

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

REPORT FOR:
MONTH YEAR

November 2023

SIGNATURE

**James Sinko - Meteorologist
Hydrology Program Manager**

DATE

December 14, 2023

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

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.

November 2023

November 2023 was the sixth month in a row with a negative North Atlantic Oscillation (NAO) monthly mean, however November 2023 average NAO index was near neutral at $-0.32SD$. This was combined with once again a positive Pacific North American Pattern (PNA) that was $+0.55$ monthly mean. This pattern resulted within a strong positive El Niño-Southern Oscillation (ENSO) eastern regime that saw increasing NINO 3.4 SST anomalies. Given the weaker NAO & PNA compared to previous months this resulted in a colder than normal November with below average precipitation. Looking at the reanalysis of November via the 500mb Geopotential Heights below it was notable troughing allowing for a cold air source from Canada. This resulted in highly anomalous lower 500mb heights over Maine in the month of November as seen below.

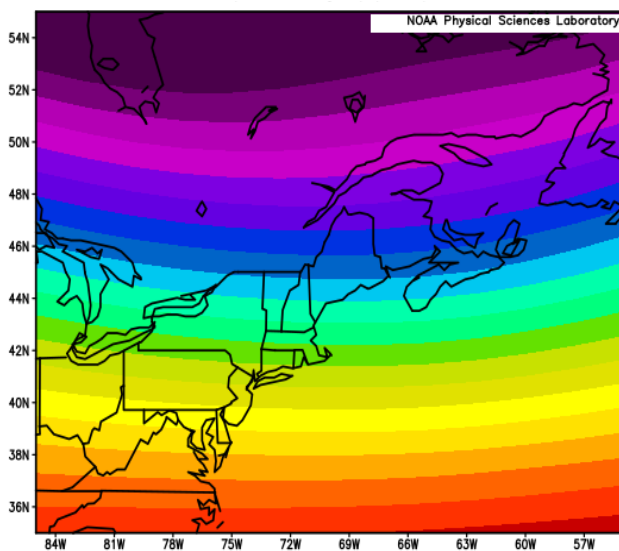


Figure 1: 500mb Geopotential Height (m) Anomalies (1991-2020 Clim)
November 2023

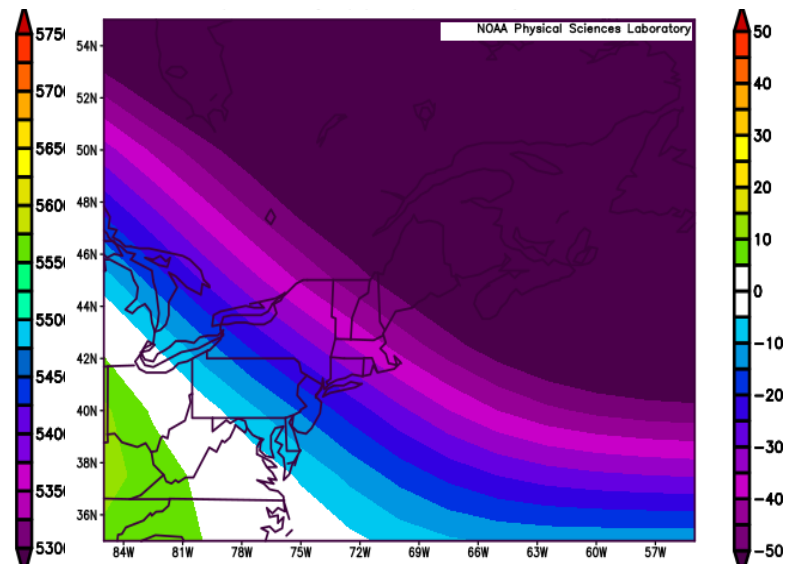


Figure 2: 500mb Geopotential Height (m) Composite Mean
November 2023

Source: [NOAA Physical Sciences Laboratory](#)

