USGS/Massachusetts Cooperative Hydrologic Monitoring Network

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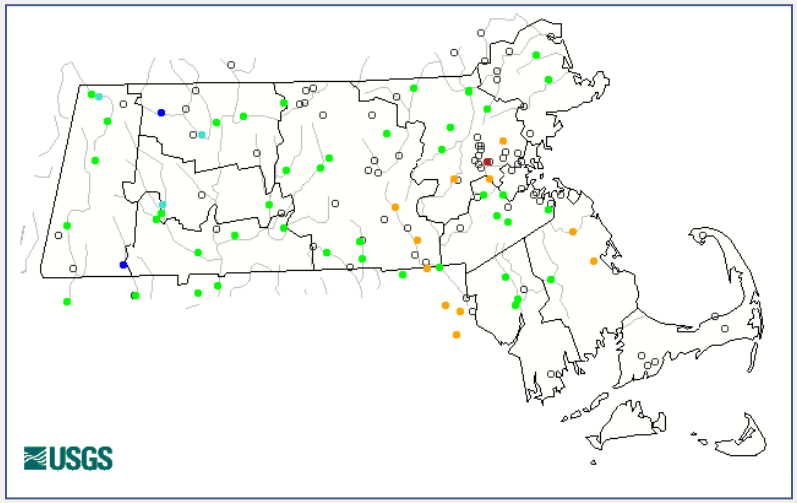
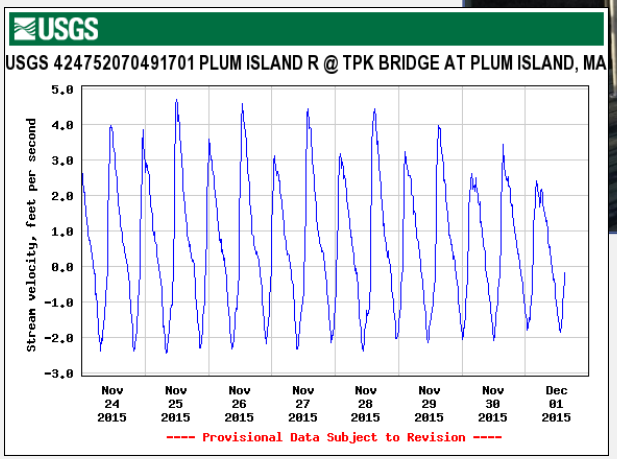
USGS/Massachusetts Monitoring Networks

- Groundwater Observation Wells (92)
- Stream Gages (57)
- Precipitation/Weather Stations (4)
- Tide Gages (4)



Stream Gage Network



Tide Gage Data

Massachusetts Groundwater Monitoring Goals

- Measure/Understand Climate Response
  - Groundwater is a long term indicator
- Improve Drought Management
  - Groundwater levels are a key long-term indicator for drought conditions
- Inform Emergency Management
  - Groundwater levels are an important environmental and public health indicator

