



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



**Thomas S. Burack, Commissioner**

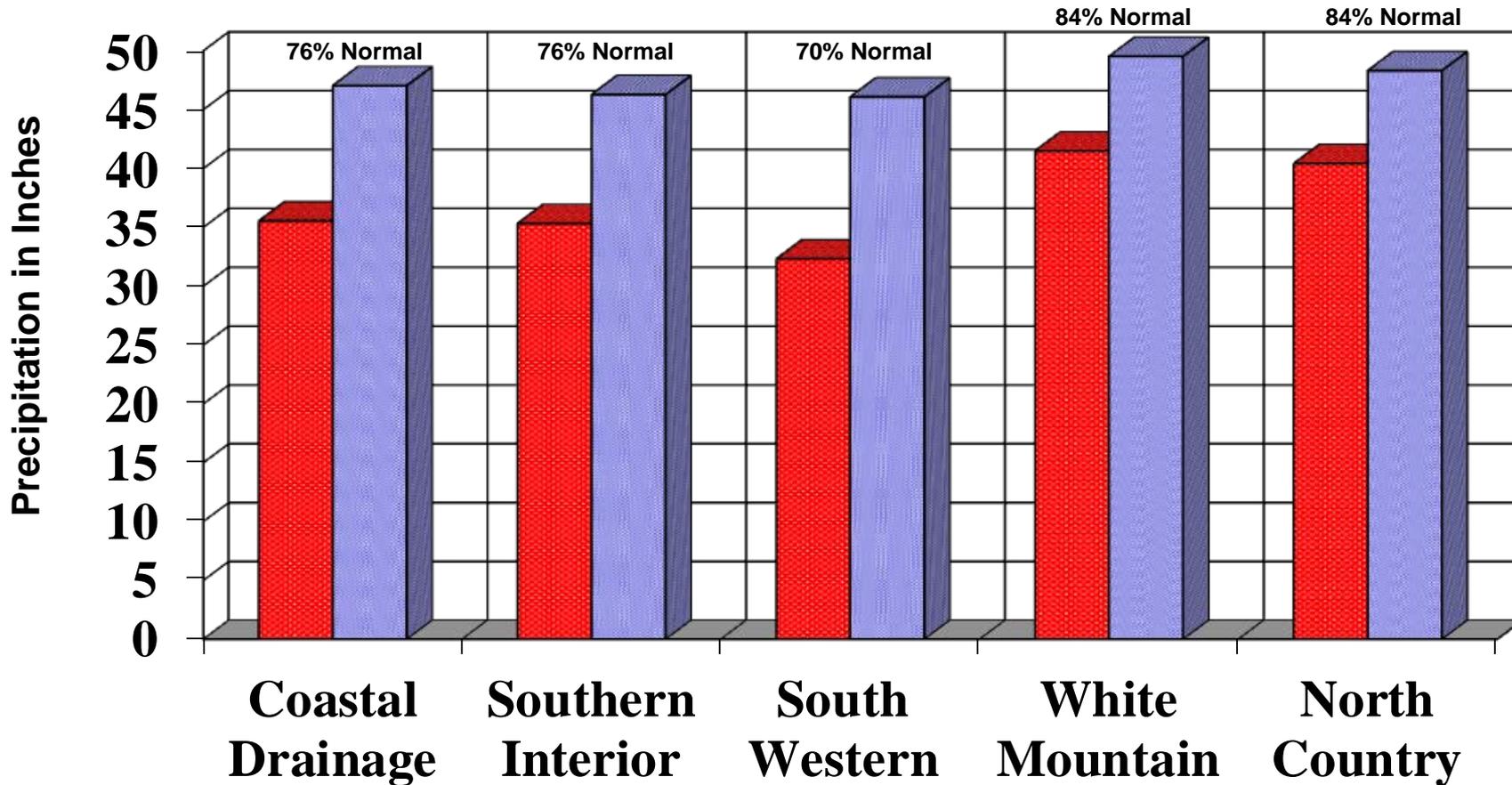
**AGGREGATED PRECIPITATION DATA for N.H.  
 DROUGHT MANAGEMENT AREAS**

	Actual Rainfall (inches)	Normal Rainfall (inches)	Deviation from Normal (inches)	Percent of Normal
<u>Coastal Drainage:</u> Rockingham, Strafford counties				
four month	13.83	16.15	-2.32	86%
six month	18.81	24.16	-5.35	78%
nine month	25.19	36.64	-11.45	69%
twelve month	35.54	47.04	-11.50	76%
<u>Southern Interior:</u> Belknap, Hillsborough, Merrimack counties				
four month	14.15	16.08	-1.92	88%
six month	19.52	24.40	-4.88	80%
nine month	25.93	36.12	-10.18	72%
twelve month	35.33	46.28	-10.95	76%
<u>South Western:</u> Cheshire, Sullivan counties				
four month	13.57	16.33	-2.76	83%
six month	19.01	24.88	-5.87	76%
nine month	25.33	36.23	-10.91	70%
twelve month	32.32	46.08	-12.19	70%
<u>White Mountain:</u> Carroll, Grafton counties				
four month	14.26	17.91	-3.65	80%
six month	22.62	26.93	-4.31	84%
nine month	30.45	39.03	-8.58	78%
twelve month	41.50	49.53	-8.03	84%
<u>North Country:</u> Coos county				
four month	14.82	17.62	-2.80	84%
six month	22.43	26.98	-4.55	83%
nine month	30.50	38.02	-7.52	80%
twelve month	40.43	48.32	-7.89	84%

four month period : August 2016 - November 2016  
 six month period : June 2016 - November 2016  
 nine month period : March 2016 - November 2016  
 twelve month period: December 2015 - November 2016

