



# Streamflow and Groundwater Conditions in Rhode Island November 2022 – January 2023

Chris Bruet  
February 14, 2023  
U.S. Geological Survey  
New England Water Science Center



Table 2, Rhode Island Drought Indices and Phases

Drought Phase	Palmer Drought Index +	Crop Moisture Index	Precipitation +	Ground Water** +	Stream flow +	Reservoirs**
<b>Normal</b>	-1.0 to -1.99	0.0 to -1.0	Slightly Dry	1 month below normal 1 month below normal	2 consecutive months below normal	Reservoir levels at or near normal for the time of year
<b>Advisory</b>	-2.0 to -2.99	-1.0 to -1.9 Abnormally Dry	2 month cumulative below 65% of normal	At least 2 out of 3 months below normal	3 consecutive months below normal	Small index Reservoirs below normal
<b>Watch</b>	-3.0 to -3.99	-2.0 to -2.9 Excessively Dry	1 of the following criteria met: 3 month cum. <65% or 6 month cum. <70% or 12 month cum. <70%	4-5 consecutive months below normal	At least 4 out of 5 consecutive months below normal	Medium index Reservoirs below normal
<b>Warning</b>	-4.0 and below	> -2.9 Severely Dry	2 out of 3 of the above criteria met: 3 month cum. <65% and 6 month cum. <65% or 6 month cum. <65% and 12 month cum. <65% or 3 month cum. <65% and 12 month cum. <65%	6-7 consecutive months below normal observation wells recording monthly record lows	At least 6 out of 7 consecutive months below normal	Large index reservoirs below normal
<b>Emergency</b>	-4.0 and below	> -2.9 Severely dry	Same criteria as Warning and Previous month was Warning or Emergency	>7 months below normal Observation wells recording monthly record lows	>7 months below normal	Continuation of previous month's conditions

+ Major Hydrologic Indicators.

\*\* Local triggers from the water system supply management plans will also be considered in a assessing drought phases on a regional basis. The WRB staff will review local plans and work with suppliers to coordinate regarding drought phases and to collect, review and report surface reservoir and ground water data.

"Normal" is defined as the statistical average of the data for the period of record. Percentages for precipitation are relative to normal.



**Table 4  
Returning to Normal**

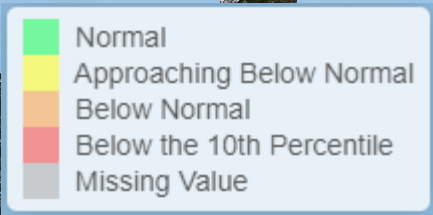
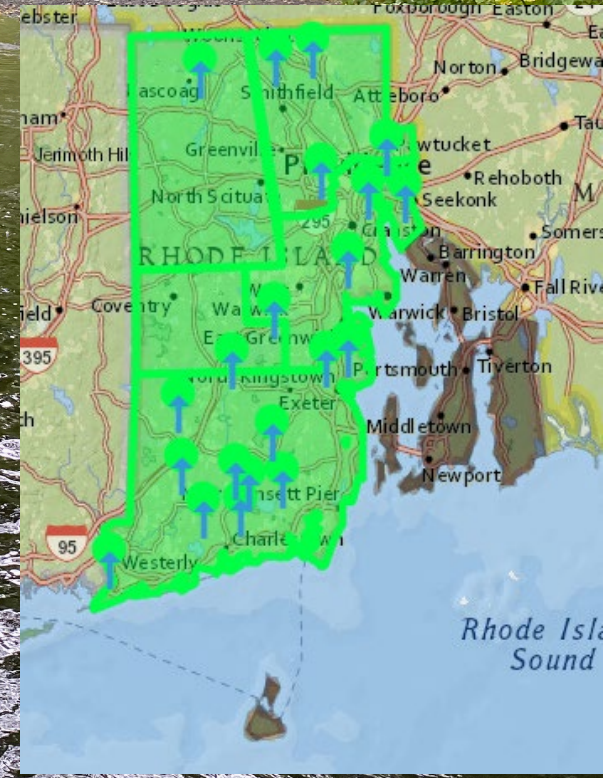
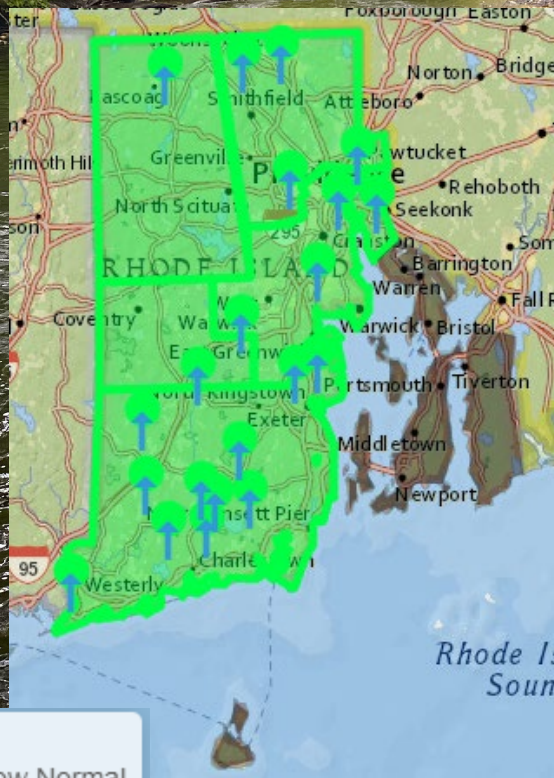
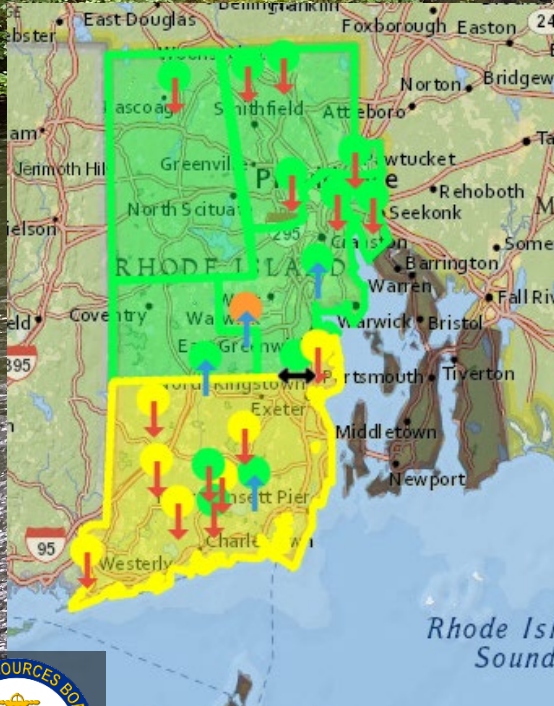
<b>Current Drought Phase</b>	<b>Next Drought Phase</b>	<b>Reduce Drought Phase by one category</b>
<b>Emergency</b>	Emergency-continued below normal conditions	Groundwater levels at or above normal and no precipitation deficit for past 3 months; and/or water resource problems which prompted the emergency have abated
<b>Warning</b>	Emergency-worsening conditions or continued below normal conditions	2 consecutive months of groundwater levels at or above normal and near normal precipitation for past 6 months
<b>Watch</b>	Warning-worsening conditions Watch continued below normal	2 consecutive months of groundwater levels at or above normal and near normal precipitation for past 6 months
<b>Advisory</b>	Watch-worsening conditions	2 consecutive months of groundwater levels at or above normal and near normal precipitation for past 3 months

# Average Monthly Streamflow Conditions November - January

November

December

January

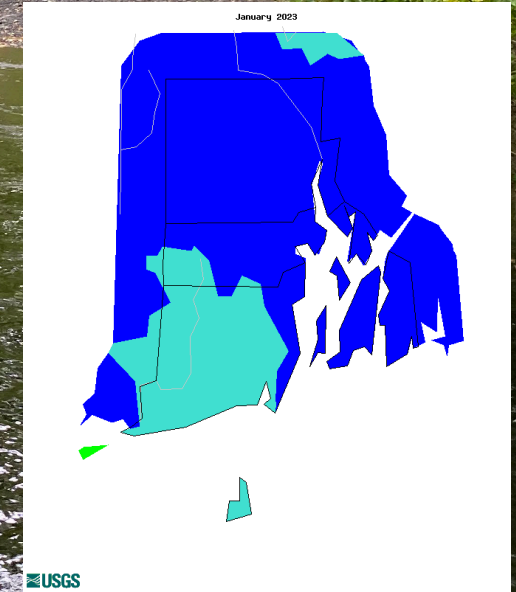
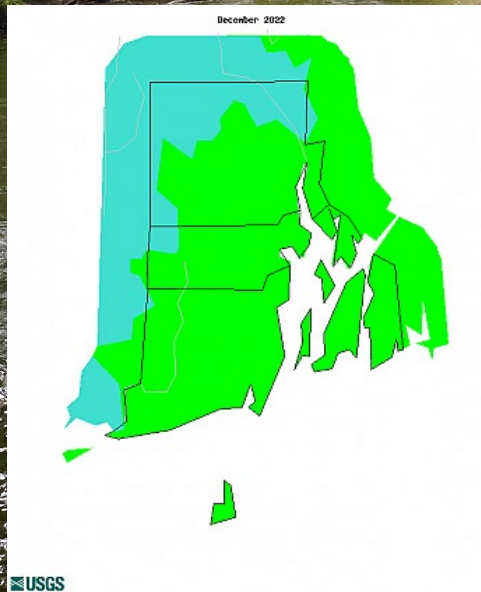
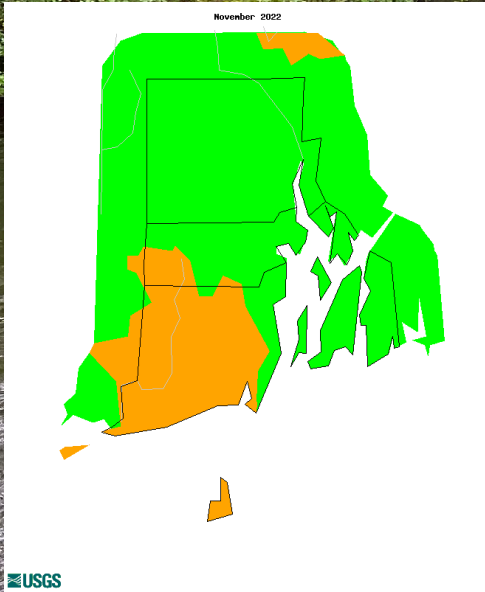


# Average Monthly Streamflow Conditions November – January

November

December

January



Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

# Average Monthly Streamflow Conditions November – January

Region & Number of Gages	Q 5/2022	Q 6/2022	Q 7/2022	Q 8/2022	Q 9/2022	Q 10/2022	Q 11/2022	Q 12/2022	Q 01/2023
Northwest (1)	3	21	19	2	81	67	38	71	97
Northeast (4)	11	9	9	3	76	82	54	71	97
Central West (1)	10	28	23	49	43	26	41	66	74
Central East (4)	6	11	19	14	46	49	49	68	94
Eastern (0)	No Gages-----								
Southern (11)	17	30	14	10	36	54	34	65	80
New Shoreham (0)	No Gages-----								
	5/2022	6/2022	7/2022	8/2022	9/2022	10/2022	11/2022	12/2022	01/2023
statewide Q	13	23	16	11	48	58	41	68	88

