NWS Form E (04-2006) (PRES. BY NWS	-5 U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION nstruction 10-924) NATIONAL WEATHER SERVICE	E HYDROLOGIC SERVICE AREA (HSA) E		
		WFO Caribou, Maine		
		REPORT FOR: MONTH YEAR		
		December 2024		
TO:	Hydrologic Information Center, W/QS31	SIGNATURE		
NO/ 132 Silve	OAA's National Weather Service 325 East West Highway	James Sinko - Meteorologist Hydrology Program Manager		
	Silver Spring, MD 20910-3283	DATE		
		January 9, 2025		

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.

#### December 2024

December 2024 broke the long streak of dry months across Eastern & Northern Maine with mostly above normal precipitation. December ended the month near to slightly above average for temperatures. The North Atlantic Oscillation (NAO) monthly mean was +1.21 SD, the Arctic Oscillation (AO) monthly mean was -0.34 SD with the Pacific North American Pattern (PNA) monthly mean at +1.70 SD. Overall, the pattern featured long wave troughing over the Eastern United States as the northern branch of the Jet Stream remained strong to our south with a strong high pressure over the Central North-Atlantic. The first half of the month featured mainly above normal temperatures with numerous precipitation events. The largest was a very warm system on December 11-12th that developed & tracked into Quebec producing significant precipitation and winds. For the remainder of the month, except the very end of the month, precipitation was generally light and temperatures mostly below normal thanks to the progressive weather pattern. This pattern was very poor to produce lasting snowpack across the area and will be discussed below...



December 2024

December 2024



Figure 1-4 Source: NOAA Physical Sciences Laboratory

Location	Total Precip	Normal Precip	Departure from Normal	% of Normal	Snowfall	Normal Snowfall	Departure from Normal	Greatest Snow Depth	Monthly Average Snow Depth
Frenchville*	3.49	2.27	1.22	153.7%					
Fort Kent	4.41	3.38	1.03	130.5%	12.5	22.3	-9.8	7	3.3
Van Buren	3.32	3.38	-0.06	98.2%	10.5	20.7	-10.2	8	2.9
Caribou	3.92	3.60	0.32	108.9%	16.5	25.2	-8.7	8	3.1
Houlton	3.57	3.37	0.20	105.9%					
Millinocket*	4.40	3.45	0.95	127.5%	14.8			10	3.3
Greenville*	5.24	4.33	0.91	121.0%					
Moosehead*	4.17	3.50	0.67	119.1%	17.5	22.6	-5.1	10	4.1
Dover-Foxcroft	5.89	4.07	1.82	144.7%	15.1	15.1	0.0	14	7.6
Corinna	4.66	4.34	0.32	107.4%	16.4	16.5	-0.1	9	3.3
Bangor	5.29	3.72	1.57	142.2%	12.6	14.7	-2.1	6	2.0
East Surry	4.35	4.97	-0.62	87.5%	12.1			8	1.6
Robbinston*	4.01	6.27	-2.26	64.0%	15.3	19.3	-4.0	9	2.2
Topsfield*	4.15	5.20	-1.05	79.8%	22.5	24.3	-1.8	11	4.6

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

\*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. \*Baileyville is a partial complete record to 1917. \*Frenchville ASOS has documented issues with precipitation measurements in the winter months. **Precipitation** ranged from 100 to 150 percent of normal, except parts of Washington County where precipitation ranged from 50 to 80 percent of normal. **Snowfall** was mainly below average except for highly isolated normal values in isolated portions of the Central Highlands and Downeast. The most significant event of the month was a wind and rain storm on the 11th into the 12th that produced 1.5 to 3 inches of rain and wind gusts over 60 mph along the coast. The rain and mild temperatures wiped out the snowpack which added 1-2 inches of additional liquid on top of the 1.5-3 inches of rain that fell. Numerous reports of flooded basements were reported across the area with the frozen grounds as water was getting in along basement walls underground. No notable rivers, small streams or urban flooding was reported. We did see rises on area rivers and streams as much of the water ran off due to frozen grounds, the most noticeable rises were on the Piscataquis River. Maps of the rainfall are located below. Another rain event at the end of the month again wiped out all of the snow, except across higher elevation sites and in spots in the North Woods. The rain event put a damper on any winter outdoor recreation across the region.

