NWS Form E-5 (04-2006) (PRES. BY NWS Instruction 10-924) **U.S. DEPARTMENT OF COMMERCE** **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION** **NATIONAL WEATHER SERVICE**	HYDROLOGIC SERVICE AREA (HSA) **WFO Caribou, Maine**
MONTHLY REPORT OF HYDROLOGIC CONDITIONS	REPORT FOR: MONTH: **May** YEAR: **2024**
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 **June 8, 2024**

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).

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

May 2024

May 2024 featured well above average temperatures while precipitation was very variable. In May the North Atlantic Oscillation (NAO) monthly mean was -0.44SD as blocking extended from north of Hudson Bay to the Maritimes of Eastern Quebec. At the same time the Pacific North American Pattern (PNA) shifted extremely negatively with a monthly mean of -2.74SD which was the lowest PNA value in May since 1950. The closest negative PNA in May was in 1964 at -2.68SD. This resulted in significant blocking in the North Pacific which resulted in large troughing over the Western US and slight ridging over the Eastern US. This pattern resulted within a continued weakening positive El Niño-Southern Oscillation (ENSO) regime transitioning to ENSO Neutral. We saw progressive systems for the most part with brief precipitation, however this pattern favored a generally warmer pattern.

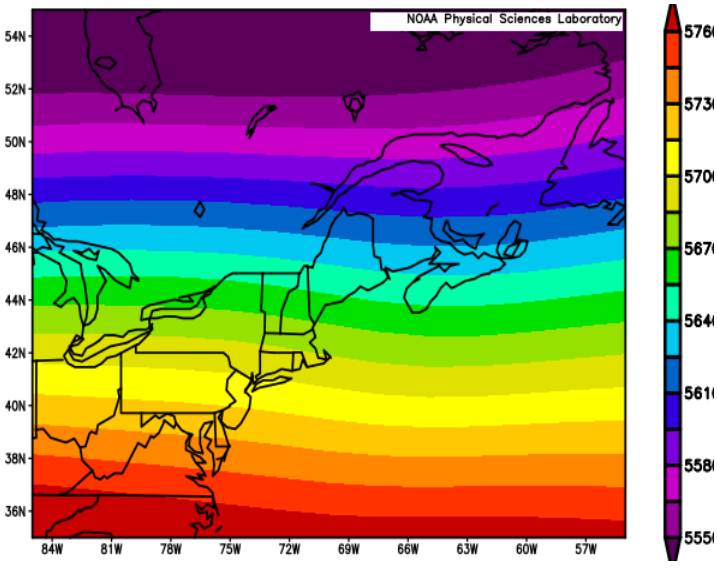


Figure 1: 500mb Geopotential Height (m) Anomalies *(1991-2020 Climo)* May 2024

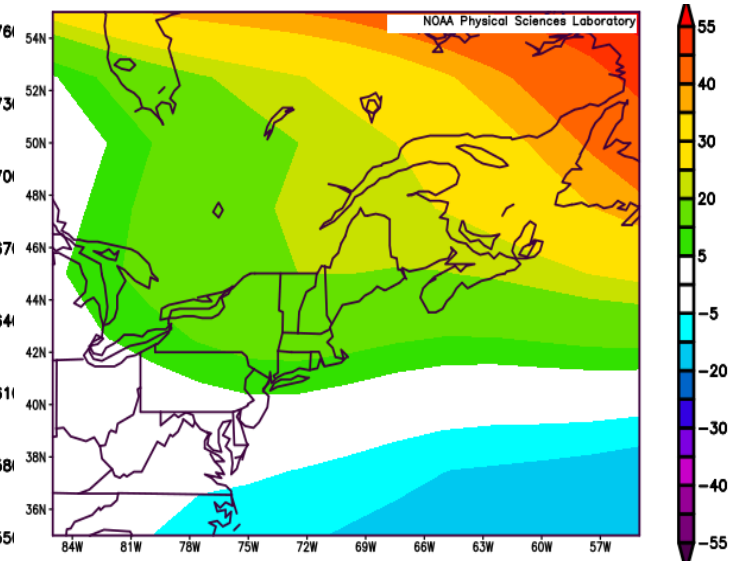


Figure 2: 500mb Geopotential Height (m) Composite Mean May 2024

Source: NOAA Physical Sciences Laboratory

Precipitation Totals for Select Locations *(All Units in Inches)*

Location	Total Precip	Normal Precip	Departure from Normal	% of Normal	Snowfall	Normal Snowfall	Departure from Normal	Greatest Snow Depth	Monthly Average Snow Depth
Frenchville*	1.91	3.07	**-1.16**	62.2%					
Fort Kent	1.79	3.31	**-1.52**	54.1%	0.0	0.1	**-0.1**	0	0.0
Van Buren	2.36	3.61	**-1.25**	65.4%	0.0	0.1	**-0.1**	0	0.0
Caribou	2.71	3.46	**-0.75**	78.3%	0.0	0.8	**-0.8**	0	0.0
Houlton	2.18	3.46	**-1.28**	63.0%					
Millinocket*	2.11	3.42	**-1.31**	61.7%	0.0			0	0.0
Greenville*	3.75	3.59	**0.16**	104.5%					
Moosehead*	2.58	3.43	**-0.85**	75.2%	0.0	0.3	**-0.3**	0	0.0
