Massachusetts-USGS Hydrologic Monitoring Networks Update

Water Resources Commission
April 9, 2024

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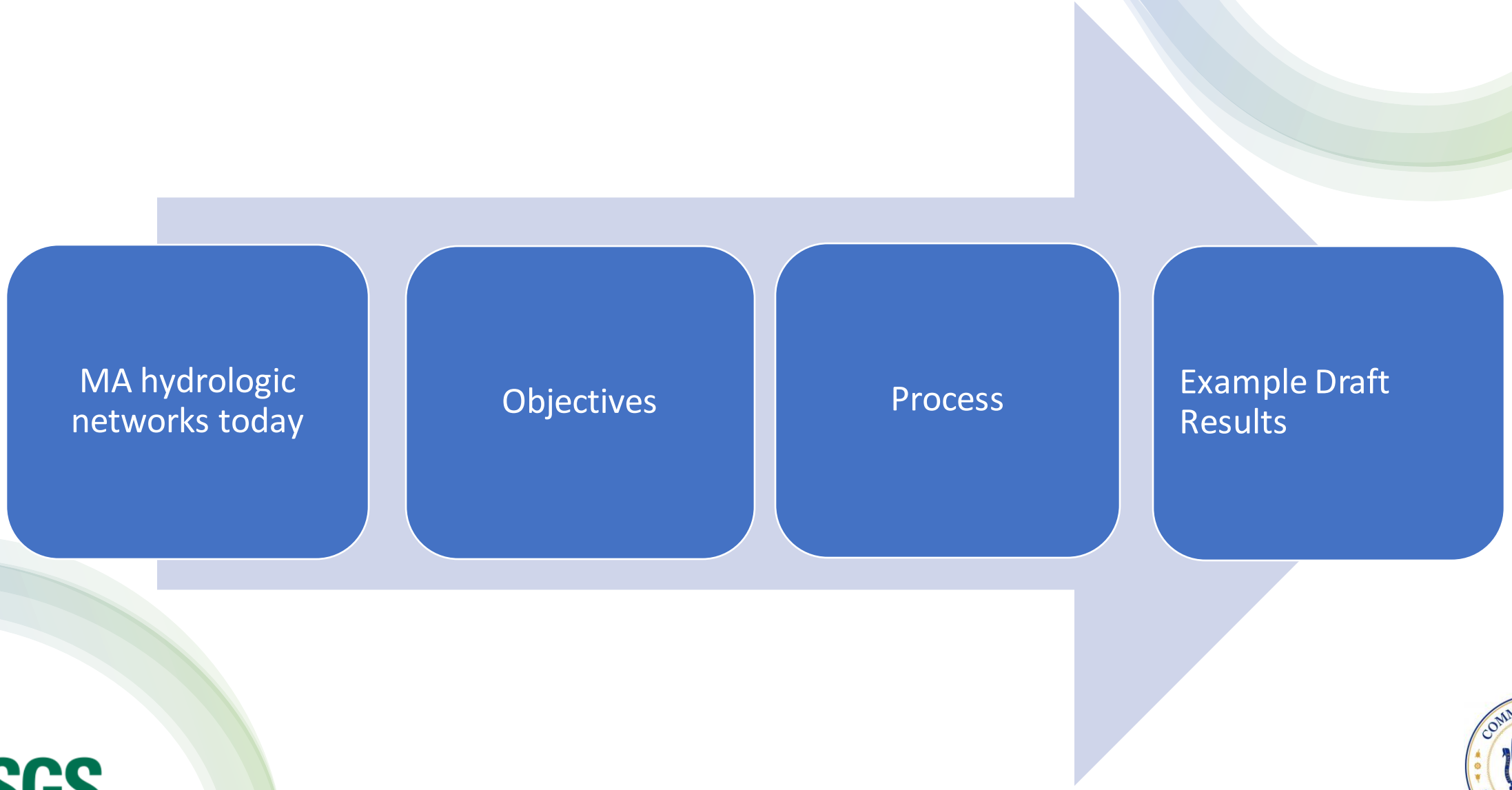
Outline