Source: Northeast River Forecast Center, NH Des Dam Bureau

# TWELVE MONTH AGGREGATED PRECIPITATION DATA for N.H. DROUGHT MANAGEMENT AREAS from December 2015 through November 2016



■ Actual 
 ■ Normal

# MONTHLY PRECIPITATION DATA FOR N.H COUNTIES



		2015	2016										
		DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
<u>Coastal drainage</u>													
STRAFFORD	actual	4.42	1.68	4.51	2.72	2.09	1.65	2.58	3.06	2.04	1.92	5.47	3.36
	normal	3.76	3.21	3.41	4.16	4.22	4.10	4.16	3.99	3.73	3.74	4.38	4.50
	deviation	0.66	-1.53	1.10	-1.44	-2.13	-2.45	-1.58	-0.93	-1.69	-1.82	1.09	-1.14
ROCKINGHAM	actual	4.39	1.71	3.98	2.45	2.10	1.76	1.94	2.38	2.36	2.63	6.25	3.62
	normal	3.73	3.27	3.41	4.19	4.20	4.10	4.10	3.77	3.54	3.76	4.34	4.30
	deviation	0.66	-1.56	0.57	-1.74	-2.10	-2.34	-2.16	-1.39	-1.18	-1.13	1.91	-0.68
Average	actual	4.41	1.70	4.25	2.59	2.10	1.71	2.26	2.72	2.20	2.28	5.86	3.49
	normal	3.75	3.24	3.41	4.18	4.21	4.10	4.13	3.88	3.64	3.75	4.36	4.40
	deviation	0.66	-1.55	0.84	-1.59	-2.12	-2.40	-1.87	-1.16	-1.44	-1.48	1.50	-0.91
<u>Southern Interior</u>													
HILLSBOROUGH	actual	4.10	1.39	3.75	2.39	1.91	1.98	1.80	2.16	3.12	3.27	4.79	3.78
	normal	3.80	3.38	3.40	3.95	4.14	4.10	4.22	3.96	3.76	3.74	4.46	4.22
	deviation	0.30	-1.99	0.35	-1.56	-2.23	-2.12	-2.42	-1.80	-0.64	-0.47	0.33	-0.44
MERRIMACK	actual	4.14	1.27	4.05	2.31	1.78	2.50	2.42	3.29	2.57	2.51	4.99	3.84
	normal	3.65	3.26	3.20	3.73	3.95	4.01	4.34	4.11	3.75	3.77	4.43	4.15
	deviation	0.49	-1.99	0.85	-1.42	-2.17	-1.51	-1.92	-0.82	-1.18	-1.26	0.56	-0.31
BELKNAP	actual	4.20	1.41	3.87	2.25	1.81	2.32	2.95	3.47	2.93	1.78	4.81	4.07
	normal	3.58	3.07	3.14	3.58	3.75	3.95	4.25	4.08	3.78	3.65	4.49	4.03
	deviation	0.62	-1.66	0.73	-1.33	-1.94	-1.63	-1.30	-0.61	-0.85	-1.87	0.32	0.04
Average	actual	4.15	1.36	3.89	2.32	1.83	2.27	2.39	2.97	2.87	2.52	4.86	3.90
	normal	3.68	3.24	3.25	3.75	3.95	4.02	4.27	4.05	3.76	3.72	4.46	4.13
	deviation	0.47	-1.88	0.64	-1.44	-2.11	-1.75	-1.88	-1.08	-0.89	-1.20	0.40	-0.24
<u>South Western</u>													
CHESHIRE	actual	3.86	1.23	3.62	2.21	1.83	2.38	2.06	2.69	5.07	2.81	3.05	3.45
	normal	3.68	3.42	3.28	3.73	3.78	4.10	4.20	4.36	4.05	3.83	4.60	3.97
	deviation	0.18	-2.19	0.34	-1.52	-1.95	-1.72	-2.14	-1.67	1.02	-1.02	-1.55	-0.52
SULLIVAN	actual	3.68	1.17	3.93	2.07	1.64	2.50	2.54	3.59	3.68	2.03	3.65	3.40
	normal	3.49	2.72	3.11	3.51	3.67	3.91	4.18	4.36	4.05	3.80	4.51	3.85
	deviation	0.19	-1.90	0.82	-1.44	-2.03	-1.41	-1.64	-0.77	-0.37	-1.77	-0.86	-0.45
Average	actual	3.77	-0.55	3.78	2.14	1.74	2.44	2.30	3.14	4.38	2.42	3.35	3.43
	normal	3.59	3.07	3.20	3.62	3.73	4.01	4.19	4.36	4.05	3.82	4.56	3.91
	deviation	0.19	-2.05	0.58	-1.48	-1.99	-1.57	-1.89	-1.22	0.33	-1.40	-1.21	-0.49
<u>White Mountain</u>													
GRAFTON	actual	4.75	1.50	4.34	2.45	2.34	3.13	3.85	4.39	4.52	1.86	4.08	3.93
	normal	3.70	3.19	2.94	3.45	3.76	4.20	4.58	4.56	4.61	4.10	4.67	4.35
	deviation	1.05	-1.69	1.40	-1.00	-1.42	-1.07	-0.73	-0.17	-0.09	-2.24	-0.59	-0.42
CARROLL	actual	5.08	1.78	4.65	3.00	2.40	2.35	3.92	4.55	3.09	1.44	5.04	4.56
	normal	4.16	3.57	3.43	4.02	4.46	4.32	4.49	4.41	4.42	3.98	4.96	4.72
	deviation	0.92	-1.79	1.22	-1.02	-2.06	-1.97	-0.57	0.14	-1.33	-2.54	0.08	-0.16
Average	actual	4.92	1.64	4.50	2.73	2.37	2.74	3.89	4.47	3.81	1.65	4.56	4.25
	normal	3.93	3.38	3.19	3.74	4.11	4.26	4.54	4.49	4.52	4.04	4.82	4.54
	deviation	0.99	-1.74	1.31	-1.01	-1.74	-1.52	-0.65	-0.02	-0.71	-2.39	-0.26	-0.29
<u>North Country</u>													
COOS	actual	4.39	1.56	3.98	2.38	2.77	2.92	3.39	4.22	5.62	2.07	3.56	3.57
	normal	4.38	3.10	2.82	3.21	3.62	4.21	4.79	4.57	4.85	4.00	4.53	4.24
	deviation	0.01	-1.54	1.16	-0.83	-0.85	-1.29	-1.40	-0.35	0.77	-1.93	-0.97	-0.67