Looking at the **Drought Monitor** we saw minor changes from the start of the month till the end that were mainly due to the significant rain event on December 11-12th. By the end of the month Moderate Drought (D1) was removed from Northern Maine and Moosehead Region including Baxter State Park. The St. John River, including much of the Allagash River basins, were removed from any drought categories. By the end of the month Moderate Drought (D1) included 53.52% of the State of Maine which was down from 92.68%. Abnormally Dry (D0) or worse accounted for 93.47% of the state which was a minor reduction from 100% at the start of the month. The frost depth at the Caribou National Weather Service Office was 5 inches on December 17th, 7 inches on the 24th and 8 inches on the 31st. Drought monitor graphics below.

**Streamflows** started the month significantly below normal with river ice forming mainly in the form of frazil across northern rivers thanks to low flow turbulence. The significant runoff event of December 11-12th resulted in rivers increasing from near record low flows to normal flows across much of the rivers except Downeast basins including the St. Croix. The Downeast basins averaged the month significant below normal.

In terms of **River Ice**... Frazil ice was present at the beginning of the month when the northern rivers including the Aroostook, St. John and Meduxnekeag were able to generate frazil ice due to turbulent flow and cold temperatures. The December 11-12th runoff caused a small Ice Jam about 100ft worth of ice on the St. John River in Van Buren. There was ice noted as far south as Bangor on the Penobscot River during the mid month period with frazil chunks. Ice began to build again across many northern and north-central river basins mainly in the form of pancake/frazil ice then eventual chunks. On the Aroostook & St. John River's the ice began to thicken into several inches thick until the 17-19th when temperatures warmed into the 40s to near 50F. This resulted in a large break in ice over the Caribou Dam and thermal break up that got stuck behind Tinker Dam. This turned into an 11 mile long Ice Jam extending from Tinker Dam in New Brunswick upstream to Little Madawaska River that did cause minor impacts in Fort Fairfield. Minor flooding was noted on the Russell Road in town near the boat launch which is very typical in spring events but unusual for December. Another Ice Jam was reported on the St. John River on the 19th near the Grand Isle townline in the Notre Dame village caused by Quisbis Island. The jam was approximately <sup>1</sup>/<sub>2</sub> mile long and consisted of chunked frazil ice with estimated thickness of 3-6 inches resulting in some backwater.

Towards the end of the month ice was significantly generated and the brief warm up and snowpack loss at the end of the month didn't impact river ice that much except on the Piscataquis on December 31st. Overnight on December 30th-31st the USGS River Gage (DOVM1) at the Lowes Covered Bridge spiked from 4.48ft at midnight to 7.05ft at 2am. Dover-Foxcroft Police Department confirmed through Piscataquis County Sheriffs Office that an Ice Jam developed approximately ½ mile downstream of the gage. The police department reported

water levels behind the jam came up around 1 foot and there were no flooding concerns. We want to thank Dover-Foxcroft Police Department for their assistance during the early morning hours to confirm the Ice Jam. By the end of the month ice on the rivers were all over the place with numerous areas of frazil, pancake, chunk ice and some sheet ice.

