



The State of New Hampshire  
**DEPARTMENT OF ENVIRONMENTAL SERVICES**



Robert R. Scott, Commissioner

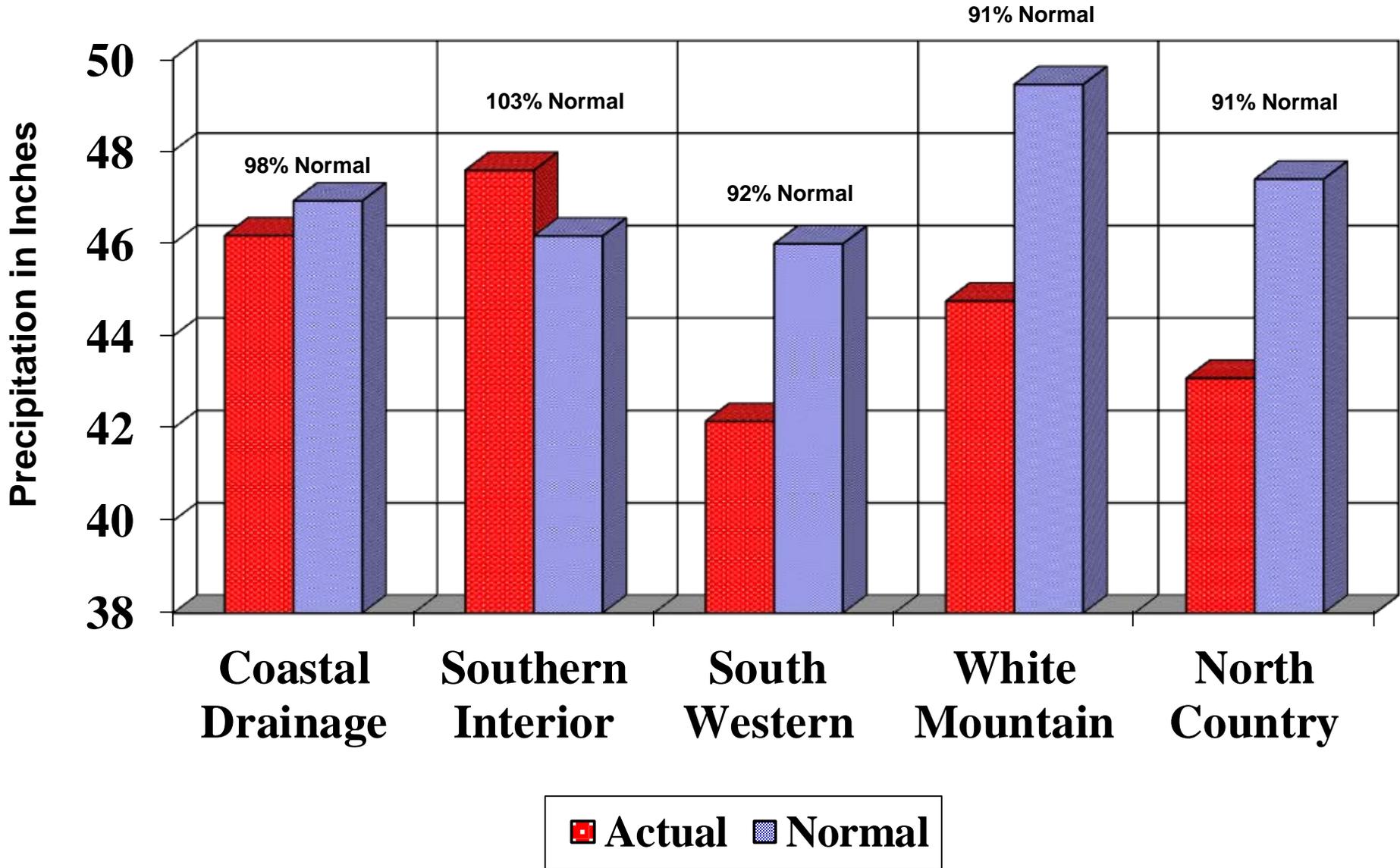
**AGGREGATED PRECIPITATION DATA for N.H.  
 DROUGHT MANAGEMENT AREAS**

	Actual Rainfall (inches)	Normal Rainfall (inches)	Deviation from Normal (inches)	Percent of Normal
<u>Coastal Drainage:</u> Rockingham, Strafford counties				
four month	21.20	15.64	5.56	136%
six month	26.55	23.86	2.69	111%
nine month	38.54	35.54	3.00	108%
twelve month	46.17	46.92	-0.75	98%
<u>Southern Interior:</u> Belknap, Hillsborough, Merrimack counties				
four month	23.09	15.99	7.11	144%
six month	27.83	24.27	3.56	115%
nine month	38.78	35.11	3.67	110%
twelve month	47.58	46.16	1.42	103%
<u>South Western:</u> Cheshire, Sullivan counties				
four month	22.32	16.79	5.54	133%
six month	27.35	24.99	2.37	109%
nine month	37.86	35.42	2.44	107%
twelve month	42.15	45.99	0.61	92%
<u>White Mountain:</u> Carroll, Grafton counties				
four month	16.56	17.85	-1.29	93%
six month	22.22	26.66	-4.44	83%
nine month	33.55	37.59	-4.04	89%
twelve month	44.75	49.44	-4.69	91%
<u>North Country:</u> Coos county				
four month	17.62	17.94	-0.32	98%
six month	23.74	26.94	-3.20	88%
nine month	33.72	36.48	-2.76	92%
twelve month	43.08	47.39	-4.31	91%

four month period : July 2018 - October 2018  
 six month period : May 2018 - October 2018  
 nine month period : February 2018 - October 2018  
 twelve month period: November 2017 - October 2018

