



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



**Robert R. Scott, Commissioner**

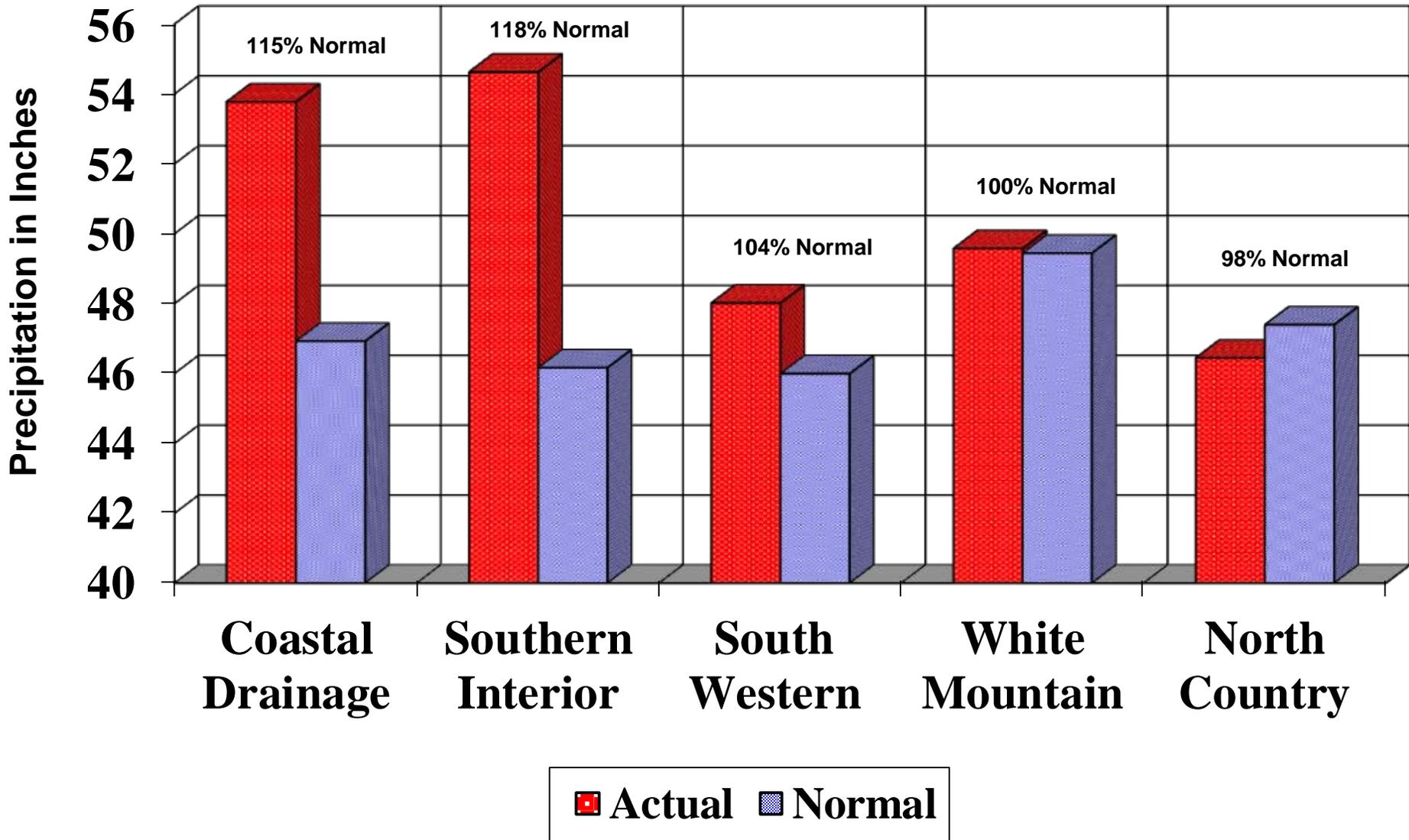
**AGGREGATED PRECIPITATION DATA for N.H.  
 DROUGHT MANAGEMENT AREAS**

	Actual Rainfall (inches)	Normal Rainfall (inches)	Deviation from Normal (inches)	Percent of Normal
<u>Coastal Drainage:</u> Rockingham, Strafford counties				
four month	25.69	16.15	9.54	159%
six month	34.40	24.17	10.24	142%
nine month	44.04	36.64	7.40	120%
twelve month	53.77	46.92	6.85	115%
<u>Southern Interior:</u> Belknap, Hillsborough, Merrimack counties				
four month	26.88	16.07	10.82	167%
six month	35.17	24.38	10.79	144%
nine month	43.87	36.10	7.77	122%
twelve month	54.62	46.16	8.46	118%
<u>South Western:</u> Cheshire, Sullivan counties				
four month	23.04	16.35	6.69	141%
six month	33.38	24.90	8.49	134%
nine month	41.66	36.25	5.41	115%
twelve month	48.01	45.99	6.47	104%
<u>White Mountain:</u> Carroll, Grafton counties				
four month	19.97	17.90	2.07	112%
six month	28.19	26.93	1.26	105%
nine month	37.86	39.04	-1.19	97%
twelve month	49.57	49.44	0.13	100%
<u>North Country:</u> Coos county				
four month	18.95	17.60	1.35	108%
six month	27.64	26.96	0.68	103%
nine month	37.08	37.99	-0.91	98%
twelve month	46.44	47.38	-0.94	98%

four month period : August 2018 - November 2018  
 six month period : June 2018 - November 2018  
 nine month period : March 2018 - November 2018  
 twelve month period: December 2017 - November 2018