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Massachusetts-USGS Hydrologic Networks

Network	Number of Stations
Weather	7
Tide	4
Streamflow	59
Groundwater - Real time	61
Groundwater - Monthly	32
Total	**163**

- Uses: drought monitoring, flood forecasting, fisheries management, ITA approvals and monitoring, WMA outdoor water use restrictions, restoration design and monitoring, research including climate impacts on water resources ….
- In FY24, $1.06 million for operation and maintenance
- In FY25, +$825,000 for a total of $1.89 million
- Network analyses conducted over the past years will inform the expansion of the networks

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Objectives

- **Assess and update the streamflow and groundwater networks to provide comprehensive monitoring of conditions that meet the needs of stakeholders.**

- Consult with state and federal stakeholders about uses of networks, problem sites, and network gaps
  - EEA, DCR, DEP (Wetlands, WMA, Drinking Water), DFW, DER
  - USGS, NWS, NERFC

- Remove sites:
  - Impacted
  - Logistics issues
  - Spatial duplicates

- Add sites:
  - Active sites but not currently part of the "least impacted networks"
  - New sites to fill geographic gaps considering the state's drought regions and major basins

- Upgrade sites so that all sites within the least impacted network are continuously measured and data is transmitted real-time

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Note: Given the sparsity of bedrock wells across the state (10 wells), the groundwater network analysis focused on non-bedrock wells.

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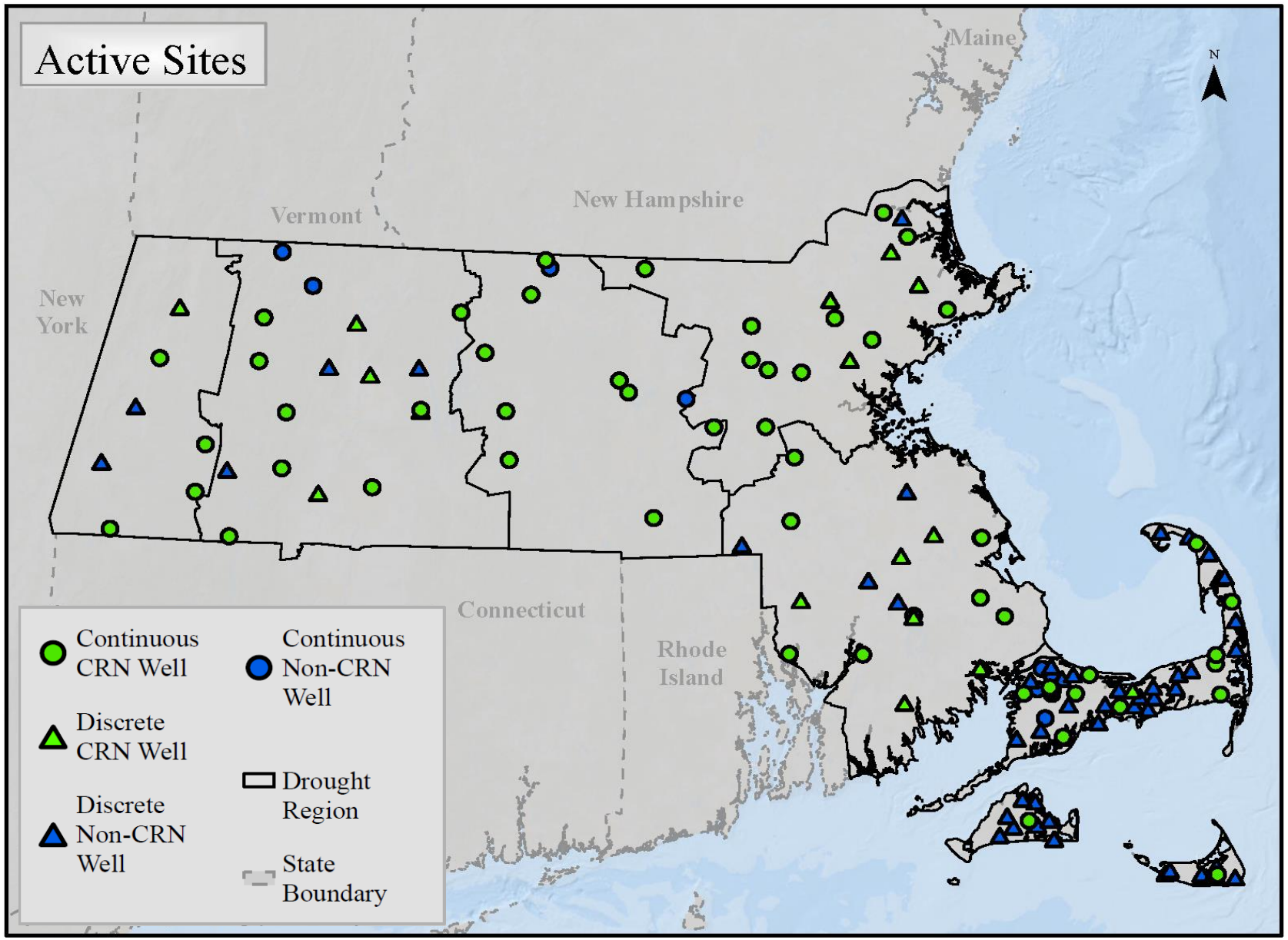
Massachusetts Groundwater Network



