cochituate Brook	Aquatic Macroinvertebrate Bioassessments
	Nutrient/Eutrophication Biological Indicators
Waushakum Pond	(Non-Native Aquatic Plants*)
	Aquatic Plants (Macrophytes)
	Oxygen, Dissolved
	Phosphorus (Total)
	Turbidity
	* TMDL not required (Non-pollutant)

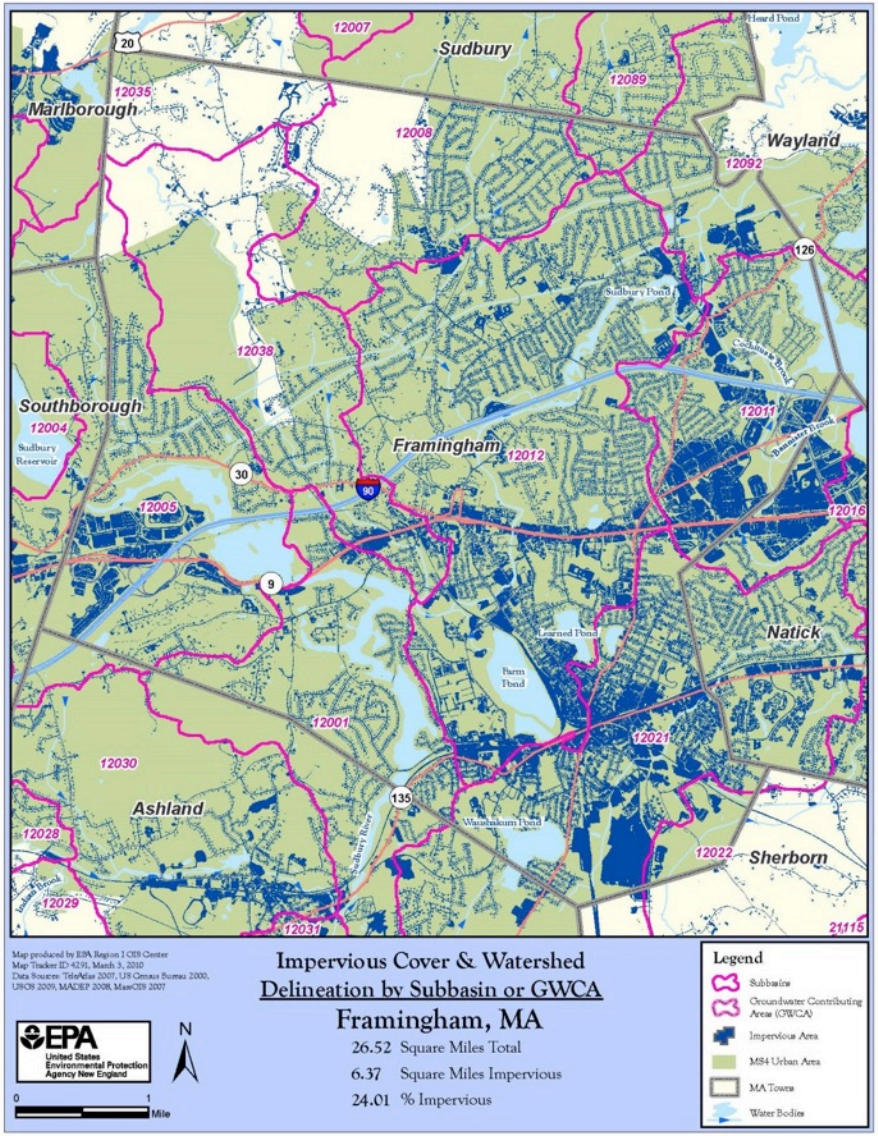


Impervious Cover





- Impervious cover results in increased surface runoff.
- As little as 10% impervious cover can result in water quality degradation.
- Approximately 24% of Framingham is impervious cover.



Stormwater Staff & Equipment

Full-time staff

- Stormwater Crew in Highway Department
  - 1 Supervisor
  - 3 Laborers
  - Stormwater Engineer
  - GIS Supervisor & technician
  - 2 Inspectors

Town owned equipment

- Vactor truck dedicated to drainage (FY16)
- Street sweepers
  - Automated stream gauges
  - Automated weather stations
  - IDDE “lab” & water quality meters

Framingham's Plan for New MS4 Permit Requirements

General

- Invest in drainage infrastructure
  - Approx. $250K annually for capital improvements
- Continue Stormwater Master Planning
  - Integrate stormwater improvements into Capital Projects
- Stay informed
  - Participate in professional organizations, workshops, etc.
  - Share information with local leadership
  - Communicate with neighboring municipalities
- Get all Town Departments involved early
- Pursue regional opportunities
  - Joined Central Massachusetts Regional Stormwater Coalition

