Executive Summary

State Water Plan

Preview and Summary

This State Water Plan has been prepared to help planners, regulators, and lawmakers make decisions about managing Connecticut's water in a manner that is consistent throughout the state with stakeholder-defined principles and available scientific data. The Plan in and of itself is not the solution to Connecticut's water issues, but it is a collection of scientific information, policy recommendations, and forward-looking steps that should help frame future water management laws, regulations, and resolution of specific local issues.

This is the first time that Connecticut has had so much scientific information about water consolidated in a single document (one of the goals from the outset). Furthermore, it is the first time that the collective will and objectives of stakeholders representing water interests in all sectors has been formulated as consensus-based policy recommendations. These two facets of the Plan, its consolidated scientific information and its expression of broadly agreeable policy directives, should serve as the platform for ANY future water management decision in the State of Connecticut.

Connecticut has long enjoyed plentiful water resources to meet its needs for drinking water, industry, environmental health, agriculture, energy, and recreation. The State's drinking water sources are among the highest quality in the United States, and new regulations to protect flow for aquatic habitat represent steps toward improving the balance between water that is used outside of its natural environment and water that remains in its natural environment. However, with the pending influence of climate change, new information on ecological flow needs, and economic trends, this good fortune will continue only if the water in the State is managed wisely and consistently in the future. This Plan will help provide such a platform for future water management decisions.

While the Plan contains hundreds of specific recommendations and ideas, it can best be summarized by its five most important points, as determined in collaboration with the Water Planning Council:





- 1. PLAN FUNCTION: The information in the Plan is not an answer, but a consistent platform for decision making based on sound science, guiding principles, and clear roadmaps. If the Plan is used thoughtfully by law-makers, regulators, and planners, and with the interpretive guidance and recommendations from the Water Planning Council, future water management decisions can be consistent, defensible, and broadly aimed at statewide stakeholder objectives.
- 2. MAINTAIN HIGHEST QUALITY DRINKING
 WATER: Connecticut leads the nation in reserving
 only the highest quality water (Class A) for
 drinking water purposes no other state does
 so as consistently. The Plan reaffirms the state's
 dedication to this high standard into the future
 through both water and land protection.
- **3. BALANCE:** As discussed below under "Goals" of the Plan," the overarching goal of the State Water Plan is to "Balance the use of water to meet all needs." Many river basins in Connecticut have plentiful water, but many others cannot satisfy current needs (instream needs such as ecological health, recreation, and aesthetics, and out-of-stream needs requiring withdrawals) during droughts or even during typical summer conditions. The Plan enhances awareness of both instream and out-of-stream water needs and the necessary balance between them, and offers many ideas for improving this balance. Further planning is needed, however, to formulate equitable response plans to existing and future pressures such as drought, climate change, development, and water diversions.
- 4. CONSERVATION: While Connecticut leads the nation in protections of drinking water quality, the State lags in its water conservation ethic. Many utilities have already taken steps to promote conservation, and EPA's WaterSense program have resulted in a long-term trend of declining water use in Connecticut, but key to preserving the integrity of high quality drinking water into the future is an increased awareness among consumers of its value and vulnerability. Outreach, therefore, including

- an understanding of the economic impacts of water conservation and the vulnerability of high quality water to climate, is one of the most important recommendations in this Plan.
- **5. MAINTAIN SCIENTIFIC DATA:** The plan advocates for the collection and use of scientific information that will help fill data gaps and aid in future planning, and the preservation of ongoing data collection enterprises, such as USGS streamflow gaging and water use reporting. The Plan also advocates for centralized access to available water-related data via a single portal.

What Does the Plan Mean by "Balance"?

Item #3 above in the list of the five most important points is based on the overarching goal defined by stakeholders, that the Plan should help improve the balance of water use in Connecticut. During the planning process, this was frequently interpreted to mean the balance of uses that rely on the removal of water from its natural environment (withdrawals, diversions, etc.) and those that require water to remain in its natural environment (for aquatic ecology, recreation, and aesthetics). Most of the information in the Plan, then, is based in part on this principle of balance, and is extended to use the familiar planning tool of the "Triple Bottom Line," where alternatives or decisions are evaluated based on their social, environmental, and economic factors. One related aspect to the concept of balance, which was widely brought up during the public comment period following Plan development, is water as a public trust. Following Water Planning Council (WPC) discussion of this prevalent comment, it was noted that there is an existing statute as follows: "Sec. 22a-15. Declaration of policy. It is hereby found and declared that there is a public trust in the air, water and other natural resources of the state of Connecticut and that each person is entitled to the protection, preservation and enhancement of the same. It is further found and declared that it is in the public interest to provide all persons with an adequate remedy to protect the air, water and other natural resources from unreasonable pollution, impairment or destruction."





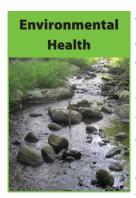
The paragraphs below help explain exactly how (and where) the Plan strives to improve this balance by promoting human and environmental health, with focused awareness of economic impacts and opportunities.



The Plan focuses significant attention on the preservation of high quality water for public health. Specifically, it strongly reaffirms the state's commitment to using only Class A water (the highest quality water occurring naturally) for human consumption (Section 5.2.3.11).

The Plan also endorses land protection measured for both surface water bodies and groundwater aguifers so that this high quality of drinking water can be preserved into the future (Section 5.2.3.1). It is important to note that these land protection measures were deemed to be among the Top-Ten policy recommendations in the Plan. Also among the Top-Ten policy recommendations are three sets of measures aimed at increasing the availability of Class A water in the future, or at least reducing the impact of expanded dependence upon it. The first is increased conservation practices throughout the state, following the example already established by many water utilities (Sections 5.2.3.3 and 5.3.2.1). Second, the Plan recommends that Class B water be considered more routinely for non-potable uses in the future, thereby reducing the consumptive use of Class A water for uses that could be lawfully satisfied with other sources (Section 5.2.3.11). Third, the Plan recommends progressive agricultural practices to help reduce impacts of irrigation on other water needs (Section 5.2.3.6). If these recommendations are codified into policy, laws, and/or regulations, the State of Connecticut will have taken important steps toward securing the highest quality of drinking water in the United States for its citizens well into the future. These steps should be accomplished with the understanding that competing needs for water exist in almost every basin in the state, and that the state's new regulations for reservoir

releases to support ecological needs downstream of water supply reservoirs can limit the availability of Class A water for future drinking water needs. The steps recommended here to preserve, protect, and enhance Connecticut's Class A water supply sources would be an effective step in balancing human health with environmental health.



