Islands Basin

20-Year Renewal Permit Meeting

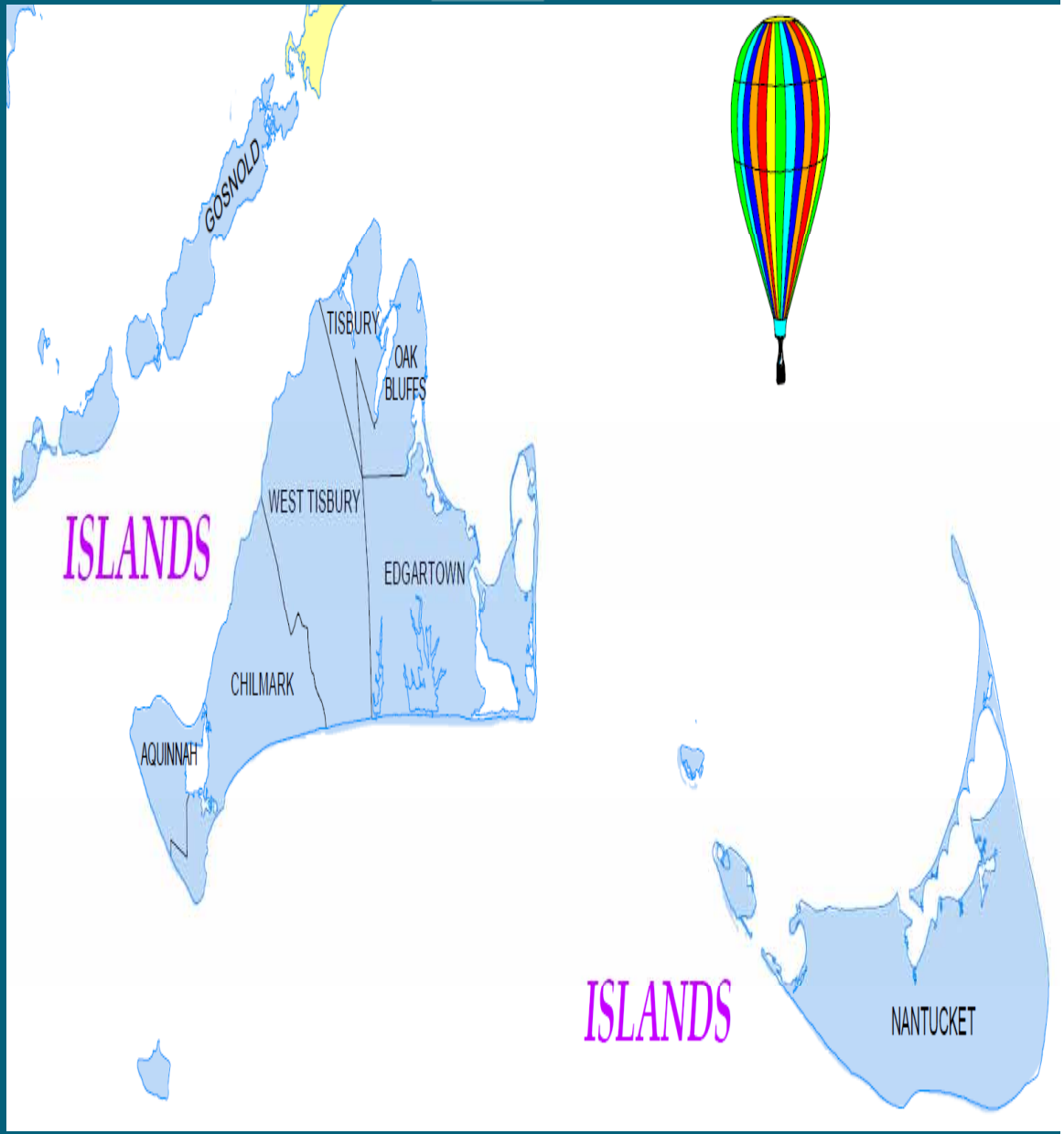
June 2, 2015
Martha`s Vineyard Commission

