



# Bellamy and Oyster River Watershed Protection Partnership

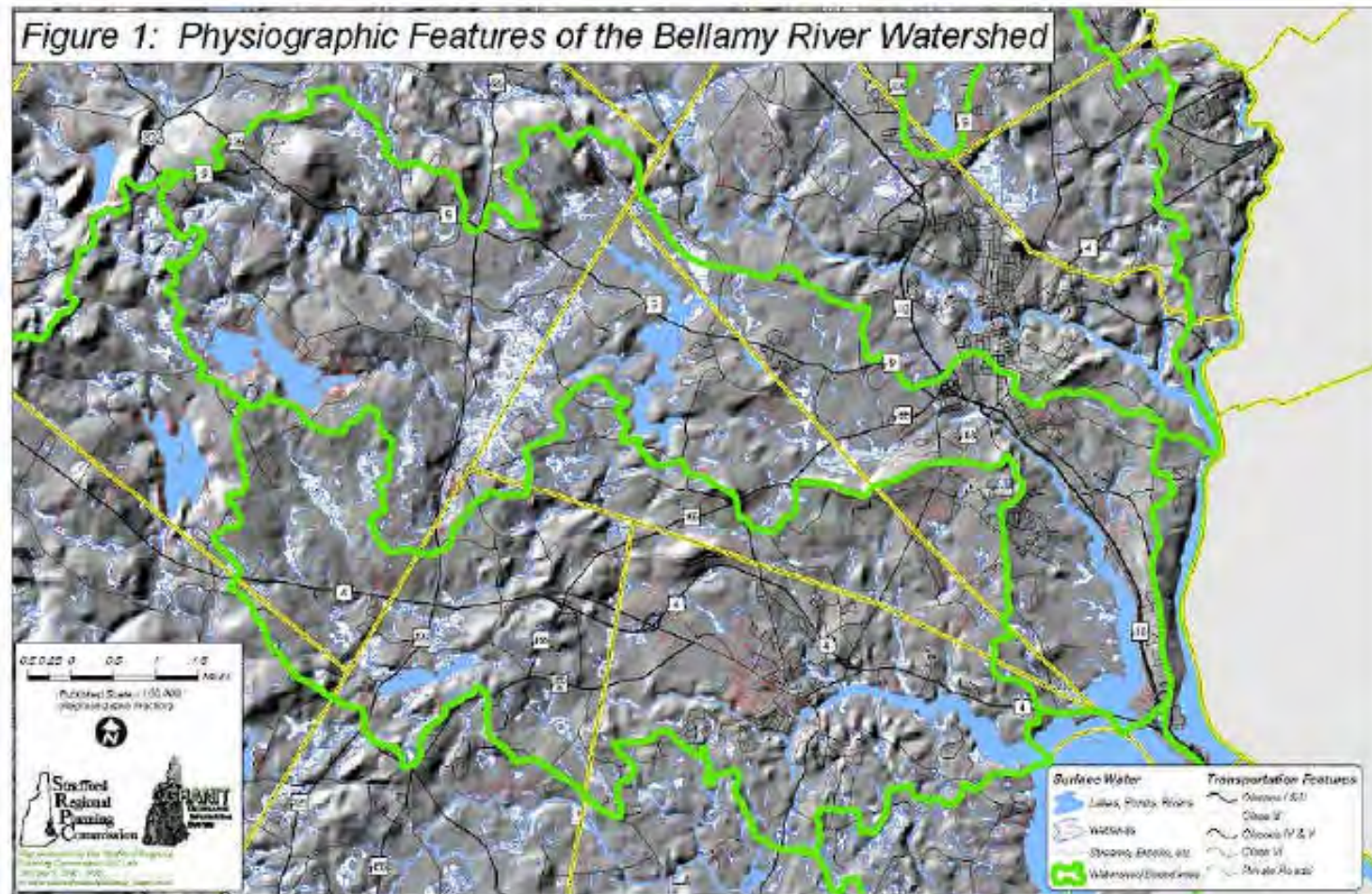
Considerations for Town Center PWSs  
Watershed Implications, Source Opportunities  
and Potential for Inter-municipal Connections

# Drinking Water Supplies in the Seacoast

- Although there are concerns for the future, there are not presently shortages in Seacoast communities
- There are several primary hydrologic limitations on the amount of water available in the region:
  - Small to moderate sized drainage basins and limited storage capacity for surface water dependent supplies
  - Moderate aquifer sizes and hydraulic characteristics for groundwater dependent utilities
  - In both cases, seasonal flow regimes leave most regional sources somewhat vulnerable in late summer