The Plan sheds a great deal of light on new information concerning ecological flow needs in streams throughout the state. In addition to the state's new regulations on Minimum Streamflow Requirements downstream of certain reservoirs, which the Plan endorses in Section

5.2.3.8, the Plan focuses new attention on estimated flow requirements throughout each basin in order to help maintain good ecological health (see Sections 2 and 3, and the Basin Summary Sheets in Appendix E). While the Plan does not recommend that the estimated ecological flow needs be used in a regulatory context beyond the existing Minimum Streamflow Requirements, the Plan does recommend that they be further studied in order to determine potentially allowable variances during periods of drought, and to better understand the impact of maintaining instream flow on water supply yield, margin of safety, cost and the consequences of not maintaining sufficient flow for ecological needs (Section 5.3.2.11). It should also be noted that the estimates of ecological flow needs are necessarily generalized at the regional basin level, and specific needs in local reaches would require further study. The Plan further emphasizes the need to preserve environmental health by encouraging the state to render unused diversion registrations (or certain unused portions of registrations) obsolete, thereby protecting water bodies from future increases in withdrawals beyond what is already expected and planned for (Section 5.2.3.7). Also, the conservation initiatives discussed above, in addition to promoting the future adequacy of Class A water supply for human health, will also help ensure that more flow



can remain in the streams to satisfy environmental needs (Sections 5.2.3.3 and 5.3.2.1). From a water quality point of view, the Plan recommends certain land management practices aimed at preserving or improving water quality throughout the state (Section 5.2.3.2). While many of the environmental aspects of the Plan focus on ecological needs, "environmental health" is more broadly addressed in the Plan as the protection of aquatic habitat and the protection of natural resources, both land and water, on which human and non-human life depend. With the endorsements in the Plan noted above, the new information on ecological flow needs throughout the state, and recommendations on how to promote improved instream flow and water quality conditions, the State will have taken important steps toward balancing human and environmental health.



The Plan does not specifically aim to increase economic growth and development, but its recommendations do strive to create awareness of the potential economic impacts associated with water management decisions, and also serve as a platform to indicate where water may

be plentiful enough to support future economic growth. In this regard, it may be wise to review the basin summary sheets in Appendix E and individual municipal/utility water supply plans with the Connecticut Economic Resource Center (CERC). It also provides a documented basis for implementing progressive water management strategies where it makes economic sense to do so. Recommendations for better understanding economic impacts of water management are included in Section 5.3.2.5. This section discusses the possibility of an evaluation that compares the implementation of the Plan to NOT implementing the Plan, using either purely financial metrics, or applying Triple Bottom Line methods (social, environmental, and economic), following the example of this section. The Plan also recommends that the WPC determine if there is a consistent way to associate financial value of water for the needs represented in the Plan (including

recreational and environmental) and the different types of utility ownership throughout the state. This section also recommends partnerships with Sustainable Connecticut and colleges and universities to address these informational and analytical needs, and concludes by recommending that the WPC formulate a template such that all water-related proposals offered for legislative consideration are accompanied by a consistent financial analysis. In other areas of the report, the Plan recommends that specific economic impacts associated with policy recommendations or next steps be considered. Section 5.3.2.11 recommends that the WPC study the financial impacts of regulatory reservoir releases associated with Minimum Streamflow Requirements. Section 5.3.2.7, which recommends consideration of Class B water for non-potable uses, clearly states that current and potential uses (new or conversions) should be evaluated for cost-effectiveness, and that case studies should be developed to better understand the potential costs (or cost savings) of infrastructure and treatment. Section 5.3.2.2 makes similar recommendations with respect to the possible case-by-case evaluations of regionalizing water systems. Likewise, Section 5.3.2.1 recommends further examination of the economic viability and potential benefits of conservation incentives and changes in billing frequency.

Background

On July 1, 2014, Public Act 14-163, "An Act Concerning the Responsibilities of the Water Planning Council," became effective in the State of Connecticut. The Act directs the state's Water Planning Council to develop a State Water Plan in accordance with 17 specific









"Not later than July 1, 2017, the Water Planning Council, established pursuant to section 25-33, as amended by this act, shall, within available appropriations, prepare a state water plan for the management of the water resources of the state."

The Water Planning Council (WPC) is comprised of representatives of the four state agencies with oversight or regulatory responsibility for water management:

- Department of Energy and Environmental Protection (DEEP)
- Department of Public Health (DPH)
- Office of Policy and Management (OPM)
- Public Utilities Regulatory Authority (PURA)

The WPC responded to Public Act 14-163 by reviewing methods by which other states had developed statewide water plans, evaluating current practices, future challenges, and opportunities within Connecticut's water management framework, and focusing the work of its Policy Committee, Science and Technical Committee, and Advisory Group on the elements and outline of the Plan. In May of 2016, the Water Planning Council, acting through the New England Interstate Water Pollution Control Commission (NEIWPCC), contracted with CDM Smith and subconsultant Milone and MacBroom to provide professional consultation and facilitation services throughout the development of the Connecticut State Water Plan (the "Plan").

Historically, Connecticut has enjoyed a bountiful supply of fresh water to meet the needs of households and businesses, agriculture, the

Requirements of the State Water Plan

- 1. Identify the quantities/qualities of water available
- 2. Identify present/projected demands for water
- Recommend utilization of water resources to balance public water supply, economic development, recreation and ecological health
- **4.** Recommend steps to increase the climate resiliency of existing water resources and infrastructure
- **5.** Recommend technology and infrastructure upgrades, interconnections and/or major engineering works
- **6.** Recommend land use and other measures to ensure the desired water quality/abundance and promote development in concert with available water resources
- Take into account desired ecological, recreational, agricultural, industrial and commercial use of water bodies
- **8.** Inform state residents on the importance of water resource stewardship/conservation
- **9.** Establish conservation guidelines/incentives for water conservation with energy efficiency consideration
- **10.** Develop a water reuse policy with incentives for matching the water quality to the use
- **11.** Meet data collection and analysis needs to provide for data driven decisions
- **12.** Account for the ecological, environmental, public health/ safety and economic impact implementation will have on the state
- **13.** Include short and long-range objectives/strategies to communicate and implement the plan
- **14.** Incorporate regional and local plans/programs for water use and management
- **15.** Promote intra-regional solutions and sharing of water resources
- **16.** Develop and recommend strategies to address climate resiliency
- **17.** Identify modifications to laws/regulations necessary in order to implement recommendations





environment, energy, and industry. According to a report on a Situation Assessment¹ from 2015:

"According to a water allocation model done in the 1980s, less than 20% of water is used for actual consumptive use. Per person usage has declined dramatically in the recent past, possibly due to water-efficient appliances, conservation, and consciousness of water usage. However, some suggested that peak water usage associated with turf or lawn watering is increasing."

While Connecticut has historically enjoyed plentiful, clean water, unique factors in the state have combined to warrant an evaluation of water management options in the future:

- The recent drought in 2016 raised awareness, even in Connecticut, river basins can become depleted.
- Connecticut is the only state in the U.S. that prohibits wastewater discharges to drinking water sources, preserving our highest quality waters for drinking (Class A). This maximizes health benefits and minimizes treatment costs. This could, however, limit future drinking water sources. High quality waters are critical to stream health and solely relying on these sources to meet consumptive demands could also have environmental impacts.

- New state streamflow requirements downstream of water supply reservoirs are highlighting the ecological need for water, which must be balanced with other water needs.
- Future climate trends in the northeast are uncertain, and planning for adaptation is essential.

It is because of these unique characteristics and uncertainties that a State Water Plan is needed for Connecticut. Ensuring that all needs for water in the future are satisfied involves focusing on new and emerging challenges.



¹ Situation Assessment in Support of State Water Planning Workshop, Podziba Policy Mediation, June 25, 2015.

Goals of the Water Plan

The overarching goal of the Plan, as defined by participating stakeholders in the first workshop of the planning process, has been to "Balance the use of water to meet all needs." More specifically, the goals included protection of public health and quality of life, protection of the environment, cost-effective water management, preparation for uncertain future climate conditions, reliance on science and data, and inclusion of Connecticut citizens in water management. Phrased together, the Plan aims to protect water quantity and quality for all of its current and future uses when regulations, climate, and economic conditions are changing. To do so, it provides technical information and policy recommendations to help inform legislative and regulatory decisions.