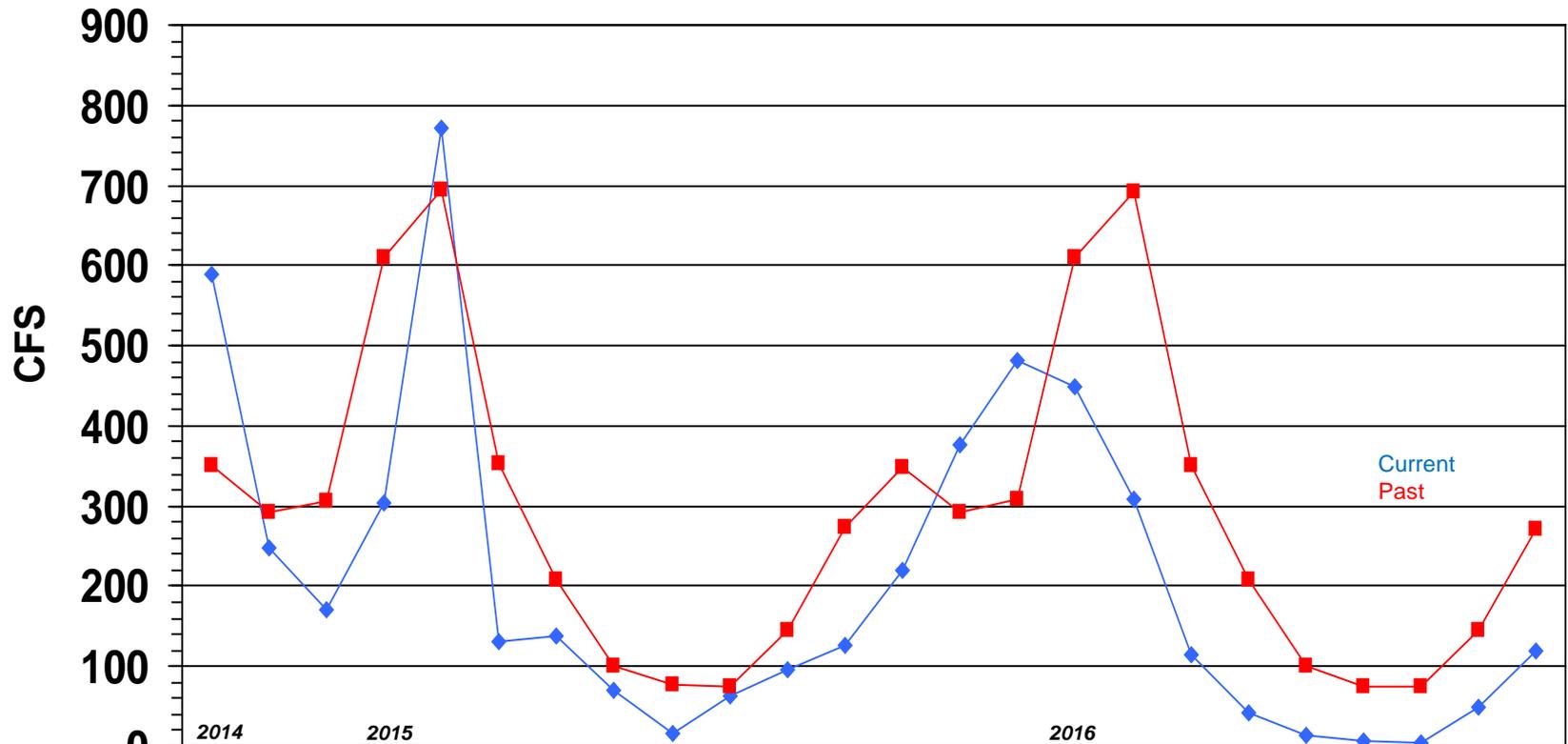
Source: Northeast River Forecast Center, NH DES Dam Bureau

# LAMPREY RIVER near NEWMARKET NH

## Gage# 01073500



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



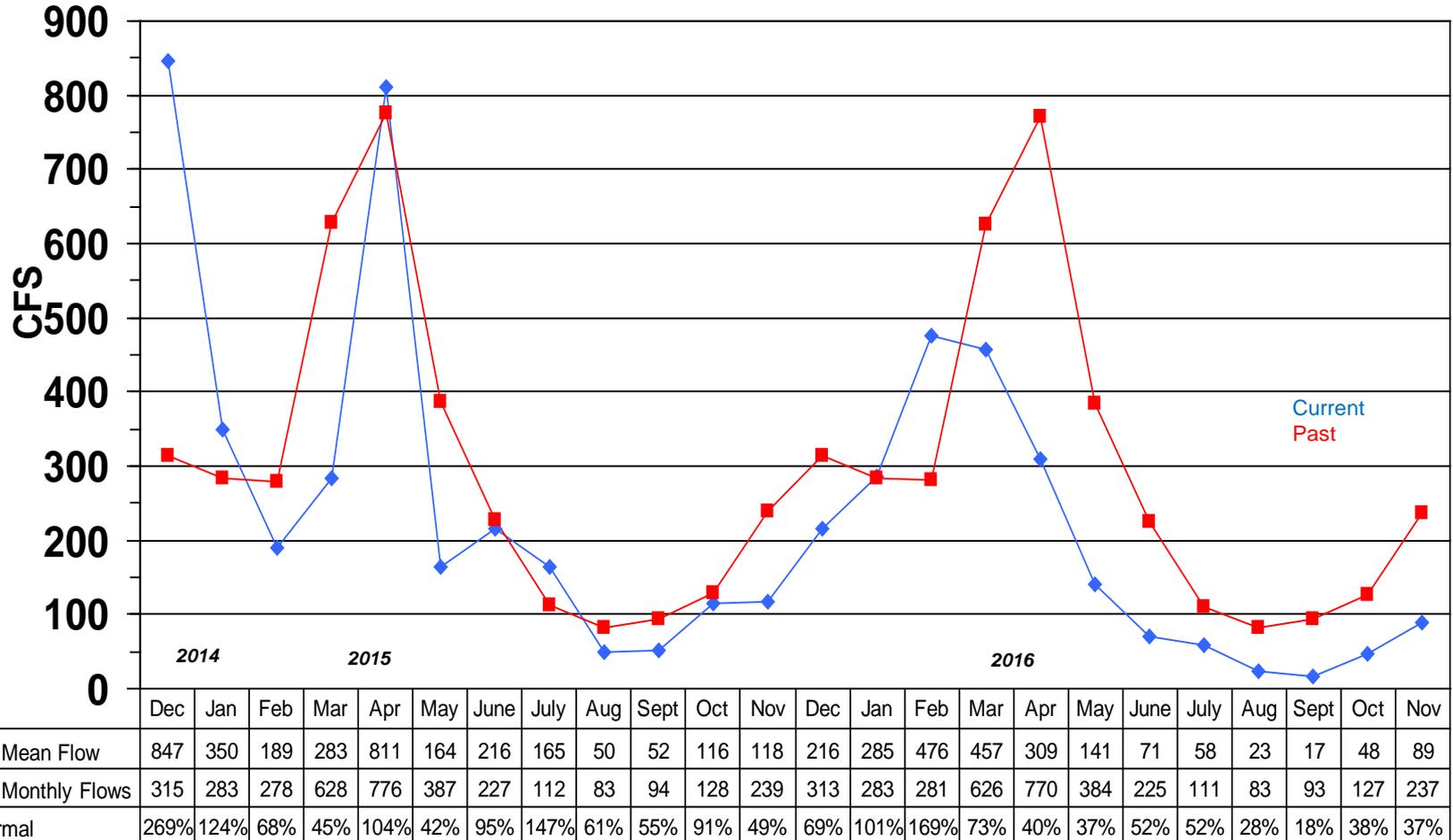
	2014			2015							2016													
	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov
◆ Monthly Mean Flow	590	248	170	305	771	132	137	70	17	63	95	127	219	376	481	450	308	115	43	14	7	5	48	119
■ Mean of Monthly Flows	351	292	307	611	695	353	209	101	76	75	146	273	349	293	309	609	691	350	207	100	75	74	145	271
% of Normal	168%	85%	55%	50%	111%	37%	66%	70%	23%	84%	65%	46%	63%	128%	156%	74%	45%	33%	21%	14%	9%	7%	33%	44%

