Nashua Basin Permit Meeting

November 17th , 2016
Double Tree by Hilton
99 Erdman Way, Leominster MA

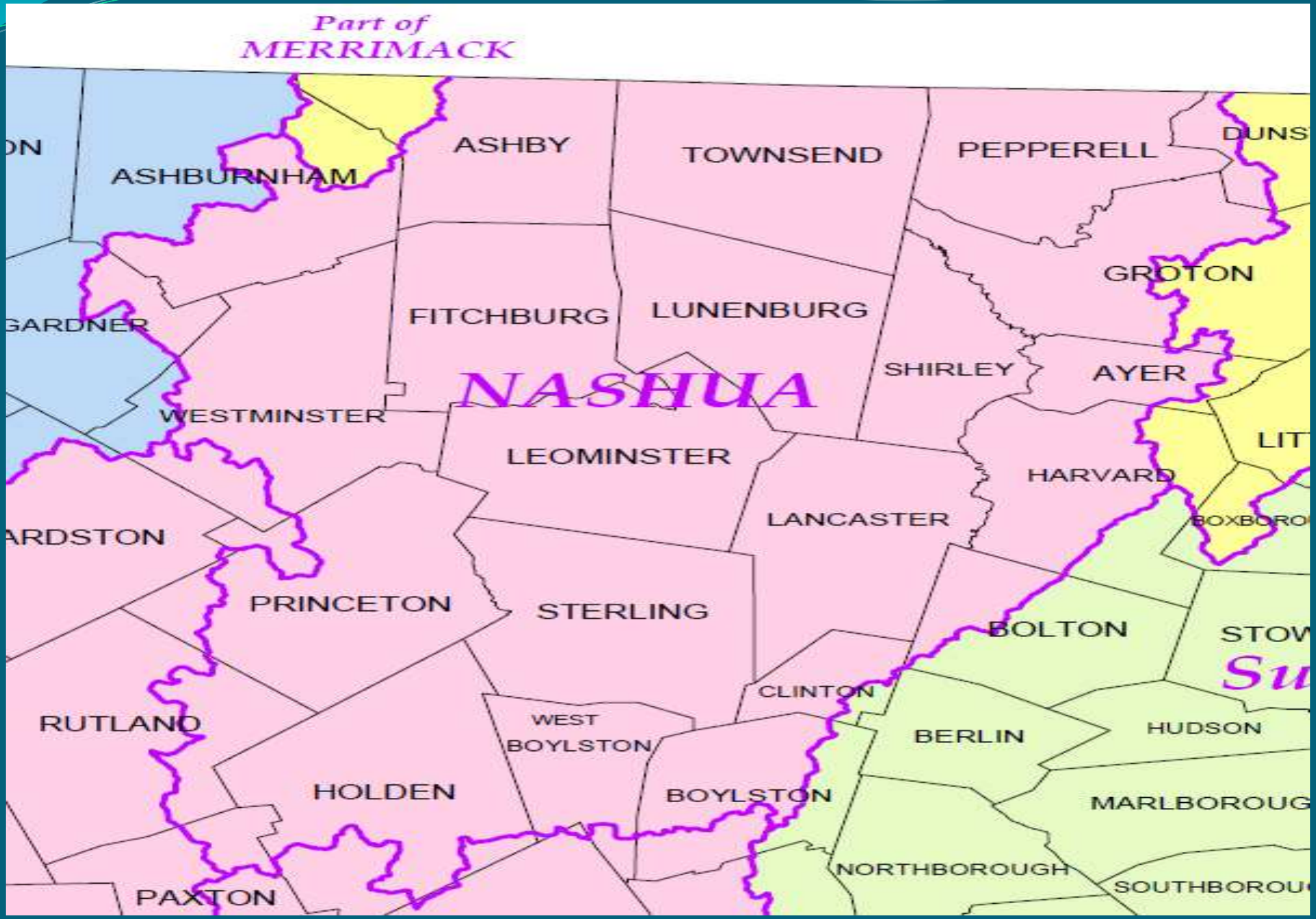
MA Executive Office of Energy and Environmental Affairs
- Department of Conservation and Recreation
- Department of Environmental Protection
- Department of Fish and Game

Nashua Meeting

Agenda

- Introductions
- WMA Permit Renewal Process
- Nashua Basin Specifics
- Questions & Answers
- Informal Agency Consultations

Nashua Basin



Meeting Purpose- Part One

- Explain the WMA permit renewal process, including:
  - WMA Purpose
  - Permit Review Schedule
  - Water Needs Forecasts
  - Safe Yield
  - Permit Conditions
  - New Permit Requirements

Meeting Purpose- Part Two

- Review Nashua data and requirements, including:
  - Water Use
  - Baselines
  - Water Use Restrictions
  - Coldwater Fisheries Resources (CFRs) and Requirements

Water Management Act Purpose

Chapter 21G, Section 7 Reasonable protection of …

- Public drinking water supplies
- Navigation
- Hydropower resources
- Fish and wildlife
- Water quality
- Water-based recreation
- Wastewater treatment capacity
- Agriculture
- Waste assimilation capacity
- Reasonable conservation practices consistent with efficient utilization of water
- Groundwater recharge areas
- Flood plains
- Wetland habitat
- Reasonable economic development and creation of jobs

Nashua Permit Renewal Schedule

Activity	Notes
Outreach meeting	November 17, 2016
Water Needs Forecast	Under development
Consultation meetings	On going, as necessary
Renewal Application Filing Period	Dec. 31, 2016- Feb. 28, 2017
MassDEP issues Order to Compete (OTC)	TBD
Applicant prepares response to OTC	TBD
OTC response due back	TBD
MassDEP reviews	Mtgs. as necessary
Draft permit and public comment period	TBD
Issue final permits*	TBD

* Permits may be appealed for up to 21 days after permit issuance. Permits under appeal are not considered final permits.

Safe Yield

55% of Annual Drought Basin Yield + Reservoir Storage

- New methodology* determines maximum withdrawal volumes on annual basis and major basin scale.

