Ipswich & North Coastal

Permit Meeting

March 24, 2015
Bradley Palmer State Park

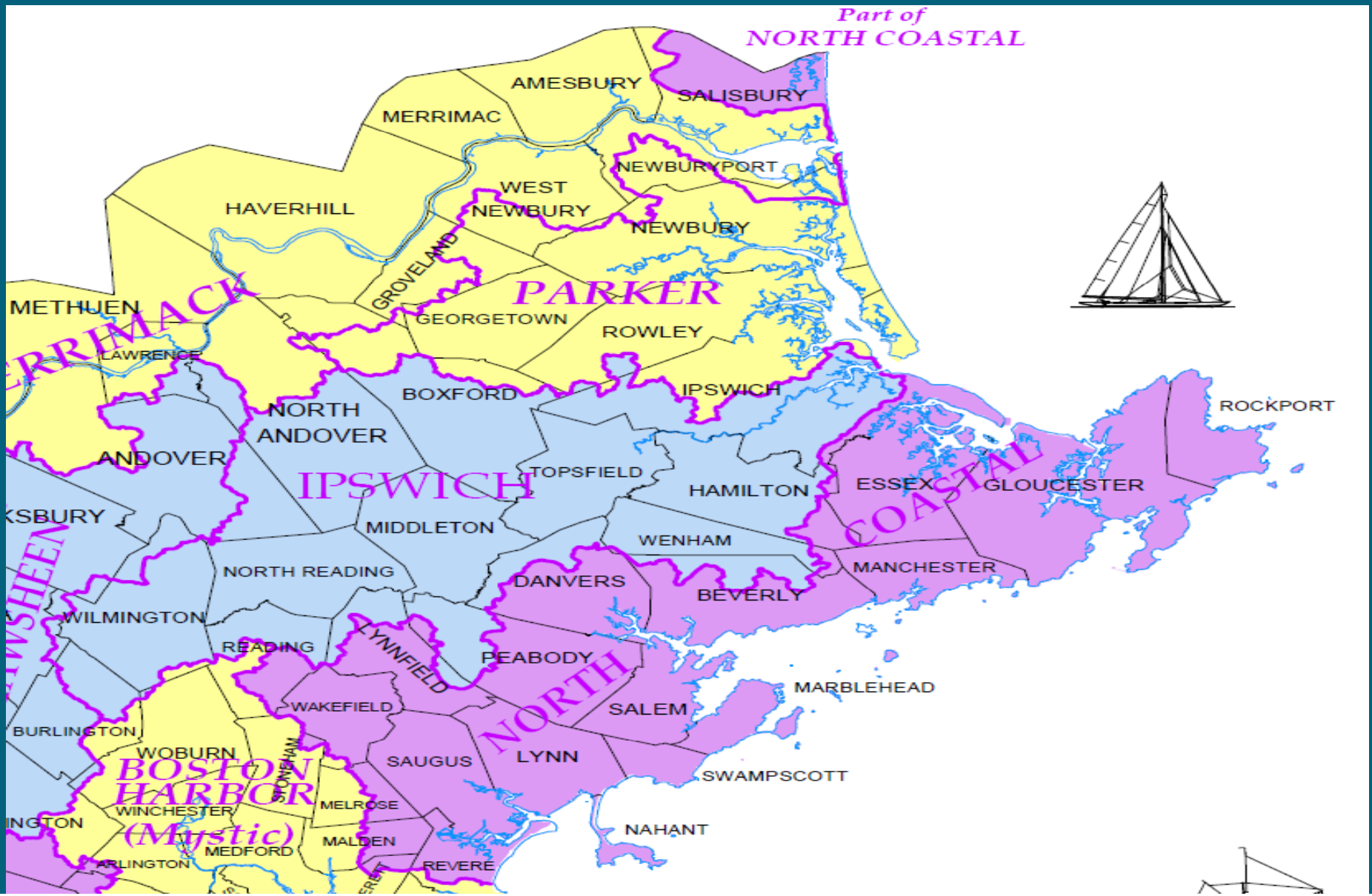
MA Executive Office of Energy and Environmental Affairs
Department of Conservation and Recreation
Department of Environmental Protection
Department of Fish and Game

Ipswich & North Coastal Meeting

Agenda

- Introductions
- WMA Permit Renewal (Ipswich) & Permit Review (N. Coastal) Process
- Ipswich & North Coastal Specifics
- Questions & Answers
- Informal Agency Consultations

Ipswich & North Coastal 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 Ipswich & North Coastal 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

