

# Condensing the Water Budget to Guide Planning Efforts for Connecticut's Water Management

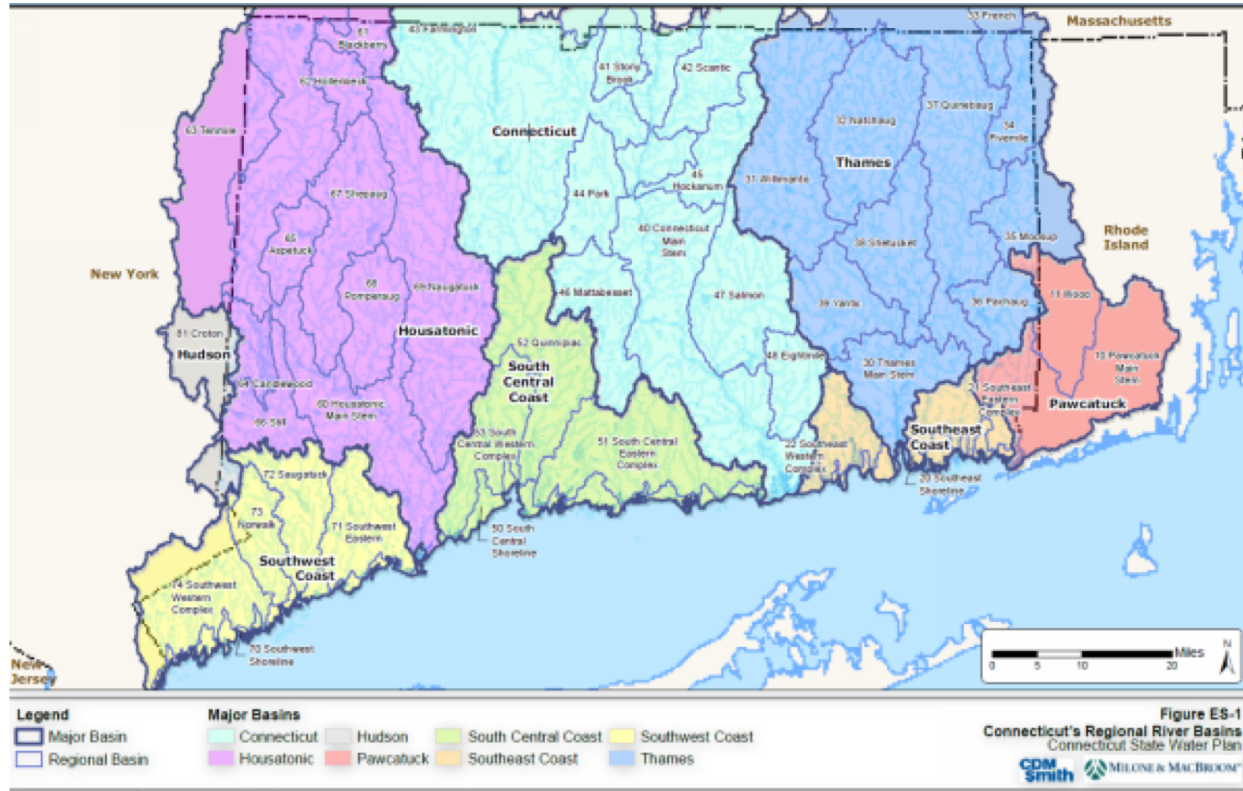
Rebecca Guihan, P.E.  
Kathryn Swanson, P.E.  
Elaine Sistare, P.E.

*January 28, 2019*

**CDM  
Smith**

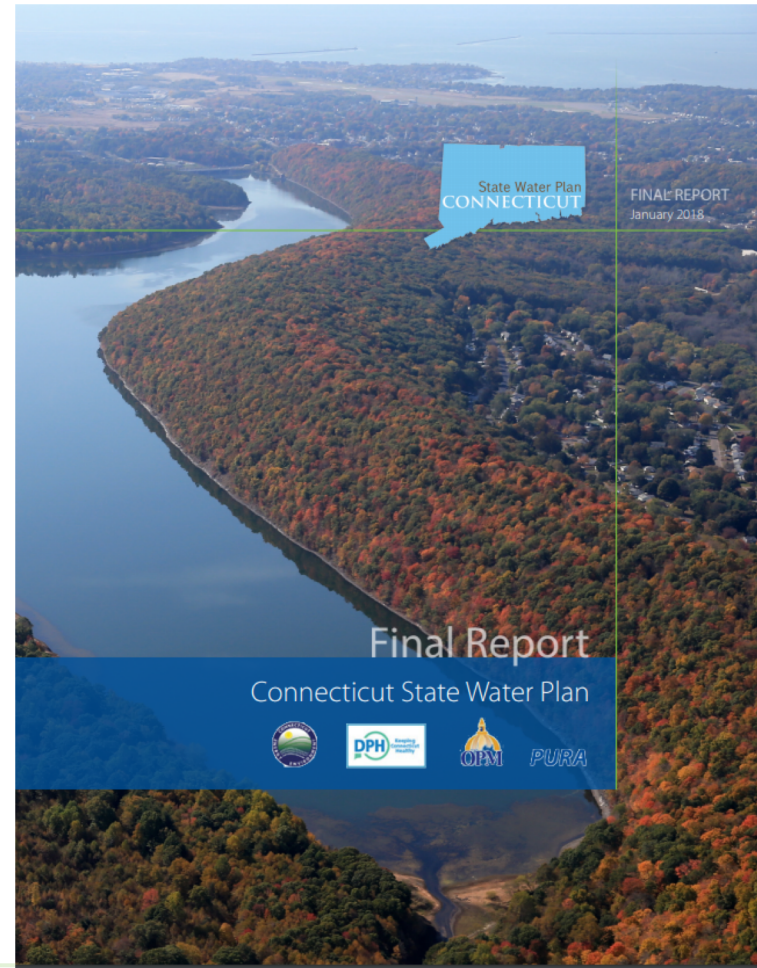


# Objective



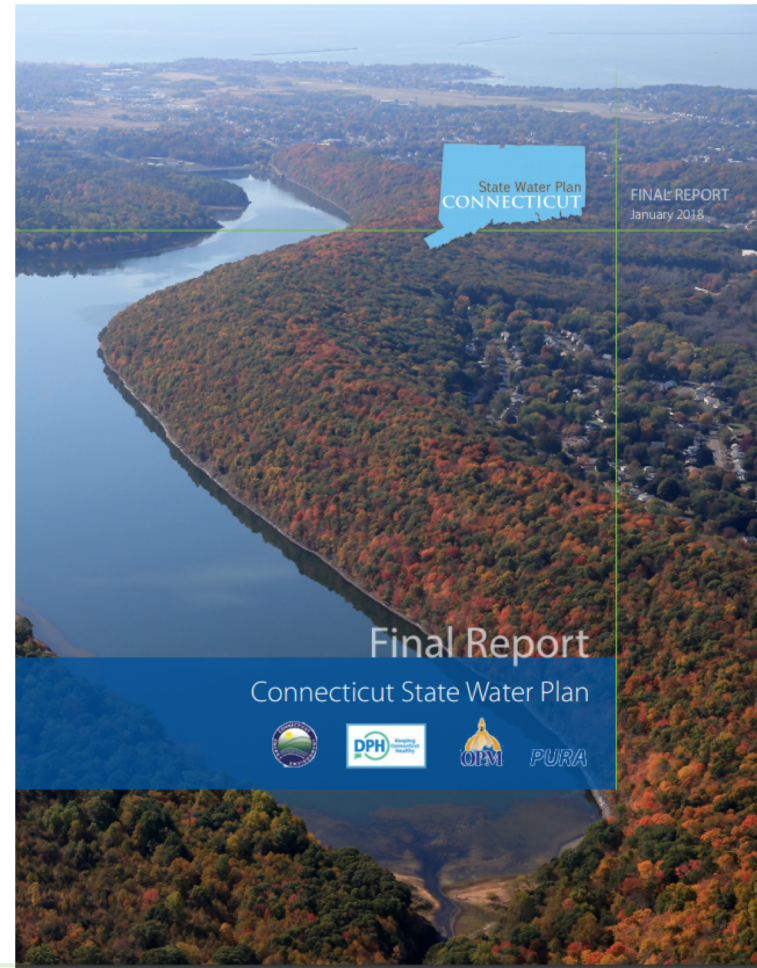
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- History
- Goals and the Planning Process
- Hydrologic Summary Sheets
- Screening Process
- Conclusion