Source: Northeast River Forecast Center, NH Des Dam Bureau

# TWELVE MONTH AGGREGATED PRECIPITATION DATA for N.H. DROUGHT MANAGEMENT AREAS from November 2017 through October 2018



# MONTHLY PRECIPITATION DATA FOR N.H. COUNTIES



		2017		2018									
		NOV	DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT
<u>Coastal drainage</u>													
STRAFFORD	actual	1.73	3.13	3.34	3.76	3.02	5.25	1.29	3.67	4.47	6.01	5.99	4.61
	normal	4.50	3.76	3.21	3.29	4.16	4.22	4.09	4.16	3.99	3.73	3.74	4.38
	deviation	-2.77	-0.63	0.13	0.47	-1.14	1.03	-2.80	-0.49	0.48	2.28	2.25	0.23
ROCKINGHAM	actual	1.56	2.56	2.94	3.72	3.23	4.99	1.50	4.25	5.04	5.84	6.36	4.07
	normal	4.29	3.73	3.27	3.30	4.19	4.19	4.10	4.10	3.78	3.55	3.76	4.34
	deviation	-2.73	-1.17	-0.33	0.42	-0.96	0.80	-2.60	0.15	1.26	2.29	2.60	-0.27
Average	actual	1.65	2.85	3.14	3.74	3.13	5.12	1.40	3.96	4.76	5.93	6.18	4.34
	normal	4.40	3.75	3.24	3.30	4.18	4.21	4.10	4.13	3.89	3.64	3.75	4.36
	deviation	-2.75	-0.90	-0.10	0.45	-1.05	0.92	-2.70	-0.17	0.87	2.29	2.43	-0.02
<u>Southern Interior</u>													
HILLSBOROUGH	actual	1.33	3.00	3.44	3.82	3.18	4.56	1.37	4.26	5.89	7.97	7.40	4.23
	normal	4.22	3.80	3.39	3.29	3.94	4.13	4.10	4.21	3.96	3.75	3.74	4.46
	deviation	-2.89	-0.80	0.05	0.53	-0.76	0.43	-2.73	0.05	1.93	4.22	3.66	-0.23
MERRIMACK	actual	1.58	3.60	3.95	3.51	2.80	4.68	1.33	3.09	4.99	8.54	5.46	4.93
	normal	4.15	3.64	3.26	3.09	3.74	3.96	4.01	4.34	4.11	3.75	3.76	4.43
	deviation	-2.57	-0.04	0.69	0.42	-0.94	0.72	-2.68	-1.25	0.88	4.79	1.70	0.50
BELKNAP	actual	1.87	3.67	3.97	3.29	2.45	4.55	1.17	3.00	3.64	6.94	4.81	4.48
	normal	4.03	3.58	3.08	3.03	3.58	3.75	3.95	4.25	4.08	3.78	3.66	4.48
	deviation	-2.16	0.09	0.89	0.26	-1.13	0.80	-2.78	-1.25	-0.44	3.16	1.15	0.00
Average	actual	1.59	3.42	3.79	3.54	2.81	4.60	1.29	3.45	4.84	7.82	5.89	4.55
	normal	4.13	3.67	3.24	3.14	3.75	3.95	4.02	4.27	4.05	3.76	3.72	4.46
	deviation	-2.54	-0.25	0.54	0.40	-0.94	0.65	-2.73	-0.82	0.79	4.06	2.17	0.09
<u>South Western</u>													
CHESHIRE	actual	1.44	3.17	4.37	3.98	3.02	3.84	1.39	4.31	7.49	8.21	6.10	4.02
	normal	3.98	3.68	3.41	3.18	3.72	3.79	4.10	4.20	4.36	4.06	3.83	4.60
	deviation	-2.54	-0.51	0.96	0.80	-0.70	0.05	-2.71	0.11	3.13	4.15	2.27	-0.58
SULLIVAN	actual	1.55	3.52	3.79	3.12	2.73	4.32	1.26	3.10	5.79	5.50	3.80	3.73
	normal	3.86	3.49	2.72	3.00	3.51	3.67	3.92	4.18	4.36	4.06	3.80	4.50
	deviation	-2.31	0.03	0.72	0.12	-0.78	0.65	-2.66	-1.08	1.43	1.44	0.00	-0.77
Average	actual	1.50	3.35	-0.55	3.55	2.88	4.08	1.33	3.71	6.64	6.86	4.95	3.88
	normal	3.92	3.59	3.07	3.09	3.62	3.73	4.01	4.19	4.36	4.06	3.82	4.55
	deviation	-2.43	-0.24	0.84	0.46	-0.74	0.35	-2.69	-0.49	2.28	2.80	1.14	-0.68
<u>White Mountain</u>													
GRAFTON	actual	2.56	3.91	3.98	2.91	2.72	5.21	1.58	4.26	4.79	4.24	3.14	4.03
	normal	4.35	3.71	3.19	2.84	3.46	3.76	4.20	4.59	4.56	4.60	4.09	4.67
	deviation	-1.79	0.20	0.79	0.07	-0.74	1.45	-2.62	-0.33	0.23	-0.36	-0.95	-0.64
CARROLL	actual	2.74	4.44	4.77	3.41	3.02	5.39	1.42	4.06	3.33	4.79	4.02	4.78
	normal	4.72	4.17	3.57	3.32	4.02	4.46	4.32	4.50	4.41	4.42	3.99	4.96
	deviation	-1.98	0.27	1.20	0.09	-1.00	0.93	-2.90	-0.44	-1.08	0.37	0.03	-0.18
Average	actual	2.65	4.18	4.38	3.16	2.87	5.30	1.50	4.16	4.06	4.52	3.58	4.41
	normal	4.54	3.94	3.38	3.08	3.74	4.11	4.26	4.55	4.49	4.51	4.04	4.82
	deviation	-1.89	0.24	1.00	0.08	-0.87	1.19	-2.76	-0.39	-0.43	0.01	-0.46	-0.41
<u>North Country</u>													
COOS	actual	2.63	3.08	3.65	2.63	2.68	4.67	2.09	4.03	4.66	5.04	3.73	4.19
	normal	4.24	3.58	3.09	2.72	3.21	3.61	4.21	4.79	4.57	4.85	4.00	4.52
	deviation	-1.61	-0.50	0.56	-0.09	-0.53	1.06	-2.12	-0.76	0.09	0.19	-0.27	-0.33