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

Islands Meeting

Agenda

- Introductions
- WMA Permit Process
- Islands Specifics
- Questions & Answers
- Informal Agency Consultations



Meeting Purpose- Part One

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

Meeting Purpose- Part Two

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

Islands Permit Renewal Schedule

Activity	Notes
Outreach meeting	June 2, 2015
Water Needs Forecast	
Consultation meetings	On going, as necessary
MassDEP issues Order to Compete (OTC)	
Applicant prepares response to OTC	
OTC response due back	
MassDEP reviews	Mtgs. as necessary
Draft permit and public comment period	
Issue final permits*	

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

Safe Yield- Standard Method

55% of Annual Drought Basin Yield + Reservoir Storage

- Statewide SY method not applicable on the Cape and Islands
  - Very few rivers and many kettle ponds
  - Unique Geology and extensive aquifers
- Used recharge values from regional USGS ground water models for Cape Cod
- Sagamore and Monomoy Flow Lenses used to represent the entire Cape Cod and Islands basins
- (USGS SIR 2004-5181 (Walter and Whealan)

Safe Yield- Islands

- Average annual recharge 27.25 inches per year
- 1965 recharge 13.9 inches, or 51 percent of average
- Used 1965 recharge rate for probable driest period/drought year
- Due to the expansive thickness of aquifers, applied entire volume (100%) of recharge (vs. 55% Q90 Statewide)
- 1965 Recharge: 0.66 MGD/square mile
- Applied over 142.12 square miles = **94.0 MGD**

Basin	Safe Yield	Total Annual Authorized Withdrawals*	Total Annualized Registered Volume *	2013 Reported Use
Islands	94.0 mgd	7.378 mgd	5.2 mgd	5.03 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 (not applicable on Islands) 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

General Timeframe: 2 months

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

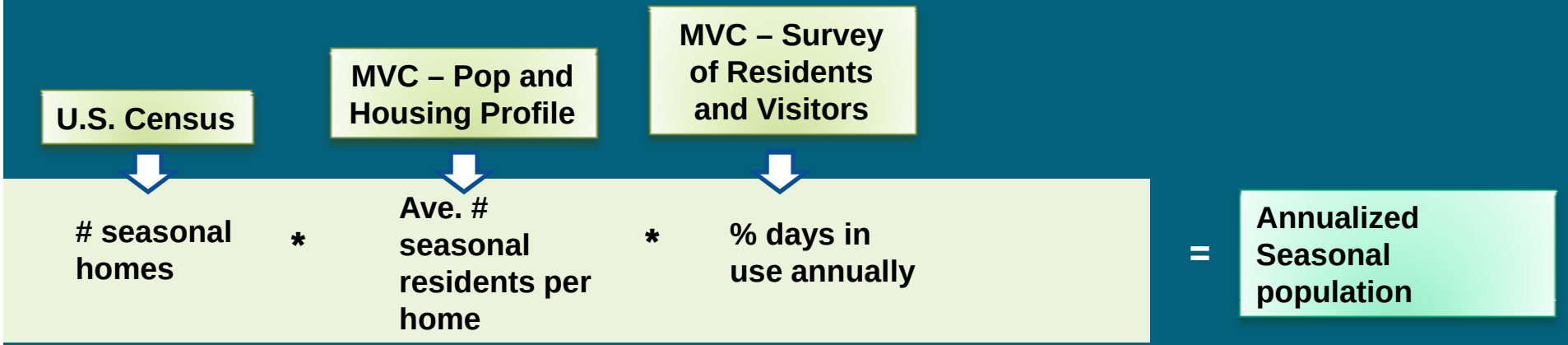
Data	Sources
Current Town-wide Population	U.S. Census, Town Planning Office & DCR estimated seasonal pop.
Population Projections	Exec. Office of Transportation (MassDOT), UMass Donahue Institute
Current Employment	MassDOT
Employment Projections	MassDOT

Seasonal Population Data Sources:

Source	Data
U.S. Census	# Vacant/Seasonal Units
Martha's Vineyard Commission, *Population and Housing Profile of Martha's Vineyard, 2006*	Ave. # residents in seasonal homes, when occupied (4.77)
Martha's Vinyard Commission, *Results of Recent Surveys of Martha's Vineyard Residents and Visitors, 2006.*	Average % of days home is occupied during each season

Fall	Winter	Spring	Summer
37%	15%	14%	85%

Seasonal Population Calculation:



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
   - 10% unaccounted-for-water (UAW)
   - BMPs (leak detection & repair, metering, pricing, public education etc.)
2. Seasonal limits on nonessential outdoor water use/Islands specific requirements

Golf Standard Conditions

All permitted golf courses will be required to:

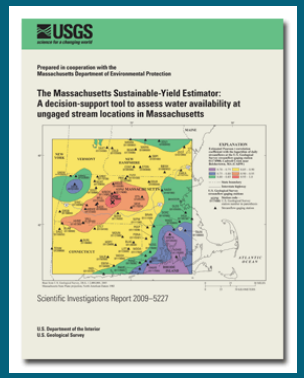
- have a conservation program that includes
  - metering,
  - irrigation system maintenance,
  - turf management, and
  - education;
- limit nonessential irrigation during drought;
- optimize withdrawals to protect cold water fisheries; and
- minimize impacts if the golf course is in a groundwater depleted subbasin (not applicable on Cape).