**Groundwater** conditions saw improvements at all sites thanks to the significant rainfall + snowmelt on December 11-12th. The Fort Kent site improved from the very low end of the "Normal" category to the mean average for the month. Calais was in upper range "Below Normal" conditions and improved to "Normal" conditions for the majority of the month but did see drops by the end of the month thanks to frost formation. Clayton Lake started the month in the low end of "Below Normal" and improved significantly to "Above Normal" and near record levels after the 11-12th rain event but finished the month as "Normal". Elsewhere in the Central Highlands and Downeast improved from "Below Normal" to "Normal" conditions. Groundwater graphics for the observation sites in Eastern & Northern Maine are below…

**Temperatures** were near to slightly above average temperatures and slightly above average precipitation. Temperatures ranged from near average to 2°F above average with the greatest positive departures across northern areas.

Town/City	Avg Monthly	Normal Monthly	Departure from	
IOWII/City	Temperature (°F)	Temperature (°F)	Normal (°F)	
Frenchville	20.7	19.3	1.4	
Fort Kent	18.1	17.0	1.1	
Van Buren	19.8	17.3	2.5	
Caribou	21.8	19.9	1.9	
Houlton	21.7	20.9	0.8	
Millinocket	24.1	23.0	1.1	
Greenville*	22.0	21.5	0.5	
Moosehead	19.2	20.6	-1.4	
Dover-Foxcroft	23.0	22.8	0.2	
Corinna	24.8	25.0	-0.2	
Bangor	26.0	25.9	0.1	
East Surry	26.9	27.3	-0.4	
Robbinston*	27.0	26.9	0.1	
Topsfield*	23.6	23.2	0.4	

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



River	Monthly Mean Flow (cfs)	% Normal (mean)	Percentile Class	Drainage (mi <sup>2</sup> )	Years of Record
Big Black River near Depot Mtn	NA	NA	Ice Impacted	171	40
St. John River at Nine Mile Bridge	NA	NA	Ice Impacted	1341	73
Allagash River near Allagash	NA	NA	Ice Impacted	1478	94
St. John River at Dickey	NA	NA	Ice Impacted	2680	79
St. John River at Fort Kent	3860	62%	Normal	5929	97
Fish River near Fort Kent	NA	NA	Ice Impacted	873	94
Aroostook River near Masardis	NA	NA	Ice Impacted	892	66
Aroostook River at Washburn	NA	NA	Ice Impacted	1654	93
St. Croix River at Vanceboro	143	23%	Low	413	96
St. Croix River at Baring	576	19%	Low	1374	65
Grand Lake Stream at Grand Lake Stream	56	21%	Much Below Normal	228.3	95
Narraguagus River at Cherryfield	381	54%	Below Normal	227	75
East Branch Penobscot River at Grindstone	NA	NA	Ice Impacted	837	102
Mattawamkeag near Mattawamkeag	NA	NA	Ice Impacted	1418	89
Piscataquis River near Dover-Foxcroft	NA	NA	Ice Impacted	298	121
Sebec River at Sebec	358	58%	Normal	326	68
Piscataquis River at Medford	NA	NA	Ice Impacted	1162	92
Penobscot River at West Enfield	11309	97%	Normal	6422	121

December Average Monthly Streamflows \*Data provided by the U.S. Geological Survey\*

Station	Percentile Class	Years of Record
Hadley Lakes	Much Below Normal	39
Kenduskeag	Below Normal	44
Calais	Normal	43
Millinocket	Much Below Normal	30
Clayton Lake	Above Normal	35
Fort Kent	Normal	48

**December Monthly Average Groundwater Levels** 





Figure 11-16: Groundwater Level Yearly Plots to Current Source: <u>United States Geological Survey</u>