Ipswich Permit Renewal Schedule

Timeline	Activity	Notes
March 24, 2015	Outreach meeting	
March – April	DRAFT and FINAL Water Needs Forecast where applicable	
April – October 2015	Consultation meetings	As necessary
April 2015	DEP issues Order to Compete (OTC)	
May – July 2015	Applicant prepares response to OTC	
August 2015	OTC response due back	
August – Oct 2015	DEP reviews	Mtgs. as necessary
November 2015	Draft permit issued and public comment period	
January 31, 2016	Issue final permits*	

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

North Coastal Permit Review Schedule

Timeline	Activity	Notes
March 24, 2015	Outreach meeting	
April – October 2015	Consultation meetings	As necessary
April 2015	DEP issues Order to Compete (OTC)	
May – July 2015	Applicant prepares response to OTC	
August 2015	OTC response due back	
August – Oct 2015	DEP reviews	Mtgs. as necessary
November 2015	Draft permit issued and public comment period	
January 31, 2016	Issue modified permits*	

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

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 *	2013 Reported Use *
Ipswich	29.4 mgd	32.81 mgd	29.58 mgd	22.93 mgd
North Coastal	25.4 mgd	21.93 mgd	20.8 mgd	16.88 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 complies 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

General Timeframe: 2 months-
All complete in this basin

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

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

Ipswich Specific Permit Conditions

- Water Banking
- Source Specific Operational Controls
- Ipswich Specific Water Use restriction triggers and requirements
- Seasonal Water Use Cap
- Private Well Bylaw
- Enhanced Water Conservation Plan when 65RGPCD standard, 10% UAW or Seasonal Cap is exceeded

North Coastal

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 DEP may vary from above requirements

Golf Standard Conditions

All permitted golf courses will be required to:

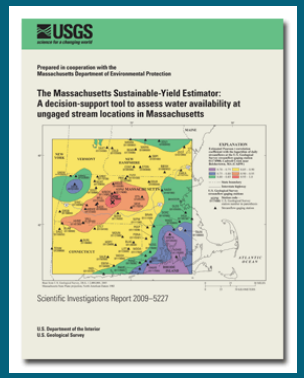
- have a conservation program that includes
  - metering,
  - irrigation system maintenance,
  - turf management, and
  - education;
- limit nonessential irrigation during drought;
- optimize withdrawals to protect cold water fisheries; and
- minimize impacts if the golf course is in a groundwater depleted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



