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# DCR-USGS Cooperative Hydrologic Monitoring Program

## *Annual Update*


**Brian Loving**

**Hydrologic Monitoring Branch Chief**

**USGS New England Water Science Center**

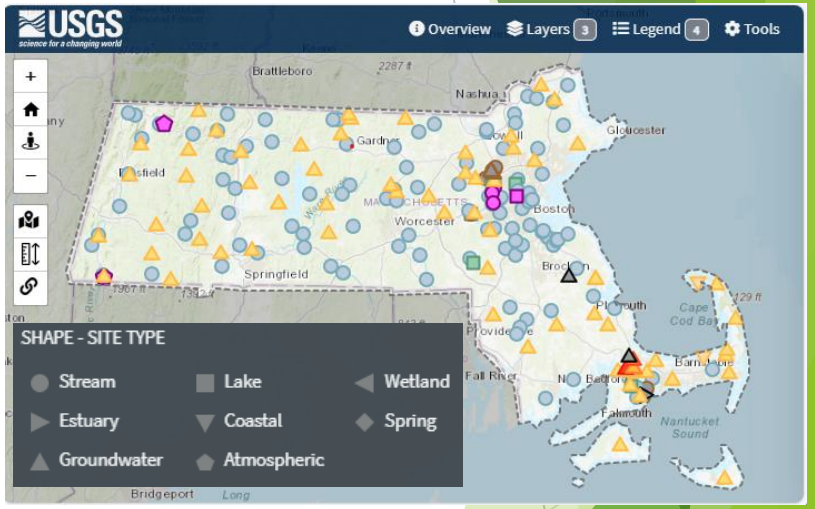


U.S. Department of the Interior
U.S. Geological Survey

# DCR-USGS Hydrologic Monitoring Network

## *Overview*

- History
- Scope
  - DCR OWR – USGS network only
  - Data types and locations
- Uses
- Data access and visualization
- Funding and costs
- What's new




*dashboard.waterdata.usgs.gov*

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# DCR-USGS Hydrologic Monitoring Network

## *History*

- **Long partnership between Massachusetts and USGS monitoring water resources**
- **Streamgages in this network**
  - **Average years of data per site: 60**
  - **Active sites with more than 100 years: 5**
    - **Millers River at Erving, MA**
    - **Millers River near Winchendon, MA**
    - **Priest Brook near Winchendon, MA**
    - **Quaboag River at West Brimfield, MA**
    - **Ware River at Gibbs Crossing, MA**
- **Groundwater level monitoring in this network**
  - **Average years of data per site: 47**
  - **Sites with more than 80 years: 3**

*Little River near Oxford, MA, 1940*

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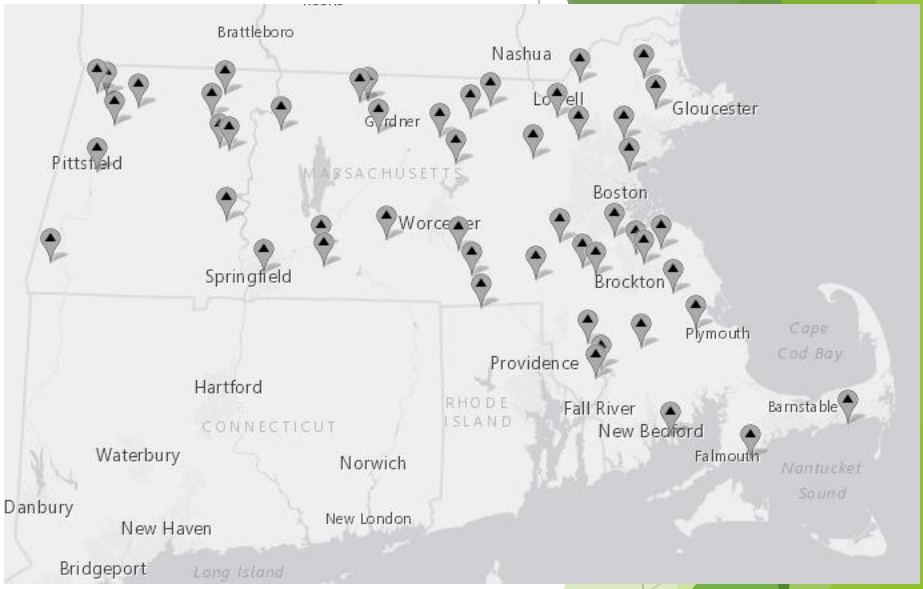
# DCR-USGS Hydrologic Monitoring Network

