Central Florida Prescribed Fire Council
Annual Meeting
September 28, 2018

John Pendergrast
National Weather Service Melbourne

Discussion on selected topics:

- *Dispersion*

- *LVORI*

- *Use of weather forecasts*

- *Weather situational awareness*

- *Outlook for upcoming Dry season*

Q&A...

Discussion on selected topics:

- *Dispersion:*

An index value predictor of vertical and horizontal smoke movement in the atmosphere using a "stability classification", mixing height and transport wind.

$$\overline{DI_c} = \left(\frac{0.004}{\sqrt{2\pi}\,W} \sum_{i=1}^{3} \left[\frac{A_R^{(1-b_i)} - x_R^{(1-b_i)}}{a_i^{(1-b_i)}} \right] + \frac{0.002\,(50{,}000 + x_V - A_V)}{HW} \right)^{-1}$$

Lavdas 1986

Discussion on selected topics:

- *Dispersion:*

- Suitable mixing of smoke is necessary to conduct a safe, manageable burn. Dispersion should be forecast within a desired range before ignition.

- Low Dispersion = less predictable smoke moment and dissipation. Human and transportation (visibility) impacts. 20 Low threshold.

- High Dispersion = spotting, potential for escape, potential difficulty in management. 75-80 High Threshold

Slide 1

Discussion on selected topics:

• *Dispersion:*

- Notable increase in dispersion most days after lifting of morning inversion . 10-11 AM. Strong surface heating and strong transport winds contribute mainly.

- NWS calculation is a stepped function (drawback) . +/- 1 mph can change value by several units.

- Low daytime dispersion can postpone fire plans for the day.

- Better modeling of atmospheric transport will assist in predictors of smoke movement/dispersion (Hysplit).

Slide 2

Discussion on selected topics:

• *LVORI:*

- An index to predict the likelihood of restricted visibility in the presence of smoke. (more specifically Superfog). #

- Smoke must be present to fully utilize the index. #

- LVORI in itself is not designed to be a predictor of fog.

 # Achtemeier

Slide 3

LVORI:
Low Visibility Ocurrence Risk Index

LVORI:

- An index based on RH and dispersion to gage fog and surface smoke potential reducing visibility = "superfog"

- Help determine degree of relative risk of low visibility

- Should not be used as a hard estimate of risk for hazardous visibility

LVORI	INTERPRETATION
< 3	Favorable for burning (better visibility)
> 7	Unfavorable for burning (potential for reduced visibility)

Slide 4

LVORI	Description
1	Ideally low risk of accidents on highways due to smoke and/or fog formation.
2,3	Relatively low risk of accidents on highways due to smoke and/or fog formation.
4-6	Moderate risk of accidents on highways due to smoke and/or fog formation.
7-10	Particularly high risk of accidents on highways due to smoke and/or fog formation.

RH	Dispersion Index											
	>40	40-31	30-26	25-17	16-13	12-11	10-9	8-7	6-5	4-3	2	1
<55	1	1	2	2	2	2	2	2	2	2	2	2
55-59	1	1	2	2	2	2	2	3	3	3	3	3
60-64	1	1	2	2	2	2	3	3	3	3	3	3
65-69	1	3	3	3	3	3	3	3	3	3	3	4
70-74	3	3	3	3	3	3	3	3	3	3	3	4
75-79	3	3	3						4	4	4	4
80-82	3	3	3						5	5	5	6
83-85	4	4	4						5	5	5	6
86-88	4	4	4						6	6	6	6
89-91	4	4	4	4	5	5	5	5	6	6	7	7
92-94	4	4	4	4	5	5	6		6		7	8
95-97	4	4	4	5	5	6	6	6	7	8	8	9
>97	4	4	4	5	5	7	8	8	9	9	10	10

Bottom Line:
LVORI is highest when RH is high & Dispersion is low.
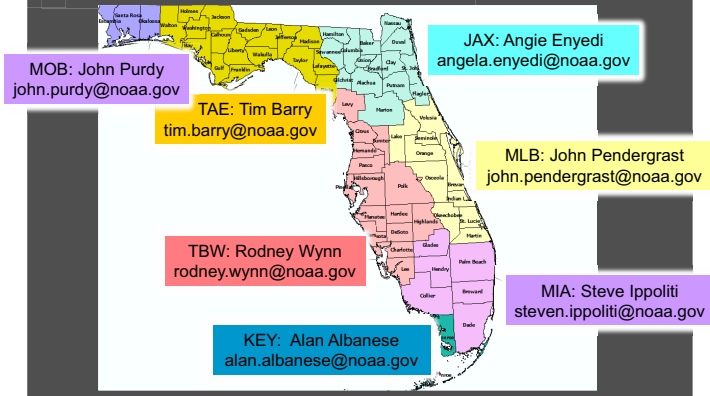
- *LVORI:*

- Terrain in the west acts to trap accumulated smoke in drainages for short and potentially longer term health/safety impacts.

