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 YEAR **June 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 **July 9, 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.

June 2024

June 2024 featured significantly above average temperatures and near average rainfall across Eastern and Northern Maine. June, the North Atlantic Oscillation (NAO) monthly mean was -0.09 SD (basically neutral) as blocking shifted far east across the North Atlantic due East of the Canadian Maritime with the mean high anchored around 50°N & 35°W. At the same time the Pacific North American Pattern (PNA) finished with a monthly mean of +0.97 SD. The El Niño-Southern Oscillation (ENSO) pattern completed the transition to ENSO Neutral as the Niño 1+2 SST departures fell to -0.6°C and the Niño 3 region dropped to -0.1°C with Niño 3.4 region at +0.4°C. June's mean pattern at 500mb across Maine features slight ridging with weak troughing over the Canadian Maritimes leading into that large North Atlantic ridging. This resulted in 500mb heights generally 10-20m higher than average for the month compared to the 1991-2020 30yr climatological average.

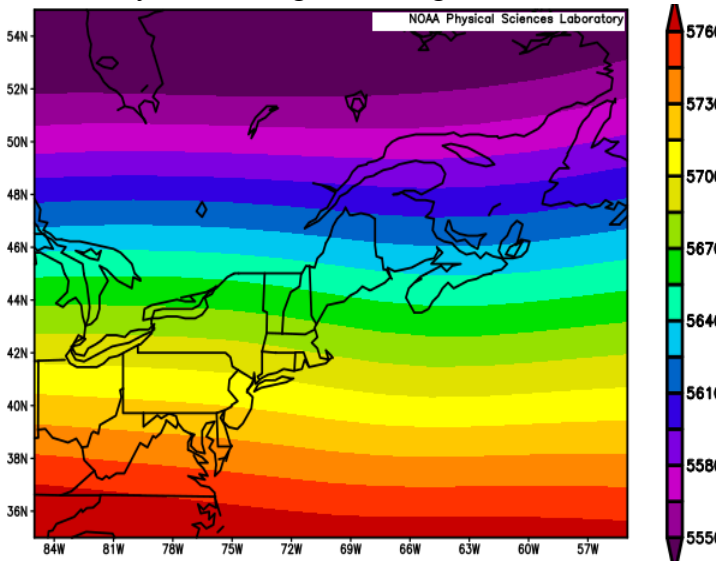


Figure 1: 500mb Geopotential Height (m) Anomalies *(1991-2020 Climo)* June 2024

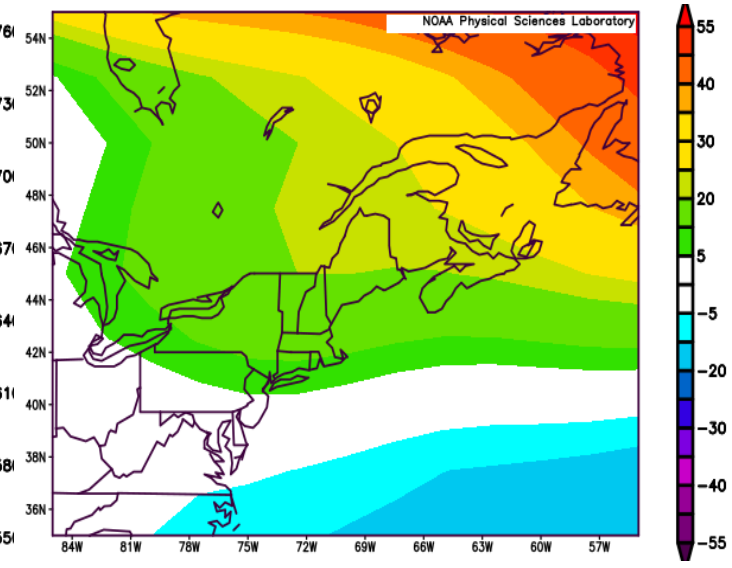


Figure 2: 500mb Geopotential Height (m) Composite Mean June 2024

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*	4.78	4.23	**0.55**	113.0%					
Fort Kent	5.80	4.42	**1.38**	131.2%	0.0	0.0	0.0	0	0.0
Van Buren	4.37	3.97	**0.40**	110.1%	0.0	0.0	0.0	0	0.0
Caribou	5.29	3.89	**1.40**	136.0%	0.0	0.0	0.0	0	0.0
Houlton	3.25	4.04	**-0.79**	80.4%					
Millinocket*	4.85	4.20	**0.65**	115.5%	0.0			0	0.0
Greenville*	3.31	4.04	**-0.73**	81.9%					
Moosehead*	5.01	4.39	**0.62**	114.1%	0.0	0.0	0.0	0	0.0
Corinna	5.24	4.02	**1.22**	130.3%	0.0	0.0	0.0	0	0.0
Bangor	4.00	3.87	**0.13**	103.4%	0.0	0.0	0.0	0	0.0
Robbinston*	3.95	4.10	**-0.15**	96.3%	0.0	0.0	0.0	0	0.0
Topsfield*	3.88	4.23	**-0.35**	91.7%	0.0	0.0	0.0	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 across Eastern and Northern Maine ranged from 75-90% of normal over Downeast and Central portions of the region upwards to 110-125% of normal over the North. Across the north where the vast majority of the rainfall was concentrated from the 9th-11th and the 23rd. Monthly **Evaporation** at WFO Caribou was just under 6 inches that resulted in dry grounds and patchy brown lawns at times during the month with even drier conditions over Central and Interior Downeast areas. On June 6th a small area of Moderate **Drought** (D1) was present near the Quebec border in Western Aroostook County per the US Drought Monitor. This was a continuation of the lack of rainfall across the North Woods in the upper St. John River basin and below normal groundwater levels as observed at Clayton Lake. Abnormally Dry (D0) conditions were present over the remainder of Northern Aroostook County along with Northwest Piscataquis and Northern Somerset counties. By June 27th, no part of the area was under D1 thanks to rainfall totals increasing in the month of June. The area under D0 shrunk in Northern Aroostook County, along with very small portions of Piscataquis and Somerset counties.