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*	1.05	2.58	-1.53	40.7%					
Fort Kent	1.81	3.23	-1.42	56%	9.2	8.9	+0.3	6	1.5
Van Buren	2.12	3.37	-1.25	62.9%	5.5	7.4	-1.9	3	0.2
Caribou	1.96	3.35	-1.39	58.5%	7.6	10.4	-2.8	3	0.6
Houlton	2.18	3.61	-1.43	60.4%					
Millinocket*	3.01	4.10	-1.09	73.4%	6.0			6	0.7
Greenville*	2.73	3.96	-1.23	68.9%					
Moosehead*	2.02	3.42	-1.40	59%					
Corinna	2.73	4.11	-1.38	66.4%					
Bangor	2.60	3.84	-1.24	67.7%	1.0	4.3	-3.3	1	0
Grand Lake Stream	2.13	4.41	-2.28	48.3%	0.0	2.7	-2.7	0	0
Robbinston*	2.63	5.50	-2.87	47.8%	0.3	3.6	-3.3	T	0
Topsfield*	2.69	5.29	-2.60	50.8%	10.7	8.4	-2.3	5	0.7

*Millinocket snowfall measured at CoOp site, not the ASOS site. Departure data is not available. *Moosehead Site is in GYX CWA

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

*Frenchville ASOS has documented issues with precipitation measurements in the winter months

Rainfall (including melted snowfall) finished the month below average across the entire area. Liquid precipitation ranged from 50 to 85 percent of normal with isolated 90-95% of normal in portions of Aroostook County. The worst locations around 50% of normal was in the North Woods, St. John Valley and much of coastal and eastern Washington county. Areas that were close to 100% were in far Northern Penobscot and west-central Aroostook County near Northern Penobscot County. **Snowfall...** The most significant events of the month occurred on the 22nd and the 27th. The storm on the 22nd produced the first measurable snow of the season in Bangor with an inch of snow. The heaviest snow was observed from the Central highlands to Southeast Aroostook County where 6-10 inches of snow was observed. Amounts dropped off to 2 to 3 inches across the Saint John Valley. The next storm on the 27th produced from 1 to 4 inches of snow from Caribou north to the Saint John Valley with up to 7 inches of snow in Western Aroostook County and Northern Somerset County along and near the Quebec Border. By the end of the month there was an inch of snow on the ground in Caribou, 4 to 6 inches in the Saint John Valley, and from to to 10 inches in western portions of the North Woods along and near the Quebec Border. There was no snow or only a trace in spots from Millinocket South to the Coast. By the end of the month much of Northern Maine into portions of the Central Highlands had developed a 1-2" frost depth with WFO Caribou reporting 1".

Streamflows... the monthly values ended up mostly around "normal" for much of the river gages across Eastern and Northern Maine. Ice signatures began to be noticeable on the northern river gages with river ice,

mainly frazil and pancake being noted. Rivers with noted ice by the end of the month were the Aroostook, Saint John, Allagash, Menduxkeag, Northern stretches of the Piscataquis and Penobscot.

Groundwater was “Much Above Normal” across much of Downeast and Central Highlands with “Above Normal” readings in the Baxter Region to Saint John Valley. Groundwater levels returned to “Normal” in the North Woods with less precipitation and the development of frost.

Temperatures... averaged from 1.5 to 3 degrees (F) below the 1991-2020 normals.

<i>Town/City</i>	<i>Avg Monthly Temperature (°F)</i>	<i>Normal Monthly Temperature (°F)</i>	<i>Departure from Normal (°F)</i>
Frenchville	29.3	31.8	-2.5
Fort Kent	27.1	30.3	-3.2
Van Buren	29.5	31.2	-1.7
Caribou	30.8	32.6	-1.8
Houlton	30.5	33.1	-2.6
Millinocket	29.8	33.0	-3.2
Greenville*	31.1	32.9	-1.8
Moosehead	29.9	32.4	-2.5
Corinna	34.0	36.7	-2.7
Bangor	34.7	37.3	-2.6
Grand Lake Stream	34.1	36.6	-2.5
Robbinston*	33.6	37.7	-4.1
Topsfield*	31.3	35.0	-3.7

**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*

In regards to **Drought** monitoring there was no drought classification for the month of November.

