



# Monthly Meeting #15

Coordinated Water System Plan  
Eastern Region

Southeastern Connecticut COG, 5 Connecticut Avenue, Norwich, Connecticut | August 9, 2017

# Agenda



1. Welcome & Roll Call (5 minutes)
2. Approval of June Meeting Minutes (5 minutes)
3. Formal Correspondence (5 minutes)
4. Public Comment Period (10 minutes)
5. ESA Modifications Discussion / Updates (10 minutes)
6. Presentation by DPH on Revised Water Supply Planning Guidance Related to Public Act 17-211 **POSTPONED**
7. Integrated Report Topics (60 minutes)
  - Source Water Protection
  - Joint Use, Management, or Ownership of Facilities; Shared Resources
  - Fire Protection
  - Water Conservation, Drought Planning, High Volume Users, and Increasing Peaking Ratios
8. Other Business (10 minutes)



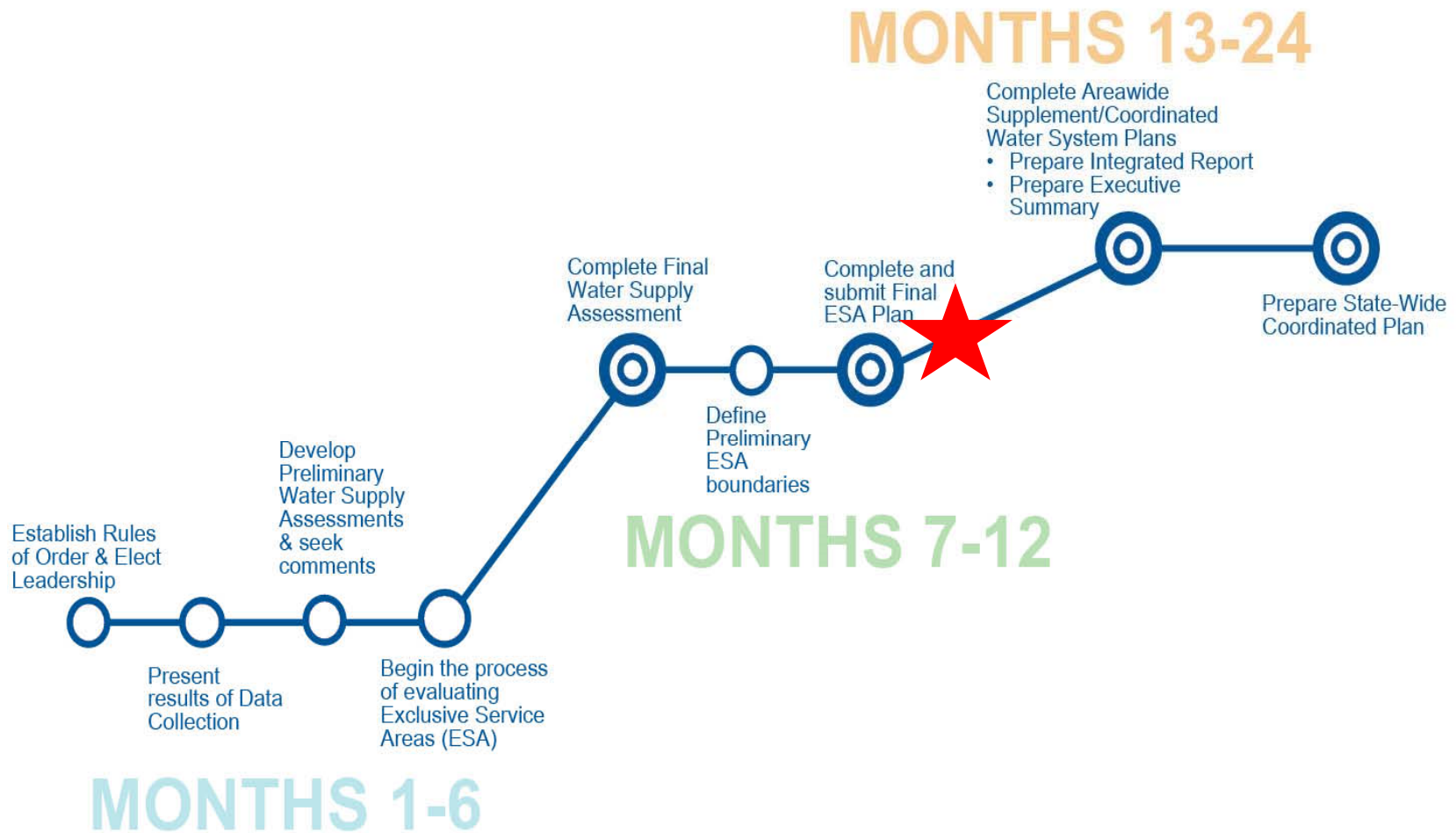
# 1. Welcome and Roll Call

# Taking Stock



- ***What Have We Accomplished?***
  - ✓ Finalized syllabus for Integrated Report
  - ✓ Discussed Integrated Report Modules #1 through #3
- ***What Are We Doing Today?***
  - ✓ Receiving updates on any ESA Modification processes
  - ✓ Discussing Integrated Report Modules #4 through #7
- ***What's Next?***
  - ✓ Additional Integrated Report Topics
  - ✓ Presentation by DPH regarding Public Act 17-211

