SUSTAINABLE WATER MANAGEMENT INITIATIVE

The Framework

Presented to the
MA Water Resources Commission
December 13, 2012

Presentation Outline

- SWMI Key Components
  - Safe Yield
  - Stream Flow Criteria
  - Baseline
- SWMI Application to Water Management Act Permitting
  - Permitting for Groundwater
  - Permitting for Surface Water
  - Mitigation
- SWMI Next Steps
  - Pilots
  - Funding
  - Research
  - Regulations

Safe Yield

Massachusetts G.L. c. 21G, § 2.

"the maximum dependable withdrawals that can be made continuously from a water source including ground or surface water during a period of years in which the probable driest period or period of greatest water deficiency is likely to occur; provided, however, that such dependability is relative and is a function of storage and drought probability."

Safe Yield is calculated as 55% of the Drought Basin Yield (annual Q90) plus Reservoir Storage Volumes

From Science to Streamflow Criteria

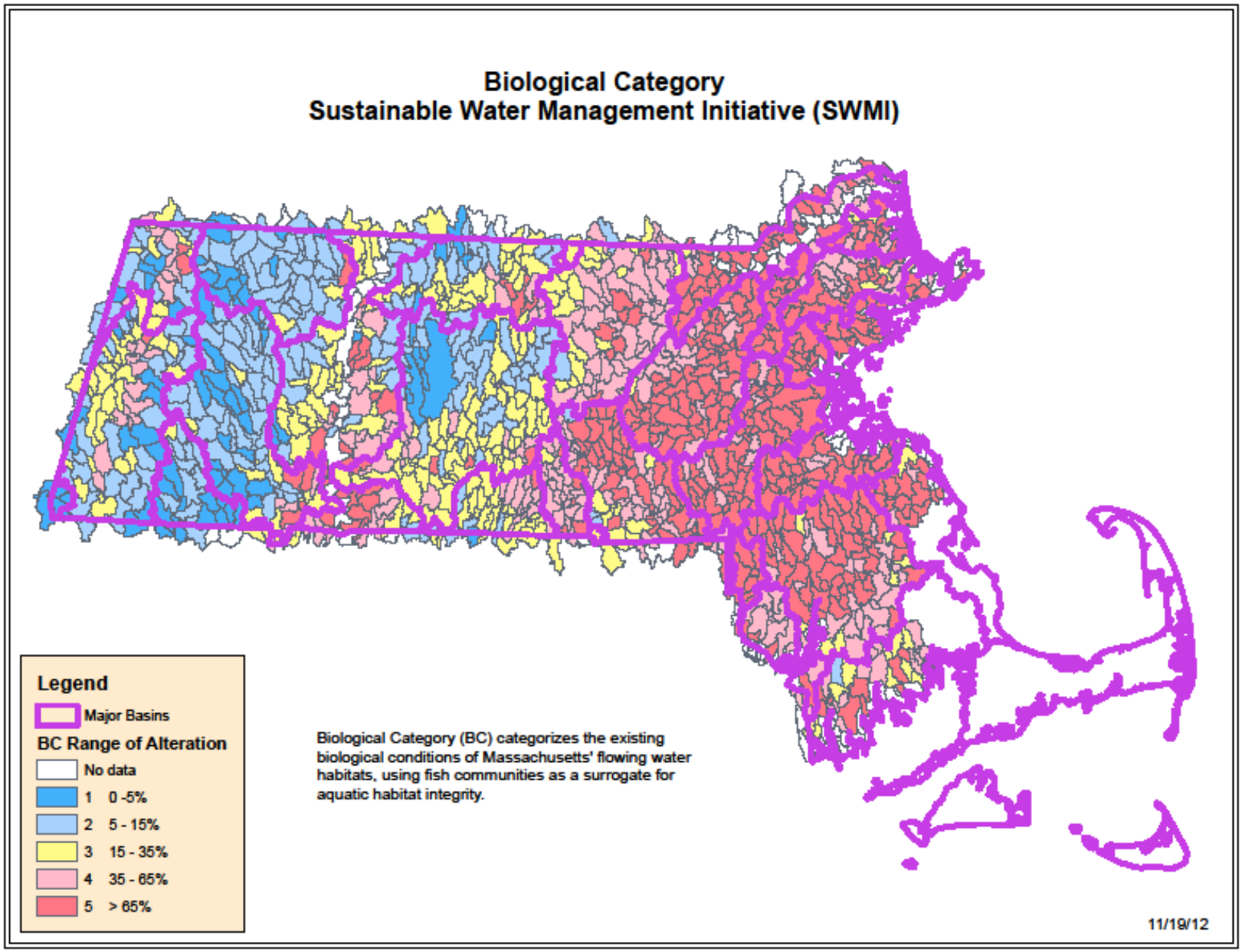
- USGS Study (Armstrong et al, 2011)
  - Found relationship between relative abundance of fluvial fish and groundwater withdrawals/impervious cover