Streamflows have been dropping significantly through the month except in areas that saw significant rainfall for the month which typically was isolated to the North Woods (St. John upper basin) and the Piscataquis upper basin. These areas were at normal conditions for the month with even above normal discharge on the Big Black River. Elsewhere, with mainly convection the rivers didn't respond as much with below normal to much below normal conditions. In fact the Fish River at Fort Kent had a record low discharge for the month of June with 93 years of record. Additional low records experienced on the St. Croix river at Vanceboro and Baring (caveat is this river is highly controlled with dams). 63 years of record at Baring and 94 years of record at Vanceboro.

Groundwater features improvements across Northern Maine in spots with rainfall that was largely absorbed across Northern Maine. Most locations across the region started the month Below Normal to Well Below Normal. Central Highlands and Downeast got worse through the month falling to Well Below Normal conditions at most sites. Across Northern Maine conditions returned to near normal conditions. The exception to all of this was in Calais in far Eastern Washington County where conditions were Above Normal for the entire month of June thanks to the previous month's heavier rainfall. At the end of June 2024 looking at the 5cm (~2 inch) soil moisture percentiles showed the conditions described above. Normal Maine featured soil moisture in the 70th-90th percentile with isolated areas in the St. Francis River watershed up >98th percentile and in the Mars Hill area. Much of the Central Highlands including Moosehead and Baxter regions south to the Bangor area and interior Downeast was in the 30th-70th percentile. There is a pocket of 90-98th percentile stretching from interior Hancock to Washington along the Route 9 corridor thanks to Thunderstorm activity.

Temperatures across the region ranged from around 3°F above the 30 year (1991-2020) normals over the Downeast areas to upwards of 4°F above average across the North. In Caribou, it was the warmest June on record (Mean 65.1°F), beating the old record from 2021 by 0.2°. Records in Caribou date back to 1939. Millinocket and Houlton both had their 6th warmest June on record. Meanwhile, Bangor had its 11th warmest June on Record. Intermittent warm to hot spells on the 4th-7th and 18th-20th were broken by periods of near to slightly below average temperatures. The highlight of the month occurred on low terrain locations across the north and central on the 19th and central and Downeast areas on the 20th when near record or record high temps of mid to upper 90s occurred. The high temperature of 96°F at Caribou on the 19th tied the all-time record of 96 (since records began there in 1939), interestingly last set on the same date just 4 years prior in 2020. Furthermore, the calendar day low of 71, which tied the warmest low of record at Caribou, meant that June 19th, 2024 average temp of 83.5 degrees was also the hottest average temperature day of record at Caribou. Other dates Caribou reached 96°F include May 22nd, 1977 and June 29th, 1944.