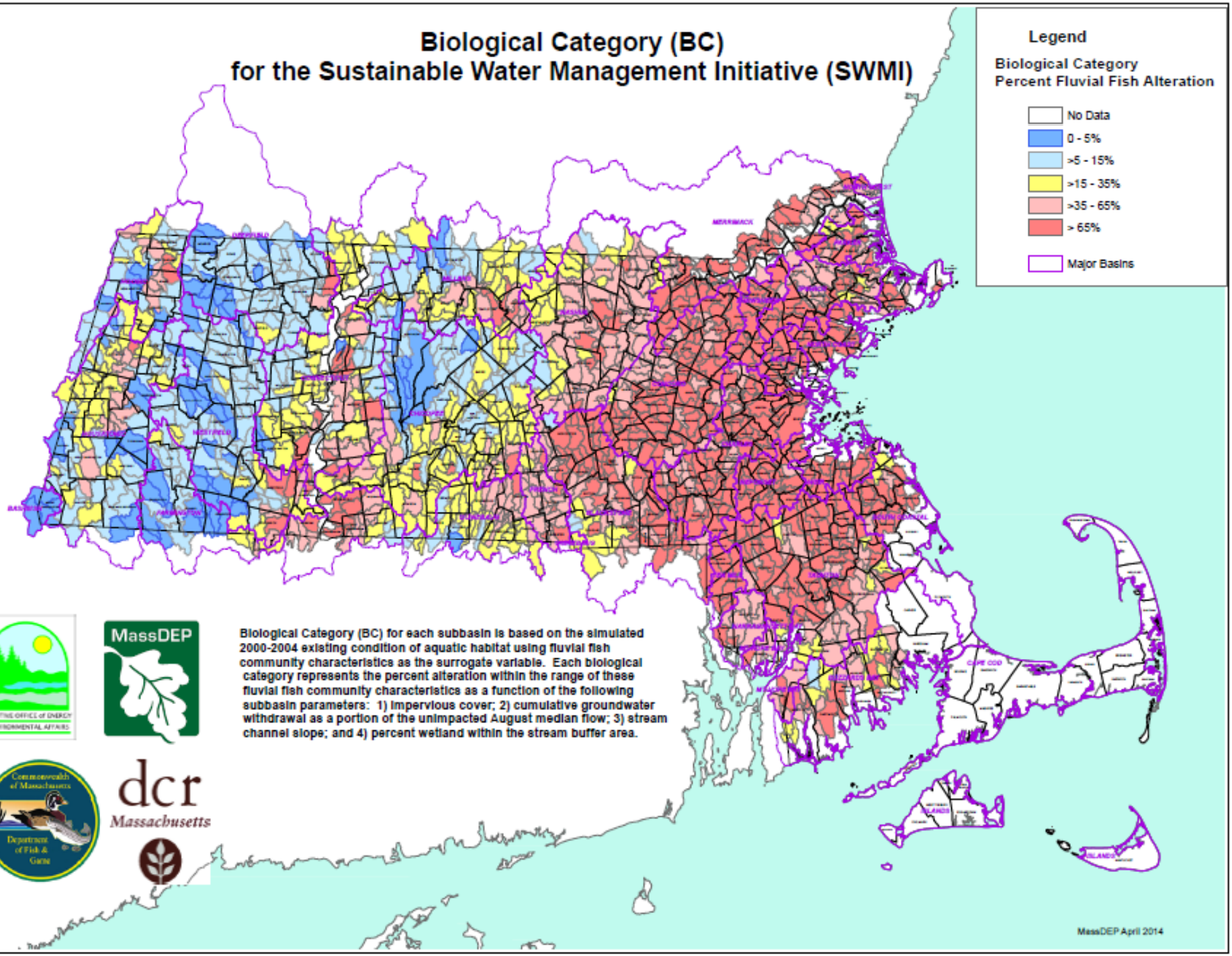
SYE

MWI

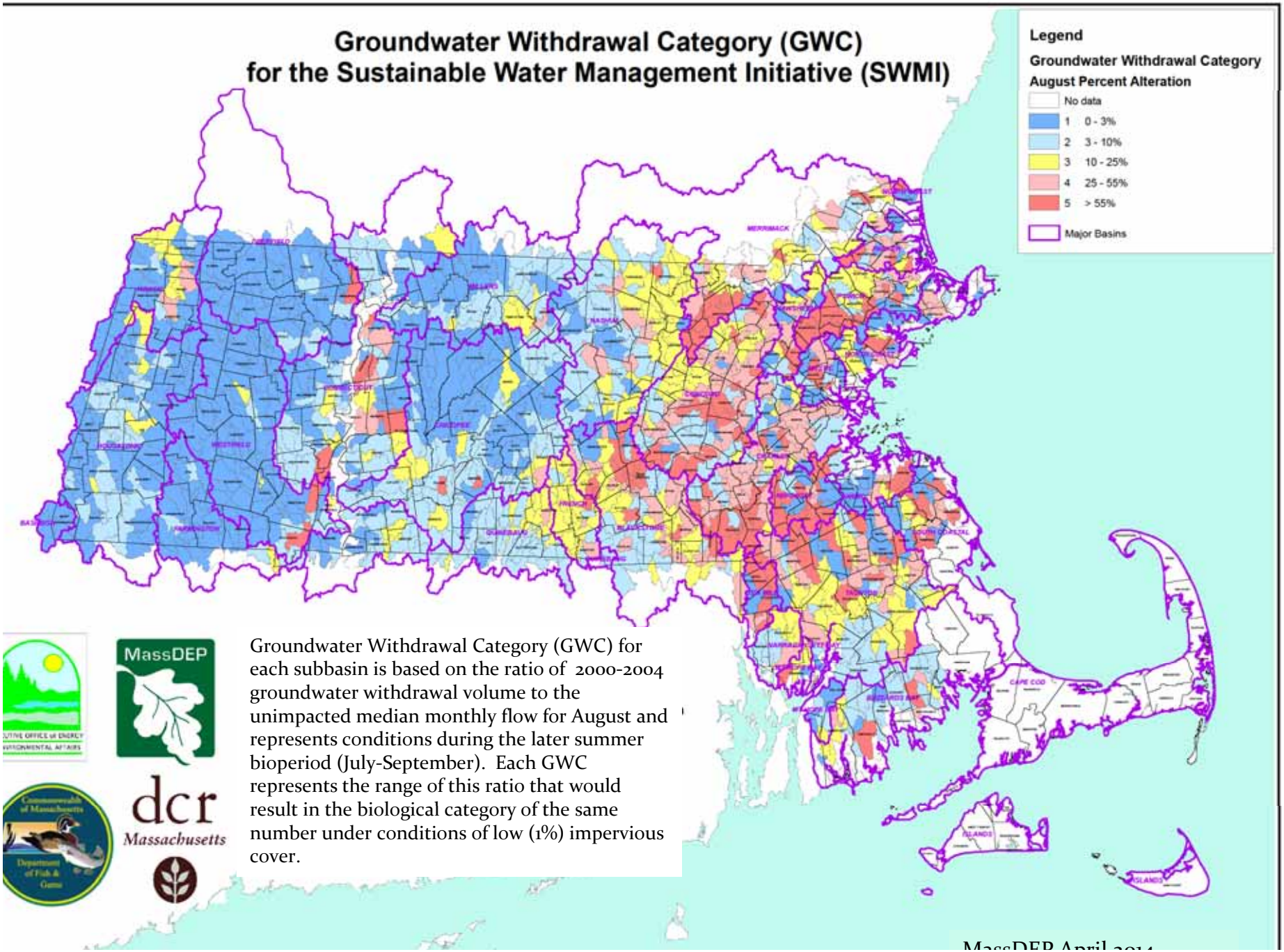
Fish and Habitat

- 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

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 template will be provided

Minimization

Required* in subbasins defined as having an August net groundwater depletion (NGD) of 25% or more by MA Water Indicator Study data.

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

<u>Minimization Requirements (to the greatest extent feasible):</u>

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

<u>*Permittees may avoid Minimization through:</u>

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 Fish ladder
- Culvert replacements meeting crossing standards
- Stream bank/channel/buffer 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 or flow barrier