The Plan does **not** attempt to prioritize any particular water use or water use category over others; that is, instream needs and out-of-stream needs are not prioritized but are accounted for in each basin's ability to provide for these needs with naturally available water. Likewise, the value of specific uses of water, if currently authorized by state policies and law, are neither advocated nor diminished relative to other uses. Instead, the Plan provides technical information

and guiding principles that may be used to inform decisions across the state on a case-by-case basis, or in the form of future legislation.

Stakeholder-Defined Goals for the State Water Plan

Provide reliable and resilient supply for all uses

Promote public health and quality of life with high quality water

Protect the Environment

Manage water cost-effectively for all uses

Develop an implementable plan

Prepare for uncertain future climate

Use science and data to recommend action

Involve Connecticut citizens in water management

In compliance with the statute authorizing the Plan's development, the Plan aims to satisfy all 17 requirements as specified. Some of these are accomplished fully in this report itself, while others can only be satisfied with ongoing collaboration, scientific evaluations, etc. At a minimum, the Plan provides information and a framework to move forward to address each of the 17 requirements in the State Statute. See Section 1.4.2 of the report for a comprehensive discussion of these requirements and how the Plan addresses each one.

Future Water Management Options to help Achieve Plan Goals

Policy and Planning Options

- Land use practices and protection
- Water conservation, incentives, rate structure
- Incorporation of existing local and state plans (i.e., water supply, energy, land, conservation)
- Regionalization of water supply and appropriate interconnections
- Identify funding mechanisms for Plan implementation and updates
- Develop monitoring plan for Plan implementation
- Statewide drought planning and mechanisms to enforce water restrictions
- Future Class B water for non-potable uses
- Water use accounting
- Ground water and private well monitoring and protection

Technology Options

- Technology and facility improvements / replacement
- Water reuse and greywater use
- Wastewater management
- Stormwater management
- Desalination
- Flood management
- Leak detection
- Real-time flow monitoring

Regulatory Options

- Address registered diversions
- Implement instream flow regulations
- Changes to laws / regulations

Outreach Options

- Public education (short and long term goals)





What the Plan Contains and Does Not Contain

This report is the final report of the Plan development process, and will be turned over to the WPC to finalize it by December 31, 2017. As such, it contains the following:

- Overview of the Goals and Planning Process (Sections 1 and 4)
- Current Condition Assessment (Technical and Policy – See Section 2)
 - Current water use patterns and natural water availability
 - Current water quality
 - Current water policies and management structure
 - Assessment of land conservation and economic conditions
- Future Condition Evaluation (Technical and Policy
 See Section 3)
 - Future water needs compared with natural water availability
 - Potential impacts of climate change on future water availability
 - Potential effectiveness of water conservation strategies
 - Future options for progressive water management
 - Challenges to meeting future water needs and/or applying the progressive options

- Recommended Policies for legislative and regulatory guidance, developed by stakeholder consensus (Section 5)
- Recommended roles for the WPC, its committees, and conflict resolution strategies (Section 5)
- Pathways toward resolution for issues that require more information, more outreach, or consensus-building before consensus-based recommendations can be made (Section 5)
- Implementation Guidelines, including funding strategies, local participation, use of technical information, adaptive water management, tracking against the Plan's goals, etc. (Section 6)

Understanding what the Plan does is equally important to understanding what this Plan does NOT attempt to do. The Plan is not the solution to all of Connecticut's water issues, nor is it an attempt to resolve them all. Rather, it is a framework for future decision making; technical information combined with policy recommendations and recommended next steps for data expansion and outreach should serve collectively to inform legislative and regulatory decisions, as well as project-specific decisions. The Plan does not rule out any specific water use, nor does it elevate or diminish the value of any particular use relative to other uses. Instead, it will help decision-makers determine the viability of future water needs and uses scientifically, and with consistent guiding principles.



How to Use This Plan

This is the first time that Connecticut has had so much scientific information about water consolidated in a single document. Furthermore, it is the first time that the collective will and objectives of stakeholders representing water interests in all sectors has been formulated as consensus-based policy recommendations. These two facets of the Plan, its consolidated scientific information and its expression of broadly agreeable policy directives, should serve as a guide for future water management decision-making in the State of Connecticut.

The Plan provides technical information and guiding principles that may be used to inform decisions across the state or on a case-by-case basis. The Plan's information may be used by:

- Lawmakers to collaborate with the Water Planning Council and formulate future legislation
- Regulators to adapt water and land regulations to changing needs and conditions
- Utilities, river basin planning groups, and other water users as a framework for decisions
- The Water Planning Council to inform decisions and recommend legislation.
- Citizens of Connecticut to better understand the water needs and availability at the regional basin scale, and to understand the consensus-based principles of the stakeholders who represent Connecticut's water interests.

The Plan does not attempt to prioritize any particular water use or water use category over others. Likewise, specific uses of water, if currently authorized by state law and regulation, are neither advocated nor diminished relative to other uses, and the Plan does not attempt to resolve site-specific or situational issues.

Specifically, the Plan includes maps and data summary sheets on each of the state's 44 regional river basins and compares water that is naturally available in each basin to the current and future needs for water in and out of the streams. These tools are not definitive statements about the adequacy of water to meet all needs, but rather, they are screening tools to indicate where risk is higher or lower regarding a basin's ability to meet all needs into the future. As such, they have been used (and may continue to be used) to help establish priorities for specific initiatives and future legislation. Examining the balance between water availability and all of the water needs in a basin under average and hydrologically stressed conditions can inform decisions scientifically, establish legislative priorities, and help promote awareness of water as a limited resource. Examples of how to interpret the technical information are included below in this Executive Summary under the heading, "Technical Findings."

Additionally, the Plan is a repository of consensusbased values of the stakeholders who participated in the development of the Plan. Its policy recommendations reflect their collective objectives for water management, and are intended to provide a basis for legislation, regulations, and situational decisions that consistently apply the views of stakeholders across the state.

A Collaborative Approach to Planning

As many other states have discovered, a central tenet to successful planning is the building of consensus for recommendations. Because consensus building

- State regulatory authorities
- Environmental advocacy groups
- ➤ Watershed groups
- Water utilities (public and private)
- Agriculture
- Industry
- Energy
- Golf courses
- Academia and science
- Public health officials
- Council of governments (COGs)
- Wastewater

Stakeholders

is so important to an implementable plan, Connecticut's process included six workshops with stakeholders representing a broad variety of water interests, including (but not limited to) those in

the box on the left.

These stakeholders participated in six facilitated workshops during the planning process, as outlined in the workshop plan shown on the right. These workshops were open to the public, and in addition to facilitated discussions with stakeholders, each workshop allocated time for public comment. The figure also indicates that public outreach is being accomplished through a series of public meetings, during which citizens of the state offered ideas, asked questions, voiced concerns, and engaged in direct dialogue with state officials and the planning consultants.

The workshops, supported also by WPC subcommittee meetings, resulted in consensus on policy recommendations (Section 5), as well as next steps, or "Pathways Forward" on issues for which consensus could not reasonably be achieved within the one-year time frame. The Pathways Forward (also in Section 5) include suggested

ways to enhance available information, increase outreach, and establish partnerships to further the collective understanding of water strategies. As these issues mature, the WPC can shepherd them through a formal decision process by which they can result in additional policy recommendations.

