



The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES



Thomas S. Burack, Commissioner

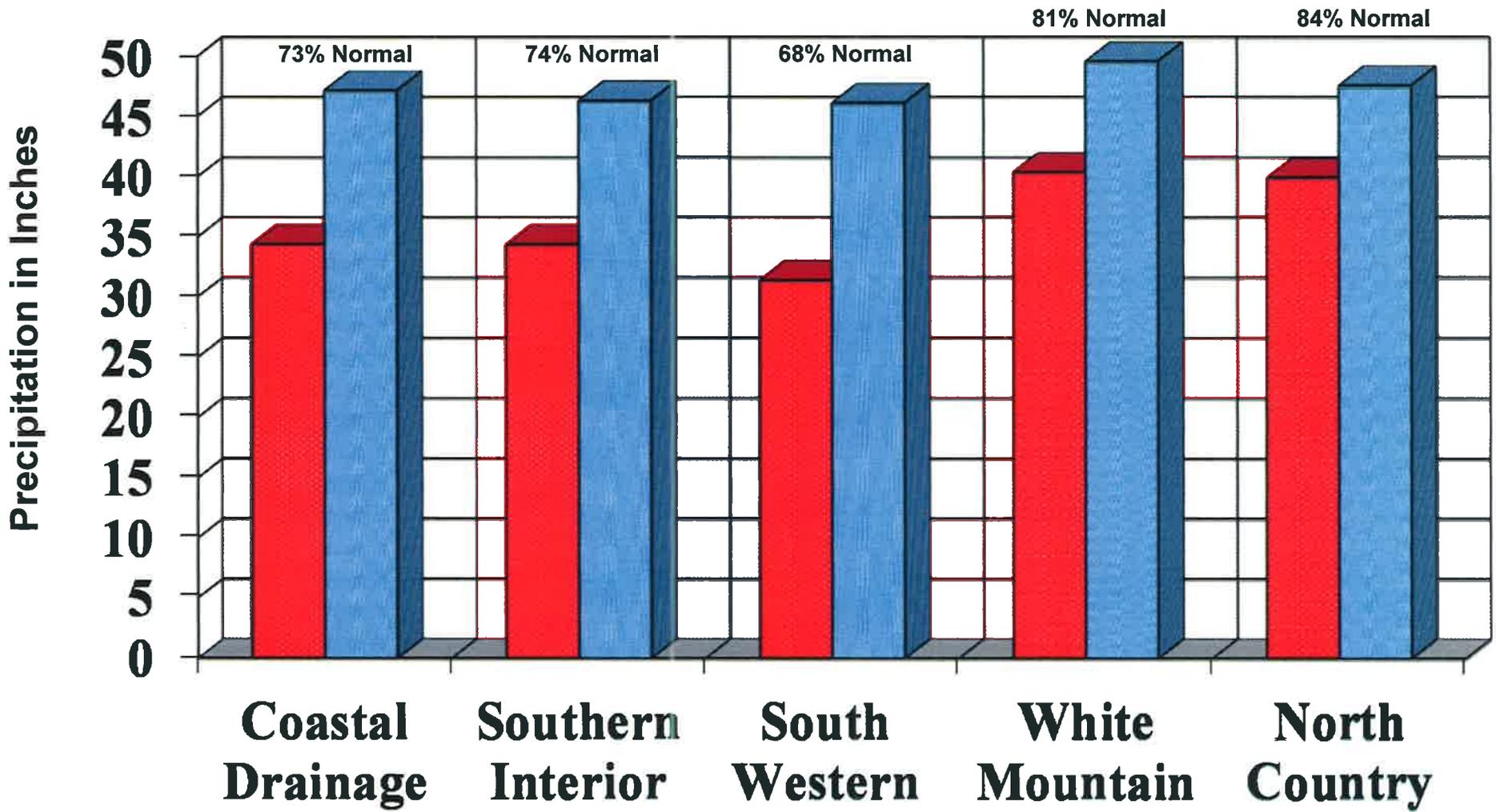
**AGGREGATED PRECIPITATION DATA for N.H.
 DROUGHT MANAGEMENT AREAS**

	Actual Rainfall (inches)	Normal Rainfall (inches)	Deviation from Normal (inches)	Percent of Normal
<u>Coastal Drainage:</u> Rockingham, Strafford counties				
four month	14.86	16.36	-2.32	91%
six month	19.78	23.88	-5.35	83%
nine month	25.84	36.32	-11.45	71%
twelve month	34.36	47.14	-12.16	73%
<u>Southern Interior:</u> Belknap, Hillsborough, Merrimack counties				
four month	14.44	15.99	-1.92	90%
six month	20.29	23.80	-4.88	85%
nine month	26.78	36.04	-10.18	74%
twelve month	34.34	46.28	-11.42	74%
<u>South Western:</u> Cheshire, Sullivan counties				
four month	11.99	15.87	-2.76	76%
six month	19.50	24.28	-5.87	80%
nine month	25.98	36.20	-10.91	72%
twelve month	31.34	46.08	-12.37	68%
<u>White Mountain:</u> Carroll, Grafton counties				
four month	14.21	17.32	-3.65	82%
six month	22.49	26.32	-4.31	85%
nine month	31.48	39.23	-8.58	80%
twelve month	40.34	49.53	-9.01	81%
<u>North Country:</u> Coos county				
four month	13.04	16.35	-2.80	80%
six month	22.88	25.77	-4.55	89%
nine month	31.96	38.39	-7.52	83%
twelve month	39.88	47.52	-7.90	84%

four month period : September 2016 - December 2016
 six month period : July 2016 - December 2016
 nine month period : April 2016 - December 2016
 twelve month period: January 2016 - December 2016

Source: Northeast River Forecast Center, NH Des Dam Bureau

TWELVE MONTH AGGREGATED PRECIPITATION DATA for N.H. DROUGHT MANAGEMENT AREAS from January 2016 through December 2016