# Limits of the Bellamy and Oyster Watersheds





# Potential Water Sources for New PWSs

	Purchase Water - Interconnection	New Source – Groundwater	New Source – Surface Water
<b>Cost Differences</b> (assuming similar installation and operational costs for distribution system)	-Cost of water	-Well development, licensing and construction -O&M on source	-Plant design, licensing and construction -O&M on source
<b>Regulation</b>	Licensed as a consecutive system	Licensed as a PWS	Licensed as a PWS
<b>Risks</b>	-Might not be most cost efficient for larger users	-Well development challenges -Operational challenges	-Treatment challenges -Higher operational costs
<b>Similar Systems on the Seacoast</b>	Town of Durham	Dover	Portsmouth (blend of sources)



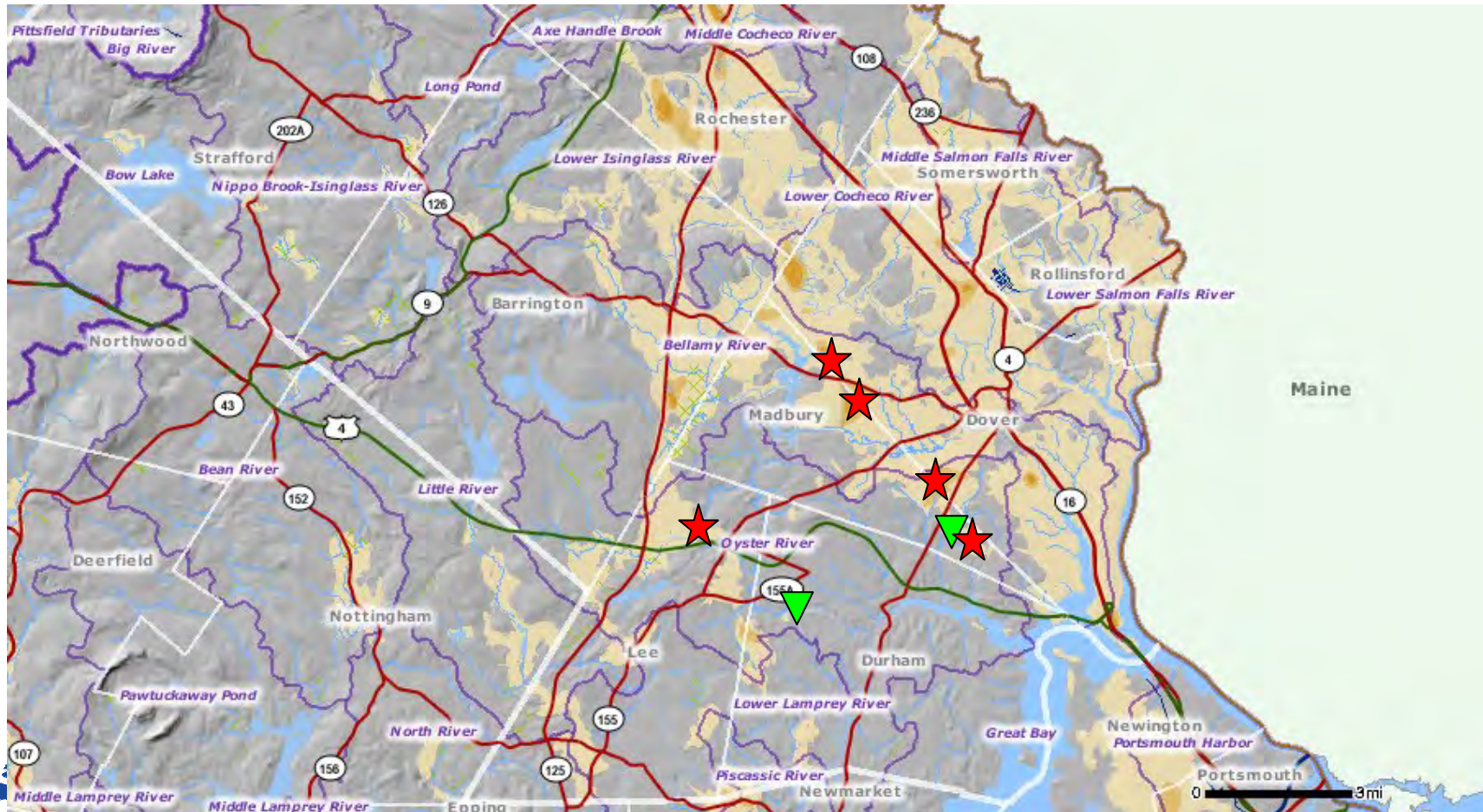
# Interconnection – What are the options

