



Water Management Act and the Sustainable Water Management Initiative

March 1, 2014
MACC Annual Meeting
Holy Cross College, Worcester, MA



Presentation Outline

- SWMI Timeline
- Summary of SWMI Science and Policy
- Pilots- what we learned
- Post-SWMI permit requirements- what's new
- Grants
- Maps/database and other resources
- Permit renewals- schedule and process



SWMI Timeline

Timeframe	Accomplishment
2007 to 2011	USGS Studies
January 2010 to February 2012	SWMI Process: 15 Advisory Committee Meetings 18 Technical Committee Meetings Numerous Work Group Meetings
November 2012	SWMI Framework released
May 2012 to February 2013	SWMI Pilots
January to June 2013	SWMI Grants, round 1 completed
Ongoing	Deliberations with stakeholder representatives
December 5, 2013	Update for SWMI Advisory Committee
January 2014	SWMI Grants, Round 2 awarded
Ongoing since March 2013	Regulation and Guidance development



SWMI Components and Achievements

- Safe Yield
- Streamflow Criteria based on Science
- Permitting
 - Balance human and environmental need
 - Establish up front permit rules and conditions
 - Minimize use and mitigate commensurate with impact where applicable
- Allow Economic Growth and Sustainable Long-term Water Use



Science and Policy Informing SWMI

- USGS Studies: August withdrawals and impervious cover have significant impact on fluvial fish
- Advisory and Technical Committees helped us develop policy from science
- Categories 1-5 (1=least impact, 5 = most impact)
 - Use fluvial fish as surrogate for healthy aquatic habitat
 - Biological Category (BC), includes impervious cover
 - Groundwater Withdrawal Category (GWC), compares withdrawals to simulated unimpacted August flow
 - Streamflow Criteria mark the boundaries between categories (310 CMR 36.14)

