

# National Weather Service Melbourne

## DRY SEASON FORECAST

# Oct 2020

The Forecast

### November – December - January

<p>STRONG EL NINO WEAK EL NINO NEUTRAL WEAK LA NINA <b>STRONG LA NINA</b></p> <p><b>ENSO State</b></p>	<p>WELL ABOVE NORMAL <b>ABOVE NORMAL</b> NEAR NORMAL BELOW NORMAL WELL BELOW NORMAL</p> <p><b>Temperature</b></p>	<p>WELL ABOVE NORMAL ABOVE NORMAL NEAR NORMAL <b>BELOW NORMAL</b> WELL BELOW NORMAL</p> <p><b>Precipitation</b></p>	<p>WELL ABOVE NORMAL ABOVE NORMAL NEAR NORMAL <b>BELOW NORMAL</b> WELL BELOW NORMAL</p> <p><b>Storminess</b></p>
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### February – March - April

<p>STRONG EL NINO WEAK EL NINO NEUTRAL WEAK LA NINA <b>STRONG LA NINA</b></p> <p><b>ENSO State</b></p>	<p>WELL ABOVE NORMAL <b>ABOVE NORMAL</b> NEAR NORMAL BELOW NORMAL WELL BELOW NORMAL</p> <p><b>Temperature</b></p>	<p>WELL ABOVE NORMAL ABOVE NORMAL NEAR NORMAL <b>BELOW NORMAL</b> WELL BELOW NORMAL</p> <p><b>Precipitation</b></p>	<p>WELL ABOVE NORMAL ABOVE NORMAL NEAR NORMAL <b>BELOW NORMAL</b> WELL BELOW NORMAL</p> <p><b>Storminess</b></p>
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## Forecast Overview | October 2020

- La Niña conditions have developed and are expected to persist over the equatorial Pacific Ocean during the next several months, with this likely becoming a moderate to potentially strong La Niña event.
- Due to the expected stronger La Niña conditions this winter and spring, there is higher confidence in the precipitation outlook for this dry season (Nov-Apr) across central Florida, with overall below normal rainfall expected across the area through this time frame.
- While ENSO state typically has a weaker influence on temperature patterns across Florida, recent trends combined with the influence of La Niña, favors above average temperatures persisting this dry season. However, periods of cooler than normal weather will likely still occur, with freezing temperatures also possible.
- Seasonal storminess is forecast to remain below normal, but individual storm systems can still bring an increased risk of hazardous weather, including severe thunderstorms and tornadoes.

## About this Product

This forecast product is a result of research from the National Weather Service (NWS) in Melbourne, Florida on the El Niño - Southern Oscillation (ENSO) and its impact on Central Florida's dry season (November – April). This research, conducted since early 1997, was produced in recognition of the fact that climatic fluctuations on regional and global scales have been shown to have a profound impact on Florida's weather from season to season. The importance of seasonal forecasting continues to increase as extreme weather events affect more of Florida's growing population. These forecasts are meant to supplement, not replace, the official NWS Climate Prediction Center's (CPC) seasonal and winter outlooks by providing more detail and adaptive meteorological interpretation of the impact of predicted climatic events on Central Florida.

## Forecast Basis & Interpretation

The seasonal forecast is produced by a team of National Weather Service Melbourne meteorologists that employ the use of linear and logistic regression equations as well as analog-based techniques. These methods are based on the official observed and forecast Niño 3.4 and 3.0 values from the Climate Prediction Center and historical weather data for the Central Florida region. The accuracy of these indices will have a bearing on the accuracy of the seasonal forecast.

The Florida dry season forecast is issued for the period between November 1, 2020 and April 30, 2021 and is intended to serve as an early warning of significant impacts from climatic variability for planners and decision makers. Seasonal temperature and precipitation for Central Florida (climate divisions 3 and 4 as shown in figure 1), as well as the number of extratropical storms expected to impact the state are forecast into two separate periods: November-December-January (NDJ) and February-March-April (FMA).

