

SWMI

Sustainable Water Management Initiative

Massachusetts Municipal Association Annual Meeting

January 25, 2013

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

Why does the Commonwealth need SWMI?

- Despite 44 inches of precipitation in an average year, rivers and streams have shown flow impacts from water withdrawals, impervious cover and other factors. Impacts *human* use and enjoyment
- Climate change including more variable precipitation may be our future; need to manage water resources responsibly for the long term
- Disputes between stakeholders over how the state allocates water have led to costly litigation, long delays and lack of certainty in water withdrawal permit decisions.
- By court order, the MassDEP/ Water Management Act Program's "safe yield" issue was remanded back to MassDEP for a redetermination of safe yield.



Key SWMI Components and Achievements

- Safe Yield
- Stream Flow 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
- Pilot Study
 - Test drive SWMI implementation
- Regulation development

Key Considerations

- “Light” requirements when not asking for more water and in basins that are healthy
- Minimization and mitigation are commensurate with impact—fair share principles
- Recognize multiple obligations, and credit mechanism will be in place
- Recognize limits of jurisdiction and practicality
- Many communities are doing what is needed now
- Final regulations will include clarity on scope of obligation and cost impact

Safe Yield

- Establishes a new methodology that determines maximum withdrawal volumes for major basins on an annual basis.

55% of Annual Drought Basin Yield + Reservoir Storage

- Where simulated flow is not available (southeastern MA + Cape and Islands), a separate methodology, namely, a Recharge Method, based on groundwater-dominated drought recharge was developed.
- Safe yield will not affect most communities, as it is in excess of foreseeable demand

USGS Scientific Investigation Reports



USGS SIR 2009-5272

Established major indicators of streamflow alteration in 1400 subbasins and their cumulative water use and discharges



USGS SIR 2011-5193

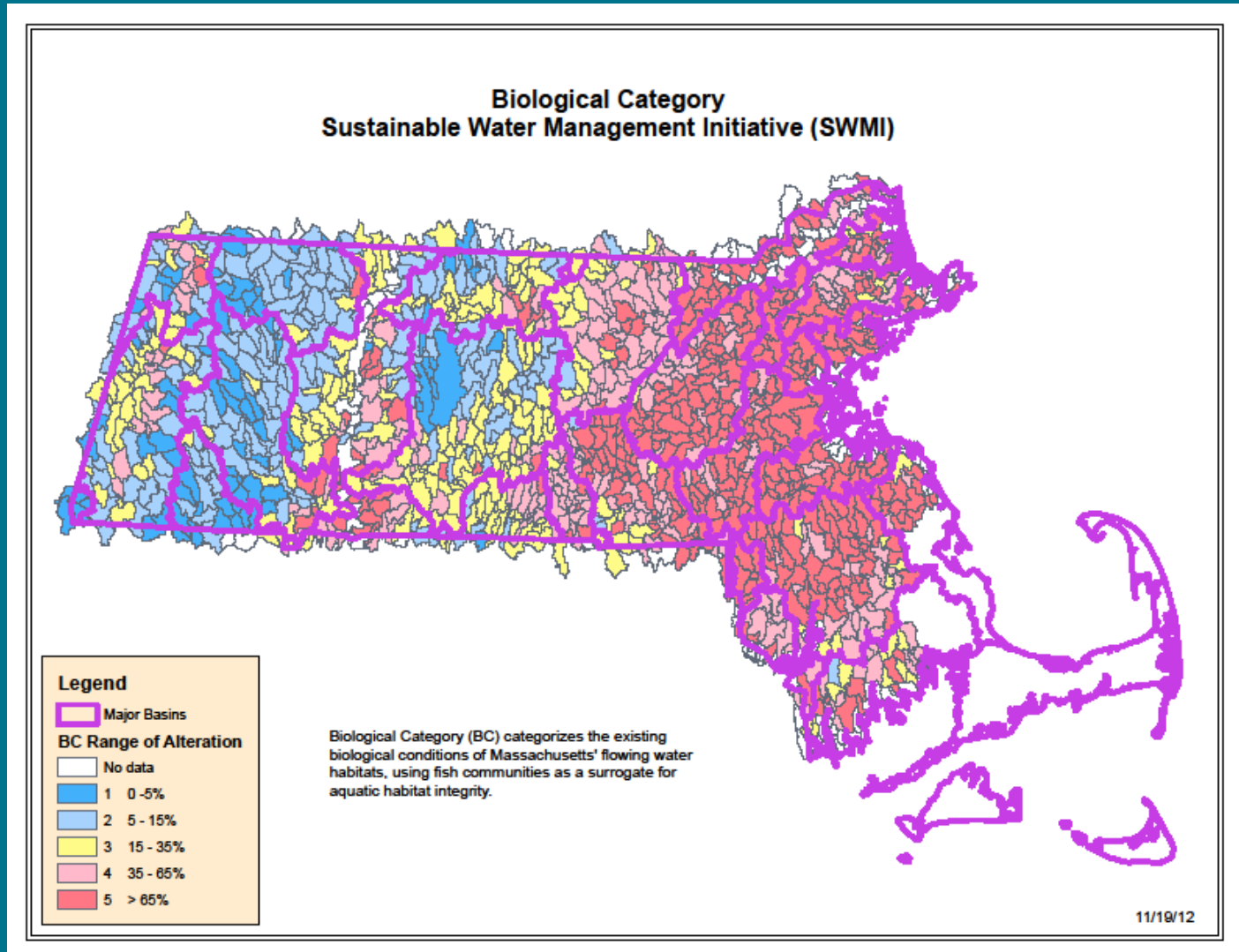
Developed a relationship between fish and human alterations (water use and impervious) and aquatic habitat

