RIVER AND WEATHER CONDITIONS

Prepared for Waterways Association Meeting 04/12/2017
National Weather Service Forecast Office, Pittsburgh PA
For the latest river and weather forecasts--http://www.weather.gov/pittsburgh

WEATHER RECAP

After the record warm February 2017, March 2017 had normal temperatures, with above normal snowfall and much above normal rainfall. River flows were above normal for much of the month.

OUTLOOK

Rest of Week: Warm and minimal rainfall. Warm but a chance of showers over Easter weekend. Rain 0.50-1.00 inches.
Week of Apr 17:. Warm with frequent showers. Rain 1.00 inch.
Week of Apr 24: Rainy week, with a cold blast the second half of week. Snow flurries possible. Rain about 1.50 inches.
Outlook May: Normal rainfall. Below normal temperatures the first half of month then rapid change to summer temperatures.
Outlook June: Below normal rainfall and above normal temperatures.

HIGH WATER POTENTIAL

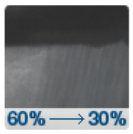
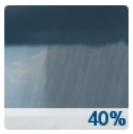
High water potential is about normal. Soils are moist but minimal rainfall for the next week with spring vegetation/foliage ahead of schedule. A minimum of 1.50 inch basin wide rainfall in 6 to 12 hours is needed to bring rivers to bank full. Rainfall through the last week of April should average around 3.00 inches which is above normal.

Location	*Mar 2017 Precipitation*	*Departure (Inches)*	*Mar Snowfall*	*Seasonal Snowfall*
Pittsburgh	5.02	+2.07	9.7 (+2.1)	32.0(-9.2)

Location	*Mar Average Temperature*	*Departure Degrees*	*Extreme High*	*Extreme Low*
Pittsburgh	39.9	+0.3	74 Mar 24	15 Mar 12,15

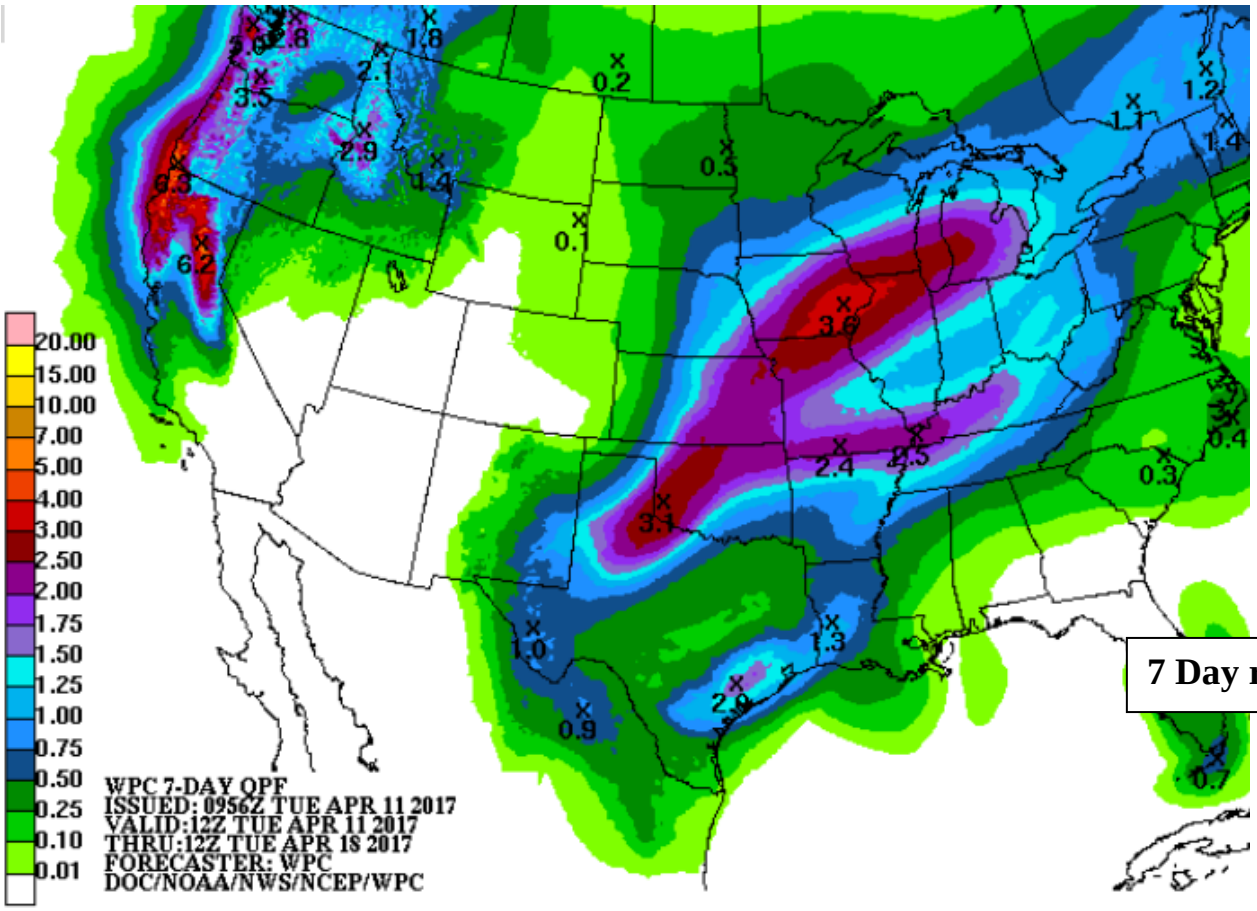
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average monthly precipitation	2.7	2.39	2.95	3.11	3.95	4.3	3.83	3.48	3.11	2.29	3.23	2.85	38.19
Average High Temperature	35.7	39.3	49.2	61.7	70.8	79.1	82.5	81.4	74.3	62.6	51.2	39.4	60.7
Average Low Temperature	21.1	23	30	40.2	49.3	58.4	62.8	61.5	54	42.9	34.7	25.3	42
Average monthly snowfall	11.8	10.3	7.6	1.5	0	0	0	0	0	0.4	2	8.3	41.9