■ Actual ■ Normal

MONTHLY PRECIPITATION DATA FOR N.H COUNTIES



		2016											
		JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
<u>Coastal drainage</u>													
STRAFFORD	actual	1.68	4.51	2.72	2.09	1.65	2.58	3.06	2.04	1.92	5.47	3.36	3.35
	normal	3.21	3.41	4.16	4.22	4.10	4.16	3.99	3.73	3.74	4.38	4.50	3.97
	deviation	-1.53	1.10	-1.44	-2.13	-2.45	-1.58	-0.93	-1.69	-1.82	1.09	-1.14	-0.62
ROCKINGHAM	actual	1.71	3.98	2.45	2.10	1.76	1.94	2.38	2.36	2.63	6.25	3.62	3.11
	normal	3.27	3.41	4.19	4.20	4.10	4.10	3.77	3.54	3.76	4.34	4.30	3.73
	deviation	-1.56	0.57	-1.74	-2.10	-2.34	-2.16	-1.39	-1.18	-1.13	1.91	-0.68	-0.62
Average	actual	1.70	4.25	2.59	2.10	1.71	2.26	2.72	2.20	2.28	5.86	3.49	3.23
	normal	3.24	3.41	4.18	4.21	4.10	4.13	3.88	3.64	3.75	4.36	4.40	3.85
	deviation	-1.55	0.84	-1.59	-2.12	-2.40	-1.87	-1.16	-1.44	-1.48	1.50	-0.91	-0.62
<u>Southern Interior</u>													
HILLSBOROUGH	actual	1.39	3.75	2.39	1.91	1.98	1.80	2.16	3.12	3.27	4.79	3.78	3.06
	normal	3.38	3.40	3.95	4.14	4.10	4.22	3.96	3.76	3.74	4.46	4.22	3.80
	deviation	-1.99	0.35	-1.56	-2.23	-2.12	-2.42	-1.80	-0.64	-0.47	0.33	-0.44	-0.74
MERRIMACK	actual	1.27	4.05	2.31	1.78	2.50	2.42	3.29	2.57	2.51	4.99	3.84	3.17
	normal	3.26	3.20	3.73	3.95	4.01	4.34	4.11	3.75	3.77	4.43	4.15	3.65
	deviation	-1.99	0.85	-1.42	-2.17	-1.51	-1.92	-0.82	-1.18	-1.26	0.56	-0.31	-0.48
BELKNAP	actual	1.41	3.87	2.25	1.81	2.32	2.95	3.47	2.93	1.78	4.81	4.07	3.25
	normal	3.07	3.14	3.58	3.75	3.95	4.25	4.08	3.78	3.65	4.49	4.03	3.58
	deviation	-1.66	0.73	-1.33	-1.94	-1.63	-1.30	-0.61	-0.85	-1.87	0.32	0.04	-0.33
Average	actual	1.36	3.89	2.32	1.83	2.27	2.39	2.97	2.87	2.52	4.86	3.90	3.16
	normal	3.24	3.25	3.75	3.95	4.02	4.27	4.05	3.76	3.72	4.46	4.13	3.68
	deviation	-1.88	0.64	-1.44	-2.11	-1.75	-1.88	-1.08	-0.89	-1.20	0.40	-0.24	-0.52
<u>South Western</u>													
CHESHIRE	actual	1.23	3.62	2.21	1.83	2.38	2.06	2.69	5.07	2.81	3.05	3.45	2.83
	normal	3.42	3.28	3.73	3.78	4.10	4.20	4.36	4.05	3.83	4.60	3.97	3.68
	deviation	-2.19	0.34	-1.52	-1.95	-1.72	-2.14	-1.67	1.02	-1.02	-1.55	-0.52	-0.85
SULLIVAN	actual	1.17	3.93	2.07	1.64	2.50	2.54	3.59	3.68	2.03	3.65	3.40	2.75
	normal	2.72	3.11	3.51	3.67	3.91	4.18	4.36	4.05	3.80	4.51	3.85	3.49
	deviation	-1.90	0.82	-1.44	-2.03	-1.41	-1.64	-0.77	-0.37	-1.77	-0.86	-0.45	-0.74
Average	actual	-0.55	3.78	2.14	1.74	2.44	2.30	3.14	4.38	2.42	3.35	3.43	2.79
	normal	3.07	3.20	3.62	3.73	4.01	4.19	4.36	4.05	3.82	4.56	3.91	3.59
	deviation	-2.05	0.58	-1.48	-1.99	-1.57	-1.89	-1.22	0.33	-1.40	-1.21	-0.49	-0.80
<u>White Mountain</u>													
GRAFTON	actual	1.50	4.34	2.45	2.34	3.13	3.85	4.39	4.52	1.86	4.08	3.93	3.54
	normal	3.19	2.94	3.45	3.76	4.20	4.58	4.56	4.61	4.10	4.67	4.35	3.70
	deviation	-1.69	1.40	-1.00	-1.42	-1.07	-0.73	-0.17	-0.09	-2.24	-0.59	-0.42	-0.16
CARROLL	actual	1.78	4.65	3.00	2.40	2.35	3.92	4.55	3.09	1.44	5.04	4.56	3.97
	normal	3.57	3.43	4.02	4.46	4.32	4.49	4.41	4.42	3.98	4.96	4.72	4.16
	deviation	-1.79	1.22	-1.02	-2.06	-1.97	-0.57	0.14	-1.33	-2.54	0.08	-0.16	-0.19
Average	actual	1.64	4.50	2.73	2.37	2.74	3.89	4.47	3.81	1.65	4.56	4.25	3.76
	normal	3.38	3.19	3.74	4.11	4.26	4.54	4.49	4.52	4.04	4.82	4.54	3.93
	deviation	-1.74	1.31	-1.01	-1.74	-1.52	-0.65	-0.02	-0.71	-2.39	-0.26	-0.29	-0.18
<u>North Country</u>													
COOS	actual	1.56	3.98	2.38	2.77	2.92	3.39	4.22	5.62	2.07	3.56	3.57	3.84
	normal	3.10	2.82	3.21	3.62	4.21	4.79	4.57	4.85	4.00	4.53	4.24	3.58
	deviation	-1.54	1.16	-0.83	-0.85	-1.29	-1.40	-0.35	0.77	-1.93	-0.97	-0.67	0.26