- Calculated % loss of relative abundance of fluvial fish using:
  - Actual conditions
  - Simulated unimpacted conditions (defined as no withdrawals, 1% impervious cover)

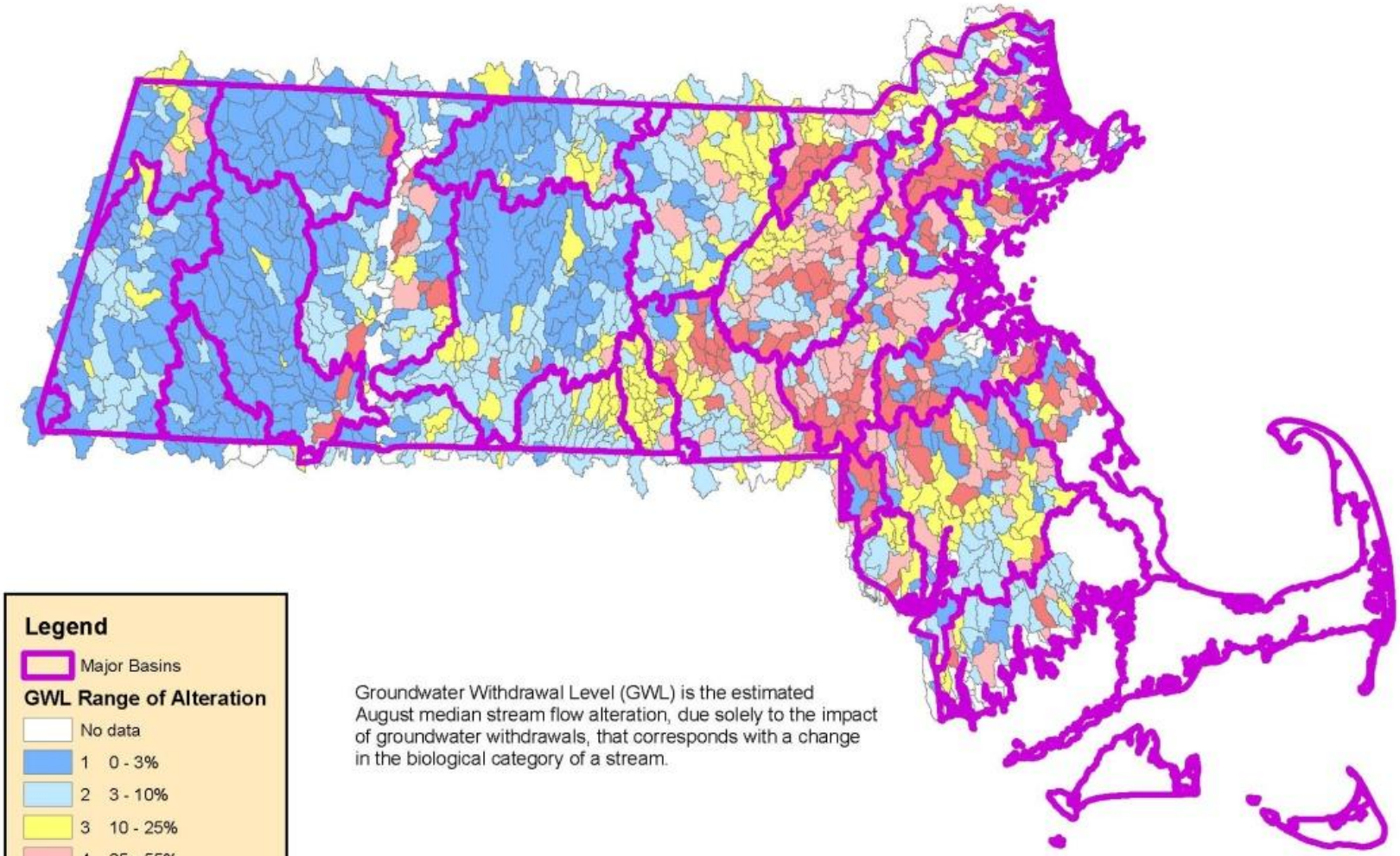
From Science to Streamflow Criteria (cont)