WEATHER FORECAST

Today	Tonight	Wednesday	Wednesday Night	Thursday	Thursday Night	Friday	Friday Night	Saturday
								
Partly Sunny then Chance Showers	Showers Likely then Chance Showers	Mostly Sunny	Mostly Clear	Partly Sunny	Mostly Cloudy	Mostly Sunny	Mostly Cloudy	Chance Showers
High: 70 °F	Low: 50 °F	High: 62 °F	Low: 41 °F	High: 64 °F	Low: 47 °F	High: 68 °F	Low: 52 °F	High: 74 °F

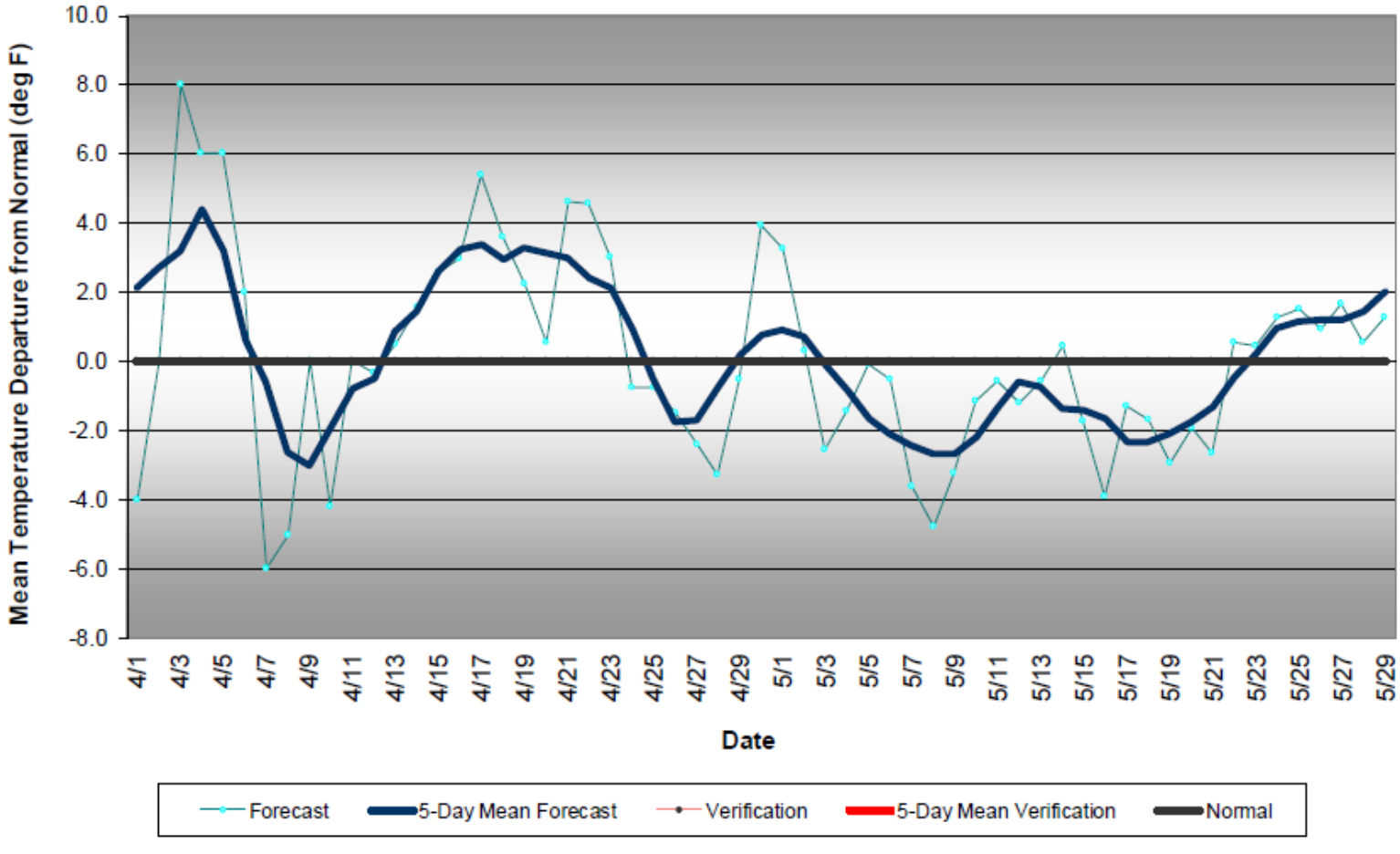
8-14 Day Outlook…Warm. Dry start then frequent showers days 10-14.
30 Day Outlook... Warm except a 3 to 4 day cold blast last week of April. Above normal rainfall.
May-Jun-Jul Outlook…Warmer than normal and drier than normal.
Aug-Sep-Oct Outlook… Warmer than normal temperatures, below normal rainfall. Tropical season below normal.
Nov-Dec-Jan Outlook… Below normal temperatures and above normal snowfall.