*For more detailed description, see the Sustainable Water Management Initiative Framework Summary (November 28, 2012)

Basin	Safe Yield	Total Annual Authorized Withdrawals*	Total Annualized Registered Volume *	2015 Reported Use
Nashua	255.5 mgd	181.19 mgd	167.46 mgd	81.72 mgd

* Withdrawal volume calculated based on 365 days

Water Needs Forecasts (WNF)

- Applications for WMA Permits require a forecast of water needs for the permit term
- DCR develops forecast
- WRC Method:
  - Population and Employment forecasts
  - 65/10 and Current Trends scenarios
  - + 5% Buffer
  - At least 3 years of reliable data
  - Temporary allocation where necessary

- URL: www.mass.gov/eea/wnf-method

Steps in Developing a Water Needs Forecast

- DCR compiles and analyzes data
- Public Notices: *Environmental Monitor*; status report to WRC
- DCR develops draft forecast; discussions with water supplier
- Basin-wide public meeting (this meeting)
- PWS includes forecast in WMA permit application

Data from Water Supplier

1. Water-use data based on actual metering for 3 to 5 years (from ASRs):
   - Residential
   - Industrial, Commercial, Municipal (Nonresidential)
   - Treatment plant losses (if any)
   - UAW
2. Population served by water system (including out of town and seasonal)
3. Anticipated significant changes in water use (large projects not captured in projections)

Data Obtained by DCR

Data	Sources
Current Town-wide Population	U.S. Census, Planning Office
Population Projections	Regional Planning Agency
Current Employment	Regional Planning Agency
Employment Projections	Regional Planning Agency

Permit Renewal Volumes

You can renew only as much as you currently have

- Existing Allocation vs Requested Volume
  - Existing Allocation = Your registration + permit = 2.0 mgd
  - DCR Projection = 2.30 mgd
- Up to 2.0 mgd can be done through the Permit Renewal Application
- Additional 0.3 mgd requires a new Permit Application (BRPWM03)
- Permit Renewal and the new Permit can be done simultaneously

  or
- New Permit can be done in the future (but before water is needed)

WMA Permit Conditions

1. Efficiency Requirements
   - 65 residential gallons per capita day (RGPCD)
   - 10% unaccounted-for-water (UAW)
   - BMPs (leak detection & repair, metering, pricing, public education etc.)
2. Seasonal limits on nonessential outdoor water use

Nashua Basin

Nonessential Outdoor Water Use Restrictions

Non-Essential: Uses not required for health or safety reasons, by regulation, for production of food or fiber, for maintenance of livestock, or to meet the core function of a business

RGPCD for prior year	CALENDAR		STREAMFLOW		
	May 1 to Sept 30	7 day Low-Flow Trigger	Flow above ABF	Flow below ABF	7 day Low-Flow Trigger
< 65 →	7 days *	1 day *	7 days	7 days*	1 day*
>65 →	2 days *	1 day*	7 days	2 days*	1 day*

* No watering 9 am to 5 pm on any day

ABF= Aquatic Base Flow
7 Day Low Flow calculated from period of record flows from a local USGS stream gage

Surface water PWSs with a Summer Management Plan with environmental considerations approved by MassDEP may vary from above requirements

Golf Standard Conditions

All permitted golf courses will be required to:

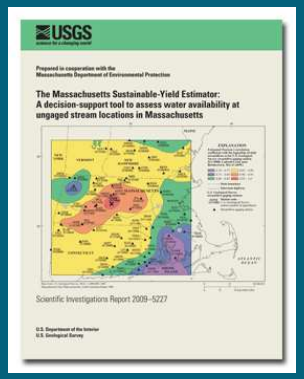
- have a conservation program that includes
  - metering,
  - irrigation system maintenance,
  - turf management, and
  - education;
- limit nonessential irrigation during drought;
- optimize withdrawals to protect cold water fisheries; and
- minimize impacts if the golf course is in a groundwater depleted subbasin.

New or expanding golf courses may also be required to:

- mitigate irrigation impacts; and
- show that there is no alternative source that is less environmentally harmful.

Science and Policy Informing WMA Permit Requirements

- USGS Studies: August withdrawals and impervious cover have significant impact on fluvial fish