Water System	Current Supply (mgd)			Current Demand (mgd)		Excess Capacity on Average Day (mgd)	Excess Capacity on Max Day (mgd)
	Wells	Surface Water	Total	Avg. Daily	Max. Daily		
Aquarion (Hampton)	5.1	0	5.1	2.4	4.9	2.7	0.2
Dover	4.2	0	4.2	2.2	3.6	2.0	0.6
Durham/UNH	0.5	1.6	2.1	0.8	1.7	1.3	0.4
Newmarket	0.6	0	0.6	0.45	0.55	0.15	0.05
Portsmouth	5.1	4.0	9.1	5.2	10.0	3.9	0
Rochester	0	3.8	3.8	2.1	3.2	1.7	0.6
Rollinsford	0.2	0	0.2	0.14	0.15	0.06	0.05
Rye	1.2	0	1.2	0.4	0.7	0.8	0.5
Seabrook	3.3	0	3.3	1.4	3.0	1.9	0.3
Somersworth	1.0	3.0	4.0	1.7	2.5	2.3	1.5
<b>Total</b>	<b>21.2</b>	<b>12.4</b>	<b>33.6</b>	<b>16.8</b>	<b>30.3</b>	<b>16.8</b>	<b>4.2</b>

**Notes:** Range of excess capacities calculated by subtracting average and maximum daily demand from total current supply