Flow or Water Level	Percentile Range	Explanation
Ice Impacted	NA	Ice impacted resulting in No Data available
Low	0 <sup>th</sup>	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 <sup>th</sup> to 10 <sup>th</sup>	The monthly mean streamflow or median water level during this month is less than the 10 <sup>th</sup> percentile when compared to all of the months during the period of record for this site.
Below Normal	$10^{\text{th}}$ to $25^{\text{th}}$	The monthly mean streamflow or median water level during this month is between the 10 <sup>th</sup> and 25 <sup>th</sup> percentiles when compared to all of the months during the period of record for this site.
Normal	25 <sup>th</sup> to 75 <sup>th</sup>	The monthly mean streamflow or median water level during this month is between the 25 <sup>th</sup> and 75 <sup>th</sup> percentiles when compared to all of the months during the period of record for this site.
Above Normal	75 <sup>th</sup> to 90 <sup>th</sup>	The monthly mean streamflow or median water level during this month is between the 75 <sup>th</sup> and 90 <sup>th</sup> percentiles when compared to all of the months during the period of record for this site.
Much Above Normal	90 <sup>th</sup> to 100 <sup>th</sup>	The monthly mean streamflow or median water level during this month is greater than the 90 <sup>th</sup> percentile when compared to all of the months during the period of record for this site.
High	100 <sup>th</sup>	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 December 2024

ProductHow Many IssuedReason for IssuanceFlood Watch1Heavy Rain & Snowmelt

#### CoCoRaHS Complete Precipitation Reports www.cocorahs.org December 2024

Station Number	Station Name/Location	Total Precipitation (inches)	Total Snowfall (inches)
ME-AR-15	Presque Isle 1.3 WSW	4.07	15.4
ME-AR-18	New Sweden 4.9 NNW	4.13	10.3
ME-AR-41	Castle Hill 1.0 S	3.77	14.6
ME-AR-42	Houlton 2.5 NNW	4.46	21.5
ME-HN-2	East Surry	4.35	12.1
ME-HN-4	Mariaville 1.4 ESE	4.75	16.0
ME-HN-64	Southwest Harbor 0.9 NW	4.22	3.5
ME-PN-10	Lincoln 4.3 NE	4.50	16.6
ME-PN-47	Milford 0.8 SSW	5.05	14.3
ME-PN-55	Orono 1.1 SSW	5.21	15.4
ME-PN-58	Hudson 2.4 ESE	4.91	11.8
ME-PN-59	Glenburn 1.5 ENE	4.67	19.2
ME-PS-9	Abbot 4.6 WNW	6.33	13.4
ME-WS-31	Eastport 1.4 ESE	4.59	18.1
*A	dditional CoCoRaHS reports were n	ot complete with 30 days of	record





## **Drought Monitor Change in December 2024**

Week	None (%)	<b>D0-D4 (%)</b>	D1-D4 (%)	D2-D4 (%)	D3-D4 (%)	D4 (%)	<b>DSCI</b>
12/3/2024	0	100	92.68	0.14	0	0	193
12/31/2024	6.53	93.47	53.52	0.00	0	0	147
Change	6.53	-6.53	-39.16	-0.14	0	0	-46