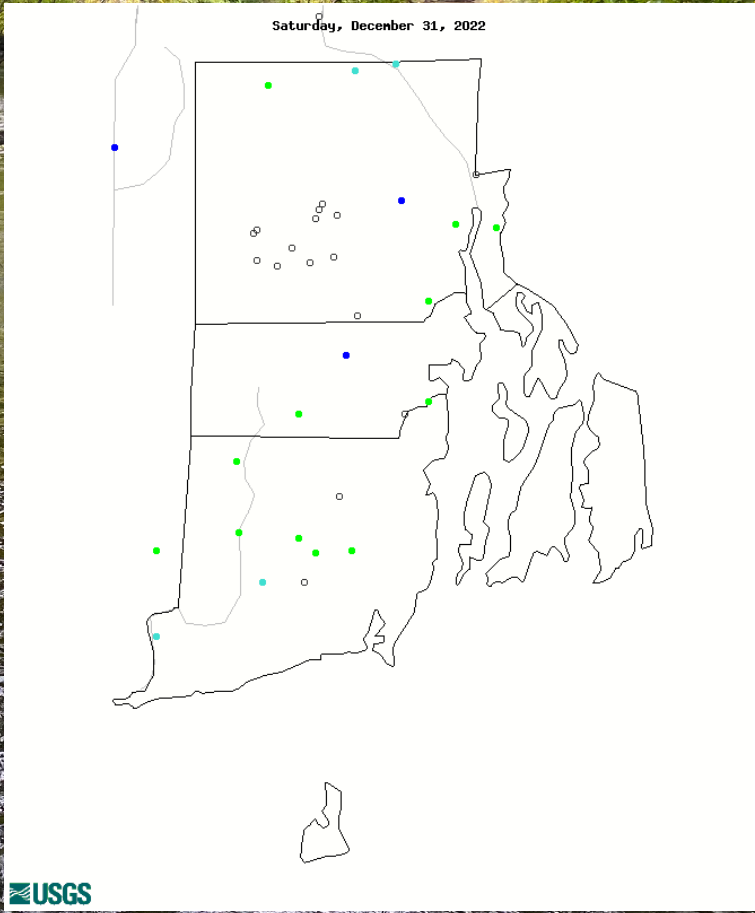
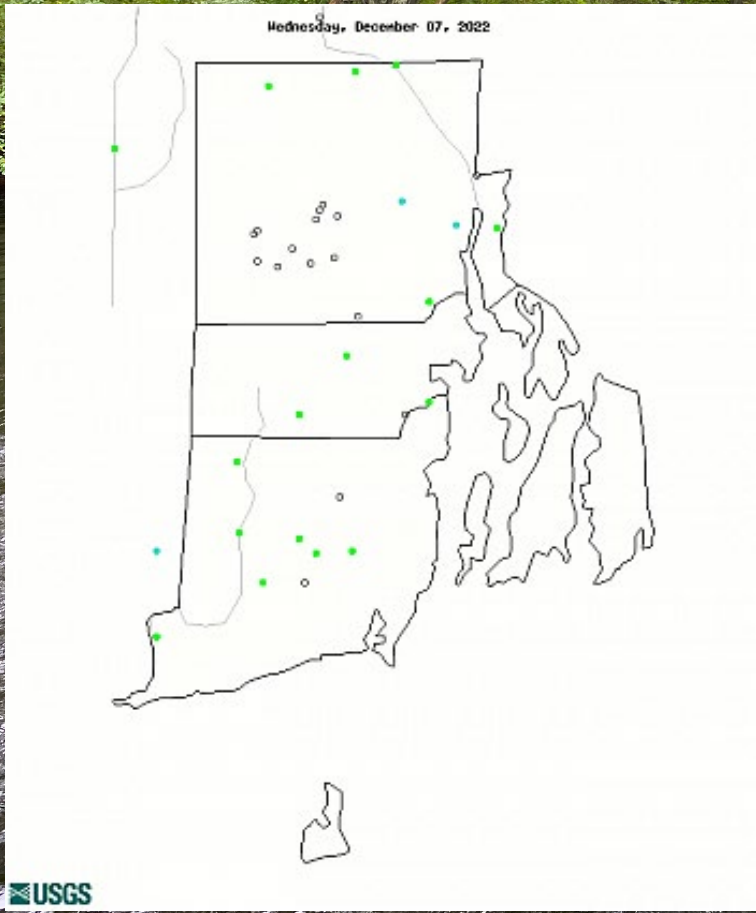
**Streamflow = Normal (Two consecutive months of normal or below normal)**