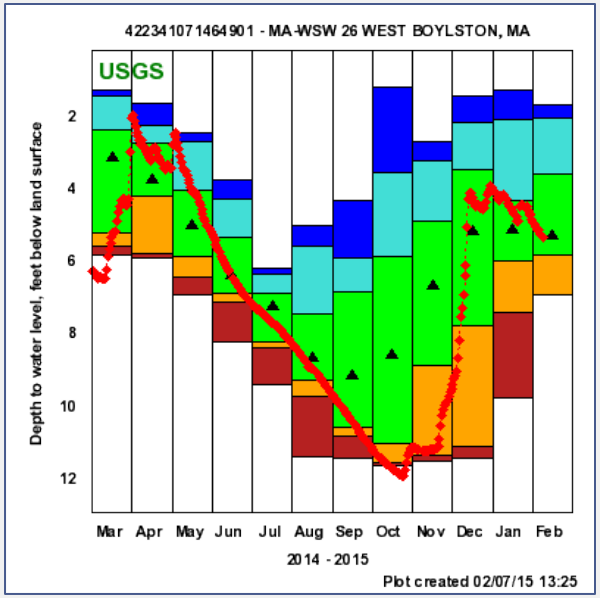
USGS/MA Groundwater Network

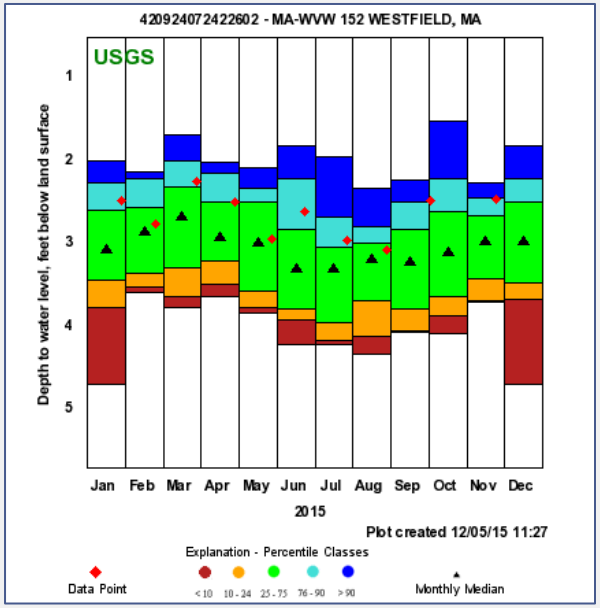
92 Observation Wells

Annual O&M ~$200,000

USGS/MA Groundwater Network

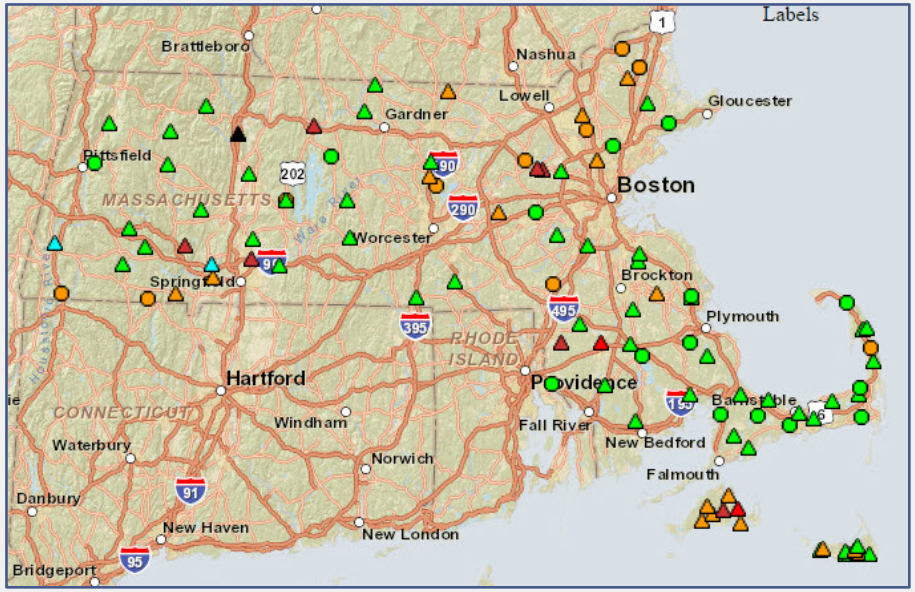
- 92 wells total (including 7 new bedrock wells)
- 26 real-time wells
- 59 measured monthly



