Yale University
School of Architecture

October 16, 2018

Public Health and Drinking Water

By Lori J. Mathieu, Public Health Section Chief, Drinking Water Section
Public Water System Sustainability

- Connecticut Department of Public Health’s Drinking Water Section
- Drought 2016/2017 – State Drought Plan
- Connecticut’s First State Water Plan
- CT DPH Water Utility Coordinated Committee Water Supply Plan
- Connecticut Institute for Resilience & Climate Adaptation (CIRCA) – Public Water System Vulnerability Assessment & Resilience Plan
- Water Quality and Human Health
- The Future of Public Drinking Water - Challenges
CT DPH Drinking Water Section Responsibilities

- Regulate 2,550 Public Water Systems
- 2.8 million CT Residents Served
  - 3.5 million Total Population
- 550 Community Systems
- 2,000 Non-Community Systems
- 150 Reservoir Systems
- Over 4,000 Groundwater Sources
- Over 350,000 private wells
### Primacy of Safe Drinking Water Act – EPA

- System engineering reviews
- Treatment/source review & approval
- Drinking Water State Revolving Loan Fund
- Drinking water quality
- Oversight of monitoring and reporting
- Ground water rule
- Revised total coliform rule

### State Statutory Oversight

- Water supply planning and regional planning (WUCC)
- Purity and adequacy of public drinking water
- Water company land regulation
- Recreation permitting, sale of excess water, certified operators, enforcement
Responsibilities – 50 Staff

• Administer Drinking Water Protection Laws
• SDWA, Primacy Since 1976
• Water Quantity Oversight – Margin of Safety
• Water Quality Review, over 500,000 Samples per Year
• Review and Approve all Significant Improvements to Public Water Systems
• Review and Approve New Treatment Plants and Systems
• Conduct Sanitary Engineering Surveys, Every 3 or 5 Years
• Review and Approve Water Supply Plans and Regional Plans
• Responsive to all Hazards, Emergency Preparedness
• Review of Sale/Use of 100,000 Acres of Water Company Land
DWS Responsibilities

- Drinking Water State Revolving Loan Fund $150 million Since 1999, with Another $200 million Moving Forward, Infrastructure Projects, Repair, Replace Upgrade, Extend to Pollution
- Proactively Protect Public Drinking Water Sources
- Proactive Enforcement of Violations, Follow-up with System Owner, Issue NOVs and Orders to Assure System Compliance
- System Takeover if Failure, System Review, Violations, etc.
- Tracking of SDWA Compliance and Reporting to EPA
- Sources of Bottled Water in CT and Bulk Water Hauling
- 24/7 Coverage and Response Concerning Public Water System Emergencies
- Track and Report Program Measures
- Administer EPA Grants Since 1980s
- Assure Compliance for all 2500 Public Water Systems
Drought Experience 2016 - 2017
The Reality of Drought is here
Drought Watch is in effect for 6 counties
Drought Advisory is in effect for 2 counties
Drought Data is available

Connecticut Drought Declarations
October 26, 2016

CT Drought Stages
- Drought Advisory
- Drought Watch
- Drought Warning
- Drought Emergency

This assessment was made by the Interagency Drought Workgroup in accordance with the Connecticut Drought Preparedness and Response Plan.
Further information is available at www.ct.gov/waterstatus

www.ct.gov/waterstatus
<table>
<thead>
<tr>
<th>Utility Name</th>
<th>Current Month</th>
<th>Monthly Average</th>
<th>% of Normal</th>
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Statewide Average: 66.9  88.3  76.8

* System uses both groundwater and reservoir supplies.
** Level Below Historical Monthly Average
# Drinking Water Section

**MARCH 2018 - MONTHLY RESERVOIR STATUS SUMMARY**

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<th>Utility Name</th>
<th>Current Month</th>
<th>Monthly Average</th>
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**Statewide Average:** 98.5  96.0  102.6

* System uses both groundwater and reservoir supply.
** Level Below Historical Monthly Average.
Reservoir Capacity - December of 2016

State of Connecticut
Reservoir Capacity Levels - Statewide

Percent

Month-Year

Jan-16 Feb-16 Mar-16 Apr-16 May-16 Jun-16 Jul-16 Aug-16 Sep-16 Oct-16 Nov-16 Dec-16

Current
Historical
Reservoir Capacity - Presently

State of Connecticut
Reservoir Capacity Levels - Statewide

Month-Year

Percent

50  55  60  65  70  75  80  85  90  95  100

Apr-17  May-17  Jun-17  Jul-17  Aug-17  Sep-17  Oct-17  Nov-17  Dec-17  Jan-18  Feb-18  Mar-18

Current  Historical
1960s Drought vs. 2016 Drought

Connecticut, Precipitation, 36-Month Period Ending in December

Jan 2014 to Dec 2016 - 5th Greatest Precipitation Deficit – Based on NOAA Data
Water Supply Plans

The water utility water supply plans prepared by the major water utilities include a water conservation component and an emergency contingency planning component (RCSA 25-32d-3).