The Report findings were then applied to the 1400 subbasins, to characterize current aquatic habitat.

Stream Flow Criteria

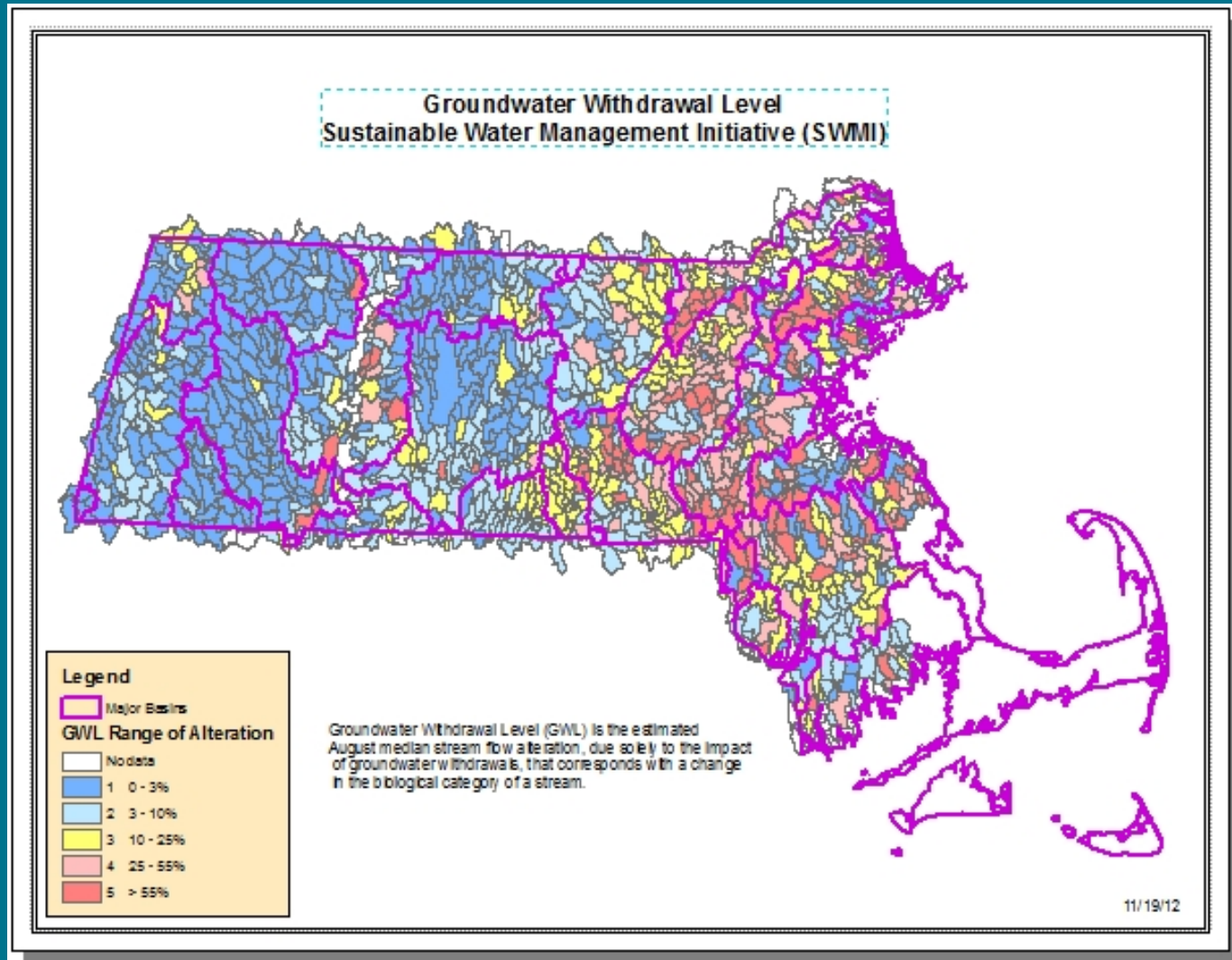
- Biological Categories (BC)
 - Uses fluvial fish as surrogate for healthy aquatic habitat
 - Basin characteristics and effects of impervious cover and groundwater withdrawals are taken into account
- Groundwater Withdrawal Level (GWL)
 - i.e., relationship of groundwater withdrawals and simulated natural streamflow
(does not include surface withdrawals nor wastewater return)
- Coldwater Fishery Resources (CFRs)
 - particular sensitive receptors

Biological Category



Groundwater Withdrawal Level

Seasonal GWL percent alterations were established on a monthly basis. The map below displays August median percent alteration ranges.



Permitting

- Permit Tiers
 - A tiered process for reviewing and evaluating permit applications
 - Establish a baseline volume
- Minimization
 - Minimize existing water withdrawal impacts, where applicable
- Mitigation
 - Mitigate increased withdrawals above baseline, where applicable

Based on the largest of either:

- 2003 – 2005 water use
- 2005 water use
- the community's registered volume

Stream Flow Principles

Groundwater Withdrawal Level

- Water withdrawal is responsible for a portion of the problem; science allows us to pinpoint that portion
- Level of review and requirements vary, based upon
