



The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES



Robert R. Scott, Commissioner

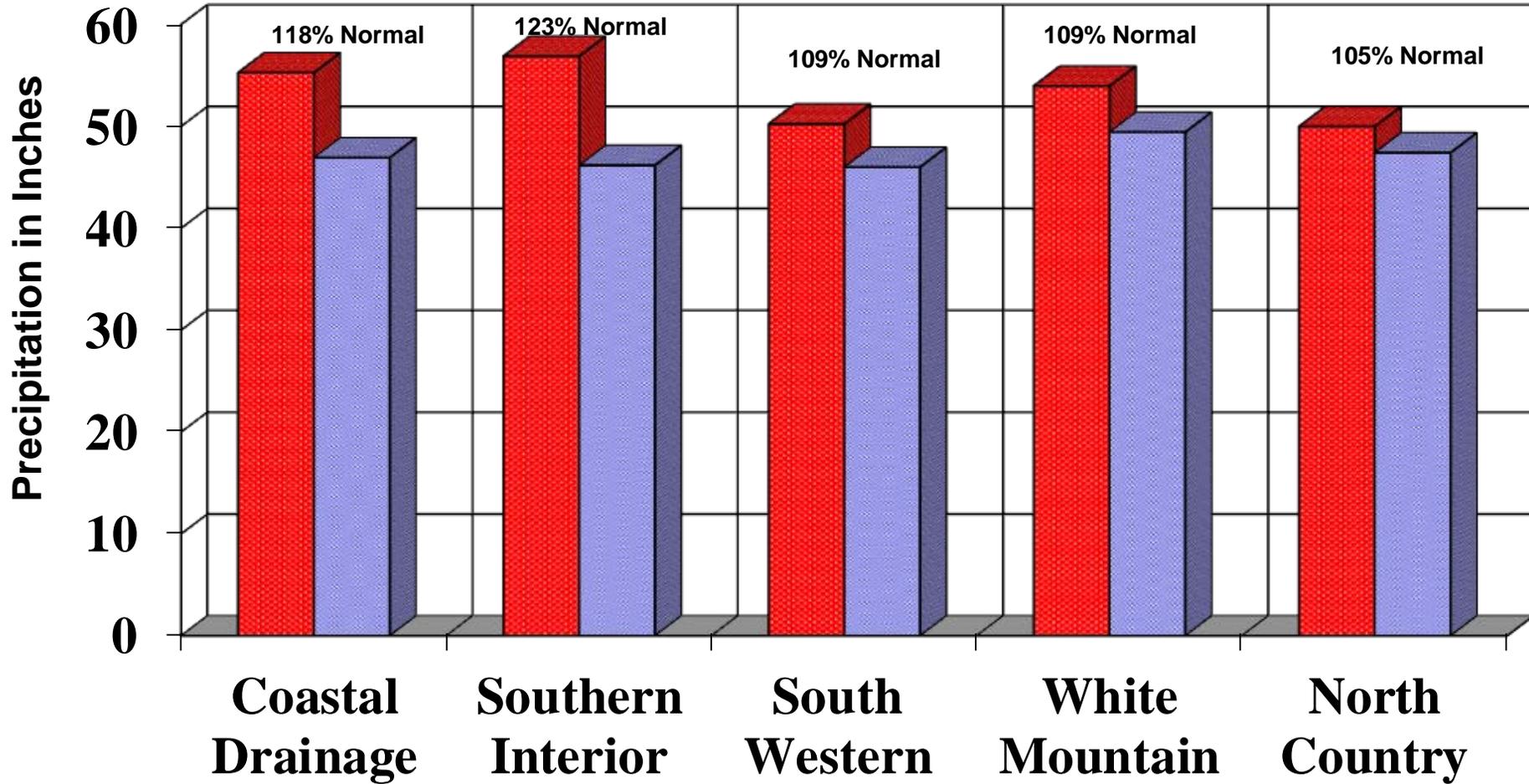
**AGGREGATED PRECIPITATION DATA for N.H.
 DROUGHT MANAGEMENT AREAS**

	Actual Rainfall (inches)	Normal Rainfall (inches)	Deviation from Normal (inches)	Percent of Normal
<u>Coastal Drainage:</u> Rockingham, Strafford counties				
four month	13.24	15.78	-2.54	84%
six month	20.86	22.76	-1.90	92%
nine month	40.62	35.27	5.36	115%
twelve month	55.26	46.92	8.34	118%
<u>Southern Interior:</u> Belknap, Hillsborough, Merrimack counties				
four month	13.44	14.86	-1.42	90%
six month	21.70	21.77	-0.07	100%
nine month	40.77	34.08	6.69	120%
twelve month	56.87	46.16	10.72	123%
<u>South Western:</u> Cheshire, Sullivan counties				
four month	13.33	14.44	-1.12	92%
six month	16.84	21.09	0.26	80%
nine month	33.02	33.38	4.15	99%
twelve month	50.22	45.99	8.74	109%
<u>White Mountain:</u> Carroll, Grafton counties				
four month	15.54	15.19	0.35	102%
six month	25.76	22.50	3.26	114%
nine month	41.21	35.89	5.32	115%
twelve month	53.95	49.43	4.52	109%
<u>North Country:</u> Coos county				
four month	14.86	13.76	1.10	108%
six month	22.33	20.44	1.89	109%
nine month	36.24	33.19	3.05	109%
twelve month	49.97	47.40	2.57	105%

four month period : February 2019 - May 2019
 six month period : December 2018 - May 2019
 nine month period : September 2018 - May 2019
 twelve month period: June 2018 - May 2019