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

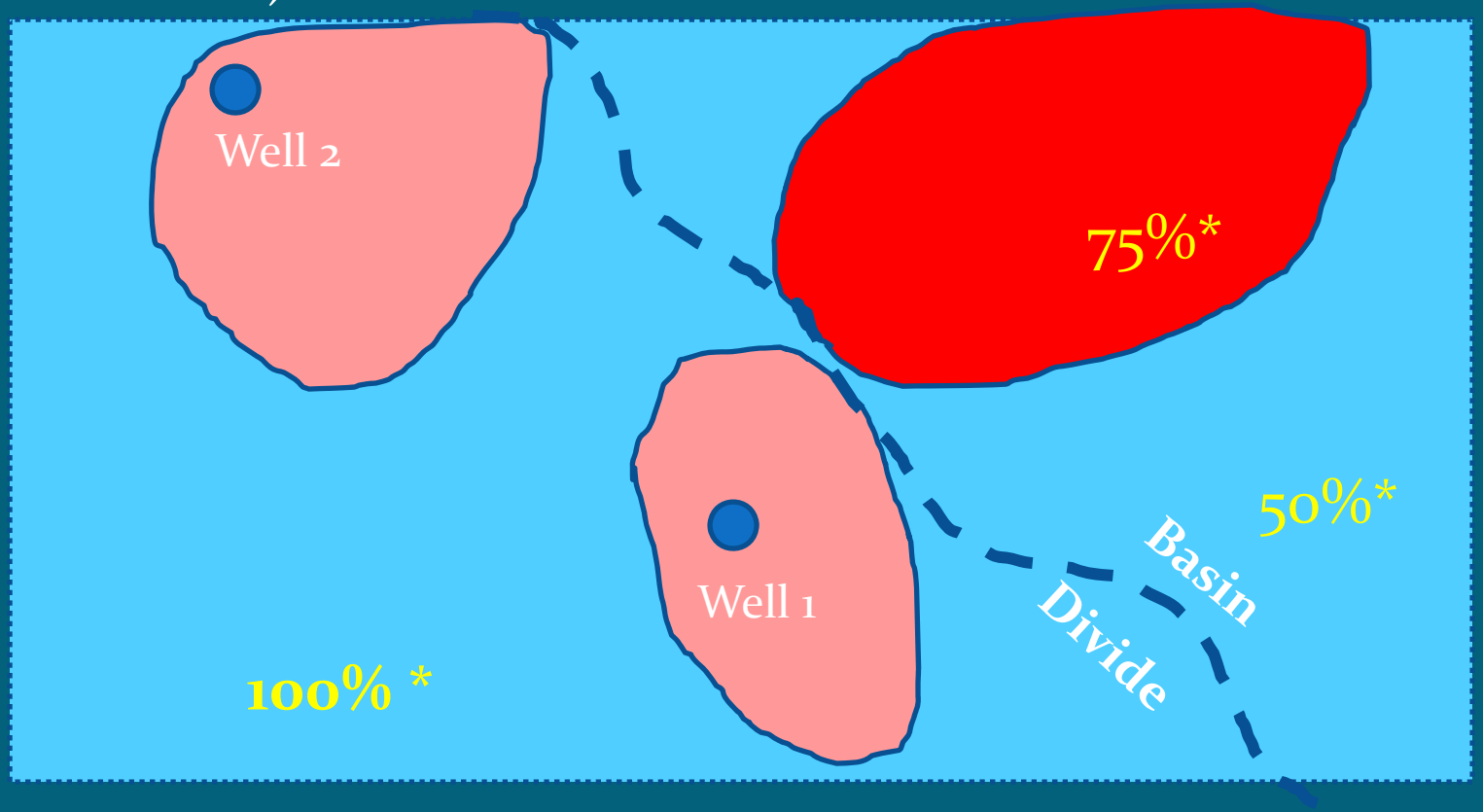
Mitigation Plan Timing

- 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



Ipswich & North Coastal 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?

Total Ipswich Water Use

Use Type	Registered Users	Permitted Users	Registered Volumes (mgd)*	Permitted Volumes (mgd)*
PWS	12	6	28.39	3.23
INDUST	1	0	0.79	0
AGRI	1	0	0.09	0
Golf Course	5	1	0.32	0
Total	19	7	29.59	3.23

* Withdrawal volume calculated based on 365 days

Total North Coastal Water Use

Use Type	Registered Users	Permitted Users	Registered Volumes (mgd)*	Permitted Volumes (mgd)*
PWS	9	4	20.8	1.13
INDUST	2	1	3.14	3.65