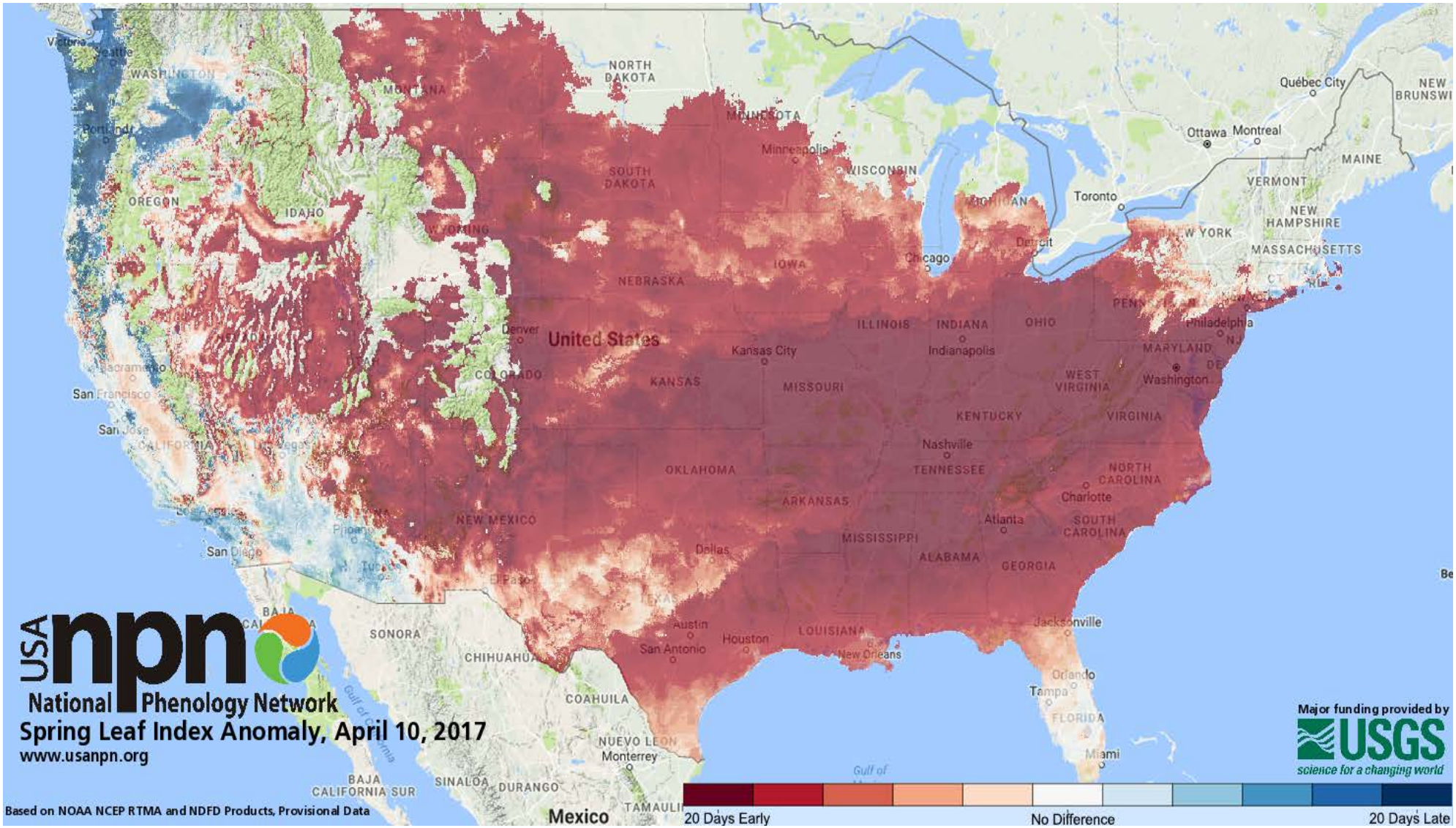
Average Yearly rainfall Pittsburgh: 38.19 inches **So far in 2017:**10.68 (+1.51)
Totals for: 2016:35.01 in 2015:40.56 in 2014:36.84 in 2013: 36.65 in; 2012: 41.74 in; 2011: 44.24 in; 2010: 37.85 in
Average Yearly snowfall Pittsburgh: 41.9 inches 2015-16 season: 29.6 inches (-12.3) **So far 2016-17**: 32.0(-9.2)
2014-15: 47.2 in 2013-14: 63.4 in; 2012-13: 57 in; 2011-12: 37 in; 2010-11: 57 in; 2009-10: 77 in