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

Legend

Major Basins

ds451_MWI BC 2013

BC Percent Alteration

No data

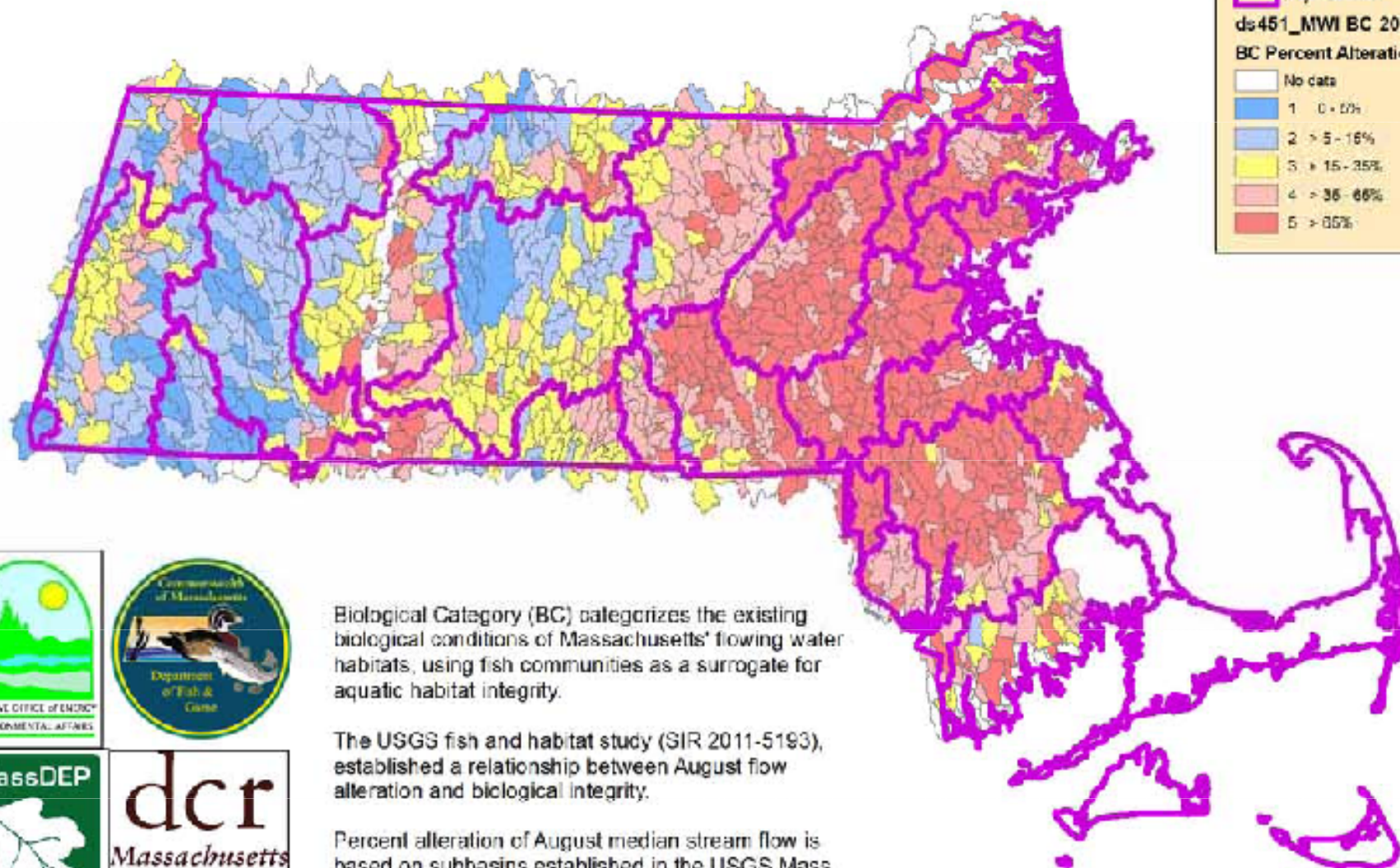
1 0 - 5%

2 > 5 - 15%

3 > 15 - 35%

4 > 35 - 65%

5 > 65%



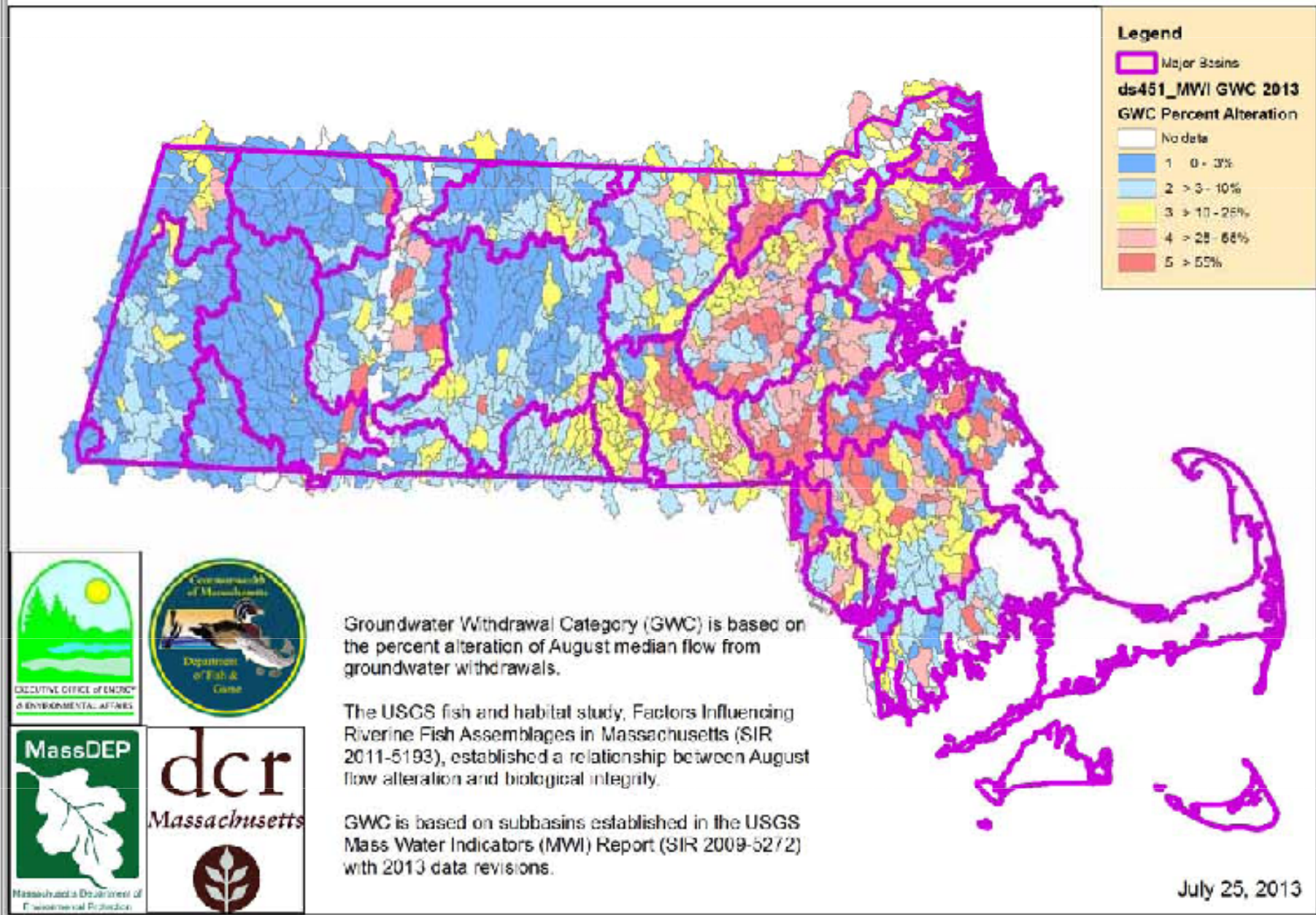
Biological Category (BC) categorizes the existing biological conditions of Massachusetts' flowing water habitats, using fish communities as a surrogate for aquatic habitat integrity.