Source: Northeast River Forecast Center, NH Des Dam Bureau

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



# MONTHLY PRECIPITATION DATA FOR N.H COUNTIES



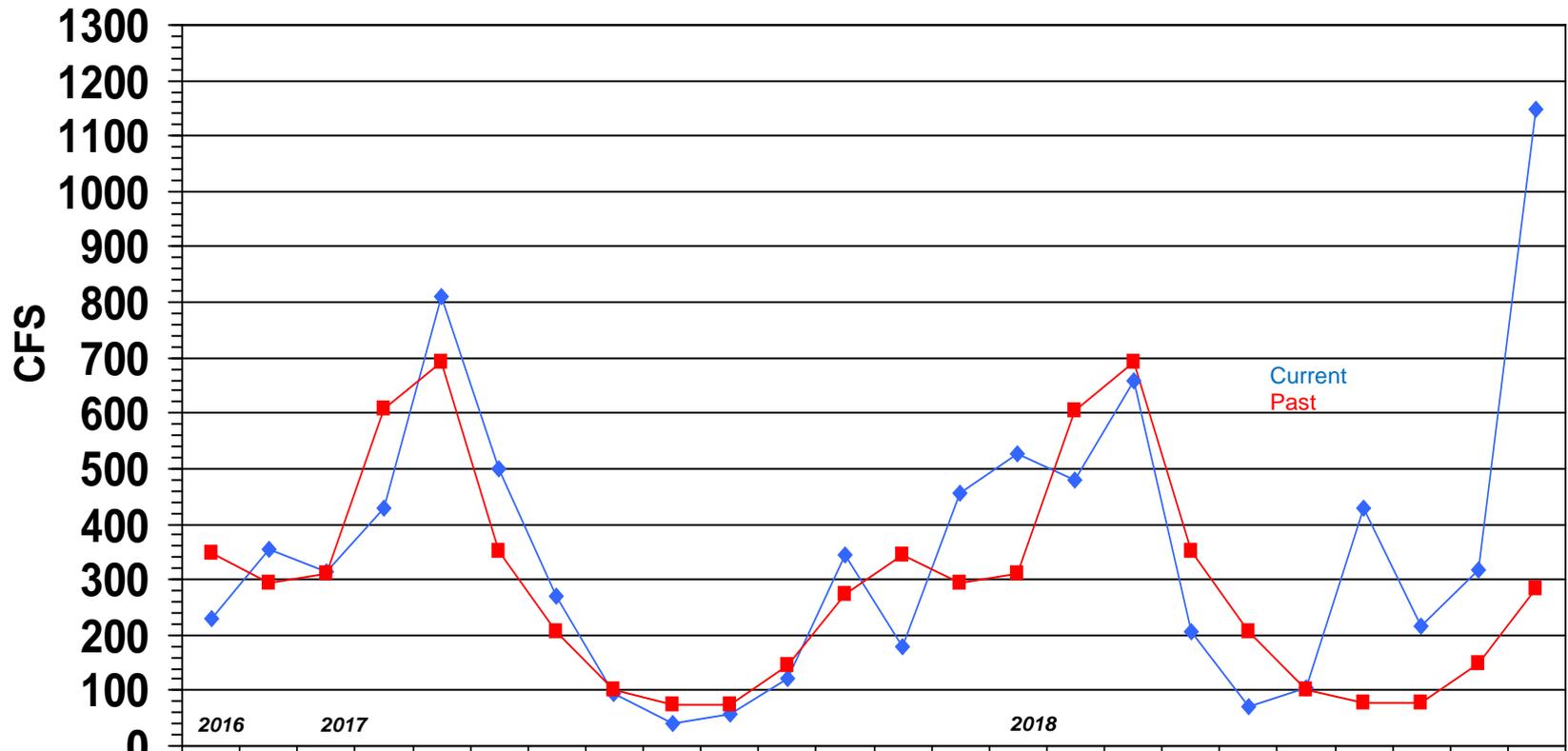
		2017	2018										
		DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
<b>Coastal drainage</b>													
STRAFFORD	actual	3.13	3.34	3.76	3.02	5.25	1.29	3.67	4.47	6.01	5.99	4.61	9.08
	normal	3.76	3.21	3.29	4.16	4.22	4.09	4.16	3.99	3.73	3.74	4.38	4.50
	deviation	-0.63	0.13	0.47	-1.14	1.03	-2.80	-0.49	0.48	2.28	2.25	0.23	4.58
ROCKINGHAM	actual	2.56	2.94	3.72	3.23	4.99	1.50	4.25	5.04	5.84	6.36	4.07	9.41
	normal	3.73	3.27	3.30	4.19	4.19	4.10	4.10	3.78	3.55	3.76	4.34	4.30
	deviation	-1.17	-0.33	0.42	-0.96	0.80	-2.60	0.15	1.26	2.29	2.60	-0.27	5.11
Average	actual	2.85	3.14	3.74	3.13	5.12	1.40	3.96	4.76	5.93	6.18	4.34	9.25
	normal	3.75	3.24	3.30	4.18	4.21	4.10	4.13	3.89	3.64	3.75	4.36	4.40
	deviation	-0.90	-0.10	0.45	-1.05	0.92	-2.70	-0.17	0.87	2.29	2.43	-0.02	4.85
<b>Southern Interior</b>													
HILLSBOROUGH	actual	3.00	3.44	3.82	3.18	4.56	1.37	4.26	5.89	7.97	7.40	4.23	9.23
	normal	3.80	3.39	3.29	3.94	4.13	4.10	4.21	3.96	3.75	3.74	4.46	4.21
	deviation	-0.80	0.05	0.53	-0.76	0.43	-2.73	0.05	1.93	4.22	3.66	-0.23	5.02
MERRIMACK	actual	3.60	3.95	3.51	2.80	4.68	1.33	3.09	4.99	8.54	5.46	4.93	8.65
	normal	3.64	3.26	3.09	3.74	3.96	4.01	4.34	4.11	3.75	3.76	4.43	4.15
	deviation	-0.04	0.69	0.42	-0.94	0.72	-2.68	-1.25	0.88	4.79	1.70	0.50	4.50
BELKNAP	actual	3.67	3.97	3.29	2.45	4.55	1.17	3.00	3.64	6.94	4.81	4.48	8.01
	normal	3.58	3.08	3.03	3.58	3.75	3.95	4.25	4.08	3.78	3.66	4.48	4.03
	deviation	0.09	0.89	0.26	-1.13	0.80	-2.78	-1.25	-0.44	3.16	1.15	0.00	3.98
Average	actual	3.42	3.79	3.54	2.81	4.60	1.29	3.45	4.84	7.82	5.89	4.55	8.63