 - Existing aquatic health
 - Minimization of existing withdrawals
 - Mitigate the withdrawal increase above baseline
 - commensurate with impact
 - considers cost and efficacy
- Option for a site-specific study

WMA Standard Permit Conditions

1. Efficiency Requirements
 1. 65 RGPCD
 2. 10% unaccounted-for-water
 3. BMPS (leak detection & repair, metering etc.)
2. **Seasonal limits on nonessential outdoor water use**
3. **Water withdrawal increases that exceed baseline**

Permit Tiers

Groundwater
withdrawals only

Permit Review Tier	Review Thresholds	Resource Conditions & Agency Consultation	Seasonal GWL Withdrawal Levels 4 & 5
Tier 1	No additional withdrawal request above baseline	If CFR in GWL 4&5, conduct desktop pumping evaluation	Implement feasible minimization
Tier 2	Additional withdrawal request above baseline	If CFR in BC 1,2 or 3, evaluate and implement feasible mitigation	Minimize, mitigate and Consult with feasible alternative analysis for large requests
Tier 3	Additional withdrawal request above baseline AND GWL or BC change	Special Condition: Demonstrate no feasible alternative, minimize and mitigate commensurate with impact	

No change
in
BC or GWL

If backsliding
is proposed

All permits require Standard Conditions for all surface and groundwater withdrawals, including 65 rgpcd, 10% UAW , water use restrictions, and standard conservation BMPs.