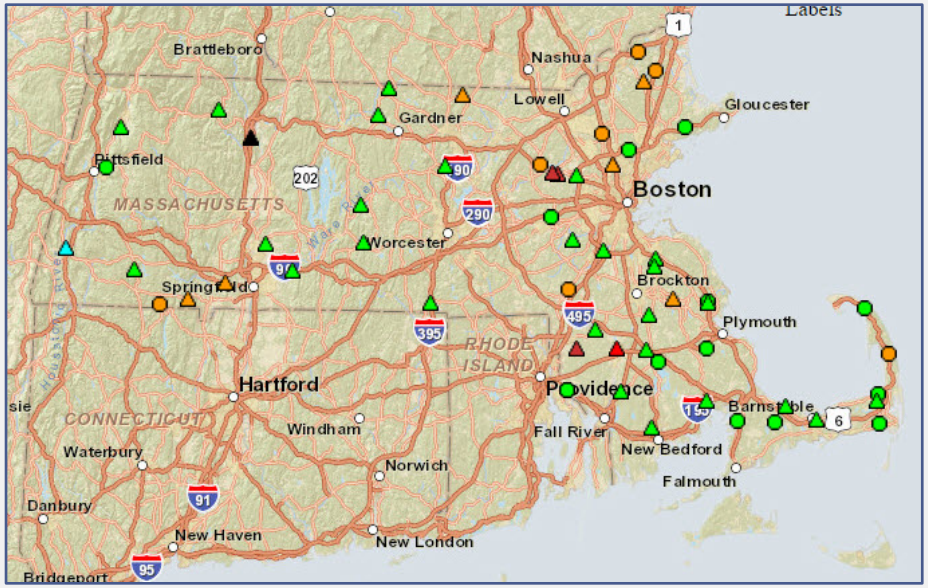


Long Term Network

105 Wells with 20+ years of Monthly Data



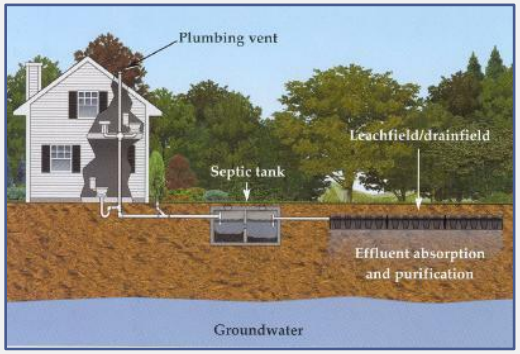
58 Wells With 50+ Years of Monthly Data

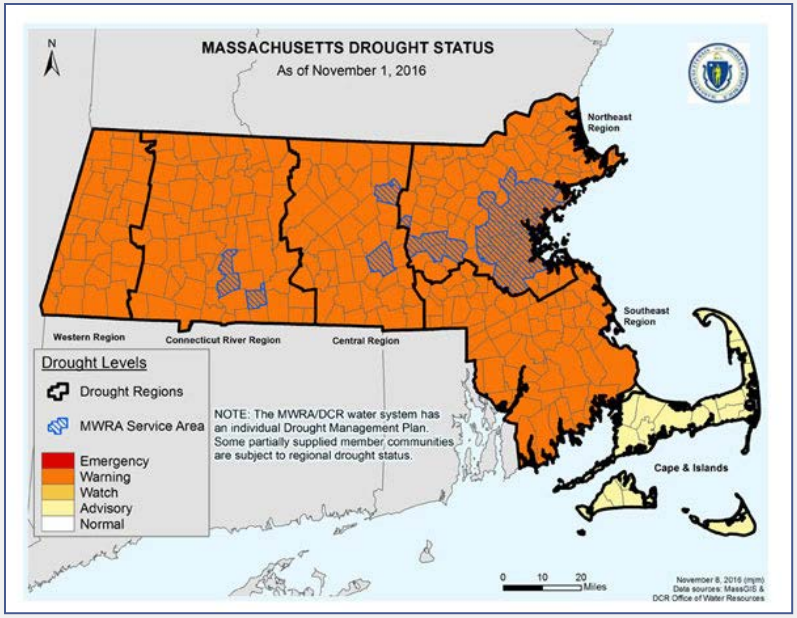


Real-time Observations

Data Uses

- Groundwater is 1 of 7 indicators in the MA Drought Management Plan
- Groundwater levels are used to trigger outdoor water restrictions in permits
- Groundwater levels are used to evaluate and permit subsurface wastewater disposal (estimating seasonal high water)