Source: Northeast River Forecast Center, NH Des Dam Bureau

TWELVE MONTH AGGREGATED PRECIPITATION DATA for N.H. DROUGHT MANAGEMENT AREAS from June 2018 through May 2019



■ Actual ■ Normal

MONTHLY PRECIPITATION DATA FOR N.H COUNTIES



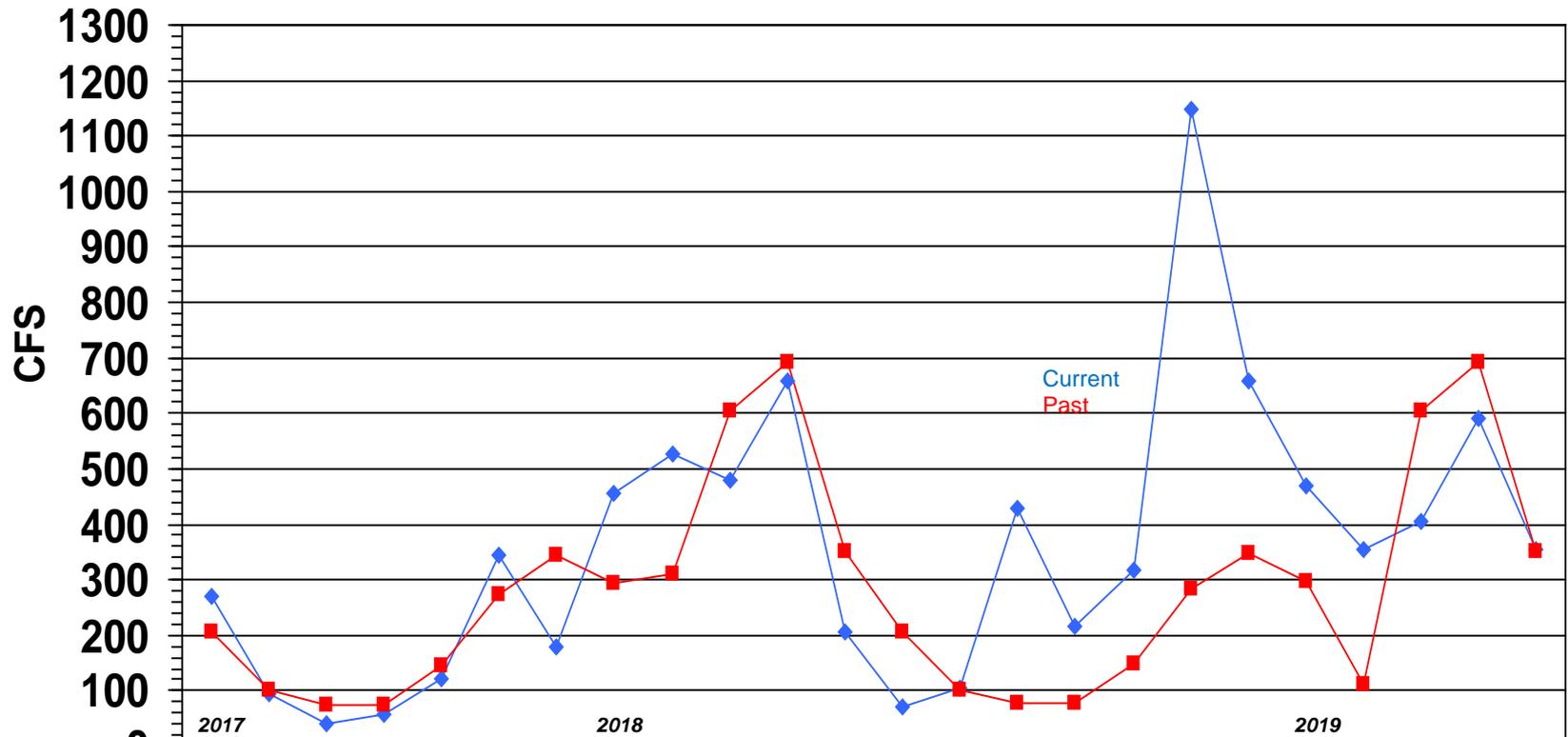
		2018							2019				
		JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY
<u>Coastal drainage</u>													
STRAFFORD	actual	3.67	4.47	6.01	5.99	4.61	9.08	4.09	4.16	3.09	2.04	5.42	3.45
	normal	4.16	3.99	3.73	3.74	4.38	4.50	3.76	3.20	3.29	4.16	4.22	4.10
	deviation	-0.49	0.48	2.28	2.25	0.23	4.58	0.33	0.96	-0.20	-2.12	1.20	-0.65
ROCKINGHAM	actual	4.25	5.04	5.84	6.36	4.07	9.41	3.38	3.62	2.78	2.05	4.88	2.76
	normal	4.10	3.78	3.55	3.76	4.34	4.30	3.74	3.26	3.30	4.19	4.19	4.10
	deviation	0.15	1.26	2.29	2.60	-0.27	5.11	-0.36	0.36	-0.52	-2.14	0.69	-1.34
Average	actual	3.96	4.76	5.93	6.18	4.34	9.25	3.74	3.89	2.94	2.05	5.15	3.11
	normal	4.13	3.89	3.64	3.75	4.36	4.40	3.75	3.23	3.30	4.18	4.21	4.10
	deviation	-0.17	0.87	2.29	2.43	-0.02	4.85	-0.02	0.66	-0.36	-2.13	0.95	-1.00
<u>Southern Interior</u>													
HILLSBOROUGH	actual	4.26	5.89	7.97	7.40	4.23	9.23	3.88	3.80	2.78	1.77	5.64	3.00
	normal	4.21	3.96	3.75	3.74	4.46	4.21	3.79	3.39	3.28	3.95	4.14	4.10
	deviation	0.05	1.93	4.22	3.66	-0.23	5.02	0.09	0.41	-0.50	-2.18	1.50	-1.10
MERRIMACK	actual	3.09	4.99	8.54	5.46	4.93	8.65	4.06	4.24	2.87	1.68	5.31	3.64
	normal	4.34	4.11	3.75	3.76	4.43	4.15	3.65	3.26	3.09	3.73	3.96	4.01
	deviation	-1.25	0.88	4.79	1.70	0.50	4.50	0.41	0.98	-0.22	-2.05	1.35	-0.37
BELKNAP	actual	3.00	3.64	6.94	4.81	4.48	8.01	4.32	4.48	2.65	1.77	5.04	4.17
	normal	4.25	4.08	3.78	3.66	4.48	4.03	3.58	3.08	3.03	3.57	3.75	3.96
	deviation	-1.25	-0.44	3.16	1.15	0.00	3.98	0.74	1.40	-0.38	-1.80	1.29	0.21
Average	actual	3.45	4.84	7.82	5.89	4.55	8.63	4.09	4.17	2.77	1.74	5.33	3.60