# 7 - Day Maps

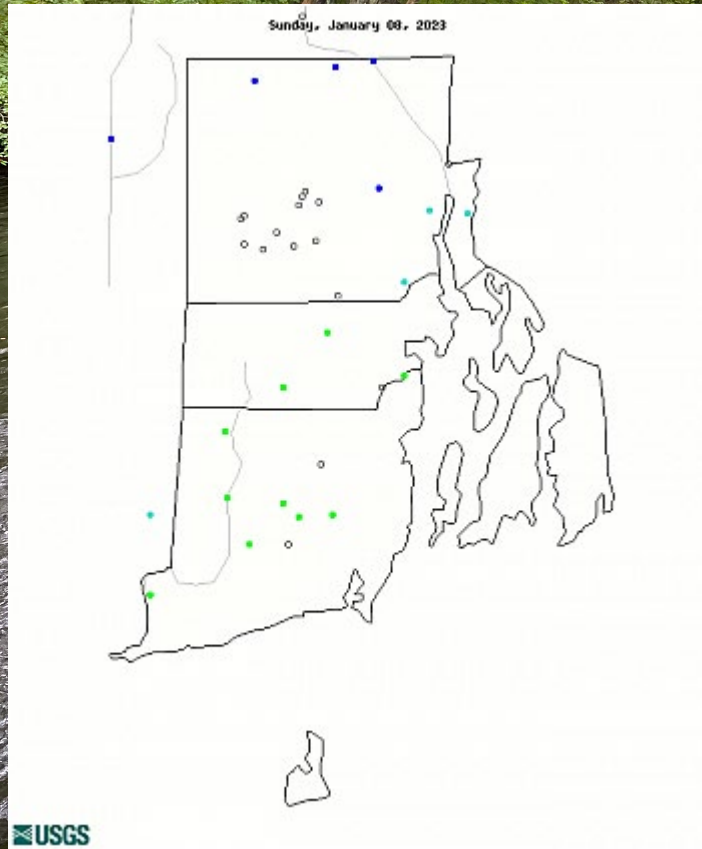
December 07, 2022

December 09, 2022

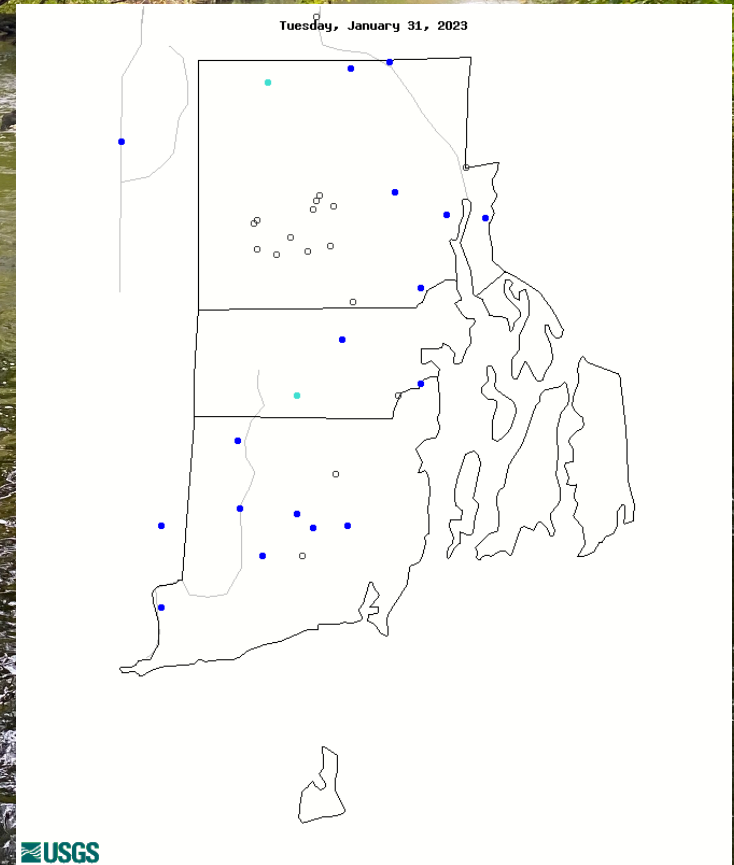


# 7 - Day Maps

January 08, 2023

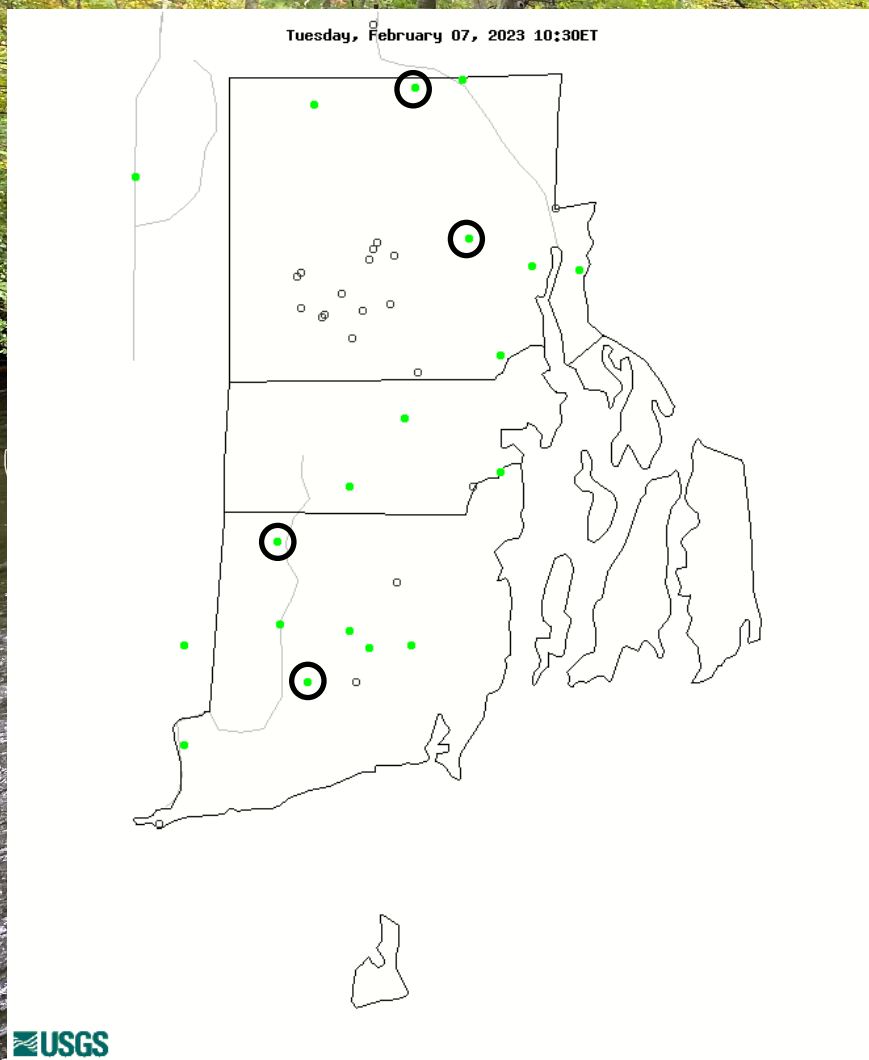


January 31, 2023





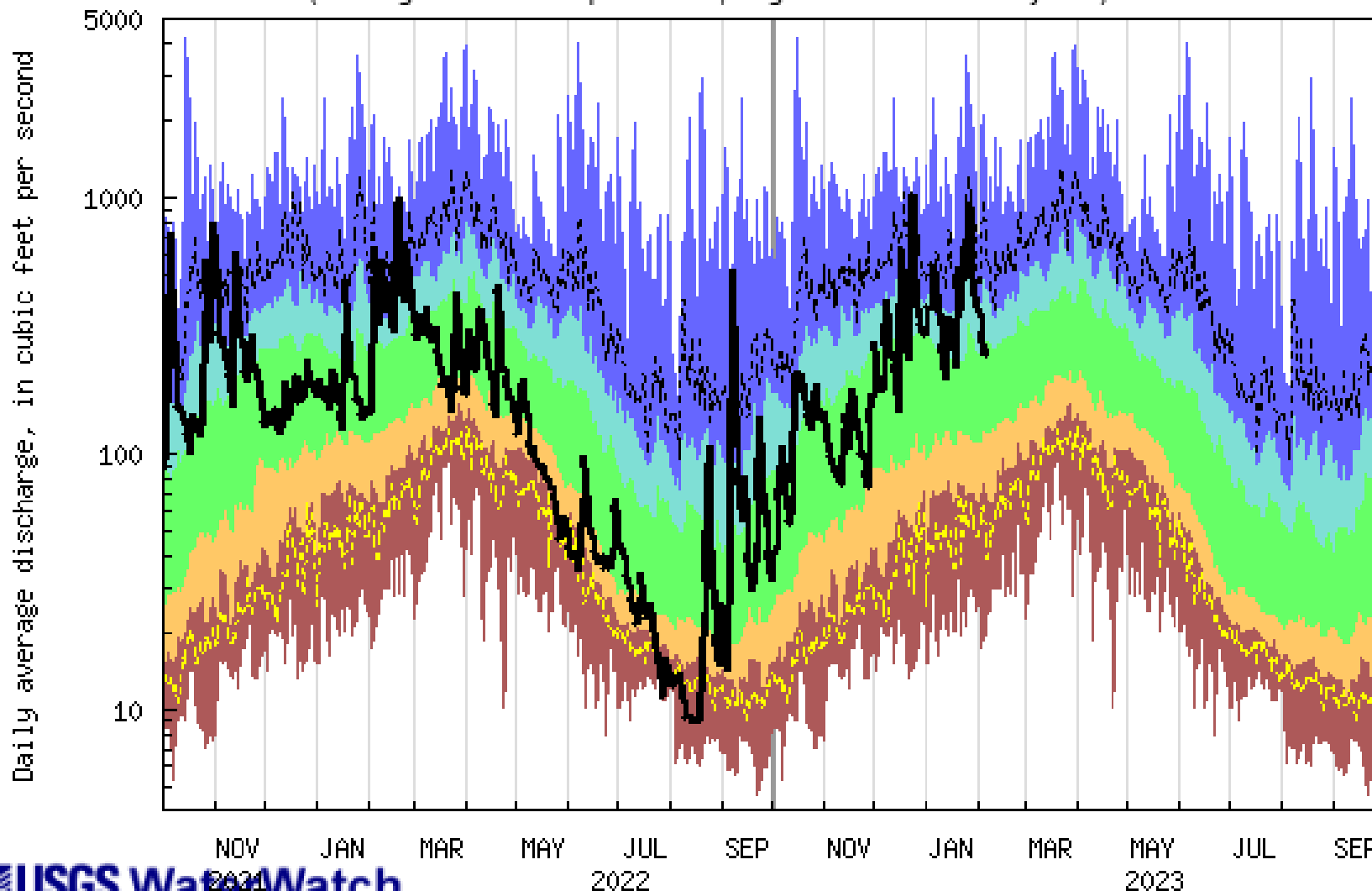
# Current Streamflow Conditions – February 07, 2023



Explanation - Percentile classes

Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 0111500 BRANCH RIVER AT FORESTDALE, RI  
 (Drainage area: 91.2 square miles, length of record: 82 - 83 years)