Town/City	Avg Monthly Temperature (°F)	Normal Monthly Temperature (°F)	Departure from Normal (°F)
Frenchville	64.5	60.8	**3.7**
Fort Kent	62.1	59.1	**3.0**
Van Buren	63.6	59.9	**3.7**
Caribou	65.1	61.4	**3.7**
Houlton	63.5	60.2	**3.3**
Millinocket	65.8	62.6	**3.2**
Greenville*	64.2	60.7	**3.5**
Moosehead	63.1	60.0	**3.1**
Corinna	65.9	63.8	**2.1**
Bangor	66.5	63.6	**2.9**
Robbinston*	63.6	60.4	**3.2**
Topsfield*	64.6	61.6	**3.0**

**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.

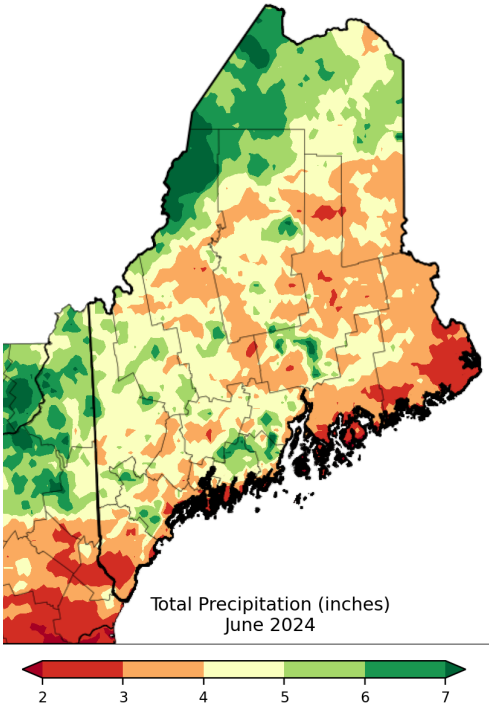


Figure 3: Total Liquid Precipitation for June

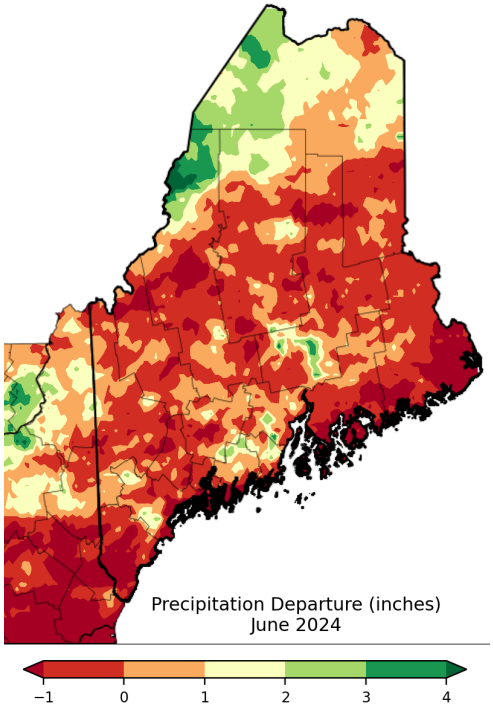


Figure 4: Liquid Precipitation Departure for June
Source: Northeast Regional Climate Center