	normal	4.27	4.05	3.76	3.72	4.46	4.13	3.67	3.24	3.13	3.75	3.95	4.02
	deviation	-0.82	0.79	4.06	2.17	0.09	4.50	0.41	0.93	-0.37	-2.01	1.38	-0.42
<u>South Western</u>													
CHESHIRE	actual	4.31	7.49	8.21	6.10	4.02	8.05	4.39	4.19	2.76	1.66	5.70	3.06
	normal	4.20	4.36	4.06	3.83	4.60	3.98	3.68	3.41	3.17	3.73	3.79	4.10
	deviation	0.11	3.13	4.15	2.27	-0.58	4.07	0.71	0.78	-0.41	-2.07	1.91	-1.04
SULLIVAN	actual	3.10	5.79	5.50	3.80	3.73	6.66	3.73	4.09	2.59	1.44	5.37	4.07
	normal	4.18	4.36	4.06	3.80	4.50	3.86	3.49	2.72	3.00	3.51	3.66	3.92
	deviation	-1.08	1.43	1.44	0.00	-0.77	2.80	0.24	1.01	-0.41	-2.07	1.71	0.15
Average	actual	3.71	6.64	6.86	4.95	3.88	7.36	4.06	-0.55	2.68	1.55	5.54	3.57
	normal	4.19	4.36	4.06	3.82	4.55	3.92	3.59	3.07	3.09	3.62	3.73	4.01
	deviation	-0.49	2.28	2.80	1.14	-0.68	3.44	0.48	0.90	-0.41	-2.07	1.81	-0.45
<u>White Mountain</u>													
GRAFTON	actual	4.26	4.79	4.24	3.14	4.03	6.74	4.65	5.06	2.41	1.90	5.64	5.47
	normal	4.59	4.56	4.60	4.09	4.67	4.35	3.70	3.19	2.84	3.46	3.76	4.20
	deviation	-0.33	0.23	-0.36	-0.95	-0.64	2.39	0.95	1.87	-0.43	-1.56	1.88	1.27
CARROLL	actual	4.06	3.33	4.79	4.02	4.78	8.19	5.10	5.64	3.23	2.28	5.46	4.68
	normal	4.50	4.41	4.42	3.99	4.96	4.72	4.16	3.57	3.32	4.02	4.46	4.32
	deviation	-0.44	-1.08	0.37	0.03	-0.18	3.47	0.94	2.07	-0.09	-1.74	1.00	0.36
Average	actual	4.16	4.06	4.52	3.58	4.41	7.47	4.88	5.35	2.82	2.09	5.55	5.08
	normal	4.55	4.49	4.51	4.04	4.82	4.54	3.93	3.38	3.08	3.74	4.11	4.26
	deviation	-0.39	-0.43	0.01	-0.46	-0.41	2.93	0.95	1.97	-0.26	-1.65	1.44	0.82
<u>North Country</u>													
COOS	actual	4.03	4.66	5.04	3.73	4.19	5.99	3.42	4.05	2.40	2.15	4.65	5.66
	normal	4.79	4.57	4.85	4.00	4.52	4.23	3.58	3.10	2.72	3.21	3.62	4.21
	deviation	-0.76	0.09	0.19	-0.27	-0.33	1.76	-0.16	0.95	-0.32	-1.06	1.03	1.45