GOLF	4	3	0.19	0.13
Total	15	8	24.13	4.91

* Withdrawal volume calculated based on 365 days

Permitted Ipswich Users (PWS)

Name	Registration Volume (mgd)	Current Permit Volume (mgd)	Total Authorized Volume (mgd)
Danvers Water Department	3.14	0.58	3.72
Hamilton Water Department	0.92	0.11	1.03
Lynnfield Center Water District	0.29	0	0.29
Salem Beverly Water Supply Board	10.17	2.27	12.44
Topsfield Water Department	0.43	0.17	0.6
Wenham Water Department	0.29	0.1	0.39

Permitted Ipswich Users (Non-PWS)

Name	Registration Volume (mgd)	Current Permit Volume (mgd)	Total Authorized Volume (mgd)
Thomson Club Inc	0.15	0	0.15

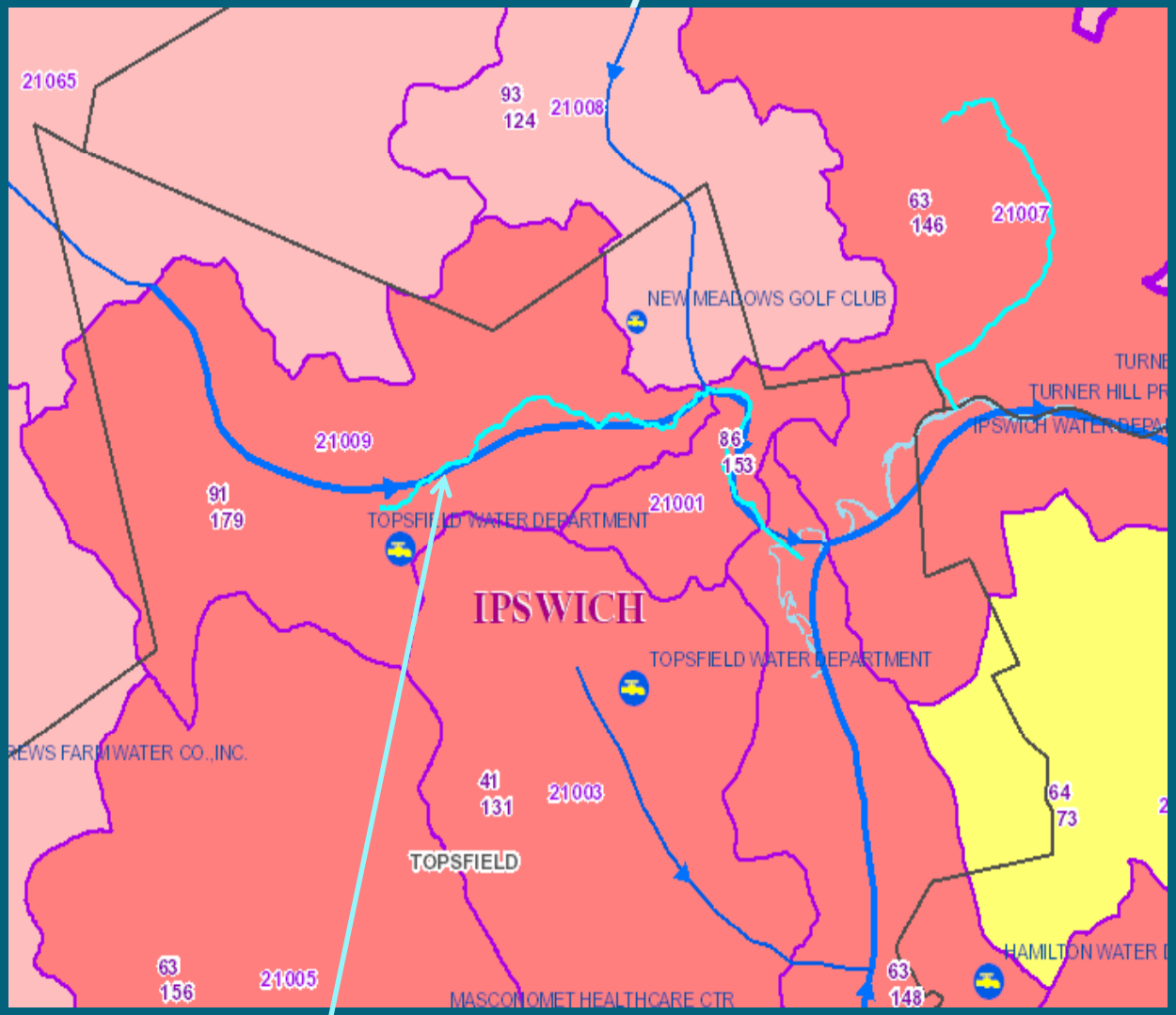
Permitted North Coastal Users (PWS)

