CITY OF CAMBRIDGE STORMWATER MANAGEMENT PROGRAM

Phase II NPDES

Stormwater Management Program

Public Meeting

March 28, 2017

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AGENDA

- NPDES Program Overview
- Year 14 accomplishments
- Looking Forward: New Permit Requirements
- Update on Climate Change Vulnerability Assessment and Preparedness & Resiliency Plan

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NPDES PROGRAM OVERVIEW

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Clean Water Act

EPA United States Environmental Protection Agency

- The Federal Water Pollution Control Act of 1948 was the first major U.S. law to address water pollution.
- Growing public awareness and concern led to sweeping amendments in 1972, the law became commonly known as the Clean Water Act (CWA).
- The 1972 amendments:
  - Established the basic structure for regulating pollutants discharges into the waters of the United States.
  - Made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained. Stormwater was not considered a point source discharge.

Cuyahoga River, OH 1969

NPDES:

National Pollutant Discharge Elimination System

Water Quality Act of 1987 regulated stormwater as a point source discharge

1990: Phase I

- Regulated stormwater discharges from Municipalities (over 100,000 population), industrial operations, construction sites (>5 acres) Boston, Worcester

1999: Phase II

- Regulates stormwater discharges from small Municipalities, 1 – 5 acre construction sites, prisons, state universities, others…
- Initial Notice of Intent submitted July 2003
- Currently Completing Year 14
- Reissued Permit Effective – July 1, 2017 - 2022

Impaired Waters

Stormwater discharges are causing or contributing to at least **55%** of the impairments in all Massachusetts' assessed waters

Source: EPA

Pollutants

Source: EPA

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Program Objective

Source: EPA

How do we do this?

Reduce discharges of pollutants from the regulated separate stormwater system (MS4) *to the maximum extent practicable*

Runoff Discharges to Nearby Waters
(Charles River and Alewife Brook)

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STORMWATER MANAGEMENT PROGRAM

Address 6 Minimum Control Measures

1. Public education/outreach
2. Public involvement/participation
3. Illicit discharge detection/elimination
4. Construction Site stormwater runoff control
5. Post-construction stormwater management
6. Pollution prevention/good housekeeping for municipal operations

Develop and implement Best Management Practices to address each program area

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YEAR 14 ACCOMPLISHMENTS

#1. PUBLIC EDUCATION & OUTREACH

Meetings

- Construction (Alewife Sewer Separation, The Port)

Neighborhood and Business Outreach

- Meetings with community groups (Alewife Sewer Separation, The Port, Williard Street, Newport/Roseland/Appleton)
- coffee talks (8) (Alewife Sewer Separation)
- Bake Sale (Alewife Sewer Separation)
- Celebrate Observatory Hill - **September 15, 2016** (Alewife Sewer Separation)

Rain Barrel Promotion – May 22, 2016

- Displays around City (DPW, City Hall, Water Dept.)
- Partnership with *Green Cambridge* for installation
- Sold 85 barrels

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#1. Public Education & Outreach (cont.)

Curb Marker installations

Stormwater Management Web Site

- www.cambridgema.gov/theworks/ourservices/stormwatermanagement

Youth Outreach

- Alewife Wetland Tour - August 3
- Enviroscape demonstration
  - DPW Roadshow – May 16
  - Fresh Pond Day – June 11
- Cambridge Science Festival

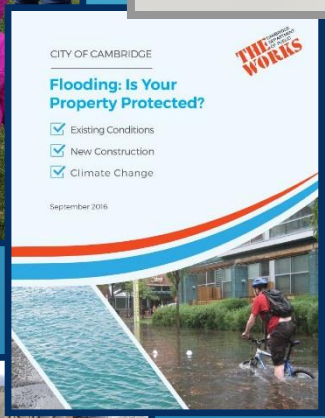
City Publications

- City View

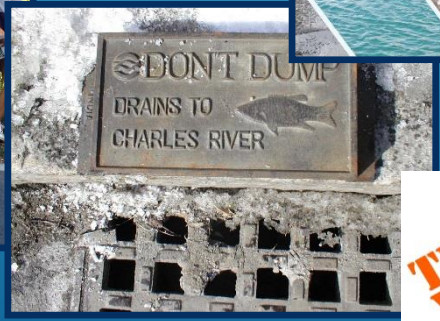
commonwealth connect
tapping into Cambridge water