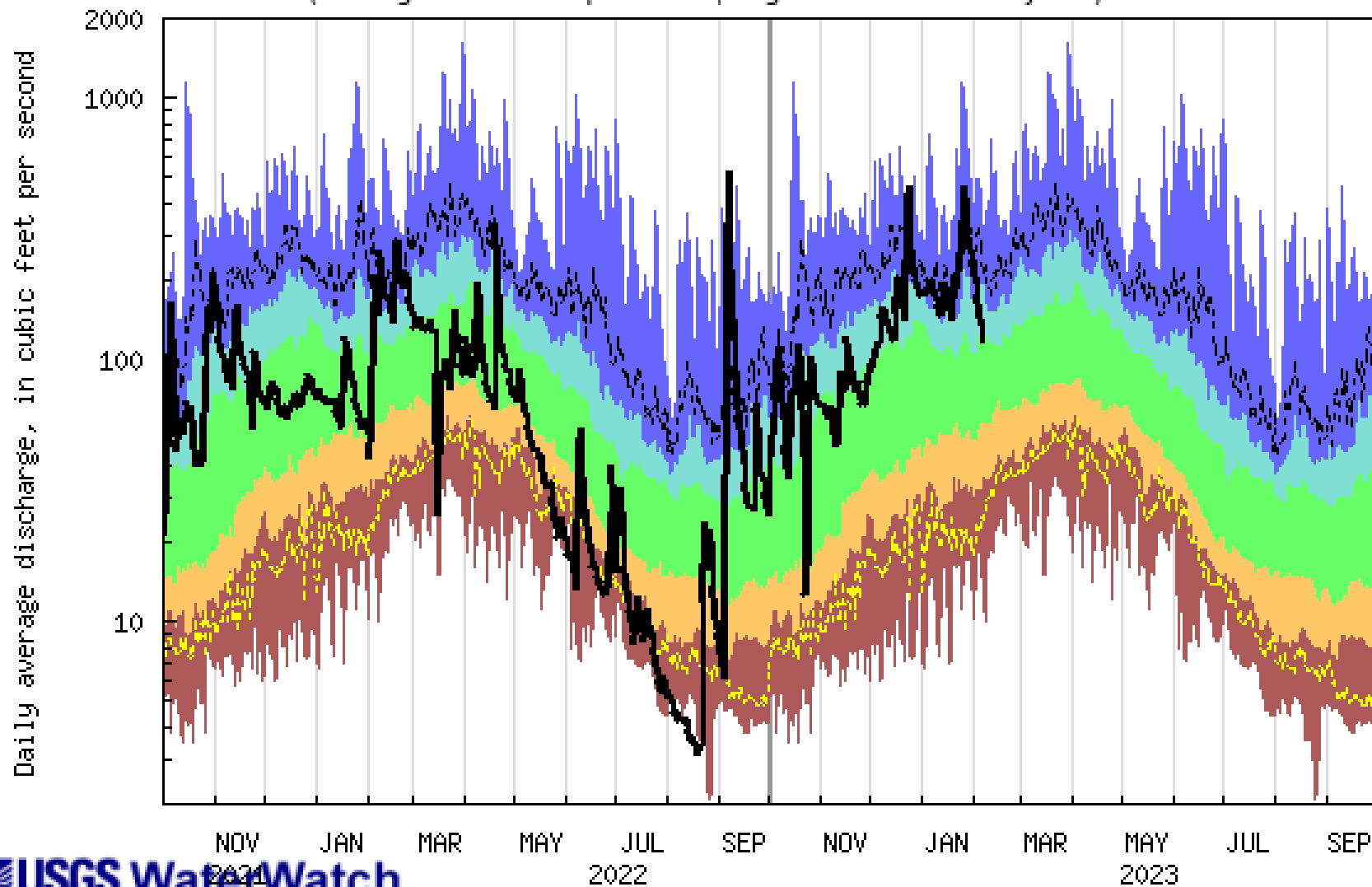


**USGS WaterWatch**

Last updated: 2023-02-07

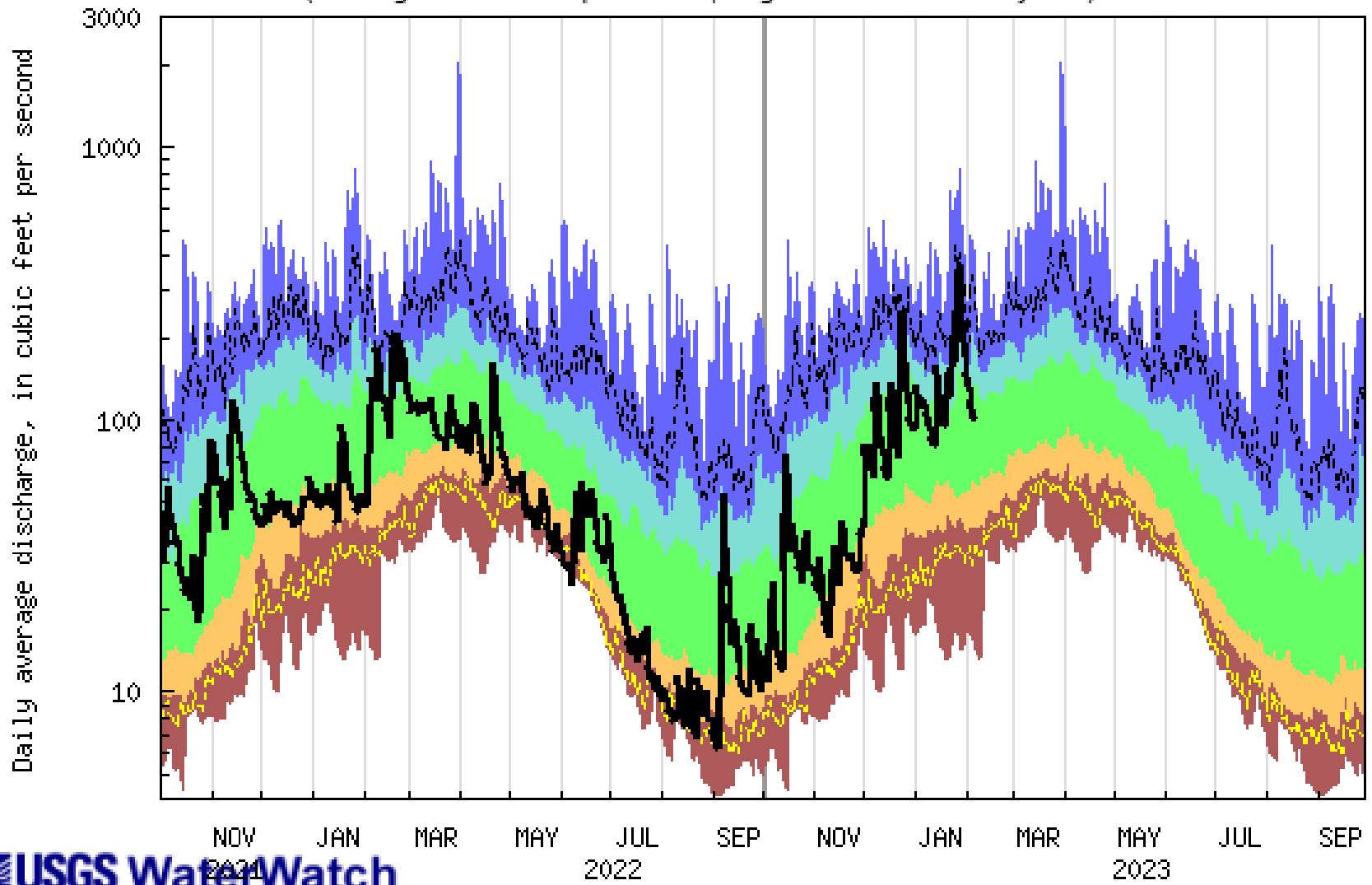
Explanation - Percentile classes							
lowest-10th percentile	5	10-24	25-75	76-90	95	90th percentile-highest	Flow
Much below Normal		Below normal	Normal	Above normal	Much above normal		

USGS 01114500 WOONASQUATUCKET RIVER AT CENTERDALE, RI  
 (Drainage area: 38.3 square miles, length of record: 80 - 81 years)



Explanation - Percentile classes							
lowest-10th percentile	5	10-24	25-75	76-90	95	90th percentile-highest	Flow
Much below Normal		Below normal	Normal	Above normal	Much above normal		

USGS 01117800 WOOD RIVER NEAR ARCADIA, RI  
 (Drainage area: 35.2 square miles, length of record: 57 - 58 years)

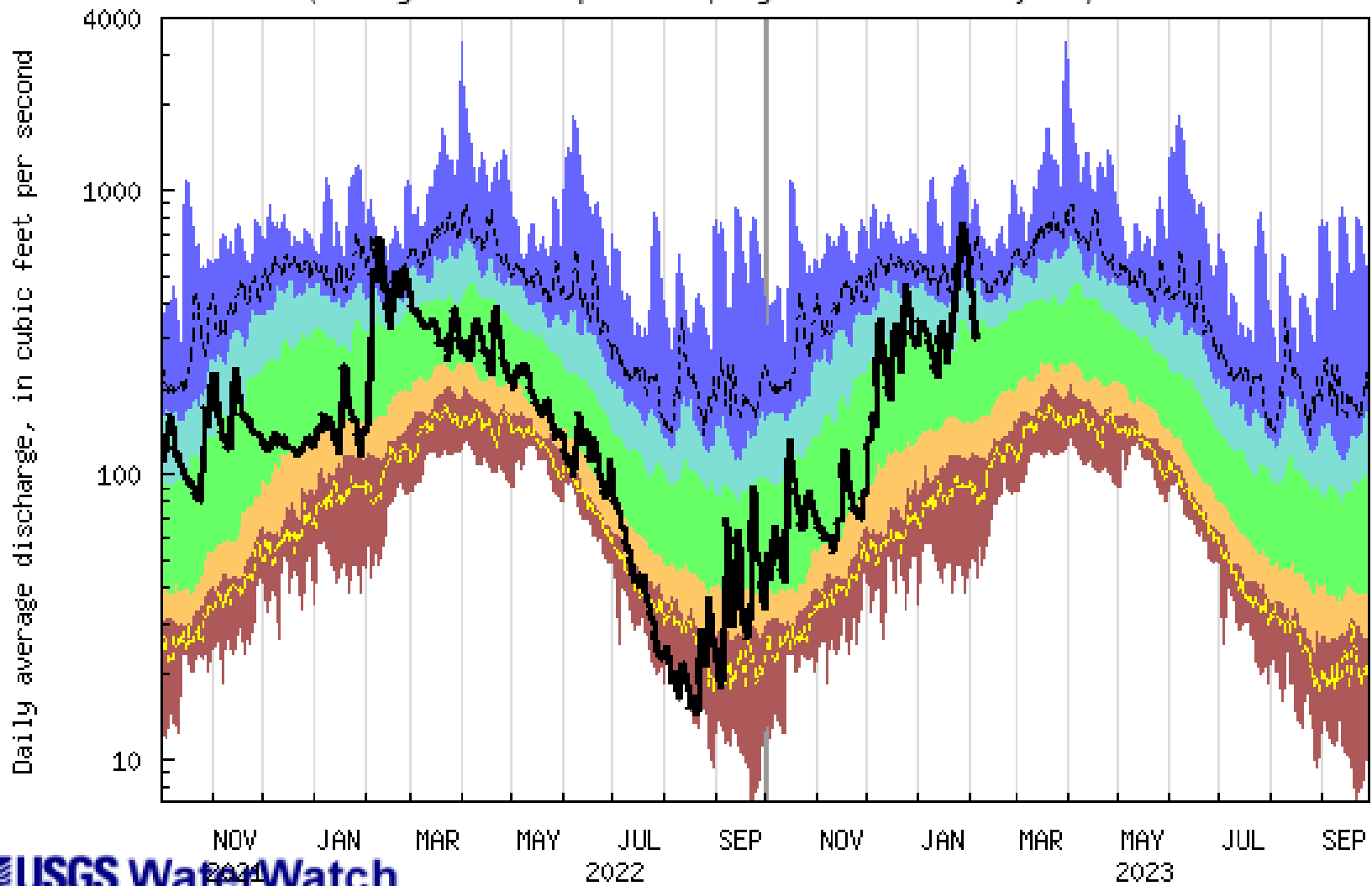


USGS WaterWatch

Last updated: 2023-02-07

Explanation - Percentile classes						
lowest-10th percentile	5	10-24	25-75	76-90	95	90th percentile -highest
Much below Normal	Below normal	Normal	Above normal	Much above normal		Flow

USGS 01117500 PAWCATUCK RIVER AT WOOD RIVER JUNCTION, RI  
 (Drainage area: 100 square miles, length of record: 81 - 82 years)

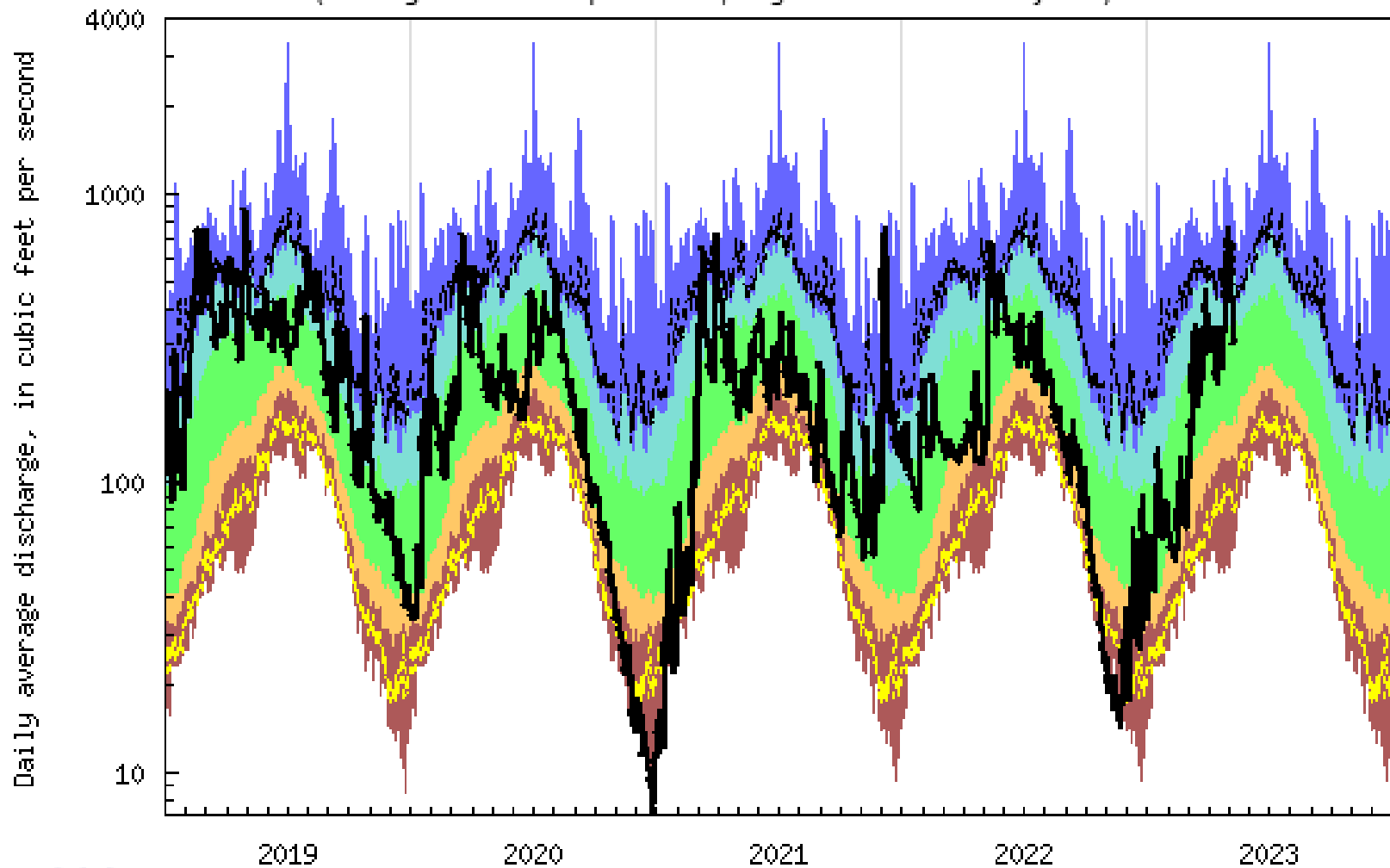


**USGS WaterWatch**

Last updated: 2023-02-07

Explanation - Percentile classes						
lowest-10th percentile	5	10-24	25-75	76-90	95	90th percentile -highest
Much below Normal		Below normal	Normal	Above normal	Much above normal	Flow