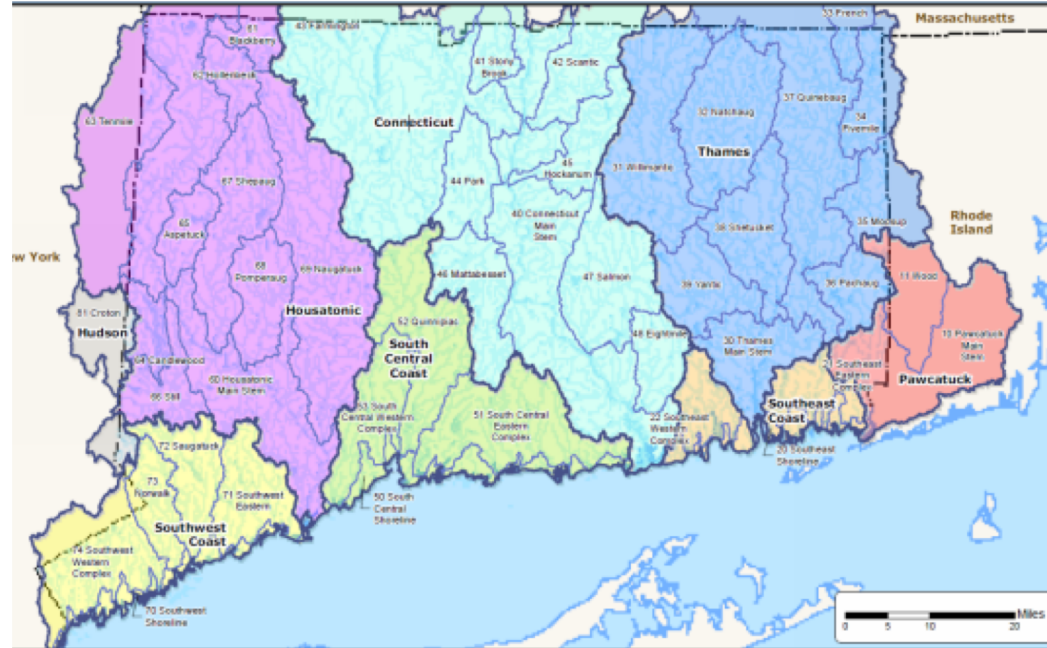
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# History

- July 2014 - CT State Legislature enacted Public Act 14-163, “An Act Concerning the Responsibilities of the Water Planning Council”



# WATER PLANNING COUNCIL



**Jack Betkoski**  
*Public Utilities  
Regulatory  
Authority*

**Lori Mathieu**  
*Department of  
Public Health*

**Mike Sullivan**  
*Office of Policy  
and Management*

**Betsey Wingfield**  
*Department of  
Energy and  
Environmental  
Protection*

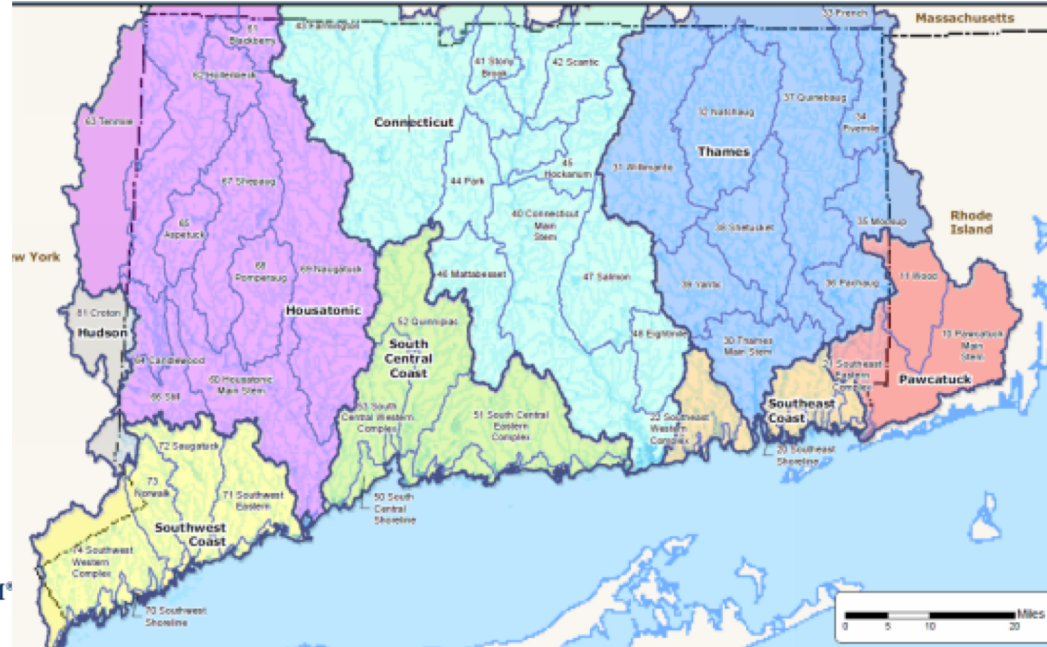
# WATER PLANNING COUNCIL



- Steering Committee
- Policy Subcommittee
- Science and Technical Subcommittee
- WPC Advisory Group
- Many stakeholders and citizens

# History

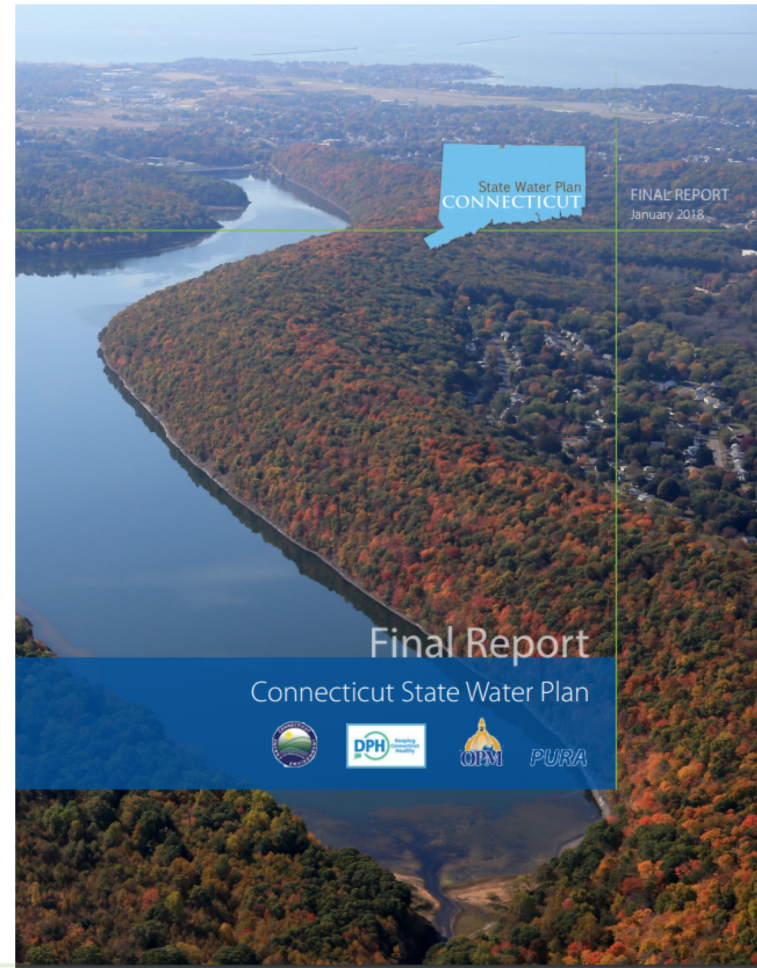
- July 2014 - CT State Legislature enacted Public Act 14-163, “An Act Concerning the Responsibilities of the Water Planning Council”
- Reviewed other statewide water plans, evaluated current practices, future challenges, and opportunities within Connecticut’s water management framework
- May 2016





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# Goals of the Water Plan

## Synopsis

- Provide balanced water use for all needs.



Out-of-Stream  
Needs

Instream  
Needs

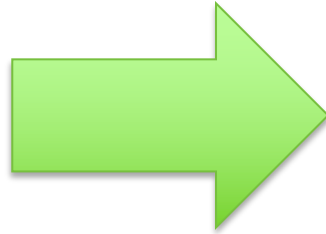
## Specific Goals (not prioritized)

- 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 users
- Develop an implementable plan
- Prepare for uncertain future climate
- Use science and data to recommend action
- Involve Connecticut citizens in water management

# Planning Process

## Phase 1 (Technical)

- Evaluate current water management
- Evaluate water availability
- Develop plan framework



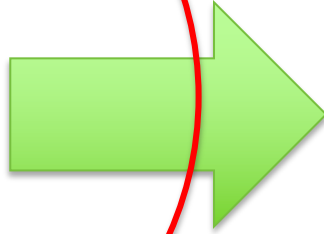
## Phase 2 (Policy)