The USGS fish and habitat study (SIR 2011-5193), established a relationship between August flow alteration and biological integrity.

Percent alteration of August median stream flow is based on subbasins established in the USGS Mass Water Indicators (MWI) Report (SIR 2009-5272) with 2013 data revisions.

July 25, 2013

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





SWMI Pilots and What Did We Learn?

Road Tested the SWMI Framework (May – Dec. 2012)

1. Amherst (site specific study)
2. Danvers-Middleton
3. Dedham-Westwood
4. Shrewsbury (mock consult)

Need more guidance on:

- Minimization requirements
- Mitigation
 - Quantifying mitigation
 - Credits for past/on-going measures
 - Timing of mitigation
 - Evaluating cost and feasibility

Safe Yield and Environmental Protection

Major Basin
Scale

WMA Safe Yield =

55% of Drought Basin Yield + Reservoir Storage

Potentially
Allocatable
Water

**Safe Yield Drought
Protection =**

Remaining 45% of Drought Basin
Yield

+

Subbasin
Scale

Seasonal
Flow

Streamflow Criteria



Permit Conditions Summary

- Standard Conditions for all permitted groundwater and surface water withdrawals
- New: CFR Consult for withdrawals in subbasins with Coldwater Fishery Resources (CFRs)
- New: Minimization for groundwater withdrawals in “ $\geq 25\%$ August Net Groundwater Depleted” Subbasins
- New: Mitigation commensurate with impact, for requests above baseline, in consultation with agencies

WMA Standard Permit Conditions

Conservation Requirements

1. 65 residential gallons per capita day (RGPCD)
2. 10% unaccounted-for-water (UAW)
3. BMPs (leak detection & repair, metering etc.)
4. Seasonal limits on nonessential outdoor water use
(New: low flow trigger, everyone goes to 1 day)

Nonessential Outdoor Water Use Restrictions

- Restrictions do not apply to essential use
- Alternative plan for Cape and Islands
- Choose:
 - Calendar- May 1-Sept
 - Streamflow- ABF
- 2 days max if above 65 rgpcd
- New low flow trigger- 1 day for everyone



Coldwater Fishery Resource (CFR) Consult



- DFW will screen subbasins for potential impacts to CFRs
- Basin Meeting serves as preliminary consult
- Goal- identify ways to reduce impacts through optimization



Minimization


Minimization is required in subbasins defined as having an August net groundwater depletions of 25% or more using Mass Water Indicators (MWI)* data.

August unaffected flow – Aug groundwater withdrawals + Aug groundwater returns

Minimization Components (to the extent feasible):

- Additional Conservation Measures
- Desktop Optimization
- Water Releases and Returns

* MWI data is based on estimated and reported withdrawals and returns for the years 2000-2004



Minimization- Additional Reasonable Conservation

- Adopt reasonable and cost-effective water conservation measures that go beyond the Standard Conditions
- Guidance provides 18 additional measures to choose from
- Outdoor use:
 - if above 65, 1 day
 - if below 65, 2 days
 - or propose equivalent action



Minimization- Desktop Optimization

Compare and screen subbasins with groundwater sources

1. Is a Coldwater Fishery Resource present?
2. Change in category if pumping shifted?
3. How much water is available (considering withdrawals and returns)?
4. What is the GWC percentage?
(withdrawals/unaffected flow)
5. Other sensitive receptors?