	normal	3.67	3.24	3.14	3.75	3.95	4.02	4.27	4.05	3.76	3.72	4.46	4.13
	deviation	-0.25	0.54	0.40	-0.94	0.65	-2.73	-0.82	0.79	4.06	2.17	0.09	4.50
<b>South Western</b>													
CHESHIRE	actual	3.17	4.37	3.98	3.02	3.84	1.39	4.31	7.49	8.21	6.10	4.02	8.05
	normal	3.68	3.41	3.18	3.72	3.79	4.10	4.20	4.36	4.06	3.83	4.60	3.98
	deviation	-0.51	0.96	0.80	-0.70	0.05	-2.71	0.11	3.13	4.15	2.27	-0.58	4.07
SULLIVAN	actual	3.52	3.79	3.12	2.73	4.32	1.26	3.10	5.79	5.50	3.80	3.73	6.66
	normal	3.49	2.72	3.00	3.51	3.67	3.92	4.18	4.36	4.06	3.80	4.50	3.86
	deviation	0.03	0.72	0.12	-0.78	0.65	-2.66	-1.08	1.43	1.44	0.00	-0.77	2.80
Average	actual	3.35	-0.55	3.55	2.88	4.08	1.33	3.71	6.64	6.86	4.95	3.88	7.36
	normal	3.59	3.07	3.09	3.62	3.73	4.01	4.19	4.36	4.06	3.82	4.55	3.92
	deviation	-0.24	0.84	0.46	-0.74	0.35	-2.69	-0.49	2.28	2.80	1.14	-0.68	3.44
<b>White Mountain</b>													
GRAFTON	actual	3.91	3.98	2.91	2.72	5.21	1.58	4.26	4.79	4.24	3.14	4.03	6.74
	normal	3.71	3.19	2.84	3.46	3.76	4.20	4.59	4.56	4.60	4.09	4.67	4.35
	deviation	0.20	0.79	0.07	-0.74	1.45	-2.62	-0.33	0.23	-0.36	-0.95	-0.64	2.39
CARROLL	actual	4.44	4.77	3.41	3.02	5.39	1.42	4.06	3.33	4.79	4.02	4.78	8.19
	normal	4.17	3.57	3.32	4.02	4.46	4.32	4.50	4.41	4.42	3.99	4.96	4.72
	deviation	0.27	1.20	0.09	-1.00	0.93	-2.90	-0.44	-1.08	0.37	0.03	-0.18	3.47
Average	actual	4.18	4.38	3.16	2.87	5.30	1.50	4.16	4.06	4.52	3.58	4.41	7.47
	normal	3.94	3.38	3.08	3.74	4.11	4.26	4.55	4.49	4.51	4.04	4.82	4.54
	deviation	0.24	1.00	0.08	-0.87	1.19	-2.76	-0.39	-0.43	0.01	-0.46	-0.41	2.93
<b>North Country</b>													
COOS	actual	3.08	3.65	2.63	2.68	4.67	2.09	4.03	4.66	5.04	3.73	4.19	5.99
	normal	3.58	3.09	2.72	3.21	3.61	4.21	4.79	4.57	4.85	4.00	4.52	4.23
	deviation	-0.50	0.56	-0.09	-0.53	1.06	-2.12	-0.76	0.09	0.19	0.27	-0.33	1.76