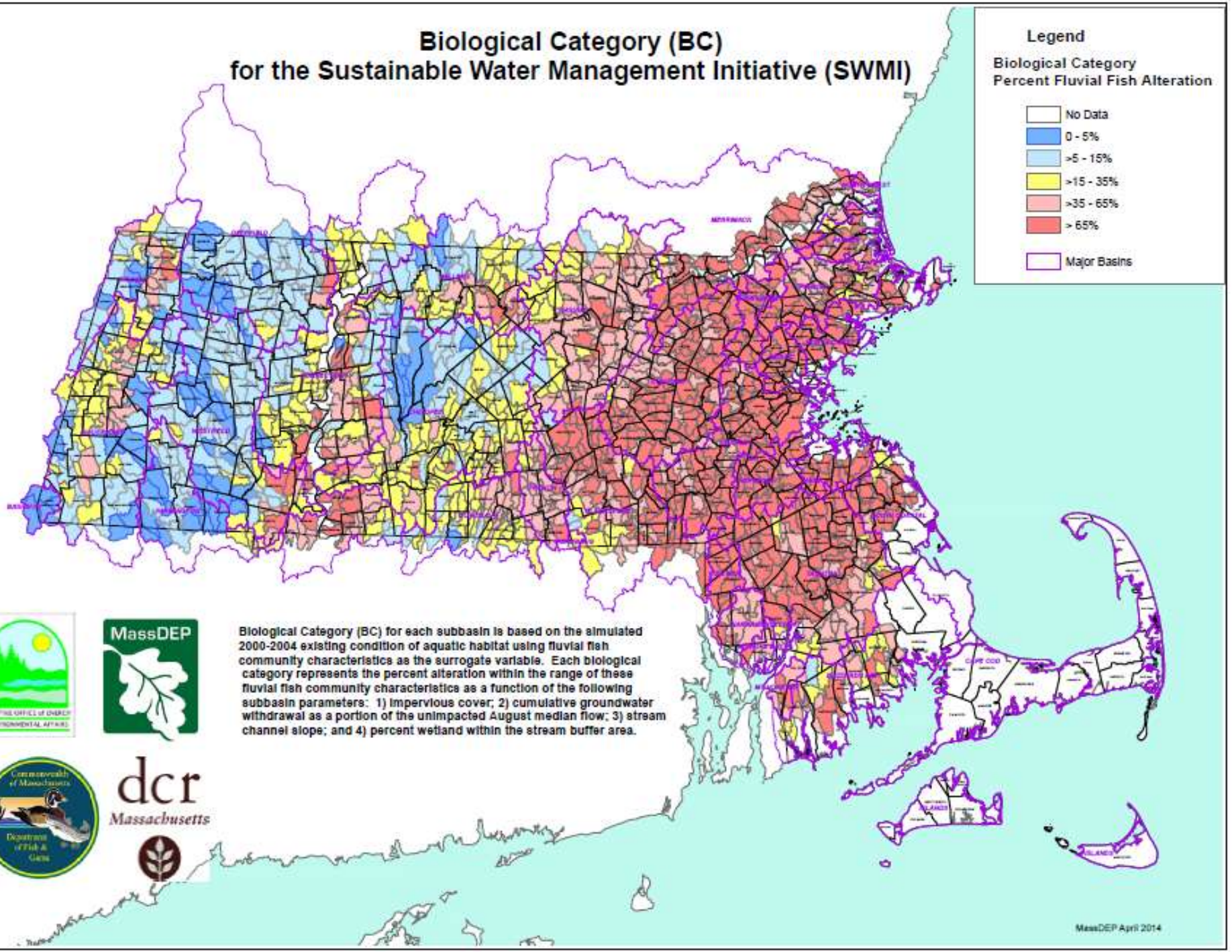
SYE

MWI

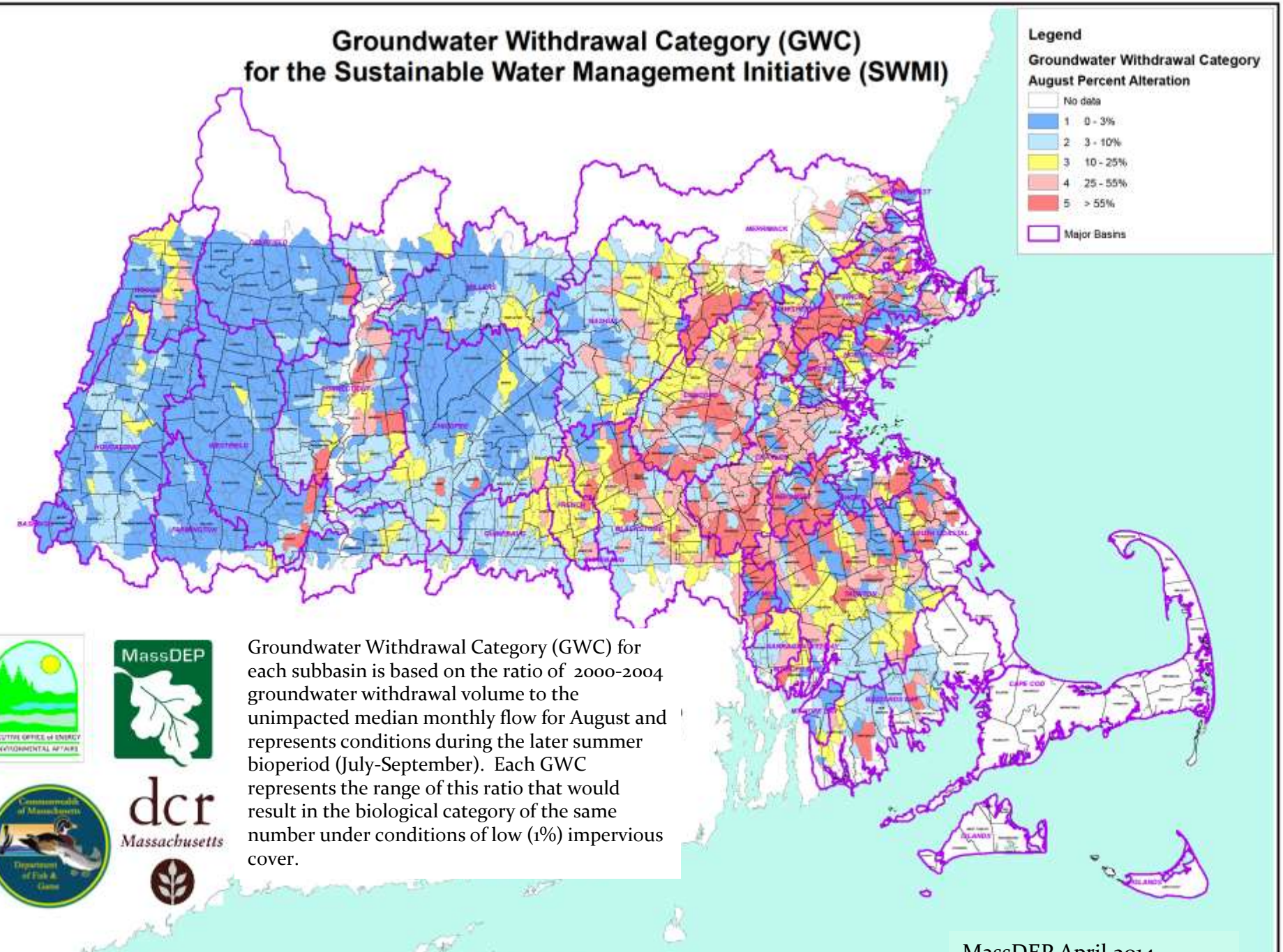
Fish and Habitat

- SWMI Advisory and Technical Committees helped us develop policy from science
- Five Biological and Groundwater Categories (1=least impact, 5 = most impact)
  - Categories use fluvial fish as surrogate for healthy aquatic habitat,
  - Impervious cover and August groundwater withdrawals used to represent impacts
- Streamflow Criteria mark the boundaries between categories (310 CMR 36.14)

Biological Category (BC)
for the Sustainable Water Management Initiative (SWMI)



Groundwater Withdrawal Category (GWC) for the Sustainable Water Management Initiative (SWMI)



