

MONTHLY REPORT OF HYDROLOGIC CONDITIONS

WFO Caribou, Maine

REPORT FOR:
MONTH YEAR

April 2023

TO: Hydrologic Information Center, W/OS31
NOAA's National Weather Service
1325 East West Highway
Silver Spring, MD 20910-3283

SIGNATURE

**James Sinko - Meteorologist
Hydrology Program Manager**

DATE

May 11, 2023

When no flooding occurs, include miscellaneous river conditions below the small box, such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Instruction 10-924).

An X inside this box indicates that no flooding occurred within this hydrologic service area.

April 2023

April 2023 was warmer than average compared to the 1991-2020 climate normals. This was a result of the monthly average of the North Atlantic Oscillation (NAO) pattern of -0.63 standard deviation, while the Pacific North American (PNA) pattern at -0.42 standard deviation. This typically results in much higher 500mb heights over New England and it was nearly a bullseye right over Maine. This is depicted below in the reanalysis of the monthly anomaly of the 500mb Geopotential Heights and the mean heights. We saw anomalous high heights for the month over the area with strong blocking in the North Atlantic with overall troughing over the area.

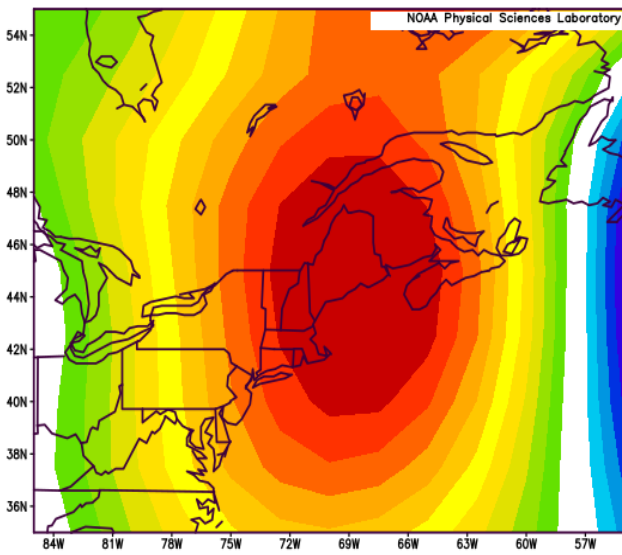


Figure 1: 500mb Geopotential Height (m) Anomalies (1991-2020 Climo) April 2023

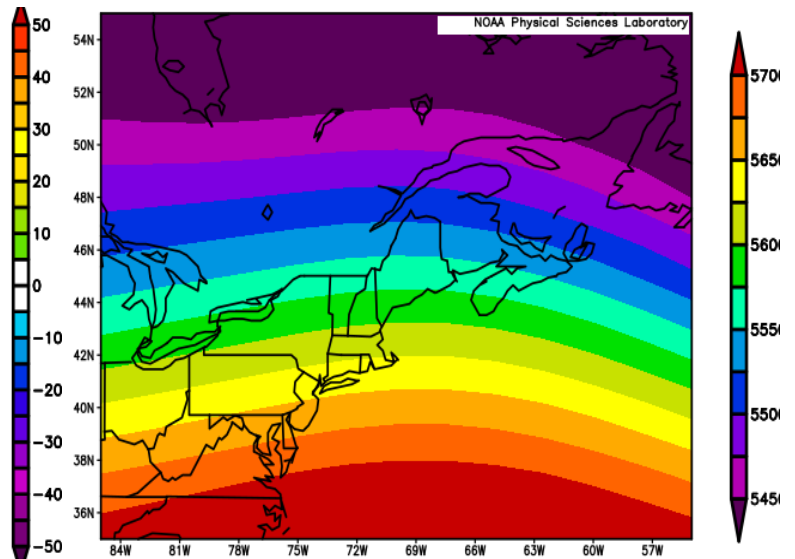


Figure 2: 500mb Geopotential Height (m) Composite Mean April 2023

Source: [NOAA Physical Sciences Laboratory](https://www.noaa.gov/physical-sciences-laboratory)

Temperatures the region as a whole averaged from 1.5 to 3 degrees above the 1991-2020 averages. The month began on a cool note with temperatures mostly below average the first 9 days of the month. Temperatures from the 10th and through the end of the month were mostly above average with only a handful of days with slightly below average temperatures. The first real mild day occurred on the 10th with a high of 60 degrees in Caribou and 63°F at Bangor. The month ended with a total of 7 days with a high in the 60s at Caribou, and 10 days with a high of 60 or warmer at Bangor including a record high of 76 degrees on the 14th.