Compare groundwater to surface water sources

6. Is there a surface water supply? With a release plan?



Tier Determination for Mitigation

- 3 Permit Tiers define mitigation requirements
- “Impact” quantified as increase over baseline and if increase causes a category change (i.e. backsliding)

Tier 1: no increase above baseline

Tier 2: increase above baseline
but no change in BC or GWC

Tier 3: increase above baseline AND change in BC or GWC

Baseline is based on the largest of either:

- 2003 – 2005 water use + 5%
- 2005 water use + 5 %
- the community’s registered volume
- Volume must be in compliance

- change in BC or GWC is evaluated for August unless withdrawals are greater during other periods
- Cumulative Assessment

Permit Requirements (new in green)		Applicability of Requirements	
Surface water sources only mitigation		Tier 1	Tier 2
a. Commensurate Mitigation (surface water release preferred if possible)		Not required	Yes, required for all
b. Summer Management Plan with environmental considerations (such as evaluating releases, fisheries management plan, or consideration of an alternative approach for watering restrictions) in these plans.		Required if don't want standard outdoor limits	
Groundwater Sources Mitigation	Tier 1	Tier 2	Tier 3
a. Commensurate Mitigation	Not required	Yes, required for all	Yes, required for all (up to 2x indirect)
b. No feasible alternative source	Not required	Not required	Yes, required for all

Mitigation- Plans

Retroactive mitigation credits for activities completed and still in effect

Action hierarchy

- 1st: Demand Management to keep volumes 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: same major basin as withdrawals
- 3rd: different major basin

Mitigation Plan Timelines

- Mitigation Plan must be submitted at start of permit period
- Timeline may phase implementation of mitigation
- Any volumes withdrawn over Baseline must be mitigated prior to when those volumes are withdrawn
- DEP will make reasonable allowances if withdrawals are already over baseline

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

- Remove dam/flow barrier
- Culvert replacements meeting crossing standards
- Stream bank/channel/buffer restoration
- Install & maintain fish ladder
- Acquire property in Zone I or II, or for other resource protection
- Stormwater bylaw with recharge requirements
- Stormwater utility *
- Implement MS4 ^{4*}
- Infiltration/Inflow removal program
- Private Well Bylaw

*must result in increase recharge to get credit



Mitigation Cost Feasibility

- Designed for applicants who are concerned that their mitigation plan is cost prohibitive.
- Applicant may submit a comprehensive budget along with their mitigation plan.
 - estimated operating costs
 - estimated capital improvement costs
- MassDEP will review the mitigation plan and budget with the applicant.
- Cost feasibility assessments will be based on impacts to rates, both year over year and over the 20-year permit period.



SWMI Assistance: Grants

- Money (state capital fund) available for 5 years (2012-2016).
- Designed to assist WMA permit holders with proposed SWMI minimization and mitigation requirements.
- Particular consideration was given to projects in highly impacted basins or subbasins, or areas with coldwater fish resources.
- 2012 Requirements:
 - Applicants must have a valid WMA permit
 - 20% financial match for implementation projects



Grant Summary Results

- MassDEP received 27 proposals for FFY12 requesting \$2.62 million dollars.
- 10 projects were funded, worth a total of \$858,250.
- MassDEP received 26 proposals for FFY13 requesting \$2.3 million dollars.
- 17 projects were recently funded, worth a total of \$1.08 million dollars

SWMI Grant Projects

Projects funded include: Fishway improvements; Optimization and recharge analyses; Developing supply management protocols; Feasibility cost/benefit analysis of minimization, mitigation, and offsets; Dam removal feasibility; Water reuse; Stormwater, wastewater/recharge analysis; Water Audits



Stormwater Recharge



Dam Removal Feasibility



Grant Lessons Learned

- Permittees are anticipating and planning for increased future water needs.
- Mitigation and minimization options are available to most if not all Permittees.
- Permittees will need considerable lead time to plan for and implement mitigation and minimization options.
- Significant water savings are available thru demand management practices.

DEP Permitting Tool

Find by Subbasin ID: Find by PWS System Name:
Find by PWSID: Find PWS by Town Name:

Click to use pull
downs and to View
All Subbasins

All Water Use
Points in Subbasin
Report

Calculation Tool
Report

Click on "X" in upper right of this form to close this window and return to main page.