- Smoke/Fog can potentially pose the most immediate risk of public safety associated with a burn in the eastern US.

- *Use of weather forecasts:*

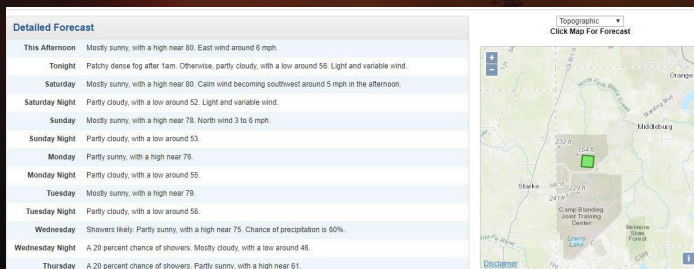## Florida NWS Fire Weather Support

* 7 NWS Forecast Offices serve Florida

MOB: John Purdy
john.purdy@noaa.gov

TAE: Tim Barry
tim.barry@noaa.gov

JAX: Angie Enyedi
angela.enyedi@noaa.gov

MLB: John Pendergrast
john.pendergrast@noaa.gov

TBW: Rodney Wynn
rodney.wynn@noaa.gov

MIA: Steve Ippoliti
steven.ippoliti@noaa.gov

KEY: Alan Albanese
alan.albanese@noaa.gov

Hourly Forecast Data – with no SPOT!

1. Go to: weather.gov   Local office

2. Click on approximate burn location on this map in middle of page, then wait for new page to load.

Click a location below for detailed forecast.

Watches, Warnings & Advisories

Hazardous Weather Outlook

Short Term Forecast

Last Map Update: Fri, Dec. 1, 2017 at 12:19:19 pm EST
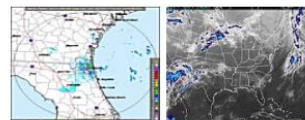

Hourly Forecast Data – with no SPOT!

3. New page loads. Refine location further (lat/long) using this map.

4. Click on your burn location, and wait for page to load.

Detailed Forecast

This Afternoon	Mostly sunny, with a high near 80. East wind around 6 mph.
Tonight	Patchy dense fog after 1am. Otherwise, partly cloudy, with a low around 56. Light and variable wind.
Saturday	Mostly sunny, with a high near 80. Calm wind becoming southwest around 5 mph in the afternoon.
Saturday Night	Partly cloudy, with a low around 52. Light and variable wind.
Sunday	Mostly sunny, with a high near 78. North wind 3 to 6 mph.
Sunday Night	Partly cloudy, with a low around 53.
Monday	Partly sunny, with a high near 76.
Monday Night	Partly cloudy, with a low around 55.
Tuesday	Mostly sunny, with a high near 79.
Tuesday Night	Partly cloudy, with a low around 58.
Wednesday	Showers likely. Partly sunny, with a high near 75. Chance of precipitation is 60%.
Wednesday Night	A 20 percent chance of showers. Mostly cloudy, with a low around 46.
Thursday	A 20 percent chance of showers. Partly sunny, with a high near 61.

Topographic
Click Map For Forecast

Disclaimer

Hourly Forecast Data – with no SPOT!

Additional Resources

Radar & Satellite Image
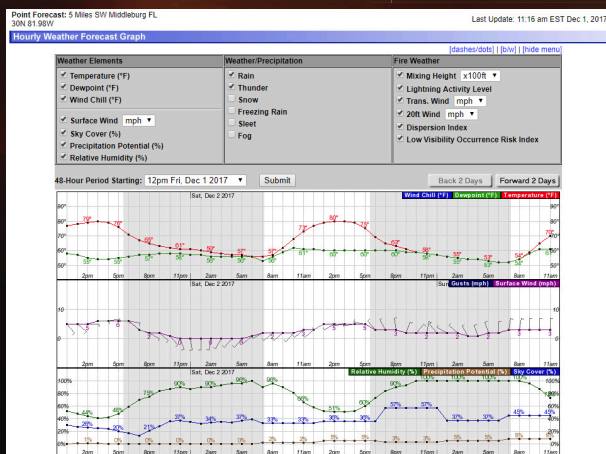
Hourly Weather Forecast
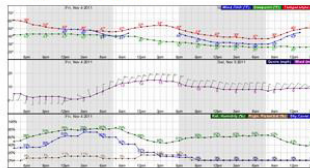
5. New page loads. To get hourly weather data, like SPOT, scroll down and look for Hourly Weather Forecast graph in bottom right of web page.