Sink hole forming near catch basin

Public education sign at Danforth bridge

Framingham's Plan for New MS4 Permit Requirements (cont)

MCM 1 & 2 - Public Education & Outreach and Involvement

- "Scoop the Poop" campaign
- STEAM programs at schools
- Improved website, social media, online reporting
- Annual rain barrel program
- Participate in Community events:
  - Earth Day, Riverfest, Farmers Market, Concerts on the Common

Wilson proudly displaying his pledge to "Scoop the Poop" at 2015 Earth Day at Town Centre

Volunteers marking storm drains

Dwayne the Storm Drain coloring books and "Scoop the Poop" dog waste bag dispensers

Framingham's Plan for New MS4 Permit Requirements (cont)

MCM 3 - Illicit Discharge Detection & Elimination Program

- Written IDDE program
- Coordinated inspections & enforcement with Conservation Commission & Board of Health
- Constantly updating GIS mapping
  - Our mapping includes all proposed requirements, except catchments
- In-house sampling
  - Dry weather monitoring for approximately 20% of outfalls each year
  - Purchased water quality meter and analytical sampling equipment for all proposed sampling constituents
- SSO tracking

Outfall dry weather sampling

Sanitary Sewer Overflow March 2010

Framingham's Plan for New MS4 Permit Requirements (cont)

MCM 4 & 5 - Construction & Post-Construction BMPs

- Adopted MassDEP Stormwater Management Standards
- 2 full-time construction inspectors
- Internal engineering design review & approval process
- Work with Planning Board and Community & Economic Development to encourage LID/GI

Installing drainage manholes May 2015

Construction site runoff July 2009

Framingham's Plan for New MS4 Permit Requirements (cont)

MCM 6 – Good Housekeeping & Pollution Prevention

- Street Sweeping program
  - Annually throughout town
  - More frequently in urbanized areas
- Catch basin cleaning program
  - Purchase a vactor truck in FY16
  - Track O&M through work order system, tied to GIS
- Stormwater BMP O&M
  - ~7 Vortex Separators, 1 subsurface infiltration basin, & 1 filter vault
  - Maintained per manufacturer recommendations & inspection history
- SWPPP for DPW facilities
- SOP templates available from CMRSWC

Framingham's Plan for New MS4 Permit Requirements (cont)

Fish advisory on Sudbury River

Learned Beach closure due to bacteria after heavy rain

Water Quality requirements

- Low priority for capital projects
  - No TMDLs!
- Pursue regional BMPs or treatment trains
- Encourage LID/GI
- Incorporate BMPs in Town projects
  - SmartSponge® BMP to protect public beach from bacteria
  - Rain gardens at Bowditch Field
  - Subsurface infiltration at new library
  - Upgrade drainage during construction projects (e.g. replace direct inlets with deep sump catch basins)

Potential Annual Stormwater Budget

The Town of Framingham currently invests approximately $1M in stormwater management annually. The below summary is the estimated annual cost to comply with new permit requirements and the increase from current spending.

		Current Estimate	Increase	
▪Operations $200K		$850K	$1M	↑
▪ Increase inspections, cleaning, & sweeping				
▪ Manage more facilities & municipal ops				
▪ Increase administration of SWMP				
▪Capital $650K-$800K		$150K	$850K - $1M	↑
▪ Drainage Improvements				
▪ Equipment for structure maintenance				
▪ Water quality BMPs				
▪Total needed	$1M	~$1.85 -$2M	↑ $850K - $1M	
▪ *Minimal regulatory compliance*				
▪ *Maintain current pace for maintenance/upgrade of drainage system and flood controls*				

Some Concerns about Proposed MS4 Permit….