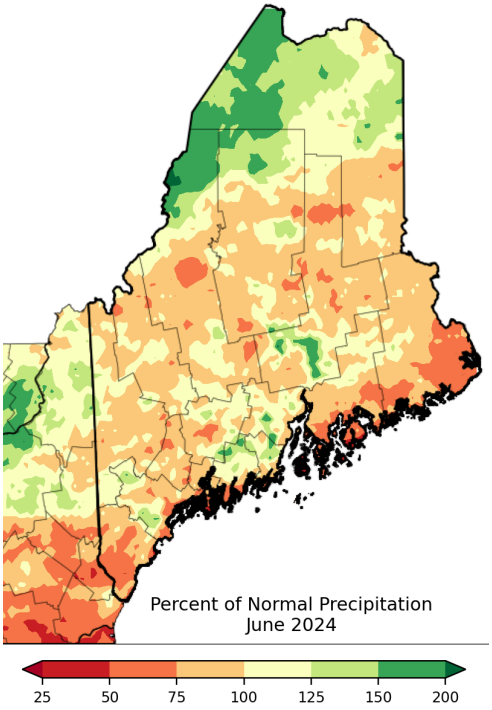


Figure 5: Percent of Normal Precipitation for June

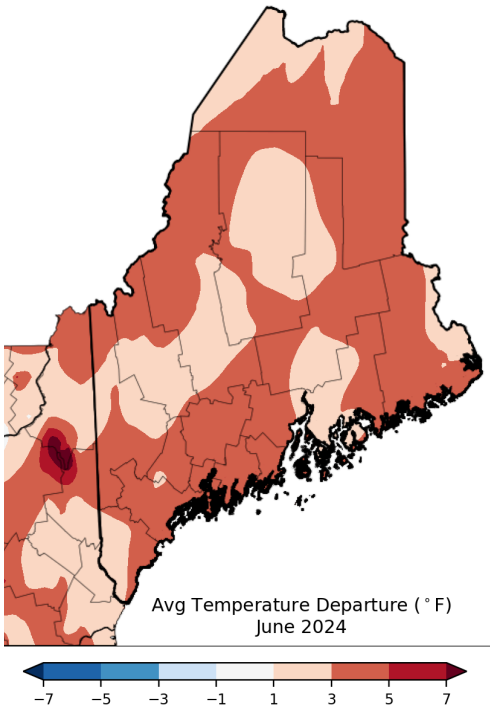


Figure 6: Average Temperature Departure for June
Source: Northeast Regional Climate Center

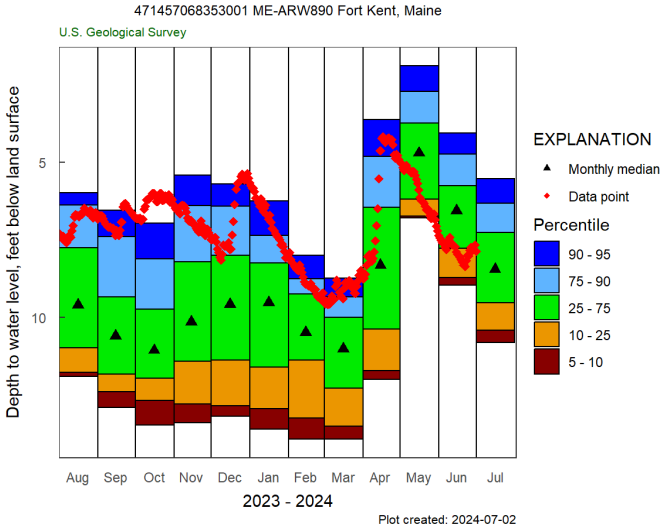
June Streamflows for Rivers

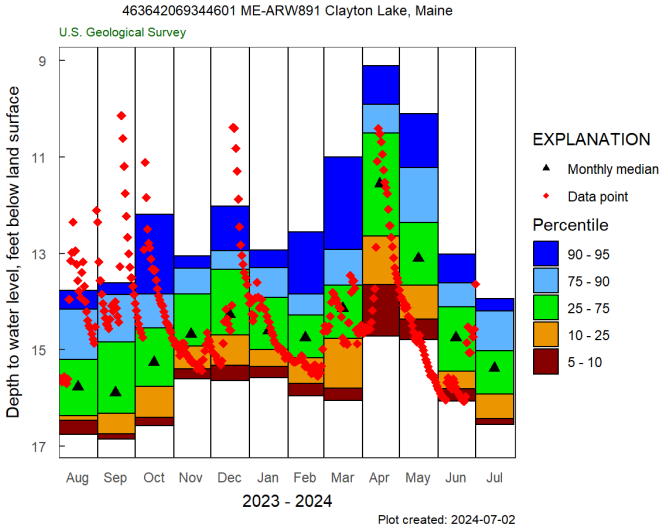
Data provided by the U.S. Geological Survey