# Bellamy and Oyster River Watersheds - Active Municipal Wells and Treatment Plants

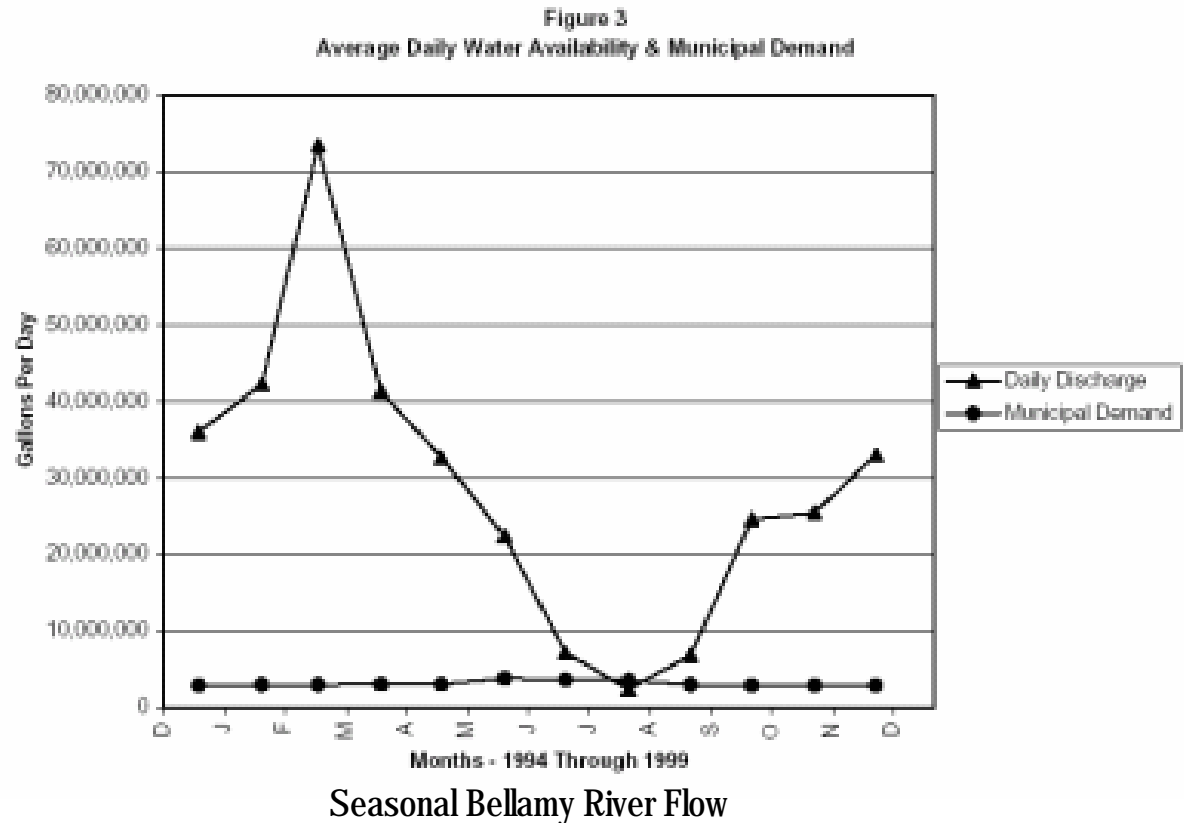


# Bellamy and Oyster River Watersheds

## Potential New Sources – Surface Water

**Basic requirement  
for development of  
new surface water  
sources:**

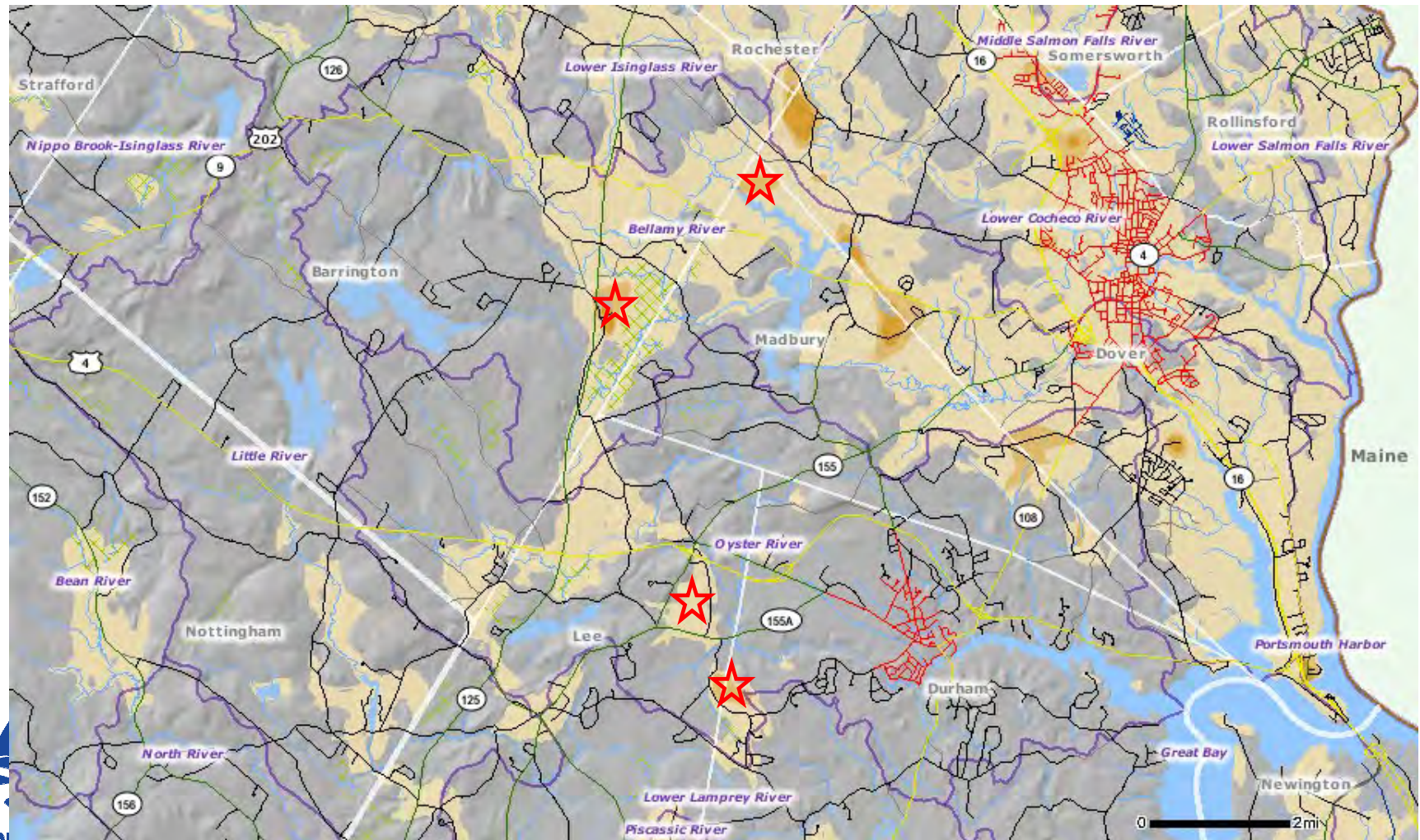
- Large, reliable water sources (rivers or lakes)
- Substantial storage capacity
- Significant financial capacity