- Policy recommendations
- Pathways forward
- Developing plan recommendations

# Planning Process

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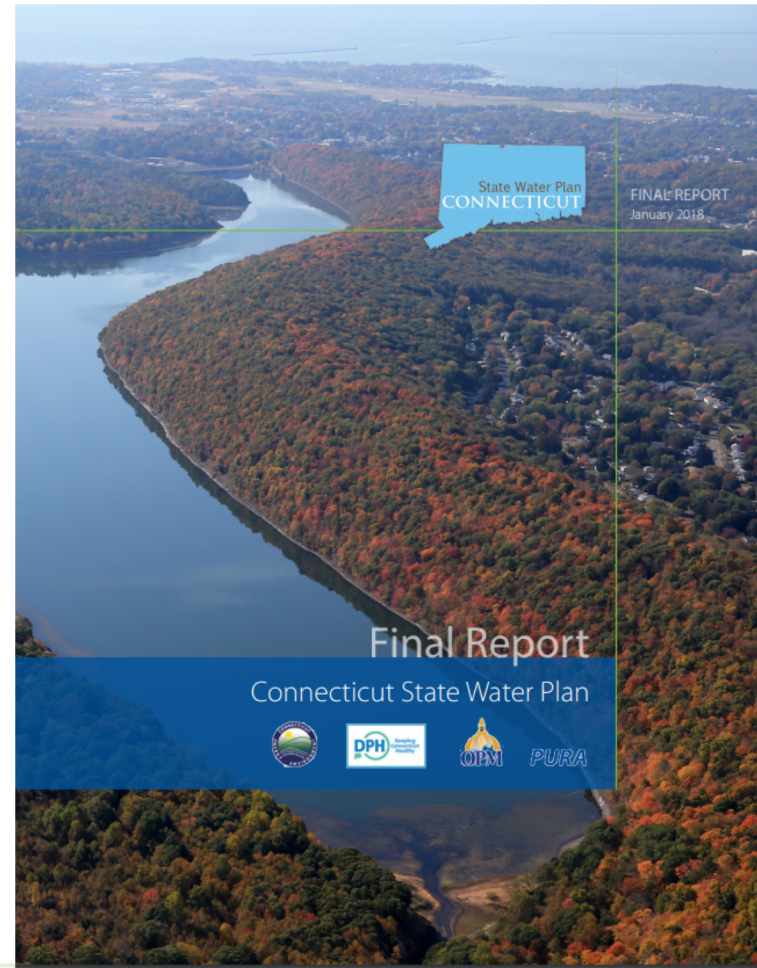


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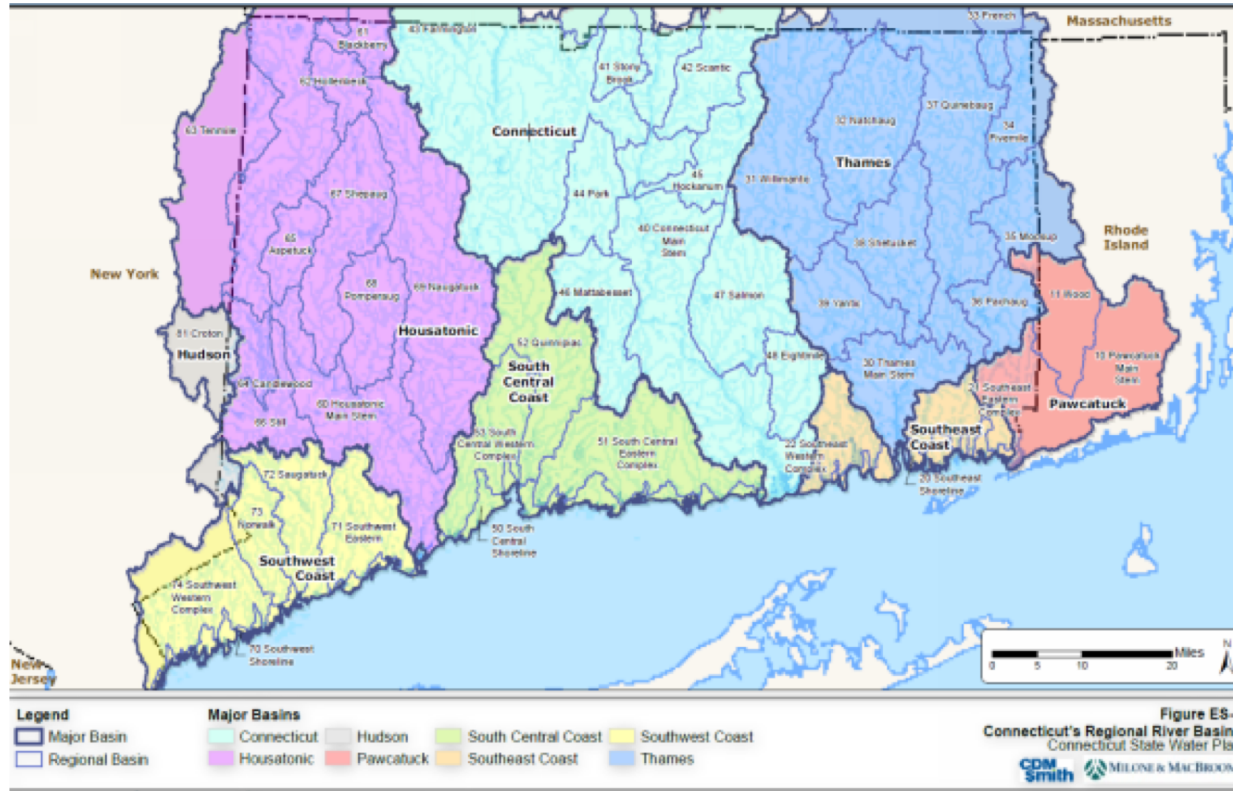
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# Data Collection and Technical Analysis



# Hydrologic Summary Sheets

## Basin Water Summary

Regional Basin: **Quinnipiac**  
 Regional Basin No.: **52**  
 Major Basin: **South Central Coast**  
 Size of Basin in CT (mi<sup>2</sup>): **166**

### Catalog of Internal and External Flows in Basin

	IN/YR	MGD	
Precipitation	43.7	345	Water In
Wastewater Discharge	3.2	25.1	
Estimated Domestic Recharge	0.5	3.9	Water Out
Evapotranspiration	22.8	179	
Groundwater Withdrawals	2.1	16.3	Internal
Surface Water Withdrawals	1.2	9.3	
Stormflow	12.4	98	
Estimated Potential Recharge (EPR)	12.2	96	
Total Streamflow (Stormflow + EPR)	24.6	194	

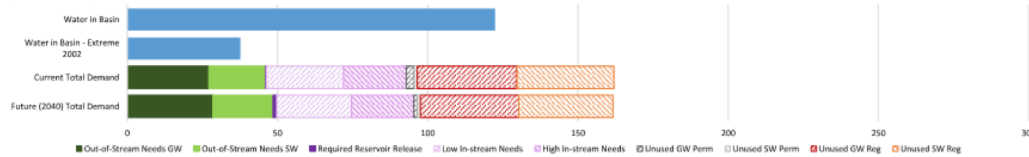


### Water Availability and Demand (MGD) - Including Estimated Ecological Flows, Regulatory Reservoir Releases, and Unused Registrations (Reg) and Permits (Perm)

#### Average Conditions (MGD)



#### July Conditions (MGD)



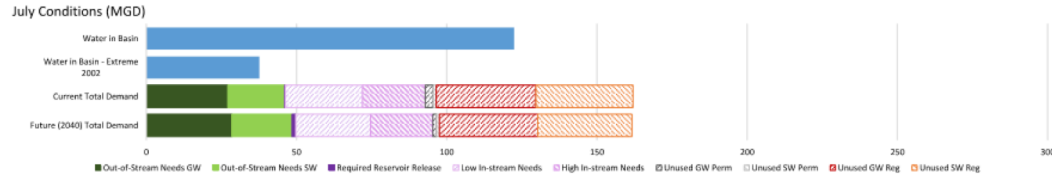
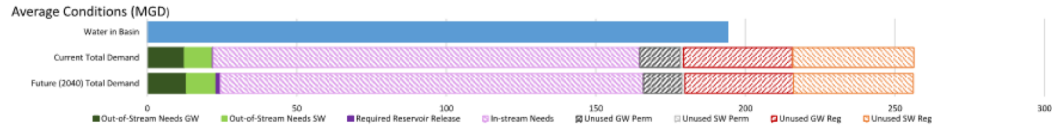
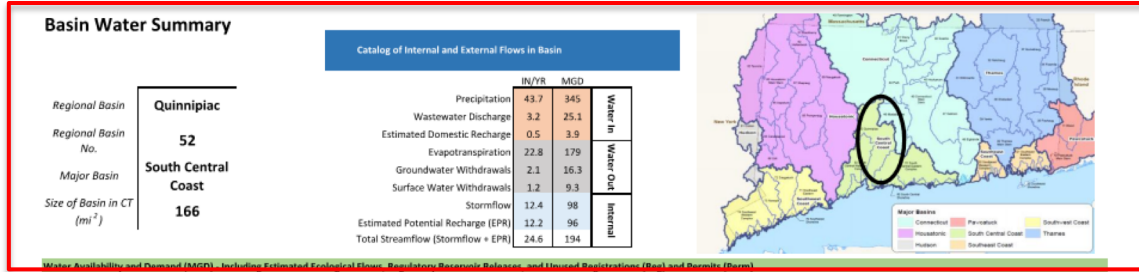
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			Out-of-stream Needs	Reservoir Release	In-stream Needs	Perm	Reg	Perm	Reg
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#### Notes:

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**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.**