<i>Town/City</i>	<i>Avg Monthly Temperature (°F)</i>	<i>Normal Monthly Temperature (°F)</i>	<i>Departure from Normal (°F)</i>
Frenchville	39.7	37.7	+2.0
Fort Kent	37.4	35.4	+2.0
Caribou	40.8	38.5	+2.3
Houlton	41.4	38.6	+2.8
Millinocket	42.7	40.4	+2.3
Greenville*	41.6	38.0	+3.6
Bangor	44.3	42.8	+1.5
Robbinston*	44.3	41.4	+2.9
Topsfield*	43.5	40.6	+2.9

**Topsfield Records date back to 2000, *Robbinston Records date back to 1994*

**Greenville data gap between 1975 and 1999*

Precipitation for the month ranged from 30 to 75 percent of average, except across parts of the Central Highlands where precipitation ranged from 75 to 100 percent of normal. In Caribou, only 1.18 inches of rain (and melted snow) was observed, which ranked as the 9th driest April on record. In Houlton, 1.48 inches of rain (and melted snow) was observed making it the 11th driest April on record. In Bangor, 1.89 inches of rain and melted snow ranked as the 13th driest April on record. **Snowfall** was well below average with nearly all of the snowfall observed during the first week of the month. In Caribou, only 3.7 inches of snow was observed, and in Bangor only an inch. In Caribou, it was the least snowy April since 2016. At the start of the month, the **Snow Depth** ranged from 18 to 44 inches across Aroostook County with the highest amounts across the higher terrain to the west of Caribou. There was 3 inches of snow on the ground at Millinocket, and little to no snow was observed in Bangor and along the coast. By the end of April, only the higher elevations of Northwest Maine had any snow left on the ground with 6 to 12 inches in the sheltered woods.

Precipitation Totals for Select Locations with all units in inches

<i>Location</i>	<i>Total Precip</i>	<i>Normal Precip</i>	<i>Departure from Normal</i>	<i>% of Normal</i>	<i>Snowfall</i>	<i>Normal Snowfall</i>	<i>Departure from Normal</i>	<i>Greatest Snow Depth</i>	<i>Monthly Average Snow Depth</i>
Frenchville*	0.70	2.35	-1.65	29.8%					
Fort Kent	1.08	3.17	-2.09	34.1%	1.3	6.6	-5.3	22	7.7
Caribou	1.18	2.99	-1.81	39.5%	3.7	8.3	-4.6	18	6.7
Houlton	1.48	2.94	-1.46	50.3%					
Millinocket*	2.37	3.51	-1.14	67.5%	0.5			3	0.4
Greenville*	3.78	3.59	+0.19	105.3%					
Bangor	1.89	3.61	-1.72	52.3%	1.0	3.7	-2.7	1	0.0
Robbinston*	2.43	4.39	-1.96	55.3%	1.4	6.0	-4.6	2	0.2
Topsfield*	2.09	4.21	-2.12	49.6%	1.7	9.6	-7.9	8	1.7

**Millinocket snowfall measured at CoOp site, not the ASOS site. Departure data is not available.*

**Topsfield Records date back to 2000, *Robbinston Records date back to 1994, *Greenville data gap between 1975 and 1999*

**Frenchville ASOS has Known Issues Measuring Liquid Equivalent of Snowfall due to Blowing & Drifting*

Streamflows during the month continued to rise with much of the basins as ice melted and continued snow melt across the northern basins. Flows increased by the end of the month to well above the 90th percentile to some daily record discharges. Across southern and central basins the month started out on the higher end but fell by the end of the month significantly. This resulted in the month averaging much below normal on a couple basins, normal across much of the central basins and above normal across the north.