# WUCC Time Frame



## 2. Approval of Meeting Minutes

## 3. Formal Correspondence

# Formal Correspondence



Date	From	To	Main Topic(s)
7/26/2017	Eastern WUCC (via DPH)	Eastern WUCC Members	Final Integrated Report Planning Elements and data request for questions regarding Source Water Protection; Joint Use of Facilities, Shared Resources; Fire Protection; and Water Conservation, Drought Planning, High Volume Users and Increasing Peaking Ratios
7/27/2017	North Willington Village Condo Association	MMI	Responses to questions for modules 1-5
8/4/2017	Connecticut Water Company	MMI	Responses to questions for modules 1-7
8/4/2017	Aquarion Water Company	MMI	Responses to questions for modules 1-7
8/4/2017	Southeastern CT Water Authority	MMI	Responses to questions for modules 4-7

# Formal Correspondence



Date	From	To	Main Topic(s)
8/8/2017	Windham Water Works	MMI	Responses to questions for modules 1-7
8/8/2017	Norwich Public Utilities	MMI	Responses to questions for modules 4-7
8/8/2017	CT DPH	WUCCs	Response to 7/19/17 email from M. Miner to the Central WUCC
8/9/2017	Jewett City Water Company	MMI	Responses to questions for modules 4-7



## 4. Public Comment Period

## 5. ESA Modifications Discussion / Updates

## 6. State Water Plan Presentation by Water Planning Council (**Postponed**)

***Water utilities may attend CWWA's Water Security Workshop on September 6, 8:30 a.m. - 11:30 a.m., MDC Training Center, 125 Maxim Road, Hartford, CT.***

*“Learn firsthand about changes to the state's Freedom of Information law affecting the disclosure of security related water company information, including what information is protected from disclosure, what information should be redacted from water supply plan submittals, and what information must be disclosed.”*

*“Attendees will also hear about issues regarding cybersecurity and what their companies can do to protect against cybersecurity threats.”*

## 7. Integrated Report Topics

# Topic Schedule



WSA	Stat.	Reg.	Task	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			State Water Plan summary	X	X					
			Request and receive data from utilities	X	X	X				
✓			Maintenance and replacement of existing supply sources / asset management (aging infrastructure)	X	X					
✓		✓	Financial Considerations / declining revenue vs. increasing costs		X					
✓	✓		Coordination of planning (between systems, with towns, across ESA boundaries)		X					
✓		✓	Source Water Protection			X				
	✓	✓	Joint Use, Management, or Ownership of Facilities, Shared Resources			X				
✓			Lack of fire protection			X				
✓	✓		Water Conservation / Drought Planning / High volume users / Increasing peaking ratios			X				
✓	✓	✓	Satellite Management / Small System challenges and viability							
		✓	Minimum Design Standards							
✓	✓	✓	Future Sources / Raw Well Water Quality / Acquisition of land for new stratified drift wells							
✓	✓	✓	Future Interconnections and Impact (including WQ) / disjointed service areas / integration							
✓			Impacts of Climate Change							
✓			Impacts of Existing and Future Regulations							
	✓	✓	Potential Impacts on Other Use of Water Resources, including WQ, Flood Management, Recreation, Hydropower, and Aquatic Habitat Issues							
		✓	Regional Population and Service Ratio, Consumption by Demand Category, Safe Yield (Impacts of Streamflow Regulations), Excess Water							
	✓	✓	Compatibility with local, regional, and state plans							
✓			Other issues							