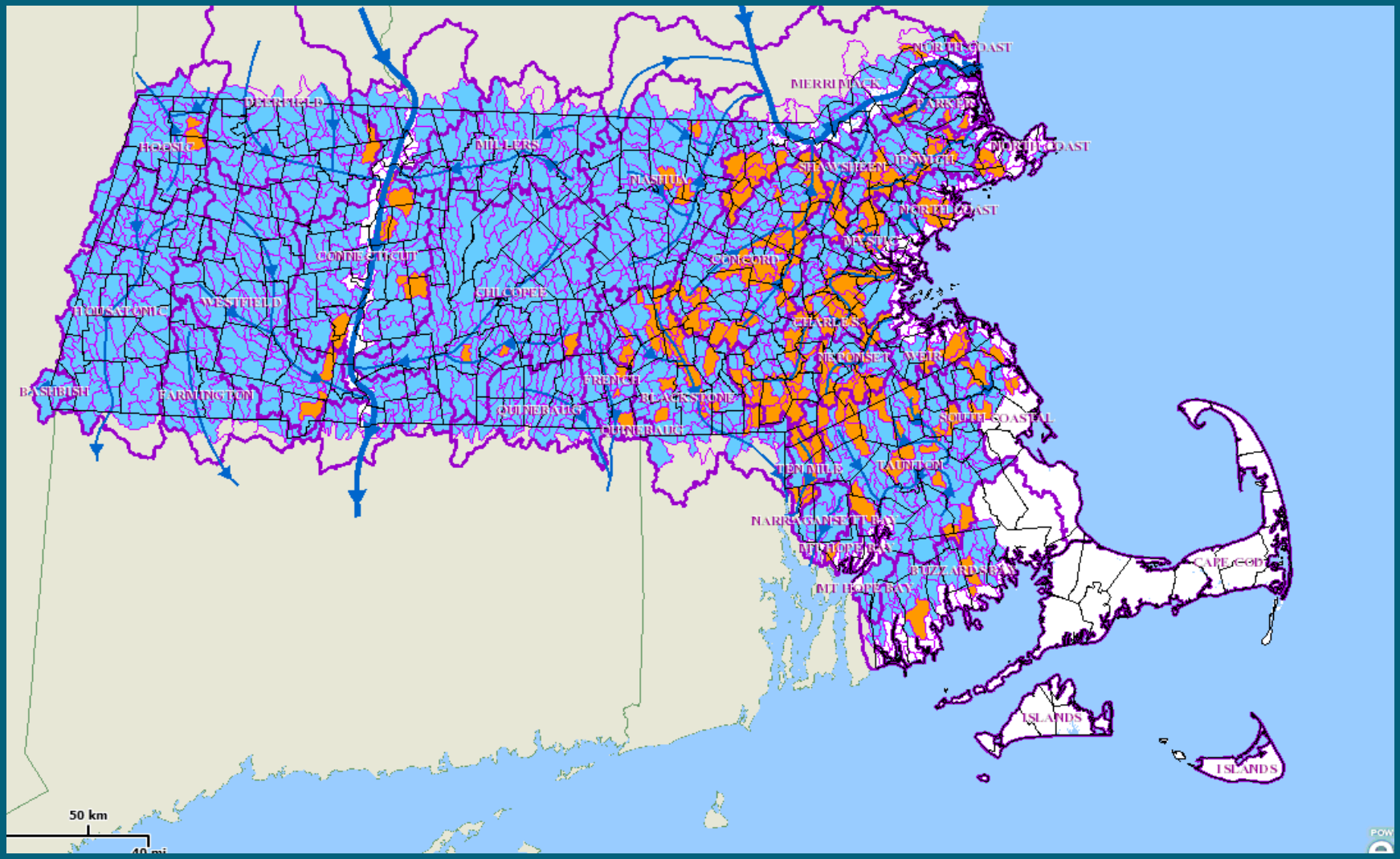
Groundwater Withdrawal Category (GWC) for each subbasin is based on the ratio of 2000-2004 groundwater withdrawal volume to the unimpacted median monthly flow for August and represents conditions during the later summer bioperiod (July-September). Each GWC represents the range of this ratio that would result in the biological category of the same number under conditions of low (1%) impervious cover.

MassDEP

dcr
Massachusetts

MassDEP April 2014

August Net Depletion



New Permit* Requirements

- CFR Consult for withdrawals in subbasins with Coldwater Fishery Resources (CFRs)
- Minimization for groundwater withdrawals in "≥25% August Net Groundwater Depleted" Subbasins
- Mitigation commensurate with impact, for requests above baseline, in consultation with agencies
- Show no feasible alternative for requests that change a category

*Those with only registrations are not subject to these requirements

Coldwater Fisheries Resource (CFR) Consult

- Basin meeting serves as the preliminary consult
- Goal: Reduce impacts to CFRs through optimization
- Optimization guidance will be provided

Minimization

Required* in subbasins that are August net groundwater depleted (NGD) by 25% or more according to MA Water Indicator Study data.

(NGD= *Aug unaffected flow – Aug GW withdrawals + Aug GW returns)*

Minimization Requirements (to the greatest extent feasible):

- Desktop Optimization
- Water Releases and Returns
- Additional Conservation Measures (Including more stringent outside water use restrictions)

***Permittees may avoid Minimization through:**

1. **Data refinement- showing August NGD is less than 25%, or**
2. **By conducting a Site-Specific Fish Community Assessment**

Mitigation

Mitigation Standard:

- "commensurate with impact", defined as:
  - volume of increase over baseline
  - does the increase cause a category change?
- considers cost and efficacy

Baseline is the largest of the following:

- 2003 – 2005 water use + 5%
- 2005 water use +5 %
- the community's registered volume
- Must be in compliance with volume authorized in 2005

Permit Tiers		Mitigation Requirements
Tier 1 = No increase above baseline	→	no mitigation
Tier 2 = Increase but no category change	→	commensurate mitigation
Tier 3 = Increase and category change	→	commensurate mitigation (2:1 if indirect mitigation) show no feasible alternative

Direct Mitigation

Can be volumetrically calculated

Eligible Activities:

1. Infiltration and inflow improvements
2. Stormwater recharge (directly connected impervious area redevelop to recharge)
3. Surface water releases

Indirect Mitigation Activities

Qualitative Credit System

- Install & maintain fishway
- Culvert replacements meeting crossing standards
- Stream restoration
- Private well bylaw
- Stormwater utility, bylaw with recharge or implement MS4*

*must result in increased recharge to get credit

- Acquire property in Zone I or II, or for other resource protection
- Infiltration/Inflow removal program
- Remove dam

Mitigation Plan Development

Action hierarchy

1st: Demand Management to stay below baseline

2nd: Direct/quantifiable mitigation

3rd: Indirect/non-quantifiable mitigation

Location hierarchy (where a choice exists)

1st: same subbasin as withdrawals (considering water quality)

2nd upstream from the subbasin of withdrawals (considering water quality)