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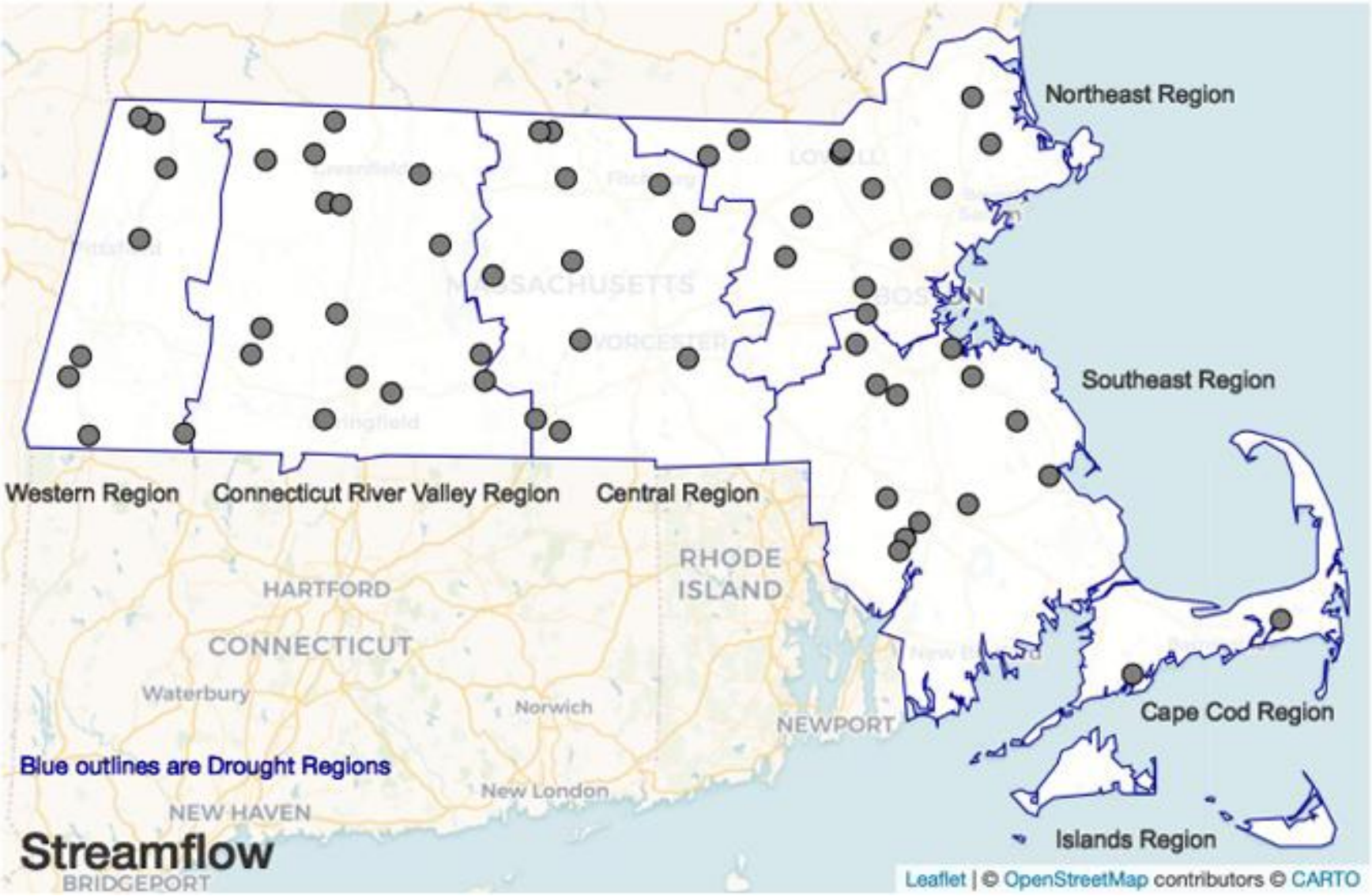
Massachusetts Streamflow Network