# SOUHEGAN RIVER at MERRIMACK NH

## Gage# 01094000



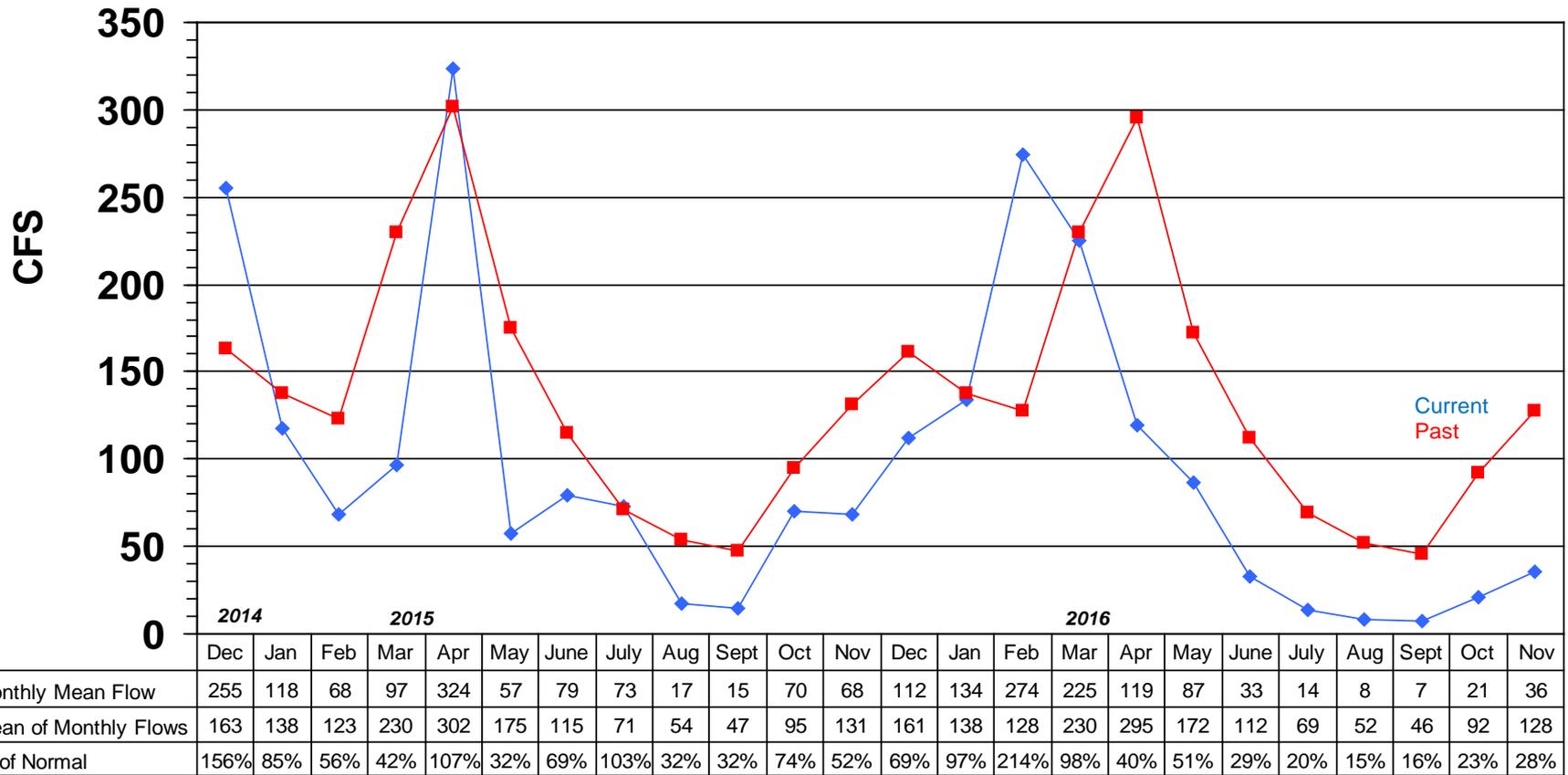
### MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS



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



MONTHLY MEAN FLOW COMPARED TO MEAN OF MONTHLY FLOWS

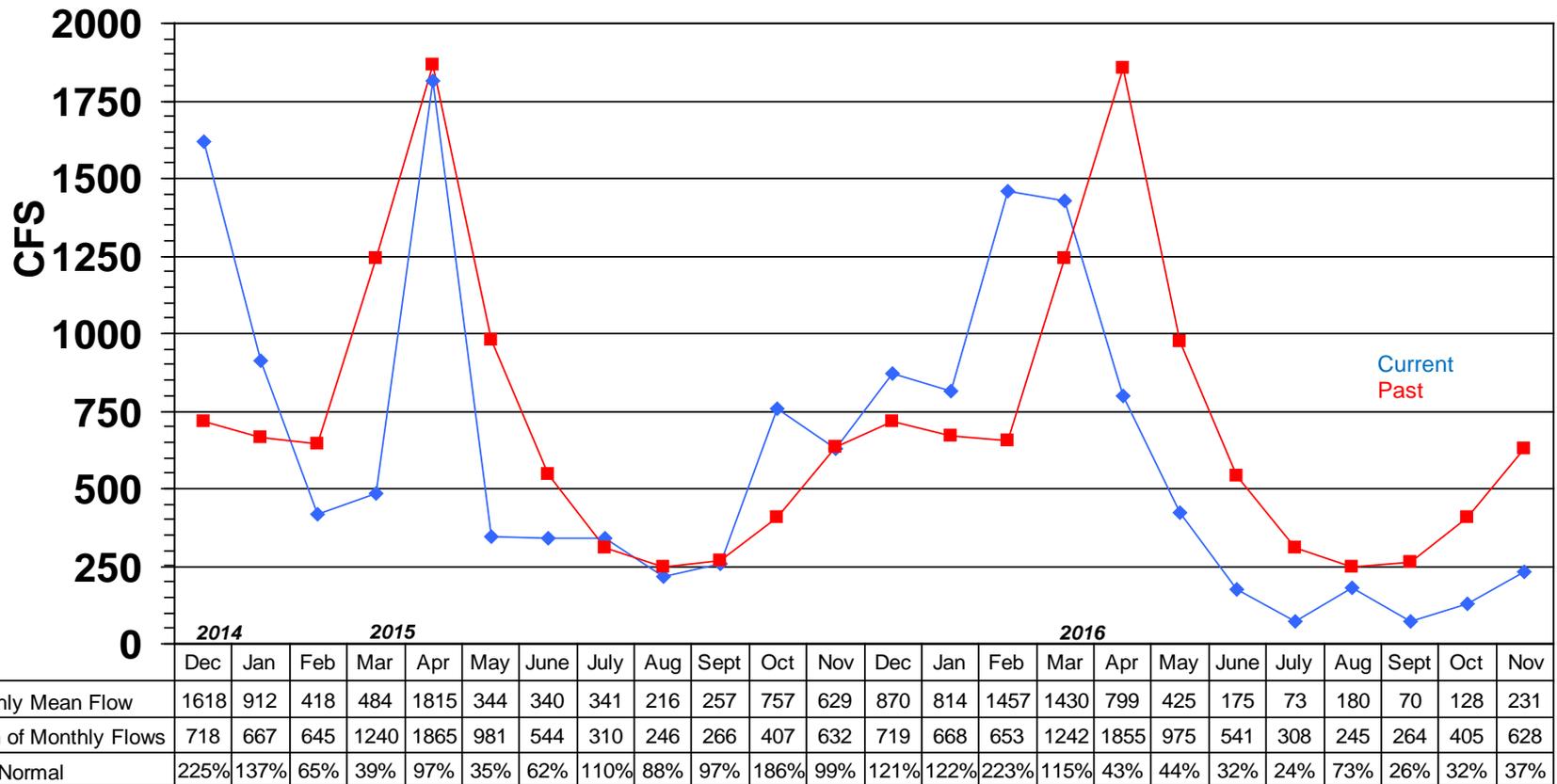


# ASHUELOT RIVER at HINSDALE NH

## Gage# 01161000



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

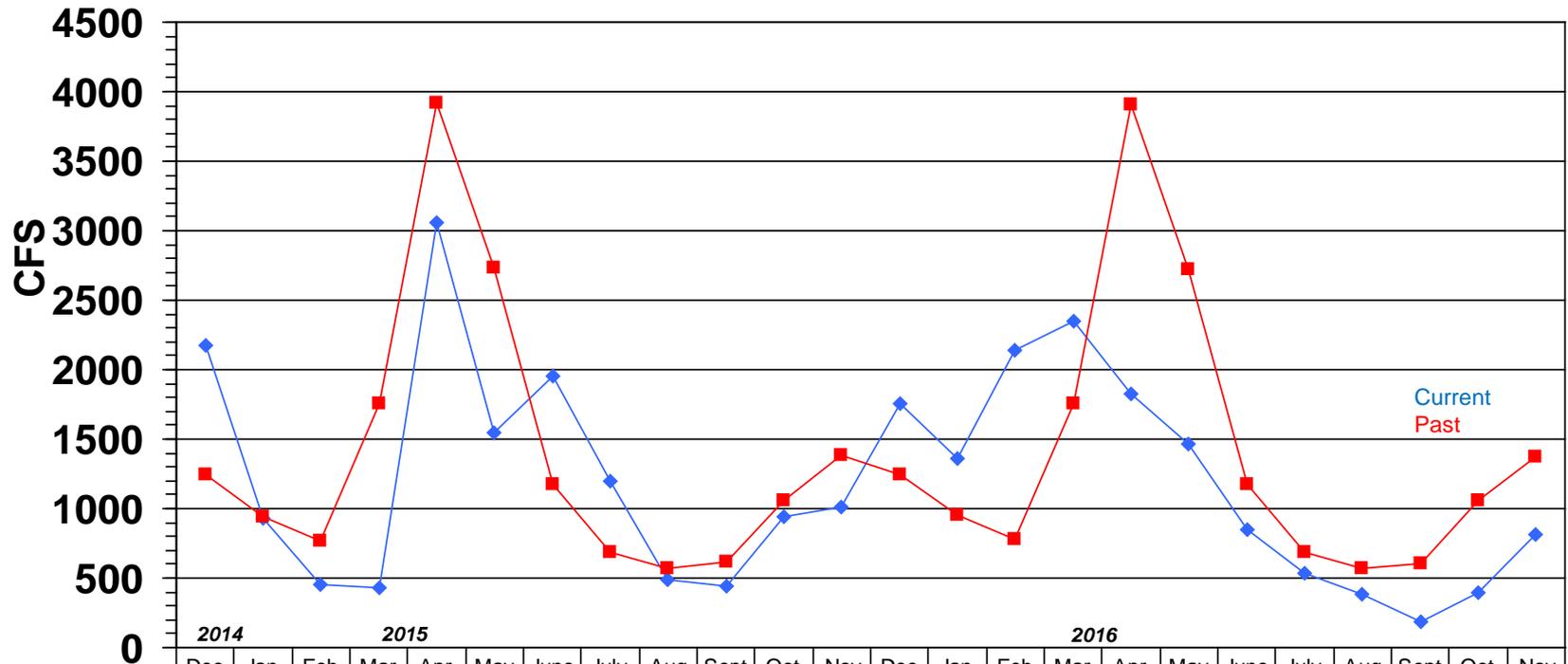


# PEMIGEWASSET RIVER at PLYMOUTH NH

## Gage# 01076500



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



	2014			2015							2016													
	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	2169	934	456	431	3059	1543	1952	1201	491	443	943	1016	1759	1357	2142	2348	1830	1461	845	538	384	186	390	814
■ Mean of Monthly Flows	1242	946	766	1755	3921	2730	1178	682	567	612	1062	1381	1247	949	778	1760	3903	2719	1175	681	565	609	1056	1376