USGS 01117500 PAWCATUCK RIVER AT WOOD RIVER JUNCTION, RI  
 (Drainage area: 100 square miles, length of record: 81 - 82 years)



**USGS WaterWatch**

*Last updated: 2023-02-07*

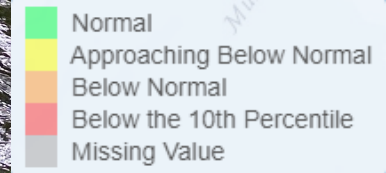
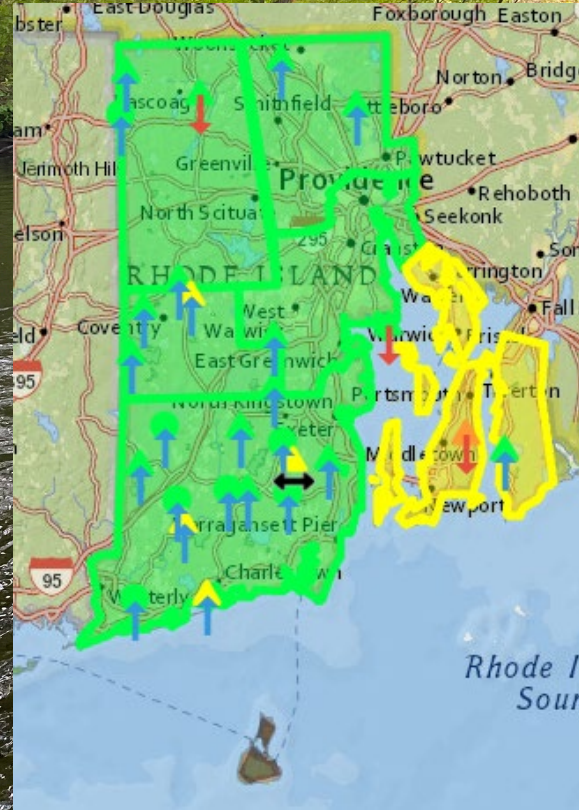
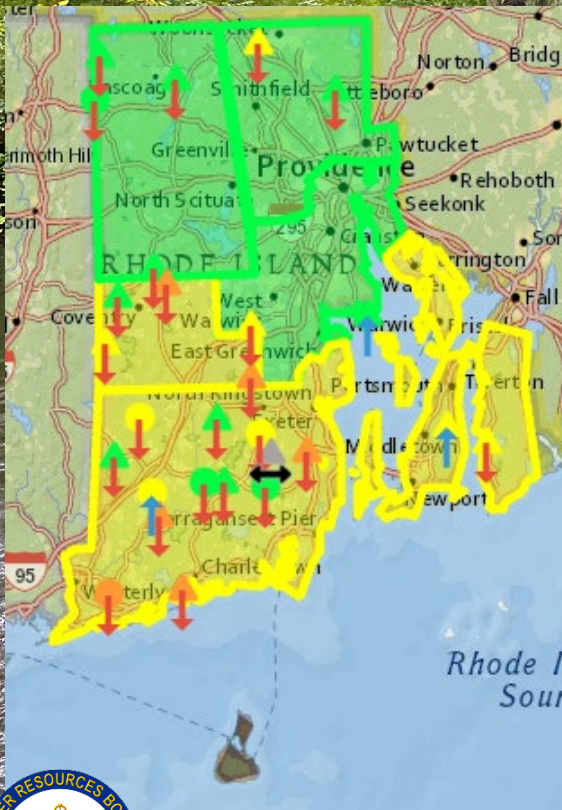
Explanation - Percentile classes						
lowest-10th percentile	5	10-24	25-75	76-90	95	90th percentile-highest
Much below Normal		Below normal	Normal	Above normal	Much above normal	
						Flow

# Groundwater Conditions

November 2022

December 2022

January 2023



# Average Groundwater Conditions

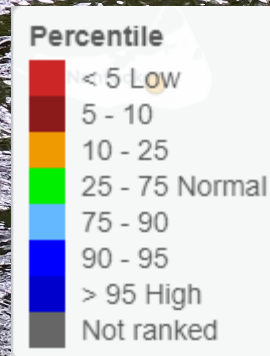
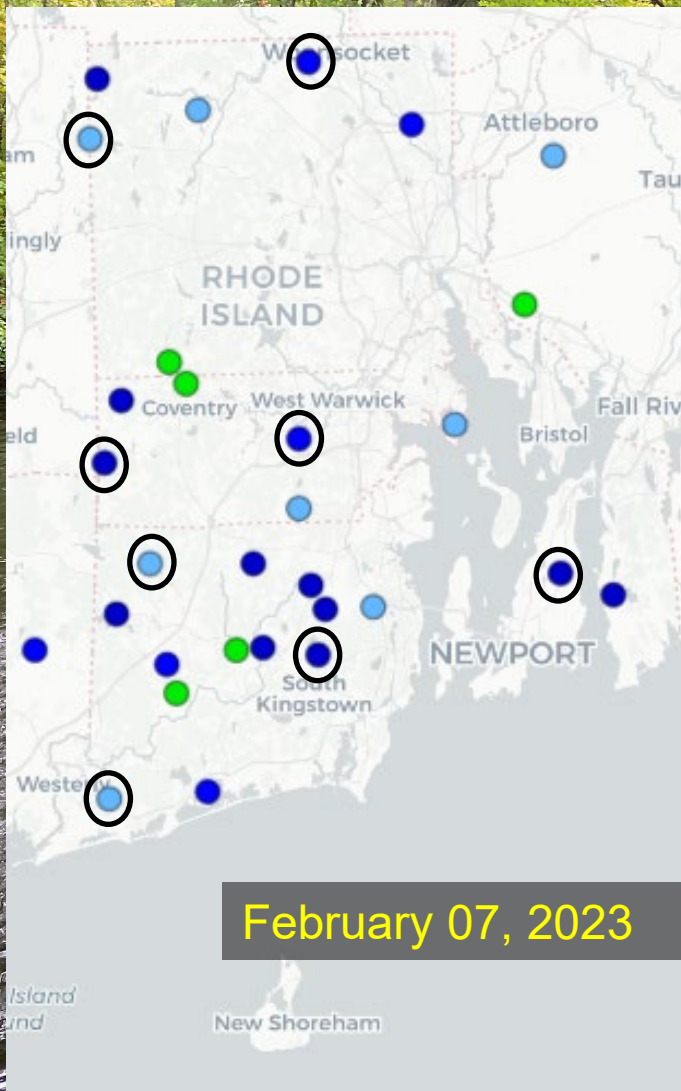
Regions	GW 5/2022	GW 6/2022	GW 7/2022	GW 8/2022	GW 9/2022	GW 10/2022	GW 11/2022	GW 12/2022	GW 01/2023
Northwest	19	31	22	13	60	64	53	69	83
Northeast	12	16	24	19	81	75	52	68	93
Central West	10	27	14	7	35	54	26	50	84
Central East	14	20	20	9	19	52	41	41	88
Eastern	17	15	17	9	11	39	32	30	97
Southern	33	30	26	17	30	42	38	54	83
New Shoreham	No Wells-----								
	5/2022	6/2022	7/2022	8/2022	9/2022	10/2022	11/2022	12/2022	01/2023
<b>statewide GW</b>	24	27	22	14	38	50	38	54	88

**Groundwater = Normal (1 Month of Normal or Below Normal)**

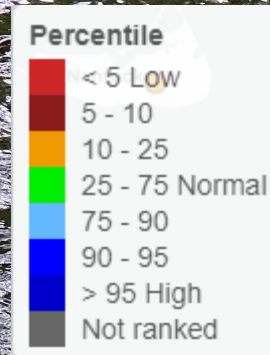
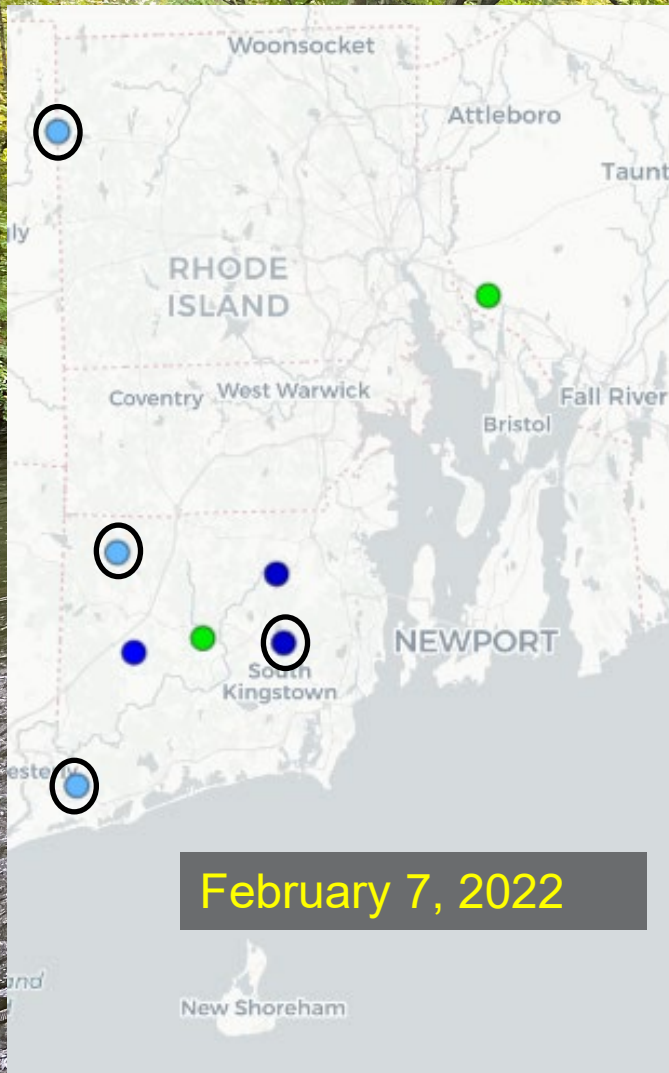