# Hydrologic Summary Sheets



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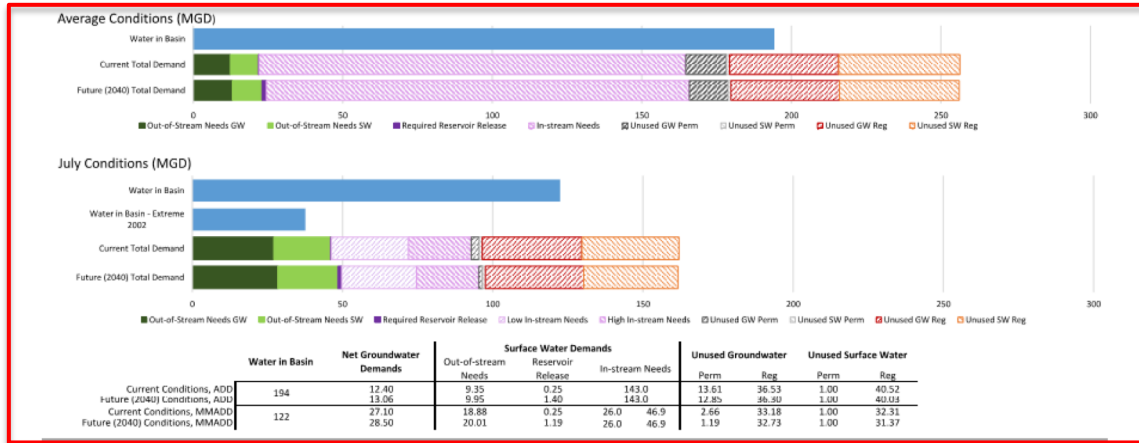
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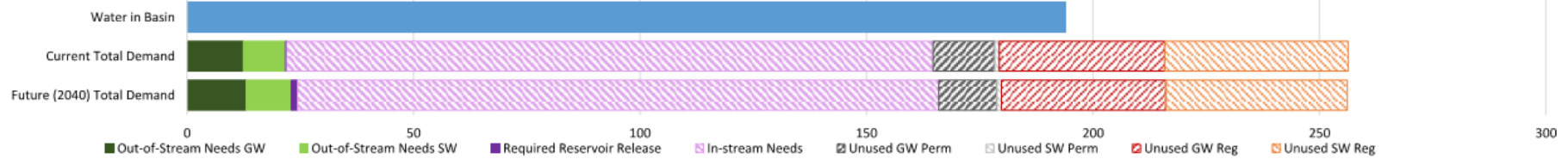
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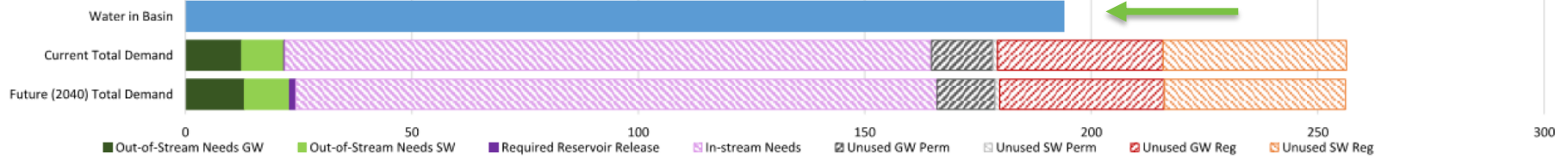
## Average Conditions (MGD)



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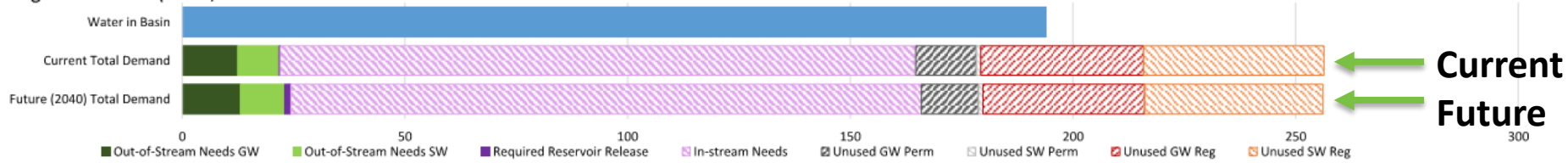
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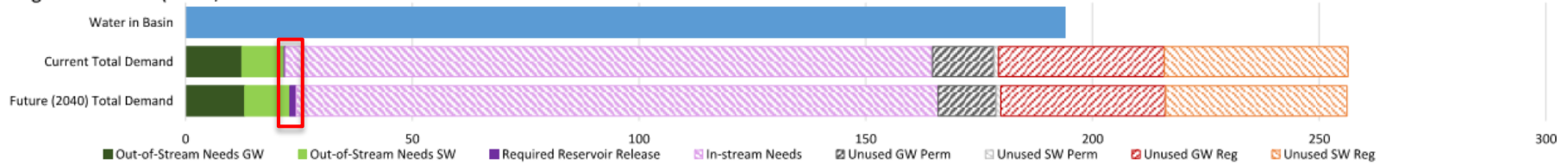


■ Out-of-Stream Needs GW   ■ Out-of-Stream Needs SW

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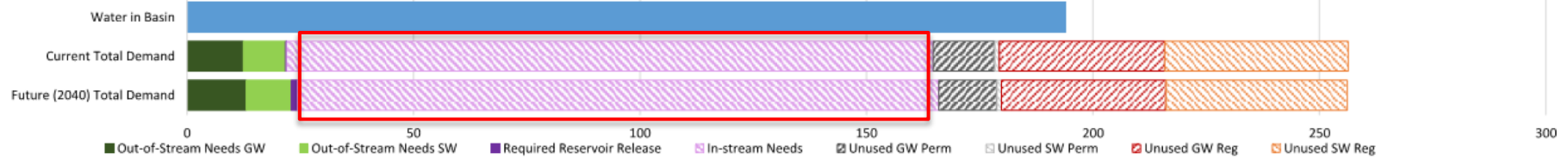


■ Required Reservoir Release

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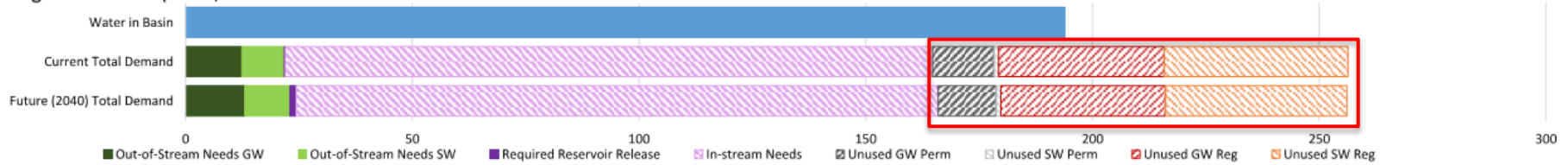