# LAMPREY RIVER near NEWMARKET NH

## Gage# 01073500



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



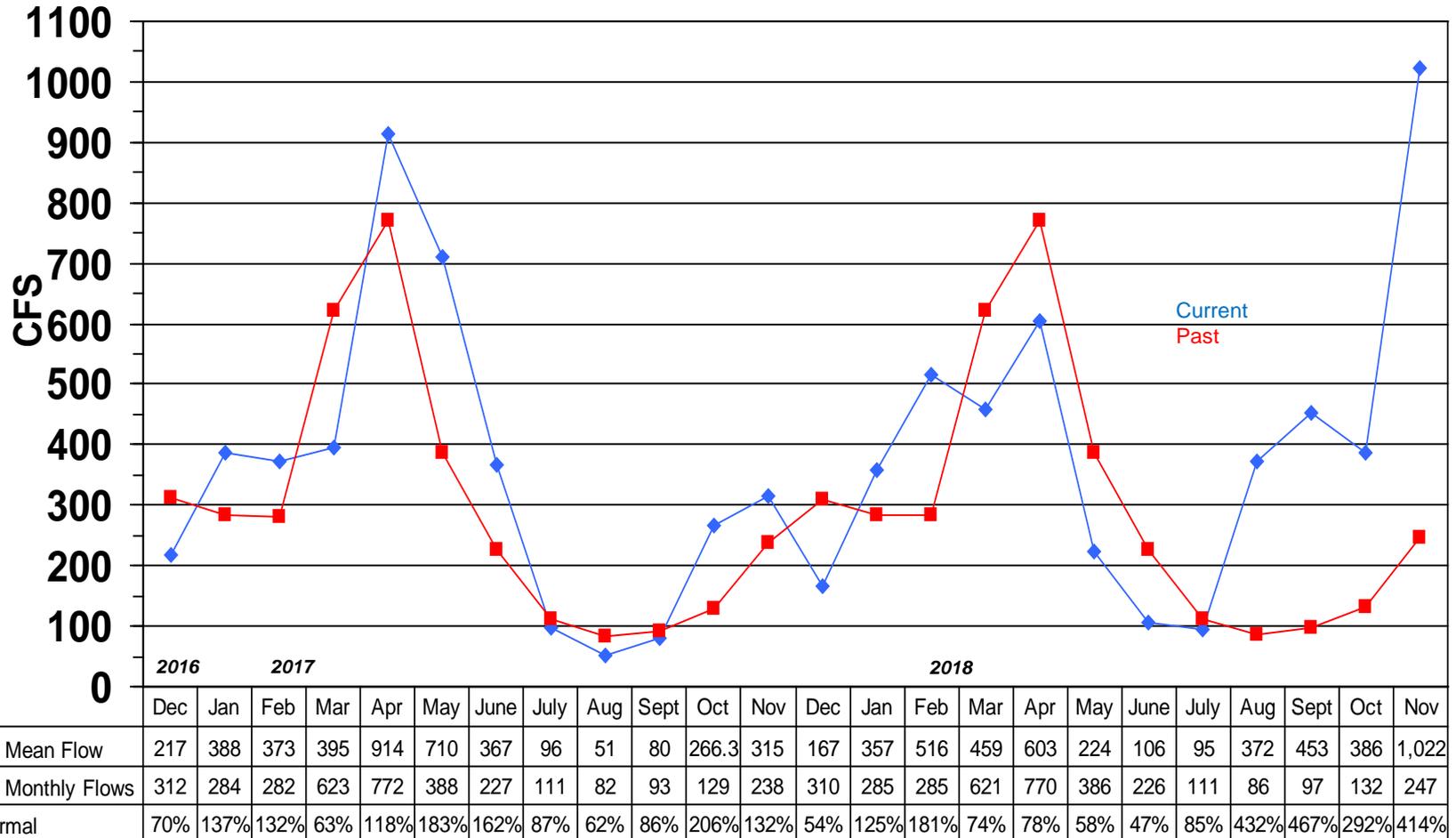
	2016	2017					2018																	
	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov
◆ Monthly Mean Flow	230	355	314	429	811	500	269	93	41	57	120.4	344	178	456	528	480	659	207	71	105	429	216	317	1,148
■ Mean of Monthly Flows	347	294	309	607	692	352	207	100	75	74	145	272	345	295	312	606	692	350	206	100	79	76	147	283
% of Normal	66%	121%	102%	71%	117%	142%	130%	93%	55%	78%	83%	126%	52%	155%	169%	79%	95%	59%	35%	105%	543%	285%	216%	406%

# SOUHEGAN RIVER at MERRIMACK NH

## Gage# 01094000



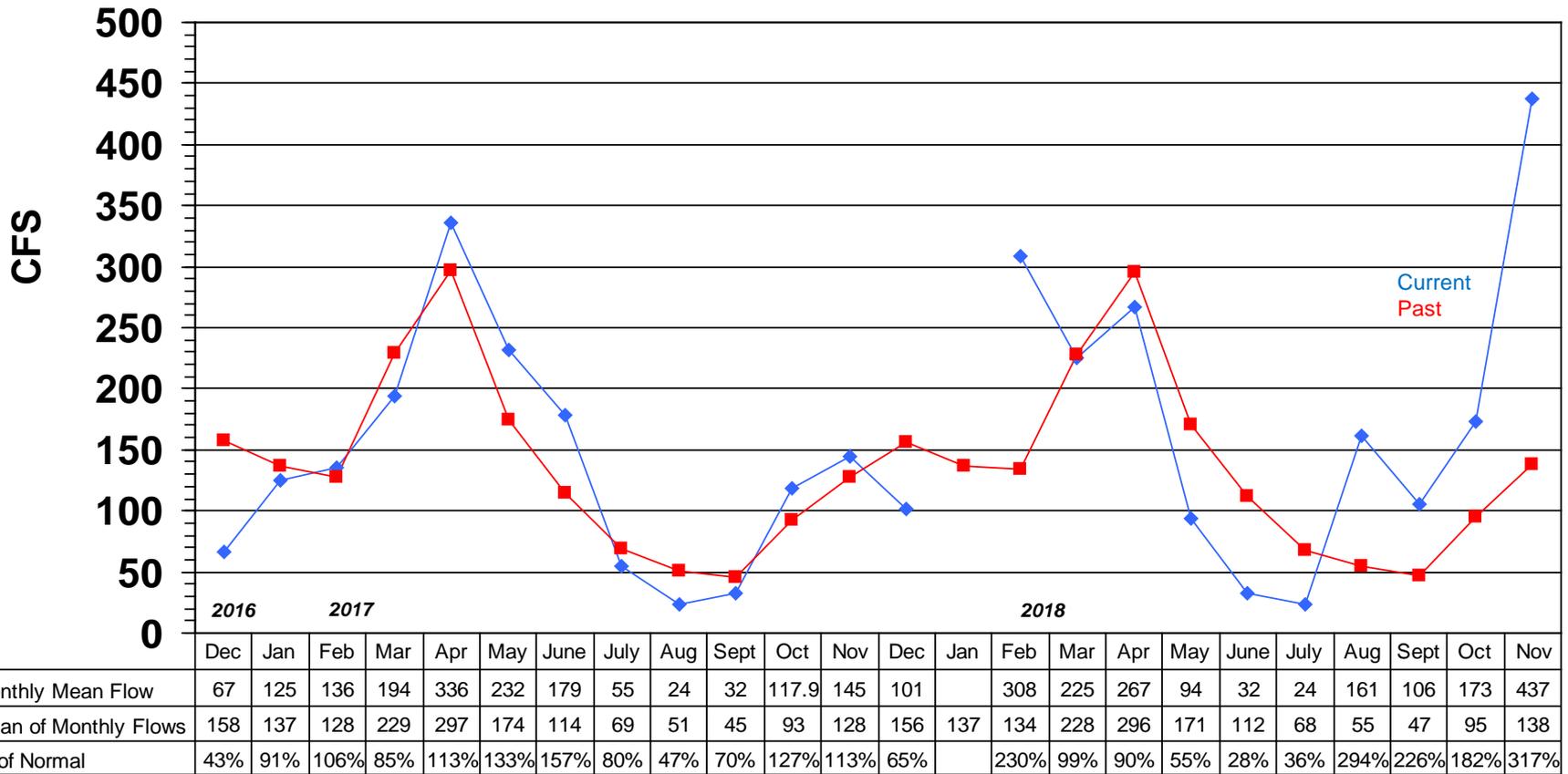
### MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS



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



MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS



Start of record 1988

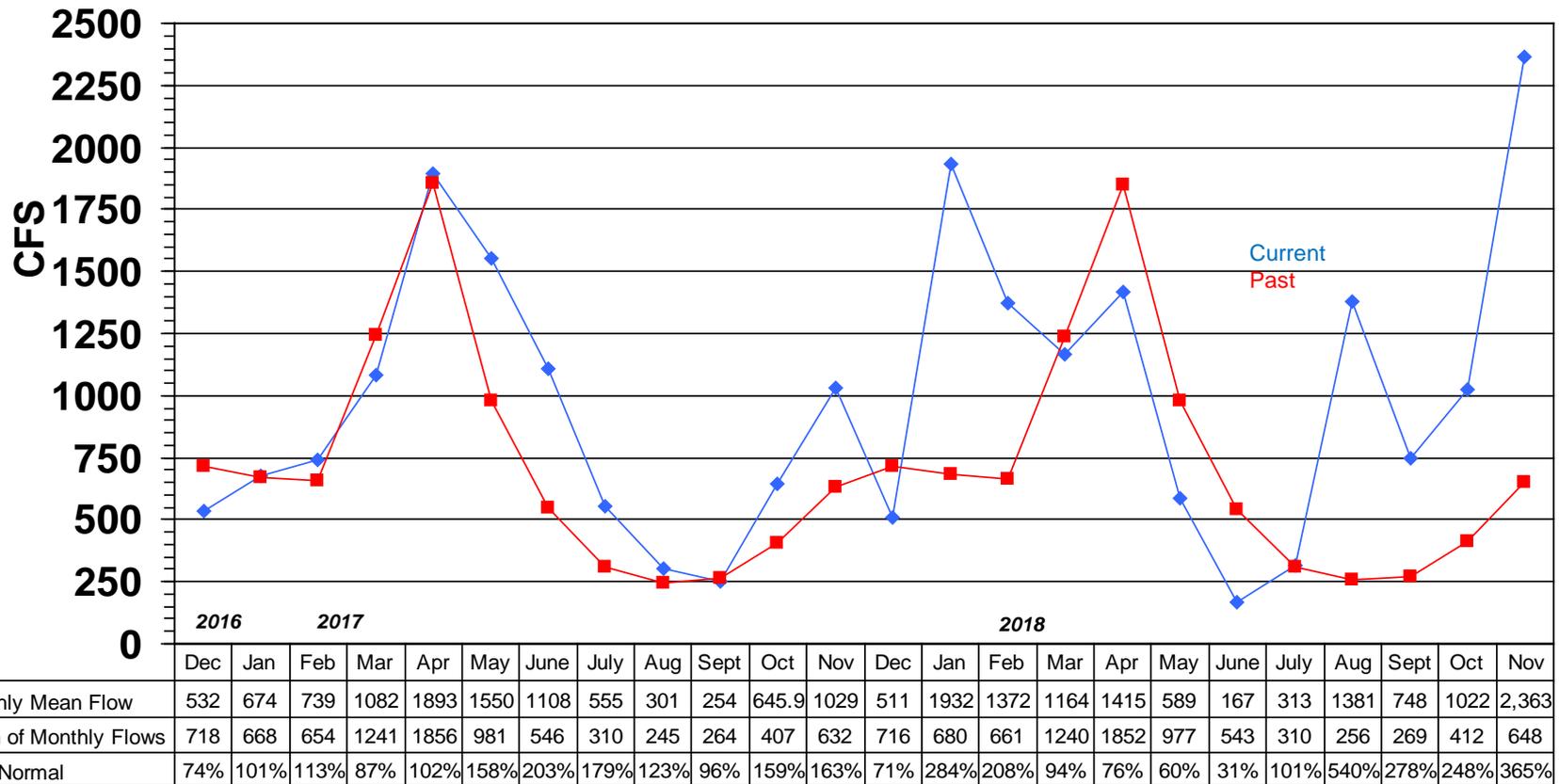
Jan - 31 days ice  
Feb - 15 days ice

# ASHUELOT RIVER at HINSDALE NH

## Gage# 01161000



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



Start of record 1907

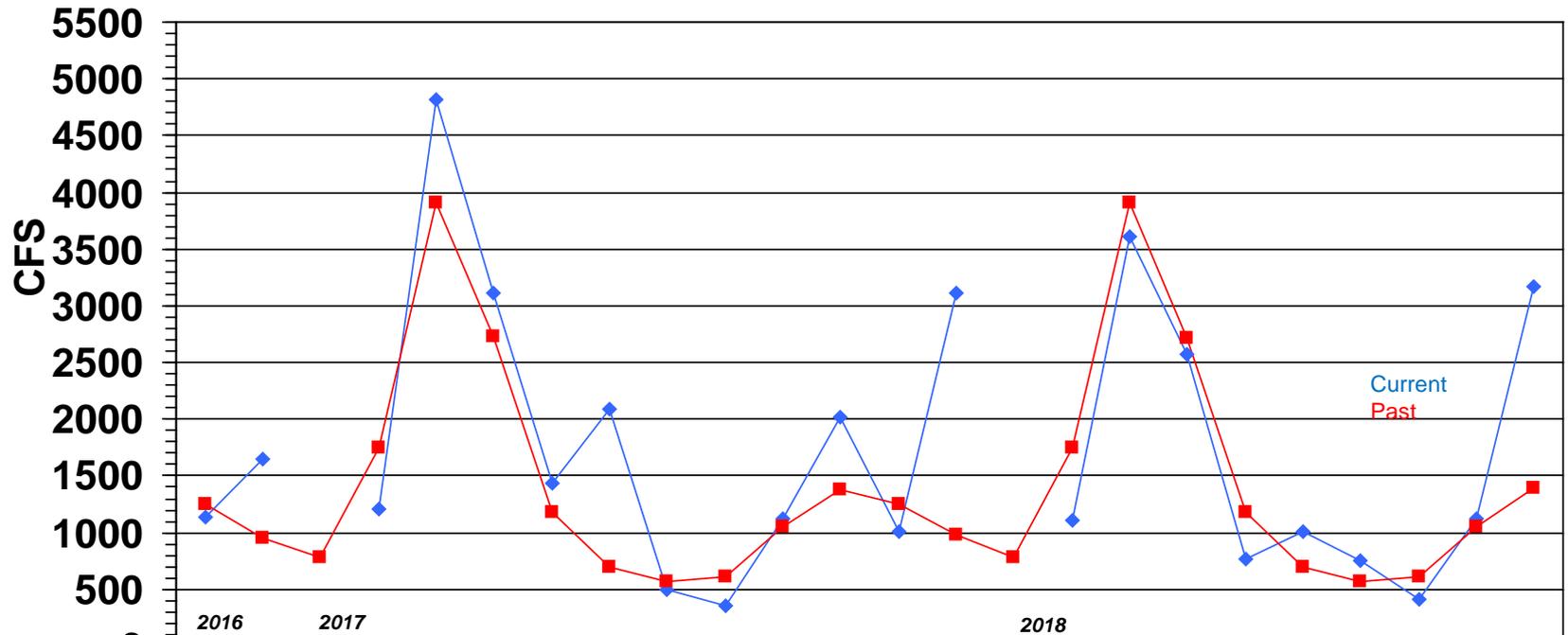
Jan - 13 days ice

# PEMIGEWASSET RIVER at PLYMOUTH NH

## Gage# 01076500



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



	2016			2017							2018													
	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov
◆ Monthly Mean Flow	1139	1651	ice	1213	4813	3106	1433	2083	502	351	1126	2012	1014	3117		1113	3608	2573	764	1011	747	413	1118	3,167
■ Mean of Monthly Flows	1246	955	778	1755	3911	2722	1177	693	565	606	1056	1382	1244	974	778	1750	3908	2721	1174	696	566	605	1057	1,397
% of Normal	91%	173%		69%	123%	114%	122%	301%	89%	58%	107%	146%	81%	320%		64%	92%	95%	65%	145%	132%	68%	106%	227%