## *Scope*

- **Data types and locations (currently)**
  - **Streamflow and level – 51 Stations**




*DCR-USGS Streamflow Stations*

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# DCR-USGS Hydrologic Monitoring Network

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- **Data types and locations (currently)**
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  - **Stream level only – 5 Stations**


*DCR-USGS Stream Level Stations*

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# DCR-USGS Hydrologic Monitoring Network

## *Scope*

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  - **Tide level – 3 Stations**


*DCR-USGS Tide Level Stations*

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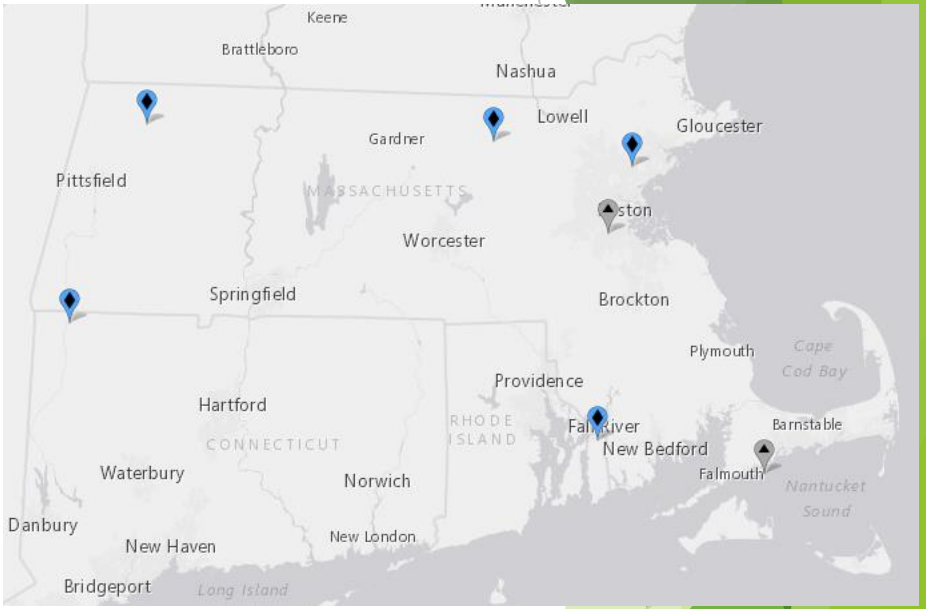
# DCR-USGS Hydrologic Monitoring Network

## *Scope*

- **Data types and locations (currently)**
  - **Streamflow and level – 51 Stations**
  - **Stream level only – 5 Stations**
  - **Tide level – 3 Stations**
  - **Atmospheric – 7 Stations**




*DCR-USGS Atmospheric Stations*

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  - **Atmospheric – 7 Stations**
  - **Stream chemistry – 1 Station**


*DCR-USGS Stream Chemistry Stations (temperature and specific conductance)*

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# DCR-USGS Hydrologic Monitoring Network

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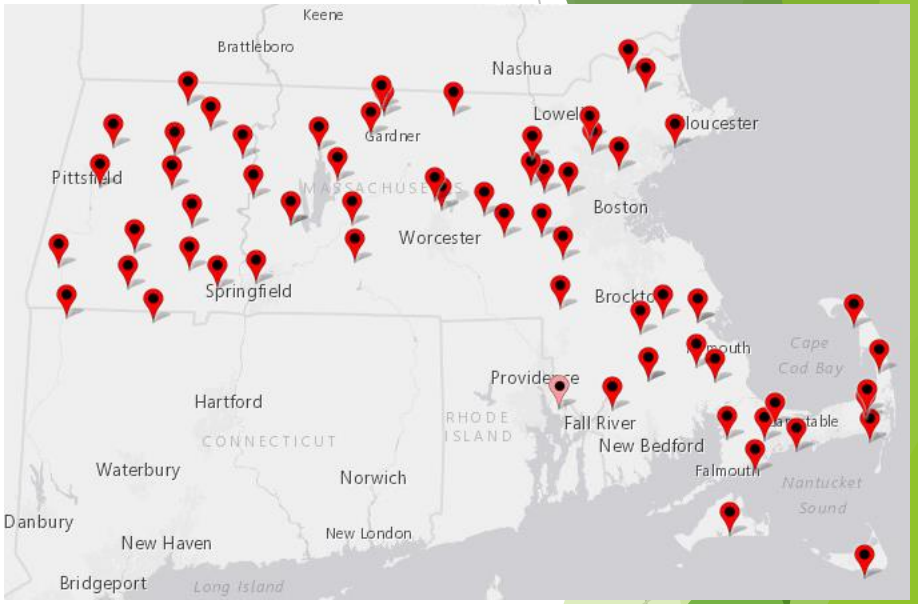
  - **Stream chemistry – 1 Station**
  - **Groundwater level – 66 Stations**