A full discussion of the stakeholder and public outreach efforts is presented in Section 4 of this report. Additionally, a State Water Plan Fact Sheet is included as Appendix A. This fact sheet has been distributed at meetings and workshops, and is also available online via the Water Planning Council website (http://www.ct.gov/water).

Facilitated Workshops to Support Plan Development

PHASE I Workshop #1: Plan Framework Goals and Water Management Options Public Meetina

PHASE II Workshop #2: Refinement of Options Workshop #3: Policies vs. Pathways Workshop #4: Paths Forward / Decision Framework(s) Workshop #5: Policy Recommendations Workshop #6: Plan Recommendations



Summary of Key Findings and Recommendations

Technical Assessment

Key to making informed decisions about future water management is a sound technical understanding of the condition of Connecticut's river basins, including the amounts of water flowing in each, and the competing demands for this water. This plan does not evaluate each municipality or water utility on its own, but rather, evaluates water availability and use patterns on a regional basis, delineated by the tributary basins to the major rivers in Connecticut. Figure ES-1 illustrates the major basins in the state, and also outlines the 44 regional basins that are tributary to these basins, and for which technical assessments are presented in this report.

Each of the 44 river basins was evaluated for water availability (surface water and potential groundwater recharge), as well as current and future water needs, both out-of-stream and instream. For the purposes of

this report, the term "out-of-stream" water use refers to water that is removed from a stream or aquifer, some of which may be returned as wastewater at another location. These are sometimes referred to as "consumptive" water uses. Private residential wells are an out-of-stream water use, and about 23% of the state's population use private residential wells. "Instream" water use refers to water that remains in its natural environment (generally streams or lakes) for ecological, recreational, or aesthetic purposes. Instream uses are also sometimes referred to as "non-consumptive" water uses.

The goal of the technical assessment was to provide a relative basis for determining which river basins may be at risk of not being able to satisfy all instream and out-of-stream needs, either now or in the future. Likewise, the evaluation identified river basins that are likely to have an abundance of water – different management policies may apply to basins with different levels of risk. Figures ES-2 and ES-3 provide an illustrative example of one way in which indicators of

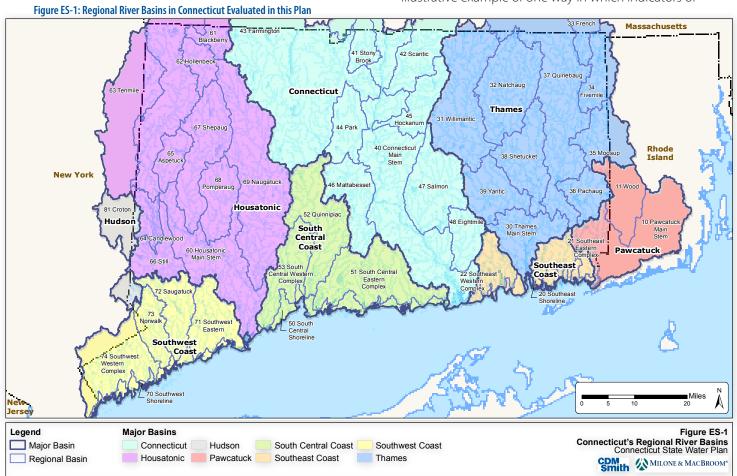


Figure ES-2*: Current River Basin Risk Indicators** - Annual Average Basis

*This also appears in Section 2 as Figure 2-6. ** "Risk" refers to a basin's ability to satisfy water needs, in this case, instream and out-of-stream needs.

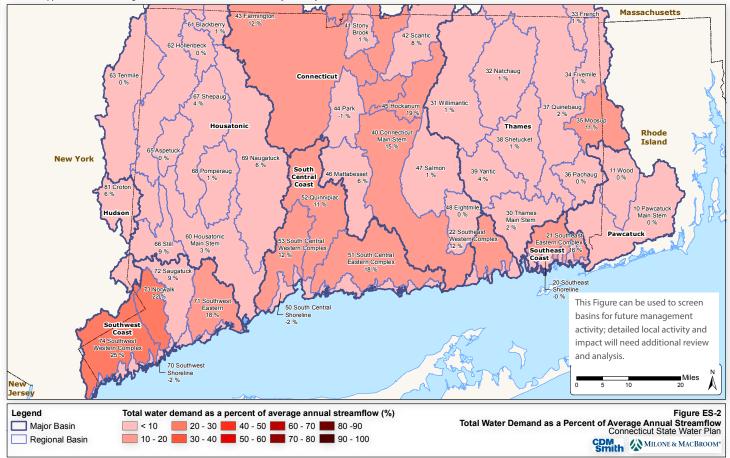
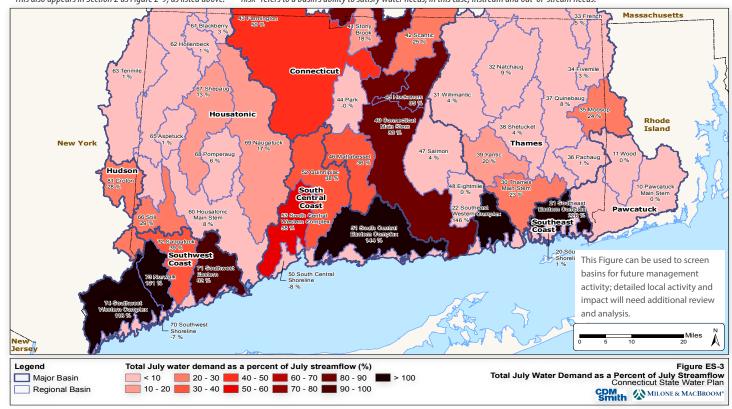


Figure ES-3*: Current River Basin Risk Indicators** - Typical Summer Conditions

*This also appears in Section 2 as Figure 2-9, as listed above. ** "Risk" refers to a basin's ability to satisfy water needs, in this case, instream and out-of-stream needs.

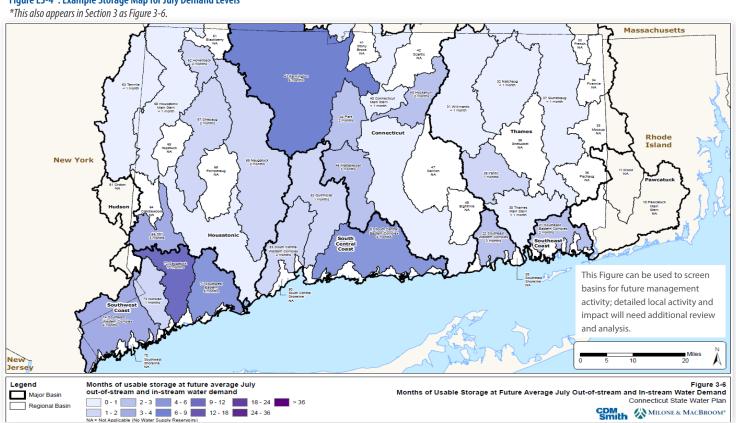


basin risk are characterized in this report. For planning purposes, this risk is defined as the possibility that a basin may not satisfy all instream and out-of-stream needs under all conditions, and is measured as the percentage of available water for which there is documented demand or need. It does not necessarily suggest that a basin is at risk of overuse, but indicates on a relative basis which basins are using more of their available water than others, and by how much. Figure ES-2 presents a current condition assessment based on annual average statistics, and Figure ES-3 presents a current condition assessment based on typical summer conditions, during which demands are generally higher and natural water flows are usually at their lowest. The report also presents results for year 2040. Detailed studies and river basin models would characterize the dynamics of specific basins in more detail (and the Plan suggests ways of accomplishing this in Section 3 and again in Section 6), but the results in this report can be used to screen basins for management activity based on their relative potential for use and overuse.