The **Ice** went out on the northern rivers around mid-month and overall was very minor flooding with local road flooding of low spots around Fort Fairfield and Caribou. There was some minor flooding in parts of Aroostook County on the 18th-19th due to the combination of rainfall and snowmelt.

Groundwater: Significant melting of the snow across the north resulted in significant runoff and absorption. This offset the significant lack of precipitation and Groundwater levels above normal all winter plus absorption allowed for April to end at average. In Calais the gage average is above normal for the month of April.

In regards to **Drought** monitoring, the entire month of March featured No Drought conditions.

Read below for specific details & maps of Streamflows, Groundwater Levels, Non-Routine Hydrologic Products issued by WFO Caribou and Drought conditions.

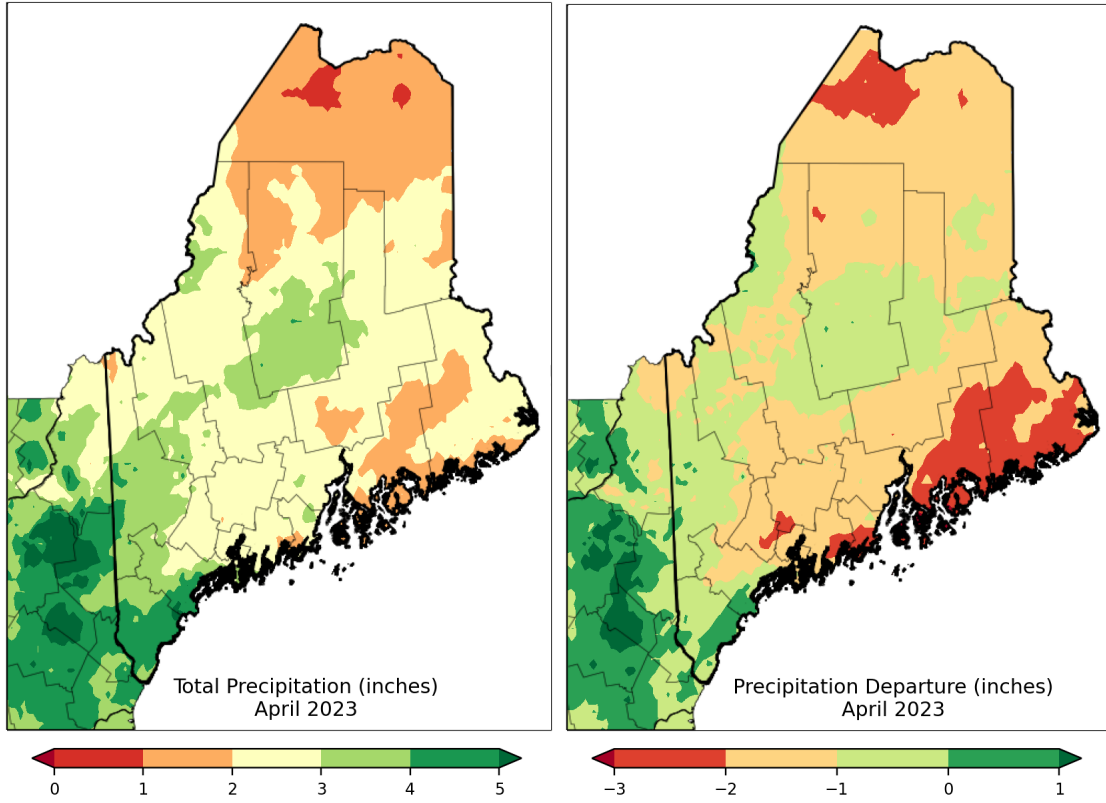


Figure 3: Monthly Precipitation Totals for April 2023

Figure 4: Monthly Precipitation Departures from Normal for April 2023

Source: [Northeast Regional Climate Center](#)