6. Click graph. This is hourly data for the location you chose (lat/long).

7. You can either look at the graph, or you can view Tabular Data.

Slide 1

Hourly Forecast Data – with no SPOT!

Slide 2

Discussion on selected topics:

• *Current conditions for SA:*

Ensure SA established with
- *Observations*
- *Radar*
- *Designated observer*
- *Transmit at once hourly WX OB over radio*
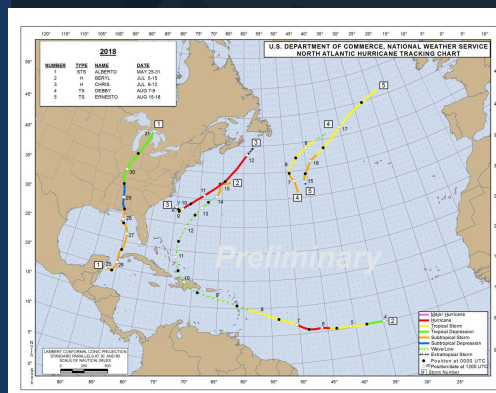- *Escape routes, safety zone access may change due to weather during burn.*

Slide 3

2018-2019 Winter/Spring Outlook
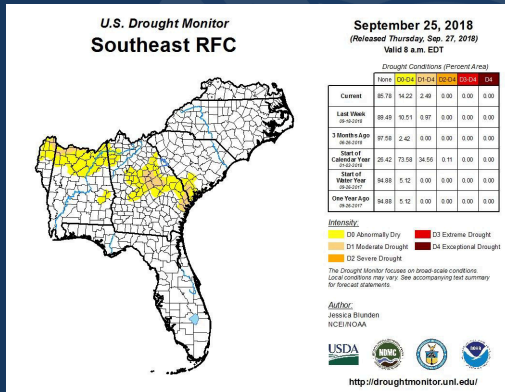*09/28/18*

John Pendergrast
National Weather Service Melbourne

Central Florida Prescribed Fire Council Annual Meeting
September 28, 2018

Slide 4

Wet season not associated with tropics

- Some flooding associated with local rainfall

- St. Johns action to minor flood in Jul-August.

Normal to below rainy season

- **Tropics Quiet locally**

- **No perceptible drought in FL at this time**

- **Minor River flooding much of Summer**
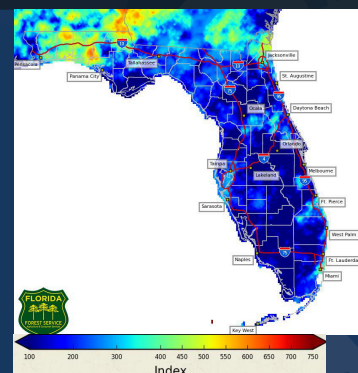
90 day Rainfall Departure (% Normal)
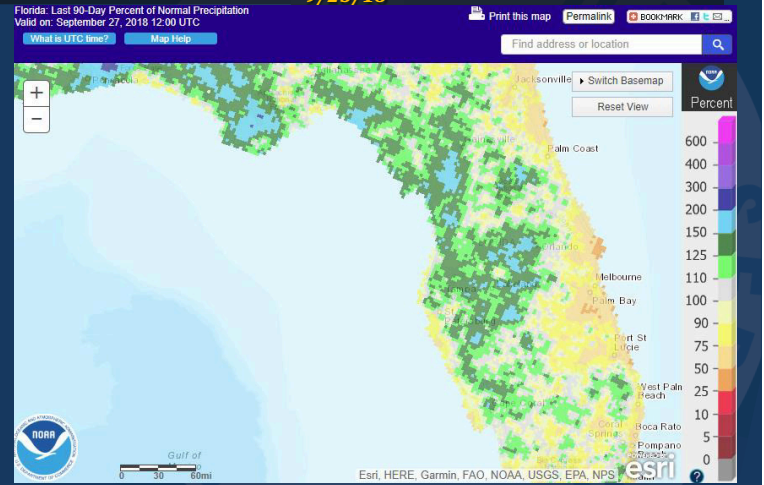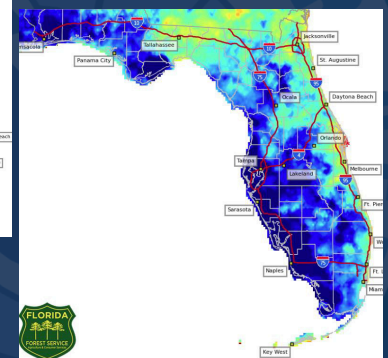
9/25/18