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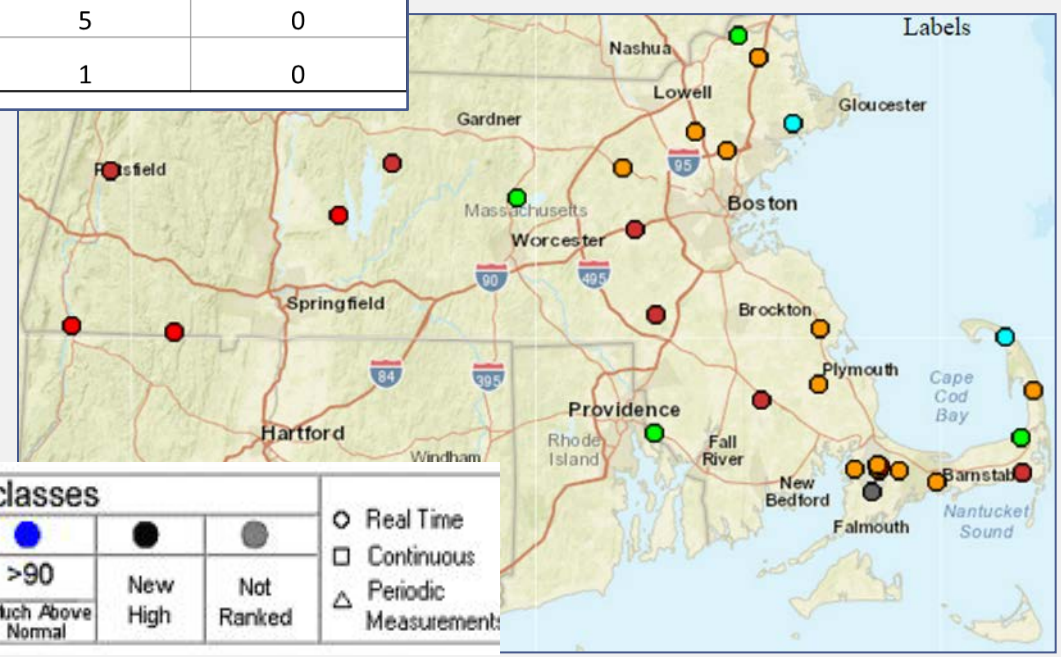
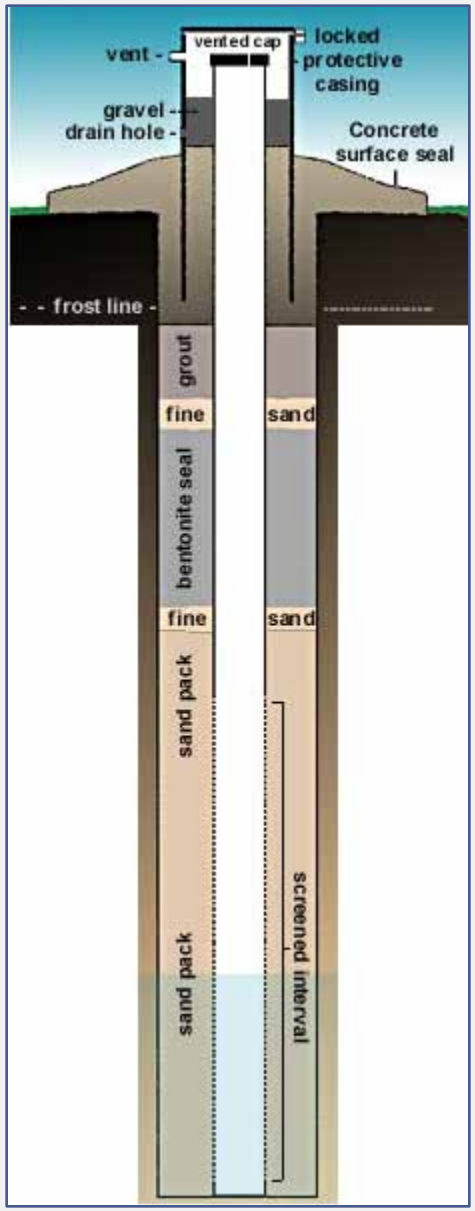
MA October Groundwater Levels