# Module #4 – Source Water Protection



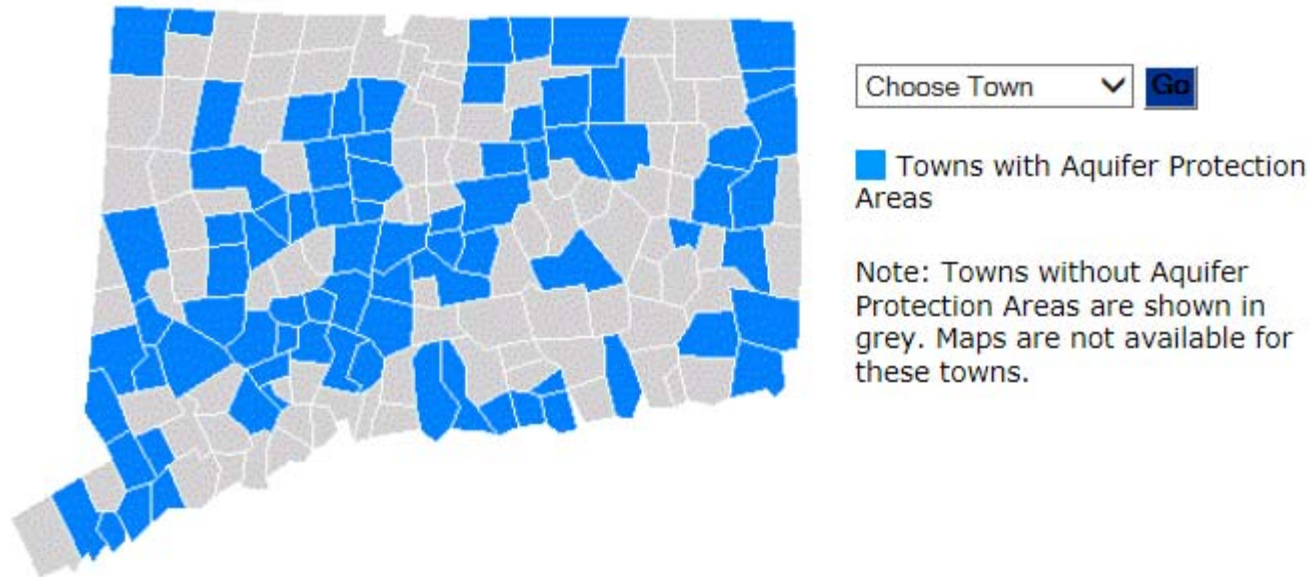
- Most utilities have groundwater supplies, but the larger utilities that serve the most people typically have one or more surface water supplies
- Protection for surface water supplies can cover a small area or a very large area spanning multiple jurisdictions (e.g. Windham Water)



# Module #4 – Source Water Protection



- The area of contribution and recharge for groundwater supplies in sand and gravel aquifers has been defined under the Level A Aquifer Protection Area program for large utilities



- Sand and gravel wells for smaller utilities, and bedrock wells typically do not have an area of contribution and recharge defined; instead they have a protective radius assigned based on pumping rate



# Module #4 – Source Water Protection

- Bedrock wells are particularly difficult to define an area of contribution and recharge for, as the source of water in the fractures could be distant from the well and outside of the area of influence
- Watershed protection for large systems typically includes regular inspections and site walks to check for septic system failures and dumping on watershed land,
- Watershed protection for smaller systems typically includes maintaining sanitary radii and keeping an eye on neighboring land uses



# Module #4 – Source Water Protection



- Connecticut Regional Source Water Protection Efforts:
  - Drinking Water Quality Management Plan <http://dwqmp.com/>
  - Connecticut Source Water Collaborative  
<http://www.ct.gov/dph/cwp/view.asp?a=3139&q=535986%20%20>
  - CT DEEP Aquifer Protection Area Program  
[http://www.ct.gov/deep/cwp/view.asp?a=2685&q=322252&deepNav\\_GID=1654](http://www.ct.gov/deep/cwp/view.asp?a=2685&q=322252&deepNav_GID=1654)

# Module #4 – Source Water Protection



- Some Additional Source Water Protection Resources
  - AWWA Source Water Protection Resource Community  
<https://www.awwa.org/resources-tools/water-knowledge/source-water-protection.aspx>
  - Source Water Stewardship – A Guide to Protecting and Restoring Your Drinking Water  
<http://www.cleanwaterfund.org/files/publications/national/sourcewater-stewardship-guide.pdf>
  - Trust for Public Land: The Source Protection Handbook  
<https://www.tpl.org/source-protection-handbook>
  - Source Water Collaborative  
<http://sourcewatercollaborative.org/>

# Module #4 Responses



## Module 4 – AWC, CWC, JCWC, N. Willington Village, NPU, SCWA, WWW

1. AWC, CWC, JCWC, and NPU have surface water and groundwater sources, WWW relies on surface water, North Willington Village (NWV) and SCWA rely on groundwater sources.
2. Multi-faceted approaches are used for source water protection:
  - AWC & CWC conduct sanitary surveys (Aquarion conducts over 3,000 annually, including land use site monitoring; CWC ensures that sanitary surveys are done each year);
  - SCWA performs visual inspections of source water areas and closely monitors sampling results; NWV examines aerial photos
  - AWC, CWC, and NPU review and comment on land use applications (planning, zoning, and wetlands); CWC reviews and comments on local POCDs and proposed local regulations

# Module #4 Responses



## Module 4 (Continued)

- Aquarion collects samples from streams in its watersheds
- AWC & CWC have spill response procedures
- JCWC and NPU conducts daily, monthly, annual, and spot inspections of watershed and infrastructure, and owns watershed land / sanitary radii
- WWW performs septic inspections near reservoirs and works with 10 watershed towns in Connecticut implementing PA 89-301