- Brochures

Flooding: Is Your Property Protected



Green Sense – Alewife Wetland



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#2. PUBLIC PARTICIPATION & INVOLVEMENT

Stormwater Wetland Tours (1) August 3, 2016

Household Hazardous Waste Collections (4) April 19, June 18, Sept 10, Oct 29

Meetings

- Annual Stormwater Meeting March 28, 2017
- Envision Cambridge (Alewife)
- Climate Change Vulnerability Assessment and Preparedness & Resiliency Plan

#3. ILLICIT DISCHARGE DETECTION & ELIMINATION (IDDE)

PROHIBIT, IDENTIFY AND REMOVE ILLICIT CONNECTION AND DISCHARGES

Water quality sampling

- Charles –Dry, wet, Oil & Grease
- Alewife - Dry, wet, Oil & Grease
- Fresh Pond Reservoir

Illicit Connections Identification/Removal

- S. Normandy Ave– lined over/under system sewer
- Normandy Ave area investigations ongoing
- Sparks Street investigations ongoing
- Matignon Road investigations ongoing

Investigation of Complaints (15)

- See, Click, Fix (11) – Dumping Into Stormdrain (sewer odors, construction sediment, salt piles, leaking dumpsters, etc)
- Other (4)

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#3 IDDE (CONT.)

Automatic Sampling Stations (5)

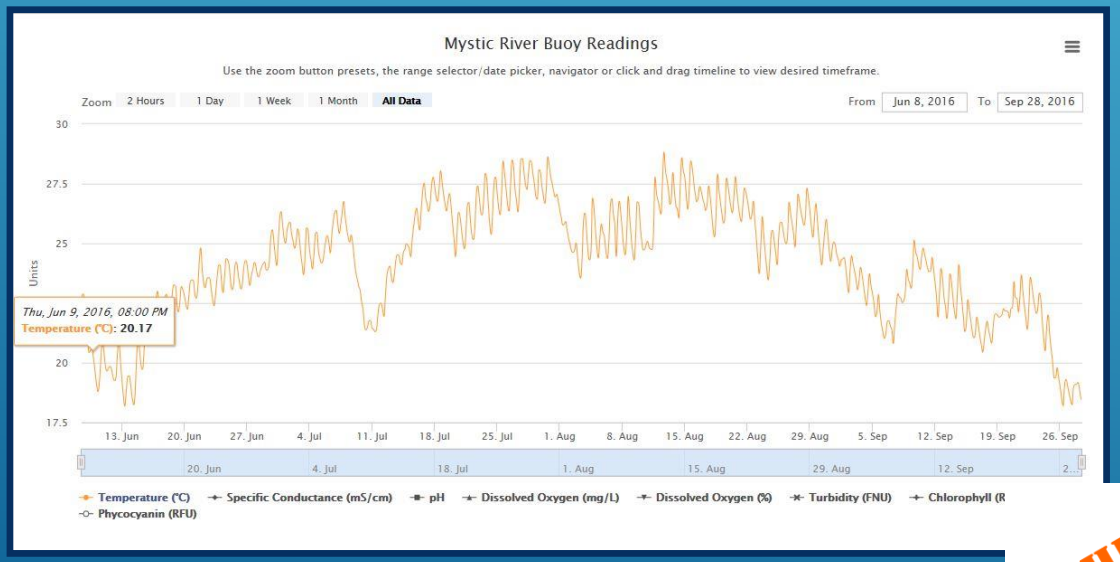
- 100% completed (Harrison Ave, Stormwater Wetland (2), Western Ave, Sparks St at Foster)
- Working on live website connection

Sewer Holding Tank Inspection Program

- Total # private sanitary tanks (19)
- Total # inspected to date (15)

Wetland Outlet

Sparks Street



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#4. CONSTRUCTION SITE RUNOFF CONTROL

REDUCE POLLUTANTS FROM CONSTRUCTION SITES THAT DISTURB ≥ 1 ACRE AND SIGNIFICANT PROJECTS

- Stormwater Control Permits: Erosion Control Plans approved: 4
- Weekly meetings with large contractors during March – Nov
- Number of active construction sites inspected: 59
- Total number of erosion & sediment control inspections:162
- WARNING tickets issued: 28
- Presentation to contractors: 1

#4. CONSTRUCTION SITE RUNOFF CONTROL (CONT.)

DON'T DUMP INTO DRAINS!