LAMPREY RIVER near NEWMARKET NH

Gage# 01073500



MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS



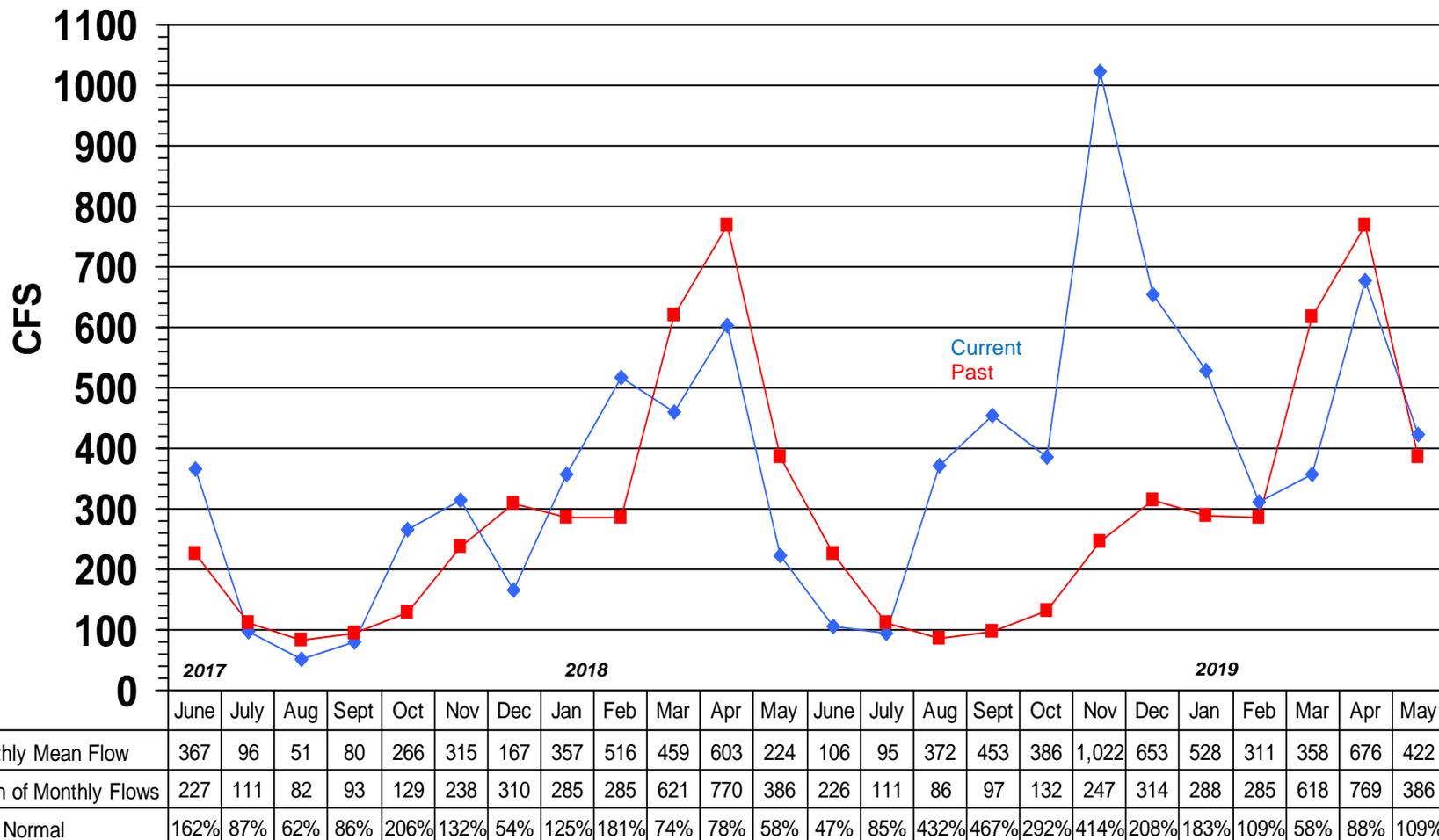
	2017	2018	2019																					
	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Monthly Mean Flow	269	93	41	57	120.4	344	178	456	528	480	659	207	71	105	429	216	317	1,148	660	471	353	405	592	356
Mean of Monthly Flows	207	100	75	74	145	272	345	295	312	606	692	350	206	100	79	76	147	283	349	298	113	603	691	351
% of Normal	130%	93%	55%	78%	83%	126%	52%	155%	169%	79%	95%	59%	35%	105%	543%	285%	216%	406%	189%	158%	312%	67%	86%	101%

SOUHEGAN RIVER at MERRIMACK NH

Gage# 01094000



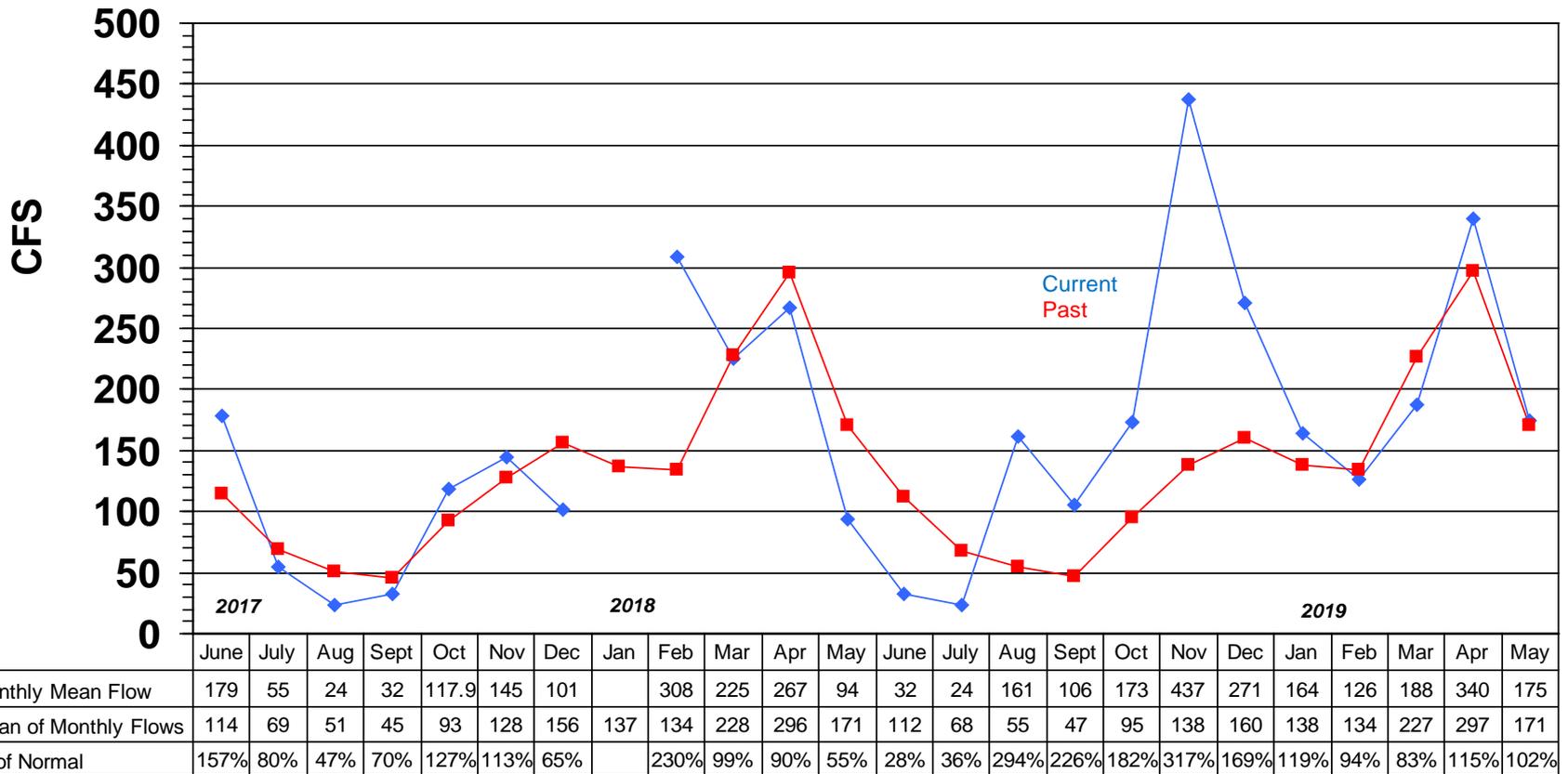
MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS



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



MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS



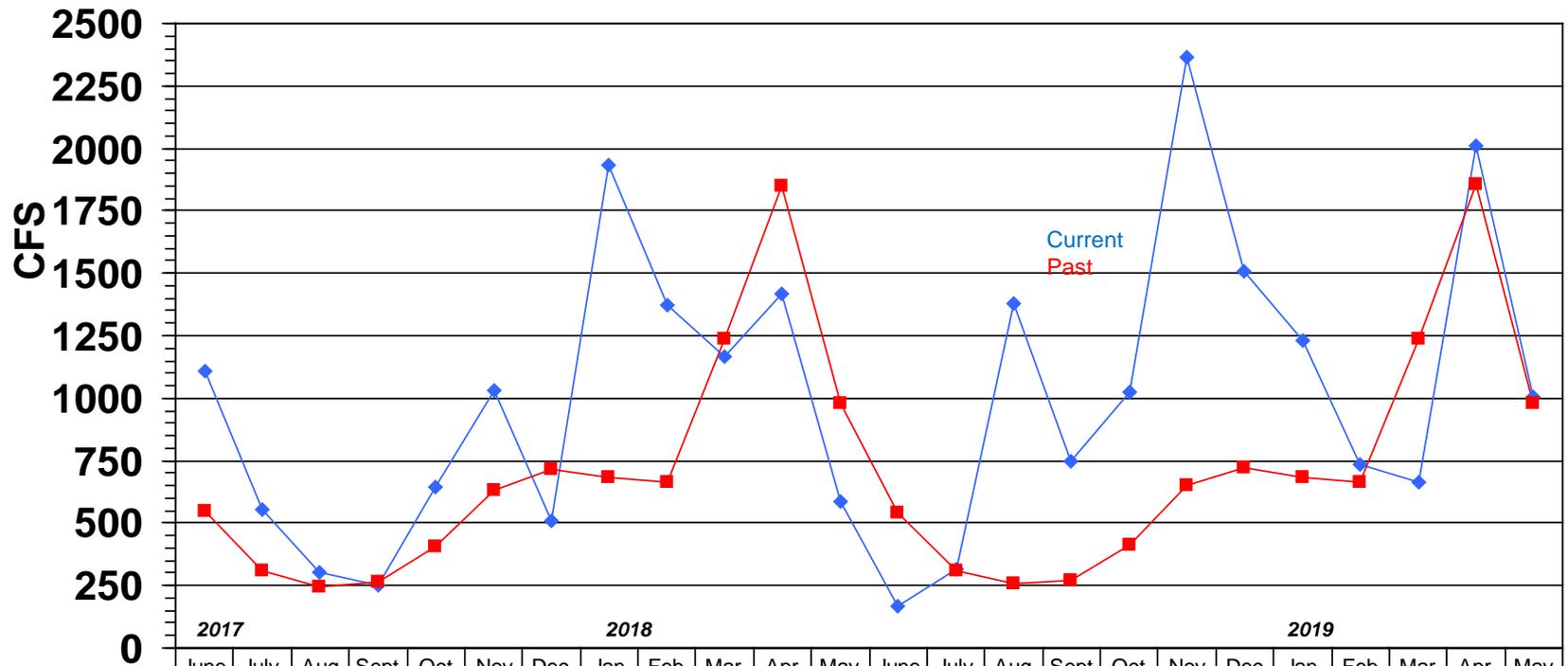
Start of record 1988

ASHUELOT RIVER at HINSDALE NH

Gage# 01161000



MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS



	2017			2018									2019											
	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
◆ Monthly Mean Flow	1108	555	301	254	645.9	1029	511	1932	1372	1164	1415	589	167	313	1381	748	1022	2,363	1506	1229	734	661	2010	1003
■ Mean of Monthly Flows	546	310	245	264	407	632	716	680	661	1240	1852	977	543	310	256	269	412	648	723	685	661	1235	1853	977
% of Normal	203%	179%	123%	96%	159%	163%	71%	284%	208%	94%	76%	60%	31%	101%	540%	278%	248%	365%	208%	179%	111%	53%	108%	103%