### 3. Challenges in source water protection include:

- Aquarion reports that home rule and the various approaches to land use regulation have presented challenges in source protection
- NPU must coordinate watershed protection and enforcement in multiple towns; WWW must coordinate in 10 communities

# Module #4 Responses



## Module 4 (Continued)

### 4. Specific concerns include:

- Aquarion is concerned with high-density affordable housing proposals, road salt (high chlorides), contamination of bedrock aquifer from adjoining residential land uses, and limited enforcement capabilities relative to erosion control in watersheds.
- CWC is concerned with communications with developers; notifications are not always received, and some commissions do not require that CWC's comments are addressed (though this has improved).
- NWV's concerns include septic system failures and open land dumping
- NPU is concerned about dirt bike / ATV activity

# Module #4 Responses



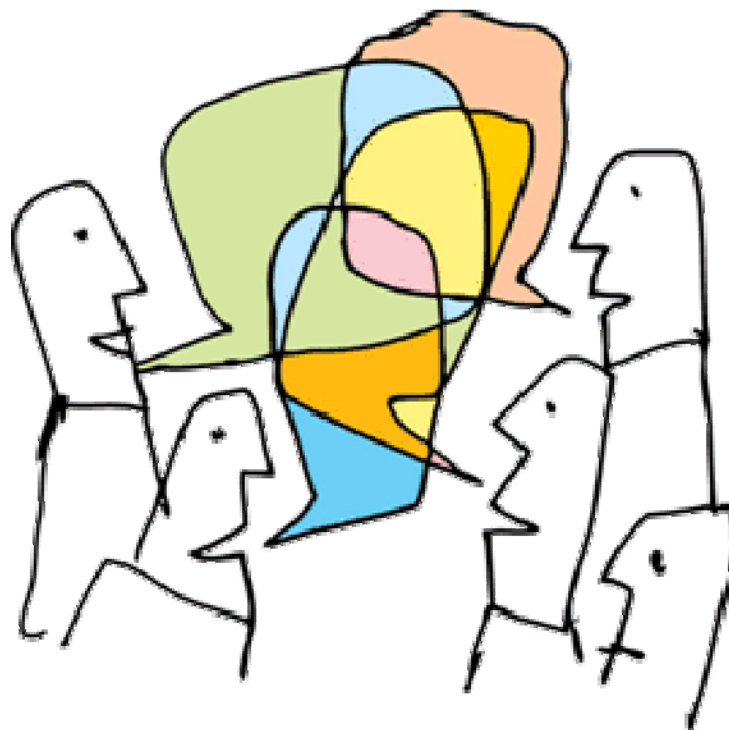
## Module 4 (Continued)

### 5. Recommendations include:

- Aquarion recommends amendments to the State's Affordable Housing Appeals Procedure
- CWC recommends that DPH continue previous training related to watershed inspections and source water protection.
- NWV suggests that less reliance on fuels for transportation would reduce risk of spills
- WWW recommends state and federal funding for purchase of land surrounding water sources; JCWC concurs

6. AWC & CWC cited the AWWA Source Water Protection Committee as a valuable resource. NWV cited DPH and DEEP as valuable resources. WWW cited the Green Valley water advisory committee. NPU recommends watershed associations to help

# Module #4 Discussion





# Module #5 – Joint Use of Resources



- Joint Use, Management, and Ownership of facilities is not typical
- Usually there is defined management and ownership by one entity, even if more than one utility benefits (e.g., one utility produces and sells finished water to another)
- Shared resources is more common, and becoming more popular particularly with municipalities:
  - Shared police services
  - Use of regional planning resources for local planning
  - Regional school districts
  - Common ordering of supplies for public works
  - Shared equipment (plowing, generators)



# Module #5 – Joint Use of Resources



- Many utilities are members of CtWARN (Connecticut Water Agency Response Network) which supports statewide emergency preparedness, disaster response, and mutual assistance matters for public and private water and wastewater utilities
- CtWARN (<http://ctwarn.org>) promotes sharing of resources under predetermined agreements so that aid is expedited; no obligation to respond
- Possibility exists for utilities to develop agreements (possibly through COGs, or WUCCs) to share certain non-emergency resources or increase purchasing power
  - Sharing of leak detection equipment was noted by one small utility as being very helpful

# Module #5 – Joint Use of Resources



- Joint Ownership or Management could occur in the future
  - Former Southeastern WUCC identified several potential regional sources of supply and interconnections to be jointly developed
  - Development of new reservoirs may need to jointly occur in order to demonstrate sufficient need to overcome expected project impacts
  - Potential for this to occur in terms of land protection – utilities could jointly protect land now for future source development

# Module #5 Responses



## Module 5 – AWC, CWC, JCWC, N. Willington Village, NPU, SCWA, WWW

### 1. Shared Resources:

- CWC notes that interconnections and consecutive systems are sharing water
- NWV has equipment available through CtWARN
- NPU shares resources with other Norwich utilities (sewer, gas, electric)
- WWW shares in purchasing bulk chemicals with the Town of Windham and is part of the CT OPM Intertown Capital Equipment Purchase Incentive Program

# Module #5 Responses



## Module 5 (Continued)

### 2. Would you benefit from sharing?

- Aquarion and SCWA reports that it would not benefit from additional sharing or joint ownership
- CWC and NPU are uncertain as large utilities have a lot of purchasing power; JCWC is located distant from interconnections
- NWV suggested that sharing of equipment such as a machine to raise well pumps would be useful, and that it has benefited from borrowing leak detection equipment.
- WWW collaborates as discussed above.