Contractor is responsible for all sediment, dewatering, and discharge from construction site.

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#4. CONSTRUCTION SITE RUNOFF CONTROL (CONT.)

Construction dewatering requires a permit from EPA/ MWRA and City of Cambridge before dewatering

Stabilized construction entrance/exit and street sweeping reduces stormwater pollution

#5. POST CONSTRUCTION STORMWATER MANAGEMENT

ADDRESS RUNOFF FROM NEW AND REDEVELOPMENT PROJECTS THROUGH THE USE OF BMPS

Stormwater Control Permits: submitted – 21 (approved - 4)

- Store on site the difference in volume between the 2 yr 24 hr preconstruction runoff and the 25 yr 24hr post construction runoff
- Peak development discharge rate less than existing conditions
- Manage stormwater runoff to reduce 80% TSS and 65% TP from site.
- Manage sewer discharge to ensure no increase in CSOs or SSOs.
- **Build to the 2070 10yr storm with a recovery plan for the 2070 100yr storm** (updated based upon CCVA Reports – still evolving)

BMP inspection

Filtration system

Infiltration swale

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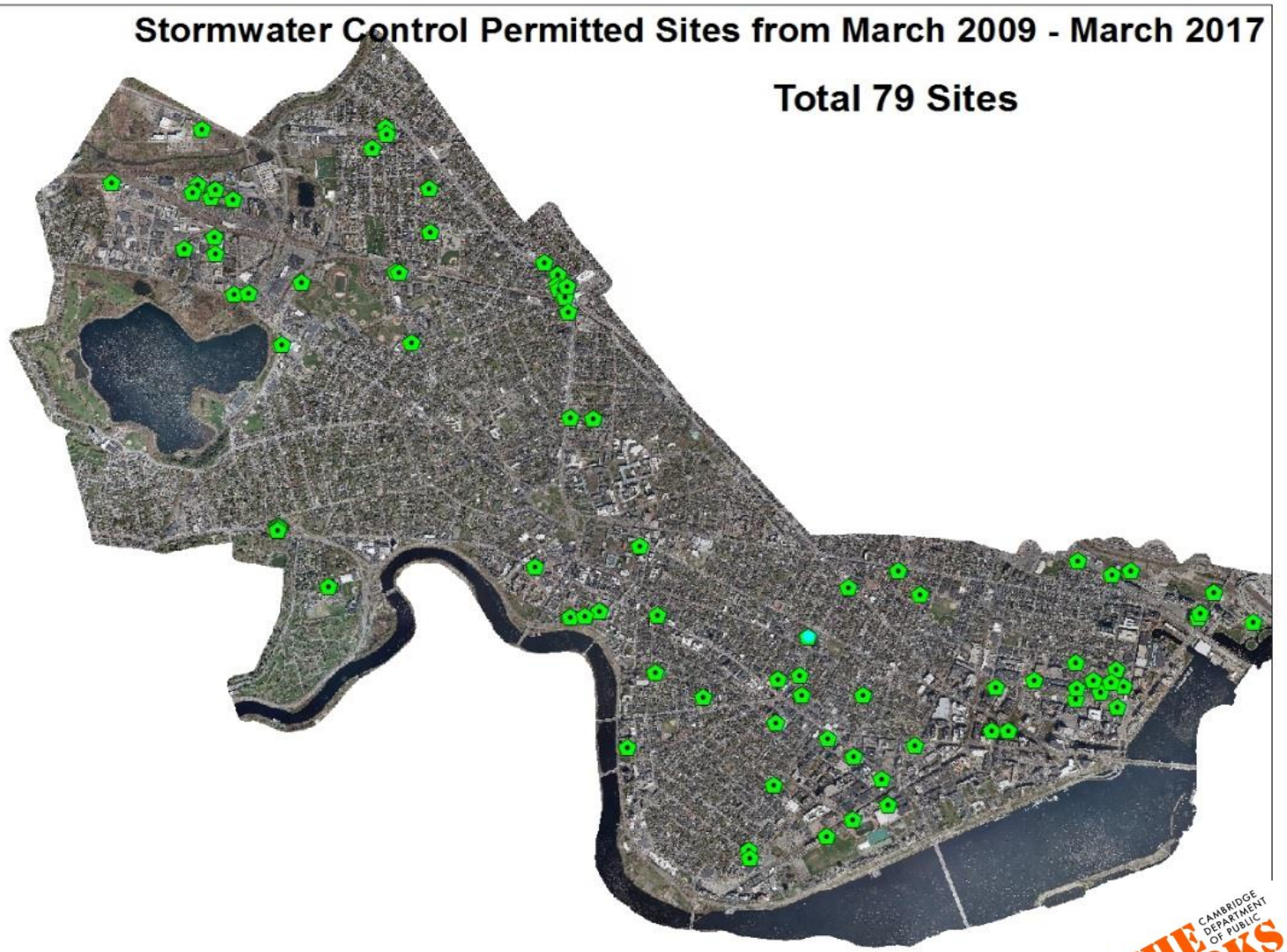
#5. POST CONSTRUCTION STORMWATER MANAGEMENT (CONT.)