3rd: same major basin as withdrawals

4th: different major basin

Take cost and feasibility into account

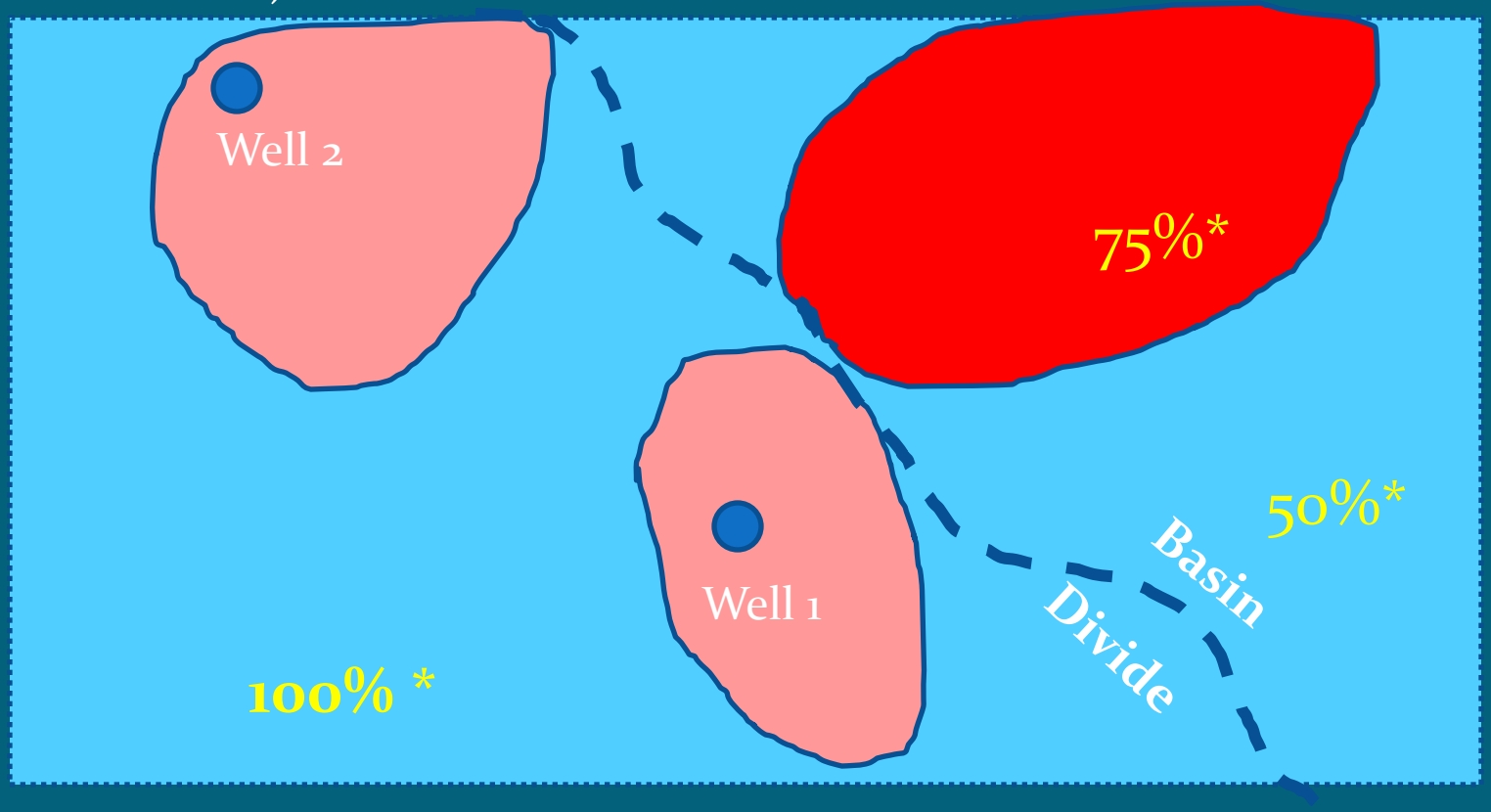
Mitigation Plan Timing

- Mitigation Plan is a live document
- Must be submitted at start of permit, can be phased-in based on use
- Retroactive credits (since 2005) considered if activity/benefit still in effect
- Volumes over Baseline must be mitigated prior to withdrawal (with allowances if withdrawals are already over baseline)

Mitigation Adjustments

Withdrawal location(s) and wastewater returns may result in adjustments in mitigation volumes and credits

- Wastewater Adjustment (* also adjusted by consumptive use factor)
- Location Adjustment Factor



Nashua Basin Specifics

- Who withdraws & how much?
- What are my water use restriction triggers?
- Who needs to minimize?
- Who has Cold Water Fishery Resources?
- What is my baseline?
- Do I need to mitigate? Projected Tier?
- What mitigation options exist?

Community-Specific One-Page Summary Sheet

Includes 6 summary tables:

1) Reported Use 2011-15
2) Performance Standards
3) WNF Scenarios
4) Permit Data
5) Subbasin Data
6) Streamflow Triggers

example

Permit Requirements*	
CFR Consult?	Yes/no
Minimization required?	Yes/no
Estimated renewal request in mgd	1.47
Baseline (BL) in mgd	1.54
Projected increase above BL in mgd	-0.07
Estimated Permit Tier	1
Mitigation Required?	no