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

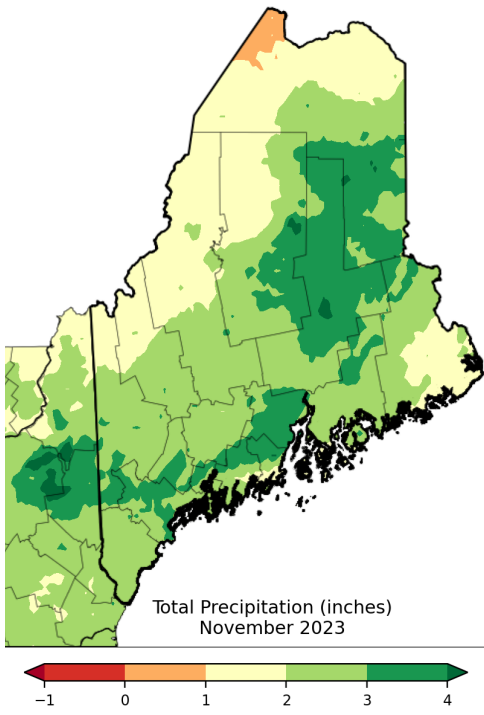


Figure 3: Total Liquid Precipitation for November

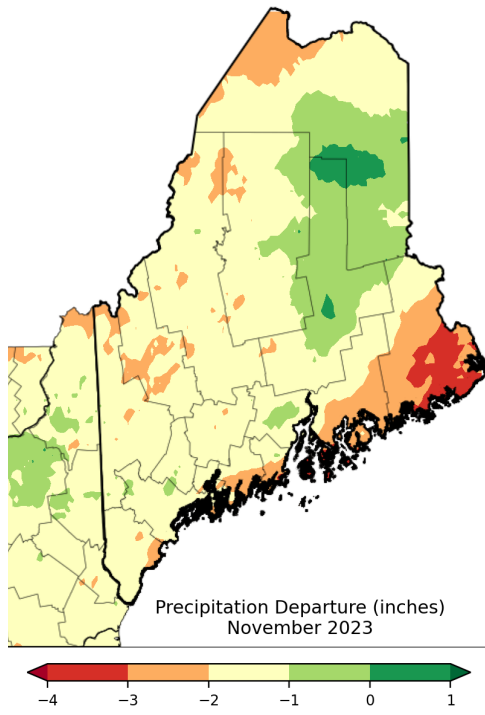


Figure 4: Liquid Precipitation Departure for November
Source: [Northeast Regional Climate Center](#)