Numb	Project Name	Permit Yea
1	237 Franklin St	2016
2	16 Prospect St	2016
3	8 Essex St	2016
4	147 Prospect St	2016
5	32 Mill St	2015
6	100 Bishop St	2015
7	2 Leighton St	2015
8	25 3 Wilkes St	2015
9	399 Bishop St	2015
10	88 Cambridgepark Dr	2015
11	90 Broadway	2015
12	1868 Mass Ave	2014
13	30 Cottage Pk Dr	2014
14	27 0 Third St	2014
15	62 Mooney St	2014
16	15 Fitchburg Ave	2014
17	150 Cambridge Park Dr	2014
18	240 3 Sidney St	2013
19	300 Massachusetts Ave au	2013
20	75 New St	2013
21	The Ave Residences	2013
22	Rhythmia	2013
23	21 Wendell	2013
24	165 Cambridgepark Dr	2013
25	Conductors Building	2013
26	Fairfield Inn	2013
27	MITTCC Vassar Street	2013
28	Porter Square Hotel	2013
29	Art Institute of Boston	2013
30	MLK School	2013
31	22 and 27 Cottage Park Ave	2012
32	Old Quincy House Renovati/ 58 Plympton St	2012
33	603 Concord Ave/ 13 Wheeler St	2012
34	Phase II - Residences at Fresh Pond/ 90 Fawcett Street	2012
35	Rogers Street Park/ 161 Rogers Street	2012
36	15 9 First St	2012
37	22 Water Street Residences	2012
38	West Annex Lot/ 169 Vassar St	2012
39	100 Brookline St/ 17 Tudor (MIT Investment Mang. Co.)	2012
40	87 Building/ 8 Education Street	2012
41	North Point III/ 2 Leighton St	2012
42	119-135 Harvard St	2012
43	Temple Place/ 7 Temple Place	2012
44	125, 150, 160 Cambridgepark Dr	2012
45	40 Norris St	2012
46	120-124 Binney Ave - Broder Properties Apartments	2012
47	Maple Leaf Micro Lofts/ 10 Gluseworks Ave	2012
48	160 Cambridge Park Dr	2012
49	35 Fresh Pond Parkway Retail Center	2012
50	168-174 Hampshire St	2012
51	Northpoint Apartment Tower IV 20 Child Street	2012
52	75 -125 Binney St	2012
53	1-7 Brattle Circle	2011
54	300 Binney Street (17 Cambridge Street)	2011
55	Novartis Institutes for Biomedical Research/ 181 Mass Ave	2011
56	610 Main Street	2011
57	225 Binney St - Alexandria Center	2011
58	75 Ames St	2011
59	430 Windsor at condos Units 1-2	2011
60	The Residences At Fresh Pond_Cabot Cabot & Forbes	2011
61	150 Second St	2011
62	106 Vassar St	2011
63	61 Mbelton St/ 665 Concord Ave. storm water control permit	2010
64	Belton Street residences	2010
65	Shady Hill School	2010
66	402 Main AVE - Substation Ave	2010
67	St. James Church	2010
68	625 Putnam ave	2010
69	FOGG Museum - Construction Permit	2010
70	1073-1081 Mass Ave	2010
71	126 Charles Street (190 parking spaces)	2010
72	87 New Street	2009
73	95 - 99 Pine St	2009
74	200-300 Akerm Park Dr (Bulfinch Properties)	2009
75	Elm Place	2008
76	221-223 Concord Turnpike	2008
77	Lutheran Church	2008
78	1663 Mass Ave (Lesley University Parking lot) 210 car Parking	2008
79	30 Jay Street	2008



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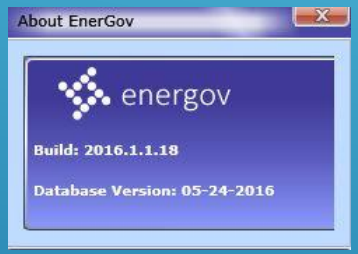
#5. POST CONSTRUCTION STORMWATER MANAGEMENT (CONT.)