 In-stream Needs

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Unused SW Perm

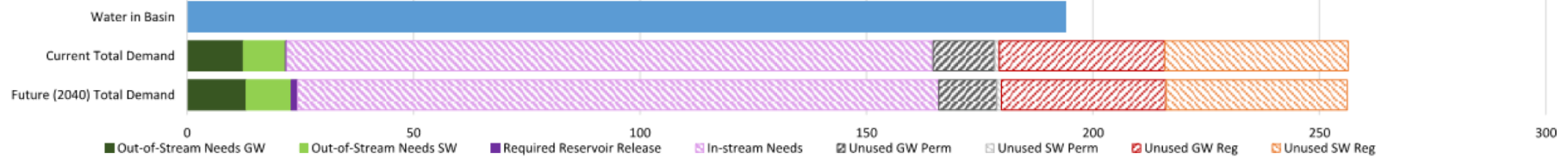
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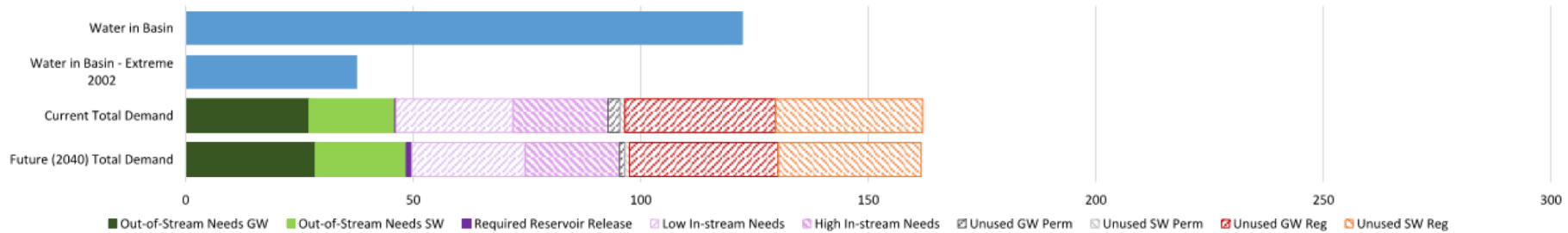
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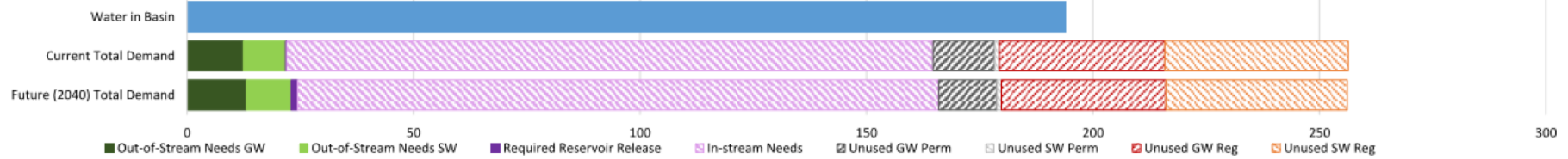
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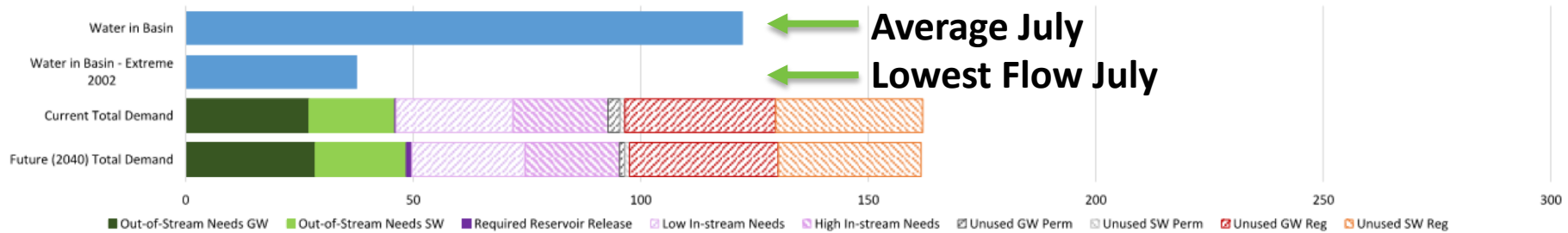
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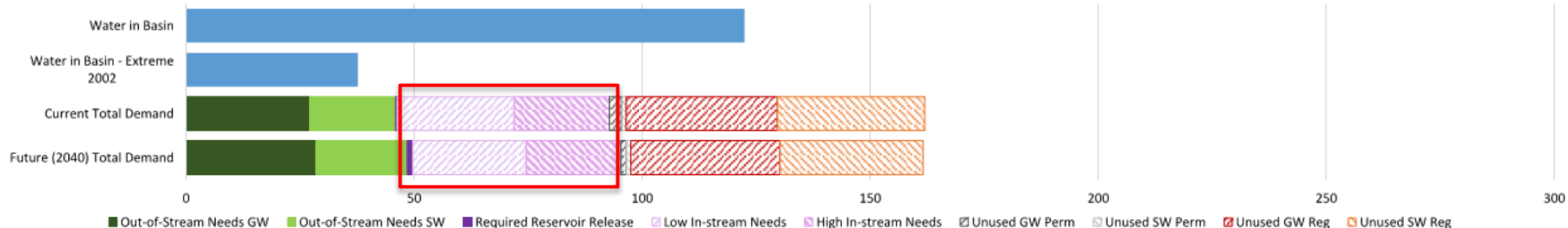
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Low In-stream Needs
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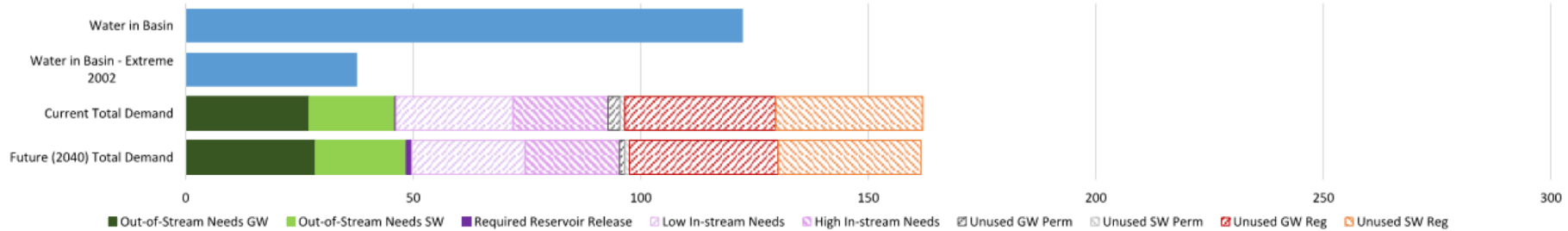
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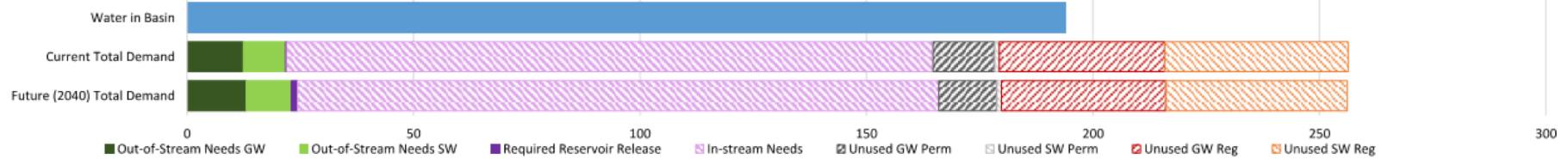