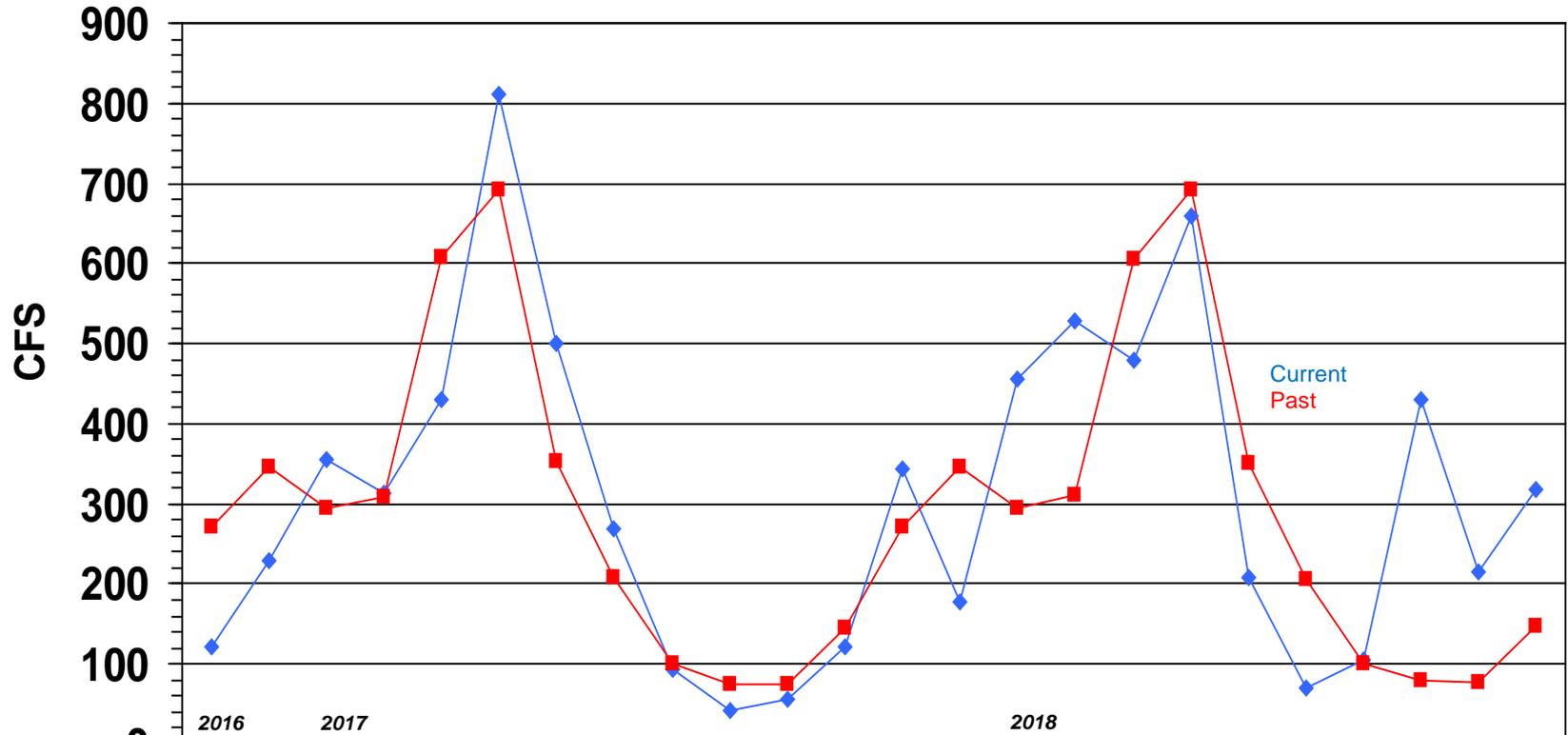
Source: Northeast River Forecast Center, NH DES Dam Bureau

# LAMPREY RIVER near NEWMARKET NH

## Gage# 01073500



### MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS



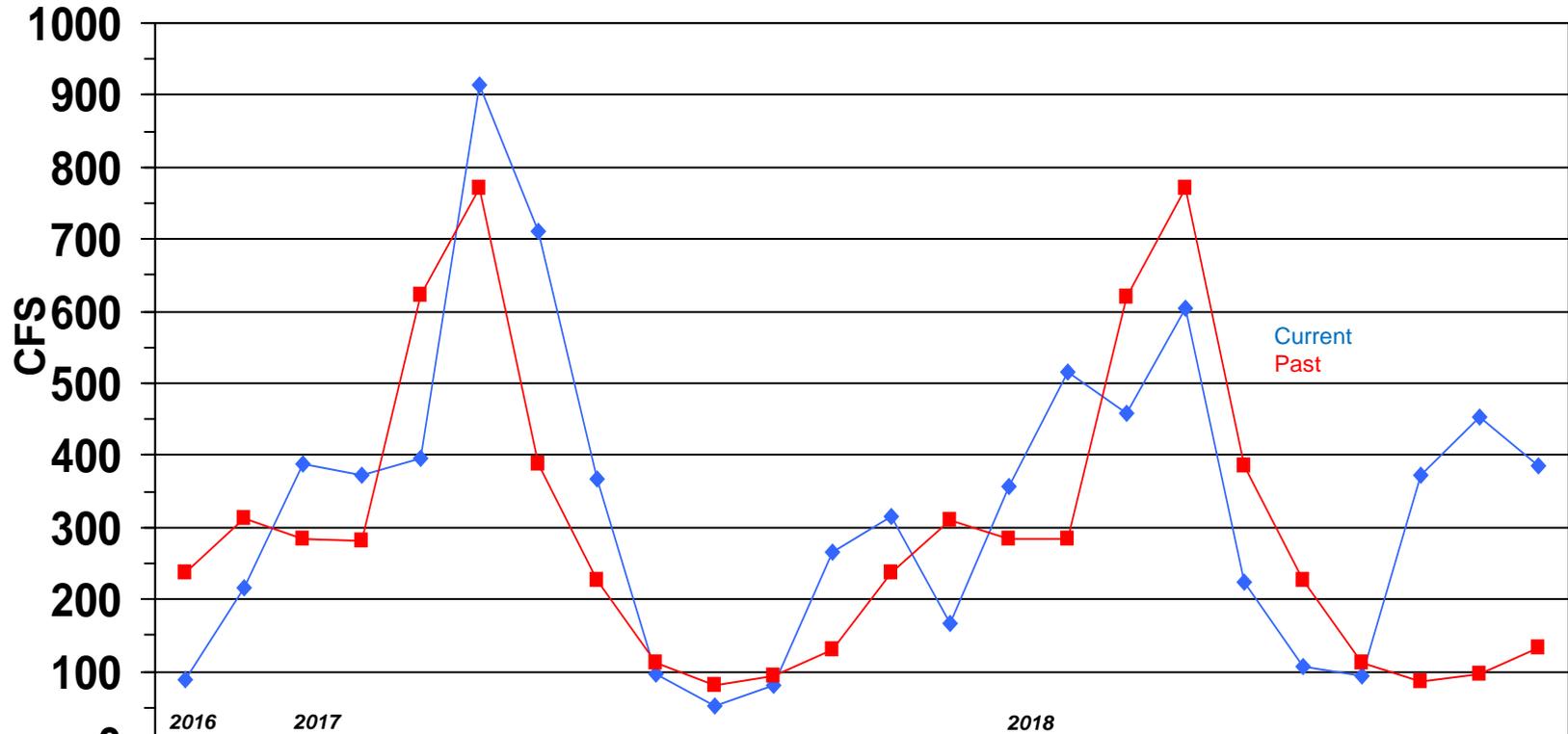
	2016	2017	2018																					
	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct
◆ Monthly Mean Flow	121	230	355	314	429	811	500	269	93	41	57	120.4	344	178	456	528	480	659	207	71	105	429	216	317
■ Mean of Monthly Flows	271	347	294	309	607	692	352	207	100	75	74	145	272	345	295	312	606	692	350	206	100	79	76	147
% of Normal	44%	66%	121%	102%	71%	117%	142%	130%	93%	55%	78%	83%	126%	52%	155%	169%	79%	95%	59%	35%	105%	543%	285%	216%