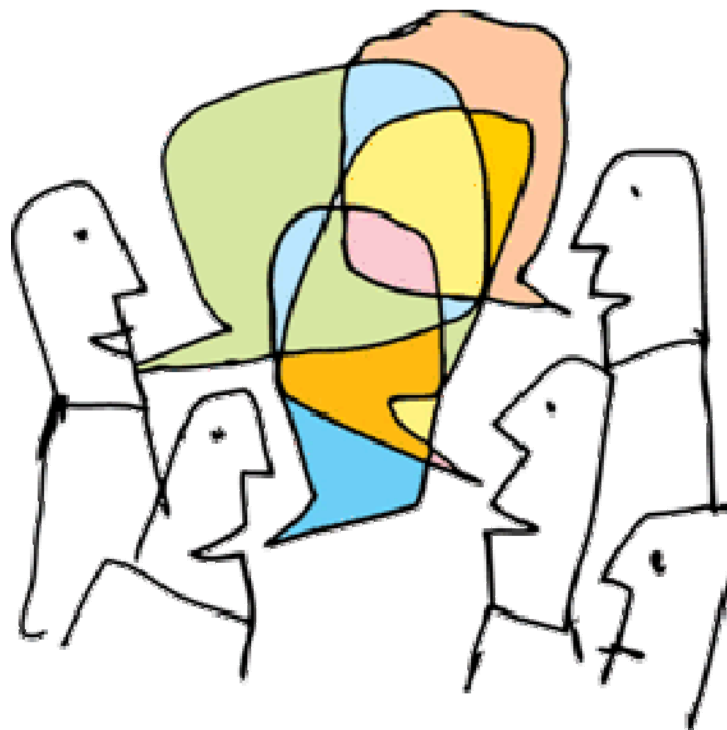
# Module #5 Responses



## Module 5 (Continued)

3. None have agreements for directly sharing resources such as equipment and facilities other than CtWARN, although AWC, CWC, NPU, and SCWA each has agreements in place for interconnections. NPU also reports informal agreements/relationships with other southeastern utilities for assistance
4. Each utility is a member of CT WARN. CWC has provided assistance through the program; SCWA has requested assistance in the past

# Module #5 Discussion



# Module #6 – Fire Protection



- Larger utilities and mid-sized utilities with storage greater than 150,000 gpd typically provide fire protection via hydrants
- Smaller utilities are typically limited to providing fire protection via building sprinklers, if at all
- The responsibility for hydrant maintenance can vary – some hydrants are private
- Some utilities have separate charges for public and private fire protection (per hydrant, per connection, per length)
- Tracking of private hydrants can sometimes go awry – this can lead to lost revenue



# Module #6 – Fire Protection

- Local emergency managers typically want as much access to fire hydrants as possible, but the desire for fire protection can conflict with local low-density planning goals
- It is typically not cost effective for a utility to extend a water main solely for fire protection purposes
- The need for fire protection sometimes provides additional incentive to fund a water main extension project that is already needed



# Module #6 Responses



## Module 6 – AWC, CWC, JCWC, NPU, SCWA, WWW

### 1. Fire protection capabilities:

- Aquarion provides fire protection in its larger systems at the request of, and at cost to, its municipalities.
- CWC and JCWC provides fire protection in its larger systems, too. Capabilities for both utilities vary by system, and distribution improvements are planned where deficiencies are noted.
- NPU and WWW provides fire protection which meets ISO requirements
- SCWA does not provide fire protection

### 2. Tanker trucks, non-potable sources (dry hydrants and ponds), and buried tanks are used in communities (and parts of communities) without water utility fire protection under purview of local fire dept.