Corinna	2.73	3.64	**-0.91**	75.0%	0.0	0.0	0.0	0	0.0
Bangor	3.61	3.34	**0.27**	108.1%	0.0	0.0	0.0	0	0.0
Grand Lake Stream	2.68	3.33	**-0.65**	80.5%	0.0	0.2	**-0.2**	0	0.0
Robbinston*	2.42	4.35	**-1.93**	55.6%	0.0	0.2	**-0.2**	0	0.0
Topsfield*	2.29	4.23	**-1.94**	54.1%	0.0	0.8	**-0.8**	0	0.0

**Millinocket snowfall measured at CoOp site, not the ASOS site. *Moosehead Site is in GYX CWA.*
**Topsfield Records date back to 2000. *Robbinston Records dates back to 1994. *Greenville data gap between 1975 and 1999.*
**Frenchville ASOS has documented issues with precipitation measurements in the winter months.*

Precipitation mostly ranged from 50 to 90% of normal, but in parts of Southern Penobscot and Western Hancock County precipitation ranged from 100 to 130 percent of normal. For most areas the first half of the month was quite dry with more frequent showers during the 2nd half of the month. The heaviest rain event occurred on the 28th when parts of Piscataquis and Southern Penobscot counties observed from 1.5 to 2.25 inches of rain. On May 15th there were numerous showers and thunderstorms across portions of the Central Highlands that resulted in a couple Flood Advisories to be issued along with 1 Flash Flood Warning. The Flash Flood Warning was for a portion of rural Piscataquis County near the south end of First Roach Pond. Doppler Radar suggested in this rural area 1 hour rainfall accumulation of 2-3". Multi-Radar / Multi-Sensor System (MRMS) data suggested Flash Flood Guidance had exceeded 200-210% of normal. Max Crest Streamflow values reached 200-300cfs/smi which typically produced flash flood conditions. Unfortunately, this occurred in extremely rural areas of Piscataquis County with no ground truth. In terms of **Evaporation**, Caribou recorded 4.05 inches of evaporation in the month with a total of 2.71 inches of rainfall. This caused the soils to dry out some by the end of the month along with rapid warming of the soils. However, thanks to the soaking rain on the 28th there were no drought conditions observed. The US Drought Monitor did indicate unusually dry conditions in far Northwest Aroostook County when issued on May 7th. Unusually dry conditions expanded slightly in far Northwest Aroostook County, and in far northern sections of both Somerset and Piscataquis counties by the end of the month.