Post Construction BMP Inspections: 52

Database maintained for private BMP facilities

Energov software: to manage permitting, inspections and code enforcement on stormwater control permits, and Conservation Commission permits



Underground flood storage

Treatment swale

Sewer storage tank

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#6. Pollution Prevention & Good Housekeeping for Municipal Operations

Street Maintenance

- 1021tons of street sweeping debris
- 1562 catch basins cleaned (364 tons)


Street Sweeping


Porous Pavement

Stormwater Best Management Practices

- Porous Asphalt:
  - Alewife Sewer Separation (Huron B): 4,224 LF in construction
  - Alewife Sewer Separation (Concord Area): 3,960 LF in construction
- Rain Gardens/Biobains:
  - Alewife Sewer Separation (Concord Area) 1 in construction
- Infiltrating Catch Basins:
  - Roseland St (3) completed
  - Newport Rd(1) completed
  - Appleton St (1)


Rain Barrel


Biobasin


Biobasin

#6. Pollution Prevention & Good Housekeeping for Municipal Operations

Trees Planted – 279

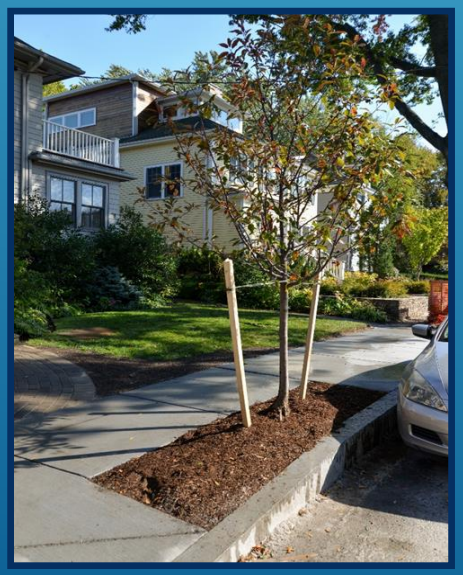
Municipal Facility Inspections

- 157 +/- total facilities (62 in separated areas)
- 90 inspected (41 in separated areas to date)

Employee Training 71

- 51 Municipal Pollution Prevention Measures
- 20 Stormwater Permit Regulations

Cartegraph for work order management



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#6. Pollution Prevention & Good Housekeeping for Municipal Operations

Capital Improvement Projects

- SCADA Improvements: real time monitoring of stormwater sampling stations (5), drain vaults #1-5, sewer vaults #1-2, and Hovey St tanks construction completed
- Wadsworth Sewer Pump Station Reconstruction design completed
- The Port: Bishop Allen Drive Flood Control (stormwater tank and pump station): 80% design
- Roseland St/Newport Rd/Appleton St sewer separation: 40% construction
- Stormwater Sampling Stations (5): construction completed

#6. Pollution Prevention & Good Housekeeping for Municipal Operations

Capital Improvement Projects cont.

- Sewer Capital Repair Program:
  - Infomaster software to characterize code defects ongoing,
  - 1st lining contract ($1.1 m) construction complete
  - 2nd lining contract ($1.0 m) in design

- Monsignor O'Brien Drain and New Outfall in design
- Broad Canal Drain extension improvements design complete
- The Port: (2nd stormwater tank and pump station) in planning
- Talbot Street Outfall in design
- Willard Street Outfall re-establishment in design and permitting

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#6. Pollution Prevention & Good Housekeeping for Municipal Operations

CAPITAL IMPROVEMENT HIGHLIGHTS FOR NEXT PERMIT YEAR

- Willard St. outfall re-establishment bid 2017/18
- The Port: Bishop Allen flood control bid 2017
- Wadsworth Pump Station Reconstruction construction2017
- Talbot St Outfall bid 2018
- Stormwater Sampling Stations live updates on website 2017
- Sewer Capital Repair Program: 2nd contract ($1.0 m) bid 2017

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LOOKING FORWARD:
NEW PERMIT REQUIREMENTS

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Status of New NPDES MS4 Permit