# Module #6 Responses



## Module 6 (Continued)

3. Aquarion reports that fires in some areas would strain its public water supply system. Areas of low flow are identified through hydraulic modeling, and the company works with fire departments and reviews ISO ratings. JCWC and NPU is most concerned with densely spaced structures downtown where fires could spread quickly. WWW reports that vulnerability is low in the service area, but wildland fires outside of the system may be difficult to fight
4. For sharing of fire-fighting resources, CWC reports that emergency interconnections could benefit neighboring water systems. NPU suggests that mutual aid agreements help with large fires in outlying areas. WWW reports having significant storage which could be used for fire protection if shared

# Module #6 Responses

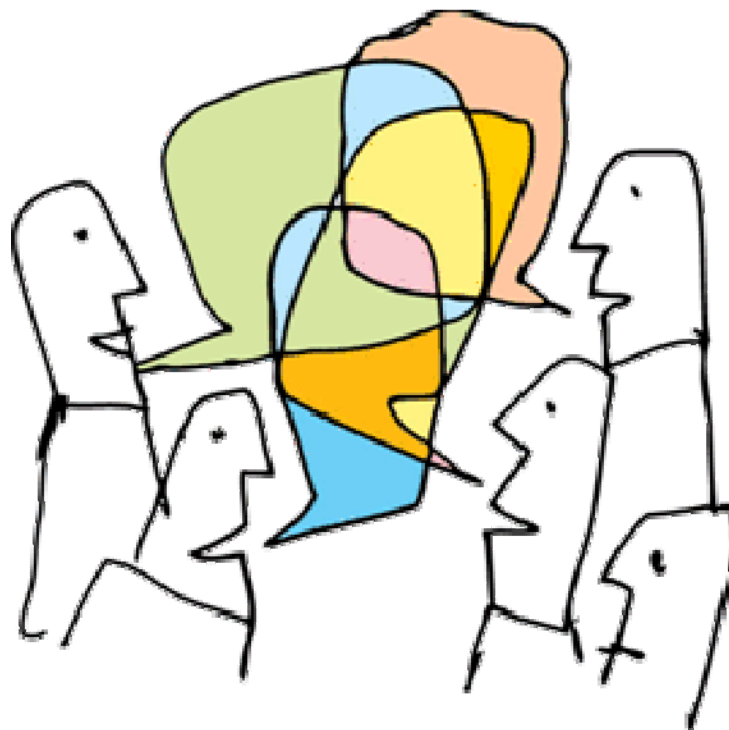


## Module 6 (Continued)

### 5. To address fire protection needs:

- CWC states that communications with fire departments should be kept up.
- NPU is making continued improvements in main size and hydrant replacements, increased storage, and other fire-protection related improvements identified through hydraulic modeling. Coordination with local fire departments is essential
- SCWA suggests that Towns would have financial responsibility for upgrading water systems to provide fire protection.
- WWW suggests that mutual aid agreements should be used to address fire protection needs

# Module #6 Discussion



# Module #7 – Conservation Planning



- Water conservation includes all the policies, strategies, and activities made to sustainably manage water
- Water utilities focus their conservation initiatives on ways to reduce customer use and unaccounted-for water loss (Supply and Demand Management)
- Water Conservation Plans are required under the Water Supply Plan Regulations
- There are 18 utilities with Water Conservation Plans for systems in the Eastern PWSMA
- The State Water Plan identifies numerous pathways forward related to water conservation, particularly regarding reducing summertime demands and outdoor water usage

# Demand Mgmt. / High Volume Users



- Demand Management focuses on tracking customer usage, offering water audits and other assistance to high volume users, rate structures, universal customer metering, hydrant controls, and public education
- High volume users are the top users by demand, typically apartments, condominiums, hospitals, industrial uses
- Nearly all large systems either have a water audit/major user assistance program in place or were developing one
- Nearly all large systems participated in 1990s retrofit program (estimated 5-10% reduction in demands); many still offer kits
- All large systems have either close to 100%, or are 100% metered (except for Groton Long Point)
- All large systems have some form of hydrant control (special keys, SCADA tracking) to prevent/mitigate unauthorized use

# Rate Structures



- Rate structures typically include a basic service charge and a charge for water actually used;
- Small systems typically use a flat rate; for large systems, only Groton Long Point uses a flat rate that increases in the summer
- Some systems include an allotment of water in the basic service charge
- Usage charges can be:
  - Declining (poor conservation incentive);
  - Uniform; or
  - Inclining (best conservation incentive)
- SCWA also includes a water conservation surcharge on its uniform rate
- Most utilities have not yet considered such seasonal rates



# Public Education Programs



- Bill Stuffers
- Direct Mailings
- Website Information / Water Calculator
- Displays
- Community Events / Educational Programming
- Notification of Billing Irregularities
- Pamphlets and Handbooks
- Newspaper Articles / Press Releases
- Public Service Announcements
- Advertising



# Demand Management



- Achieving water savings via demand management conservation is difficult for small utilities, as they do not typically meter customers
- Rate structures for small residential systems are often built directly into some other annual or quarterly fee (condo or association fee)
- Leaks need to be identified via spikes in demand and then evaluated with leak detection equipment