% of Normal	175%	99%	54%	25%	78%	56%	166%	176%	87%	72%	89%	74%	141%	143%	275%	133%	47%	54%	72%	79%	68%	30%	37%	59%

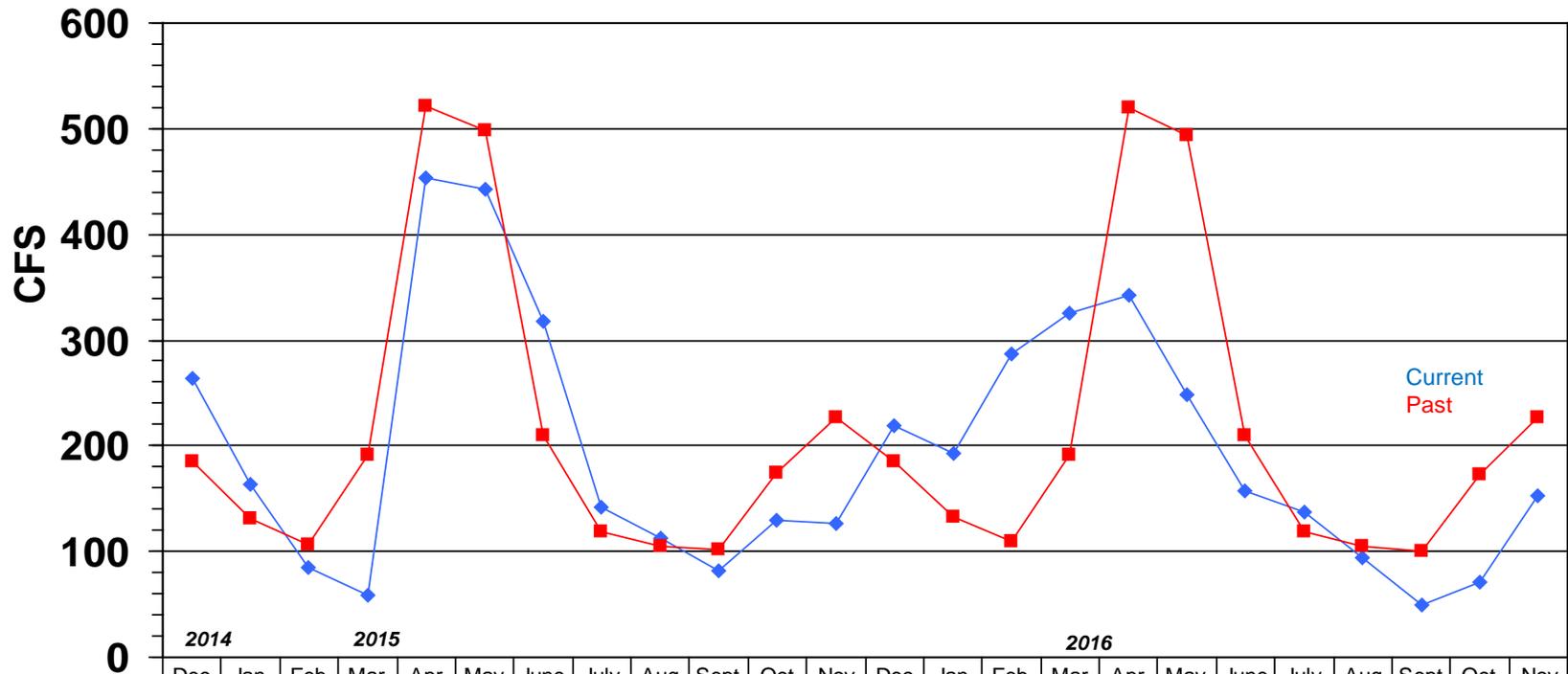
# AMMONOOSUC RIVER at BETHLEHEM JUNCTION NH

## 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



	2014			2015									2016											
	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	263	163	85	59	453	443	317	142	112	81	129	126	219	193	287	325	342	249	158	138	94	50	71	152
Mean of Monthly Flows	185	131	106	191	522	498	210	118	105	102	174	227	185	132	109	192	520	494	209	118	105	101	173	226
% of Normal	142%	124%	80%	31%	87%	89%	151%	120%	107%	79%	74%	55%	118%	146%	263%	169%	66%	50%	76%	117%	89%	50%	41%	67%