Name	Registration Volume (mgd)	Permit Volume (mgd)	Total Authorized Volume (mgd)
Gloucester Department Public Works	3.38	0.37	3.75
Lynnfield Center Water District	0.32	0	0.32
Rockport Water Department	0.72	0	0.72
Salisbury Town Of	0.81	0.03	0.84

Permitted North Coastal Users (Non-PWS)

Name	Registration Volume (mgd)	Permit Volume (mgd)	Total Authorized Volume (mgd)
Bass Rocks Golf Club	0	0.08	0.08
Kernwood Country Club	0.1	0	0.1
Rousselot Peabody Inc	2.74	0.6	3.34
Market Street	0	0.2	0.2

Ipswich & North Coastal Coldwater Fishery Resources

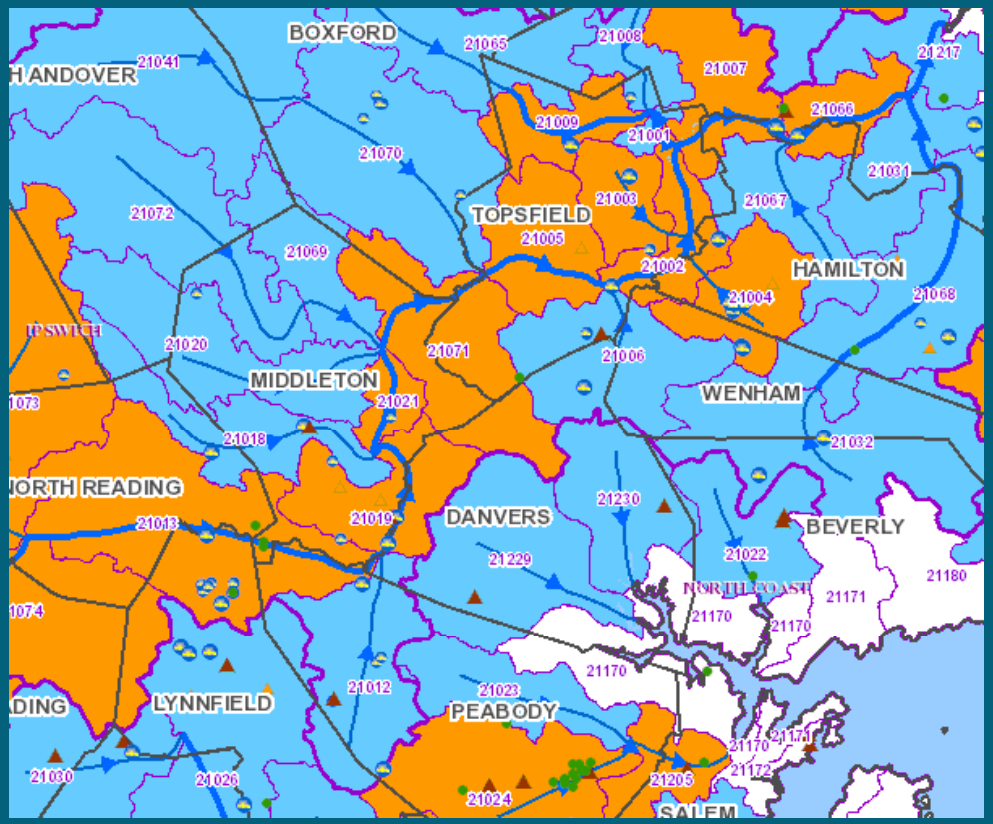


CFRs are light blue

CFRs are considered a particularly sensitive receptor warranting protection.