7 Day rain forecast

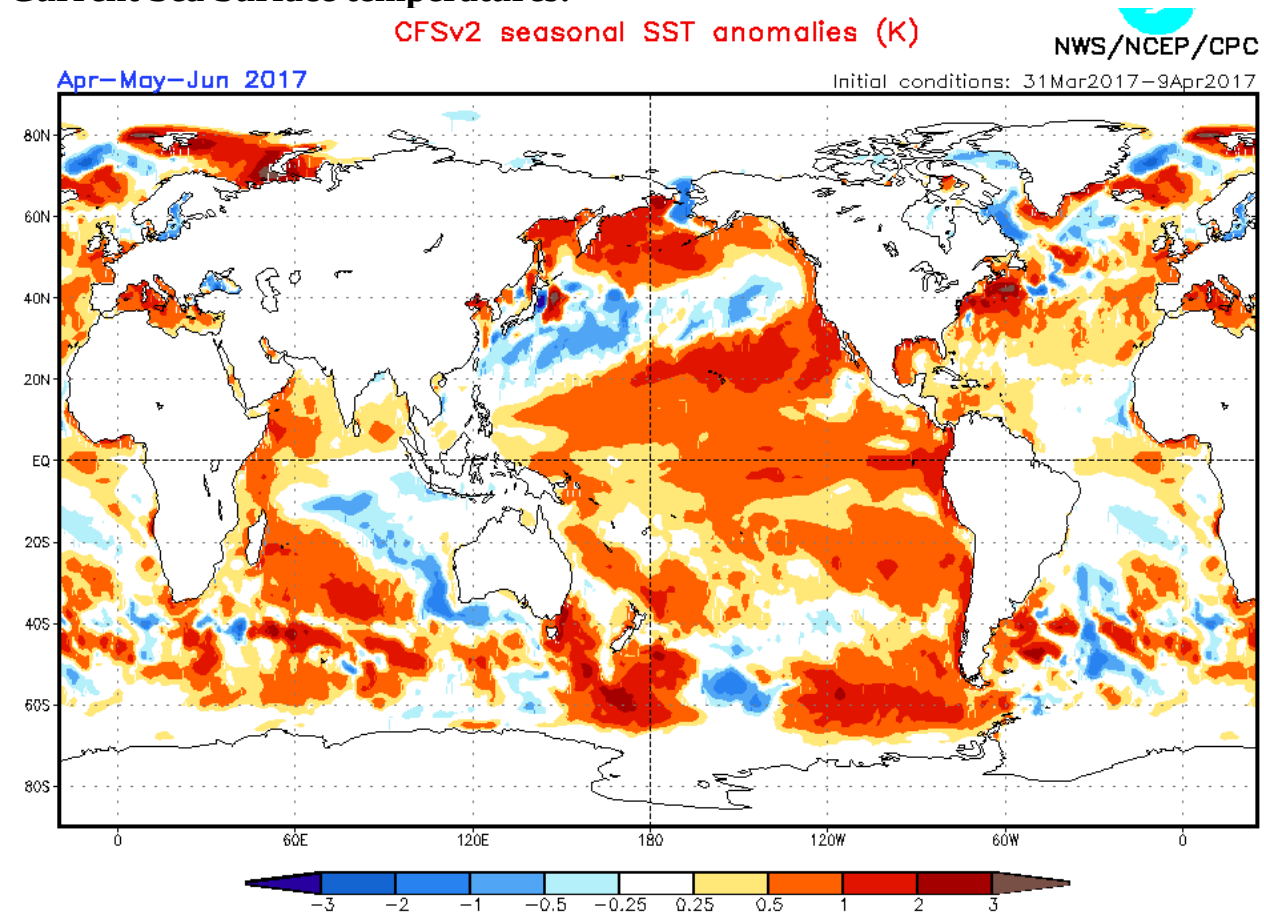
Western Pennsylvania Temperature Forecast
April-May 2017