Double Click on Sub Basin ID to view USGS Water Volumes Use Form

Subbasin Characteristics

Sub Basin ID: **22019** Major Basin: **South Coastal** HUC12 Name: **Indian Head River-Indian Head Brook to mouth**

Subbasin Cumulative Data (includes this subbasin and all upstream contributing subbasins)

Subbasin Information	August Wastewater Discharges (mgd)	August Groundwater Withdrawals (mgd)	Additional GW Withdrawal Volume to Cause a Change in Existing GWC and BC:
Area (Square Miles): 14.95 Impervious Cover (%): 12.3 Surface water withdrawals exist in or upstream of subbasin: YES	Ground Water Discharge: 0.000 Septic Systems: 0.602 Surface Water (NPDES): 0.000	PWS and Commercial Wells: 1.264 Private Wells: + 0.049 Total Groundwater Withdrawals: = 1.313	To Change GWC (mgd): 0.421 To Change BC (mgd): 0

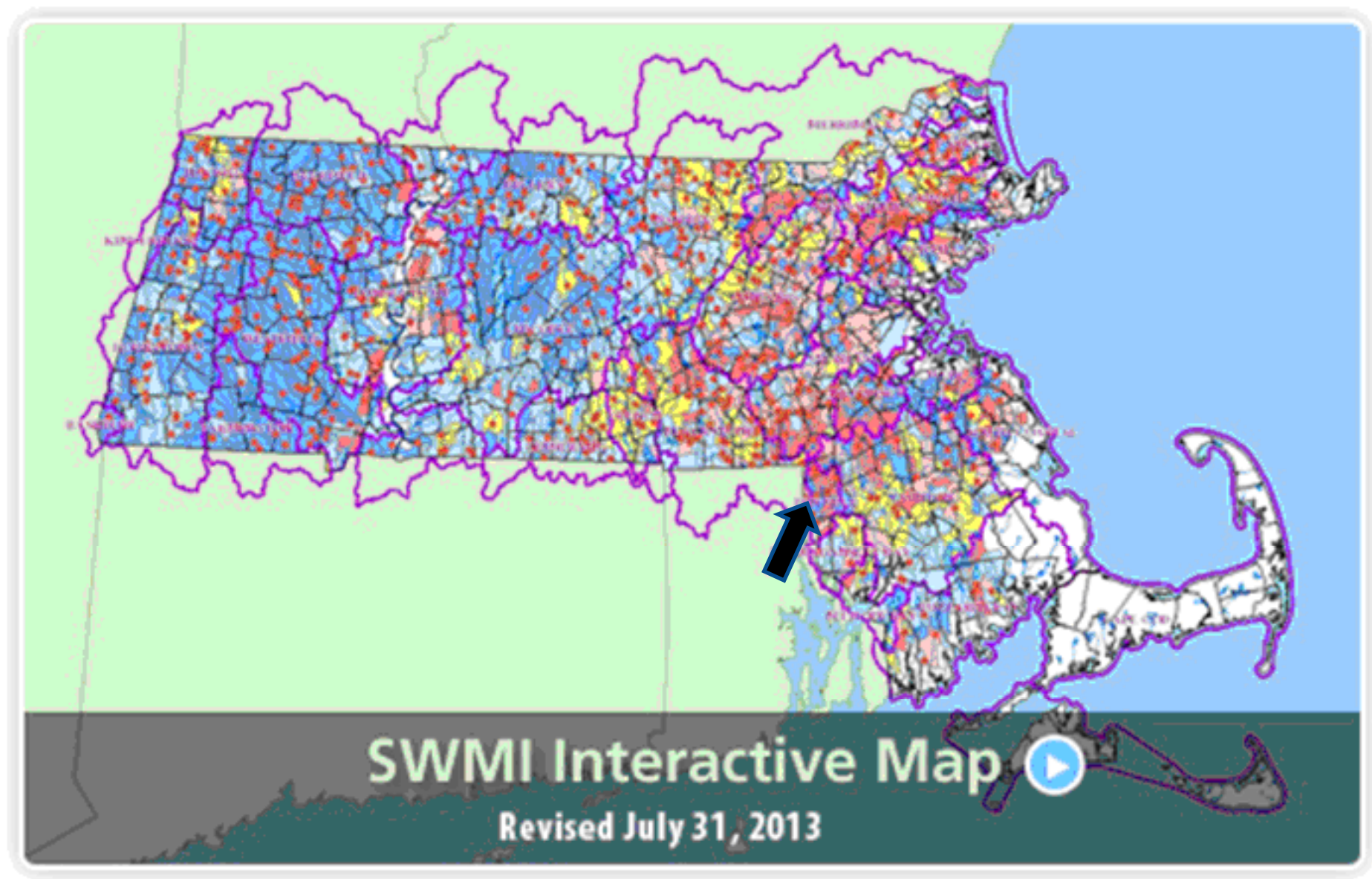
Individual Subbasin Data (only includes this subbasin)