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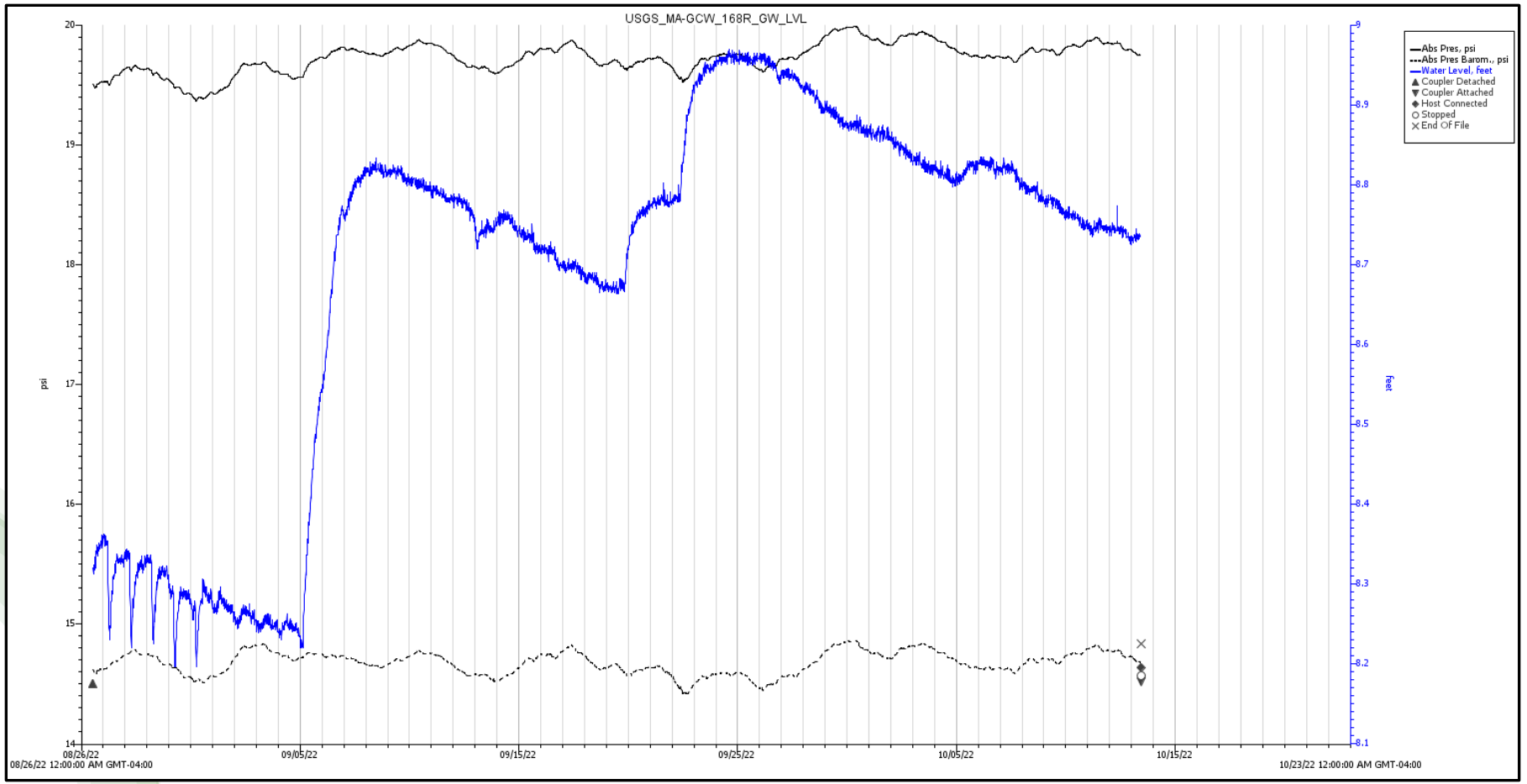