Jan - 16 days ice  
Feb - all ice

Start of record 1903

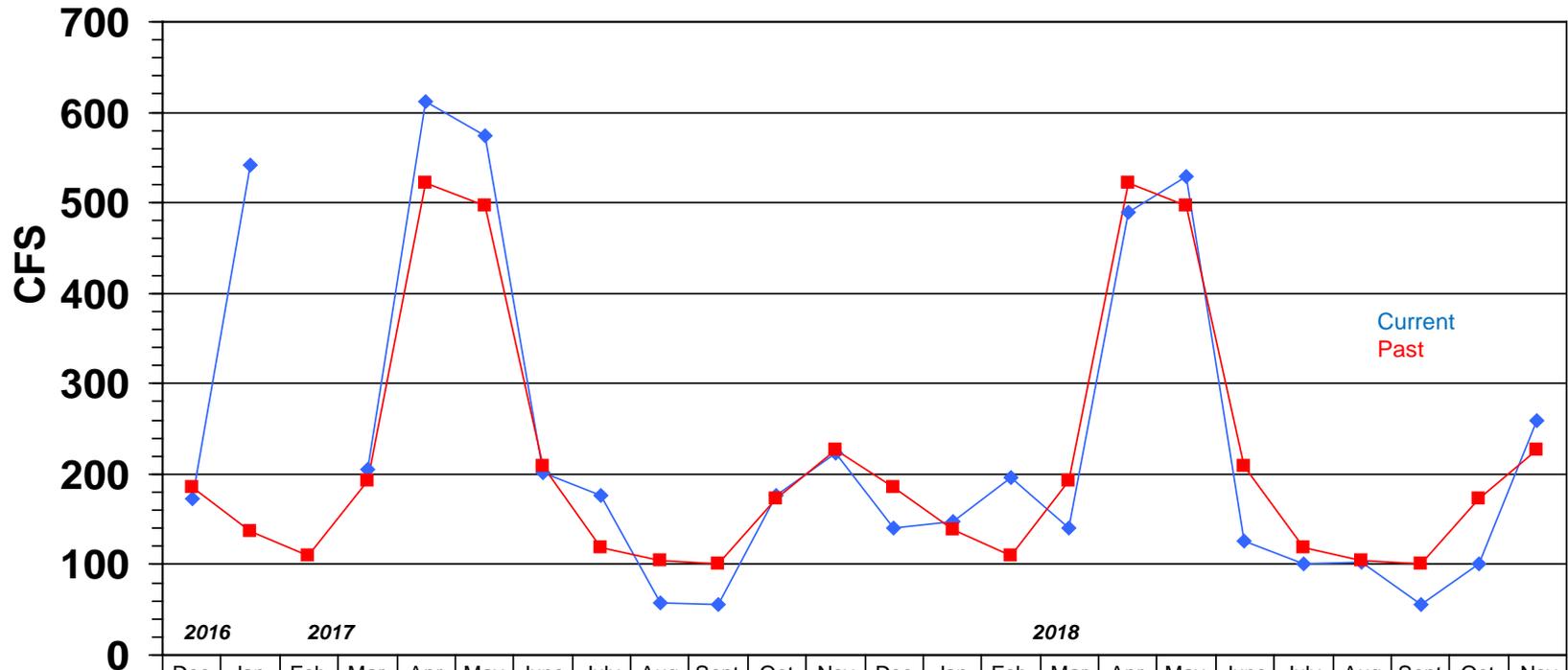
# AMMONOOSUC RIVER at BETHLEHEM JUNCTION NH