# Bellamy and Oyster River Watersheds

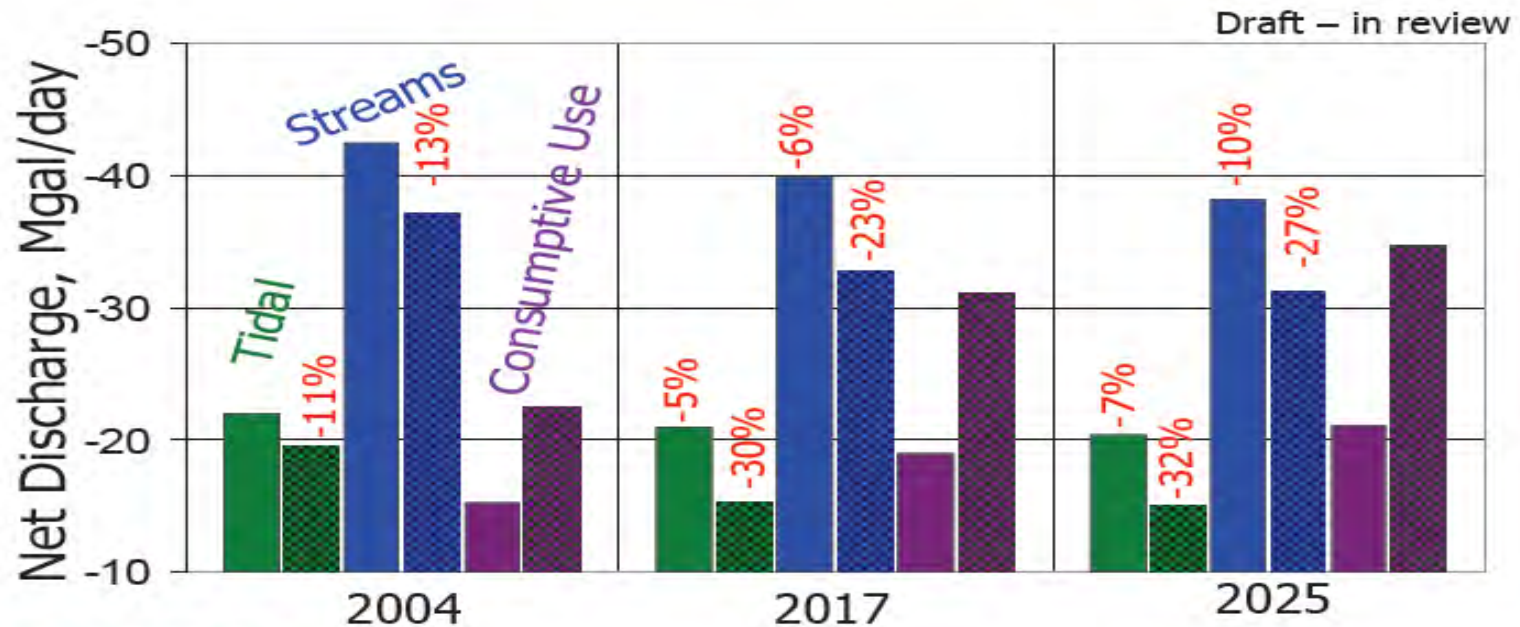
## Potential New Sources - Groundwater





# Seacoast Drainage Basins Groundwater Point of Discharge

Current and Future Balance of GW  
Existing sewerage and fully sewerage



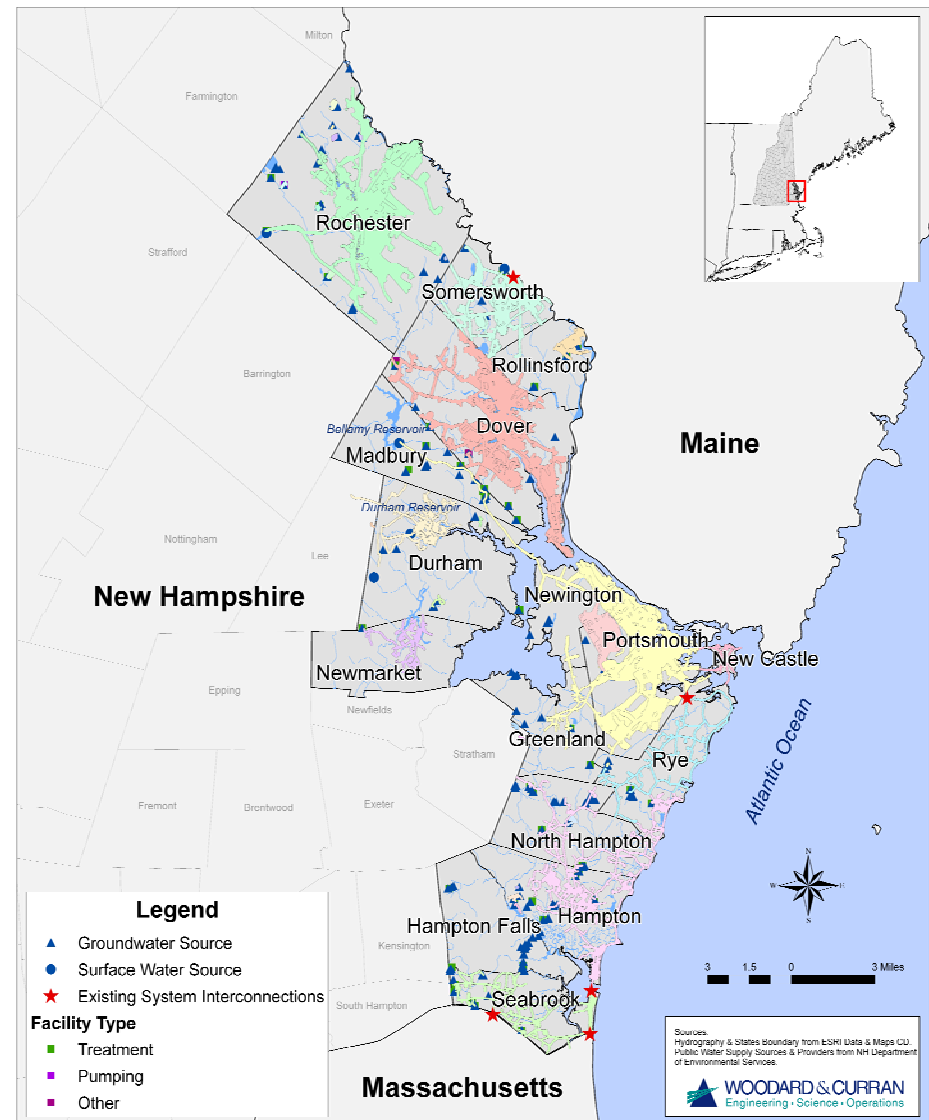
# Work Done to Date

## 2005 Mutual Aid Study

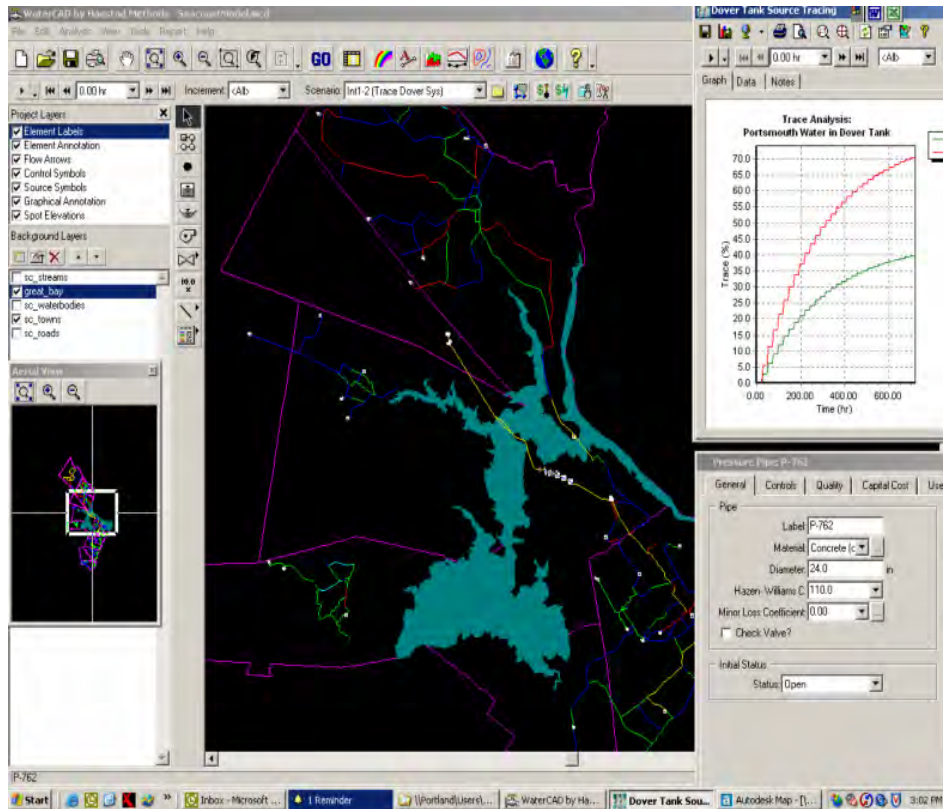
- 14 Seacoast Communities
- Served by 10 Utilities
- Emergency Interconnections
- Acute Supply Redundancy
- Not fully applicable for long term supply assessment
- Provides a baseline for identifying potential water sellers



## Seacoast Mutual Aid Study



# 2005 Mutual Aid Study Questions Answered



- How much excess capacity does each water utility have on an emergency basis?
- How much can be conveyed through existing interconnections?
- What capital expenditures would be needed to achieve the desired water conveyance?