# SOUHEGAN RIVER at MERRIMACK NH

## Gage# 01094000



### MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS

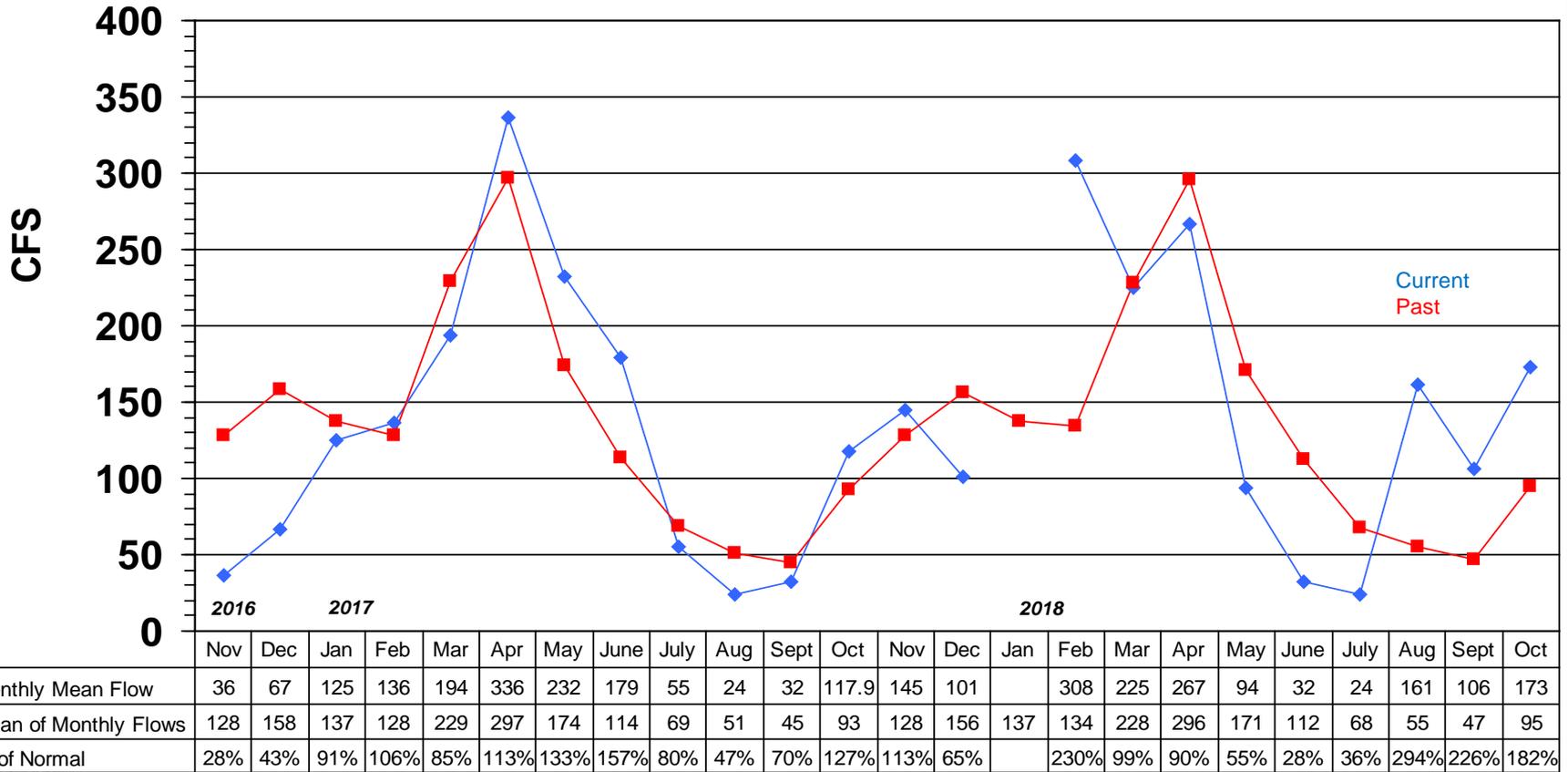


	2016	2017	2018																					
	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct
◆ Monthly Mean Flow	89	217	388	373	395	914	710	367	96	51	80	266.3	315	167	357	516	459	603	224	106	95	372	453	386
■ Mean of Monthly Flows	237	312	284	282	623	772	388	227	111	82	93	129	238	310	285	285	621	770	386	226	111	86	97	132
% of Normal	37%	70%	137%	132%	63%	118%	183%	162%	87%	62%	86%	206%	132%	54%	125%	181%	74%	78%	58%	47%	85%	432%	467%	292%