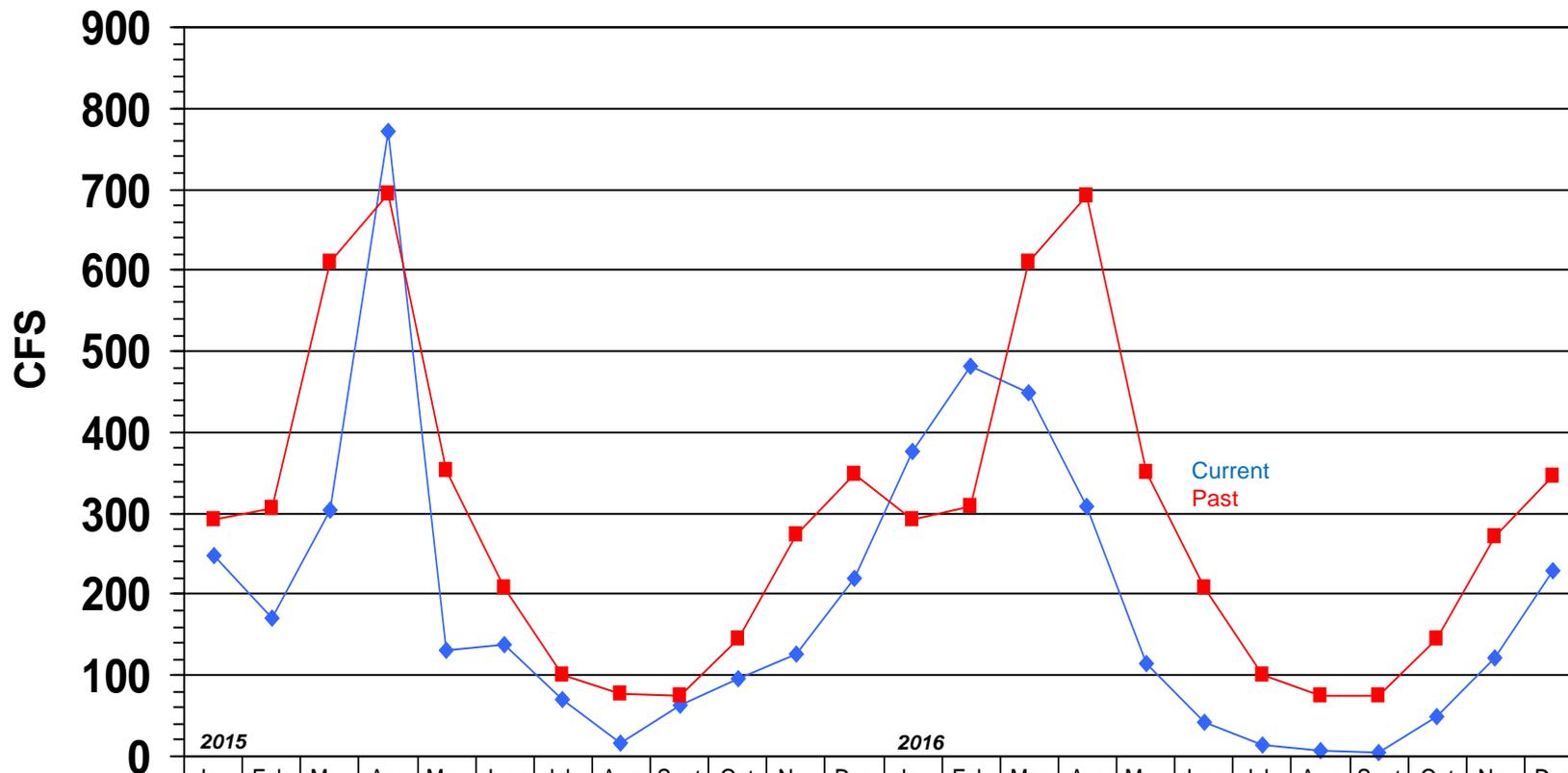
Source: Northeast River Forecast Center, NH DES Dam Bureau

LAMPREY RIVER near NEWMARKET NH

Gage# 01073500



MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS



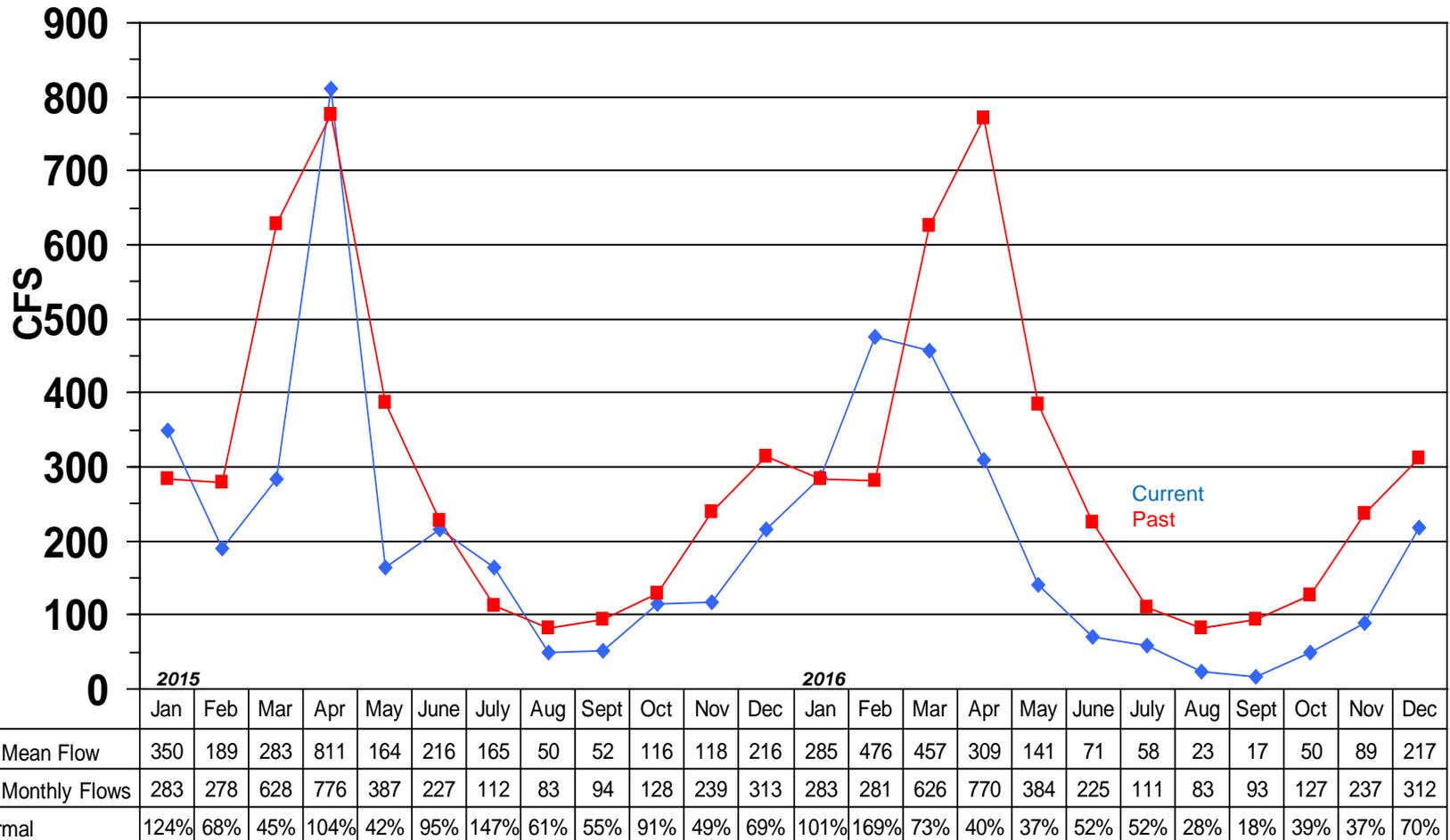
	2015												2016											
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
◆ Monthly Mean Flow	248	170	305	771	132	137	70	17	63	95	127	219	376	481	450	308	115	43	14	7	5	50	121	230
■ Mean of Monthly Flows	292	307	611	695	353	209	101	76	75	146	273	349	293	309	609	691	350	207	100	75	74	145	271	347
% of Normal	85%	55%	50%	111%	37%	66%	70%	23%	84%	65%	46%	63%	128%	156%	74%	45%	33%	21%	14%	9%	7%	34%	44%	66%