These maps clearly indicate that while many basins in the state appear to have plentiful water under average annual and typical summer conditions, other basins may not be able to satisfy all water needs all the time (including both instream and out-of-stream needs). The overarching goal of this Plan is to recommend policies and strategies aimed at improving the balance of meeting these needs under all conditions.

Certain caveats are important when considering the maps of basin risk. First, the results are generalized to the basin scale, and are not indicative of potential risks to small tributaries, river reaches with localized well fields nearby, or other local subsystems of the basin. Second, many of the basins contain reservoirs, and stored water can be an effective buffer against the basin's risk of not satisfying all needs under all conditions. To address this in the report, maps of total storage in each basin are included (Figures 2-10 through 2-12), and an example is shown below as Figure ES-4. Third, some basins may include additional water flowing in from upstream basins, whose quality may be suitable for certain non-potable needs and instream needs, but not necessarily all water needs. Fourth, drought conditions are often worse than typical summer conditions, and normal summer risks may be amplified during droughts.

Figure ES-4*: Example Storage Map for July Demand Levels



Because of these caveats, the maps and diagrams in this report are intended to be used as screening tools only – that is, tools to compare the potential risks in basins relative to each other, but not to definitively determine if or where a river basin may be unable to satisfy all of its water needs.

To help address the fourth caveat above, and to illustrate the water use patterns in each basin in comparison to water available for these uses, basin summary sheets were created for all 44 regional basins in Connecticut. The summary sheets are included in Appendix E, and tabulate and illustrate the available water under average annual, typical summer, and "worst-case" summer conditions, where "worst cast" is approximated as the historical month of July in

the past thirty years with the lowest recorded flow. In total, these summary sheets include:

- Water that originates and occurs naturally within the basin
- All documented out-of-stream water uses (water withdrawals from surface water or groundwater)
- All required reservoir releases, historic or pending (site specific)
- Estimated ecological flow needs (basin-wide)
- Unused diversion registrations and permit volumes (water that is administratively allowed to be withdrawn, but has not been taken historically).

An example summary sheet, Figure ES-5 for the Quinnipiac basin, a good example because it

Figure ES-5: Example Basin Summary Sheet for the Quinnipiac Basin **Basin Water Summary** IN/YR MGD Precipitatio 43.7 345 Regional Basin Quinnipiac Wastewater Discharge 3.2 25.1 Regional Basin 52 No. 22.8 179 South Central 2.1 16.3 Major Basin Š Coast 9.3 Size of Basin in Cl 12.4 98 166 (mi^2) Estimated Potential Recharge (EPR) Average Conditions (MGD) Water in Basin Current Total Demand Future (2040) Total Demand July Conditions (MGD) Current Total Demand Future (2040) Total Demand Surface Water De Demands In-stream Needs Needs Release Reg Reg 40.52 40.03 Current Conditions, ADE Future (2040) Conditions, ADE 12.40 13.06 143.0 143.0 13.61 12.85 Current Conditions, MMADI Future (2040) Conditions, MMADI 122 1. Average Daily Demand (ADD) is the average estimated water withdrawn from the system on any day in the year. 2. Maximum Monthly Average Daily Demand (MMADD) is the average estimated daily water withdrawn from the system during July, which typically has the highest average 3. Net groundwater demand accounts for the difference between groundwater withdraws and estimated recharge through on-site wastewater systems.

6. Required Reservoir Releases reflect estimated Minimum and Multi Level Release Rule amounts. They do not account for possible exemptions. The in-stream needs are calculated using the USGS StreamStats program. The OSO is presented for

4."Water in Basin" accounts for water originating within the basin (CT portion only). Not all water in a basin is accessible or classified to support all existing or potential uses 5. "Water in Basin - Extreme" refers to the lowest July streamflow on record during the period 1985-2015.

average annual conditions, and a range is provided for July conditions, based on the Q80 (Low In-stream Needs) and Q50 (High In-stream Needs) for the July-Oct bioperiod.

Disclaimer: This Water Basin Summary sheet is part of a State-wide screening tool and is not intended to be used as stand-alone guidance.

CDM MILONE & MACBROOM

includes all of the elements listed above, and demonstrates potential risks under certain conditions. A guide to understanding the summary sheets is included in Appendix E, and the calculations are discussed in Sections 2 and 3.

As an example for how the basin summary sheets can be interpreted, Figure ES-5 illustrates that on an average annual basis, there is sufficient water in the basin to satisfy current instream and out-of-stream needs (solid bars), but that if all unused registrations and permits were exercised in the future, the available water would be insufficient. We can draw the same conclusion for typical summer conditions, but note that for extremely dry conditions (the shortest blue bar), there is not sufficient water even for documented out-of-stream water needs in this basin. This was evidenced during the 2016 drought, during which portions of the upstream river were nearly dry.

These screening tools were vetted using some of the recent knowledge about impacts to river basins during the 2016 drought. Several examples are discussed briefly here:

Quinnipiac River Basin: The maps and summary sheet, discussed previously, suggest a moderate-to-high risk that the Quinnipiac Basin may not be able to support all of its needs during average annual conditions or typical summer conditions. However, there are 1-2 months of storage in the basin that can partially offset concerns about short-term seasonal droughts. The basin summary sheet, however, suggests that during severe drought conditions, there will not likely be sufficient water in the basin even to satisfy all out-of-stream needs (though the tools do not indicate specifically where such problems might occur). Indeed, during 2016, flow in the mainstem Quinnipiac dropped to approximately 1 cfs near the town of Southington.

Pomperaug River Basin: The maps show that under average conditions and typical summer conditions, the Pomperaug River Basin can likely satisfy its instream and out-of-stream needs (requiring

~55% - 65% of naturally occurring water). However, the basin summary sheet for the Pomperaug Basin suggests that during significant drought conditions (similar to 2016), the out-of-stream needs amount to ~80% of available water, and there would not be enough remaining water expected to satisfy instream needs. Indeed, during 2016, anecdotal evidence suggests that certain reaches in the basin were nearly dry. Again, the screening methodology does not pinpoint the location or severity of stream or aquifer depletion, but the tools can be used to identify the relative level of risk under various conditions.

Farmington River Basin: Similar to the Pomeraug, the Farmington Basin shows only moderate risk during average conditions, but the risk rises sharply during typical summer conditions. During severe drought conditions, it is not expected that there will be enough water flowing naturally in the basin to satisfy all needs, or even the out-of-stream needs on their own. However, much of the storage in the state is located in the Farmington basin, and the storage map in Section 3 indicates that the basin can store between 6 and 9 months of supply at expected July demand levels. This would be an effective offset to concern about seasonal drought, though the findings suggest that even this basin could be susceptible to multi-year droughts. And to vet the screening process, most of the basin was sufficiently supplied during the 2016 drought, but (as suggested by the comparison of available water to out-of-stream needs), the Coppermine Brook (a tributary) did run dry in 2016. This is a good example of how the screening tools can be used to indicate the presence of risk, but not pinpoint the specific location, and also to illustrate potential offsets on a spatially-averaged basis.