*DCR-USGS Groundwater Level Stations (Continuous and in real time)*

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# DCR-USGS Hydrologic Monitoring Network

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  - **Groundwater level – 66 Stations**
  - **Groundwater level (monthly) – 57**


*DCR-USGS Groundwater Level Stations (Monthly discrete measurements)*

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# DCR-USGS Hydrologic Monitoring Network

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  - Atmospheric – 7 Stations
  - Stream chemistry – 1 Station
  - Groundwater level – 66 Stations
  - Groundwater level (monthly) – 57
- Changes during FY24
  - 6 monthly wells converted to real time


*DCR-USGS Groundwater Level Stations (Monthly discrete measurements)*

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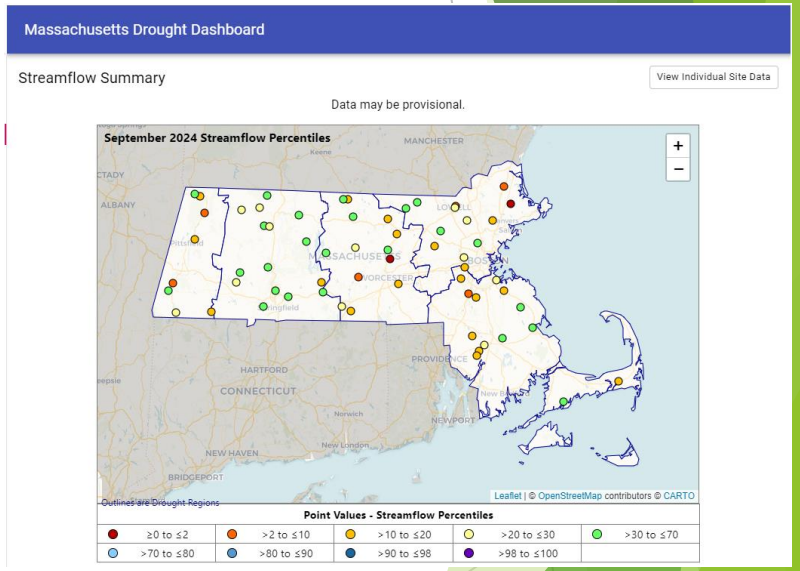
# DCR-USGS Hydrologic Monitoring Network

## *Uses*

- Drought Management
  - Assessing conditions
    - Spatial
    - Temporal
    - Multiple hydrologic parameters
  - Reliable and quantifiable information
- Flood Hazard Management
  - Real-time conditions
  - Some stations located for flood uses
  - Integrated with NWS flood forecasting




*Massachusetts Drought Dashboard*

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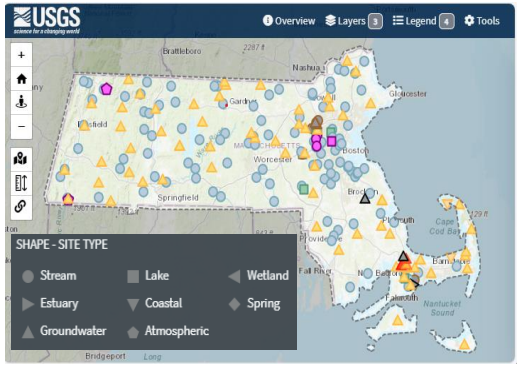
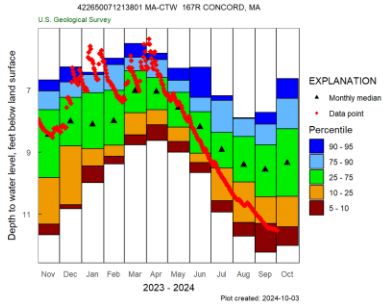
# DCR-USGS Hydrologic Monitoring Network