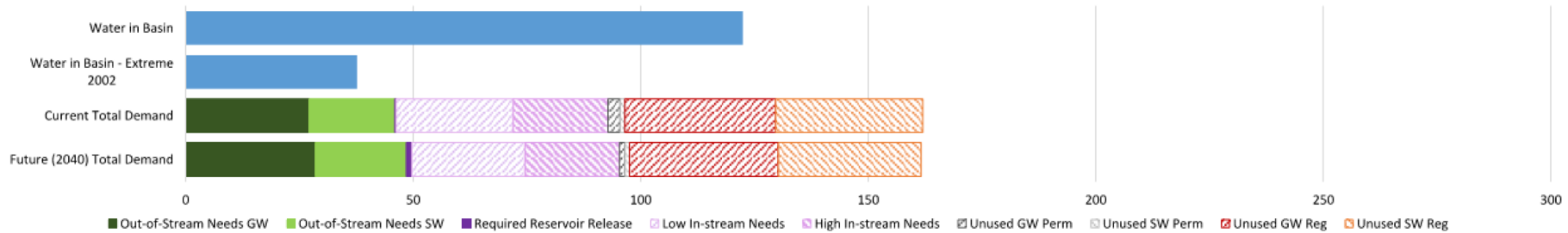
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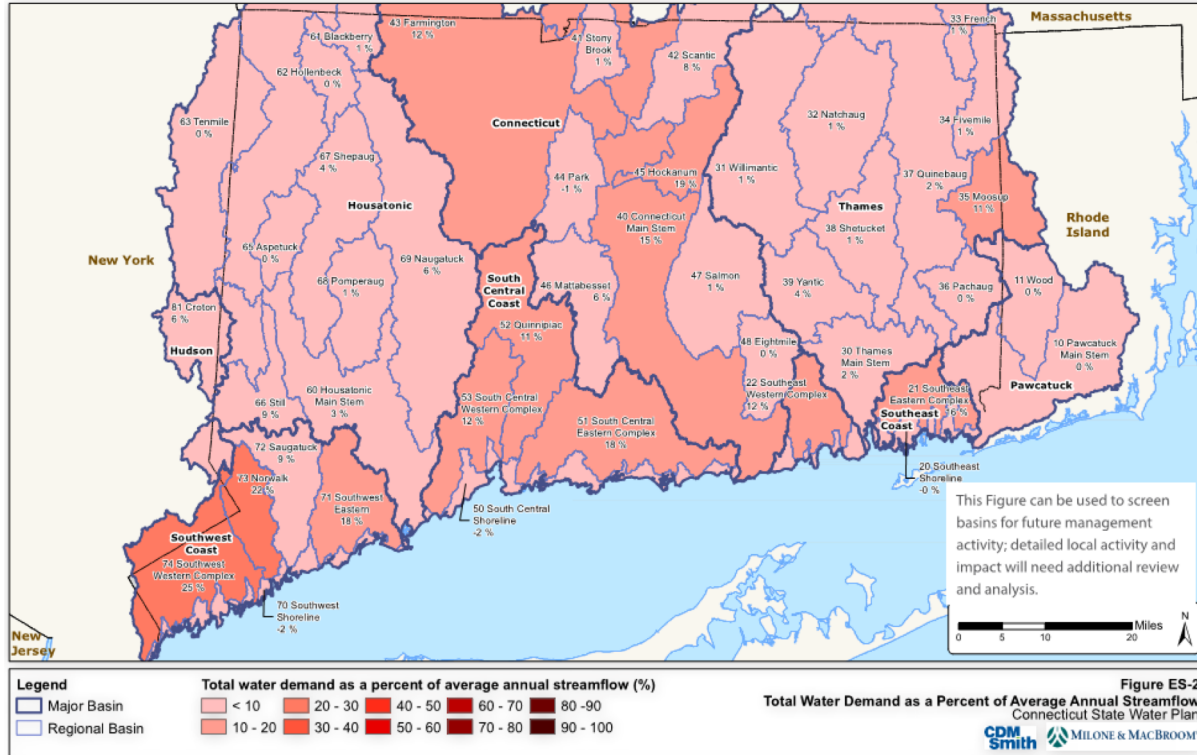
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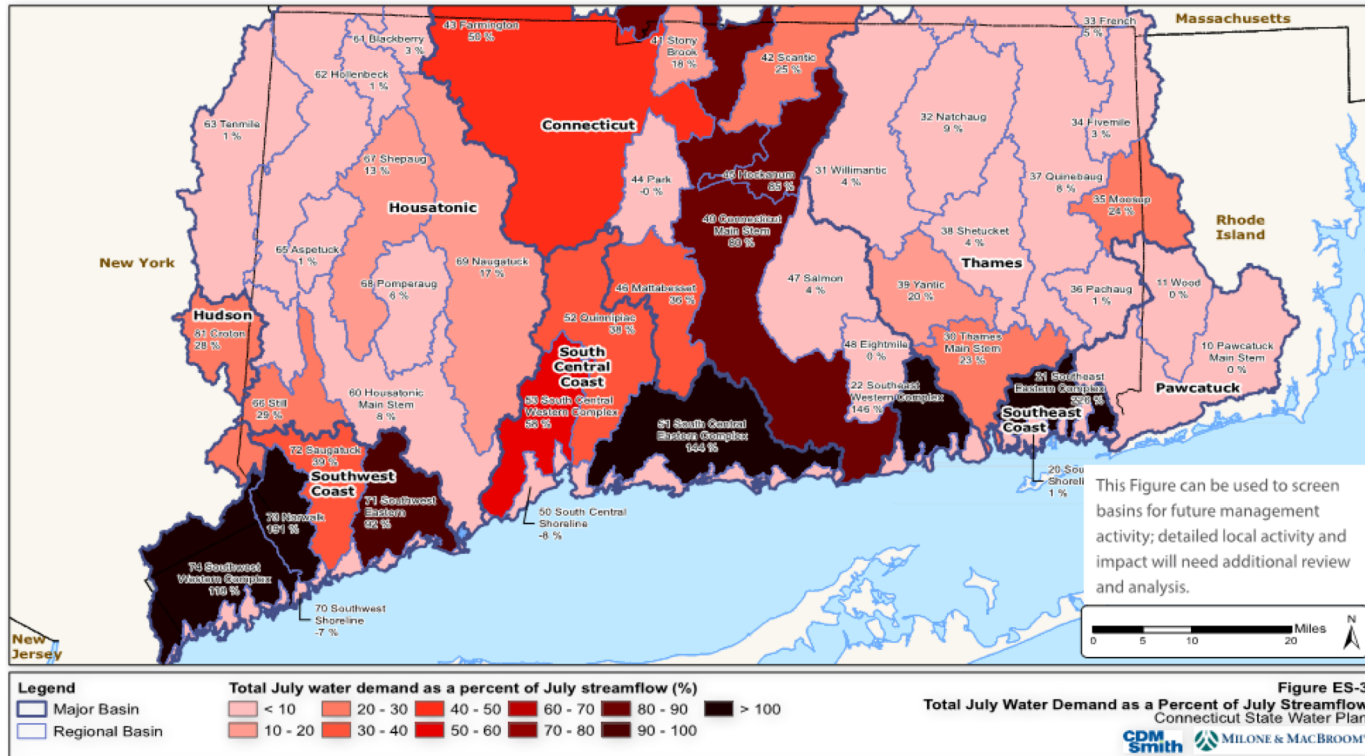
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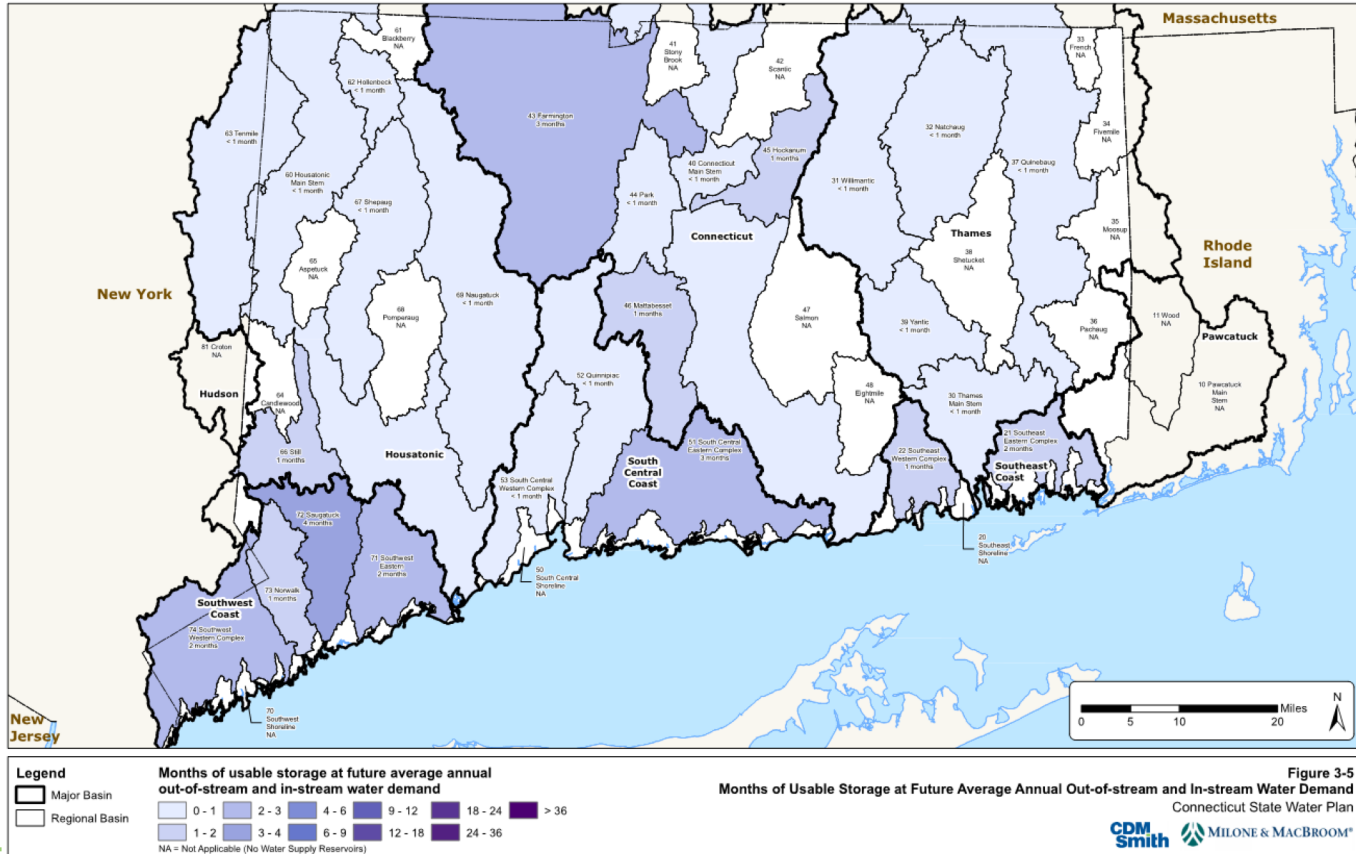
# Supply/Demand Maps