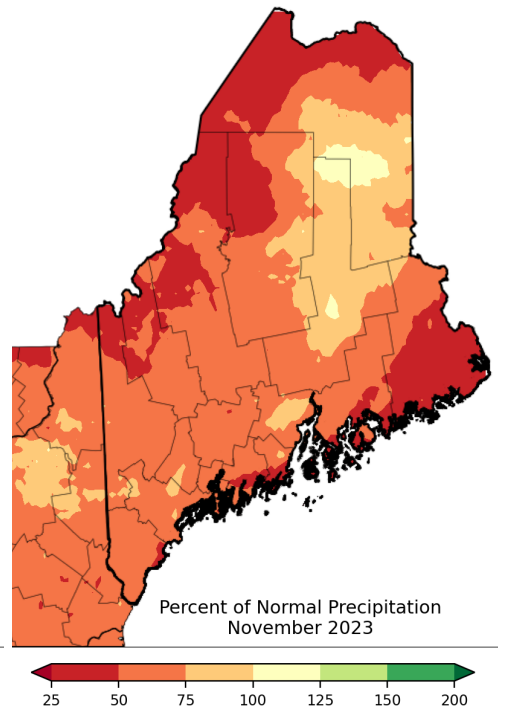


Figure 5: Percent of Normal Precipitation for November

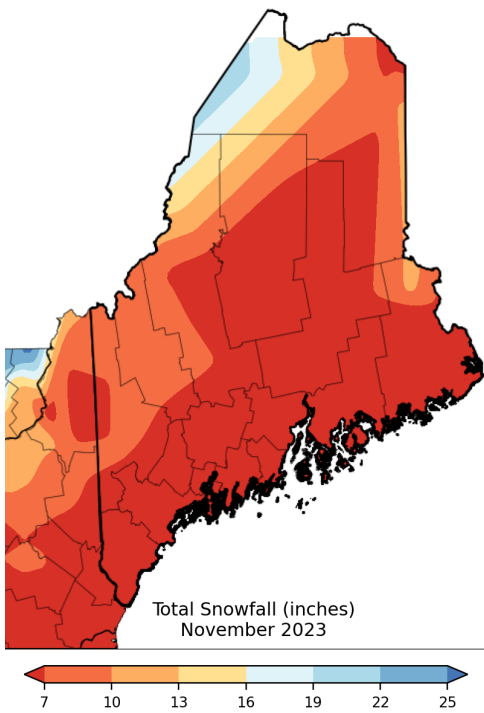


Figure 6: Total Snowfall for November

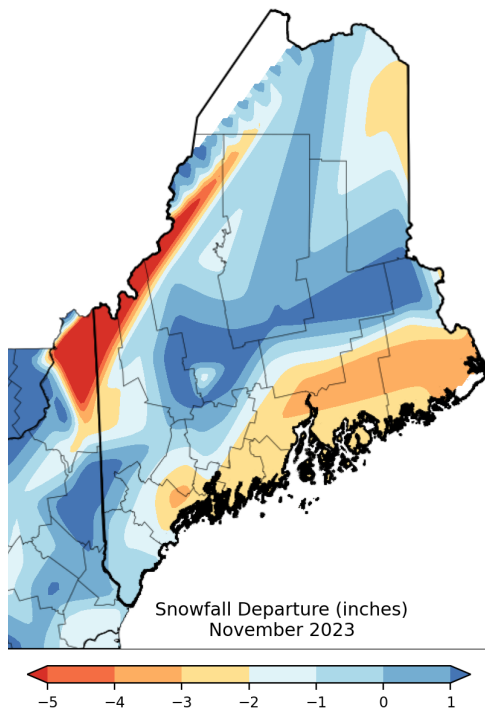


Figure 7: Total Snowfall Departure for November
Source: [Northeast Regional Climate Center](#)