SOUHEGAN RIVER at MERRIMACK NH

Gage# 01094000



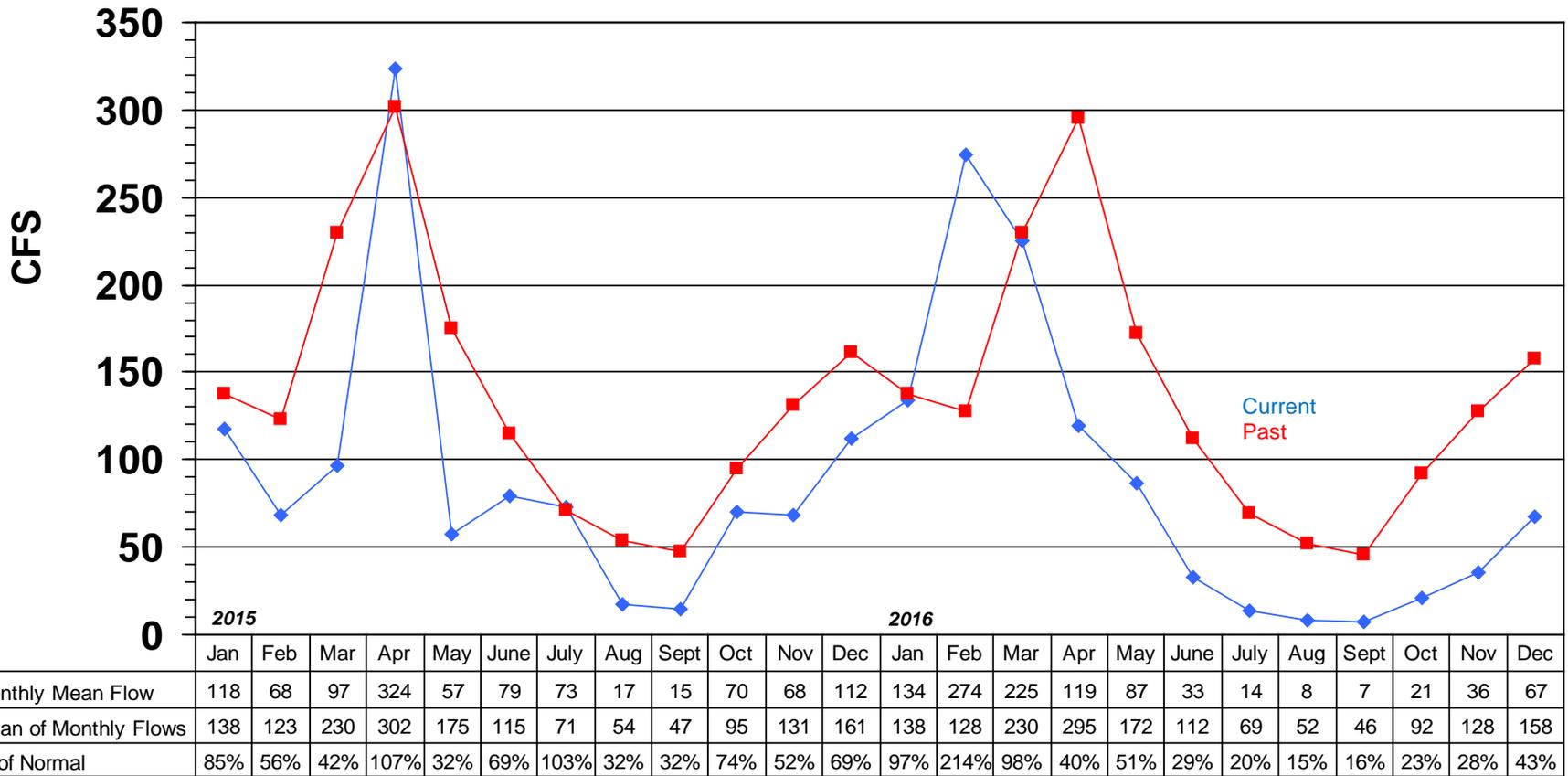
MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS



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



MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS

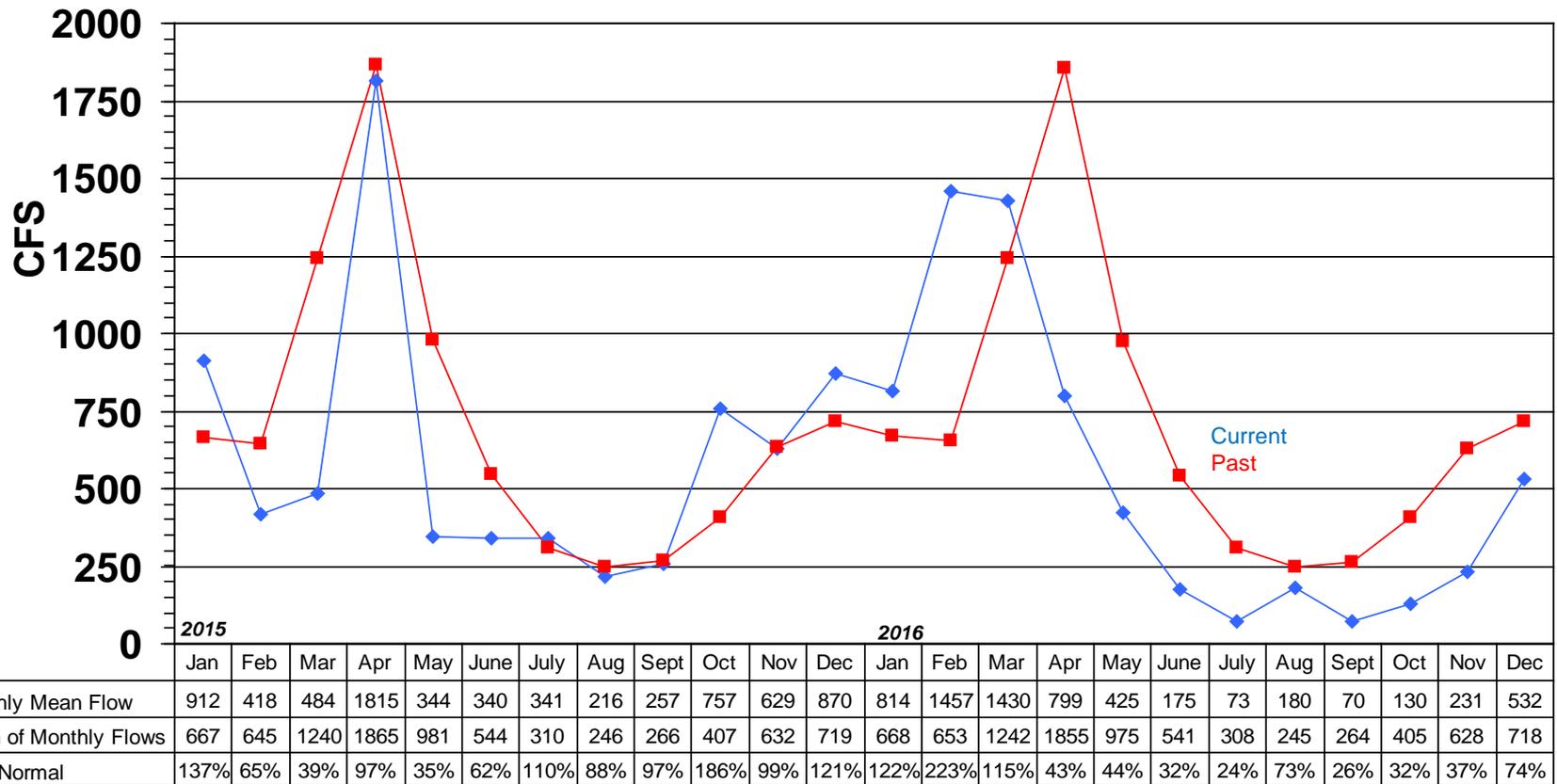


ASHUELOT RIVER at HINSDALE NH

Gage# 01161000



MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS

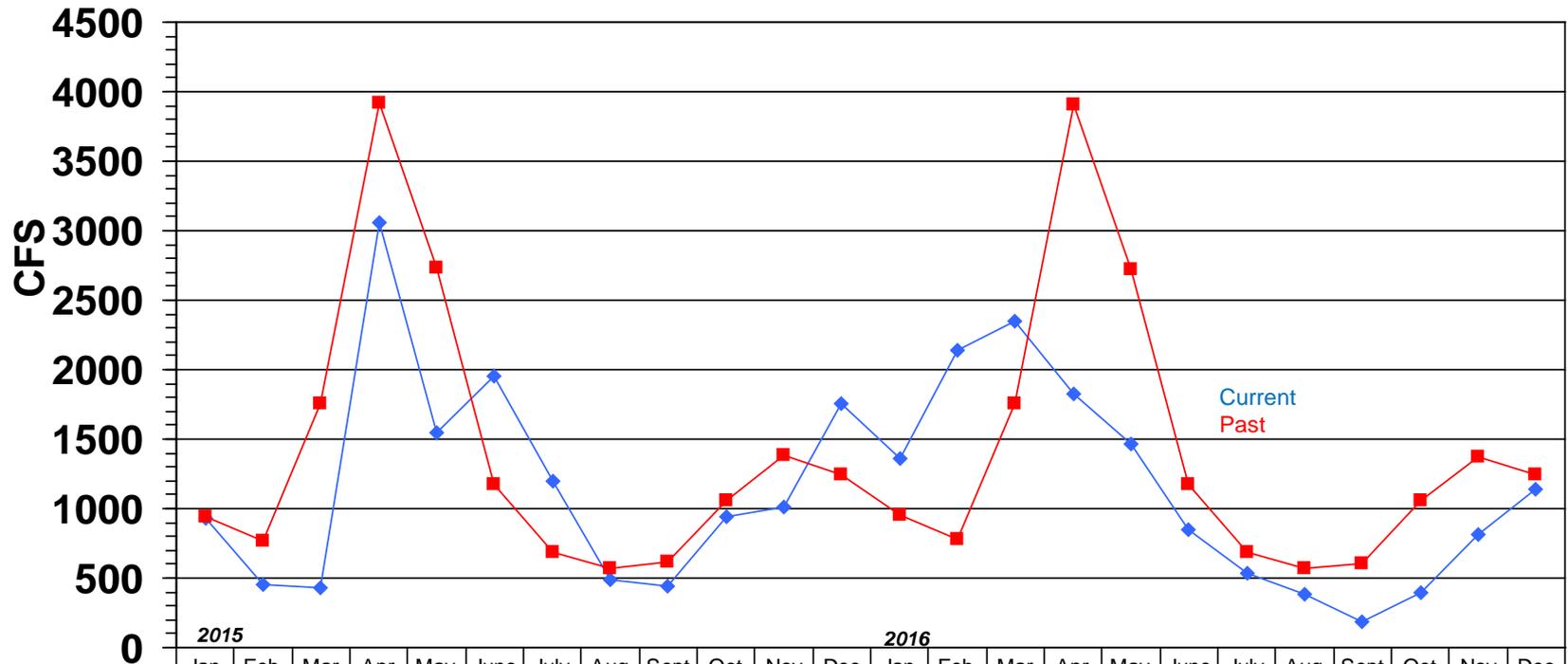


PEMIGEWASSET RIVER at PLYMOUTH NH

Gage# 01076500



MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS



	2015												2016											
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
◆ Monthly Mean Flow	934	456	431	3059	1543	1952	1201	491	443	943	1016	1759	1357	2142	2348	1830	1461	845	538	384	186	390	814	1139
■ Mean of Monthly Flows	946	766	1755	3921	2730	1178	682	567	612	1062	1381	1247	949	778	1760	3903	2719	1175	681	565	609	1056	1376	1246