60 day Rainfall Departure (% Normal)

9/25/18
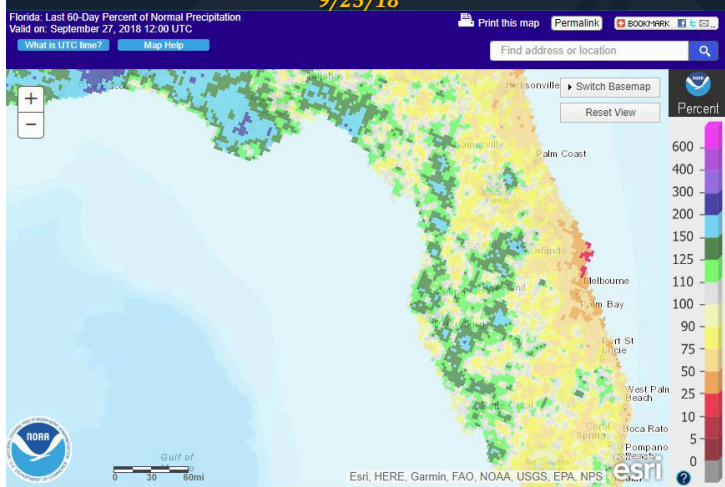
KBDI Values 2017 / 2018

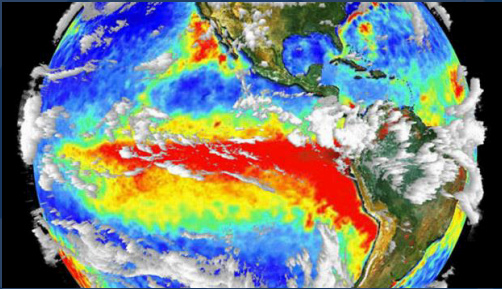*Inland boundary collisions largely responsible for higher totals.*

09/2017

Detailed KBDI (4km Resolution)

09/2018
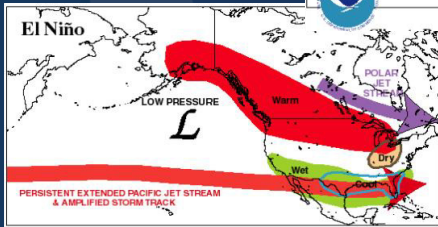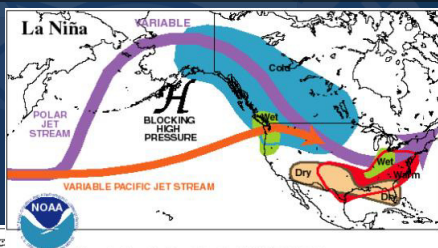
ENSO pattern and Florida

Several decades of observing ENSO has allowed for prediction skill especially during the Northern hemisphere Winter months.
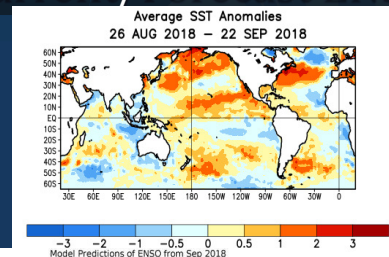

Why ENSO and Florida Dry Season?