*includes comments to explain data sources and decisions

Total Nashua Water Use

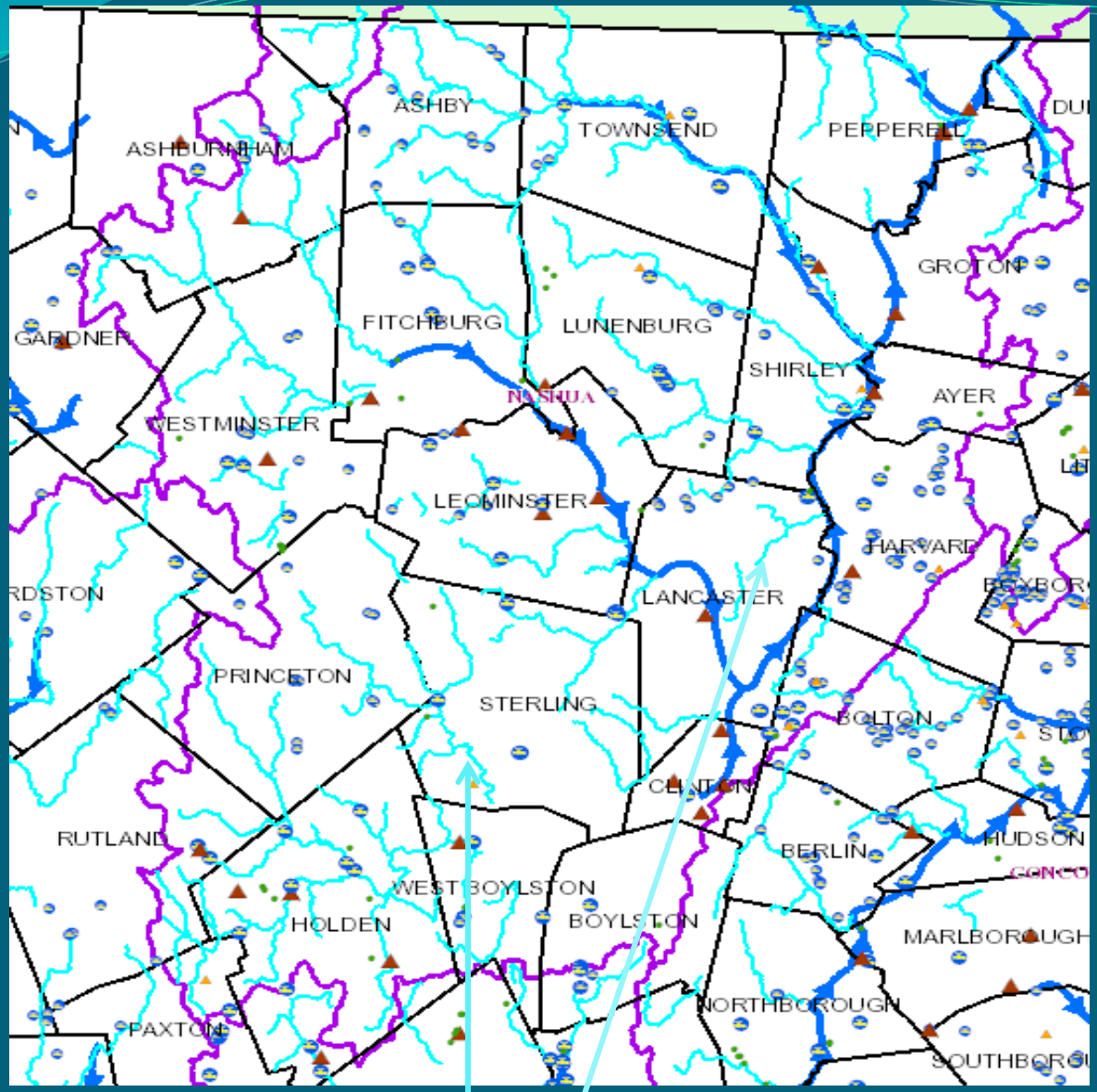
Use Type	Registered Users	Permitted Users	Registered Volumes (mgd)*	Permitted Volumes (mgd)*
PWS	19	14	156.93	12.3
INDUST	6	2	9.78	1.2
GOLF	6	1	0.461	0.086
WMAOTH	1	0	0.143	0
COMM	0	1	0	0.15
AGRI	4	0	0.141	0
Total	36	18	167.46	13.74

* Withdrawal volume calculated based on 365 days

Permitted Nashua Users

Name	Registration Volume (mgd)	Current Permit Volume (mgd)	Total Authorized Volume (mgd)
Ayer DPW Water Division	0.82	0.5	1.32
Boylston Water District	0.19	0.11	0.3
Groton Water Department	NA	0.3	0.3
Holden Water Department	1.15	0.3	1.45
Lunenburg Water District	0.29	0.25	0.54
Massachusetts Development Finance Center	1.35	3.45	4.8
MCI Shirley II	0	0.54	0.54
Pepperell Water Department	0.74	0.56	1.3
Rutland Water Department	0.26	0.11	0.37
Shirley Water District	NA	0.31	0.31
Sterling Water Works	0.4	0.23	0.63
Townsend Water Department	0.76	0	0.76
West Groton Water District	0.27	0	0.27
Worcester DPW	9.85	5.43	15.28
Epic Enterprises Inc	0	0.15	0.15
International Inc	0.2	0.15	0.35
Munksjo Paper Inc	0	1.08	1.08
LGA LLC	0	0.12	0.12