Permit holders with CFRs
Topsfield Water Department

Ipswich Minimization Requirements



Town	Subbasin(s)	Aug NGD %
LCWD	21013	70%
Thomson CC	21013	70%
Danvers	21019	59%
Topsfield	21003 21009	102% 47%
Hamilton	21002 21004	30% 250%
Wenham	21004	250%

North Coastal Minimization Requirements

Town	Subbasin(s)	Aug NGD %
Salisbury	10004	183%
Rousselot Peabody	21024	252%

Ipswich & North Coastal PWS Baseline Volumes

Ipswich Basin PWS	Baseline Volume (mgd)	Reported Use 2011 (mgd)	Reported Use 2012 (mgd)	Reported Use 2013 (mgd)
Danvers Water Department	3.35	3.23	3.13	2.96
Hamilton Water Department	0.92	0.60	0.65	0.59
Lynnfield Center Water District	0.29	0.38	0.40	0.46
Salem Beverly Water Supply Board	10.82	9.38	9.58	9.11
Topsfield Water Department	0.46	0.38	0.38	0.40
Wenham Water Department	0.35	0.30	0.34	0.36

North Coastal Basin PWS	Baseline Volume (mgd)	Reported Use 2011 (mgd)	Reported Use 2012 (mgd)	Reported Use 2013 (mgd)
Gloucester Department Public Works	3.75	2.87	3.0	3.1
Lynnfield Center Water District	0.32	0.25	0.16	0.18
Rockport Water Department	0.72	0.72	0.52	0.53
Salisbury Town Of	0.81	0.49	0.52	0.56

Ipswich & North Coastal Non-PWS Baselines

Ipswich

Name	Baseline Volume (mgd)	Current Total Allocation (mgd)	Reported Use 2011 (mgd)	Reported Use 2012 (mgd)	Reported Use 2013 (mgd)
Thomson Club Inc	0.15	0.15	0.05	0.06	0.06

North Coastal

Name	Baseline Volume (mgd)	Current Total Allocation (mgd)	Reported Use 2011 (mgd)	Reported Use 2012 (mgd)	Reported Use 2013 (mgd)
Bass Rocks Golf Club	0.08	0.08	0.06	0.08	0.07
Kernwood Country Club	0.10	0.10	0.07	0.08	0.09
Rousselot Peabody Inc	2.74	3.34	1.53	1.53	1.78
Market Street	0.08	0.20	0.02	0.01	0.04

Ipswich Nonessential Water Use Triggers

Trigger	Voluntary Trigger Value	Mandatory Trigger Value	Permittees assigned
Ipswich River at South Middleton, MA	24.9 cfs	18.7 cfs	Lynnfield Center; Thomson CC
Ipswich River near Ipswich, MA	70 cfs	52.5 cfs	Topsfield; Hamilton; Wenham; & Danvers-Middleton on approved Drought Plan; Salem-Beverly TBD

North Coastal Nonessential Water Use Triggers

Trigger	May- June Trigger Value	July – Sept. Trigger Value	7 Day Low Flow Trigger Value	Permittees assigned
Ipswich River at South Middleton, MA	44 cfs	14 cfs	1.0 cfs	Kernwood CC; Rousselot Peabody;
Ipswich River near Ipswich, MA	125 cfs	42 cfs	4.9 cfs	Bass Rocks CC;
Saugus River at Saugus Ironworks at Saugus, MA	20 cfs	6 cfs	1.4 cfs	Market Street;
Parker River at Byfield	20 cfs	6 cfs	0.5 cfs	Salisbury; Gloucester; and Rockport on Drought Plan

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

DEP 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.