Projected ENSO conditions are a large component of the Florida seasonal rain and temperature forecasts.
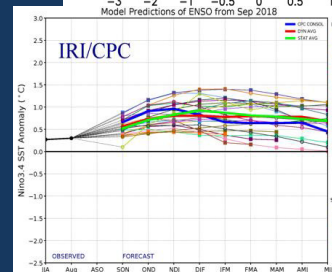
ENSO Wintertime Patterns
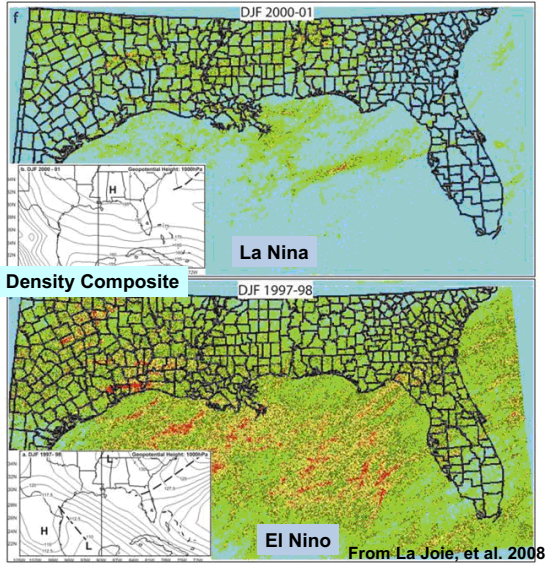

Current/Forecast ENSO Conditions

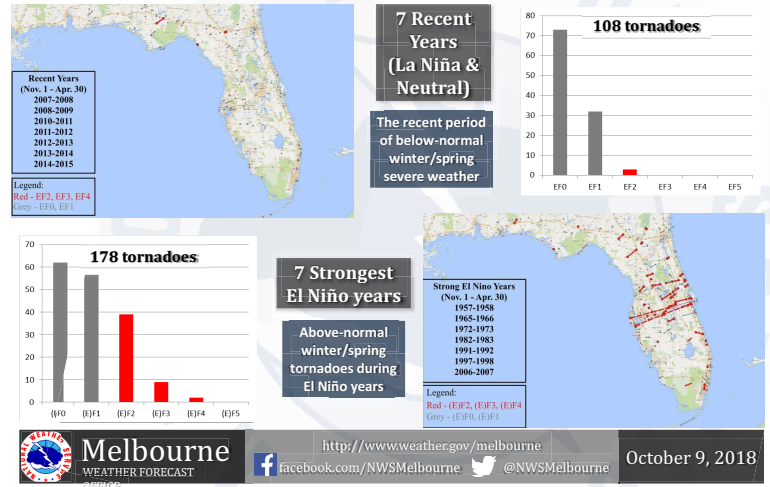**Above normal SSTs are occurring over the east and central Pacific.**
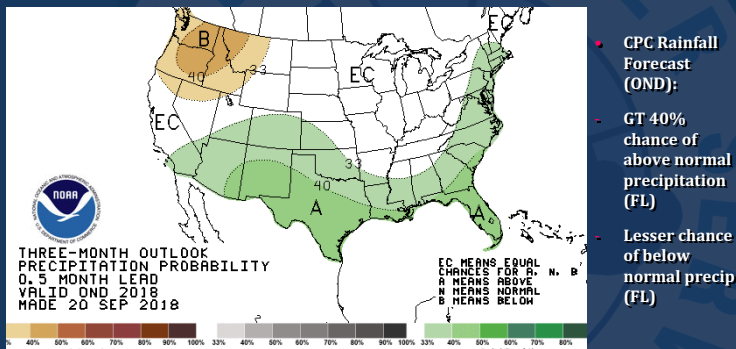
Weak to possibly moderate El Nino conditions into Spring 2019

Lightning Density Composite

La Nina

DJF 2000-01

El Nino

DJF 1997-98

From La Joie, et al. 2008

Florida El Niño Severe Weather Awareness
La Niña vs. El Niño: A Look Back

Recent Years
(Nov. 1 - Apr. 30)
2007-2008
2008-2009
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015

Legend:
Red - EF2, EF3, EF4
Grey - EF0, EF1

7 Recent Years (La Niña & Neutral)

The recent period of below-normal winter/spring severe weather

108 tornadoes

178 tornadoes

7 Strongest El Niño years

Above-normal winter/spring tornadoes during El Niño years

Strong El Nino Years
(Nov. 1 - Apr. 30)
1957-1958
1965-1966
1972-1973
1982-1983
1991-1992
1997-1998
2006-2007

Legend:
Red - (E)F2, (E)F3, (E)F4
Grey - (E)F0, (E)F1

Melbourne WEATHER FORECAST OFFICE

http://www.weather.gov/melbourne
facebook.com/NWSMelbourne   @NWSMelbourne

October 9, 2018

NOAA Forecast Oct-Dec Rainfall

THREE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID OND 2018
MADE 20 SEP 2018

EC MEANS EQUAL CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW

- CPC Rainfall Forecast (OND):