Net Groundwater Depletion (NGD)

Coldwater Fisheries Resource Exist: No	Net Groundwater Depleted (%): 22.6
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Unaffected streamflow, Ground Water withdrawals, Groundwater Withdrawal Category (GWC) and Biologic Category (BC).

Estimated August Condition		Proposed Changes to existing GW Withdrawal		Existing vs. Proposed	
Unaffected Streamflow (mgd)*	3.151	Change (+/-) to existing GW Withdrawal (mgd)	0	Calculate	Clear
GW Withdrawals (mgd)**	- 1.313	Unaffected Streamflow(mgd)	3.151		
(Unaffected Streamflow) - (GW Withdrawals)	= 1.839	Proposed Total GW Withdrawal (mgd)	- 1.313		
(GW Withdrawals) / (Unaffected Streamflow)	= 41.7%	(Unaffected Streamflow) - (Prop. GW Withdrawal)	= 1.839		
Groundwater Withdrawal Category (1-5) GWC:	4	(Proposed GW Withdrawal) / (Unaffected Streamflow)	= 41.7%	0.0%	Percent Difference
Biologic Category (1-5) BC:	5	Proposed Groundwater Withdrawal Category (1-5)	4	NO	Change in GWC?
		Proposed Biologic Category (1-5)	5	NO	Change in BC?



Permit Renewal Process

Months before permit expires	Activity
20 months	Start Basin Planning Process <ul style="list-style-type: none">•Draft water needs forecasts developed,•consultations upon request
16 months	Basin Outreach Meeting
12 months	Permit Filing Deadline <ul style="list-style-type: none">•Public Comment Period•consultations as necessary
9 months	Orders to Complete Issued by DEP
6 months	Response to Orders to Complete Due
3 months	Draft Permit Issued for Comment



What's Next?

- Formal Public Hearings and Comment – March & April 2014
- Outreach on Proposed Regulations – Ongoing
- Final Regulations Promulgated – Summer 2014
- Additional USGS Studies
 - Surface Water
 - Groundwater recharge areas
 - Impervious Cover
- Resume Permitting

River Basin Permitting Dates

1 Year Interim Permits
expected to be issued.

Basins previously permitted to be
adjusted at next 5-Year Review

Water Source	Projected 5- Year Review Issuance
Hudson	November 2015
Blackstone	February 2017
Charles	February 2017
North Coastal	February 2016

* Basins with Permits on File

Water Source	Expiration Date	Outreach Meeting
Cape Cod *	November 2014	January 2015
Ipswich *	Early 2015	March 2015
Boston Harbor * /Taunton *	February 2015	April 2015
Islands *	February 2015	May 2015
Buzzards Bays	May 2015	February 2015
Concord	August 2015	May 2015
South Coastal *	August 2015	October 2014
Ten Mile	November 2015	August 2014
Deerfield	February 2016	November 2014
Housatonic	May 2016	February 2015
Westfield	November 2016	August 2015
Millers	February 2017	November 2015
Chicopee	May 2017	February 2016
Quinebaug	August 2017	May 2016
Connecticut	November 2017	August 2016
Nashua	February 2018	November 2016
French	May 2018	February 2017
Shawsheen	August 2018	May 2017
Merrimack	November 2018	August 2017
Parker	February 2019	November 2017
Narragansett	May 2019	February 2018



Further information

- Massachusetts Sustainable Water Management Initiative (SWMI), Framework Summary, dated November 28, 2012 at :
<http://www.mass.gov/eea/docs/eea/water/swmi-framework-nov-2012.pdf>
- MassDEP webpage at:
<http://www.mass.gov/dep/water/resources/swmi.htm>
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