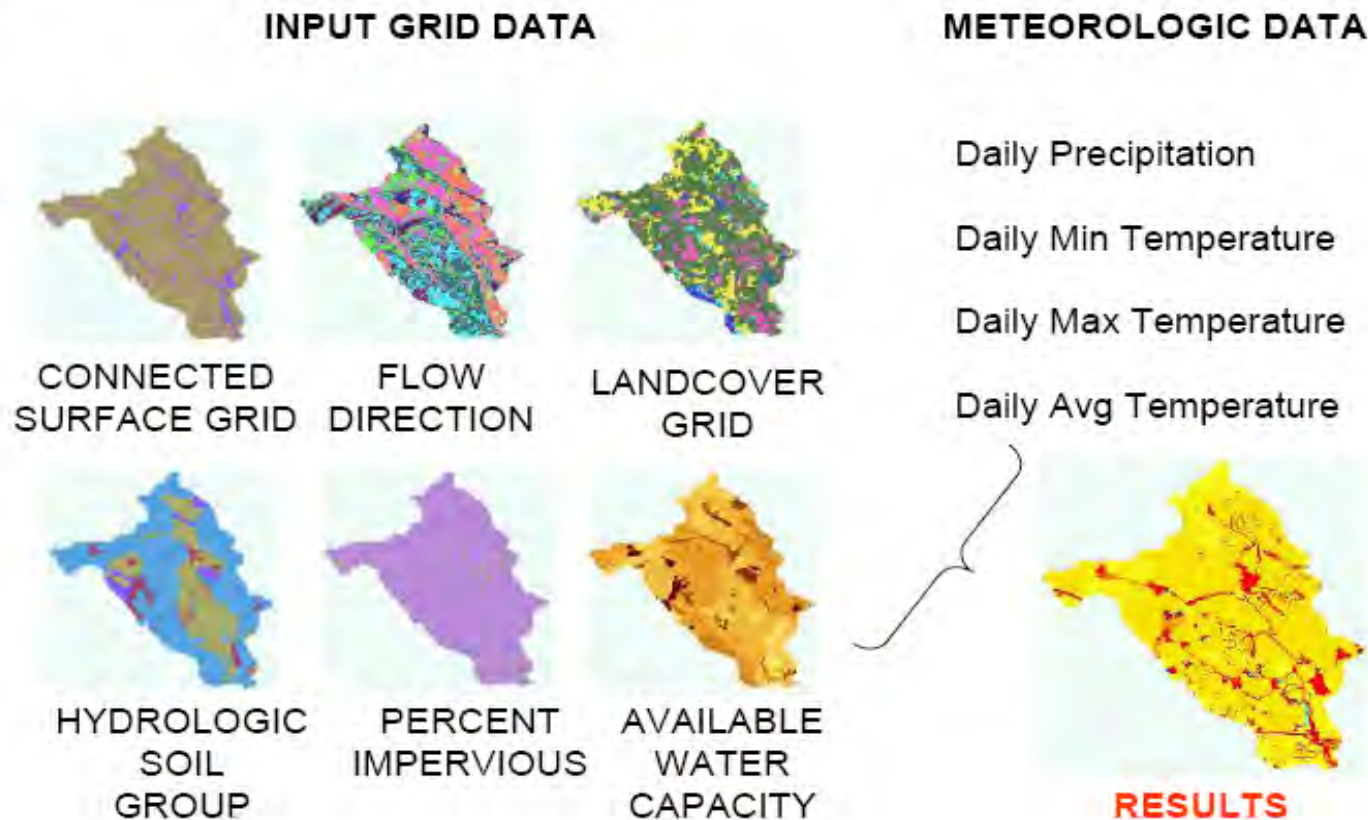




# Other Work Currently Underway

## NH-DES Seacoast Groundwater Modeling

### Ground Water Availability – Recharge Modeling



# Seacoast Water Utilities

## How to meet future system demands

Long-term supply sustainability is the goal:

- Water Conservation
- Demand Management
- Aquifer and Watershed Protection
- Land Use Planning and Monitoring
- Investigate aquifer recharge & aquifer storage



# Bellamy and Oyster River Watersheds

## Potential for Aquifer Recharge and Aquifer Storage

### Aquifer recharge and storage considerations:

Potential to increase water available to wells

Potential to increase dry weather stream flow

Flattens the hydrologic cycle (stores water in times of plenty; see insert)