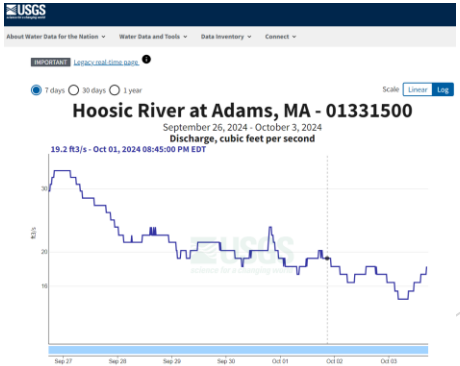
## *Data Access and Visualization*

- **Multiple agencies serve the data**
  - **DCR – Drought Dashboard**
  - **NWS – water.noaa.gov**
  - **USGS**
    - **National Water Dashboard**
    - **“WDFN” station pages**
    - **WaterWatch**
    - **New England GW Levels App**




*USGS National Water Dashboard*

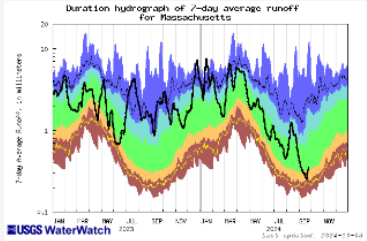




*USGS Station Plots and Tables*

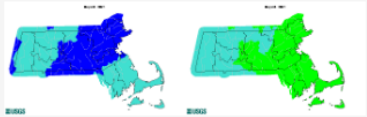
### Duration Hydrograph

Present a time-history runoff along with historical runoff percentiles.




### Comparison of Streamflow Maps

Compare two streamflow condition maps side-by-side



*USGS WaterWatch*

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# DCR-USGS Hydrologic Monitoring Network

## *Funding and costs*

- **FY24 vs FY25 DCR/USGS costs**

| | FY24 | FY25 | *Increase* |
|---|---|---|---|
| DCR-OWR | $1,064,516 | $1,215,381 | 14% |
| USGS | $ 289,130 | $ 289,130 | 0% |
| Total | $1,353,646 | $1,504,511 | 11% |

  - **USGS matching funds flat for years**
  - **FY25 increase to DCR due to:**
    - **Inflationary increase of 6.4% on total program cost, all borne by DCR**
    - **6 monthly wells converted to realtime**
    - **Several monthly wells were active, but inadvertently left off FY24 agreement**

*Popponesset Bay Tide Gage*

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# DCR-USGS Hydrologic Monitoring Network

## *Funding and costs*

- **Per record costs, by type**

| | FY24 | FY25 | FY26* |
|---|---|---|---|
| Stream flow/level | $17,000 | $17,800 | $17,800 |
| Stream level (only) | $ 7,300 | $ 8,700 | $ 8,700 |
| Tide level | $ 7,300 | $ 8,700 | $ 8,700 |
| Precipitation (add-on) | $ 2,600 | $ 2,800 | $ 3,400 |
| Precipitation (stand-alone) | $ 5,400 | $ 5,700 | $ 6,000 |
| 6-parameter Atmo | $ 7,000 | $ 7,000 | $ 7,300 |
| Stream Temp/SC | $ 5,400 | $ 5,700 | $11,000 |
| Groundwater level | $ 6,000 | $ 6,360 | $ 6,600 |
| Groundwater level (monthly) | $ 1,100 | $ 1,265 | $ 1,800 |
| *Projected | | | |

- **Network expansion coming in FY25, with possibly more in FY26, make it difficult to project total FY26 program cost**

*Little River near Oxford, MA, 2024*

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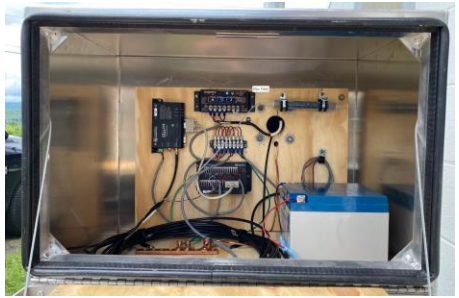
# DCR-USGS Hydrologic Monitoring Network

## *What's new*

- **Surveying all stations to NAVD88**
  - **SW field nearly work complete, updating data**
  - **GW work to be completed calendar 2025**
- **Conversions of monthly wells to real-time gages**
- **Network expansion (Viki to discuss next)**

*GNSS Survey to NAVD88*

*Upgraded Cheshire Well*



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# DCR-USGS Hydrologic Monitoring Network

***Questions?***


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