In summary, Table ES-1 helps explain how many basins in Connecticut may be at risk over the next 25 years of not meeting all of the water needs (again, the "balanced" needs of instream and out-of-stream uses). While generally, the results suggest that most basins can supply adequate and safe drinking water under most conditions (especially with the benefits of storage, which is not accounted for in the table),



Table ES-1: Number of Basins at Risk of Not Satisfying Water Needs*

Hydrology and Demand	Approximate Number of Regional Basins Potentially at Risk of Not Satisfying Needs (out of 44)			
Conditions (Today through 2040)**	Out-of-Stream AND Instream Needs	Out-of-Stream Needs Only	Instream Needs Only	
Average Annual	4	0	1	
Typical Summer	13	7	1	
Severe Drought Month	44***	22	44***	
Average Annual, with all unused registered diversions**** exercised	22	15	NA	

*This table does NOT account for storage, which can offset short-term seasonal risks significantly

they also demonstrate that some basins may not be able to satisfy all instream and out-of-stream needs in all locations and at all times under all circumstances (potential stress is likely to be localized, and not universal throughout any basins). Further discussion is available in Section 7.

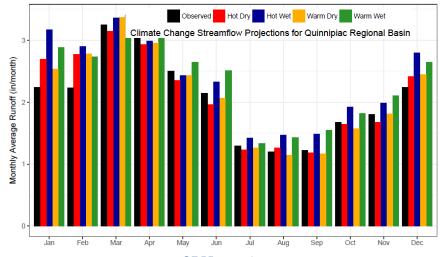
Further technical analysis was conducted to estimate potential ways in which the balance of water needs and water availability could be affected by **climate change** (a future unknown), and by **water conservation** (a way of hedging against known or unknown future conditions, and a consensus-based theme of several policy recommendations in this Plan).

Climate Change: The technical study evaluated the potential range of future climate trends as they could be manifest in monthly precipitation, monthly temperatures, and monthly streamflow throughout the state. Methods and results for all 44 basins are presented in Section 3.1.4 and Appendix F. Again, using the Quinnipiac Basin as an example, Figure ES-6 illustrates an

important finding. Results from more than 100 Global Climate Models (GCMs) averaged into four possible future scenarios were used to define the ranges of possible future conditions in Connecticut, and the trends consistently suggested that on average, annual rainfall and runoff will be higher in 2040 than they are today. On a monthly basis, however, changes

are distributed throughout the year; Runoff is likely to be significantly higher in the future in winter months, and maybe only modestly lower in summer months. Additionally, the potential for reservoir refill from higher winter runoff could positively affect the reliability of certain water supplies. These results, fairly consistent across the state, suggest that future flood risks could increase, and also serves as a warning of potentially drier summer conditions even though more rain is expected annually. Additional work is recommended to address the following:

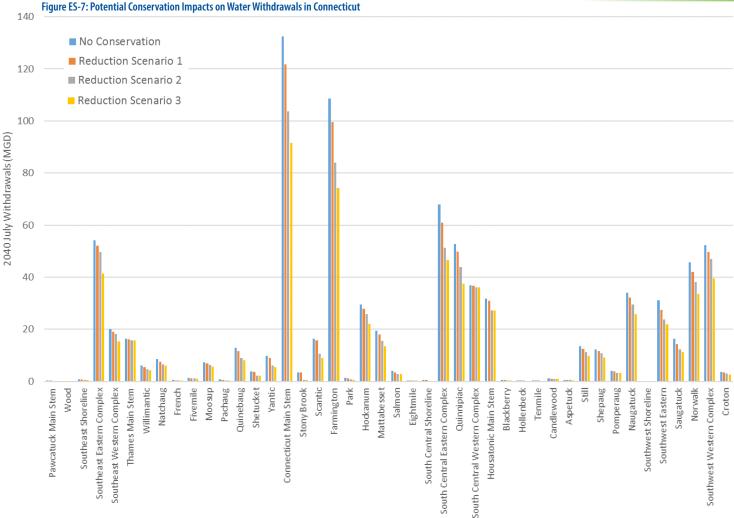
Figure ES-6: Example Climate Change Impacts on Runoff in the Quinnipiac Basin by 2040



^{**}No major changes in demand are expected between now and 2040. Climate change results suggest only slightly less water availability in the summer, which may be offset by storing projected higher runoff values earlier in the year.

^{***}This does NOT mean that 100% of rivers or river reaches are at risk, but rather, that there may be tributary reaches in each basin that could be at risk.

^{****} Most water diversions in Connecticut were grandfathered from permitting through a registration process. Registered volumes do not necessarily represent actual overallocation of water as many remain unused or underutilized. Although there may be practical limitations to using their maximum capacity, full use of some unused registrations could put rivers in jeopardy of not meeting all instream and out-of-stream needs. See Sections 5.2.3.7 and 5.3.2.3 for recommendations.



- Evaluation of coastal flooding frequency, duration, and depth based on storm surge patterns and sea level rise.
- Evaluation of potential impacts to water supply in specific basins known to be at risk of not satisfying all future water needs (per the information in this report).
- Evaluation of potential longer-term climate trends, extending 50 or 100 years into the future

 not as predictions, but as a way to bound the ranges of possible conditions for which adaptive and preemptive measures can be taken.
- Follow a growing nationwide trend of formulating preemptive responses to ANY future climate trend (sometimes referred to as "no regret" decisions), which will yield benefits regardless of the way the climate trends at low cost and

low risk. Examples may include system-specific drought indicators, early warning systems for floods, incentives for green infrastructure to promote recharge, reduce runoff peaks, and help control nonpoint source pollution.

Water Conservation: The technical analysis also estimated upper bounds on expected opportunities to conserve water in each basin, based on basin demographics, historic use patterns, and national standards for potential water savings over time through fixture replacement, tighter plumbing codes, and active response to drought conditions in the summer. Results are presented and discussed in Section 3.1.3. Figure ES-7 illustrates upper limits of potential reductions in water withdrawals for out-of-stream uses under three potential conservation scenarios; current federal guidelines for indoor water conservation (Scenario 1), aggressive conservation measures for indoor water use (Scenario 2), and



aggressive indoor conservation measures coupled with 20% reduction in outdoor water use in the summer (Scenario 3). Results suggest that water conservation could be an effective management tool to improve the balance between instream and out-of-stream water uses in basins where this balance may be difficult to achieve. The analysis focused only on household water conservation, and did not attempt to estimate savings in other uses, such as industrial, energy, agriculture, etc.