Potential to organically enrich groundwater

Can cause conflicts with “downstream” water users

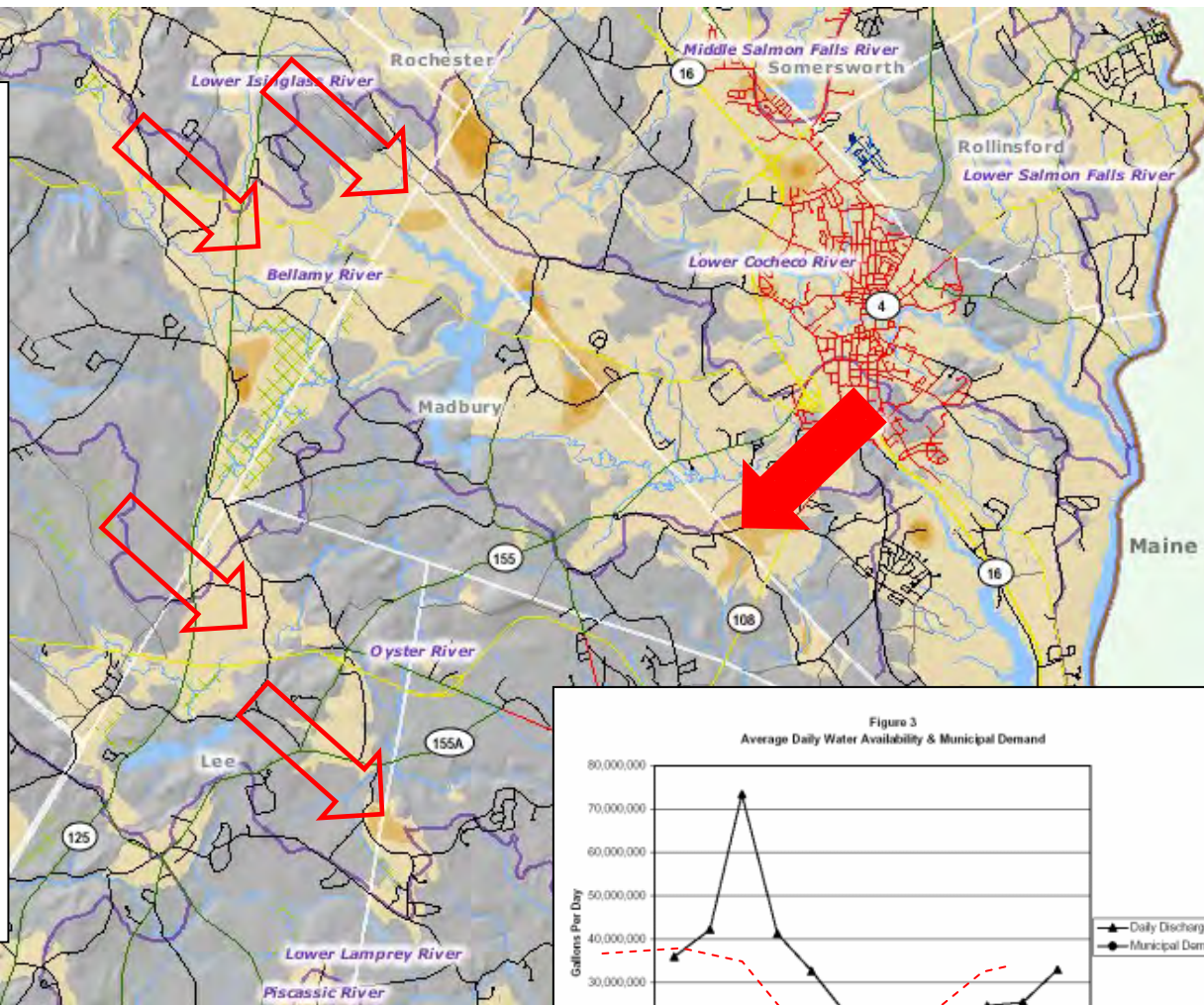
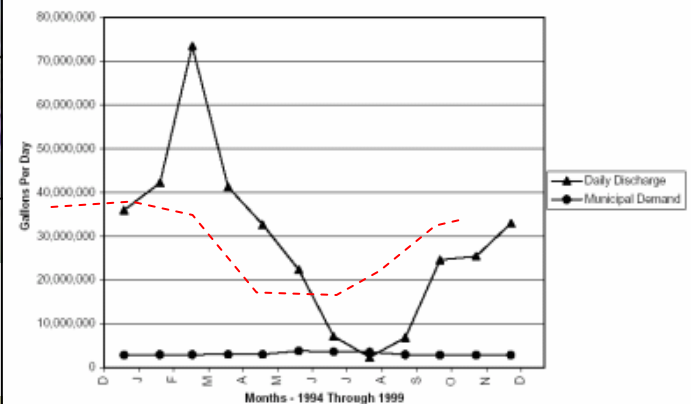


Figure 3  
Average Daily Water Availability & Municipal Demand





# Financial and Management Considerations

- Keep the end in mind
  - Public Health
  - Affordability
  - Resource Protection
- Business of the Utility
  - Utility Structure
  - Rate Setting
  - O&M Costs



# Information Sources

- Presentation on Land Use by David Wunsch, Ph.D.; NH State Geologist
- Bellamy River Hydrologic Budget Report; BORWPP
- USGS On-line Resources
- NH-DES GRANIT On-line Data Mapping Tool
- Seacoast Mutual Aid Study





# Questions?

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