# Current Groundwater Conditions

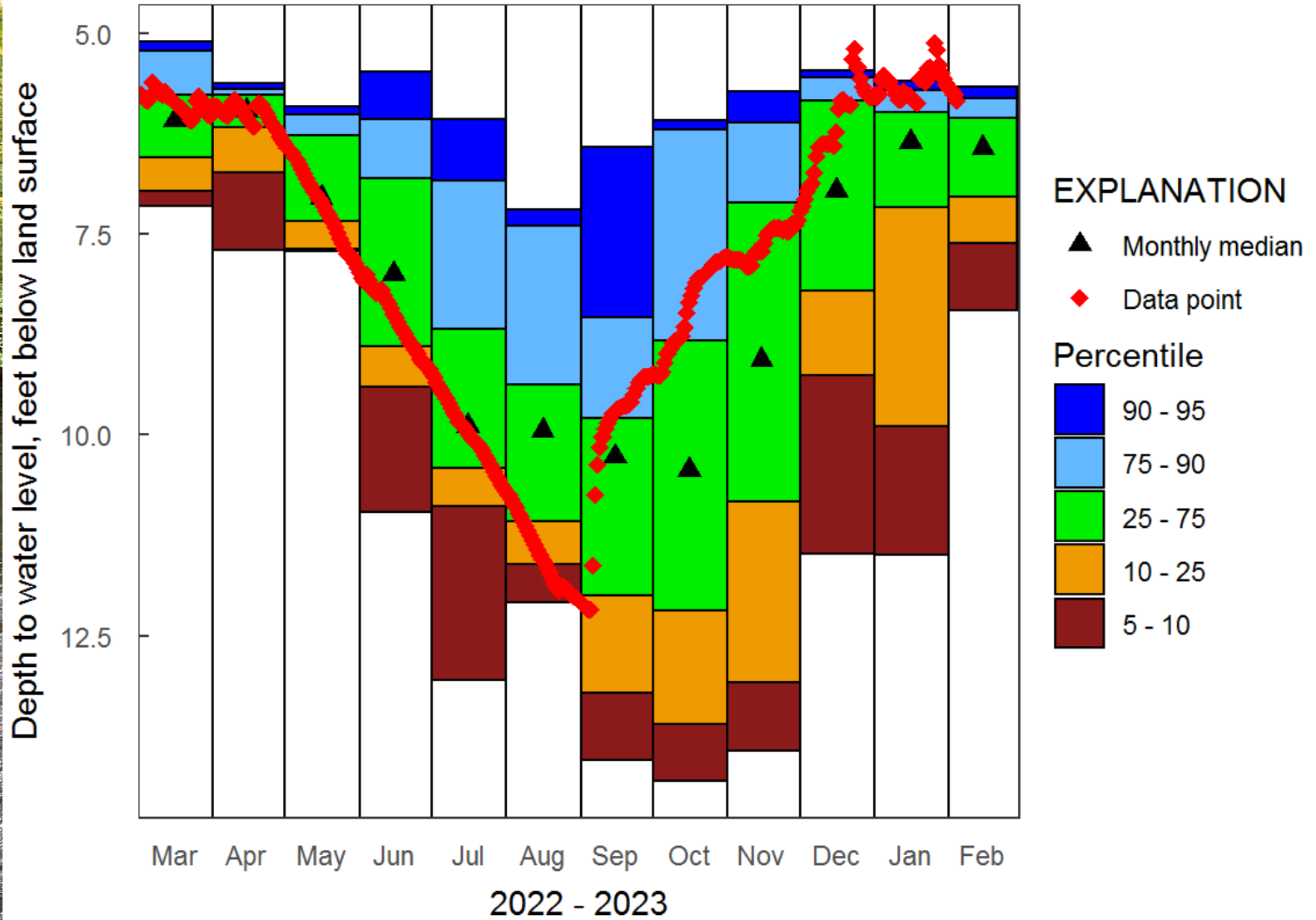


# Current Groundwater Conditions



415546071474701 RI-BUW 395 BURRILLVILLE, RI

U.S. Geological Survey



EXPLANATION

- ▲ Monthly median
- ◆ Data point

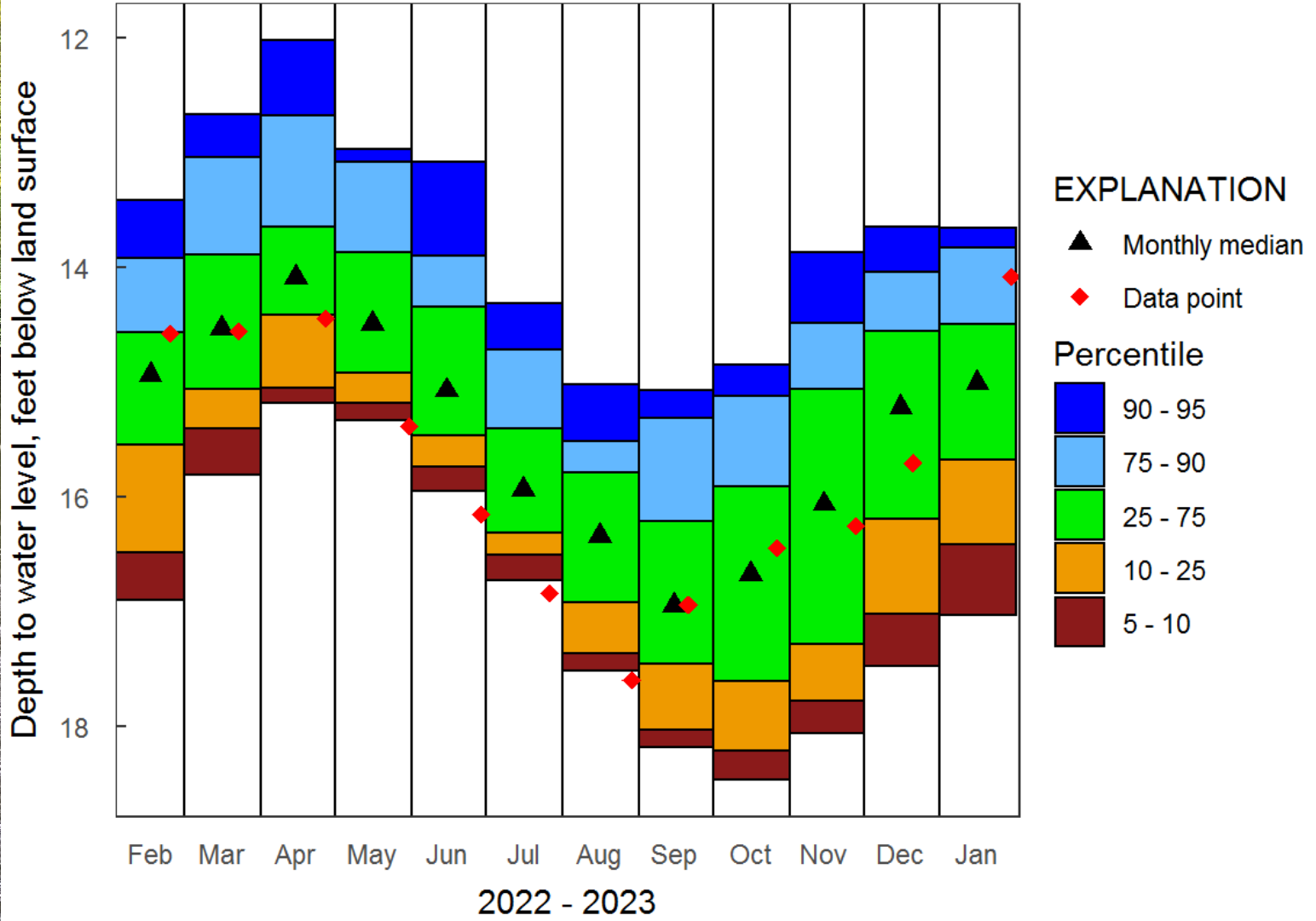
Percentile

- 90 - 95
- 75 - 90
- 25 - 75
- 10 - 25
- 5 - 10

Plot created: 2023-02-07

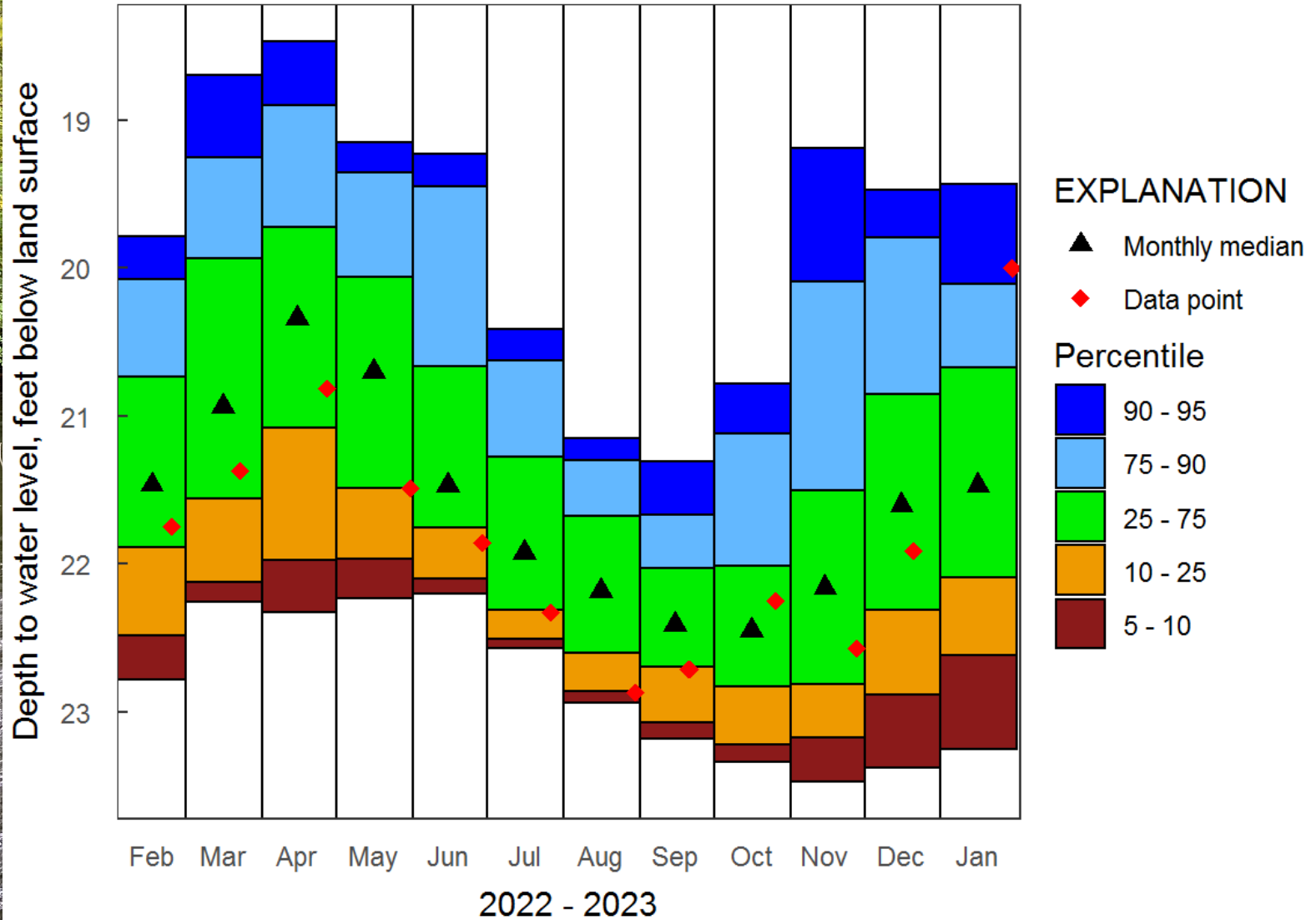
415710071402201 RI-BUW 187

U.S. Geological Survey



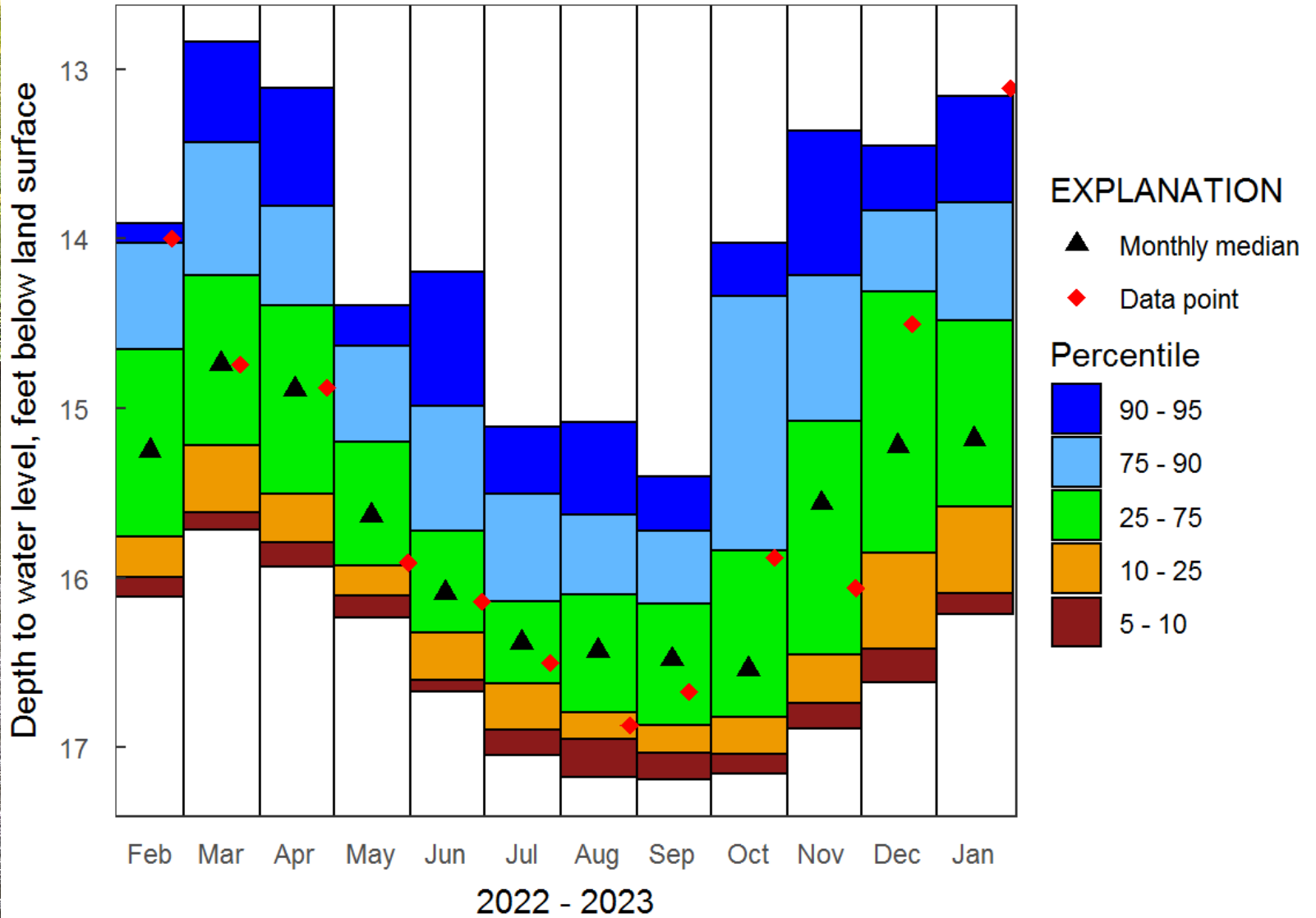
Plot created: 2023-02-07

U.S. Geological Survey



Plot created: 2023-02-07

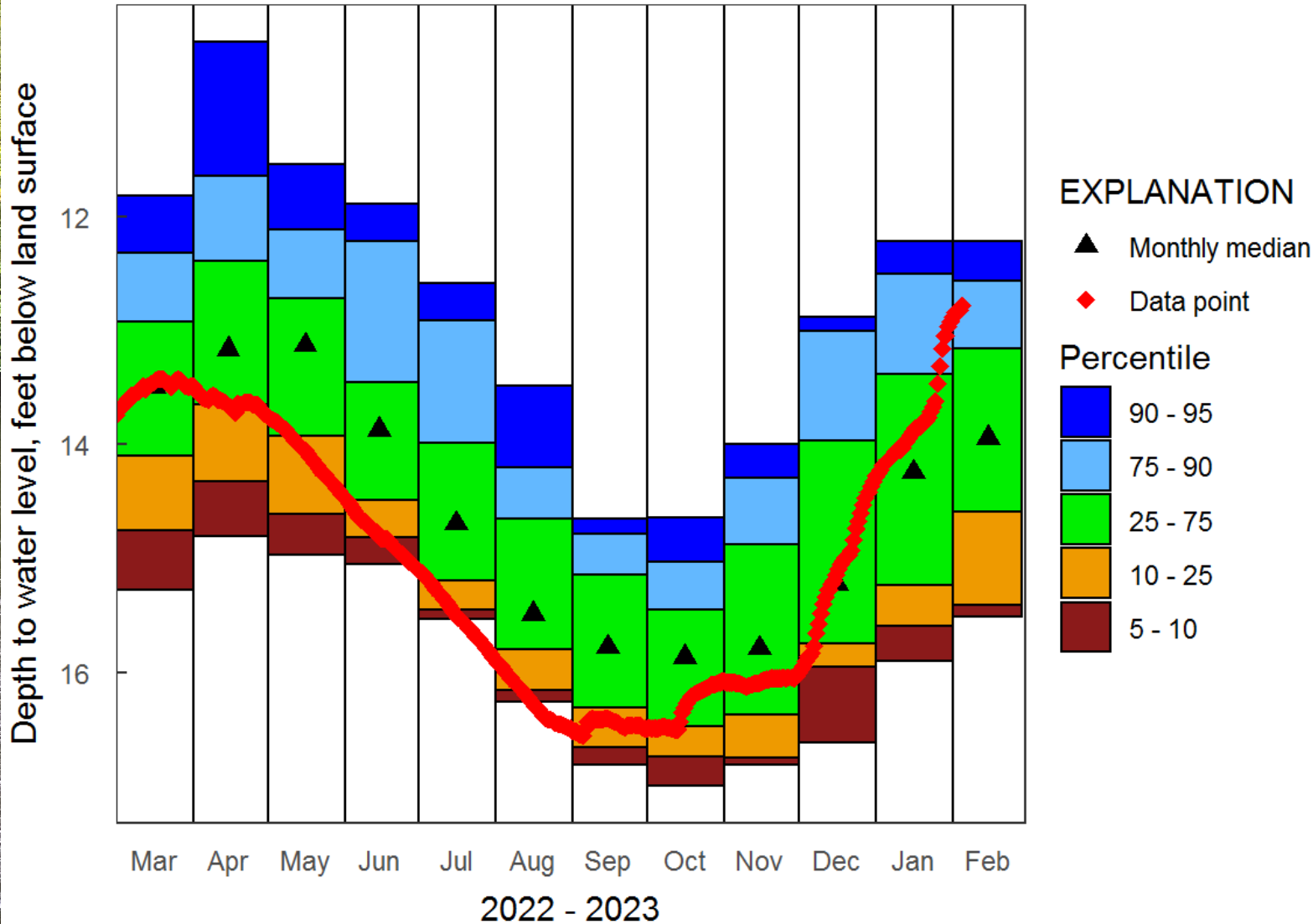
U.S. Geological Survey



Plot created: 2023-02-07

413358071433801 RI-EXW 475 EXETER, RI

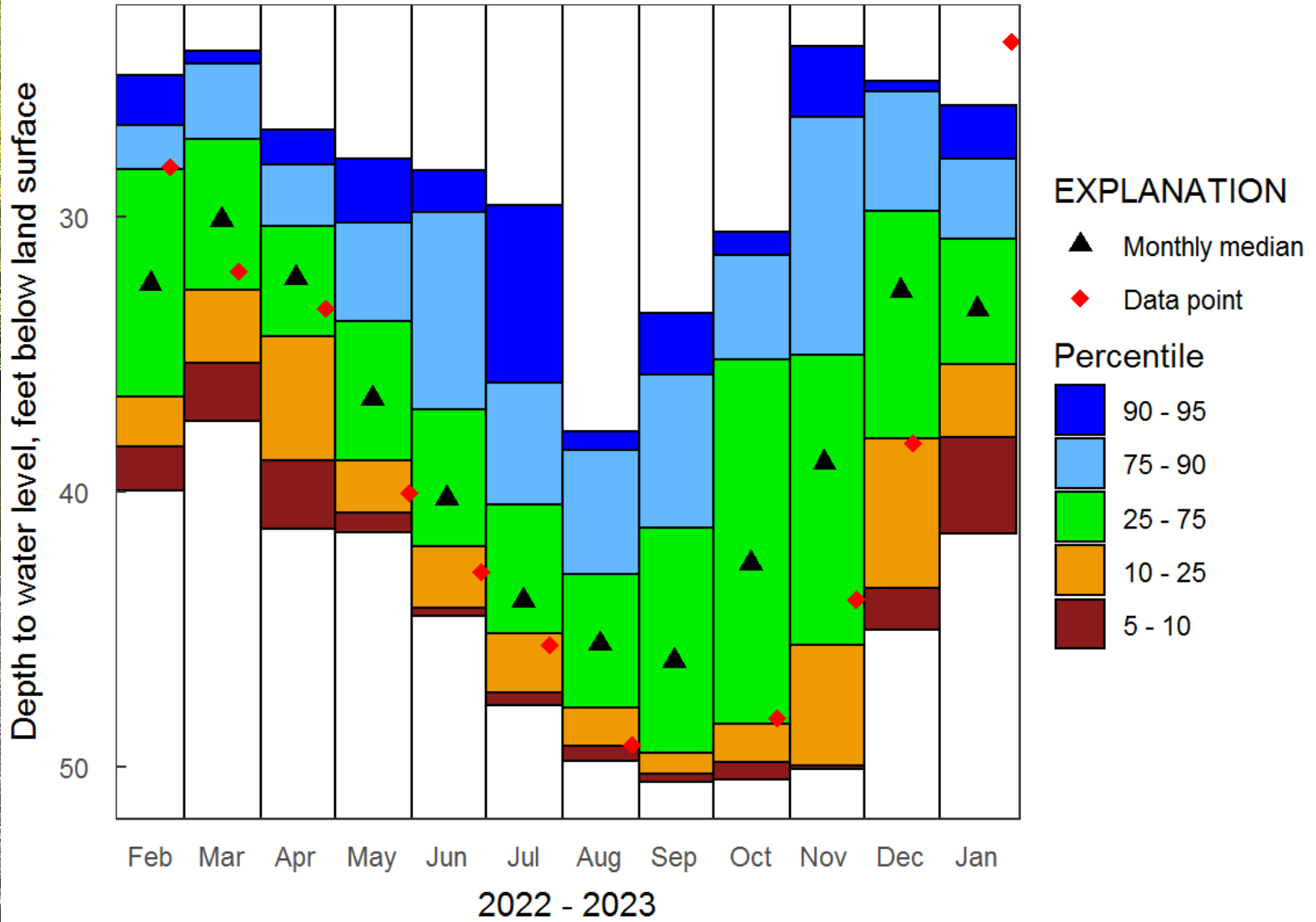
U.S. Geological Survey



Plot created: 2023-02-07

413325071152401 RI-POW 551

U.S. Geological Survey

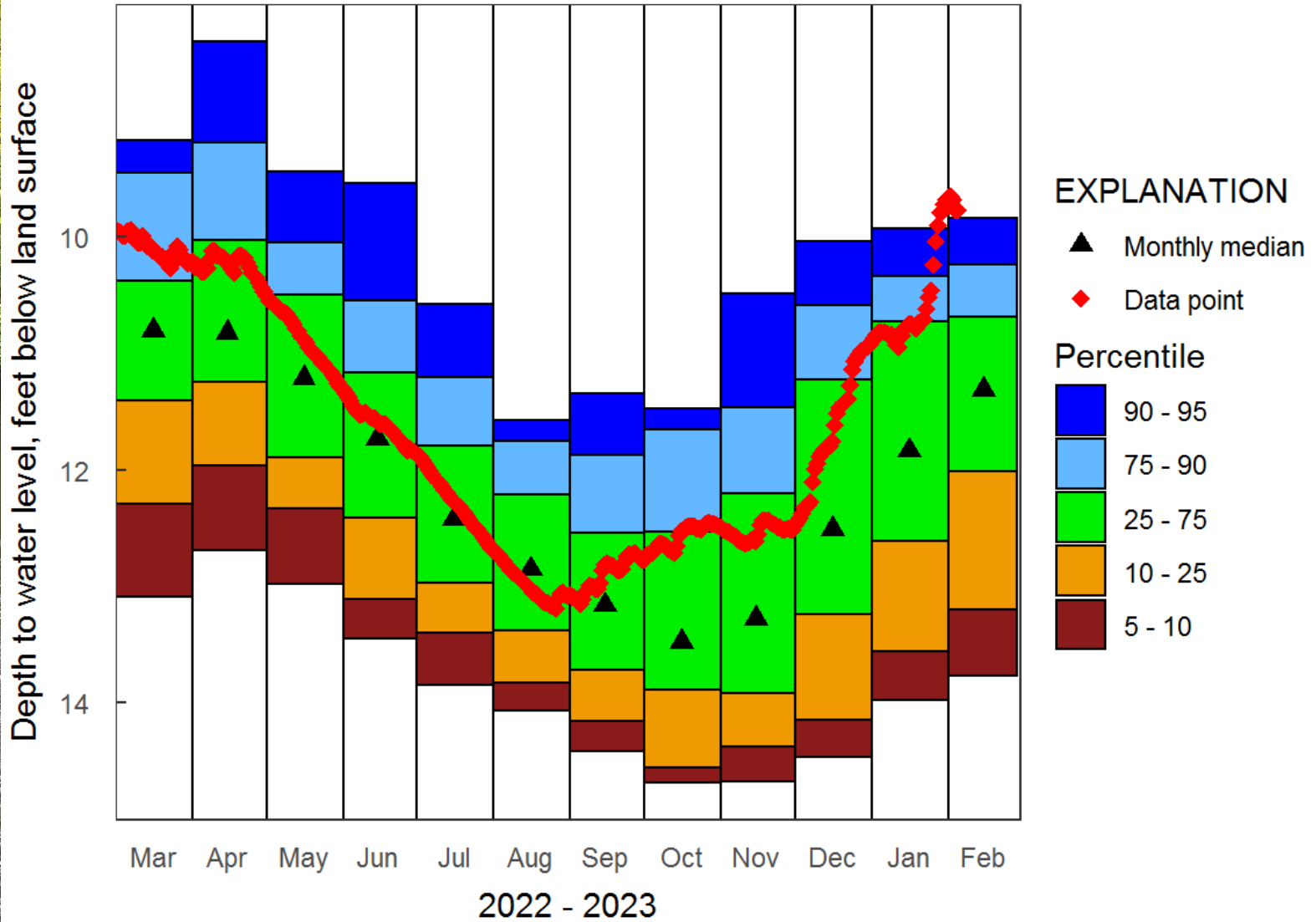


Plot created: 2023-02-07



412918071321001 RI-SNW 6 SOUTH KINGSTOWN, RI

U.S. Geological Survey



EXPLANATION

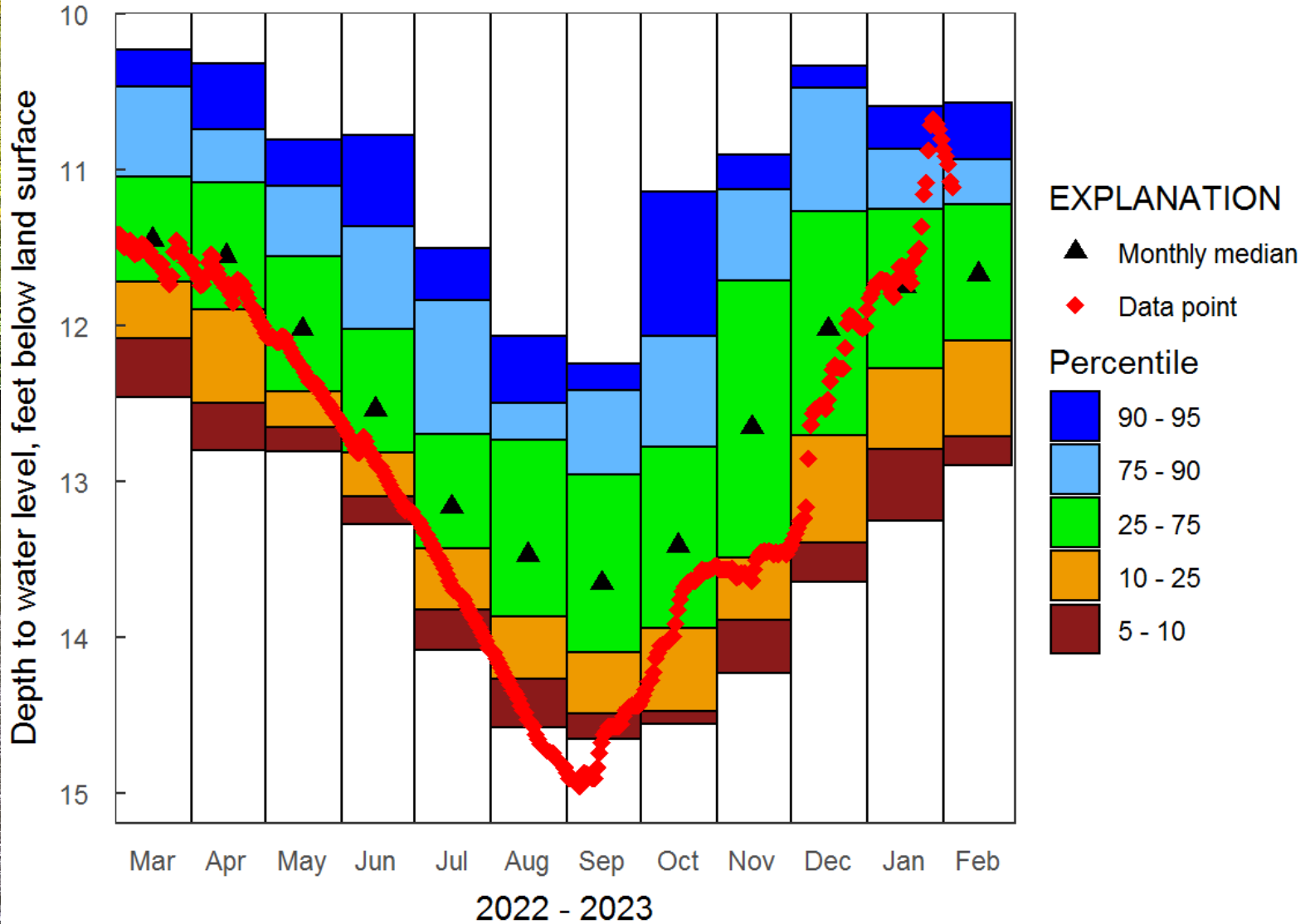
- ▲ Monthly median
- ◆ Data point

Percentile

- 90 - 95
- 75 - 90