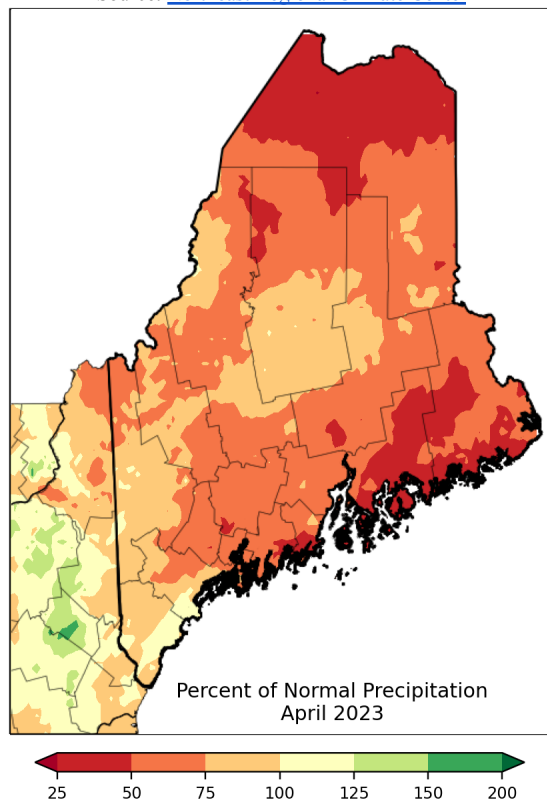


Figure 5: Percent of Normal Precipitation April 2023

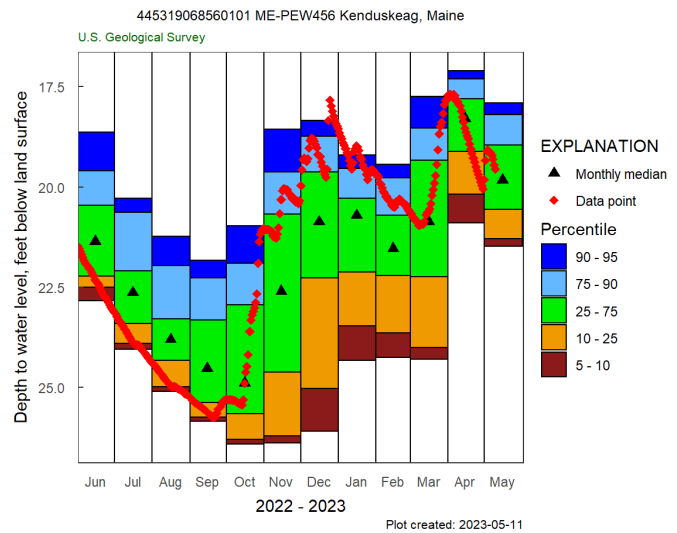
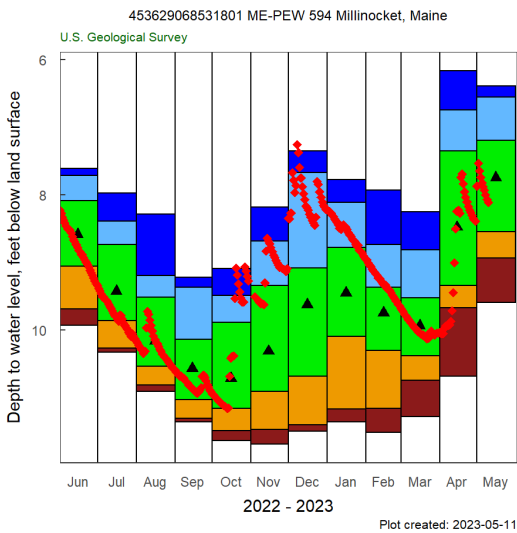
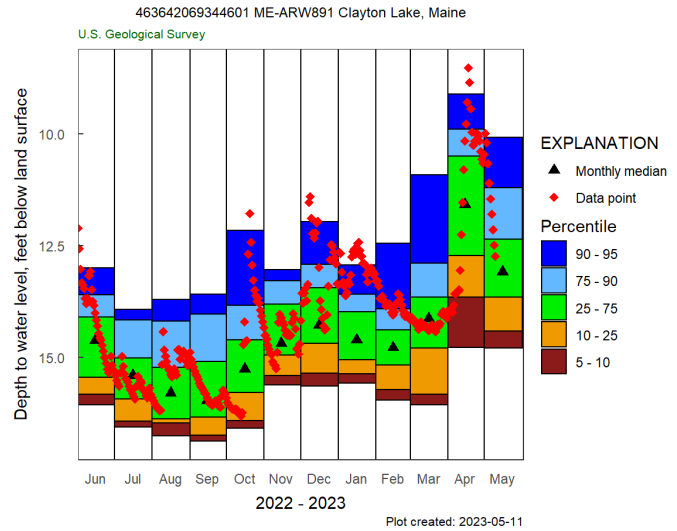
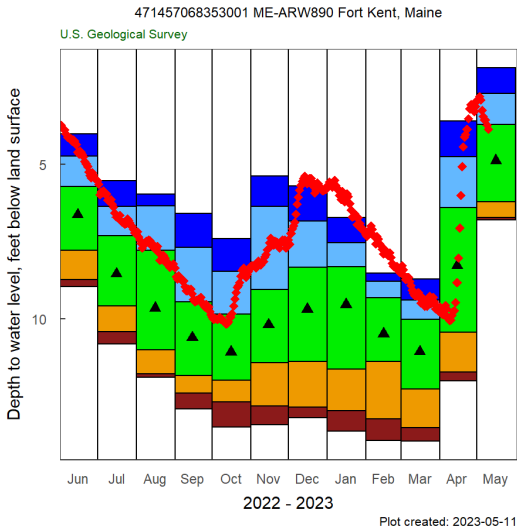
Source: [Northeast Regional Climate Center](#)