- Categorized fisheries based on estimated loss of fluvial fish
  - Bio Cat 1 (least impacted, loss of up to 5%)
  - Bio Cat 5 (severely degraded, loss of 65% or more)

- Developed Groundwater Withdrawal Levels
  - Impervious at 1%, calculated withdrawals associated with BC losses
  - For example, a GWL 1 (3% reduction in flow) corresponds to BC 1 (5% loss of relative abundance of fluvial fish)


Biological Category
Sustainable Water Management Initiative (SWMI)
Legend
Major Basins
BC Range of 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.
11/19/12

Groundwater Withdrawal Level
Sustainable Water Management Initiative (SWMI)



Groundwater Withdrawal Level (GWL) is the estimated August median stream flow alteration, due solely to the impact of groundwater withdrawals, that corresponds with a change in the biological category of a stream.

11/19/12

Groundwater Withdrawal Levels/ Seasonal Streamflow Criteria

Groundwater Withdrawal Levels	Groundwater Withdrawal Levels (GWLs)	% Alteration of Estimated Unimpacted Monthly Flow from Ground Water Withdrawals				
		Jul-Aug-Sep	Oct-Nov	Dec-Jan-Feb	Mar-Apr	May-Jun
1	0 to < 3%	3%	3%	3%	3%	3%
2	3 to <10%	10%	5%	3%	3%	5%
3	10 to <25%	25%	15%	10%	10%	15%
4	25 to <55%	Feasible Mitigation and Improvement				
5	55% or greater					

Baseline

- Reference withdrawal against which a withdrawal request will be compared
  - Higher of 2003-2005 average use plus 5%
  - 2005 use, plus 5%
  - Registered volume

WMA Permitting for Groundwater

- Tier 1: No increase in groundwater withdrawal over baseline
  - Standard Conditions 1-8, GWL 4 & 5 minimize existing withdrawals, coldwater fisheries receive add'l consideration

- Tier 2: Increase in groundwater withdrawal, no GWL/BC change
  - Same as Tier 1 + mitigate impacts + other measures

- Tier 3: Increase in groundwater withdrawal, GWL/BC change
  - Same as Tier 2 + mitigate impacts + demonstrated no feasible alternative

WMA Permitting for Surface Water

- Permits will include Standard Conditions 1- 8*
- Requests above baseline will require mitigation commensurate with impact
- Mitigation proposal will require consultation with agency staff and development of a Drought & Demand Management Plan (DDMP)
- Evaluate the feasibility of releases

* Surface water suppliers may develop watering restrictions different from those required in the Standard Conditions as part of a DEP-approved DDMP

Mitigation

Demand Management

- Ban on nonessential, outdoor water use
- Private well bylaw
- Conservation rate structure
- Water banking
- Higher water efficiency
- Rebates for appliances

Water Supply Improvement

- Enterprise account

Wastewater Improvement

- Recharge through septic or groundwater discharge
- I/I removal

Habitat Improvement

- Dam removal
- Land acquisition / CR
- Culvert resizing/replacement
- Restore stream buffers
- Mitigation Fund for restoration

Stormwater /IC

- Recharge Stormwater
- Stormwater utility
- Adopt MS4
- Reduce or disconnect IC

Instream Flow

- Reservoir Releases

SWMI Pilot Process

- Applying SWMI framework to select communities/public water supplies
- Range of conditions represented
- Conducted with input from community/public water suppliers and stakeholders
- Results of pilots will inform and guide development of regulations

Next Steps

- Funding

- Research

- Regulations

Thank You!

http://www.mass.gov/eea/swm