## Streamflow data for selected NH stations as of December 5, 2016

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?
<b>Androscoggin River Basin</b>										
01052500	Diamond River near Wentworth Location, NH	221	193	22	16	6.8	115%			
01053500	Androscoggin River at Errol, NH	1210	1610	500	451	0	75%	FALSE	FALSE	FALSE
01054000	Androscoggin River near Gorham, NH	1750	1920	1300	1310	795	91%	FALSE	FALSE	FALSE
<b>Saco River Basin</b>										
01064500	Saco River near Conway, NH	843	651	105	97	66	129%	FALSE	FALSE	FALSE
01064801	BEARCAMP RIVER AT SOUTH TAMWORTH, NH	116	136	6	4.8	4.5	85%	FALSE	FALSE	FALSE
<b>Piscataqua River Basin</b>										
01072800	COCHECO RIVER NEAR ROCHESTER, NH	121	94	--	--	2.2	129%			FALSE
01073500	LAMPREY RIVER NEAR NEWMARKET, NH	303	290	7	5	--	104%	FALSE	FALSE	
<b>Merrimack River Basin</b>										
01074520	EAST BRANCH PEMIGEWASSET RIVER AT LINCOLN, NH	237	292		49	46	81%	FALSE	FALSE	FALSE
01075000	PEMIGEWASSET RIVER AT WOODSTOCK, NH	401	345		56	--	116%	FALSE	FALSE	FALSE
01076000	BAKER RIVER NEAR RUMNEY, NH	260	160		15	--	163%	FALSE	FALSE	
01076500	PEMIGEWASSET RIVER AT PLYMOUTH, NH	1260	910		118	45	138%	FALSE	FALSE	FALSE
01078000	SMITH RIVER NEAR BRISTOL, NH	96	99		6.2	2.7	97%	FALSE	FALSE	FALSE
01081000	WINNIPESAUKEE RIVER AT TILTON, NH	295	548		136	48	54%	FALSE	FALSE	FALSE
01081500	MERRIMACK RIVER AT FRANKLIN JUNCTION, NH	2490	1920		551	--	130%		FALSE	
01082000	CONTOOCOOK RIVER AT PETERBOROUGH, NH	99	100		6.3	--	99%	FALSE	FALSE	
01085000	CONTOOCOOK RIVER NEAR HENNIKER, NH	491			37	--		FALSE	FALSE	
01085500	CONTOOCOOK R BL HOPKINTON DAM AT W HOPKINTON, NH	831	711		39	--	117%	FALSE	FALSE	
01086000	WARNER RIVER AT DAVISVILLE, NH	185	180		5.3	--	103%	FALSE	FALSE	
01087000	BLACKWATER RIVER NEAR WEBSTER, NH	233			13.7	--		FALSE	FALSE	
01090800	PISCATAQUOG RIVER BL EVERETT DAM, NR E WEARE, NH	93			1.2	--				
01091500	PISCATAQUOG RIVER NEAR GOFFSTOWN, NH	247			8.8	--		FALSE	FALSE	
01092000	MERRIMACK R NR GOFFS FALLS, BELOW MANCHESTER, NH	4880	4340		644	98*	112%		FALSE	
01094000	SOUHEGAN RIVER AT MERRIMACK, NH	273	195		12.9	--	140%	FALSE	FALSE	
<b>Connecticut River Basin</b>										
01129200	CONNECTICUT R BELOW INDIAN STREAM NR PITTSBURG, NH	446	594		42	30	75%		FALSE	FALSE
01129500	CONNECTICUT RIVER AT NORTH STRATFORD, NH	1790	1400		176	108	128%		FALSE	FALSE
01131500	CONNECTICUT RIVER NEAR DALTON, NH	4130	2290		389	115	180%		FALSE	FALSE
01137500	AMMONOOSUC RIVER AT BETHLEHEM JUNCTION, NH	130	135		28	21	96%	FALSE	FALSE	FALSE
01138500	CONNECTICUT RIVER AT WELLS RIVER, VT	4900	4330		690	152*	113%	FALSE	FALSE	
01144500	CONNECTICUT RIVER AT WEST LEBANON, NH	7490	5570	380*	902	82*	134%		FALSE	
01152500	SUGAR RIVER AT WEST CLAREMONT, NH	251	290	40	38	14	87%	FALSE	FALSE	FALSE
01154500	CONNECTICUT RIVER AT NORTH WALPOLE, NH	11000	8290	260*	1058	115*	133%		FALSE	
01158000	ASHUELOT RIVER BELOW SURRY MT DAM, NEAR KEENE, NH	238	149	4.5	2.7	0.4	160%	FALSE	FALSE	FALSE
01158600	OTTER BROOK BELOW OTTER BROOK DAM, NEAR KEENE, NH	66	65	1.6	1.1	0.3	102%	FALSE	FALSE	FALSE
01160350	ASHUELOT RIVER AT WEST SWANZEY, NH	526	578	32	--	--	91%	FALSE		