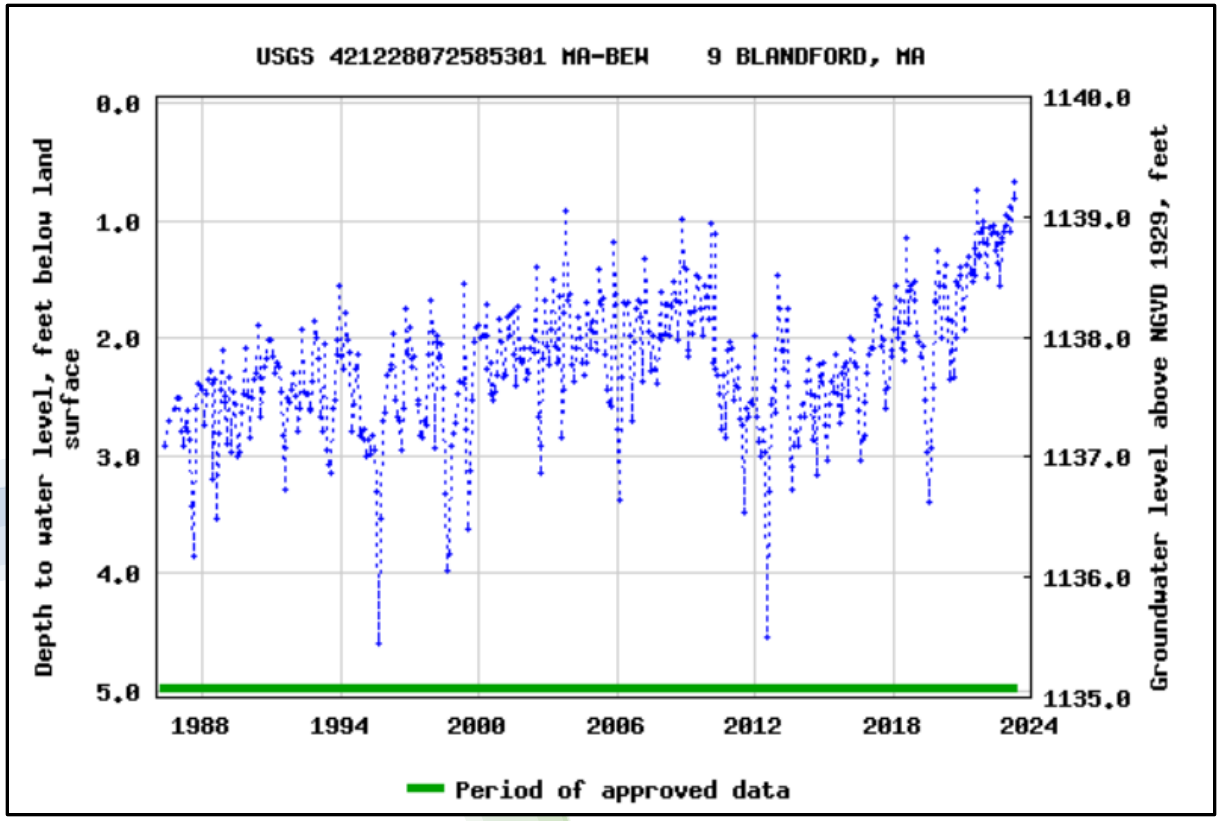
MA Network Analysis Process