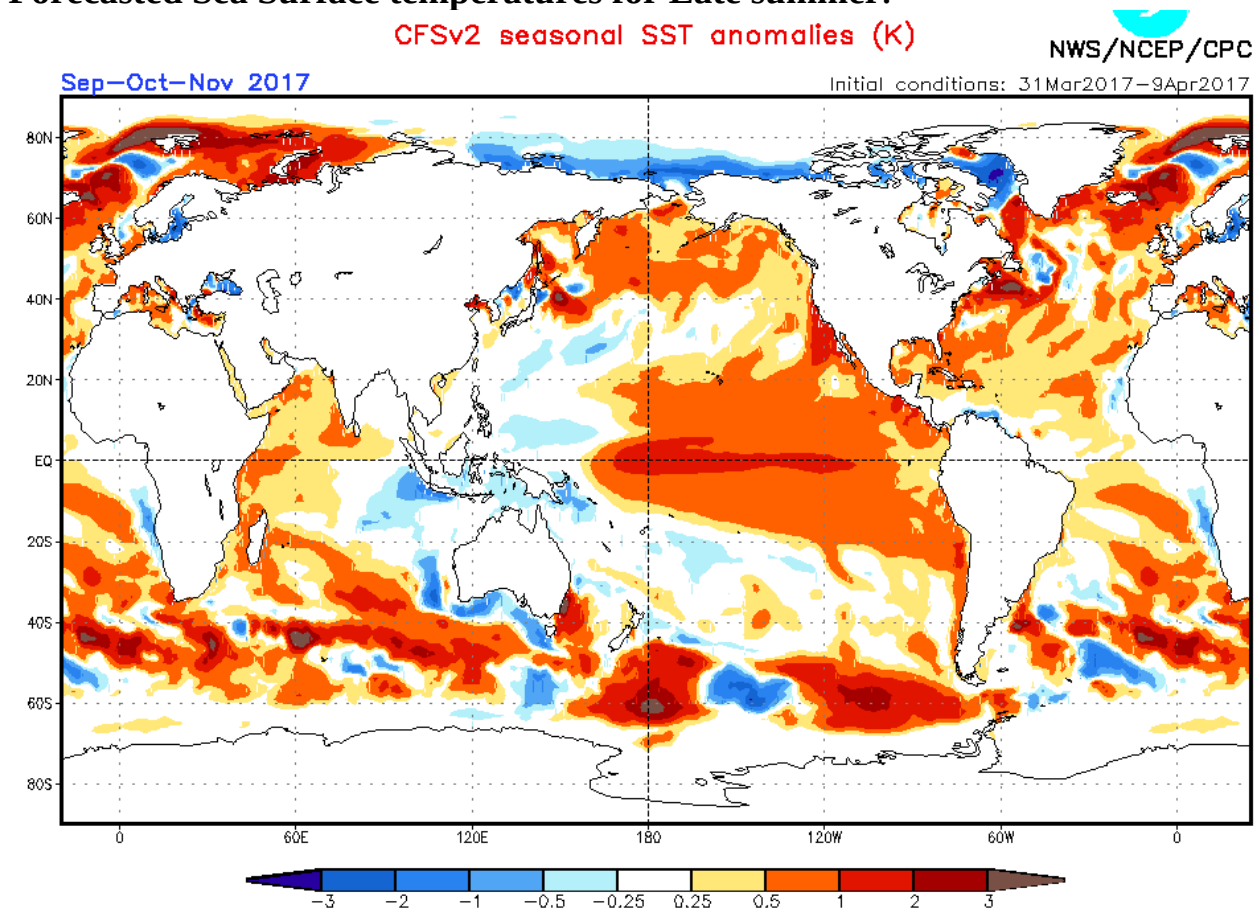


These warm temperatures have impacted the growth of apples in Pennsylvania, causing advanced fruit tree bud development about two weeks earlier than normal this year. The average date of the last frost in Pennsylvania is roughly May 10 while in Adams County, where most of the tree fruit is grown, the last frost date is April 11. Apple tree buds are likely to withstand temperatures around 10 degrees Fahrenheit but, at full bloom, blossoms can be killed by temperatures as high as 27 degrees. Trends toward earlier blooming of fruit trees has become apparent to many agricultural scientists across the state. Since the mid-1990s, the date of bloom has become notably earlier and more unpredictable.

Current Sea Surface temperatures:



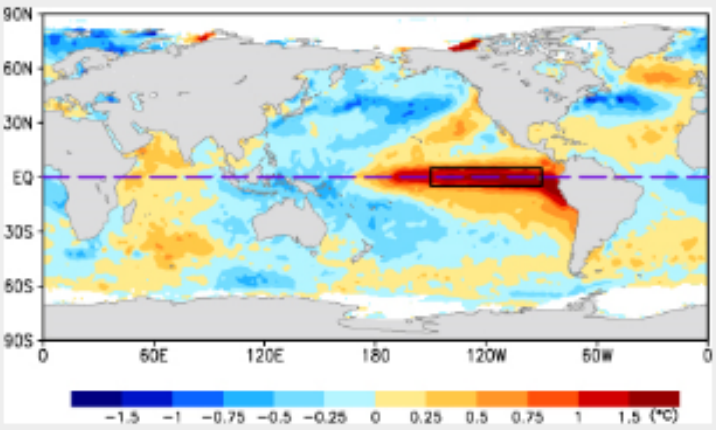
Forecasted Sea Surface temperatures for Late summer:



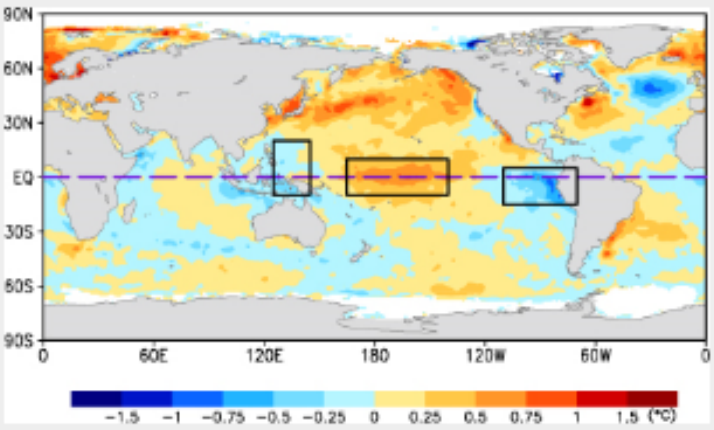
The El Niño Modoki

El Niño Modoki is a coupled ocean-atmosphere phenomenon in the tropical Pacific. It is different from another coupled phenomenon in the tropical Pacific namely, El Niño. Conventional El Niño is characterized by strong anomalous warming in the eastern equatorial Pacific (see figure below). Whereas, El Niño Modoki is associated with strong anomalous warming in the central tropical Pacific and cooling in the eastern and western tropical Pacific (see figure below). Associated with this distinct warming and cooling patterns the teleconnections are very different from teleconnection patterns of the conventional El Niño. Hence, the new phenomenon is of interest to the climate community.

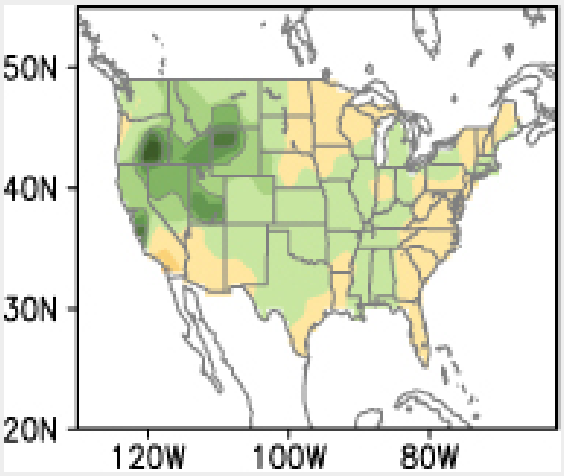
Anomalous SST during **El Niño**



Anomalous SST during **El Niño Modoki**



USA, rainfall during **El Niño**



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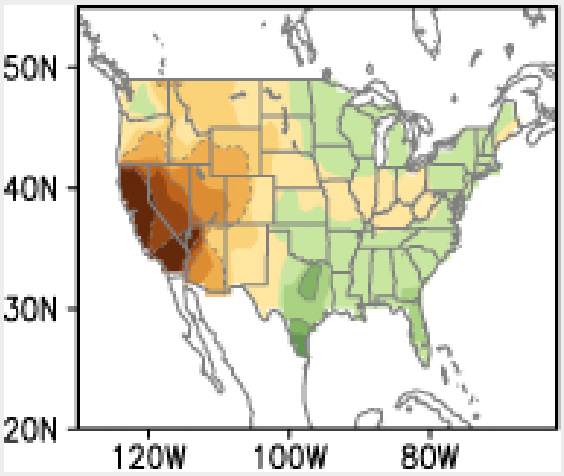

SUMMARY

More severe weather likely this spring/summer.

May be more slow moving "Flash Flooding Thunderstorms" this summer .

Summer temperatures above normal, with temperatures averaging as much as 3 degrees above normal .

Hurricane season below average number of storms , but formation favors western Atlantic

If Modoki El Nino forms/remains through the end of the year. Winter 2017-18 snowy than normal similar to 2009-2010 with East Coast Storms