Policy and Water Management Background

To establish a platform for the recommendations in this Plan, Sections 2.2 and 3.2 of this report offer overviews of current programs, initiatives, regulations, and responsibilities for water management in Connecticut, as well as options for future water management strategies and the challenges that must be overcome. These overviews, originally presented and posted to the WPC website as

Table ES-2: Future Water Management Options to Help Achieve the Plan's Goals				
Category	Options			
Policy and	Land use practices and protection			
Planning	Water conservation, incentives, rate structures			
Options	Incorporation of existing local and state plans, such as water supply, energy, land conservation, etc.			
	Regionalization of water supply and appropriate interconnections			
	Identify funding mechanisms for Plan implementation and updates			
	Develop monitoring plan for Plan implementation			
	Statewide drought planning and mechanisms to enforce water restrictions			
	Future Class B water for non-potable uses			
	Water use accounting			
	Groundwater and private well monitoring and protection			
Technology	Technology and facility improvements/replacement			
Options	Water Reuse and Greywater use			
	Wastewater management			
	Stormwater management			
	Desalination			
	Flood management			
	Leak detection			
	Real-time flow monitoring			
Regulatory	Address registered diversions			
Options	Implement instream flow regulations			
	Changes to laws / regulations			
Outreach Options	Public Education — Short and Long Term			

individual white papers, are provided both to help educate readers, and to help evaluate how future water management can best be accomplished. Section 2.2.1 offers insight into the following:

- The roles and responsibilities of the four state entities who collectively manage and regulate water in Connecticut (DEEP, DPH, OPM, and PURA), as well as areas of overlap in their responsibilities. Like many states, Connecticut relies on more than one agency to regulate water management activities. The current regulatory framework for water management includes certain roles that function toward different objectives, and toward the overarching goal of the Plan, which is to satisfy all current and future water needs.
- The structure of the Water Planning Council and its supporting committees and work groups, all of whom are tasked with orchestrating the development of the State Water Plan
- Current water management programs in the state and the organizations responsible for their oversight.

This report also describes current land management practices and how they relate to water policies, watershed protection, aquifer protection, etc. Section 2.2.2 is devoted to this topic, as a platform from which to evaluate future management opportunities. Ultimately, water and land management policies are intrinsically linked in Connecticut: some water management policies and programs affect land management, and some land management policies and programs affect water management.

Section 3.2.1 offers an overview of the water management options identified by statute and by stakeholders for consideration in future decisions (see Table ES-2). Coupled with these options are the challenges that Connecticut will face when deciding upon and implementing new water strategies, and these challenges are discussed as contextual background in Section 3.2.2, and listed below in Table ES-3.





Table ES-3: Future Water Management Challenges

Overarching Challenges Inherent in the Connecticut Regulatory Framework* (Section 1 of this Report)	Challenges Unique to Certain Water Uses or Sectors* (Section 2 of this Report)
Connecticut's Established Home Rule	Water Allocation (registered diversions, small unreported uses, etc.)
Levels of Authority during Plan Implementation	Adoption of Instream Flow Requirements as an Ecological Water use
Connecticut's Prohibition of Class B waters for human consumption	Public Water Supply Issues (Coordination with WUCC process, Barriers to regionalizing small supplies, changes in future consumption)
Public Perception and Uncertainty (including lack of a "conservation ethic" in Connecticut)	Watershed and Groundwater Protection Where Incentives are Lacking
Funding Constraints	Water System Vulnerabilities and Security Issues
Data Gaps	The Food-Energy-Water Nexus
Understanding Economic Impacts	Emerging Contaminants
	Aging Infrastructure
	Funding for Water Reclamation
	Constraints on Water and Sewer System Expansion

^{*}The Challenges are not presented in any specific order of importance, and this report explains that many of these challenges also have beneficial histories that will extend into the future for the benefit of Connecticut's citizens and environment.

New Policy Recommendations

With the above information as background, stakeholders formulated policy recommendations aimed at guiding future legislative, regulatory and planning decision for water throughout the state. These recommendations do not solve all of Connecticut's water problems, nor do they elevate or diminish the value of any particular water use relative to other uses. Rather, these policy recommendations should become guiding principles in future decision making for:

- Future water legislation
- Future regulations on water allocation and management
- Future decisions on specific water projects
- Future activities to help keep Connecticut's water planning process thorough, consistent and data-driven

The policy recommendations in this plan are presented in Section 5.2. They were drafted, reviewed, revised, and agreed upon by the WPC Policy Subcommittee under the guidance of the Plan's consulting team. They were all drafted in response to stakeholder directives from the series of workshops conducted during the one-year planning process. Their themes are listed in no particular order of priority or importance, and include the following:

- Land Use Practices and Protection Related to Water
- Water Quality Impacts of Land Use
- Water Conservation
- Consistency with Existing State Plans (for example, the State Plan of Conservation and Development)
- Monitoring for Plan Implementation
- Agricultural Practices
- Unused Registered Water Diversions
- Implementation of Minimum Stream Flow Regulations
- Outreach, Education and Public Engagement
- Regionalization of Water
- Class B Water for Non-Potable Use
- Data
- Coordination with Water Utility Coordinating Committees (WUCCs)

A separate policy paper was drafted for each of these themes (See Section 5.2.3). Each paper includes many specific recommendations, from which the Policy Subcommittee culled the following suggestions as the most important policies for focus within the next several years as the Plan is introduced:



Top 10 Consenus-Based Policy Recommendations:

- **1.** Water management should follow scientific examples.
- 2. As possible, remove obsolete water registrations.
- **3.** Encourage innovation in agricultural water practices.
- **4.** Water data (or access to it) should be centralized in a single database and/or portal to other sources.
- 5. Consider Class B Water for individual non-potable uses if environmentally prudent and cost-effective, using guidelines to be developed by the WPC for review of Class B water for non-potable uses using the Triple Bottom Line philosophy (environmental, social, and economic metrics).

- **6.** Develop an education and outreach strategy focusing on water conservation topics.
- **7.** The WPC should provide ongoing review of other Connecticut state plans in order to identify and address inconsistencies.
- **8.** Encourage regional water solutions where they are practical and beneficial.
- 9. Reaffirm support for the protection of Class I and II land contributing to water supply. Expand protections to other watershed lands and land that feeds aquifers used for public water supply or by private wells.
- Create a data-based water education program aimed at the general public and municipal officials.

Pathways Forward for Continuing Discussion

Not all water issues were resolved (or expected to be resolved) by stakeholder consensus during the one-year planning process. Those that were are listed and explained with policy recommendations in Section 5.2. Issues for which consensus requires additional work before recommending policies that are mutually agreeable to the Water Planning Council member agencies and their stakeholders are discussed in Section 5.3.

Planning is an ongoing process. Many issues identified by the State Water Plan statute or by stakeholders during the planning process yielded productive dialogue, but not necessarily a clear consensus on policy recommendations. Rather, needs were identified for additional information, possible partnerships, and opportunities for facilitated consensus-building before recommendations can be made with broad stakeholder support. For each of these issues, the State Water Plan has prepared a series of Next Steps, or "Pathways"

Forward," which are intended to help the WPC and its stakeholders advance each unresolved issue closer to consensus. Even if consensus cannot be fully achieved, these next steps could help educate decision makers on the benefits and disadvantages of future water management strategies, so that legislative and regulatory decisions can be more informed than they would be today.

The next steps are offered as suggested ideas, to be advanced or initiated at the discretion of the WPC based on its priorities and available resources. None of the suggestions are mandates or requirements, and they do not represent recommendations for changes in policies, laws, or regulations. They are intended to serve only as menus of ideas that can improve the clarity with which the WPC advances (or elects not to advance) these issues in the future.

For each issue that requires additional steps if consensus is to be reached, the Pathways Forward include 3 types of recommendations:



- Additional Information Needs intended to provide stakeholders with more complete data, opinions, case studies, and impact assessments with which to continue the dialogue.
- Possible Partnerships which may provide both an impetus and a mechanism for accomplishing fact-finding, pilot studies, or even implementation of progressive water management techniques.
- Opportunities for Consensus Building and/ or Communication – intended to gather public input and support, or facilitate formal dialogue between stakeholders or interested participants in an implementation effort.