- 25 - 75
- 10 - 25
- 5 - 10

Plot created: 2023-02-07

U.S. Geological Survey



EXPLANATION

- ▲ Monthly median
- ◆ Data point

Percentile

- 90 - 95
- 75 - 90
- 25 - 75
- 10 - 25
- 5 - 10

Plot created: 2023-02-07

Table 2, Rhode Island Drought Indices and Phases

Drought Phase	Palmer Drought Index +	Crop Moisture Index	Precipitation +	Ground Water** +	Stream flow +	Reservoirs**
<b>Normal</b>	-1.0 to -1.99	0.0 to -1.0	Slightly Dry	1 month below normal 1 month below normal	2 consecutive months below normal	Reservoir levels at or near normal for the time of year
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**Table 4  
Returning to Normal**

<b>Current Drought Phase</b>	<b>Next Drought Phase</b>	<b>Reduce Drought Phase by one category</b>
<b>Emergency</b>	Emergency-continued below normal conditions	Groundwater levels at or above normal and no precipitation deficit for past 3 months; and/or water resource problems which prompted the emergency have abated
<b>Warning</b>	Emergency-worsening conditions or continued below normal conditions	2 consecutive months of groundwater levels at or above normal and near normal precipitation for past 6 months
<b>Watch</b>	Warning-worsening conditions Watch continued below normal	2 consecutive months of groundwater levels at or above normal and near normal precipitation for past 6 months
<b>Advisory</b>	Watch-worsening conditions	2 consecutive months of groundwater levels at or above normal and near normal precipitation for past 3 months

# Statewide Summary: Streamflow - Recap

- Based on the State Guide Plan 721
  - Conditions are above normal and have been trending upward since November.
    - November 41%
    - December 68%
    - January 88%
  - Southern drought region has shown recovery
    - November 34%
    - December 65%
    - January 80%

# Statewide Summary: Groundwater - Recap

- Returning to Normal based on State Guide Plan
  - 2 consecutive months at or above normal statewide
    - November 38%
    - December 54%
    - January 88%
      - Southern region
        - » November 34%
        - » December 54%
        - » January 83%
  - Conditions have trended upward and are at **normal or above normal** for past three months.



Questions?