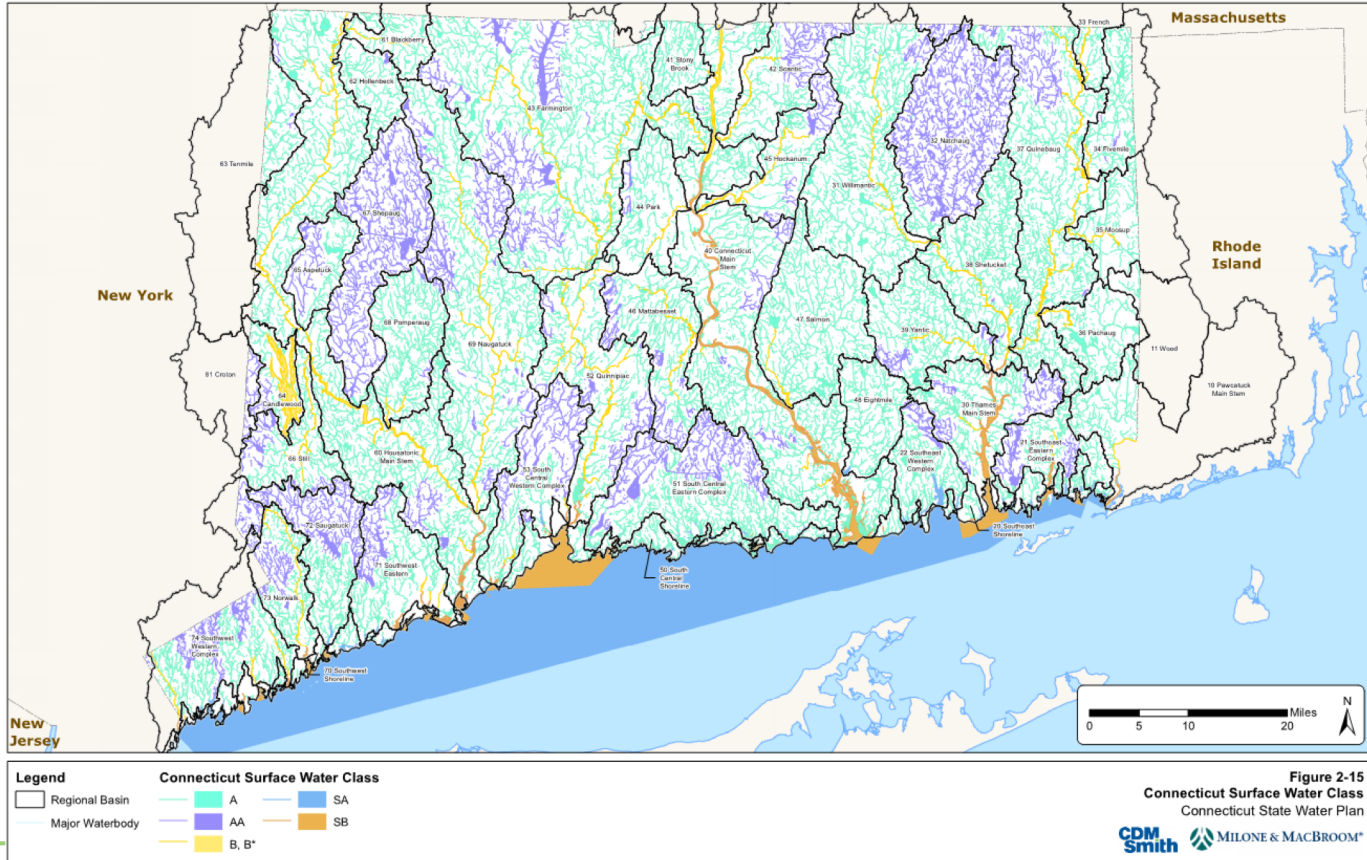
# Supply/Demand Maps



# Storage Capacity Map



# Surface Water Quality Map



# Groundwater Quality Map

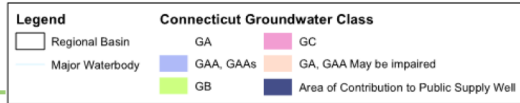
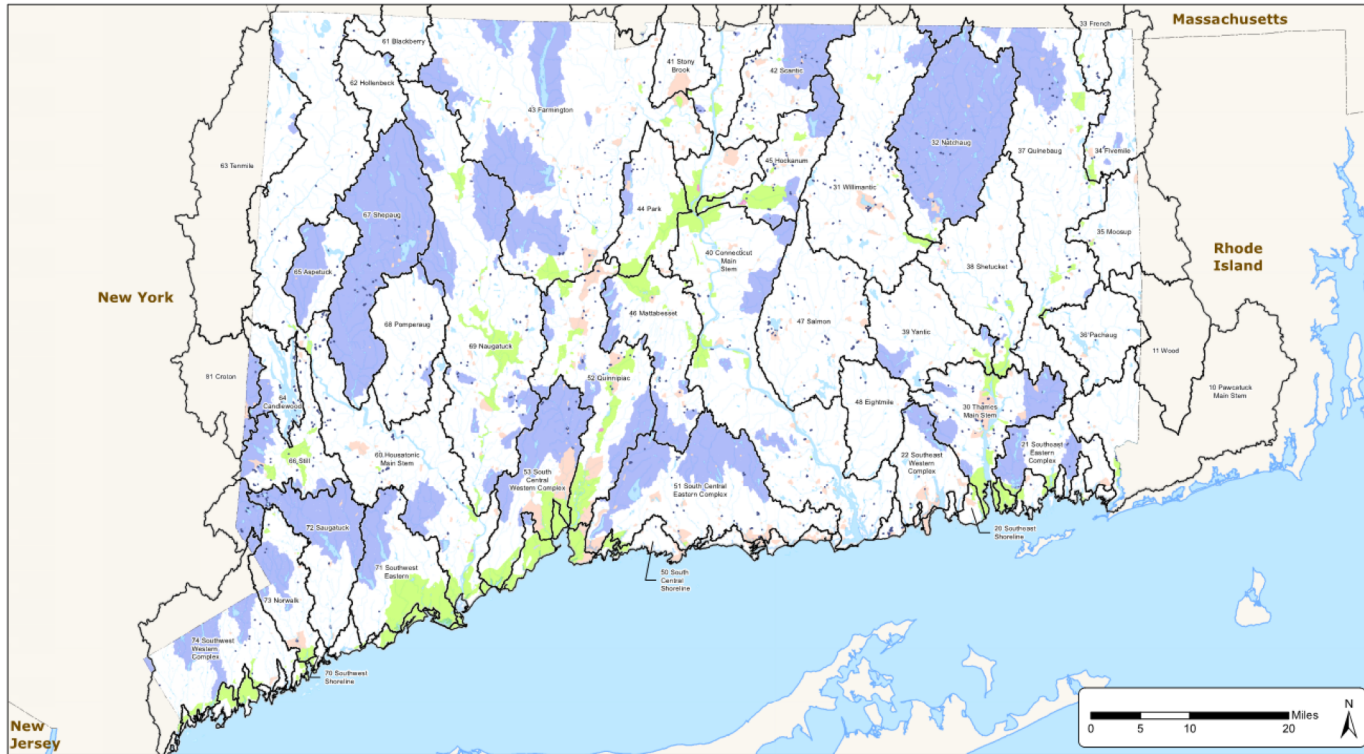
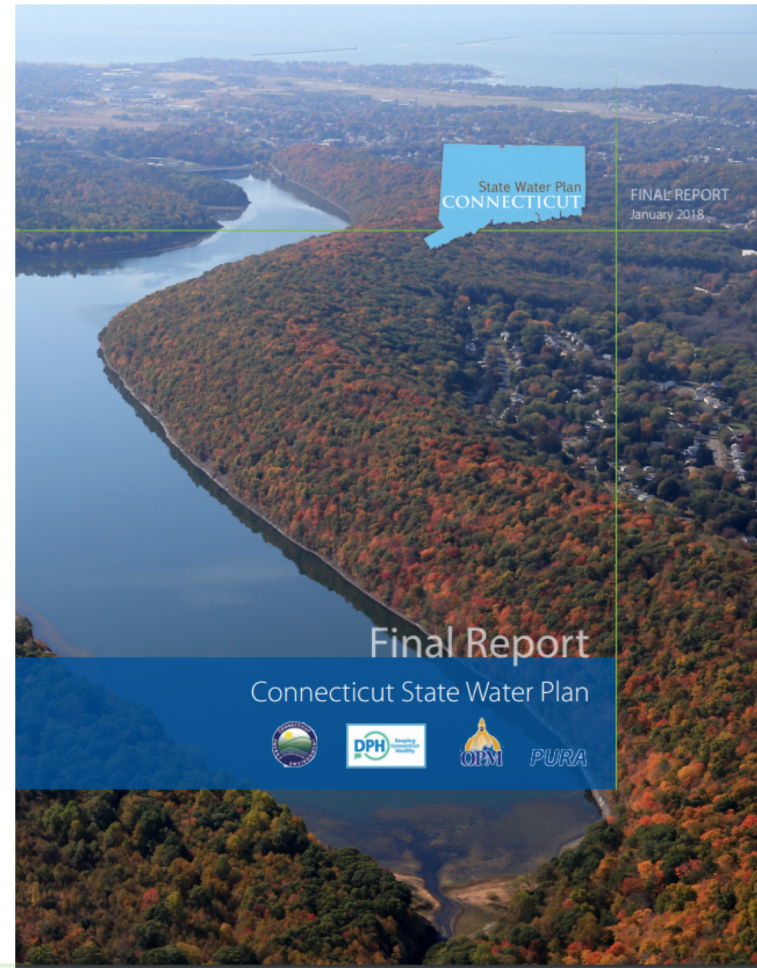


Figure 2-16  
Connecticut Groundwater Class  
Connecticut State Water Plan



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# Screening Process

- The Science and Technical Subcommittee was tasked with assessing all of the available data compiled in the Plan and highlighting some regional basins that are good examples of the following categories:

- High Risk of Stress
- Tipping Point
- “Pristine”







# Quinnipiac

High Risk of Stress

Tipping Point

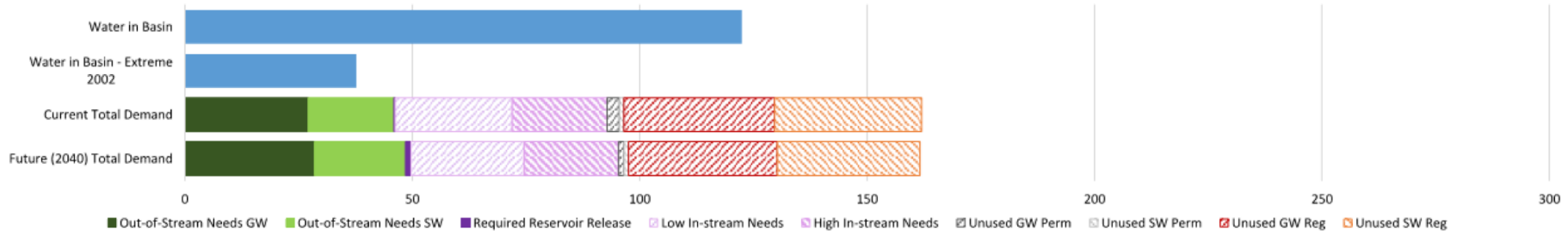
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# Pomperaug