# SOUCOOK RIVER at PEMBROKE ROAD near CONCORD NH, Gage# 01089100



## MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS



Start of record 1988

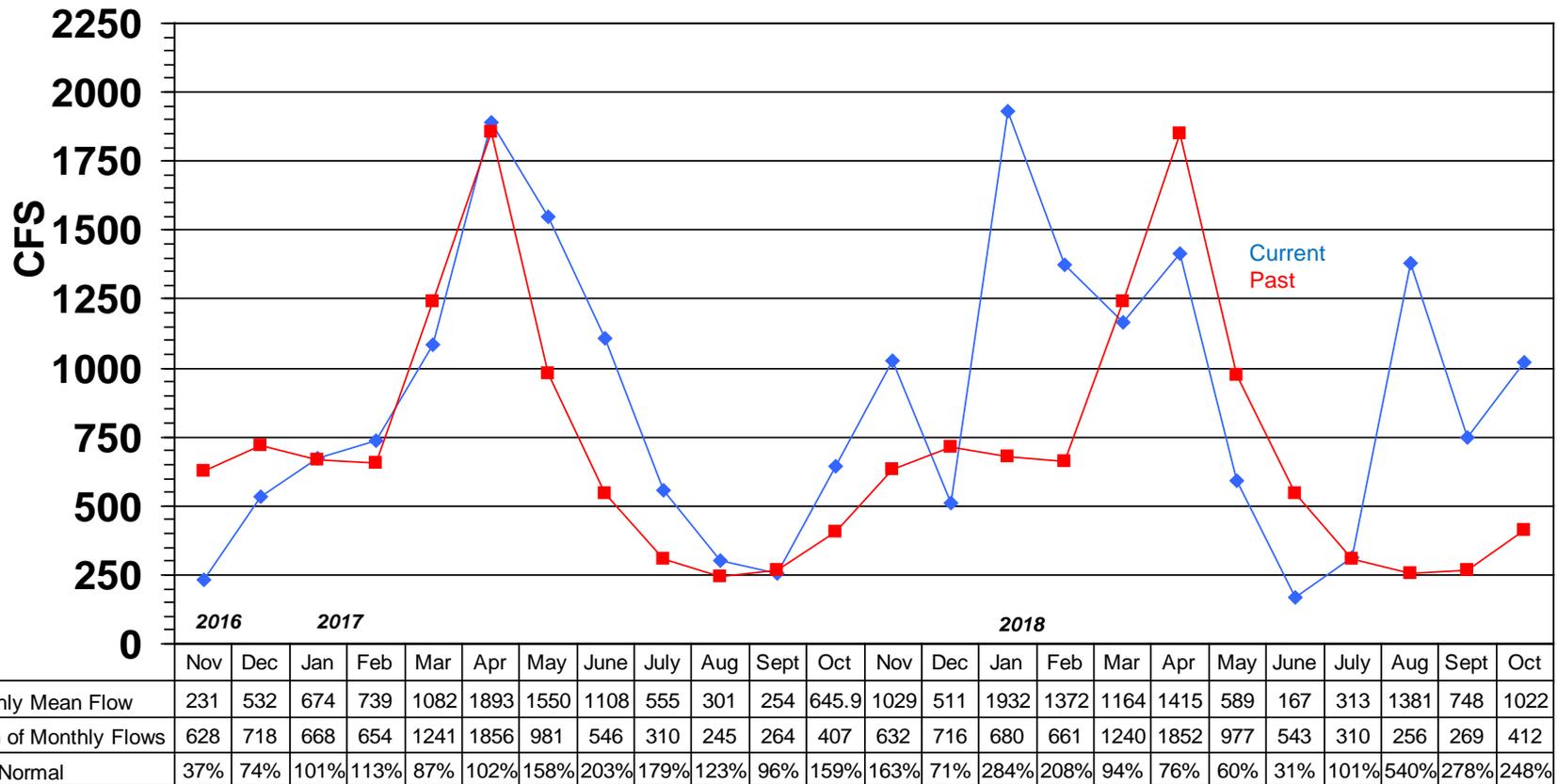
Jan - 31 days ice  
Feb - 15 days ice

# ASHUELOT RIVER at HINSDALE NH

## Gage# 01161000



### MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS



Start of record 1907

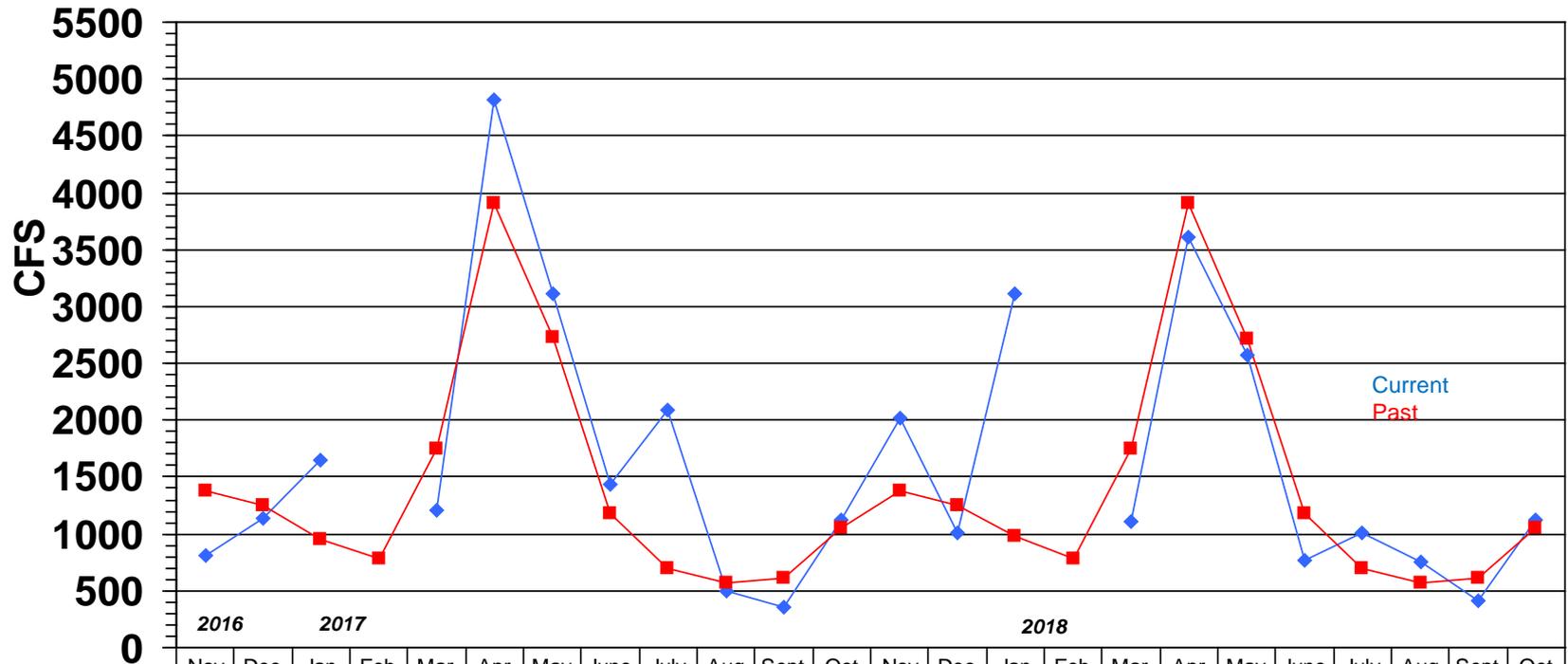
Jan - 13 days ice

# PEMIGEWASSET RIVER at PLYMOUTH NH

## Gage# 01076500



### MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS



	2016	2017	2018																					