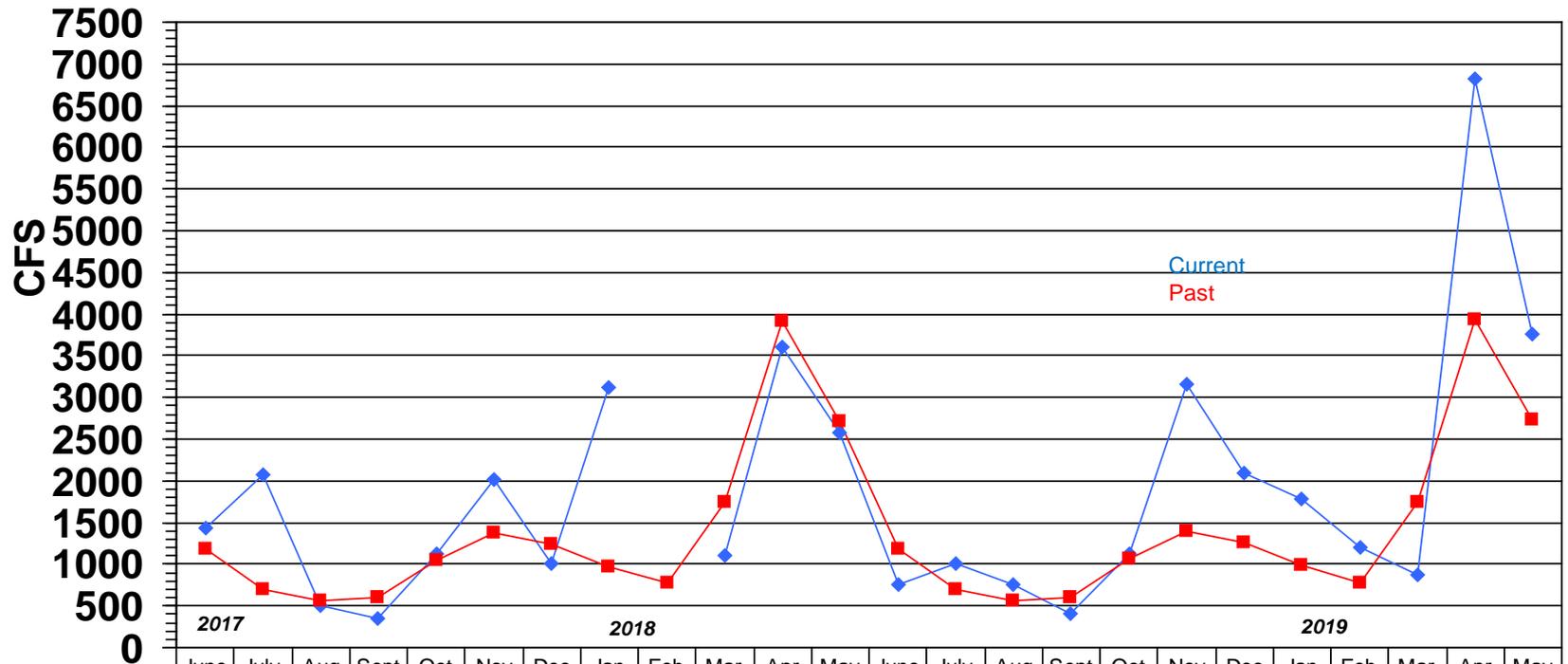
Start of record 1907

PEMIGEWASSET RIVER at PLYMOUTH NH

Gage# 01076500



MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS



	2017	2018												2019										
	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
◆ Monthly Mean Flow	1433	2083	502	351	1126	2012	1014	3117		1113	3608	2573	764	1011	747	413	1118	3,167	2084	1777	1209	881	6820	3755
■ Mean of Monthly Flows	1177	693	565	606	1056	1382	1244	974	778	1750	3908	2721	1174	696	566	605	1057	1,397	1251	981	782	1742	3933	2730
% of Normal	122%	301%	89%	58%	107%	146%	81%	320%		64%	92%	95%	65%	145%	132%	68%	106%	227%	167%	181%	155%	51%	173%	137%