High Risk of Stress

Tipping Point

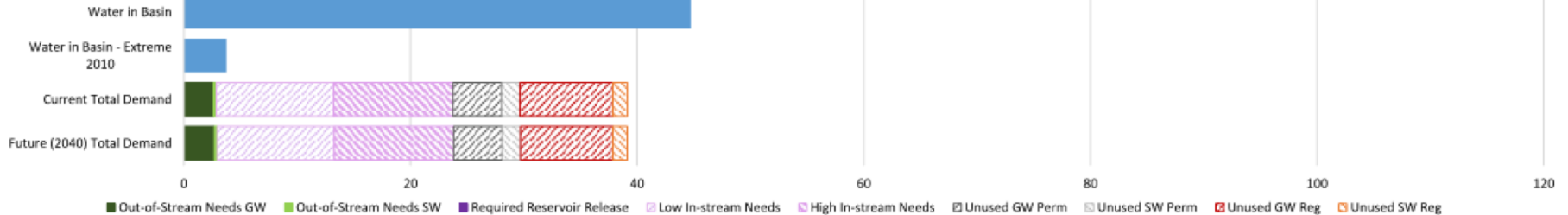
“Pristine”

Water Availability and Demand (MGD) - Including Estimated Ecological Flows, Regulatory Reservoir Releases, and Unused Registrations (Reg) and Permits (Perm)

## Average Conditions (MGD)



## July Conditions (MGD)



# Eightmile

High Risk of Stress

Tipping Point

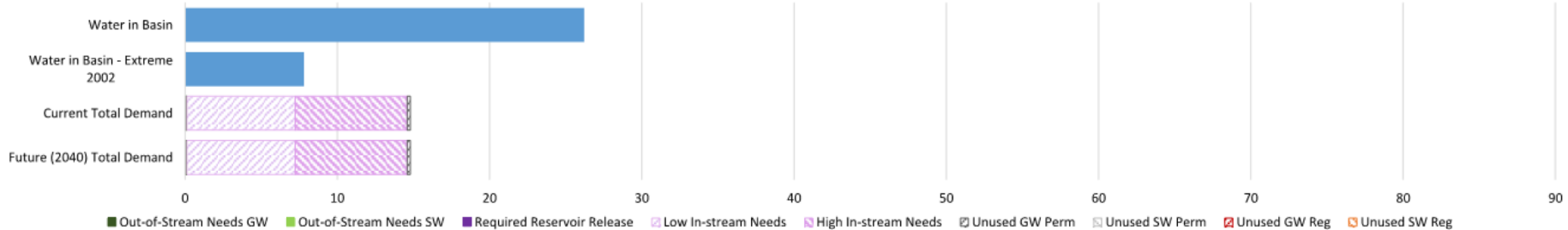
“Pristine”

Water Availability and Demand (MGD) - Including Estimated Ecological Flows, Regulatory Reservoir Releases, and Unused Registrations (Reg) and Permits (Perm)

## Average Conditions (MGD)



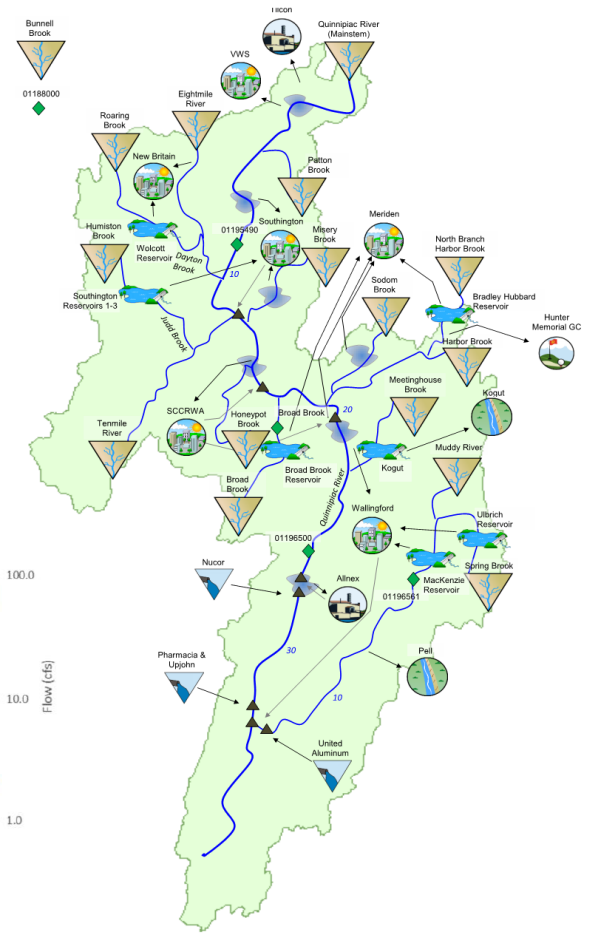
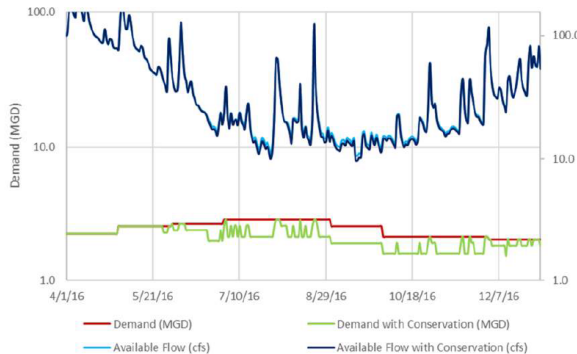
## July Conditions (MGD)



# Future Modeling Opportunities

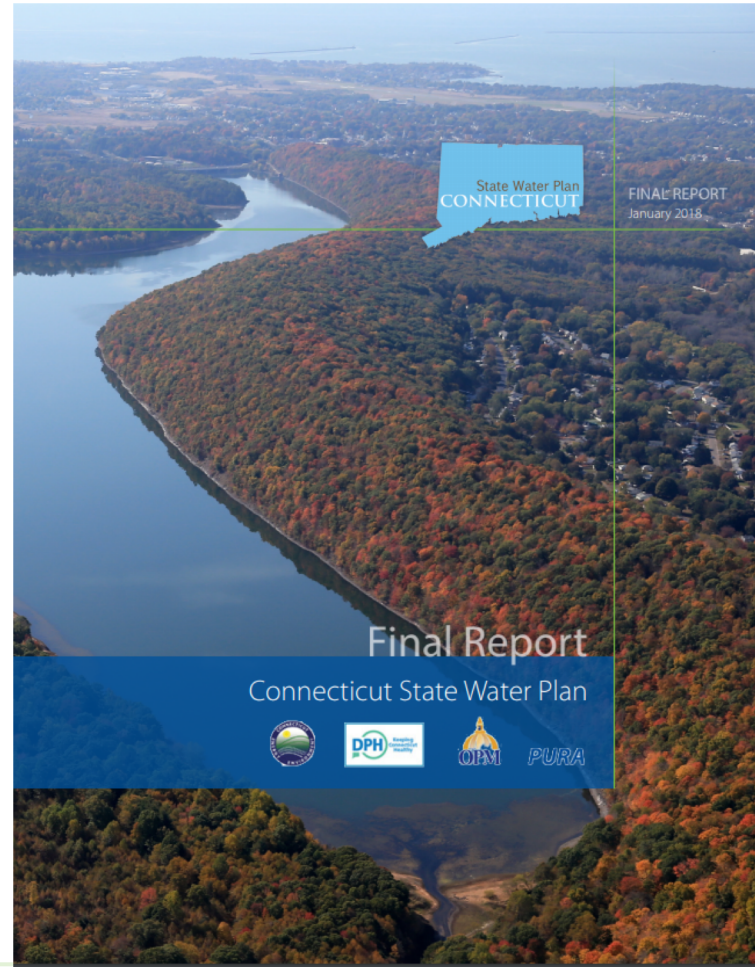
- To examine local issues
- To study impacts of policy decisions
- To assist with basin planning

Example only:  
Water Conservation



# Table of Contents

- History
- Goals and the Planning Process
- Hydrologic Summary Sheets
- Screening Process
- **Conclusion**



# Conclusion

- Hydrologic summary sheets were part of a high level screening tool used by the Science and Technical Subcommittee.
- This approach could be adapted to other regions and states.
- Regions that may be at risk of not satisfying all demands were identified.
- The technical analysis informed how policy recommendations were included in the Plan during Phase II of the project.



**Workshop Participation during Plan Development**



Thank you!





# Questions? Contact us!



Water  
Partnership  
with **CDM  
Smith**

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Find more insights through our water partnership  
at [cdmsmith.com/water](http://cdmsmith.com/water) and [@CDMSmith](https://twitter.com/CDMSmith)