	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct
◆ Monthly Mean Flow	814	1139	1651	ice	1213	4813	3106	1433	2083	502	351	1126	2012	1014	3117		1113	3608	2573	764	1011	747	413	1118
■ Mean of Monthly Flows	1376	1246	955	778	1755	3911	2722	1177	693	565	606	1056	1382	1244	974	778	1750	3908	2721	1174	696	566	605	1057
% of Normal	59%	91%	173%		69%	123%	114%	122%	301%	89%	58%	107%	146%	81%	320%		64%	92%	95%	65%	145%	132%	68%	106%

Jan - 16 days ice  
Feb - all ice

Start of record 1903

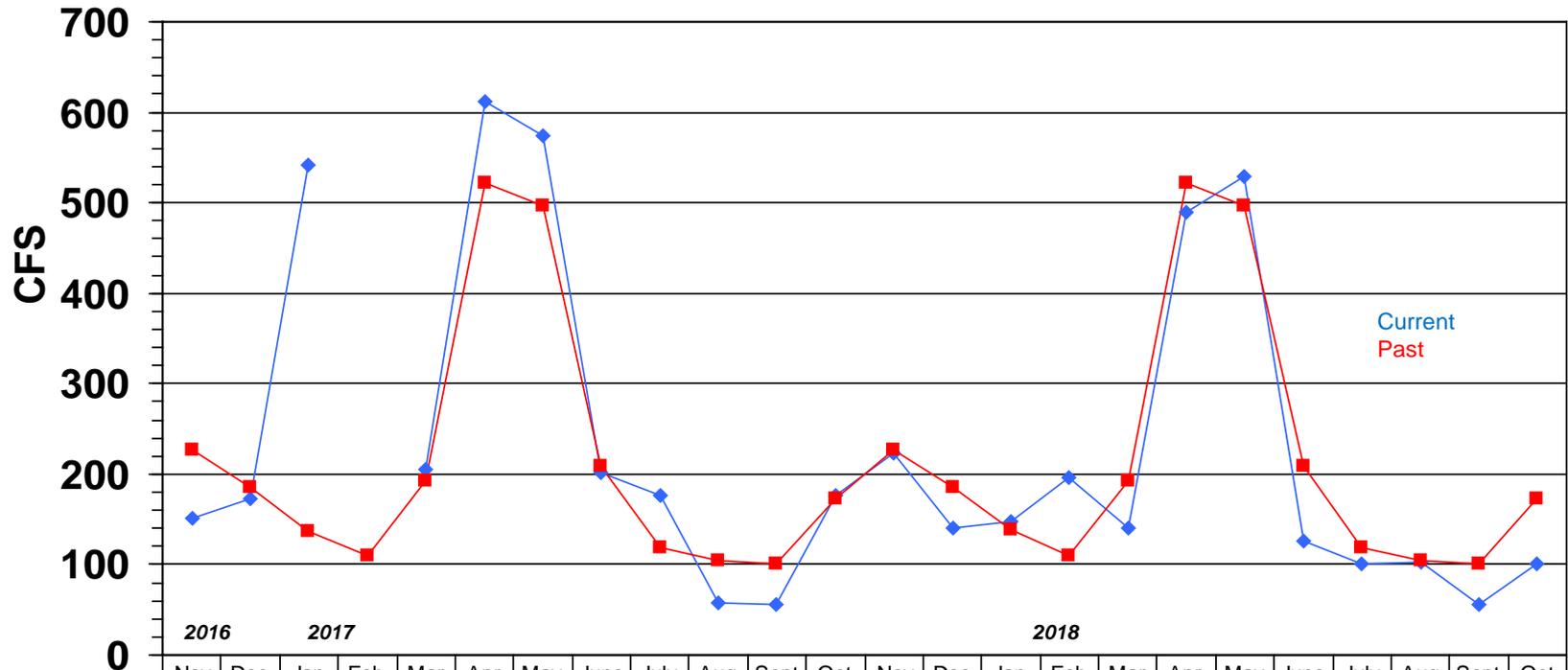
# AMMONOOSUC RIVER at BETHLEHEM JUNCTION NH