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



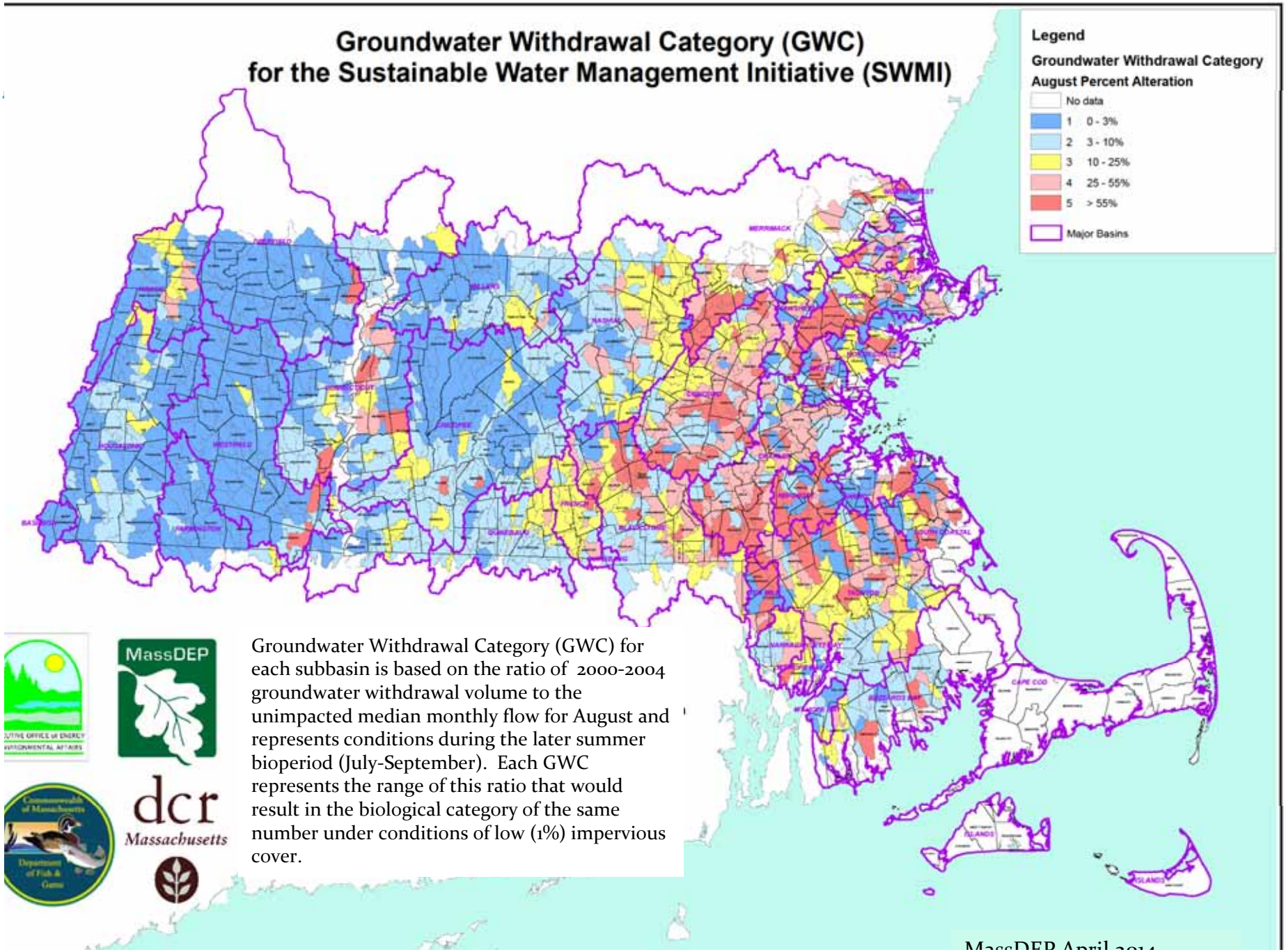
SYE

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)

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

*Those with registrations only 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

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
- Volume must be in compliance

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 for Islands

- Install & Maintain a fish ladder
- Culvert replacements meeting crossing standards
- Stream restoration
- Private well bylaw
- Water Quality improvements
  - Wastewater & Stormwater
- Acquire property in Zone I or II, or for other resource protection
- Infiltration/Inflow removal program
- Remove dam/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)

Islands Basin Specifics

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

Total Islands Water Use

Use Type	Registered Users	Permitted Users	Registered Volumes (mgd)*	Permitted Volumes (mgd)*
PWS	5	4	2.50	1.91
Golf	3	3	0.206	0.268
Agricultural	1	0	0.074	0
Cranberry	1	0	2.42	0
Total	10	7	5.20	2.178