% of Normal	99%	54%	25%	78%	56%	166%	176%	87%	72%	89%	74%	141%	143%	275%	133%	47%	54%	72%	79%	68%	30%	37%	59%	91%

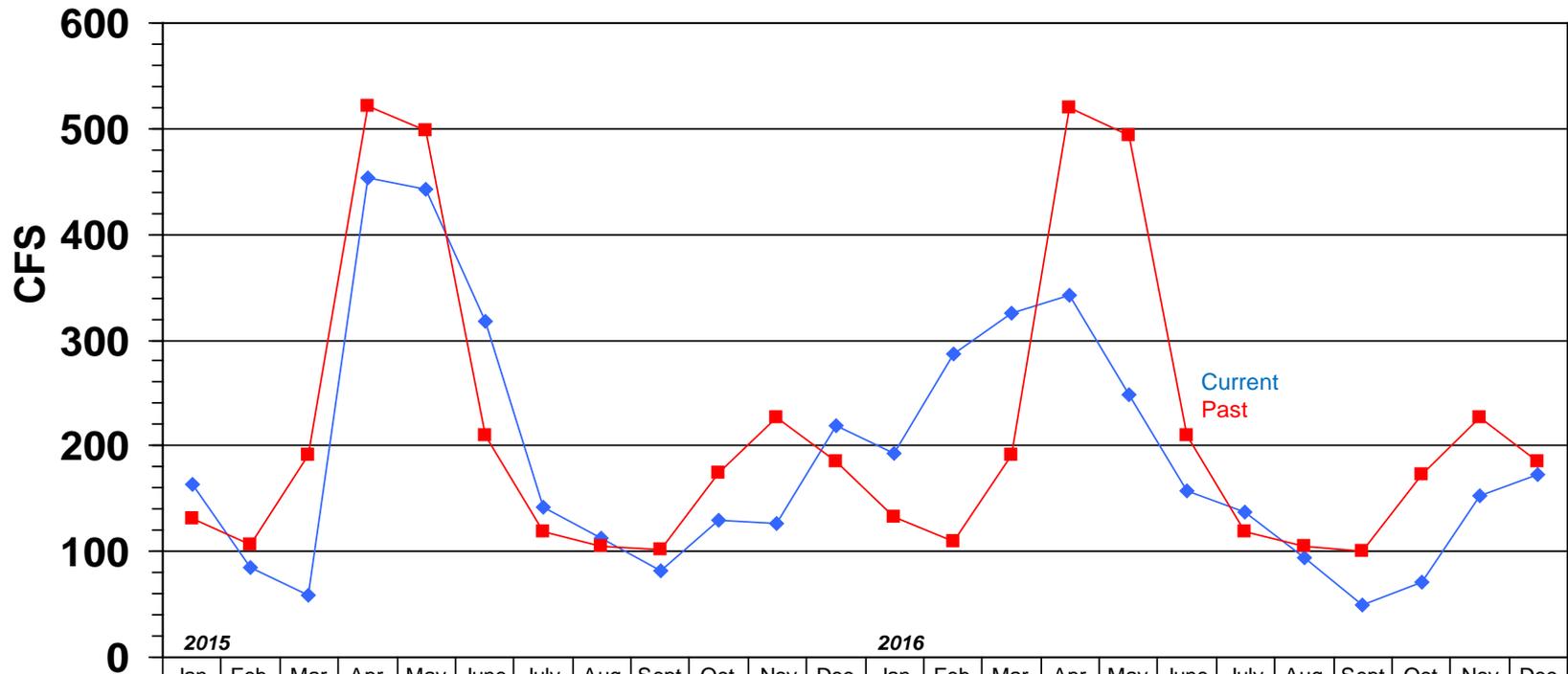
AMMONOOSUC RIVER at BETHLEHEM JUNCTION NH

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



	2015									2016														
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Monthly Mean Flow	163	85	59	453	443	317	142	112	81	129	126	219	193	287	325	342	249	158	138	94	50	71	152	172
Mean of Monthly Flows	131	106	191	522	498	210	118	105	102	174	227	185	132	109	192	520	494	209	118	105	101	173	226	185
% of Normal	124%	80%	31%	87%	89%	151%	120%	107%	79%	74%	55%	118%	146%	263%	169%	66%	50%	76%	117%	89%	50%	41%	67%	93%