Included are triggers for implementing stricter water conservation at various stages during a drought.

Changes needed to emergency drought triggers based on new water usages to start conservation measures and emergency sources earlier. Add triggers that begin emergency source water testing to aid in decision making for water companies and DPH to determine withdrawal rates and treatment before the source is used.

In addition, Water Utility Coordinating Committees in the preparation of their area-wide water supply plans are required to evaluate water conservation as one of their charges. This drought plan incorporates and supplements these efforts.
• DPH Press Release 6/27/16
• Circular Letter #2016-20 on 6/29/16
• Gov. Malloy Press Release on 10/28/16
  • Reduce Consumption by 15%
• Circular Letter #2016-27 on 11/1/16
• Circular Letter #2016-30 on 11/21/16
• Emergency Orders to Aquarion, Waterbury and Danbury issued in October & November

**Drought Preparedness & Response Plan**
• Existing Plan Dated 08/04/2003
• Proposed Plan Dated 09/02/2016
• [http://www.dpuc.state.ct.us/dockcurr.nsf/8e6fc37a54110e3e3e852576190052b64d/e4f2ff5f748b44018525804a0064b45f/$FILE/CT%20Drought%20Plan%20-%202016-10-12.pdf](http://www.dpuc.state.ct.us/dockcurr.nsf/8e6fc37a54110e3e3e852576190052b64d/e4f2ff5f748b44018525804a0064b45f/$FILE/CT%20Drought%20Plan%20-%202016-10-12.pdf)
• Review & provide written comments to PURA by 12/16/16 in Docket #16-10-12
Drought Response

  • Response to 2002 drought and reflects the desire of state agencies to develop more formalized operating procedures in order to improve the effectiveness and predictability of future state drought response activities
  • Provides statewide guidance to assess and minimize the impacts of a drought
  • Plan is currently under revision | Public comment period closed on December 16th, 2016.
  • Plan to be revised by end of 2018
Drought Response

- Changing the current mindset of water companies, home owners and landscaping industry
- Better information, knowledge, training, and tools
- Availability of better systems and components
- Collaboration with businesses in what they tell and sell to the consumer
- Possible Legislation/Policy: Conservation Rates and Local Emergency Ordinance
- Restart of Residential retrofit board, establish new oversight, leak detection requirements, focus on water sense standards
- Initiate water audits of top water users to determine water usage and investigate large amounts of unaccounted for water of these users
The Connecticut State Water Plan

• Brought to you by: The Water Planning Council
  • Steering Committee, Policy and Science & Technical Subcommittees, and Water Planning Council Advisory Group
  • Numerous Stakeholders, including:

• Consulting provided through NEIWPCC by CDM Smith and Milone & MacBroom, Inc.

www.ct.gov/water
Why Do We Need a State Water Plan?

Water is our most important natural resource

Balancing all water needs

Preserving and protecting the state’s public drinking water supply

Increasing frequency of drought

Climate change impacts

Environmental impairments caused by registered diversions

Increasing peak day demands for lawn irrigation

www.ct.gov/water
Requirements of the State Water Plan

**Science**
- Quantities / Qualities of Water
- Present / Projected Demands
- Appropriate Regions
- Data-Driven Decisions

**Considerations**
- Public Health & Safety
- Ecological & Environmental Needs
- Economic Impacts
- Balance

**Engagement**
- Inform State Residents
- Communication & Implementation of Plan
- Incorporate Regional & Local Plans
- Businesses, Towns, Local Health Departments and Regional Governments

**Policy**
- Climate Resiliency
- Infrastructure & Land Use Measures
- Recommendations on Laws / Regulations
- Conservation / Water Reuse
- Inter-Regional Solutions & Sharing

**Public Act 14-163**

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**Drinking Water Section**

[37x173]DPH

[21x391]Drinking Water Section

[131x504]Requirements of the State Water Plan

[139x453]Science

[139x417]• Quantities / Qualities of Water
[139x391]• Present / Projected Demands
[139x365]• Appropriate Regions
[139x340]• Data-Driven Decisions

[550x453]Considerations

[550x417]• Public Health & Safety
[550x391]• Ecological & Environmental Needs
[550x365]• Economic Impacts
[550x340]• Balance

[139x176]Engagement

[139x140]• Inform State Residents
[139x114]• Communication & Implementation of Plan
[139x88]• Incorporate Regional & Local Plans
[157x41]• Businesses, Towns, Local Health Departments and Regional Governments

[550x176]Policy

[550x141]• Climate Resiliency
[550x118]• Infrastructure & Land Use Measures
[550x95]• Recommendations on Laws / Regulations
[550x72]• Conservation / Water Reuse
[550x49]• Inter-Regional Solutions & Sharing

[377x245]Public Act 14-163
Key Highlights of the State Water Plan

- Platform for consistent, informed decision making
- Maintain highest quality drinking water
- Balance in-stream and out-of-stream needs
- Water conservation
- Maintain scientific data

www.ct.gov/water
What We Have Learned:

- CT has ample high quality water for our needs
- The water is not always where we need it when we need it
- We need wise and efficient use of our water
- Climate change will add stress to our natural systems and management systems
- Now is the time to implement this Plan’s priority action items
### What is in the Final Plan?