** Withdrawal volume calculated based on 365 days

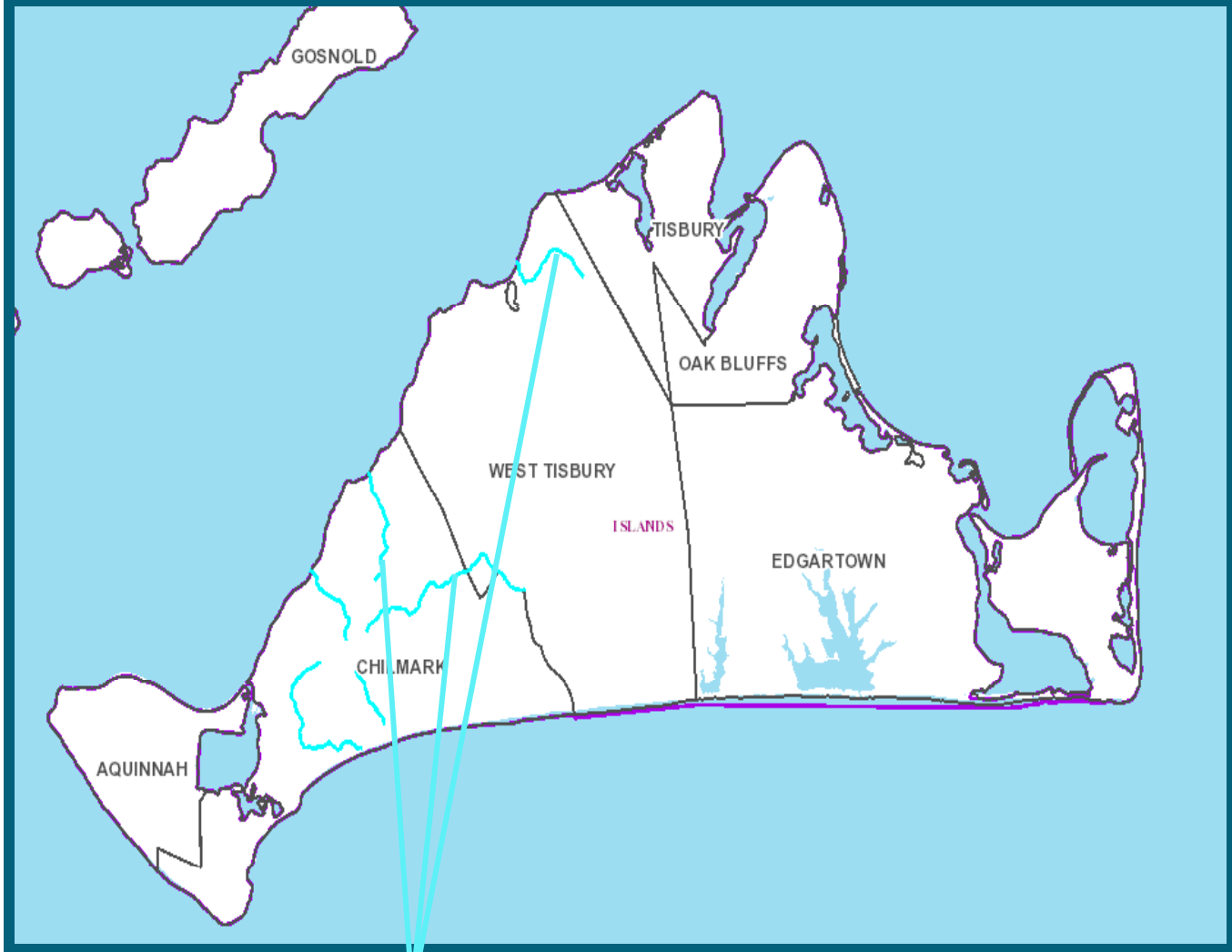
Permitted Islands Users

Name	Registration Volume (mgd)	Permit Volume (mgd)	Total Authorized Volume (mgd)
Edgartown Water Department	0.65	0.27	0.92
Oak Bluffs Water District	0.58	0.35	0.93
Tisbury Water Works	0.55	0.22	0.77
Wannacomet Water Company	0.61	1.07	1.68
Golf Club of Martha's Vineyard	0	0.15	0.15
Miacomet Golf Course	0	0.118	0.118
Nantucket Golf Club	0	0.192	0.192

Islands Baseline Volumes

PWS	Baseline Volume (mgd)	Reported Use 2012 (mgd)	Reported Use 2013 (mgd)	Reported Use 2014 (mgd)
Edgartown Water Department	0.89	0.89	0.85	0.94
Oak Bluffs Water District	0.88	0.97	0.95	1.02
Tisbury Water Works	0.77	0.68	0.7	0.73
Wannacomet Water Company	1.50	1.69	1.60	1.64
Golf Club of Martha's Vineyard	0.15	0.108	0.085	0.109
Miacomet Golf Course	0.11	0.116	0.113	0.114
Nantucket Golf Club	0.14	0.125	0.11	0.1

Coldwater Fishery Resources



CFRs are light blue

CFRs are considered a particularly sensitive receptor warranting protection.