Streamflow data for selected NH stations as of January 3, 2017

Station number	Station name	Est Mean flow (ft3/s)	Long term median flow (ft3/s)	99% flow (ft3/s)	7Q10 flow (ft3/s)	Lowest Period of Record daily flow(ft3/s)	% of Median flow	Below 0.99 Flow?	Below 7Q10 Flow?	Below Record Flow?
Androscoggin River Basin										
01052500	Diamond River near Wentworth Location, NH	ICE	140	22	16	6.8				
01053500	Androscoggin River at Errol, NH	1520	1719	500	451	0	88%	FALSE	FALSE	FALSE
01054000	Androscoggin River near Gorham, NH	1810	2010	1300	1310	795	90%	FALSE	FALSE	FALSE
Saco River Basin										
01064500	Saco River near Conway, NH	ICE	408	105	97	66		#VALUE!	#VALUE!	#VALUE!
01064801	BEARCAMP RIVER AT SOUTH TAMWORTH, NH	ICE	82	6	4.8	4.5		#VALUE!	#VALUE!	#VALUE!
Piscataqua River Basin										
01072800	COCHECO RIVER NEAR ROCHESTER, NH	77	125	--	--	2.2	62%			FALSE
01073500	LAMPREY RIVER NEAR NEWMARKET, NH	259	224	7	5	--	116%	FALSE	FALSE	
Merrimack River Basin										
01074520	EAST BRANCH PEMIGEWASSET RIVER AT LINCOLN, NH	131	157		49	46	83%	FALSE	FALSE	FALSE
01075000	PEMIGEWASSET RIVER AT WOODSTOCK, NH	227	220		56	--	103%	FALSE	FALSE	
01076000	BAKER RIVER NEAR RUMNEY, NH	144	105		15	--	137%	FALSE	FALSE	
01076500	PEMIGEWASSET RIVER AT PLYMOUTH, NH	ICE	653		118	45		#VALUE!	#VALUE!	#VALUE!
01078000	SMITH RIVER NEAR BRISTOL, NH	58	74		6.2	2.7	78%	FALSE	FALSE	FALSE
01081000	WINNIPESAUKEE RIVER AT TILTON, NH	315	774		136	48	41%	FALSE	FALSE	FALSE
01081500	MERRIMACK RIVER AT FRANKLIN JUNCTION, NH	1380	1800		551	--	77%		FALSE	
01082000	CONTOOCOOK RIVER AT PETERBOROUGH, NH	ICE	89		6.3	--		#VALUE!	#VALUE!	
01085000	CONTOOCOOK RIVER NEAR HENNIKER, NH	293			37	--		FALSE	FALSE	
01085500	CONTOOCOOK R BL HOPKINTON DAM AT W HOPKINTON, NH	440	623		39	--	71%	FALSE	FALSE	
01086000	WARNER RIVER AT DAVISVILLE, NH	116	175		5.3	--	66%	FALSE	FALSE	
01087000	BLACKWATER RIVER NEAR WEBSTER, NH	105			13.7	--		FALSE	FALSE	
01090800	PISCATAQUOG RIVER BL EVERETT DAM, NR E WEARE, NH	53			1.2	--				
01091500	PISCATAQUOG RIVER NEAR GOFFSTOWN, NH	197			8.8	--		FALSE	FALSE	
01092000	MERRIMACK R NR GOFFS FALLS, BELOW MANCHESTER, NH	2760	4000		644	98*	69%		FALSE	
01094000	SOUHEGAN RIVER AT MERRIMACK, NH	206	206		12.9	--	100%	FALSE	FALSE	
Connecticut River Basin										
01129200	CONNECTICUT R BELOW INDIAN STREAM NR PITTSBURG, NH	795	735		42	30	108%		FALSE	FALSE
01129500	CONNECTICUT RIVER AT NORTH STRATFORD, NH	1960	1300		176	108	151%		FALSE	FALSE
01131500	CONNECTICUT RIVER NEAR DALTON, NH	2280	2020		389	115	113%		FALSE	FALSE
01137500	AMMONOOSUC RIVER AT BETHLEHEM JUNCTION, NH	94	97		28	21	97%	FALSE	FALSE	FALSE
01138500	CONNECTICUT RIVER AT WELLS RIVER, VT	2660	3810		690	152*	70%	FALSE	FALSE	
01144500	CONNECTICUT RIVER AT WEST LEBANON, NH	1520	4500	380*	902	82*	34%		FALSE	
01152500	SUGAR RIVER AT WEST CLAREMONT, NH	239	250	40	38	14	96%	FALSE	FALSE	FALSE
01154500	CONNECTICUT RIVER AT NORTH WALPOLE, NH	10800	5950	260*	1058	115*	182%		FALSE	
01158000	ASHUELOT RIVER BELOW SURRY MT DAM, NEAR KEENE, NH	105	98	4.5	2.7	0.4	107%	FALSE	FALSE	FALSE
01158600	OTTER BROOK BELOW OTTER BROOK DAM, NEAR KEENE, NH	50	52	1.6	1.1	0.3	96%	FALSE	FALSE	FALSE
01160350	ASHUELOT RIVER AT WEST SWANZEY, NH	284	489	32	--	--	58%	FALSE		

*Flow duration and record low mean daily flow significantly affected by reservoir operations