Unlike the policy recommendations, where the intent is for the legislature to adopt the draft policies as guiding principles for future laws and regulations, these next steps are suggested

opportunities specifically for the Water Planning Council. As needed, legislative authorization and/ or funding may be needed to take certain steps. In other cases, the intent of these steps is that they be implemented under the authority and discretion of the Water Planning Council. They are intended to serve as reasonable opportunities that the Water Planning Council could undertake in the future to clarify certain issues or draw stakeholders closer to consensus for future policy recommendations.

Some of the issues that require further information and outreach are also included in the recommended policies. This is because the approach to certain aspects of these issues was agreeable to the stakeholders, while other aspects require more time and information. The list of Pathways Forward topics, included in Section 5.2, are listed in Table ES-4.

Table ES-4: Categorization of Pathways Forward

Theme	Category	Specific Options and Challenges	Developed with	
	Policy and	Conservation and Incentives	Stakeholders	
Mater Management Options Lechnology	Regionalization and appropriate interconnections	(Section 5.3.2.1)		
		Identify funding mechanisms for Plan implementation	Developed with WPC	
		Statewide drought planning	(Section 5.3.2.2)	
p		Future Class B water for non-potable uses	Grouped into	
9		Water use accounting	"Overcoming Future	
en		Groundwater and private well monitoring and protection	Challenges" (Section	
Ĕ		(grouped with Watershed/Aquifer protection, below)	5.3.2.3)	
ıge	Technology	Technology and facility improvements/replacement	Grouped into	
ne		Water Reuse and Greywater Use	"Technology Issues"	
Ĕ		Wastewater management (combined with Reuse, above)	 (Section 5.3.2.3)	
ē		Stormwater management		
Vat	/at	Desalination		
>		Flood management		
	Regulatory	Address registered diversions		
		Changes to laws / regulations		
	Inherent in CT	Levels of authority for implementation		
S	Reg. Structure	Understanding Economic Impacts		
ge	Specific to	Watershed/aquifer protection where incentives are lacking		
<u>ā</u> Cer	Certain Uses	Vulnerability and security issues		
hal		Food-Energy-Water Nexus		
ਹ		Emerging contaminants		
re		Aging infrastructure		
Future Challenges		Constraints on system expansion		
Œ.		Climate Change		
		Water Quality Impairments		

Plan Implementation

Lastly, Section 6 of the Plan offers guidelines for implementation. These include an enabling framework that allows the WPC to make decisions on recommending or implementing next steps, seek funding, and formulate new policy recommendations for legislative or regulatory consideration. The guidelines also offer suggestions for ways in which the WPC can effectively work to resolve ongoing water conflicts in the future, whether the conflict is localized or universal throughout the state.

Funding

Section 6 also provides a comprehensive list of possible funding sources for Plan Implementation, including both state and federal programs and their potential relevance to the recommendations in this Plan as it moves forward. A table of examples is also provided, which shows how specific recommendations for water conservation may qualify for certain funding programs.

Tracking Progress

Section 6 also offers guidelines for tracking the implementation of the Plan against its own goals and the 17 requirements of the originating statute (see earlier text box). The Plan addresses in some way all 17 of the requirements, but full satisfaction of the intent of the statute will come partially through the implementation phases of the Plan, not just the planning process to date. To enable this, the Plan should serve as a unifying platform for scientific information, guiding principles, and roadmaps toward consistent future decisions.

Future Roles of the Water Planning Council

To date, the Water Planning Council has been tasked by statute to oversee the development of the State Water Plan. To effectively implement the Plan by promoting consistent use of its data and recommendations, the WPC has proposed that its future roles include:

- Early Review of Proposed Water Legislation: WPC can help move legislations forward in three ways:
 - Offer consensus support from the four member agencies
 - Suggest clarifications using the Plan's information
 - Recognize potential conflicts or disagreements early so that they can be addressed
- Develop proposed legislation as needed
- Hire a Water Plan "Chief" to oversee the implementation of the Plan and serve as a liaison between the WPC, public, and legislature.
- Offer three forms of conflict avoidance and resolution:
 - Mediation using a non-regulatory appointee
 - Non-binding arbitration for willing parties
 - Binding arbitration for willing parties or as deemed necessary by the legislature
- Seek and secure funding for the Plan's recommendations
- Prioritize and initiate next steps outlined in the Plan
- Potentially add a fifth non-regulatory member to the WPC to avoid tie votes
- Obtain statutory authority as necessary for:
 - Implementation when funding is available,
 - Appointment of a mediator and a Water Plan Chief
 - Arbitration authority at the discretion of parties in conflict.
- Continue to oversee the subcommittees if necessary (the Water Planning Council will determine the necessity and frequency of meetings for the Policy and Science and Technical Subcommittees, though the Advisory Group will continue forward, likely with additional members):
 - Policy Subcommittee, on issues pertaining to future legislation and additional policy recommendations that may result from future consensus building





- Science and Technical Subcommittee, on issues related to basin evaluation and modeling, counsel on data collection, use, and access, etc.
- Advisory Group, on issues pertaining to Plan Implementation

Possible Legislation

The Plan does not recommend specific legislation, but its policy recommendations are intended to help formulate consistent future legislation aimed at preserving and improving the balance of water uses throughout the state. Several examples of potential legislation that stakeholders envision might arise from the implementation of the Plan include:

- Retiring obsolete diversion registrations determined not to be needed now or in the future
- Water conservation laws or incentives in concert with ongoing utility initiatives
- Private well testing program
- Statutory authority for the Water Planning Council, as outlined above

Near-Term Steps (within the first several years)

The Plan recommends the following near-term steps toward implementation (suggested within the next few years, but clearly dependent on available time and resources):

- Consider the hiring of a Water Plan Chief to oversee all aspects of Plan implementation and help ensure consistent interpretation of its information and recommendations.
- Begin outreach program, especially to parties who did not participate actively in the development of the Plan, including municipal officials, state lawmakers, etc.
- Identify basins for which simulation modeling could help improve the balance of water uses (possibly from the high-priority basins identified

in the Plan), and identify funding mechanisms for initiating basin studies. A recommended tool (SWAM) or similar software modeling tools, as well as an example of how simulation modeling can effectively evaluate state-wide policies within the regional basins at a more local level is included in Section 3.1.6).

- Consider the establishment of volunteer River Basin Commissions (as needed, and only where existing basin-wide groups, regional planning authorities, or COGs do not purport to function at the desired scale) to prioritize local issues in river basins and apply the data and principles in the Plan to recommend action to the WPC (following examples from other states)
- Formulate plans for centralized data portal and assign this to a specific agency or organization
- Seek funding for policy recommendations that require financial support (outreach, data collection and consolidation, etc.)
- Review the Plan recommendations to determine if and when to propose specific legislation. This may involve briefings with law makers and/or collaborative working sessions.
- Consider the topics outlined in Section 6 that are not covered heavily in the Plan, but which the WPC should discuss among the overall priorities in the near term. These topics include components brought up during the public comment period ending in November 2017 and include the water-energy nexus (harmonizing energy priorities with stewardship of the water resources of the state), the need for transparency and local involvement in decisions on how water is used and where it can be transferred, health equity, environmental equity, emerging and re-emerging contaminants, stormwater management, wastewater management, and dam removal.

The Plan should serve as a unifying platform for scientific information, guiding principles, and roadmaps toward consistent future decisions.