April Streamflows for Rivers

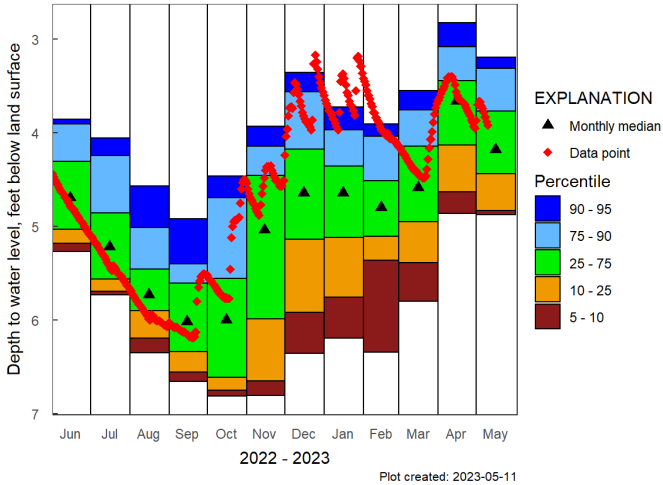
River	Monthly Mean Flow (cfs)	% Normal (mean)	Percentile Class	Drainage (mi ²)	Years of Record
Big Black River near Depot Mtn	NA	NA	Ice Affected	171	38
St. John River at Nine Mile Bridge	NA	N/A	Ice Affected	1341	71
Allagash River near Allagash	7440.17	143.71%	Above Normal	1478	90
St. John River at Dickey	19873.67	128.15%	Normal	2680	75
St. John River at Fort Kent	18389.99	68.35%	Below Normal	5929	95
Fish River near Fort Kent	3705.19	107.10%	Normal	873	92
Aroostook River near Masardis	7926.61	159.22%	Much Above Normal	892	64
Aroostook River at Washburn	16771.88	191.10%	Much Above Normal	1654	91
St. Croix River at Vanceboro	714.02	90.20%	Normal	413	93
St. Croix River at Baring	2542.17	46.92%	Much Below Normal	1374	62
Grand Lake Stream at Grand Lake Stream	216.89	57.94%	Normal	228.3	93
Narraguagus River at Cherryfield	740.30	60.81%	Much Below Normal	227	74
East Branch Penobscot River at Grindstone	8081.50	158.45%	Much Above Normal	837	100
Mattawamkeag near Mattawamkeag	8104	92.84%	Normal	1418	87
Piscataquis River near Dover-Foxcroft	2051.17	98%	Normal	298	119
Sebec River at Sebec	1768.60	103.11%	Normal	326	67
Piscataquis River at Medford	6740.67	92.44%	Normal	1162	90
Penobscot River at West Enfield	27920	92.88%	Normal	6422	119