Minimization Proposal

- Develop a Minimization Plan
 - Optimization of existing sources
 - Consideration of releases from surface water impoundments, if applicable
 - More stringent outdoor water use restrictions
 - Implementation of reasonable conservation measures
 - Implementation of NEWWA's Toolbox
 - Other measures to improve streamflow

Mitigation Proposal

Action hierarchy

1. Demand Management
2. Direct/ quantifiable
3. Indirect / non-quantifiable

Take cost
and
feasibility

into account

*Commensurate
with Impact*

• Develop a Mitigation Plan

- **Demand Management** (ex. adopt conservation water rates, provide water saving devices, increase billing frequency, etc.)
- Water supply protection improvement (ex. land acquisition)
- Wastewater return (ex. Additional septic system returns)
- In-stream flow improvements (reservoir water release)
- Aquatic habitat (ex. maintain fish ladder)
- Stormwater / impervious cover (ex. LID)

Site-Specific Study

- Consultation to scope effort
- Streamflow assessment and analysis
 - Actual observed flow compared to modeled flow for flow alteration determination
 - Establishment of flow criteria (relative to the site specific data)
 - Costs and time considerations
- Report findings
- Water use restriction consideration
- Develop site-specific mitigation commensurate with impact

SWMI Pilot Study

- How did we pick the pilot water supply communities?
- Road test the SWMI framework
- Mock consultation / review of presenting circumstances
 - Review of water withdrawal sources
 - Evaluate water withdrawal request
 - Review BC, GWL and CFR
 - Itemize Minimization and Mitigation
- Site-Specific Study (Amherst and Shrewsbury)
 - Site selection
 - Project scope
- Review data

PWS: Public Water Supply

Pilot PWS systems:
Amherst
Danvers-Middleton
Dedham-Westwood
Shrewsbury

What did we learn from the Pilots

- Preliminary information tells us ...
 - Outreach/education is needed
 - PWS specific data is likely relevant and necessary
 - Quantifying mitigation credits needs more guidance
 - Timing of mitigation measures needs clarification
 - Cost concerns
- Mock consultation
 - Preparation time by all participants is needed
 - A PWS consultant should be engaged and present
 - Multiple consultation meetings are likely
- Site-Specific Study Option
 - Objectives need more clarification
 - Mitigation requirements needs more clarification
 - Cost and time concerns

vs.

SWMI Data Check Option

1. Check withdrawal volumes
2. Compare distribution volumes
3. Submit findings

SWMI Implementation

- Regulation and Policy Development (in progress)
- Permit application forms and worksheets (in progress)
- Financial assistance (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
 - Mitigation projects designed to improve flow impacts
ex. dam removal, culvert replacement, etc.

SWMI, Next Steps

2010 ...	2012 ...	SWMI Framework
		Pilot Study
		SWMI grant program for WMA permittees
2013 ...		Regulation development + more USGS studies
2014 ...		Proposed Permit Schedule:
		South Coastal , Cape Cod, Charles, Blackstone
		Hudson, North Coastal
2015...		Boston Harbor, Taunton, Ipswich, Islands
		Buzzards Bay, Concord , Ten Mile
2016...		Deerfield, Housatonic, Farmington, Westfield
2017...		Millers, Chicopee, Quinebaug, Connecticut
2018...		Nashua, French, Shawsheen, Merrimack,
2019...		Parker, Narragansett

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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