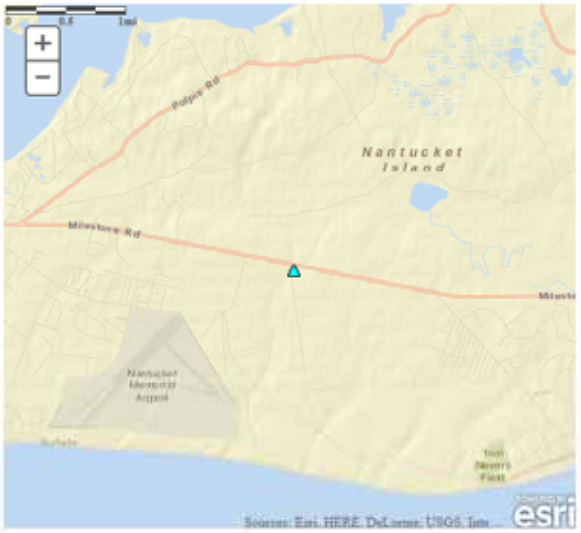
PWS Potentially Impacting CFRs
None

Groundwater Level Triggered Outdoor Restrictions for PWS

- Triggered by:
  - MA Drought Advisory or greater declared for the Cape and Islands Region; or
  - Below-normal groundwater levels.
    - Below USGS monthly 25th percentile values
    - Monitoring begins March 1st for May 1st start date
    - Apply if below trigger level for 60 consecutive days; Lifted when levels are above trigger for 30 days

- When restrictions are implemented:
  - Notify MassDEP within 14 days
  - No lawn watering from 9 am to 5 pm
  - Irrigation systems/sprinklers allowed 2 days per week

Site Number: 411555070021901 - MA-NBW 228 NANTUCKET, MA



DESCRIPTION:
Latitude 41°15'55", Longitude 70°02'19" NAD27
Nantucket County, Massachusetts, Hydrologic Unit 01090002
Well depth: 35.6 feet
Land surface altitude: 38.83feet above NGVD29.
Well completed in "Sand and gravel aquifers (glaciated regions)" (N100GLCIAL) national aquifer.
Well completed in "Outwash" (112OTSH) local aquifer

AVAILABLE DATA:

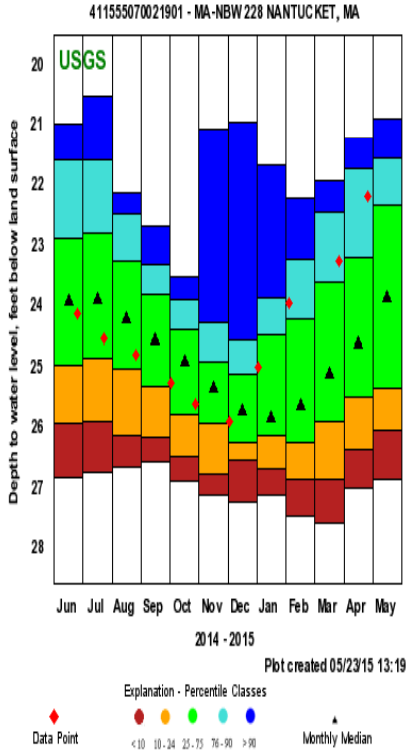
Data Type	Begin Date	End Date	Count
Field groundwater-level measurements	1976-03-04	2015-04-24	468
Field/Lab water-quality samples			

Additional Data Sources	Begin Date	End Date	Count
Groundwater Watch ""offsite""	1976	2015	468
Annual Water-Data Report (pdf) ""offsite""	2005	2013	9

OPERATION:
Record for this site is maintained by the USGS Massachusetts Water Science Center
Email questions about this site toMassachusetts Water Science Center Water-Data Inquiries

Groundwater

Site Statistics



Most recent data value: 22.21 on 4/24/2015
Period of Record Monthly Statistics for 411555070021901
Depth to water level, feet below land surface
All Approved Continuous & Periodic Data Used In Analysis
Note: Highlighted values in the table indicate closest statistic to the most recent data value.

Month	Lowest Median	10th %ile	25th %ile	50th %ile	75th %ile	90th %ile	Highest Median	Number of Years
Jan	27.12	26.68	26.13	25.85	24.50	23.88	21.68	32
Feb	27.46	26.86	26.25	25.65	24.22	23.24	22.22	37
Mar	27.60	26.87	25.92	25.12	23.62	22.47	21.94	37
Apr	27.00	26.37	25.51	24.64	23.21	21.74	21.21	35
May	26.86	26.04	25.36	23.87	22.36	21.57	20.89	34
Jun	26.82	25.95	24.97	23.95	22.89	21.58	21.00	34
Jul	26.76	25.90	24.86	23.92	22.80	21.58	20.51	37
Aug	26.66	26.14	25.03	24.24	23.28	22.50	22.13	37
Sep	26.56	26.16	25.32	24.57	23.81	23.32	22.68	33
Oct	26.88	26.48	25.78	24.93	24.39	23.92	23.53	35
Nov	27.13	26.77	25.94	25.36	24.91	24.28	21.07	31
Dec	27.25	26.55	26.25	25.72	25.13	24.59	20.97	34