- Effective Date: July 1, 2017
- Notice of Intent Due: September 27, 2017
- Stormwater Management Plan Due (SWMP):July 1, 2018

https://www3.epa.gov/region1/npdes/stormwater/MS4_MA.html

What's New: More prescriptive

Changes in the new permit

Highlights

SWMP is a living document – updated annually

- Description of Best Management Practices (BMP) and updates
- Sanitary Sewer Overflow (SSO) inventory and management
- Document compliance with regulations and authority
- All written procedures for inspections, enforcement, reviews

Develop and implement programs to address TMDLs

- Charles River: Phosphorous and Pathogens

Enhanced Program to address Water Quality Limited Waterbodies

- Nitrogen: N/A
- Phosphorus: Alewife Brook
- Solids, Metals, Oil And Grease: Charles River and Alewife Brook
- Bacteria or Pathogens: Alewife Brook
- Chloride: Segment of Charles River

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Changes in the new permit cont.

6 MINIMUM CONTROL MEASURES

1. Public education/outreach
   - 4 groups, 2 targeted messages each residential, business/commercial/institutional, developers/construction, industrial
2. Public involvement/participation
   - Provide public an opportunity to review and implement the SWMP
3. Illicit discharge detection/elimination
   - Sanitary Sewer Overflow (SSO) inventory and management (5 years). Maintain updates in SWMP
   - System catchment mapping
   - Written IDDE Program
   - Assessment and Ranking of Outfalls
   - Dry and Wet weather sampling system vulnerability factors
   - Employee Training

Changes in the new permit cont.

4. Construction Site stormwater runoff control
   - Written procedures for site plan review, E&S control inspection and enforcement
5. Post-construction stormwater management
   - Low Impact Development strategies must be used (MEP)
   - New Development and Redevelopment projects must meet certain requirements and standards from the Massachusetts Stormwater Handbook
   - As-built drawings must be submitted within 2 years
   - Assess street design and parking lot guidelines and other regulations that affect the creation of impervious surfaces. Modify regulations to support low impact design options
   - Review municipal facilities for opportunities to install BMPs and reduce impervious area through retrofits

Changes in the new permit cont

6. Pollution prevention/good housekeeping for municipal operations
   - Written programs included in SWMP O&M procedures for municipal facilities and infrastructure
   - Catch Basin maintenance – 50% sump and prioritization of problem areas
   - Road salt use optimization plan
   - Annual inspection of all stormwater treatment structures
   - Stormwater Pollution Prevention Plans (SWPPP) maintenance garages, public works yards, transfer stations and other waste handling facilities

UPDATE ON CLIMATE CHANGE VULNERABILITY ASSESSMENT AND PREPAREDNESS AND RESILIENCY PLAN

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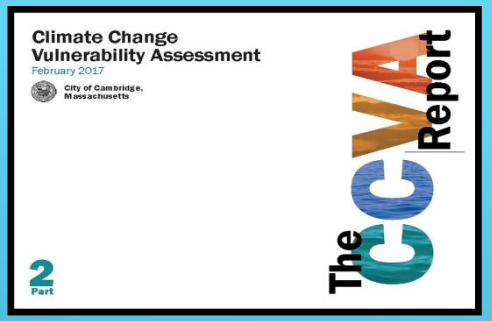
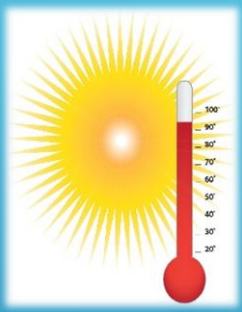
CLIMATE CHANGE VULNERABILITY ASSESSMENT (CVVA)



Technical Foundation for Preparedness and Resiliency Plan

- Identifies key physical and social vulnerabilities
- Climate stress test (temperature and flooding)



CVVA Report Part 1 – November 2015

- focused on the risks from increasing temperatures and precipitation

CVVA Report Part 2 – February 2017

- addresses vulnerabilities related to sea level rise (SLR) and storm surges (SS)

www.cambridgema.gov/climateprep

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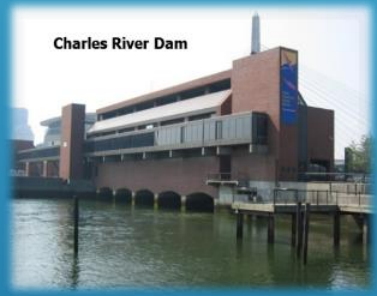
CVVA Key SLR/SS Findings

Alewife Watershed:

- By 2045, Amelia Earhart Dam flanked
- Greatest flooding impacts from SLR/SS.
- By 2070, modeling shows that large portions of the area could be subject to 20% chance of annual flooding (once every five years)

- Conventional flood management techniques, such as storage basins and tanks, would be insufficient to deal with flood volumes.