Nashua Fishery Resources



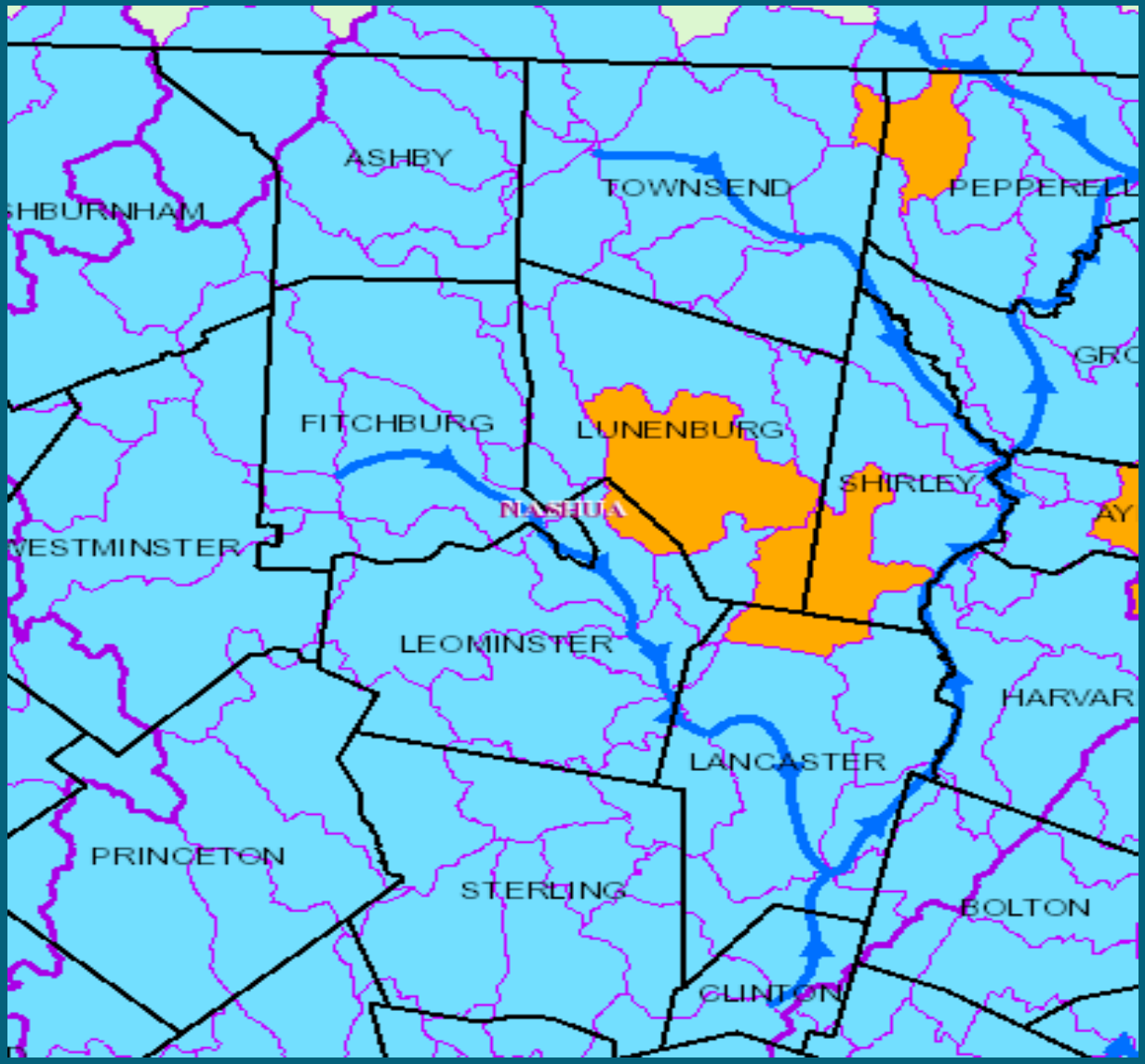
CFRs are light blue

CFRs are considered a particularly sensitive receptor warranting protection.

CFR Present near Permitted Source(s)	
Boylston	Sterling
Groton	Townsend
Holden	West Groton
Lunenburg	Worcester
Pepperell	International Inc .*
Rutland*	MassDevelopment*
Shirley	

*CFR Consultations not required

Nashua Minimization Requirements



Permits Requiring Minimization
Ayer (in Merrimack)
Groton (in Merrimack)
Lunenburg
Pepperell
Shirley
Epic Enterprises Inc

Nashua Baseline Volumes

Nashua Basin PWS	Baseline Volume (mgd)	Reported Pumping 2013 (mgd)	Reported Pumping 2014 (mgd)	Reported Pumping 2015 (mgd)
Ayer DPW Water Division*	0.82	0.65	0.76	0.89
Boylston Water District*	0.3	0.28	0.26	0.25
Groton Water Department*	0	0	0	0
Holden Water Department	0.9	1.02	0.98	0.89
Lunenburg Water District	0.5	0.44	0.45	0.51
Massachusetts Development Finance Agency	0.45	0.82	0.82	1.08
Pepperell Water Department	0.83	0.69	0.69	0.66
Rutland Water Department	0.37	0.36	0.41	0.33
MCI Shirley	0.36	0.29	0.33	0.19
Shirley Water District	0.31	0.34	0.38	0.41
Sterling Water Works	0.63	0.62	0.57	0.54
Townsend Water Department	0.76	0.55	0.53	0.58
West Groton Water District	0.27	0.19	0.19	0.2
Worcester DPW**	9.85	9.86	10.8	13.65
Epic Enterprises Inc	0.13	0.16	0.15	0.16
International Inc	0.35	0.19	0.35	NR
Munksjo Paper Inc	1.07	0	0	0
LGA LLC	0.03	0	0	0

* Nashua Basin Only

** Normal Variation calculated as 13.74 mgd

Nashua Nonessential Water Use Triggers

Trigger Location	May- June Trigger Value (cfs)	July – Sept. Trigger Value (cfs)	7 Day Low Flow Trigger Value (cfs)	Permittees assigned
Squannacook River near West Groton	62	24	11	Ayer, Groton, West Groton, Lunenburg, Pepperell, Shirley, MCI- Shirley, Townsend, Epic , International, Munksjo Papers, LGA LLC
Stillwater River near Sterling	26	10	1.8	Boylston, Sterling
Quinapoxet River	44	21	3.5	Holden, Rutland, Worcester

Online SWMI Interactive Maps

- GIS map provides an interactive graphic display that includes:
  - GWC & BC
  - August Net groundwater depletion
  - Water use points
  - Cold Water Fishery Resources
  - Aquifers and more