Start of record 1903

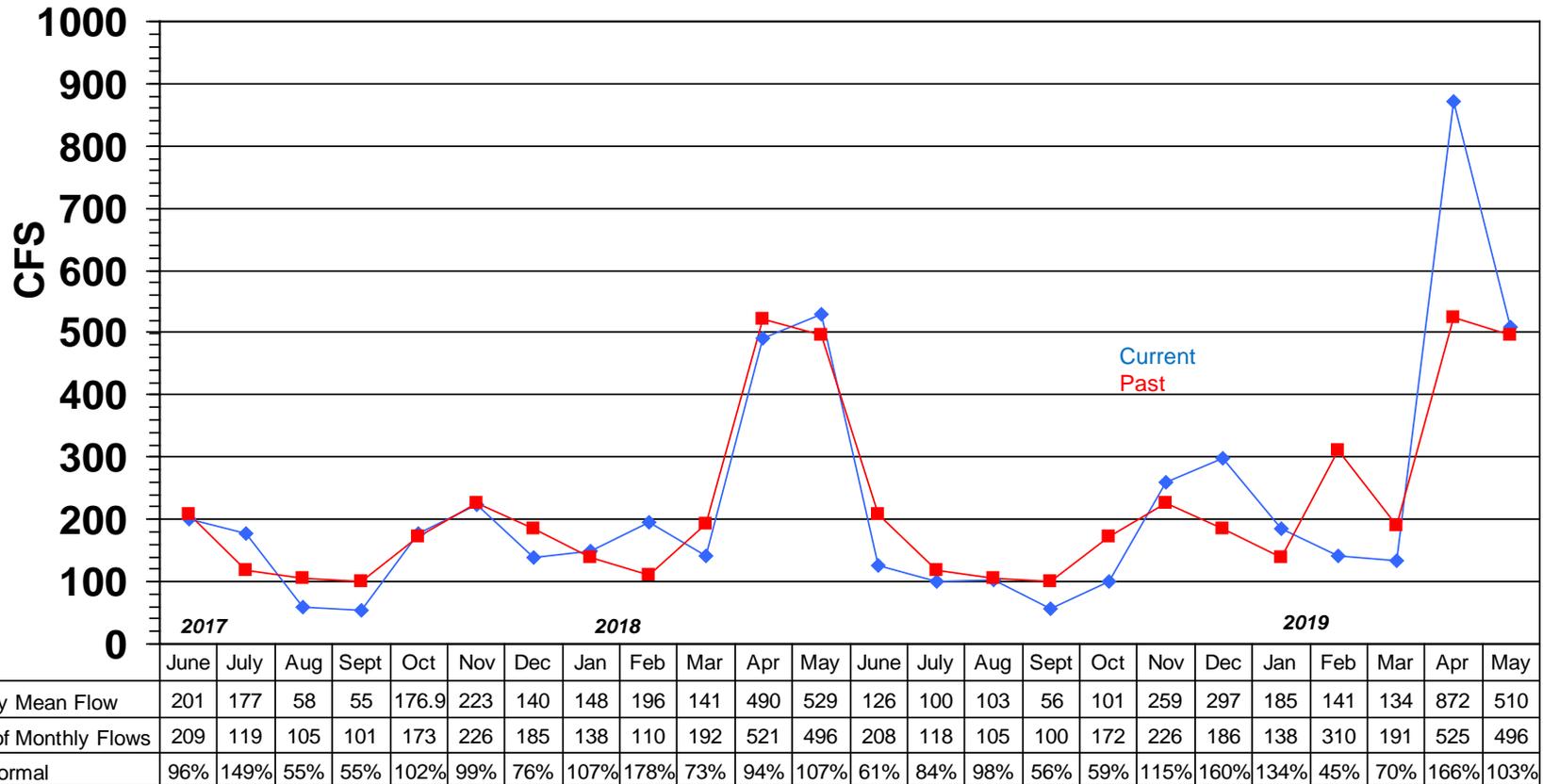
AMMONOOSUC RIVER at BETHLEHEM JUNCTION NH

Gage# 01137500



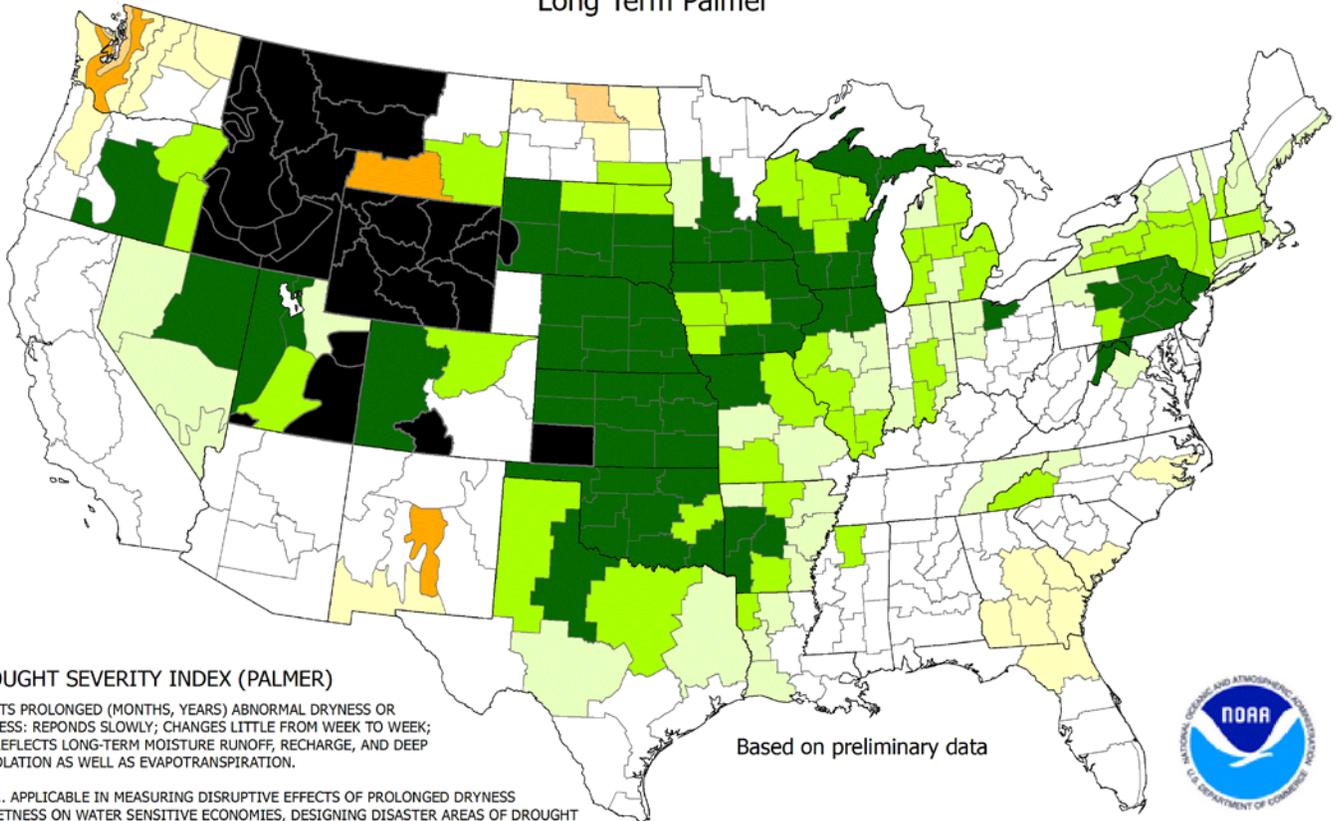
MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS

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



Start of record 1939

Drought Severity Index by Division
 Weekly Value for Period Ending Jun 08, 2019
 Long Term Palmer



Based on preliminary data



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.

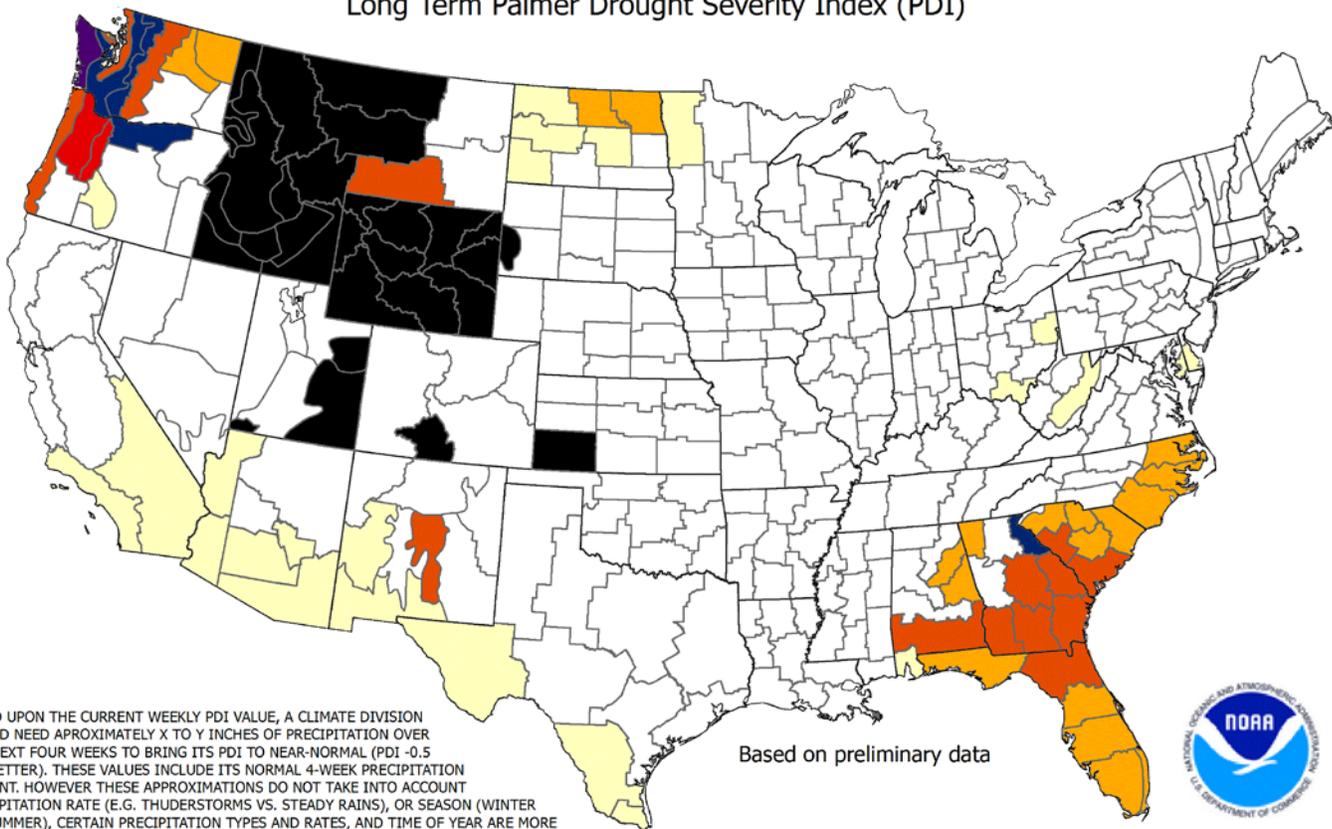
LIMITATIONS... IS NOT GENERALLY INDICATIVE OFFSHORT-TERM (FEW WEEKS) STATUS OF DROUGHT OR WETNESS SUCH AS FREQUENTLY AFFECTS CROPS AND FIELD OPERATIONS (THIS IS INDICATED BY THE CROP MOISTURE INDEX).

- | | |
|-----------------------------------|--------------------------------------|
| ■ -4.0 or less (Extreme Drought) | ■ +2.0 to +2.9 (Unusual Moist Spell) |
| ■ -3.0 to -3.9 (Severe Drought) | ■ +3.0 to +3.9 (Very Moist Spell) |
| ■ -2.0 to -2.9 (Moderate Drought) | ■ +4.0 and above (Extremely Moist) |
| ■ -1.9 to +1.9 (Near Normal) | ■ 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 Jun 08, 2019
 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
- Trace to 3 Inches
- 3 to 6 Inches
- 6 to 9 Inches
- 9 to 12 Inches
- 12 to 15 Inches
- Over 15 Inches
- Missing/Incomplete

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