## Gage# 01137500



### MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS

This station replaces gage# 01137000 which was discontinued by DES at the end of Sept 2004

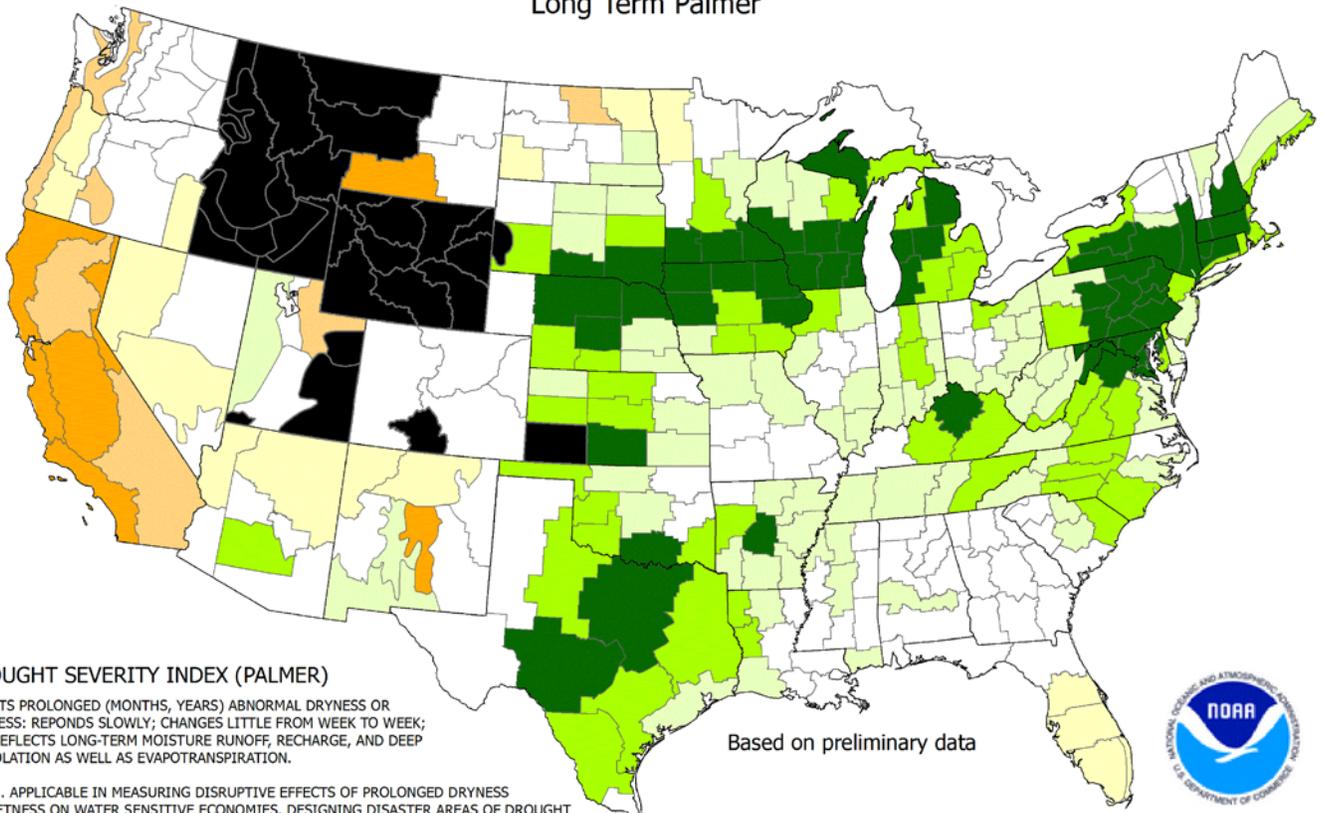


	2016		2017		2018																			
	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct
—◆— Monthly Mean Flow	152	172	541	ice	205	611	574	201	177	58	55	176.9	223	140	148	196	141	490	529	126	100	103	56	101
—■— Mean of Monthly Flows	226	185	137	109	193	521	496	209	119	105	101	173	226	185	138	110	192	521	496	208	118	105	100	172
% of Normal	67%	93%	395%		106%	117%	116%	96%	149%	55%	55%	102%	99%	76%	107%	178%	73%	94%	107%	61%	84%	98%	56%	59%

Dec – 19 days ice

Start of record 1939

Drought Severity Index by Division  
 Weekly Value for Period Ending Nov 10, 2018  
 Long Term Palmer



**DROUGHT SEVERITY INDEX (PALMER)**

DEPICTS PROLONGED (MONTHS, YEARS) ABNORMAL DRYNESS OR WETNESS; RESPONDS SLOWLY; CHANGES LITTLE FROM WEEK TO WEEK; AND REFLECTS LONG-TERM MOISTURE RUNOFF, RECHARGE, AND DEEP PERCOLATION AS WELL AS EVAPOTRANSPIRATION.

USES... APPLICABLE IN MEASURING DISRUPTIVE EFFECTS OF PROLONGED DRYNESS OR WETNESS ON WATER SENSITIVE ECONOMIES, DESIGNING DISASTER AREAS OF DROUGHT OR WETNESS; AND REFLECTING THE GENERAL LONG-TERM STATUS OF WATER SUPPLIES IN AQUIFERS, RESERVOIRS AND STREAMS.

LIMITATIONS... IS NOT GENERALLY INDICATIVE OFFSHORT-TERM (FEW WEEKS) STATUS OF DROUGHT OR WETNESS SUCH AS FREQUENTLY AFFECTS CROPS AND FIELD OPERATIONS (THIS IS INDICATED BY THE CROP MOISTURE INDEX).