April Average Groundwater Levels

Station	Percentile Class	Years of Record
Hadley Lakes	Normal	37
Kenduskeag	Normal	44
Calais	Above Normal	23
Millinocket	Normal	29
Clayton Lake	Normal	44
Fort Kent	Normal	45



445227067520101 ME-WW797 Township T24MD BPP (Hadley Lakes)
U.S. Geological Survey



450713067162801 ME-WW796 Calais, Maine
U.S. Geological Survey

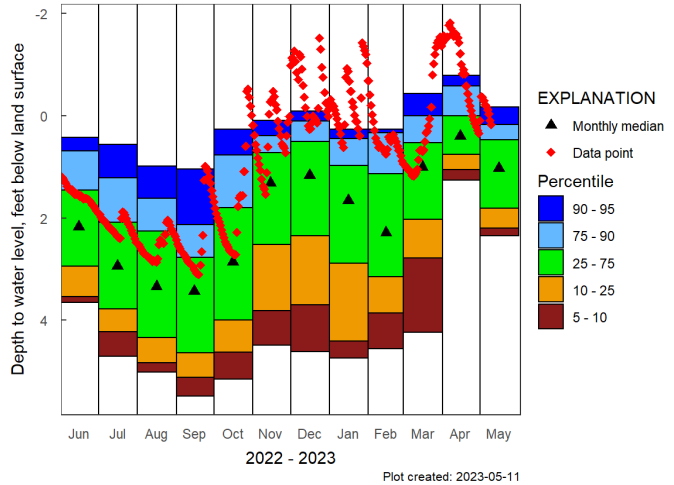


Figure 6-11: Groundwater Level Yearly Plots to Current
Source: [United States Geological Survey](https://www.usgs.gov/)

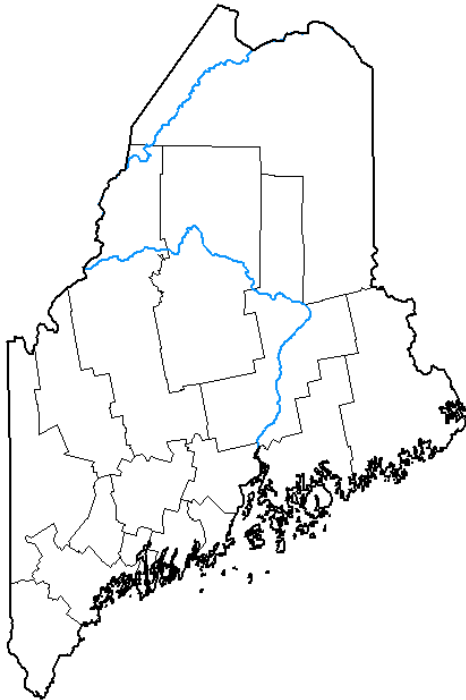
Flow or Water Level	Percentile Range	Explanation
Low	0 th	The monthly mean streamflow or median water level during this month is the lowest ever recorded during the period of record for this site.
Much below normal	0 th to 10 th	The monthly mean streamflow or median water level during this month is less than the 10 th percentile when compared to all of the months during the period of record for this site.
Below normal	10 th to 25 th	The monthly mean streamflow or median water level during this month is between the 10 th and 25 th percentiles when compared to all of the months during the period of record for this site.
Normal	25 th to 75 th	The monthly mean streamflow or median water level during this month is between the 25 th and 75 th percentiles when compared to all of the months during the period of record for this site.
Above normal	75 th to 90 th	The monthly mean streamflow or median water level during this month is between the 75 th and 90 th percentiles when compared to all of the months during the period of record for this site.
Much above normal	90 th to 100 th	The monthly mean streamflow or median water level during this month is greater than the 90 th percentile when compared to all of the months during the period of record for this site.
High	100 th	The monthly mean streamflow or median water level during this month is the highest ever recorded during the period of record for this site.