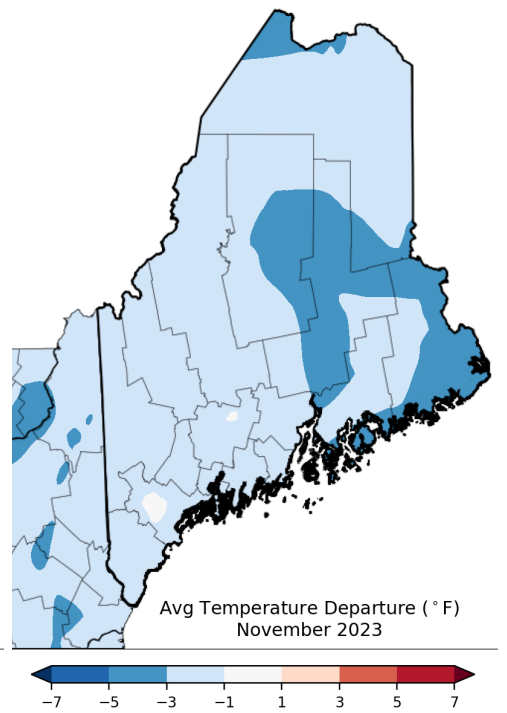


Figure 8: Average Temperature Departure for November

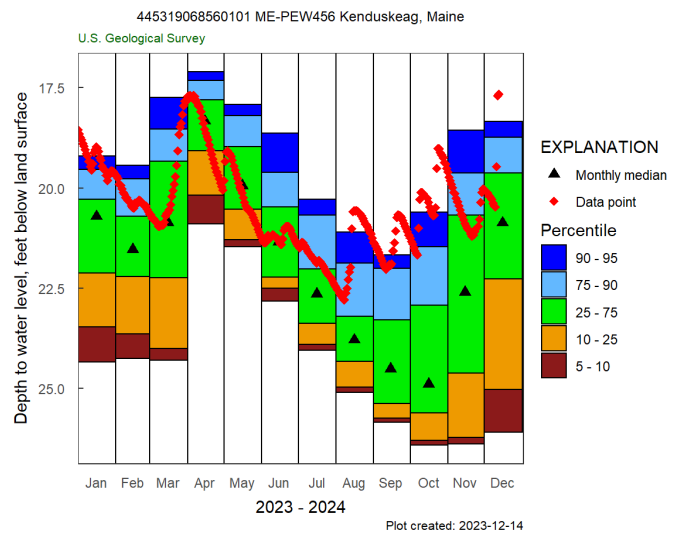
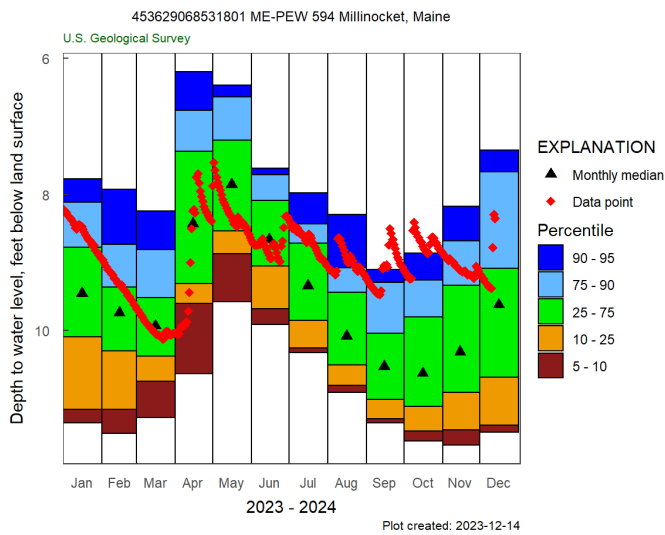
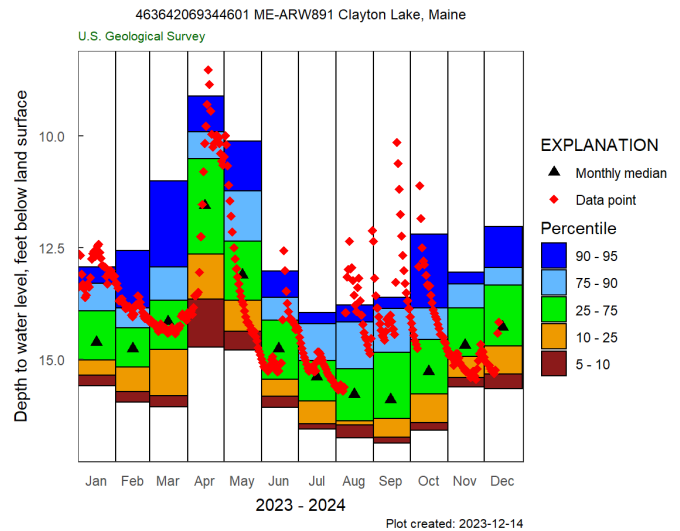
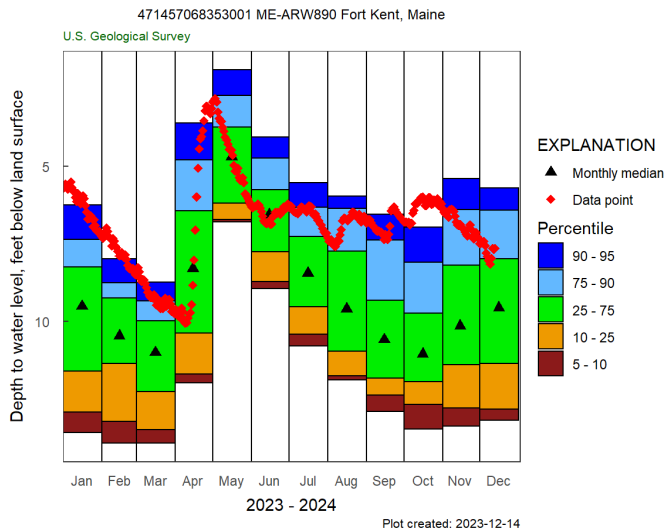
November Streamflows for Rivers