# Supply Management



- Supply Management focuses on source metering, annual evaluation of production and unaccounted-for water, leak detection, system pressure evaluations, and asset management
- All utilities conduct source metering; most conduct annual evaluations of water usage / calculation of unaccounted-for water
  - Large utilities typically conduct daily readings
  - Small utilities typically conduct weekly readings
- Most utilities conduct leak detection surveys – mandated by DEEP diversion permits every five years
  - Many utilities commission a survey based on the percentage of non-revenue or unaccounted-for water usage
- Large systems (and many small systems) have an asset management plan for underground infrastructure – some are more robust than others

# Increasing Peaking Ratios



- Increased peaking ratios in large systems is becoming more common because although ADD is declining, MMADD and PDD are staying the same (or even increasing)
- Even though Margin of Safety (MOS) is calculated based on ADD, sufficient supply must be available to meet MMADD and PDD with adequate MOS
- Therefore, even though water usage (and revenue) declines, the same level of water needs to be planned for and allocated
  - Many diversion permits are based on peak use, some are based on MMADD usage
  - May exacerbate “over-allocation” of basins

# State Water Plan Goals



- The State Water Plan recognizes that summertime demand increases are largely driven by outdoor water usage
- Reducing outdoor water usage in the summer is expected to have a substantial impact on overall water use
- This needs to be accomplished both through a water conservation ethic (non-emergency) and through drought response protocols (including voluntary and mandatory water use restrictions)

# Module #7 – Drought Planning



- 2003 Connecticut Drought Preparedness and Response Plan recommended implementation of four drought stages and responses (Advisory, Watch, Warning, Emergency)
- Recommended measures and indexes to serve as a relative guide for activating a drought stage
- Utilities with surface water supplies typically use the storage thresholds to set drought stages (80% of normal, 70% of normal, 60% of normal, and 50% of normal or less than 50 days of supply)

# Module #7 – Drought Planning



- Since the 2015-2016 drought, many utilities have been reevaluating their drought planning procedures
- Issues include:
  - Moved through triggers too quickly to determine benefit of conservation measures
  - Lack of enforcement capabilities for mandatory conservation measures in some communities
  - Time of year concerns – being at 80% of capacity in March is very different for short-term planning than being at 80% of capacity in September
  - Aquarion has started using drought models to predict timing of triggers in southwestern CT

# Module #7 – Drought Planning



- Revisions to the 2003 Drought Response Plan are pending
- In its 12/16/2016 comments, CWWA supported addition of a fifth stage of “Heightened Drought Awareness”, a cautionary stage where the Interagency Drought Workgroup determines it is appropriate to alert parties who may need to begin planning to implement a Drought Advisory
- CWWA supported continuing to use reservoir storage as a primary rather than a secondary indicator of drought, but suggested that different criteria may be appropriate
  - Days of supply remaining may be more appropriate than percentage of normal supply



# Module #7 – Drought Planning



- CWWA supported strengthening enforcement of water use restrictions and recommended further support for municipalities in adopting the Model Water Use Ordinance
- CWWA supported further encouragement of promotion of water conservation measures and updates to the State Building Code to reduce wasted water
- CIRCA resiliency study may provide some detail on changing drought patterns in Connecticut



# Module #7 Responses



## Module 7 – AWC, CWC, JCWC, NPU, SCWA, WWW

1. Each utility has a water conservation plan (typically evaluated annually). CWC's is dated 2015, NPU's is dated 2011, and WWW's is dated 2012. Aquarion is updating its plan for a 2018 publication, and SCWA is also updating its plan.
2. Many approaches to conservation have been beneficial:
  - Aquarion reports that it uses leak detection, main replacements, meter testing, documentation of unbilled usage, and in-plant usage management to reduce supply side losses. Aquarion uses education, monthly billing, and two-day per week irrigation restrictions in its southwest towns to reduce demands. WaterSmart customer portals are being pilot tested, and an analysis of customer water consumption has been completed. Aquarion is an EPA WaterSense Utility partner.
  - CWC has a water calculator on its web site and uses bill stuffers. The company provided a one-time rebate to customers who reduced usage from the previous year by 10%.

# Module #7 Responses



## Module 7 (Continued)

- SCWA utilizes a variety of approaches but primarily relies on its water conservation surcharge on usage over 20,000 gallons per quarter.
- WWW reports that supply and demand monitoring has helped track water conservation goals

### 3. Most beneficial conservation measures:

- Aquarion, CWC, and WWW each view low-flow plumbing fixtures as the reason for much of the decreasing demands.
- Aquarion anticipates that the irrigation restriction in southwest Fairfield County will have a large impact.
- CWC reports that monitoring unusually high bills and aggressive leak detection have both been beneficial.
- SCWA states that the water conservation surcharge has caused the most reduction.