Charles Watershed:



- By 2055, Charles River Dam flanked
- Through 2070, Propagated flooding (river water backing up through the storm drainage pipes) more likely than overland flooding from storm surge.

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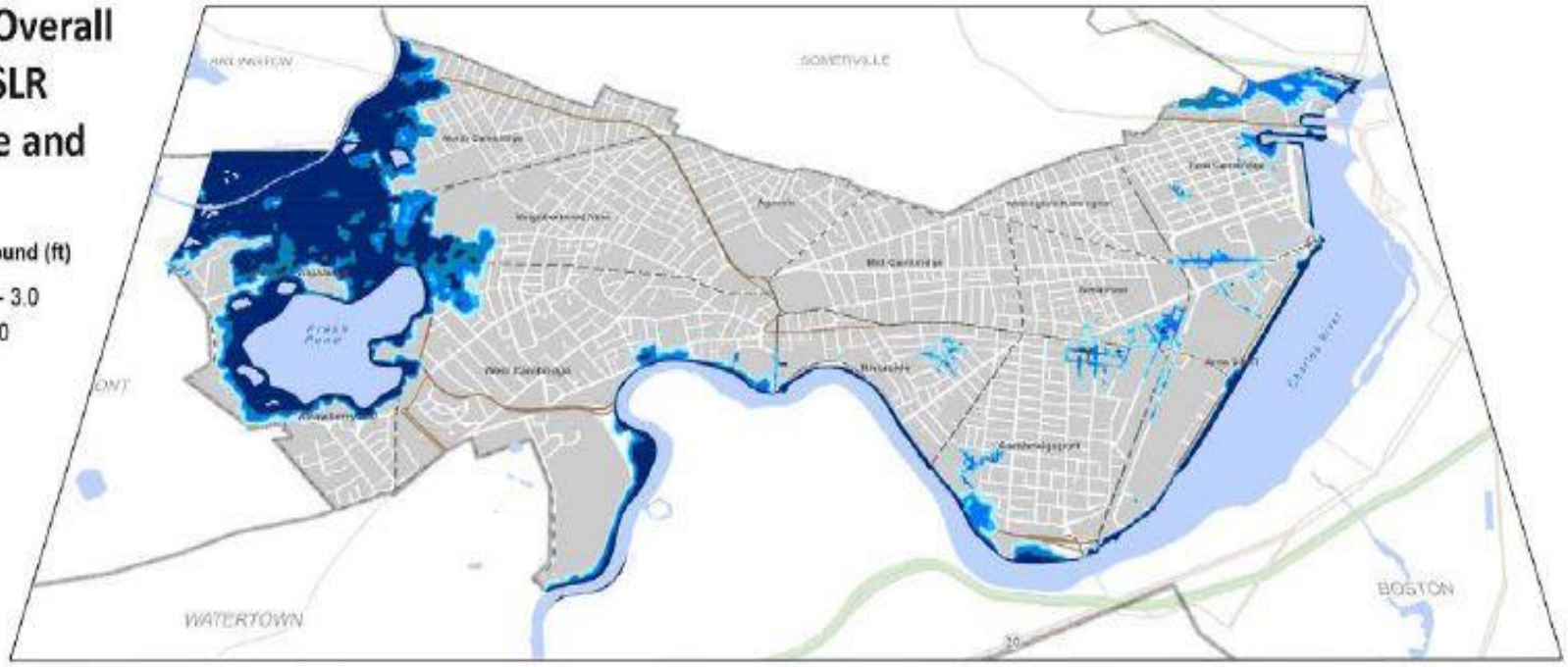
2070 Depth of Overall Flooding from SLR and StormSurge and Propagation

Depth of flooding above ground (ft)