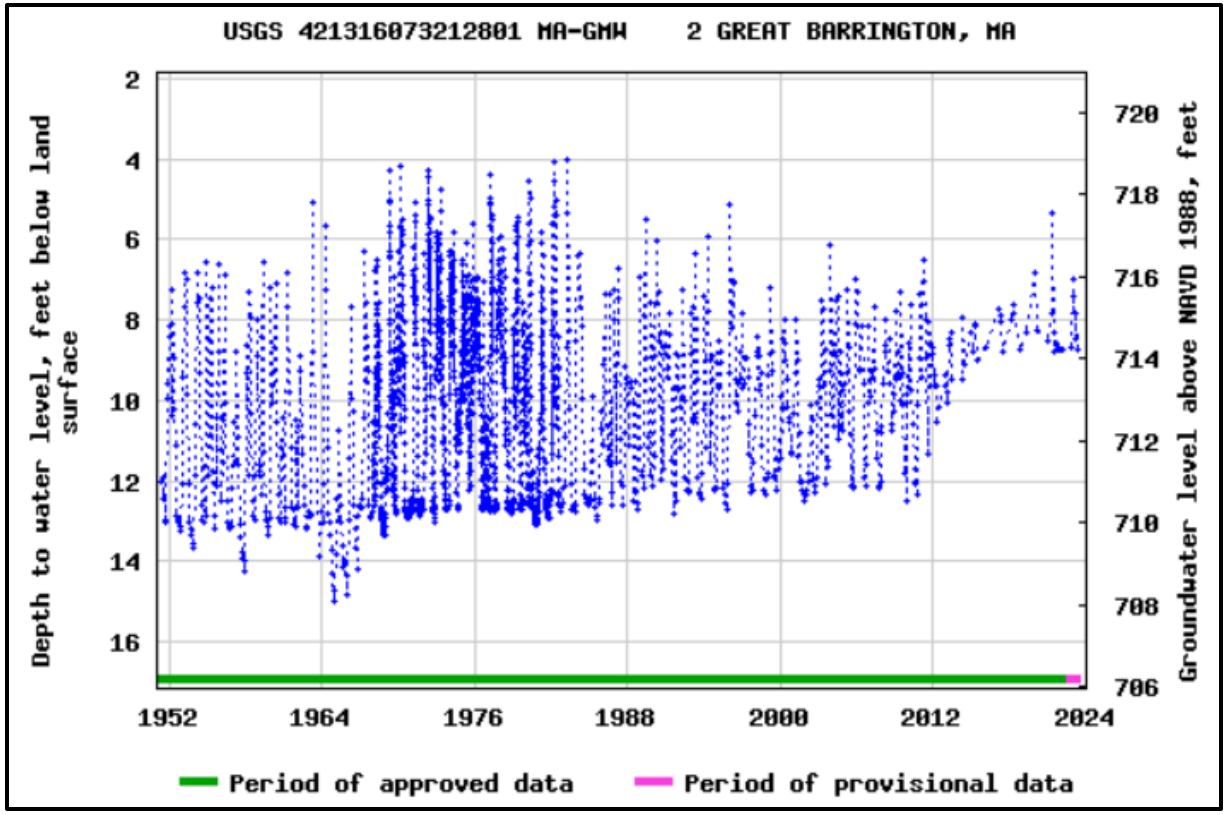
1. Collect time series data where no continuous data, i.e., 30+monthly manual wells