Streamflows were dismal in the month of May with continued long term deficits combined with the peak discharge being over a month earlier than typical. By the end of the month we have record low monthly mean discharge on several rivers including the St. John, Mattawamkeag and the St. Croix. 12 other river observation

points in Eastern and Northern Maine were at much below normal levels with many in the 5-10th percentile for monthly mean discharge. The “best” river was Grand Lake Stream near Grand Lake Stream where it was Below Normal in the 10-24th percentile range which wasn’t good.

Groundwater long term deficits in the North Woods continued to take its toll across the North Woods with Clayton Lake groundwater observations being Below Normal then at Record Low levels by the end of the month. Elsewhere across Central Highlands to Bangor Region and western portions of Downeast Maine dropped to near Normal conditions. St. John Valley into Eastern Aroostook dropped from normal to slightly below normal conditions.

Temperatures… across the area ranged mainly from 2.5 to 4.5 degrees above 1991-2020 normals. In Caribou it tied with 2001 as the 4th warmest May on record. Both Houlton and Millinocket observed their 7th warmest May on record, and in Bangor it tied with 2015 for the 12th warmest May on record. Temperatures were a bit below average from the 8th through 12th and again the last few days of the month, otherwise temperatures were consistently above average.

Town/City	Avg Monthly Temperature (°F)	Normal Monthly Temperature (°F)	Departure from Normal (°F)
Frenchville	55.3	51.7	**3.6**
Fort Kent	53.3	49.4	**3.9**
Van Buren	54.1	50.4	**3.7**
Caribou	56.4	52.2	**4.2**
Houlton	55.3	51.2	**4.1**
Millinocket	57.4	53.2	**4.2**
Greenville*	55.9	51.4	**4.5**
Moosehead	54.4	50.8	**3.6**
Corinna	57.6	54.7	**2.9**
Bangor	57.4	54.5	**2.9**
Grand Lake Stream	55.2	52.9	**2.3**
Robbinston*	54.4	51.7	**2.7**
Topsfield*	57.2	52.9	**4.3**

**Topsfield Records date back to 2000, *Robbinston Records date back to 1994*
**Greenville data gap between 1975 and 1999 *Moosehead Site is in GYX CWA on CWA border*