DEP Permitting Tool

Find by Subbasin ID: 21066 | Find by PWS System Name: | Click to use pull downs and to View All Subbasins | All Water Use Points in Subbasin Report | Calculation Tool Report

Find by PWSID: | Find PWS by Town Name:

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 water use volumes

Subbasin Characteristics

Sub Basin ID:	Major Basin:	HUC12 Name:
21066	Ipswich	Ipswich River-Nichols 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):	130.39	Ground Water Discharge:	0.134	PWS and Commercial Wells:	8.666	To Change GWC (mgd):	1.644
Impervious Cover (%):	11.4	Septic Systems:	+ 3.966	Private Wells:	+ 1.095	To Change BC (mgd):	0
Surface water withdrawals exist in or upstream of subbasin:	YES	Total Subsurface Discharge:	= 4.100	Total Groundwater Withdrawals:	= 9.761		
		Surface Water (NPDES):	0.000				

Individual Subbasin Data (only includes this subbasin)

Coldwater Fisheries Resource Exist: No

Net Groundwater Depletion (NGD)

Net Groundwater Depletion (%): 27.3

Positive value indicates depleted.
Negative value indicates surcharged.

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	
			Change (+/-) to existing GW Withdrawal (mgd)	0		Calculate / Clear	
Unaffected Streamflow (mgd)*		20.737	Unaffected Streamflow(mgd)		20.737		
GW Withdrawals (mgd)**	-	9.761	Proposed Total GW Withdrawal (mgd)	-	9.761		
(Unaffected Streamflow) - (GW Withdrawals)	=	10.976	(Unaffected Streamflow) - (Prop. GW Withdrawal)	=	10.976		
(GW Withdrawals) / (Unaffected Streamflow)	=	47.1%	(Proposed GW Withdrawal) / (Unaffected Streamflow)	=	47.1%	0.0%	Percent Difference
Groundwater Withdrawal Category (1-5)	GWC:	4	Proposed Groundwater Withdrawal Category (1-5)		4	NO	Change in GWC?
Biologic Category (1-5)	BC:	5	Proposed Biologic Category (1-5)		5	NO	Change in BC?

USGS report SIR 2009-5272 ("Mass. Indicators") describes subbasin delineation, streamflow simulation, and water withdrawal and discharge volume calculations.

* August unaffected streamflow = median August streamflow simulated using 1960-2004 USGS records of measured daily streamflow.
Streamflow simulated for pour point of subbasin and includes streamflow from all upstream subbasins.

** GW Withdrawals = 2000 to 2004 average August pumping from PWS and commercial wells; private well volumes estimated from U.S. Census data.

mgd = million gallons per day

Groundwater Withdrawal Category (GWC) is the ratio of GW Pumping to Unaffected Streamflow (in percent) in the following ranges:
GWC1 (0 to <3%); GWC2 (3 to <10%); GWC3 (10 to <25%); GWC4 (25 to <55%); GWC5 (55% or greater)

Biologic Category (BC) is the estimated biological condition based on streamflow, impervious cover and natural basin characteristics.
The Biological Categories represent the estimated percent loss in the relative abundance of fluvial fish in the following ranges:
BC1 (0 to <5%); BC2 (5 to <15%); BC3 (15 to <35%); BC4 (35 to <65%); BC5 (65% or greater)

Summary Info for Permits

Ipswich Permits	CFR present	Minimization required	Projected Permit Tier	Alternative analysis
Danvers Water Department	No	Yes	2	No
Hamilton Water Department	No	Yes	1	No
Lynnfield Center Water District	No	Yes	1	No
Salem Beverly Water Supply Board	No	No	2	No
Topsfield Water Department	Yes	Yes	2	No
Wenham Water Department	No	Yes	2	No
Thomson Club Inc	No	Yes	1	No

North Coastal Permits	CFR present	Minimization required	Projected Permit Tier	Alternative analysis
Gloucester Department Public Works	No	No	1	No
Lynnfield Center Water District	No	No	1	No
Rockport Water Department	No	No	1	No
Salisbury Town of	No	Yes	1	No
Bass Rocks Golf Club	No	No	1	No
Kernwood Country Club	No	No	1	No
Rousselot Peabody Inc	No	Yes	1	No
Market Street	No	?	1	No

*** Consultation with DFG will be required**

Permit Reviews

Ipswich Basin Permit Holder	Reviewer
Danvers Water Department	McCann
Hamilton Water Department	Connors
Lynnfield Center Water District	D'Urso
Salem-Beverly Water Supply Board	McCann
Thomson Country Club	Butler
Topsfield Water Department	D'Urso
Wenham Water Department	Connors

North Coastal Basin Permit Holder	Reviewer
Bass Rocks Golf Club	Chen
Rousselot Peabody, Inc	Connors
Gloucester DPW	Friend
Kernwood Country Club	Butler
Rockport Water Department	Connors
Town of Salisbury	McCann
Market Street	Chen
Lynnfield Center Water District	D'Urso

DEP Reviewers

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Community-Specific One-Page Summary Sheet

- Includes 6 summary tables:

1) Reported Use 2009-13
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

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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