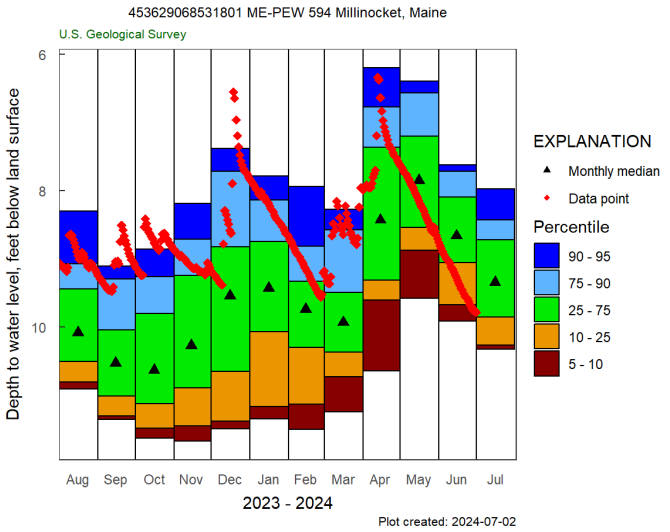
River	Monthly Mean Flow (cfs)	% Normal (mean)	Percentile Class	Drainage (mi^2)	Years of Record
Big Black River near Depot Mtn	337	127%	Above Normal	171	39
St. John River at Nine Mile Bridge	2397	115%	Normal	1341	72
Allagash River near Allagash	1465	69%	Normal	1478	92
St. John River at Dickey	4259	98%	Normal	2680	77
St. John River at Fort Kent	3844	37%	Much Below Normal	5929	96
Fish River near Fort Kent	455	26%	Low	873	93
Aroostook River near Masardis	759	60%	Normal	892	65
Aroostook River at Washburn	1390	58%	Normal	1654	92
St. Croix River at Vanceboro	159	19%	Low	413	94
St. Croix River at Baring	529	24%	Low	1374	63
Grand Lake Stream at Grand Lake Stream	105	24%	Much Below Normal	228.3	94
Narraguagus River at Cherryfield	154	44%	Below Normal	227	75
East Branch Penobscot River at Grindstone	969	44%	Much Below Normal	837	101
Mattawamkeag near Mattawamkeag	626	32%	Much Below Normal	1418	88
Piscataquis River near Dover-Foxcroft	228	48%	Below Normal	298	120
Sebec River at Sebec	459	90%	Normal	326	68
Piscataquis River at Medford	1338	72%	Normal	1162	91
Penobscot River at West Enfield	6556	57%	Below Normal	6422	120