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

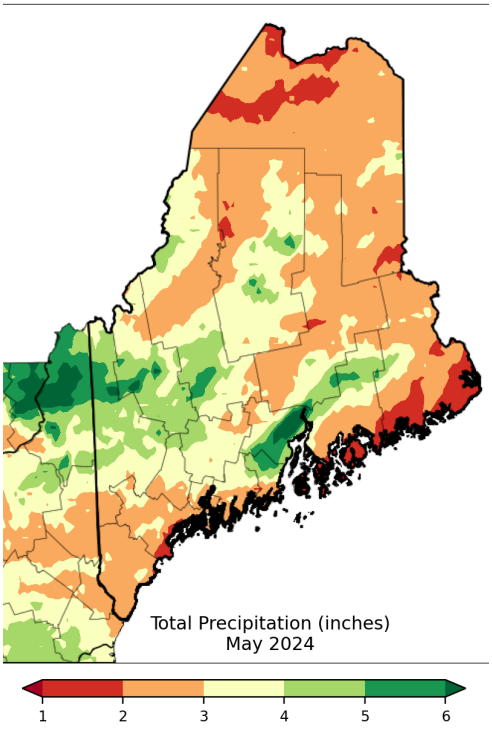


Figure 3: Total Liquid Precipitation for May

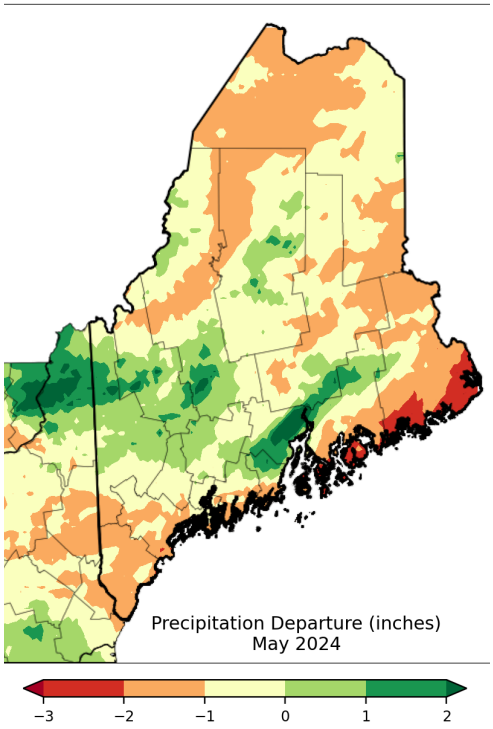


Figure 4: Liquid Precipitation Departure for May
Source: Northeast Regional Climate Center

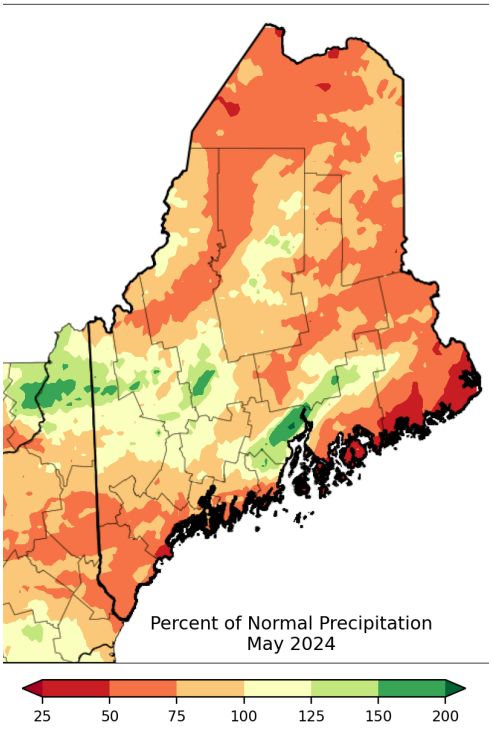


Figure 5: Percent of Normal Precipitation for May

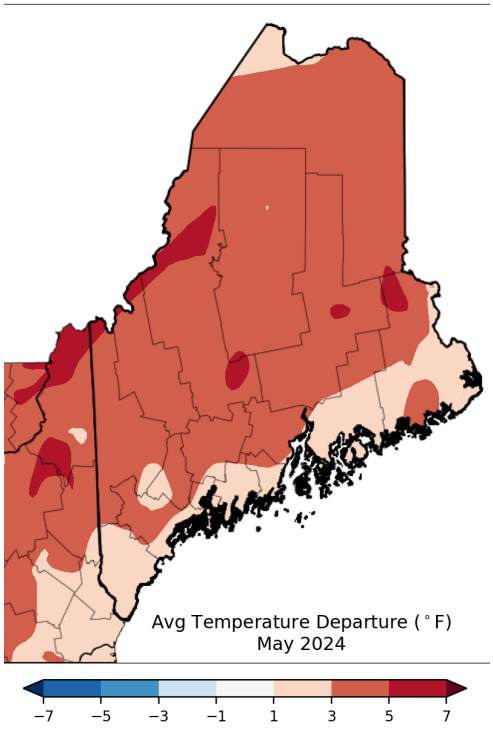


Figure 6: Average Temperature Departure for May
Source: Northeast Regional Climate Center