Based on preliminary data

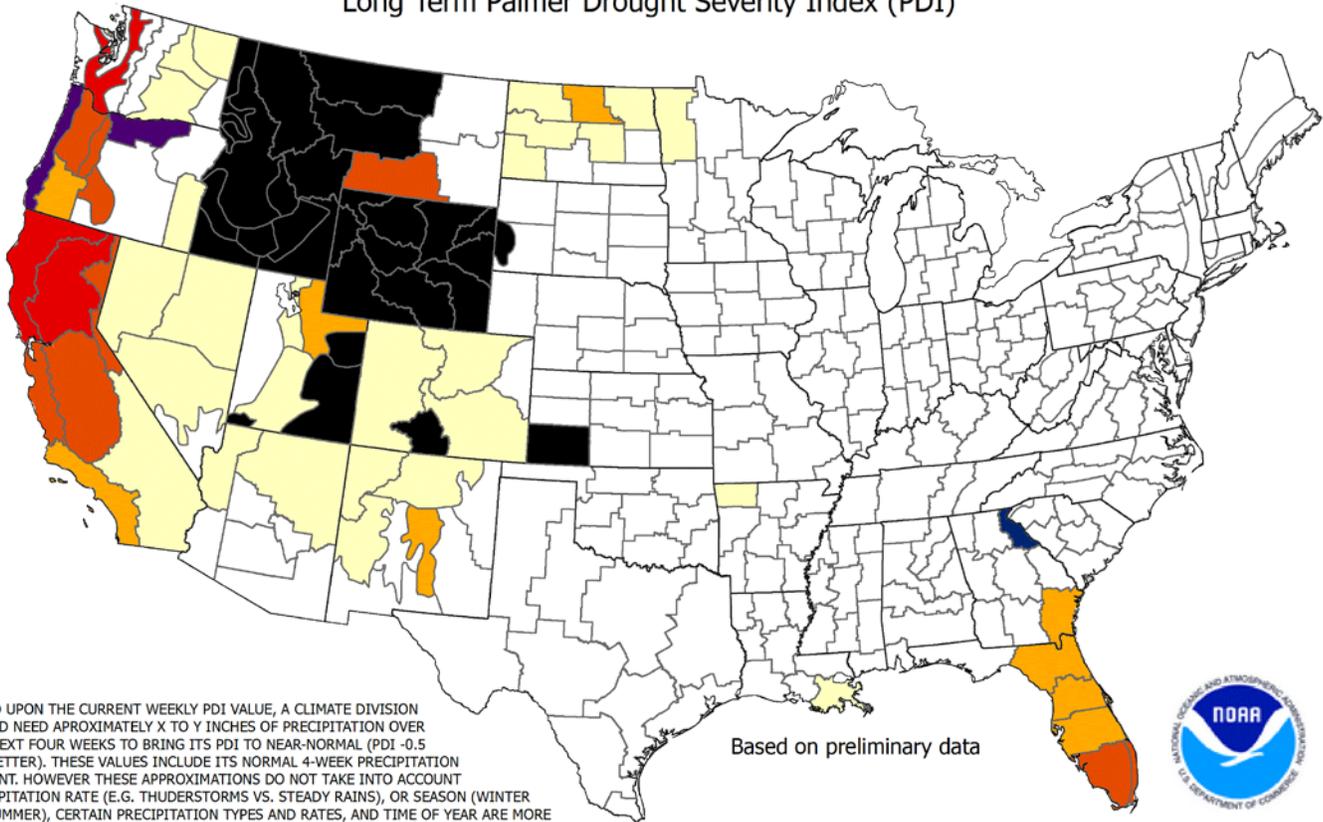


- 4.0 or less (Extreme Drought)
- 3.0 to -3.9 (Severe Drought)
- 2.0 to -2.9 (Moderate Drought)
- 1.9 to +1.9 (Near Normal)
- +2.0 to +2.9 (Unusual Moist Spell)
- +3.0 to +3.9 (Very Moist Spell)
- +4.0 and above (Extremely Moist)
- Missing/Incomplete

**THE PALMER DROUGHT SEVERITY INDEX**

The Palmer Index uses temperature and rainfall information in a formula to determine dryness. The advantage of the Palmer Index is that it is standardized to local climate.

Additional Precip. Needed (In.) to bring PDI to -0.5  
 Weekly Value for Period Ending Nov 10, 2018  
 Long Term Palmer Drought Severity Index (PDI)



Based on preliminary data

BASED UPON THE CURRENT WEEKLY PDI VALUE, A CLIMATE DIVISION WOULD NEED APPROXIMATELY X TO Y INCHES OF PRECIPITATION OVER THE NEXT FOUR WEEKS TO BRING ITS PDI TO NEAR-NORMAL (PDI -0.5 OR WETTER). THESE VALUES INCLUDE ITS NORMAL 4-WEEK PRECIPITATION AMOUNT. HOWEVER THESE APPROXIMATIONS DO NOT TAKE INTO ACCOUNT PRECIPITATION RATE (E.G. THUNDERSTORMS VS. STEADY RAINS), OR SEASON (WINTER VS. SUMMER), CERTAIN PRECIPITATION TYPES AND RATES, AND TIME OF YEAR ARE MORE CONDUCTIVE FOR AMELIORATING DROUGHT WHILE OTHERS MAY PRODUCE LESS DROUGHT REDUCTION (E.G. RUNOFF OR FROZEN GROUND).

UNCOLORED CLIMATE DIVISIONS ARE CURRENTLY AT NEAR-NORMAL TO MOIST PDI CONDITIONS. (EXAMPLE - IF 4-WEEK NORMAL PRECIPITATION IS 3 INCHES AND PDI DEFICIT TO BRING TO -0.5 IS 4 INCHES, THE VALUE IS 7)

- |                   |                    |
|-------------------|--------------------|
| Zero Inches       | 9 to 12 Inches     |
| Trace to 3 Inches | 12 to 15 Inches    |
| 3 to 6 Inches     | Over 15 Inches     |
| 6 to 9 Inches     | Missing/Incomplete |

This is the amount of rainfall required in a week's time to bring the index back to zero inches required.