MA Network Analysis Process

2. Evaluate time series data for impacts





MA Network Analysis Process

3. Evaluate & fill gaps in the network

Evaluate Active Sites in or near MA border

Identify Discontinued Sites

Consider New Sites

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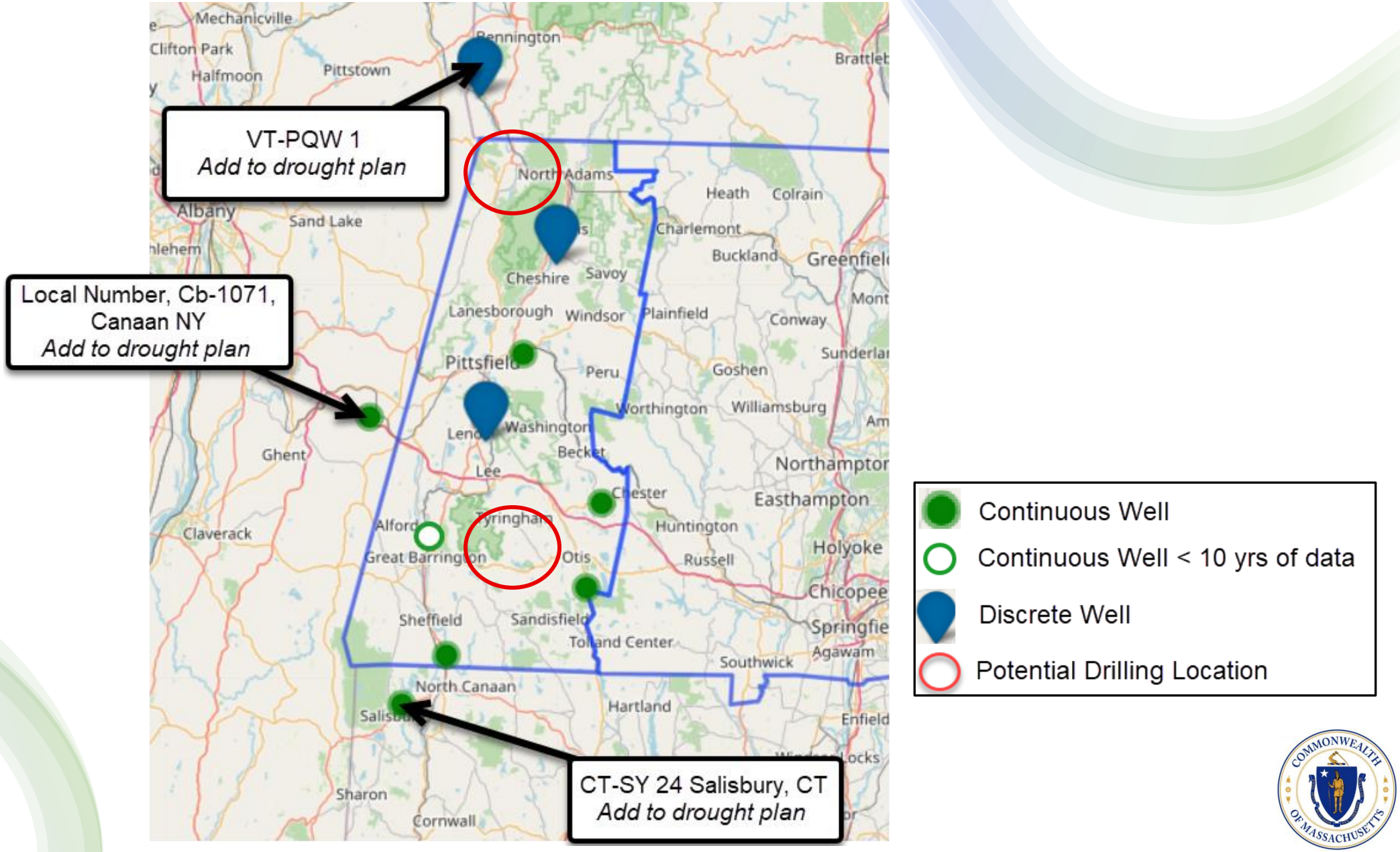
DRAFT – Western Region Groundwater