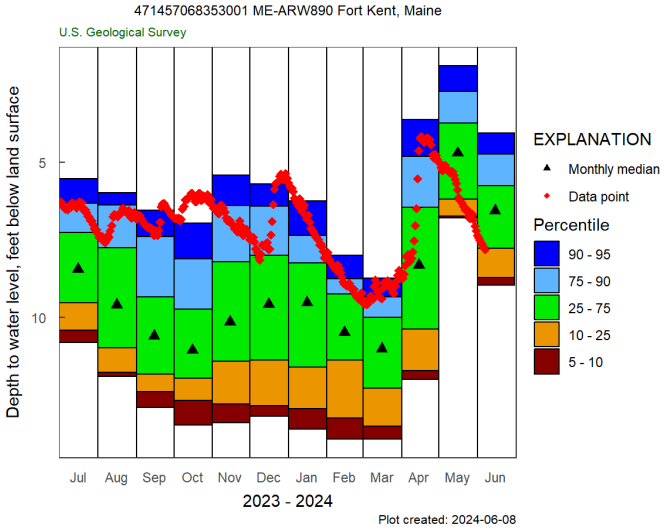
May Streamflows for Rivers

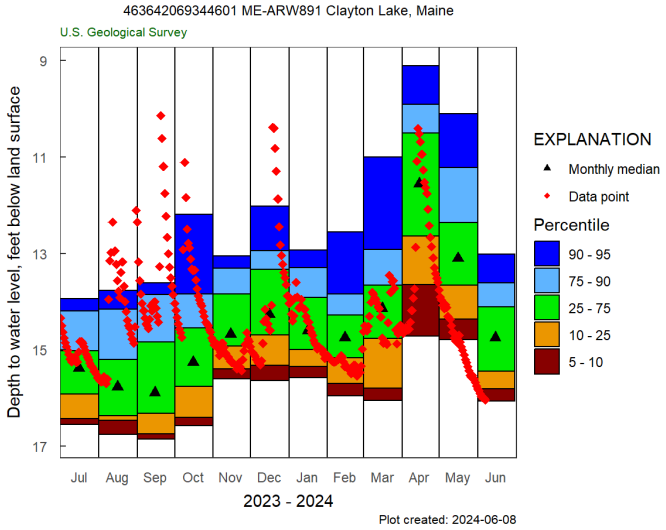
Data provided by the U.S. Geological Survey

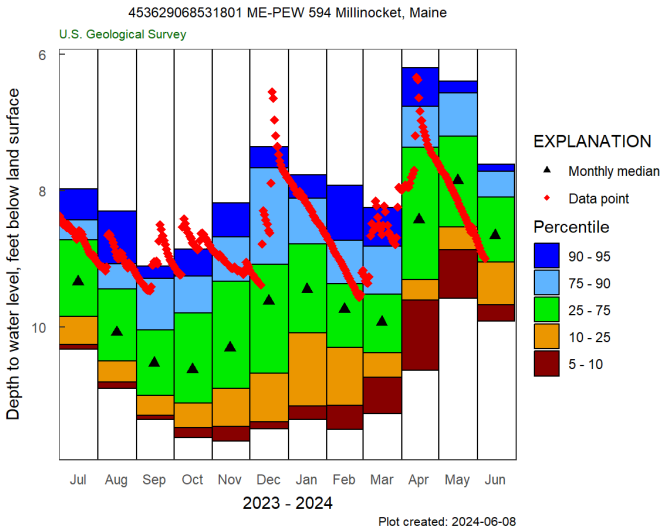
River	Monthly Mean Flow (cfs)	% Normal (mean)	Percentile Class	Drainage (mi^2)	Years of Record
Big Black River near Depot Mtn	214	28%	Much Below Normal	171	39
St. John River at Nine Mile Bridge	1873	28%	Much Below Normal	1341	72
Allagash River near Allagash	1575	26%	Much Below Normal	1478	92
St. John River at Dickey	3737	26%	Much Below Normal	2680	77
St. John River at Fort Kent	4500	14%	Low	5929	96
Fish River near Fort Kent	799	16%	Low	873	93
Aroostook River near Masardis	1282	32%	Much Below Normal	892	65
Aroostook River at Washburn	2152	29%	Much Below Normal	1654	92
St. Croix River at Vanceboro	259	25%	Much Below Normal	413	94
St. Croix River at Baring	744	20%	Low	1374	63
Grand Lake Stream at Grand Lake Stream	174	40%	Below Normal	228.3	94
Narraguagus River at Cherryfield	278	42%	Much Below Normal	227	75
East Branch Penobscot River at Grindstone	2021	42%	Much Below Normal	837	101
Mattawamkeag near Mattawamkeag	1180	22%	Low	1418	88
Piscataquis River near Dover-Foxcroft	497	42%	Below Normal	298	120
Sebec River at Sebec	294	24%	Much Below Normal	326	68
Piscataquis River at Medford	1722	38%	Much Below Normal	1162	91
Penobscot River at West Enfield	9086	39%	Much Below Normal	6422	120