## 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

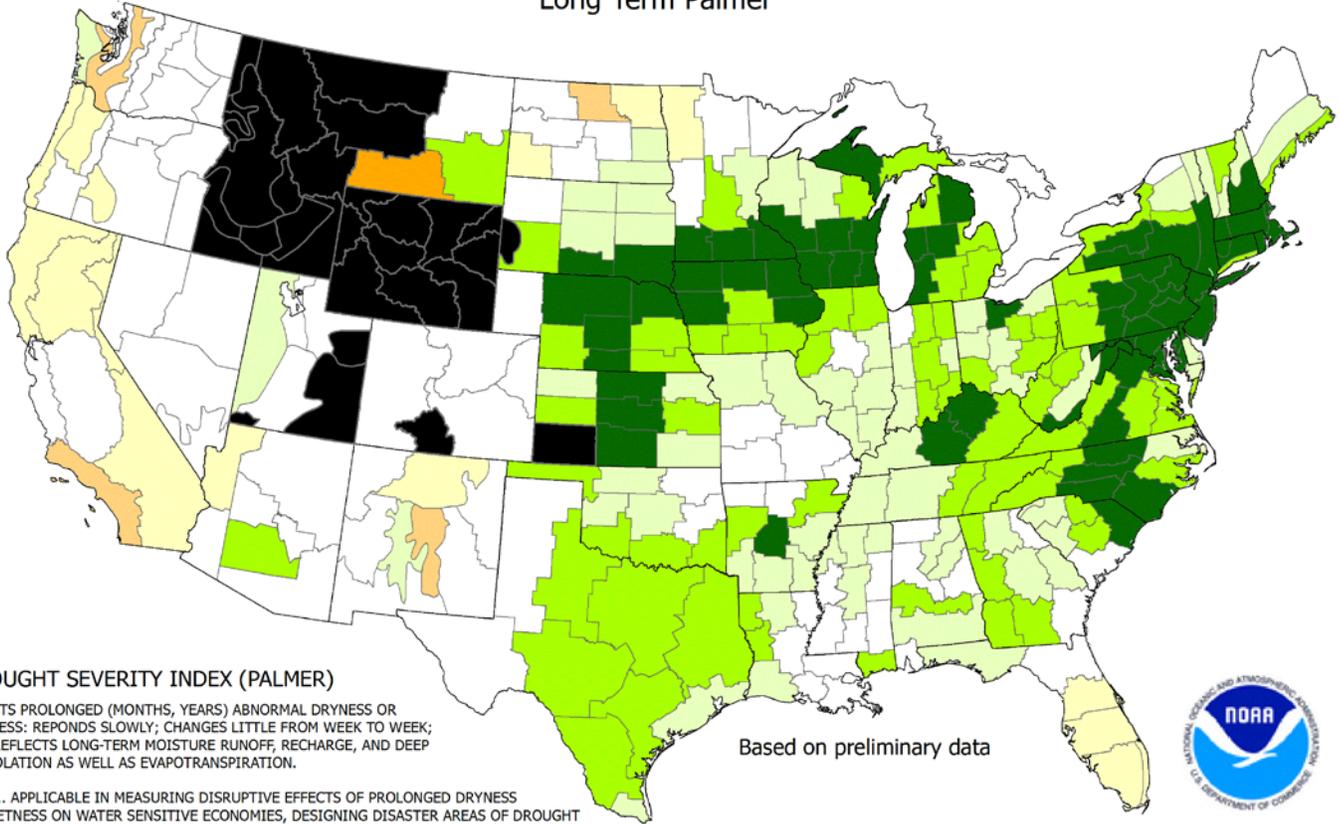


	2016	2017	2018																					
	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov
—◆— Monthly Mean Flow	172	541	ice	205	611	574	201	177	58	55	176.9	223	140	148	196	141	490	529	126	100	103	56	101	259
—■— Mean of Monthly Flows	185	137	109	193	521	496	209	119	105	101	173	226	185	138	110	192	521	496	208	118	105	100	172	226
% of Normal	93%	395%		106%	117%	116%	96%	149%	55%	55%	102%	99%	76%	107%	178%	73%	94%	107%	61%	84%	98%	56%	59%	115%

Dec - 19 days ice

Start of record 1939

Drought Severity Index by Division  
Weekly Value for Period Ending Dec 01, 2018  
Long Term Palmer