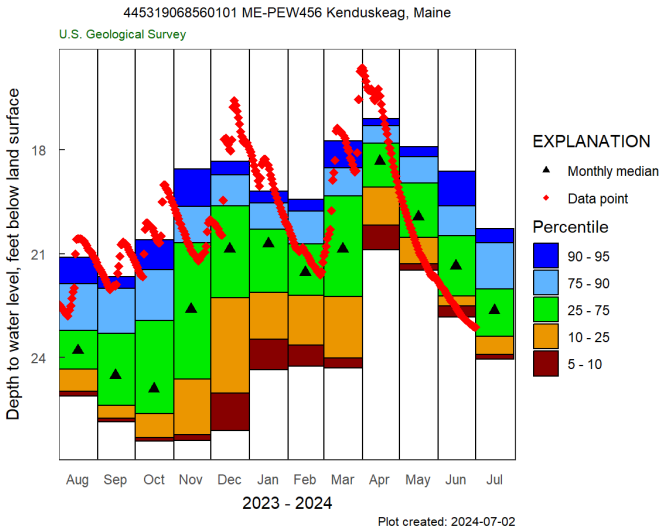
June Average Groundwater Levels

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









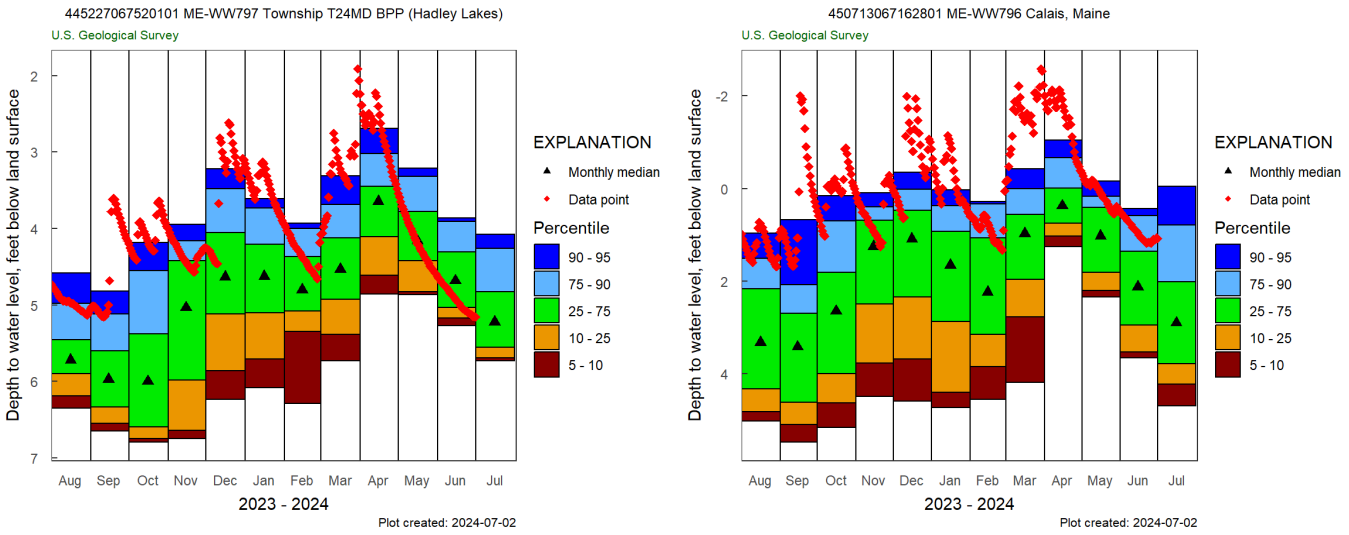


Figure 9-14: Groundwater Level Yearly Plots to Current
Source: United States Geological Survey

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.

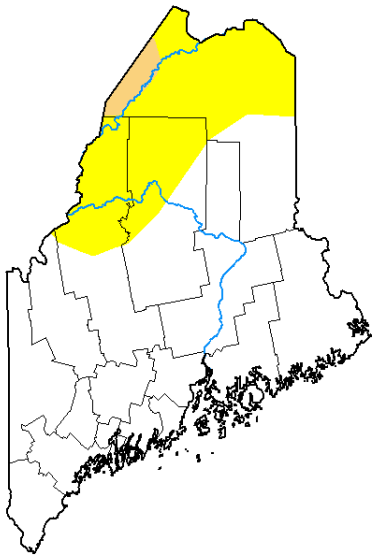
Non-Routine Hydrologic Products from WFO Caribou, ME
June 2024

Product	How Many Issued	Reason for Issuance
Flood Advisories	3	Excessive Rainfall

Drought Monitor
June 4, 2024 vs. June 25, 2024

U.S. Drought Monitor

Maine



June 4, 2024

(Released Thursday, Jun. 6, 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 mor information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:

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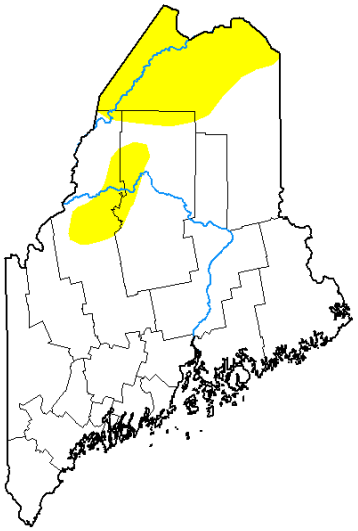
droughtmonitor.unl.edu

U.S. Drought Monitor

Maine



June 25, 2024

(Released Thursday, Jun. 27, 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

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droughtmonitor.unl.edu

Drought Monitor June Change