#### Background (White Papers)
- Current Policies
- Future Options

#### Technical Information
- Water Needs
- Climate Change
- Water Conservation

#### Recommendations

#### Policies

#### Pathways Forward

#### Implementation of Near Term

#### Goals

#### Topics for Future Discussion

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**Not a Solution to all CT Water Issues, but a consensus-based plan to frame future water decisions**
Top Consensus-Based Policy Priorities

- Be Scientifically Based
- Remove Obsolete Registered Diversions
- Encourage Innovative Agricultural Practices
- Increase Access to a Centralized Data
- When appropriate, consider Non-Potable Uses of Class B Water
- Review for Consistency with Other State Plans
- Encourage Regional Water Solutions
- Protect Watershed Lands
- Promote Data-based Water Education Program
- Develop Water Conservation Outreach Strategies

Not a Solution to all CT Water Issues, but a consensus-based plan to frame future water decisions

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Topics for Further Consideration

- Water Conservation
- Regionalization/Interconnections
- Registered Water Diversions
- Aging Infrastructure
- Economic Impacts
- Technology Issues
- Private Wells

- Funding for Implementation
- Future Class B Water for Non-Potable Uses
- Statewide Drought Planning
- Wastewater and Water Reuse
- Water Use Accounting
- Instream Flow

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Comments Received & Responses

~200 comment letters submitted from various stakeholders

• Business Communities
• Citizen-Led Coalitions
• Environmental Advocacy Organizations
• Members of the Public
• Municipal Officials
• Specialty Groups
• State Agencies
• Legislators
• Water Suppliers

Response Considerations:

• Stakeholder consensus was vital during development of the State Water Plan
• Substance of the Plan was heavily reliant on issues that all stakeholders could agree upon during development

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Additional Topics Included in the Plan as a Result of Public Comment Period

- Health Equity
- Drought Planning/Town Involvement
- Environmental Equity
- Harmonizing Energy Priorities
- Transparency / Local Involvement in Water Decisions
- Water as a Public Trust
- Large Water Uses, incl. Bottled Water
- Emerging & Re-emerging Contaminants
- Stormwater Management
- Green Infrastructure / Low-Impact Development

- Dam Removal
- Bio-solids & Other Wastewater Topics
- Climate Change, esp. Inland Flooding Potential & Future Drought Risks
- Agricultural and Industrial Water Needs, Uses & Practices.
Water Utility Coordinating Committees

- WUCC Process Finalization
- Statewide WUCC Plan
- Priorities of Public Drinking Water Statewide

• Reports are posted on our website

www.ct.gov/water
• Water Utility Coordinated Committee (WUCC) Integrated Report drafts will be published for public review and comment in March.*

* Pending approval by the committees
CIRCA Plan

DWS has received a HUD Grant to develop a Drinking Water Vulnerability Assessment and Resiliency Plan.

December 21, 2016 DPH entered an agreement with UConn’s Connecticut Institute of Resilience and Climate Adaptation (CIRCA) to help prepare the Plan.

A stakeholder workshop was held on April 6th, 2018.
CIRCA Plan

• Purpose
  • Following Storm Sandy in 2012,
  • DPH wished to assess and identify public water system vulnerabilities along the four southern counties
  • Improve resiliency of public water systems
  • Identify work items to improve resiliency
  • Recommend action items for water companies to initiate
  • Prepare an internal DPH DWS Emergency Response for DWS Staff preparation and training
Recommendations
Drinking Water Section
Water Quality Challenges

- Unregulated contaminants
- Lead
- Manganese
- PFAS
- Legionella
- Etc, etc
PFAS (Per- and polyfluoroalkyl substances)

- Per- and polyfluoroalkyl substances (PFAS) are a group of man-made chemicals that includes PFOA, PFOS, GenX, and many other chemicals.
- PFAS have been manufactured and used in a variety of industries around the globe, including in the United States since the 1940s.
- PFOA and PFOS have been the most extensively produced and studied of these chemicals. Both chemicals are very persistent in the environment and in the human body – meaning they don’t break down and they can accumulate over time.
- There is evidence that exposure to PFAS can lead to adverse human health effects.
Emerging Contaminant

PFAS – Fire Foam

Figure 1. Conceptual site model for fire training areas.
PFAS – Waste Release & Disposal
Figure 3. Conceptual site model for landfills and WWTPs.
Public Water System Resiliency

• Climate change and extreme storms will represent an ongoing challenge and threat to public health protection
• Drinking water quality will continue to be challenged
• Aging system infrastructure, needed investment
• Number of sustainability challenged public water systems
• State Policy
• Focus on interconnection need and investment
• Protecting the existing and future sources of public drinking water
Thank you!

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