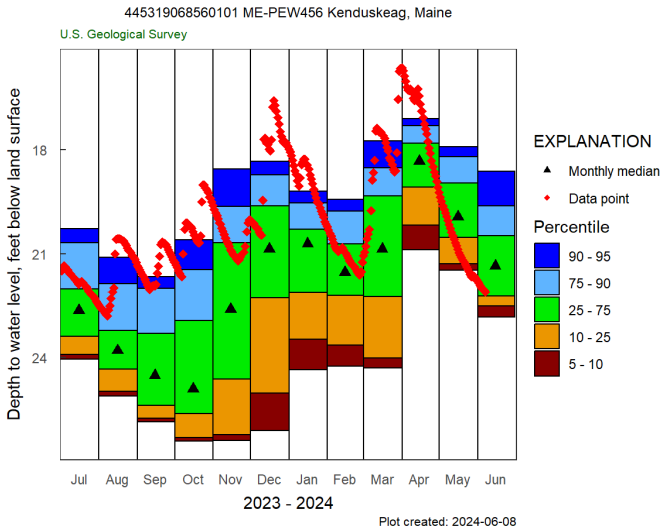
May Average Groundwater Levels

Station	Percentile Class	Years of Record
Hadley Lakes	Normal	38
Kenduskeag	Below Normal	45
Calais	Above Normal	24
Millinocket	Normal	29
Clayton Lake	Much Below Normal	45
Fort Kent	Normal	45