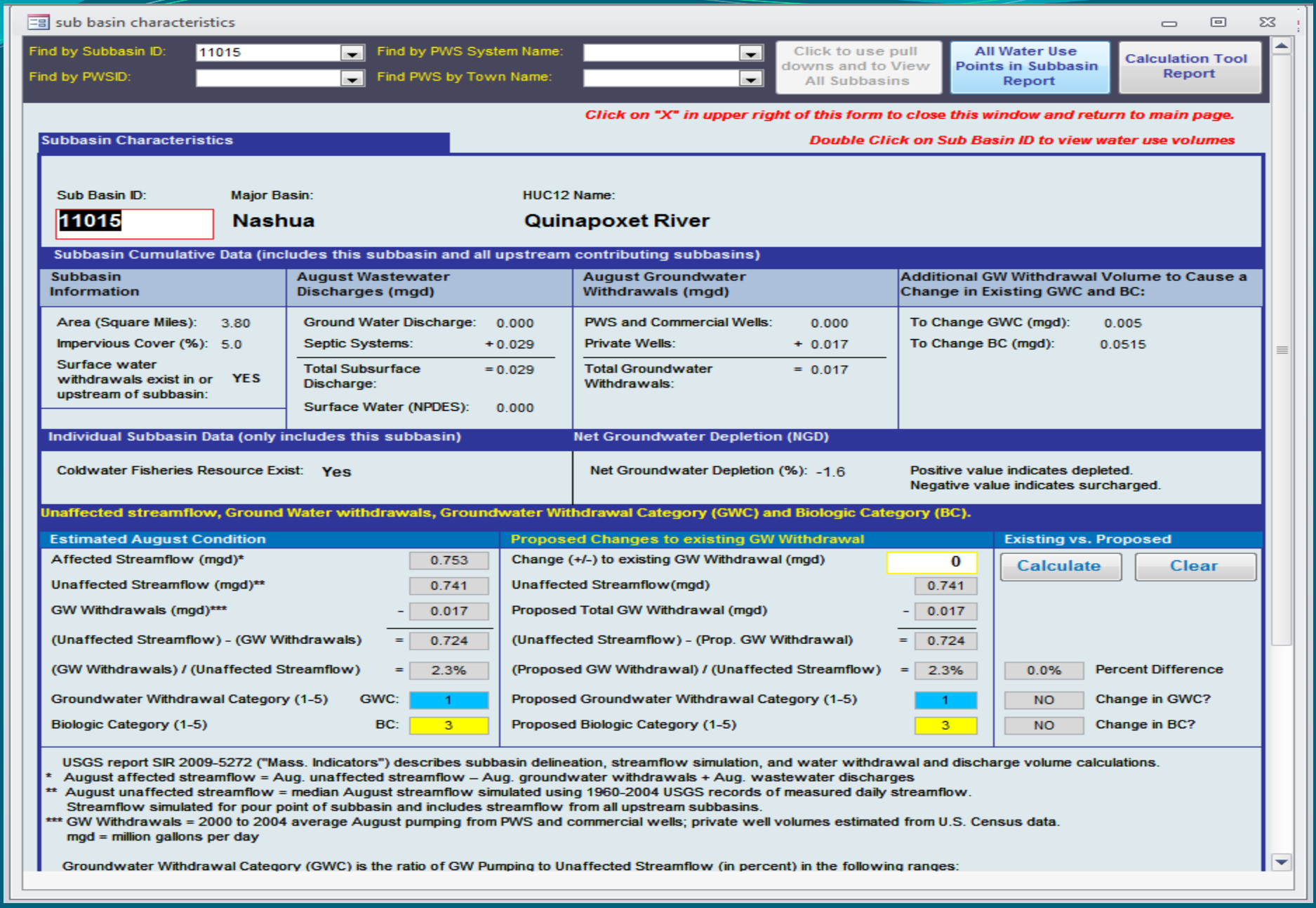
- Map is at

http://www.mass.gov/eea/agencies/massdep/water/watersheds/sustainable-water-management-initiative-swmi.html

MassDEP Permitting Tool

- Displays data and equations to determine BC, GWC, August NGD for 1400 subbasins.
- User may increase or decrease water use and see resulting change in above values.
- Two main views:
  - PWS information includes: recent usage, baseline volumes, projected usage, sources, and other users
  - Subbasin information includes: cumulative area, % of impervious cover, streamflow values, etc.

MassDEP Permitting Tool



Summary Info for Nashua Permits

Nashua Permits	Current Total Allocation (MGD)	DCR 65/10 +5% Buffer Forecast for 2034 (MGD)	Potential Allocated Volume (MGD)
Ayer DPW Water Division	1.32*	Interim Allocation	1.32*
Boylston Water District	0.30*	0.44 (two basins)	0.30
Groton Water Department	0.30*	0.57 (two basins)	0.30
Holden Water Department	1.45	Interim Allocation	1.45
Lunenburg Water District	0.54	0.59	0.59
Massachusetts Development Finance Agency	4.8	NA	TBD
Pepperell Water Department	1.3	0.94	0.94
Rutland Water Department	0.37	Interim Allocation	0.37
MCI Shirley	0.54	NA	0.54
Shirley Water District	0.31	Interim Allocation	0.31
Sterling Water Works	0.63	0.72	0.72
Townsend Water Department	0.76	No additional volumes	0.76
West Groton Water District	0.27	No additional volumes	0.27
Worcester DPW	15.28*	25.03 (two basins)	15.28*
Epic Enterprises Inc	0.15	NA	0.15
International Inc	0.35	NA	0.35
Munksjo Paper Inc	1.08	NA	1.08
LGA LLC	0.12	NA	0.12

* Nashua Basin Only

Summary Info for Nashua Permits

Nashua Permits	CFR Present	Minimization required	Projected Permit Tier	Alternative analysis
Ayer DPW Water Division	No	No (Merrimack)	2	No
Boylston Water District	Yes	No (Blackstone)	1	No
Groton Water Department	Yes	No (Merrimack)	3	No
Holden Water Department	Yes	No	3	Yes
Lunenburg Water District	Yes	Yes	2	No
Massachusetts Development Finance Agency	No	No	3	Yes
Pepperell Water Department	Yes	No	2	No
Rutland Water Department	No	No	1	No
MCI Shirley	No	No	2	No
Shirley Water District	Yes	Yes	2	No
Sterling Water Works	Yes	No	1 or 3	?
Townsend Water Department	Yes	No	1	No
West Groton Water District	Yes	No	1	No
Worcester DPW	Yes	No	2	No
Epic Enterprises Inc	No	Yes	3	Yes
International Inc	No	No	1	No
Munksjo Paper Inc	No	No	1	No
LGA LLC	No	No	TBD	TBD

Nashua Permit Reviews

Nashua Permit Holder	DCR Reviewer
Ayer	Drury
Boylston	Drury
Groton	Drury
Holden	McCrory
Lunenburg	McCrory
Mass Development Center	-
Pepperell	Drury
Rutland	Graham
MCI Shirley	-
Shirley	Graham
Sterling	Cohen
Townsend	No Volumes
West Groton	No Volumes
Worcester	Drury
Epic Enterprises	-
International Inc	-
Munksjo Paper Inc	-
LGA LLC	-

DEP Reviewer

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DCR Reviewers

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WMA Regulations and Permit Assistance

- Regulation (Promulgated November 7, 2014) and Policy Development (Ongoing)
- Permit application forms and worksheets
- Financial assistance (Annual Grant Program)
  - Eligible planning projects:
    - Optimization
    - Outdoor water use restrictions
    - Implementation of reasonable water conservation
      - NEWWA and MWWA Toolbox of BMPs
  - Eligible implementation projects:
    - Demand management (water audits, soil moisture sensors etc..)
    - Mitigation projects designed to improve flow impacts

      ex. dam removal, culvert replacement, etc.

Further information

- MassDEP Technical Resources webpage at:
  http://www.mass.gov/eea/waste-mgnt-recycling/water-resources/preserving-water-resources/sustainable-water-management/

- MassDEP SWMI webpage at:
  http://www.mass.gov/dep/water/resources/swmi.htm

- Massachusetts Sustainable Water Management Initiative (SWMI), Framework Summary, November 28, 2012 at :
  http://www.mass.gov/eea/docs/eea/water/swmi-framework-nov-2012.pdf

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