As of 5/22/2015 23:40-2

Statistics Options

View month/year statistics

- USGS Groundwater Level Statistics for NBW 228
- Trigger = monthly 25th percentile*

* Will be updated in permits every 5 years.

Monthly 25th Percentile Trigger Values*

	NBW 228	ENW 52
March	25.92	19.06
April	25.51	18.56
May	25.36	18.18
June	24.97	17.96
July	24.86	18.14
August	25.03	18.47
September	25.32	18.77

* As of April 24, 2015; updated values in permits will be as of date of permit issuance; Revised USGS values based on updated records will be included in 5-year permit revisions or upon request

Summary Info for PWS Permits

PWS	CFR present	Baseline (mgd)	Current Allocation	Potential Permitted volume (mgd)	DCR 2031 Forecast with Buffer Vol. (mgd)
Edgartown Water Department	No	0.89	0.92	0.92	1.22
Oak Bluffs Water District	No	0.88	0.93	0.93	Temporary Allocation
Tisbury Water Works	No	0.74	0.77	0.77	0.87
Wannacomet Water Company	No	1.50	1.68	1.68	2.31
Golf Club of Martha's Vineyard	No	0.15	0.15 (180 days)	0.15	-
Miacomet Golf Course	No	0.11	0.118 (210 days)	0.118	-
Nantucket Golf Club	No	0.14	0.192 (240 days)	0.192	-

Online SWMI Interactive Maps

- GIS map provides an interactive graphic display that includes:
  - Water use points
  - Cold Water Fishery Resources
  - Aquifers and more

- Map is at

http://www.mass.gov/eea/agencies/massdep/water/watershed/ 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 PWSID: 4221000 Find by PWS NAME: Preview Report

PWSID: 4221000 Public Water Supplier Name: OAK BLUFFS WATER DISTRICT

Baseline and 20 Year Water Needs Forecast Rates:

BASIN	BASELINE RATE (MGD)	BASELINE METHODOLGY	20 Year Water Needs Forecast + 5% (65/10)
ISLANDS	0.88	AUTHORIZED RATE	Final WNF pending permit renewals in this basin

2010 Authorized Rates:

BASIN	REGISTERED RATE (MGD)	2010 PERMITED RATE (MGD)	2010 AUTHORIZED RATE (MGD)
ISLANDS	0.58	0.35	0.93

Actual Annual Use (mgd):

BASIN	2006	2007	2008	2009	2010	2011	2012
ISLANDS	0.92	1.08	1.03	0.9	0.99	0.89	0.97

PWS Authorized Rates, Water Use Points and Subbasins

Renewal Authorized Rates | PWS Withdrawal Points by Subbasin | All Water Use Points In PWS's Subbasins | Subbasins

Comments	BASIN	Block 1 Rate	Block 1 Enc	Block 2 Rat	Block 2 End I	Block 3	Block 3 Er	Block 4 Ra	Block
Islands permits not yet renewed	ISLANDS								

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) Groundwater 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 in November 7, 2014) and Policy Development (Ongoing)
- Permit application forms and worksheets (Winter 2015)
- 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.

Islands Permit Reviews

Permit Holder	DEP Reviewer	DCR Reviewer
Edgartown Water Department	Friend	Graham
Oak Bluffs Water District	Friend	Cohen
Tisbury Water Works	McCann	Cohen
Wannacomet Water Company	McCann	McCrory
Golf Club of Martha's Vineyard	Chen	-
Miacomet Golf Course	Chen	-
Nantucket Golf Club	Chen	-

DEP Reviewers

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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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