**DROUGHT SEVERITY INDEX (PALMER)**

DEPICTS PROLONGED (MONTHS, YEARS) ABNORMAL DRYNESS OR WETNESS; REponds 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

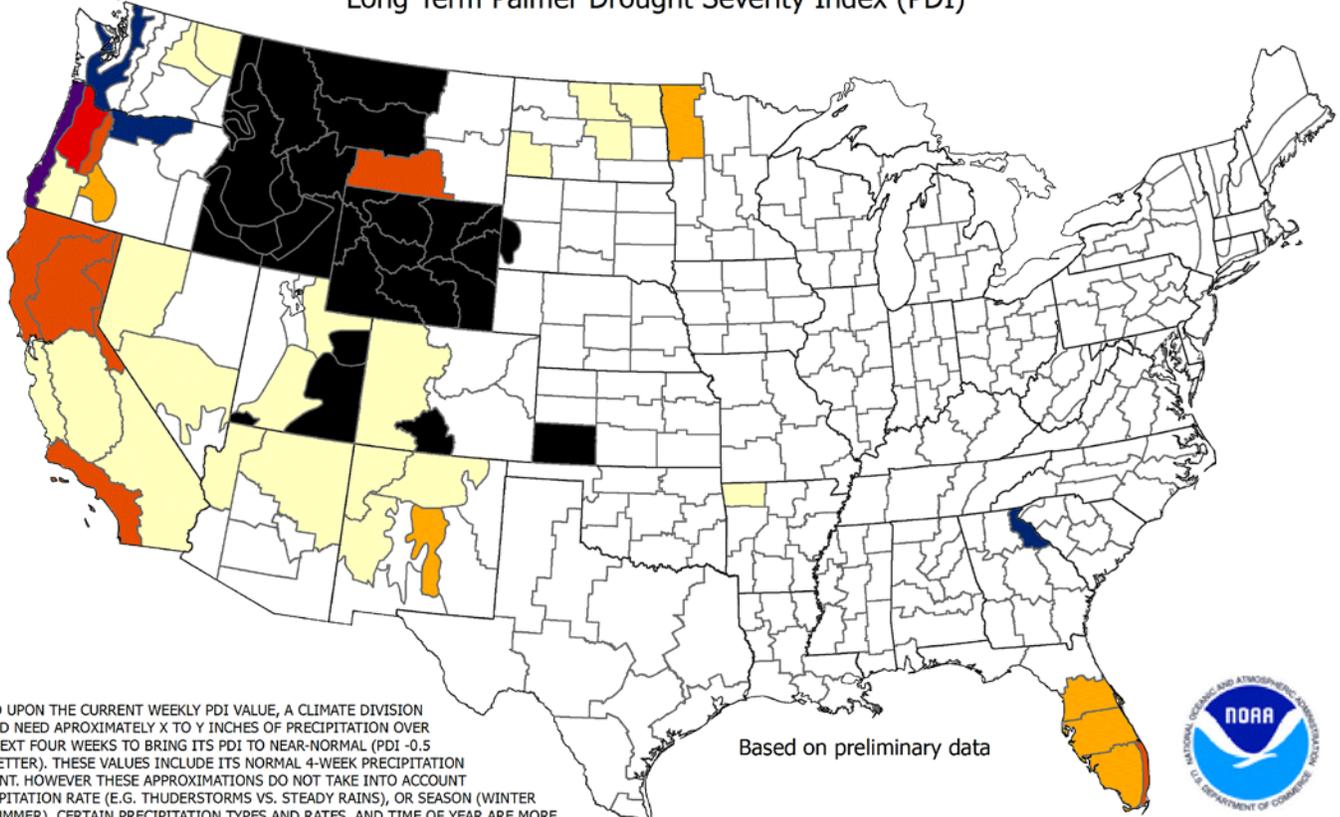


- 4.0 or less (Extreme Drought)
- 3.0 to -3.9 (Severe Drought)
- 2.0 to -2.9 (Moderate Drought)
- 1.9 to +1.9 (Near Normal)
- +2.0 to +2.9 (Unusual Moist Spell)
- +3.0 to +3.9 (Very Moist Spell)
- +4.0 and above (Extremely Moist)
- Missing/Incomplete

**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 Dec 01, 2018  
 Long Term Palmer Drought Severity Index (PDI)



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)

Based on preliminary data



- |                   |                    |
|-------------------|--------------------|
| 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.