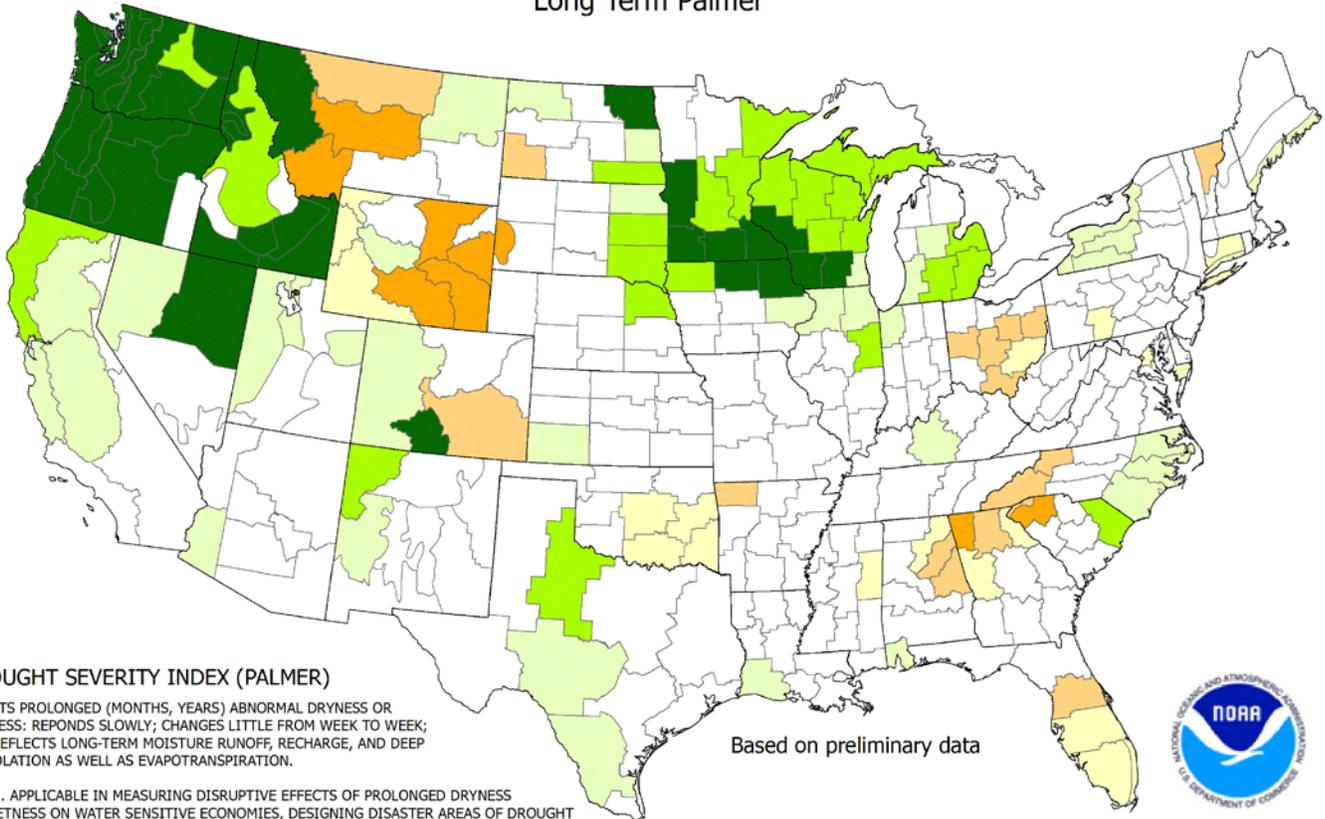
**Estimated

Average % of median for all basins

92%

SUMMARY			
	Below 0.99 Flow?	Below 7Q10 Flow?	Below Record Flow?
FALSE =	20	26	13
TRUE =	0	0	0

Drought Severity Index by Division
Weekly Value for Period Ending Dec 31, 2016
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

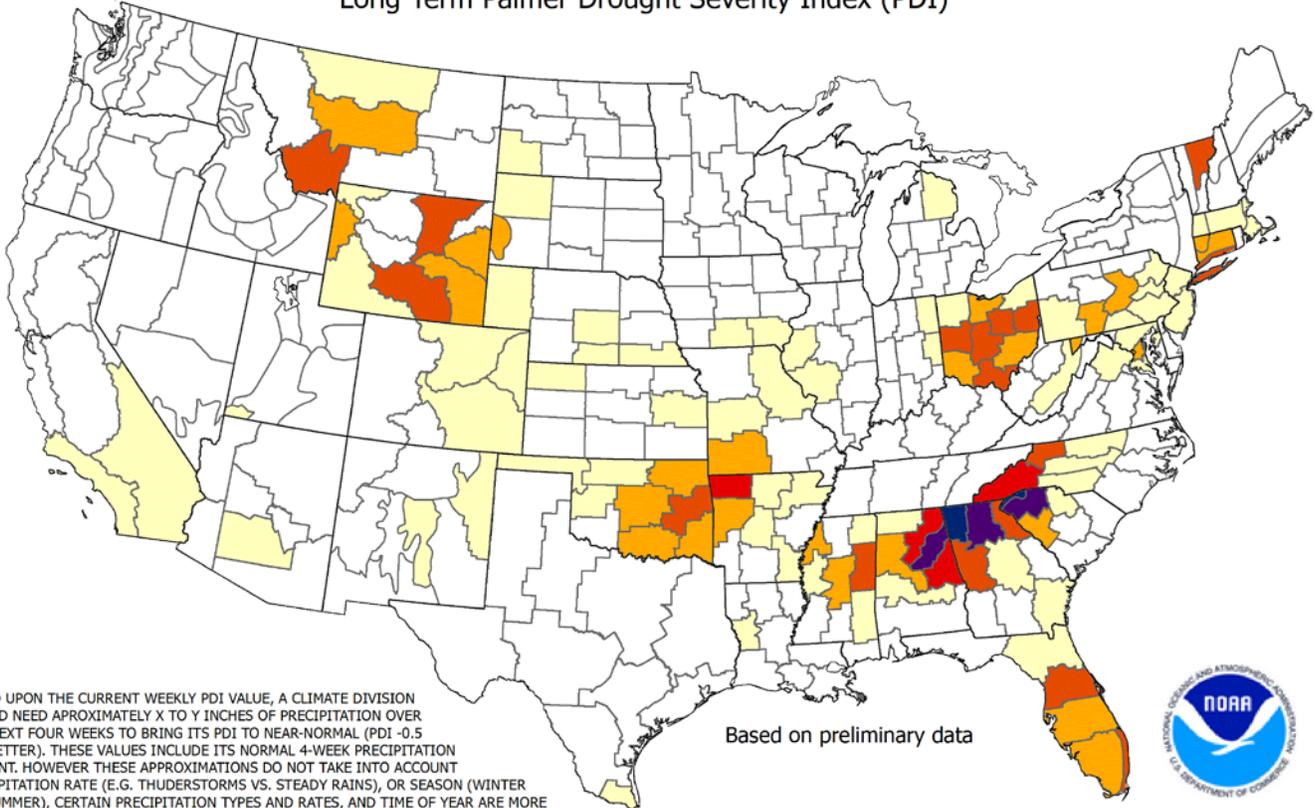


- 4.0 or less (Extreme Drought)
- 3.0 to -3.9 (Severe Drought)
- 2.0 to -2.9 (Moderate Drought)
- 1.9 to +1.9 (Near Normal)
- +2.0 to +2.9 (Unusual Moist Spell)
- +3.0 to +3.9 (Very Moist Spell)
- +4.0 and above (Extremely Moist)

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 31, 2016
 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
 - Trace to 3 Inches
 - 3 to 6 Inches
 - 6 to 9 Inches
- 9 to 12 Inches
 - 12 to 15 Inches
 - Over 15 Inches

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