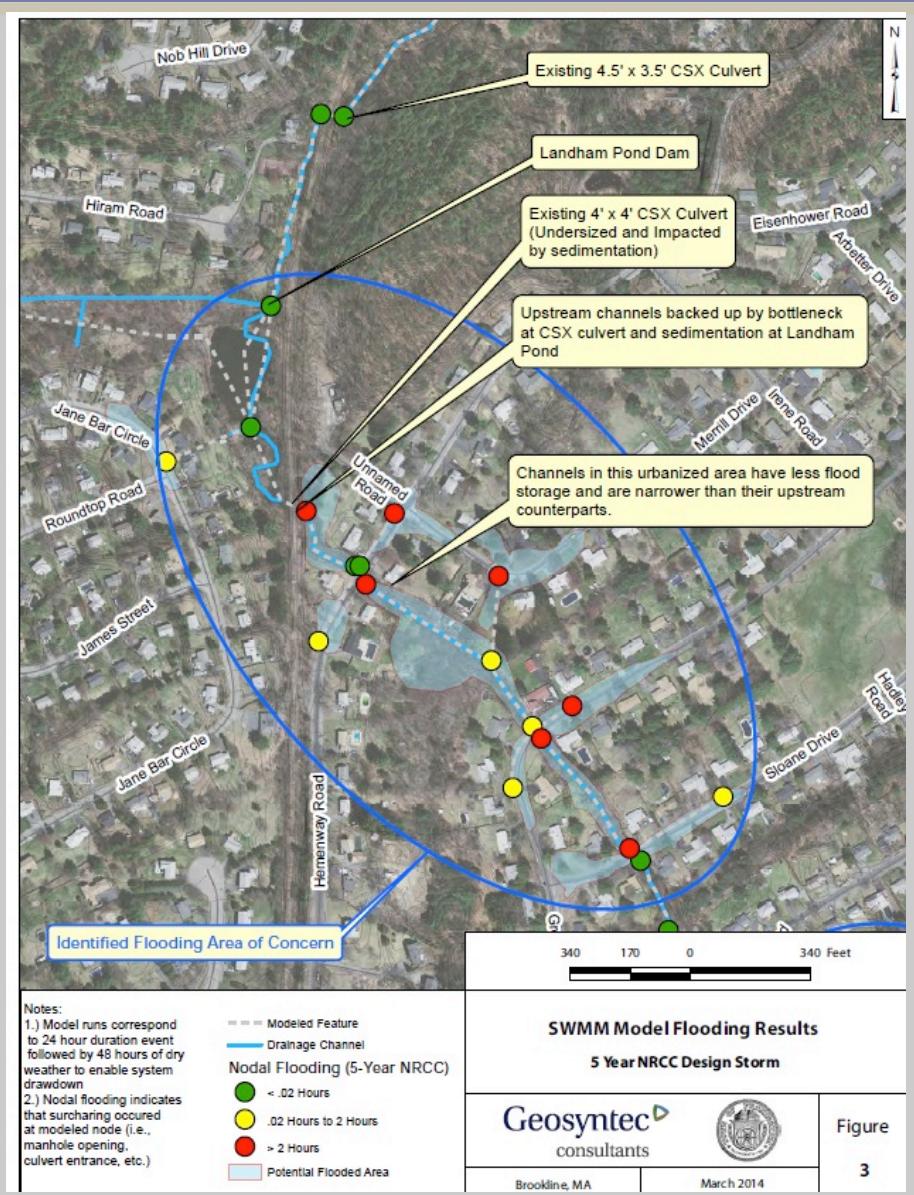
- Detailed methods, aggressive schedules, & significant costs for BMPs.
- Regional efforts will be needed.
- EPA needs to synchronize requirements with MassDEP.
- Municipalities need more state & federal financial and technical support.
- Water quality reduction goals & requirements are unrealistic.

Capital Project:
Learned Beach SmartSponge® BMP

Before

After

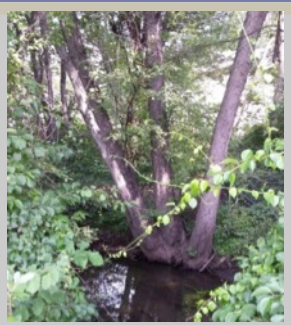
Capital Project:
Landham Pond Dam Removal



Neighborhood flooding in July 2009

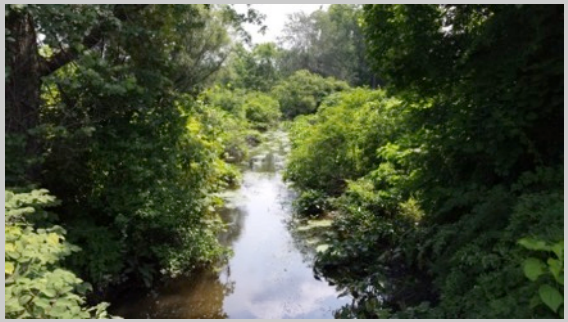
Dam structure

Capital Project:
Beaver Dam Brook Stream Restoration



Example of stream bank section. Note: erosion at tree roots

Looking downstream. Note: shallow stream with sedimentation



Looking downstream from Beaver Street bridge

Looking east from park. Note: invasive Japanese knotweed dominating western bank

- Initial planning phase
- Funded by MassDEP Grant for ecological restoration
- MCP Site
- EJ community
- Flooding & WQ concerns

Questions?

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