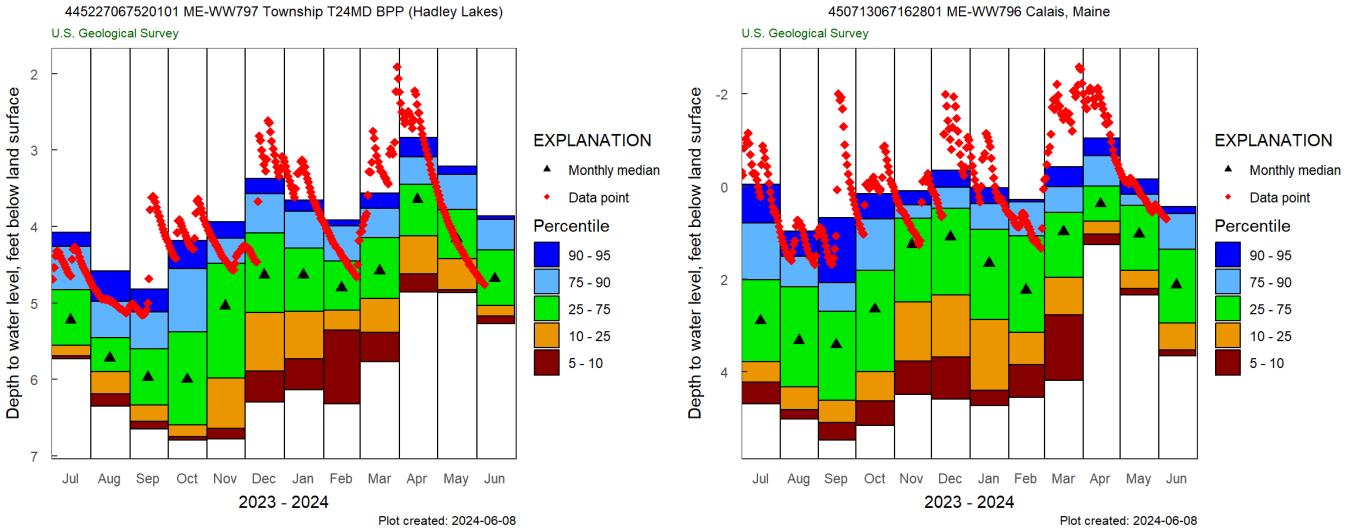


Figure 9-14: Groundwater Level Yearly Plots to Current
Source: United States Geological Survey

Flow or Water Level	Percentile Range	Explanation
Ice Impacted	NA	Ice impacted resulting in No Data available
Low	0th	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	0th to 10th	The monthly mean streamflow or median water level during this month is less than the 10th percentile when compared to all of the months during the period of record for this site.
Below Normal	10th to 25th	The monthly mean streamflow or median water level during this month is between the 10th and 25th percentiles when compared to all of the months during the period of record for this site.
Normal	25th to 75th	The monthly mean streamflow or median water level during this month is between the 25th and 75th percentiles when compared to all of the months during the period of record for this site.
Above Normal	75th to 90th	The monthly mean streamflow or median water level during this month is between the 75th and 90th percentiles when compared to all of the months during the period of record for this site.
Much Above Normal	90th to 100th	The monthly mean streamflow or median water level during this month is greater than the 90th percentile when compared to all of the months during the period of record for this site.
High	100th	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 from WFO Caribou, ME
May 2024

Product	How Many Issued	Reason for Issuance
Flash Flood Warning	1	Excessive Rainfall from Thunderstorms
Flood Advisories	2	Excessive Rainfall

Drought Monitor
May 7, 2024 vs. May 28, 2024

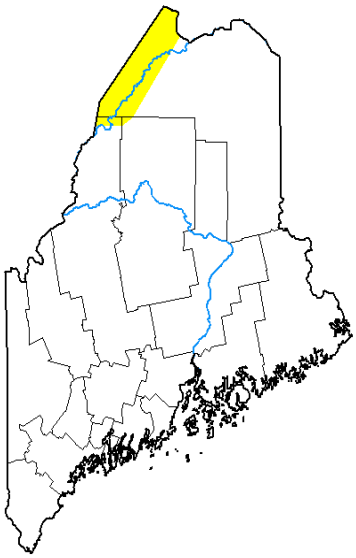
U.S. Drought Monitor

Maine

May 7, 2024

(Released Thursday, May. 9, 2024)

Valid 8 a.m. EDT



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:

Curtis Riganti
National Drought Mitigation Center

droughtmonitor.unl.edu

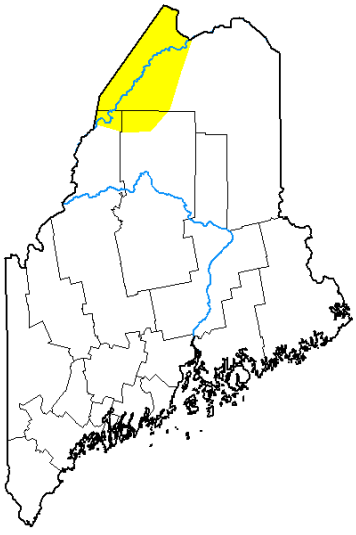
U.S. Drought Monitor

Maine

May 28, 2024

(Released Thursday, May. 30, 2024)

Valid 8 a.m. EDT



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