## December 11-12th, 2024 Rain + Snowmelt Event



#### **Observed Rainfall**

Aroostook County 1 WSW Madawaska 3.37 in 0823 AM 12/12 Trained Spotter AROOSTOOK NWR LIMESTONE 4 NN 3.26 in 0705 AM 12/12 HADS Houlton 2.5 NNW 2.62 in 0700 AM 12/12 COCRAHS 0.9 E Eagle Lake 2.60 in 0745 AM 12/12 COOP 1 N Charleston 3.46 in 0431 AM 12/12 Public Frenchville Airport 2.54 in 0653 AM 12/12 ASOS	
1 WSW Madawaska  3.37 in  0823 AM 12/12  Trained Spotter    AROOSTOOK NWR LIMESTONE 4 NN 3.26 in  0705 AM 12/12  HADS    Houlton 2.5 NNW  2.62 in  0706 AM 12/12  COCORAHS    0.9 E Eagle Lake  2.60 in  0745 AM 12/12  COOP    Frenchville Airport  2.54 in  0653 AM 12/12  ASOS	
AROOSTOOK NWR LIMESTONE 4 NN 3.26 in  0705 AM 12/12  HADS    Houlton 2.5 NNW  2.62 in  0709 AM 12/12  COCRAHS    0.9 E Eagle Lake  2.60 in  0745 AM 12/12  COOP    Frenchville Airport  2.54 in  0653 AM 12/12  ASOS	
Houlton 2.5 NNW  2.62 in  0700 AM 12/12  COCORAHS Penobscot County    0.9 E Eagle Lake  2.60 in  0745 AM 12/12  COOP  1 N Charleston  3.46 in  0431 AM 12/12  Public    Frenchville Airport  2.54 in  0653 AM 12/12  ASOS  Bangor International Airport 2.63 in  0653 AM 12/12  ASOS	
0.9 E Eagle Lake  2.60 in  0745 AM 12/12  COOP  1 N Charleston  3.46 in  0431 AM 12/12  Public    Frenchville Airport  2.54 in  0653 AM 12/12  ASOS  Bangor International Airport 2.63 in  0653 AM 12/12  ASOS	
Frenchville Airport 2.54 in 0653 AM 12/12 ASOS Bangor International Airport 2.63 in 0653 AM 12/12 ASOS	
Bangor International Airport 2,63 in 0653 AM 12/12 ASOS	
Fort Kent 1 SE 2.58 in 0700 AM 12/12 COOP	
1 E Houlton 2 36 in 0653 AM 12/12 ASOS Millinocket 2 SE 2.51 in 0738 AM 12/12 COOP	
1 E Opient 2.35 in 0710 AM 12/12 Trained Spotter Milford 0.8 SSW 2.49 in 0500 AM 12/12 COCORAHS	
2 SSE Cartla Hill 2.38 in 0745 AM 12/12 COOPDANS 4 ESE Orrington 2.38 in 0745 AM 12/12 AWS	
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0.5 5 K INPERTILE BRIDGE 2.20 IN 0700 AM 12/12 USUS 2 ESE MUSSON 2.21 IN 0044 AM 12/12 TRAINED SPORT	r.,
Freque 151 1.5 WSW 2.14 10 0707 AM 12/12 COUNTS HUDSON 2.4 ESE 2.17 10 0/13 AM 12/12 COUNTARS	
CAPTOOL 2.11 In 6/47 AM 12/12 CWOP MILLINOCKET 2.16 IN 6467 AM 12/12 ASOS	
Carlboo 2/10 in 0430 AM 12/12 COOP Corinna 1.95 in 0700 AM 12/12 COOP	
Van Buren 1 NNC 2.67 in 6768 AM 12/12 COOP Greenfield 1.81 in 1215 AM 12/12 CWOP	
Last Gall NERON Site 1.97 in 078 AM 12/12 ASUS Bangor 1.71 in 0750 AM 12/12 CWOP	
Westfield NERKOW Site 1.72 in 0100 AM 12/12 HADS Kenduskeag 1.68 in 0745 AM 12/12 CWOP	
Presque Isle Airport 1.64 in 0433 AM 12/12 AWUS Alton 1.66 in 0745 AM 12/12 CWOP	
Westfield NERON Site 1.53 in 0/45 AM 12/12 HADS Hermon 1.25 in 0750 AM 12/12 CHOP	
Clayton Lake 1.52 in 0/16 AM 12/12 ANOS Hermon 1.25 in 0/36 AM 12/12 CMOP	
Woodland 1.42 in 0748 AM 12/12 CWOP	
Presque Isle 1.39 in 0415 AM 12/12 CMOPPisCataquis County	
Dickey 1.13 in 0600 AM 12/12 HADS Kingsbury Precip 2.47 in 0745 AM 12/12 USGS	
2 ENE Smyrna Mills 0.93 in 0750 AM 12/12 AWS Abbot 4.6 WNW 2.37 in 0700 AM 12/12 COCORAHS	
Dover-foxcroft 2 E 2.18 in 0700 AM 12/12 COOP	
Hancock County Greenville 2.11 in 0656 AM 12/12 ASOS	
Dedham 2 SE 3.26 in 0700 AM 12/12 COOP Shirley 2.09 in 0745 AM 12/12 HADS	
Otis 2.06 in 0608 AM 12/12 CWOP Abbat 2.04 in 0700 AM 12/12 HADS	
Lamoine 1.71 in 1150 PM 12/11 CWOP 11 6 NH Moorphone Crossing 1.00 in 0700 AM 12/12 HADS	
Orland 1.65 in 1040 PM 12/11 Trained Spotter 11.6 NW Modelin Crossing 1.99 in 6766 AM 12/12 hads	
East Surry 1.61 in 0745 AM 12/12 CWOP	
East Surry 1.56 in 0630 AM 12/12 COCORAHSWashington County	
Brooksville - 3.5 ESE 1.56 in 0745 AM 12/12 CWOP Vanceboro 1.57 in 0730 AM 12/12 USGS	
Blue Hill 1.33 in 0745 AM 12/12 CWOP Cooper 1.56 in 1200 AM 12/12 CWOP	
Naskeag 1.25 in 0748 AM 12/12 CWOP Danforth, ME 1.22 in 0745 AM 12/12 HADS	
Sedgwick Ridge 1.22 in 1030 PM 12/11 CWOP Eastport 1.4 ESE 1.10 in 0700 AM 12/12 COCORAHS	
Acadia National Park 1.19 in 0658 AM 12/12 RAWS Mooseborn 1.07 in 0719 AM 12/12 RAWS	
Lamoine 1.13 in 0740 AM 12/12 CWOP Whiting 2.3 WSW 0.03 in 0700 AM 12/12 COCORANS	
Southwest Harbor 0.9 NW 1.11 in 0700 AM 12/12 COCORAHS 5.7 NE Alexander 0.97 in 0700 AM 12/12 COCORAHS	
Southwest Harbor 2.6 SE 0.91 in 0730 AM 12/12 COCORAHS 3.7 NC Alexander 0.87 in 0730 AM 12/12 COCORAHS 3.7 NC Alexander 0.87 in 0730 AM 12/12 COCORAHS	
Winter Harbor-SERC 0.77 in 0746 AM 12/12 CWOP 1 ESE Meddybemps 0.80 in 0730 AM 12/12 Trained Sports	C
Southwest HbrSeawall 0.74 in 0748 AM 12/12 CWOP Robbinston 0.69 in 1158 PM 12/11 COOP	
Surry 0.66 in 1140 PM 12/11 CWOP &&	