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

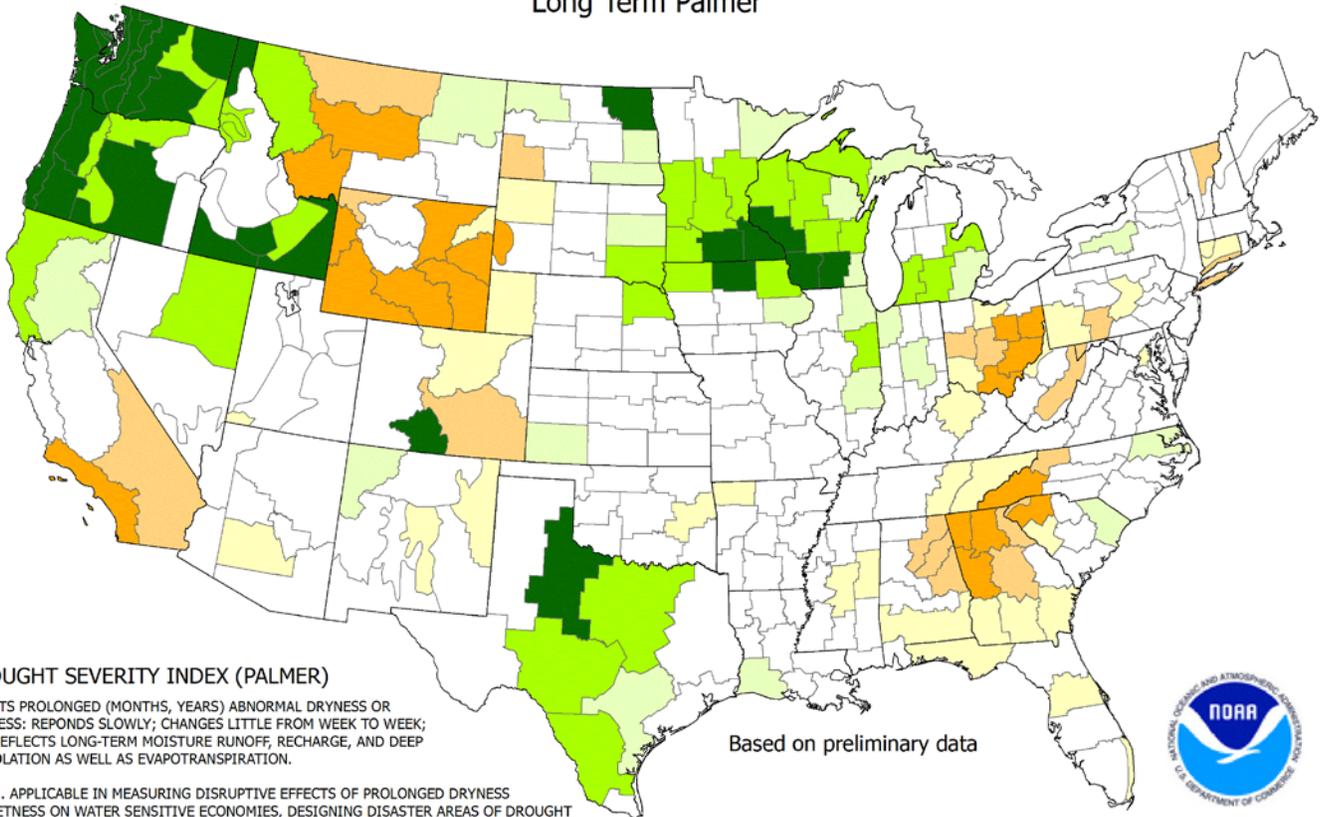
\*\*Estimated

Average % of median for all basins

113%

SUMMARY			
	Below 0.99 Flow?	Below 7Q10 Flow?	Below Record Flow?
FALSE =	24	30	16
TRUE =	0	0	0

Drought Severity Index by Division  
Weekly Value for Period Ending Dec 03, 2016  
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).

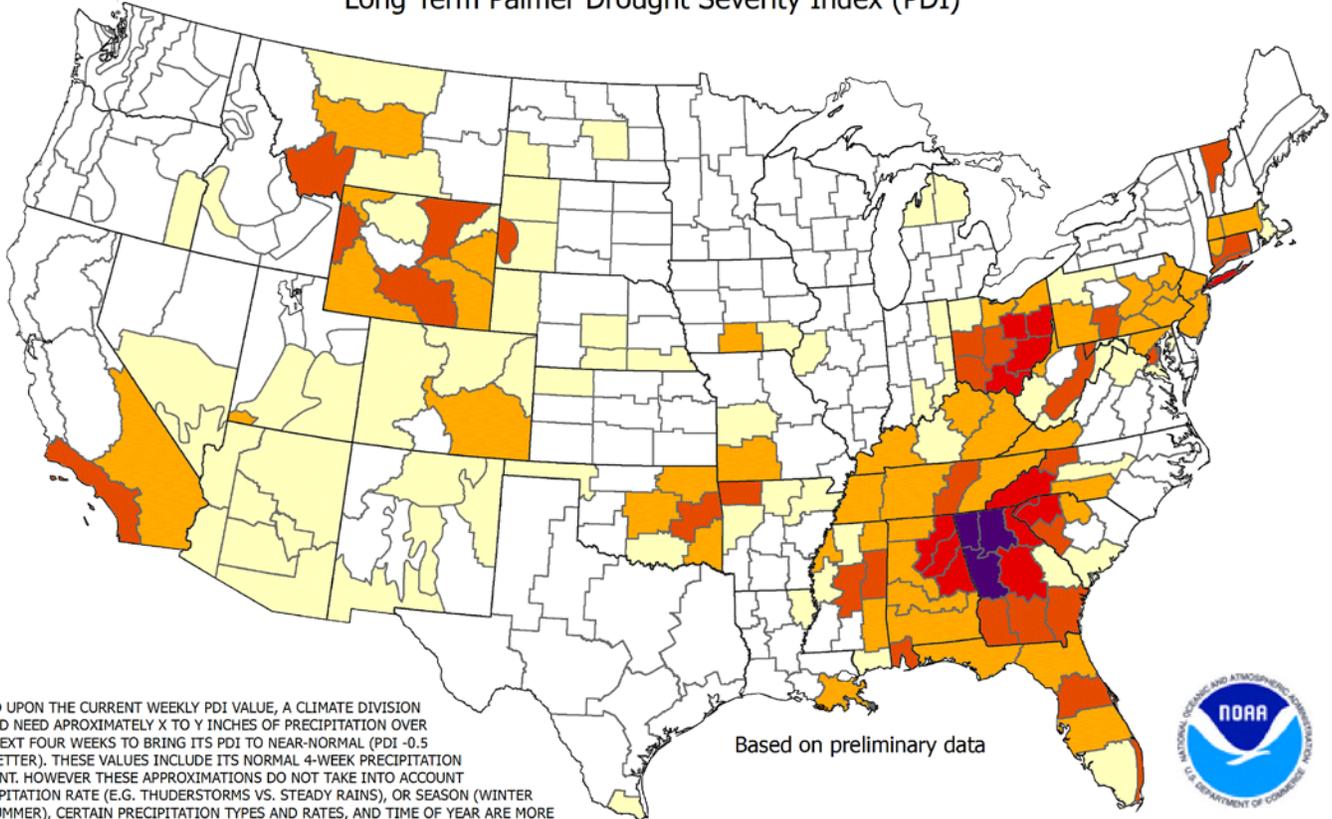
Based on preliminary data

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li><span style="color: orange;">■</span> -4.0 or less (Extreme Drought)</li> <li><span style="color: lightorange;">■</span> -3.0 to -3.9 (Severe Drought)</li> <li><span style="color: yellow;">■</span> -2.0 to -2.9 (Moderate Drought)</li> <li><span style="color: white;">■</span> -1.9 to +1.9 (Near Normal)</li> </ul> | <ul style="list-style-type: none"> <li><span style="color: lightgreen;">■</span> +2.0 to +2.9 (Unusual Moist Spell)</li> <li><span style="color: green;">■</span> +3.0 to +3.9 (Very Moist Spell)</li> <li><span style="color: darkgreen;">■</span> +4.0 and above (Extremely Moist)</li> </ul> |
|--|---|

**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 03, 2016  
 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

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