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	271.31	79.9%	Normal	171	39
St. John River at Nine Mile Bridge	1560.81	64.69%	Below Normal	1341	72
Allagash River near Allagash	1466.67	86.68%	Normal	1478	93
St. John River at Dickey	3661.76	83.33%	Normal	2680	78
St. John River at Fort Kent	3313.58	36.90%	Below Normal	5929	96
Fish River near Fort Kent	684.28	51.83%	Normal	873	93
Aroostook River near Masardis	936.36	60.16%	Normal	892	65
Aroostook River at Washburn	2004.12	74%	Normal	1654	92
St. Croix River at Vanceboro	432.92	91.33%	Normal	413	95
St. Croix River at Baring	1092.07	44.57%	Below Normal	1374	64
Grand Lake Stream at Grand Lake Stream	73.99	35.88%	Much Below Normal	228.3	95
Narraguagus River at Cherryfield	471.13	78.60%	Normal	227	74
East Branch Penobscot River at Grindstone	1161.62	61.18%	Normal	837	102
Mattawamkeag near Mattawamkeag	2090	69.83%	Normal	1418	88
Piscataquis River near Dover-Foxcroft	525.70	74.86%	Normal	298	120
Sebec River at Sebec	583.07	97.07%	Normal	326	67
Piscataquis River at Medford	1902.59	68.4%	Normal	1162	91
Penobscot River at West Enfield	11452.67	92.72%	Normal	6422	120

November Average Groundwater Levels

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



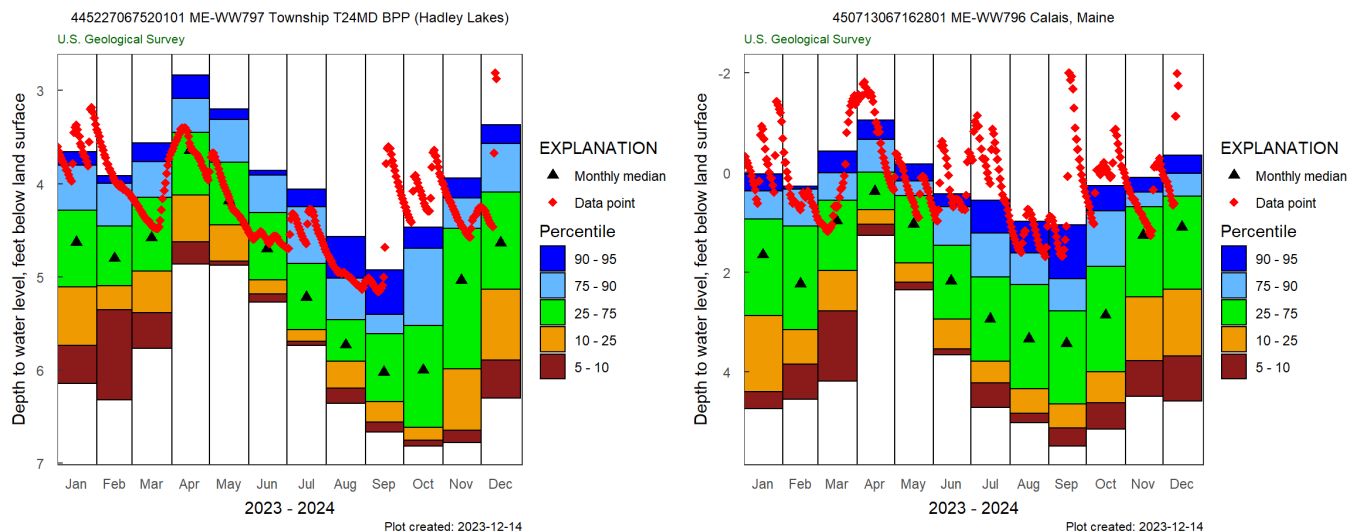


Figure 9-14: Groundwater Level Yearly Plots to Current
Source: [United States Geological Survey](https://www.usgs.gov/)

Flow or Water Level	Percentile Range	Explanation
Ice Impacted	NA	Ice impacted resulting in No Data available
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 from WFO Caribou, ME November 2023

Product	How Many Issued	Reason for Issuance
River Flood Warning	1	Minor Flood Stage Forecast @ BPRM1