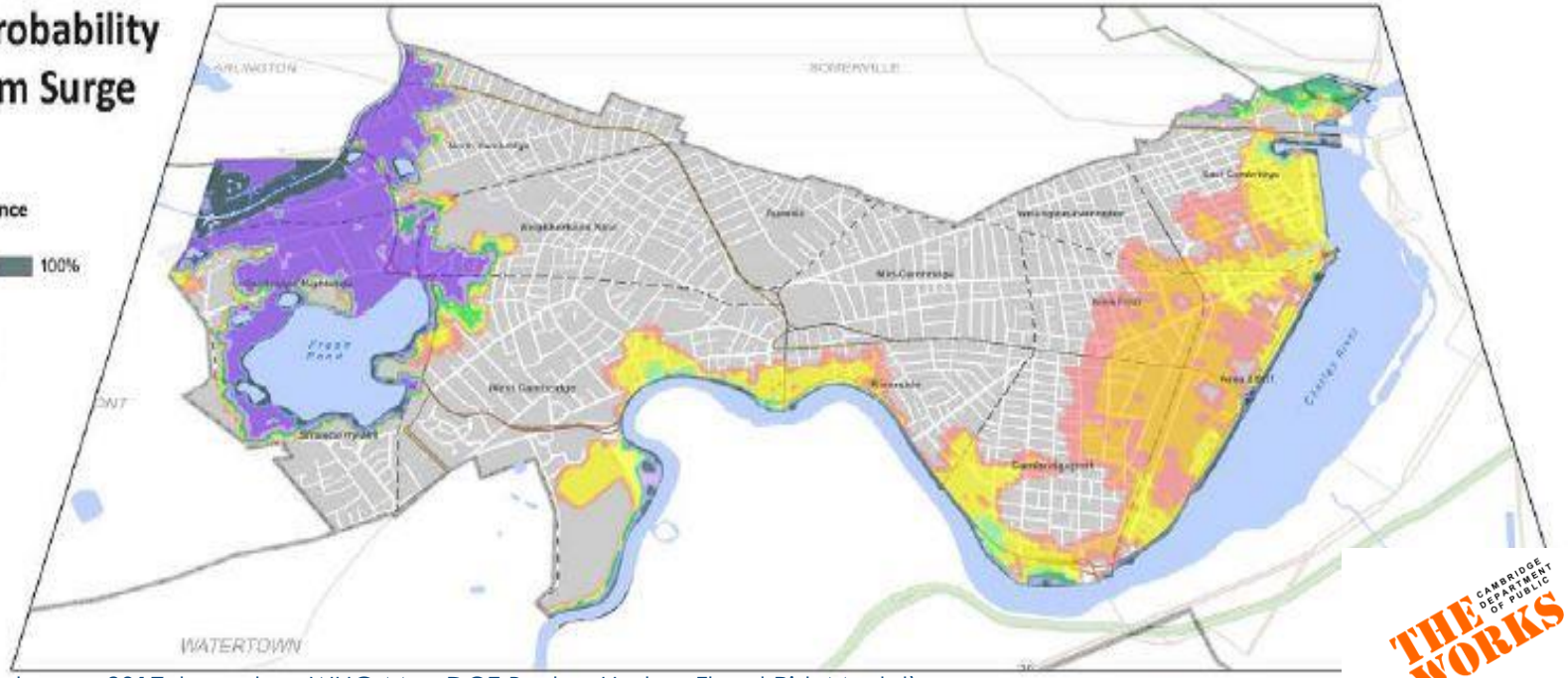
- 0 - 0.5
- 0.5 - 1.0
- 1.0 - 2.0
- 2.0 - 3.0
- > 3.0



2070 Percent Probability of SLR and Storm Surge Flooding

Percent probability of exceedance

- Dry
- 0.1%
- 0.2%
- 0.5%
- 1%
- 2%
- 5%
- 10%
- 20%
- 25%
- 30%
- 50%
- 100%



(Source: Kleinfelder, February 2017, based on WHG MassDOT Boston Harbor Flood Risk Model)

Climate Change Preparedness & Resiliency Plan (CCRP)

- Two Year planning progress
- Develop objectives, strategies, implementation plans, and monitoring metrics
- Neighborhood level Plan for Fresh Pond-Alewife Area and The Port (pilot)
- Expand to other high risk neighborhoods
- Develop a city-wide plan with integrated actions that increase preparedness and resilience at the building/parcel, neighborhood, citywide, and regional scales

Resiliency Strategies:

- A Prepared Community
- Adapted Buildings
- Resilient Infrastructure
- Resilient Ecosystems

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Comments/Questions

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