Region	Number of wells	MA Drought Plan Index (# consecutive months majority below 25th percentile)	Number of wells below 10th percentile for Oct	Number of wells at Record Low for Oct
Western	5	8	3	1
CT River Valley	11	7	1	9
Central	10	7	2	1
Northeast	17	7	3	2
Southeast	12	6	5	0
Cape and Islands	13	0	1	0

- 13 record lows in October 2016
- Data inform DMTF



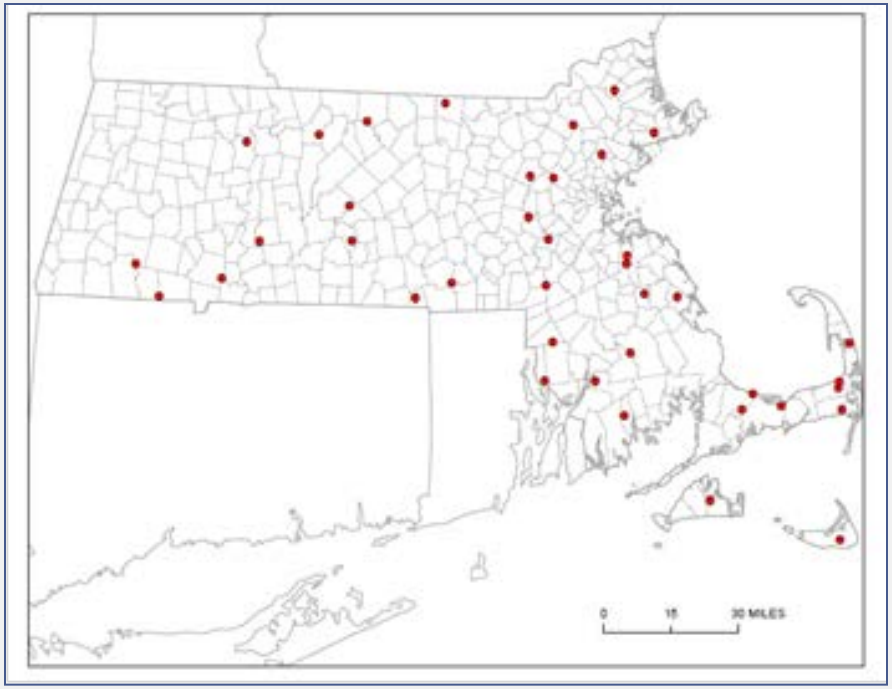
Physical Status of Wells



- 55 steel wells older than 50 years (1965 and before) in acidic ground water!
- 20 wells with entire screen full of sediment, likely collapsed

NGWMN Well Replacement Grant

- Maintain and modernize historic ground water monitoring network (records back to 1936)
- 2-year grant to replace 39 old steel wells with PVC
- Assure the continuous collection and provision of ground water level data to meet the NGWMN objective of assessing long-term water level trends.



Location of 39 ground water wells proposed for replacement

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FY17 Hydrologic Monitoring Network Budget

State

$800,000

USGS

$290,124

NSIP

$68,900

Total Budget

$1,159,024

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Program Budget FY17

- Stream Gages
  - $875,185
- Ground Water
  - $208,679
- Precipitation/Weather
  - $17,000
- Tide Gages
  - $18,000
- Soil Moisture
  - $2,500