**Non-Routine Hydrologic Products
April 2023
WFO Caribou, ME**

Product	How Many Issued	Reason for Issuance
Flood Advisory	3	Ice Jam
Flood Advisory	2	Excessive Rainfall + Snowmelt
Flood Advisory	1	Excessive Rainfall

Drought Conditions for April 2023

**U.S. Drought Monitor
Maine**



April 4, 2023

*(Released Thursday, Apr. 6, 2023)
Valid 8 a.m. EDT*

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	100.00	0.00	0.00	0.00	0.00	0.00
Last Week <i>03-28-2023</i>	100.00	0.00	0.00	0.00	0.00	0.00
3 Months Ago <i>01-03-2023</i>	100.00	0.00	0.00	0.00	0.00	0.00
Start of Calendar Year <i>01-03-2023</i>	100.00	0.00	0.00	0.00	0.00	0.00
Start of Water Year <i>09-27-2022</i>	88.92	11.08	3.23	0.00	0.00	0.00
One Year Ago <i>04-05-2022</i>	69.40	30.60	7.46	4.22	0.00	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

David Simeral
Western Regional Climate Center



droughtmonitor.unl.edu

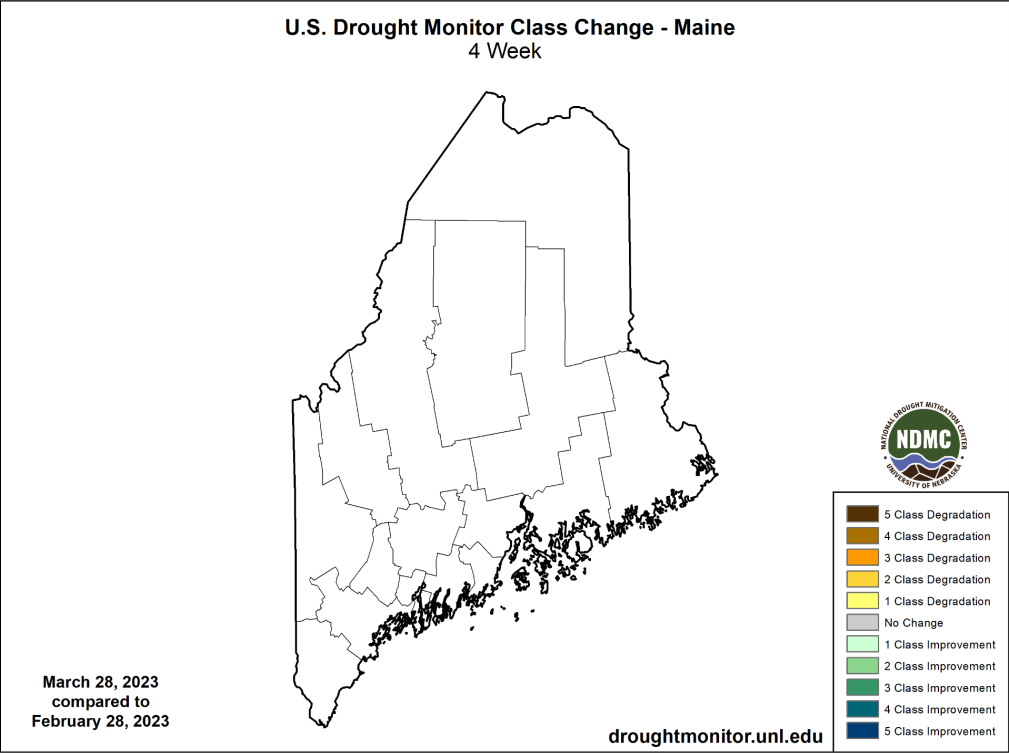


Figure 12-14: U.S. Drought Monitor Drought Classification & Statistics for April

Source: [U.S. Drought Monitor](https://droughtmonitor.unl.edu)

Flooding Photos for April 2023

First Photo is thanks to Caribou Police Department, Photos 2-4 from Fort Fairfield Police Department