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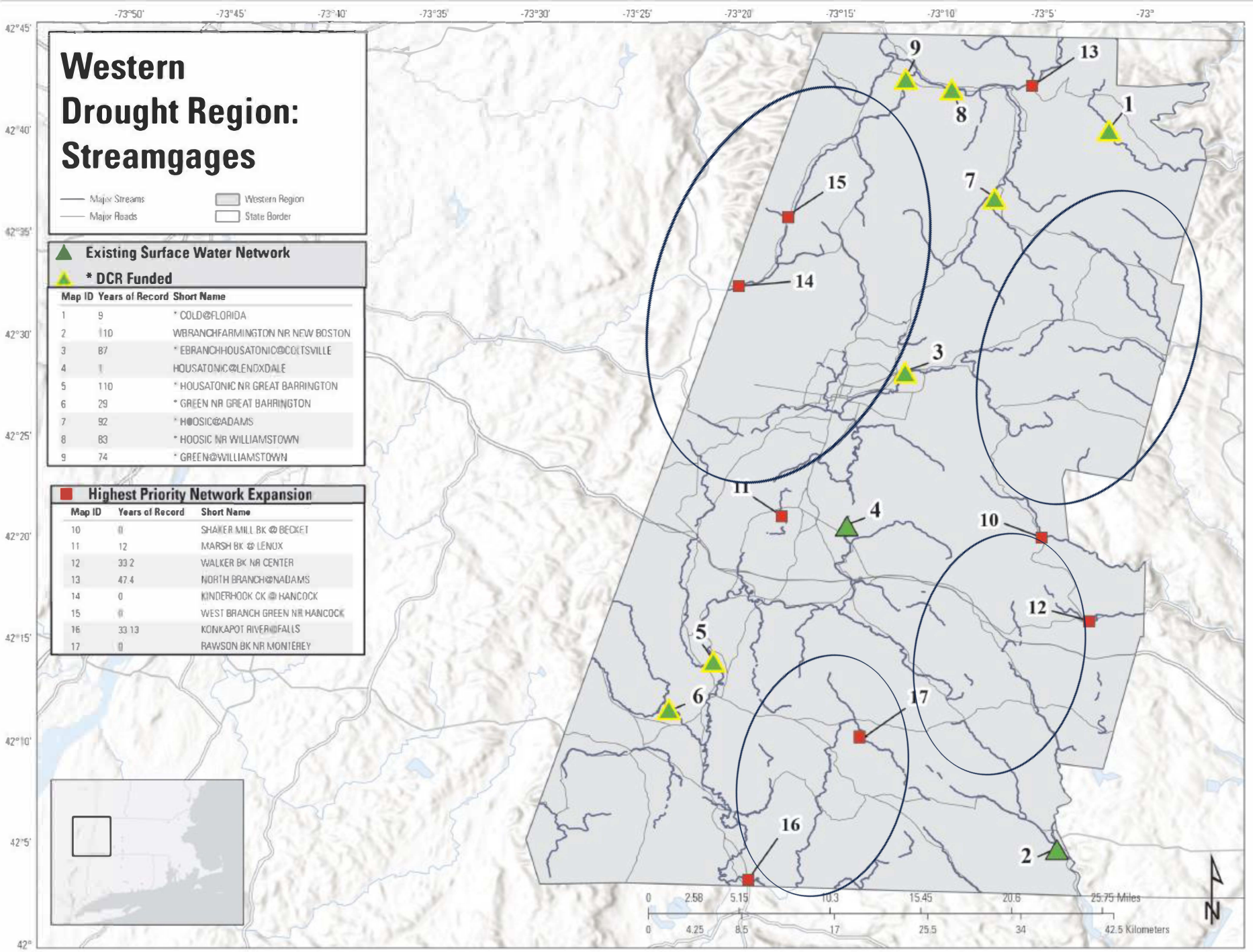

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Additional Recommendations

- Keep up-to-date with compiled databases as site conditions change
- Conduct network analyses as needed or every 10 years if keep up-to-date with database
- Conduct a bedrock well network analysis – only 10 active bedrock wells across the state, creating a network may require significant investment.
    - Perhaps start with one well in each drought region to help understand homeowner implications during drought, etc.
- Add sites for representing:
    - Headwater stream gages → drought monitoring, aquatic health
    - Sites representing varying positions in the landscape (valley bottom, hilltop, etc.)
- Consider the impact of sea level rise on coastal sites → designate as separate network?

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Questions?

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