# Module #7 Responses



## Module 7 (Continued)

- WWW also notes that discontinuing flushing during drought helps meet water conservation goals.
4. For high-volume users, Aquarion reports that 8% of its customers are non-residential but account for 32% of demand. JCWC reports that high volume industrial uses have largely ceased. NPU reports that its top 10 users account for 39% of full billed consumption, and high seasonal users (golf course) increase summertime demand. WWW has several high-volume irrigation and commercial customers.
  5. Aquarion reports that summer peaking ratios are higher than off-season ratios, but believes the two-day watering restriction will begin to address this. CWC notes that ratios haven't changed much in its systems, and vary significantly with the weather. NPU notes that the declaration of a drought in the media appears to have little effect on demand prior to activation of drought triggers. SCWA and WWW notes that its peaking ratios vary seasonally.

# Module #4-7 Responses



## Module 7 (Continued)

### 6. Drought trigger levels:

- CWC utilizes days of available supply and ability to maintain levels in storage tanks to set its triggers.
- Aquarion's approaches vary:
  - For surface water systems, triggers are based on reservoir levels, but the methodology can vary from system to system. For groundwater systems, triggers are based on groundwater levels, specific capacity, or pumping duration.
  - Most Aquarion systems have not hit triggers in the last decade. Stamford and Greenwich are the exceptions. Aquarion is revising its triggers to be based on predictive modeling rather than comparison to historical levels. Triggers will be revised again for full implementation of the Streamflow Regulations.

# Module #7 Responses



## Module 7 (Continued)

- NPU uses reservoir levels for triggers and typically reaches “Drought Advisory” (80%) each summer. NPU is currently evaluating options to consider seasonally-adjusted drought triggers based on predictions of rainfall variation
- SCWA has had to implement voluntary conservation measures twice and mandatory conservation measures once in the past decade
- WWWW stops flushing and disallows municipal irrigation / splash park use before initiating conservation measures for the public

### 7. Aquarion reports the following lessons from the recent drought:

- Conservation is important not only as drought response, but also as an everyday management tool that can improve resiliency and defer the need for costly improvements.

# Module #7 Responses



## Module 7 (Continued)

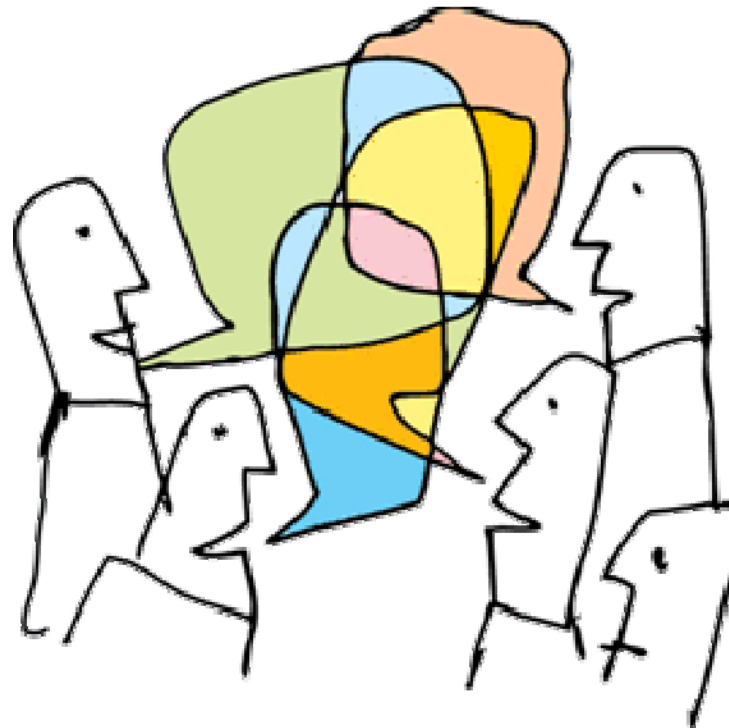
- Where demand is close to safe yield or available supply, more sophisticated drought planning tools and more conservative triggers are needed.
- Conservative drought triggers may lead to more “false” drought alerts but will also provide earlier response when needed.

NPU reports that reservoir levels alone does not seem to be viable for drought planning, particularly in consideration of required streamflow releases

SCWA reports the need to concentrate on establishing more interconnections between its systems and with neighboring systems

WWW reports the need to continue productive communication and coordination with USACE for releases, and need to review and plan for in-reservoir maintenance to increase storage

# Module #7 Discussion





# Upcoming Modules



- Satellite Management / Small System Challenges and Viability
- Minimum Design Standards
- Future Sources, Raw Well Water Quality, Acquisition of Land for New Stratified Draft Wells

## 10. Other Business

# Potential Sept. 13<sup>th</sup> Meeting Agenda



1. Welcome & Roll Call
2. Approval of August Meeting Minutes
3. Formal Correspondence
4. Public Comment Period
5. ESA Modifications Discussion/Update
6. DPH Presentation on Public Act 17-211
7. Integrated Report Topics
  - Follow-up of Previous Modules
  - Satellite Management/ Small System Viability
  - Minimum Design Standards
  - Future Sources, Raw Well Water Quality, and Acquisition of Land for New Stratified Drift Wells
8. Other Business