- GT 40% chance of above normal precipitation (FL)

- Lesser chance of below normal precip (FL)

NOAA CPC Oct-Dec Temperature

THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID OND 2018
MADE 20 SEP 2018

EC MEANS EQUAL CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW

- CPC Temp Forecast for (OND):

- 33-50% chance of greater than normal temperatures

- Lesser chance of below normal temperature
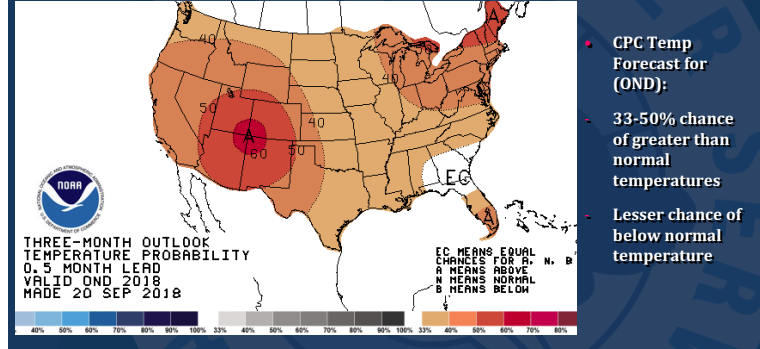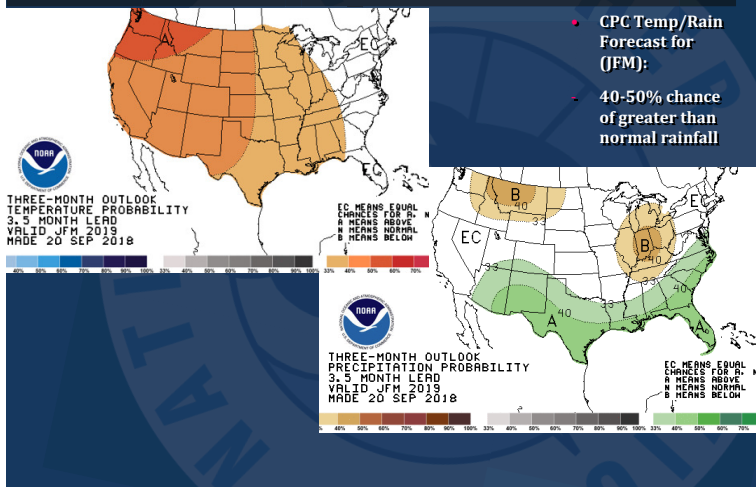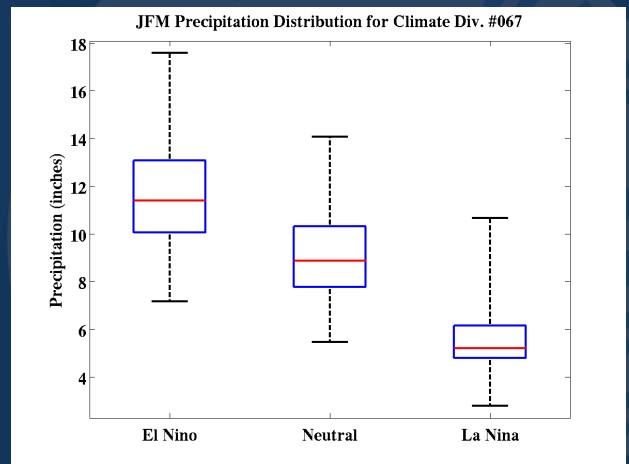
NOAA CPC Jan-Mar Temp/Rain

- CPC Temp/Rain Forecast for (JFM):
- 40-50% chance of greater than normal rainfall

Jan-Mar Rainfall Norms (C.FL)

Impact Information

Expectation…

- **More rain than normal forecast through Winter.**

- **Weak to Moderate EL Nino has been associated with more "storminess".**

- **Degree of ENSO has little influence on the start date of the wet season.**

Summary

EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

issued by

CLIMATE PREDICTION CENTER/NCEP/NWS
and the International Research Institute for Climate and Society
13 September 2018

ENSO Alert System Status: El Niño Watch

Synopsis: There is a 50-55% chance of El Niño onset during the Northern Hemisphere fall 2018 (September-November), increasing to 65-70% during winter 2018-19.

* Note: These statements are updated once a month (2nd Thursday of each month) in association with the ENSO Diagnostics Discussion.

Questions ?????????