#### **<u>River Ice Photos</u>**

# December 16, 2024 - Aroostook River - Fort Fairfield Ice Jam - Looking Upstream Photo Courtesy: Roxanne Bubar



December 16, 2024 - Aroostook River - Fort Fairfield Ice Jam - Russell Rd Minor Flooding Photo Courtesy: Roxanne Bubar



December 16, 2024 - Aroostook River - Fort Fairfield Ice Jam - Route 1A Bridge Photo Courtesy: Roxanne Bubar



December 20, 2024 - Aroostook River - Fort Fairfield - Route 1A Bridge Photo Courtesy: James Sinko



December 20, 2024 - Aroostook River - Fort Fairfield - Looking Downstream Photo Courtesy: James Sinko



December 20, 2024 - Aroostook River - Fort Fairfield - Looking Upstream Photo Courtesy: James Sinko



December 20, 2024 - Aroostook River - Fort Fairfield - Looking Down near Route 1A Photo Courtesy: James Sinko



December 24, 2024 - Aroostook River - Washburn - Looking Upstream





December 27, 2024 - Aroostook River - Route 1 Presque Isle - Looking Upstream

December 29, 2024 - Aroostook River - Washburn - Looking Upstream



December 29, 2024 - Aroostook River - Washburn - Looking Downstream





December 29, 2024 - St. John River - "Narrow Gauge" St. Francis - Looking Upstream