The ENSO state and forecasts for storminess, rainfall, and temperature are divided into five categories, or quintiles: well below normal, below normal, normal, above normal, and well above normal. Discussions for each individual forecast parameter are included on the next several pages to help address uncertainty and should be used to supplement the forecast charts.



**Fig 1.** Temperature and precipitation forecasts are provided for Division 3 and 4 (Central Florida) while storminess forecasts are for the entire state of Florida.

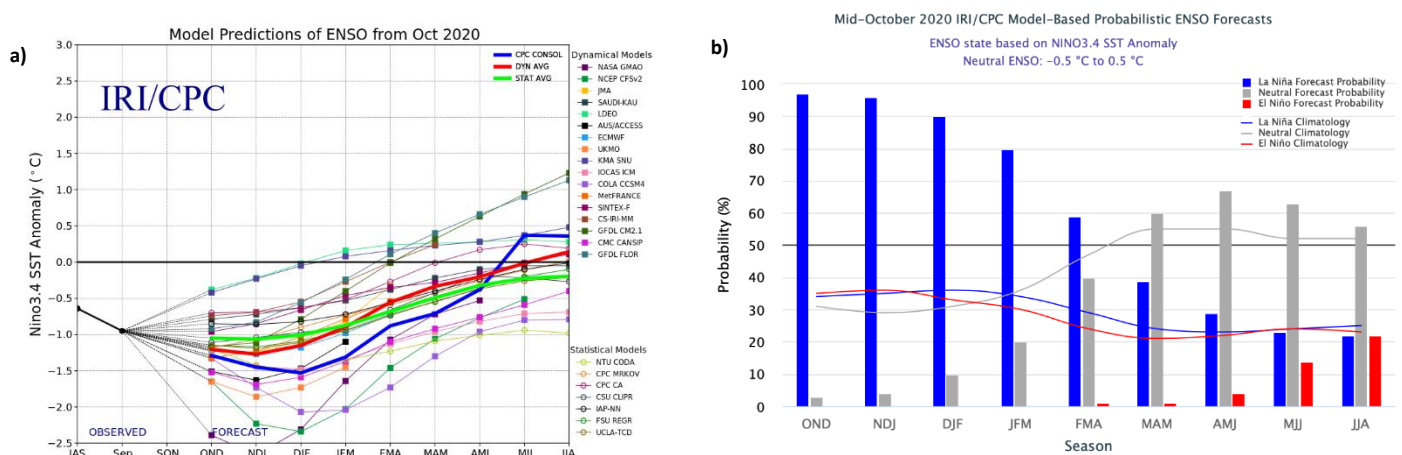
# ENSO

*Latest Discussion* | The latest El Niño/Southern Oscillation (ENSO) diagnostic discussion from the Climate Prediction Center states that La Niña conditions are present and are favored to continue through the Northern Hemisphere winter 2020-2021 and spring 2021 (fig. 1b).

During the past summer, cooler than normal sea surface temperatures (SSTs) emerged over the central and eastern equatorial Pacific Ocean, with these negative SST anomalies strengthening into October. The latest 3-month (July through September 2020) running mean of SST departures in the Niño 3.4 region was  $-0.6^{\circ}\text{C}$ . As of October 26th, the latest weekly SST departure in the Niño 3.4 region was  $-1.4^{\circ}\text{C}$ . The most recent forecasts of statistical and dynamical models (fig. 1a) collectively show SSTs staying much cooler than normal through the winter of 2020-2021, with La Niña conditions then slowly decreasing in strength into the spring of 2021.

*Additional Information* | The El Niño Southern Oscillation or ENSO is a complex meteorological phenomenon that relates to changes in sea surface temperature and sea level pressure over the equatorial regions of the Pacific Ocean. ENSO has a warm phase (El Niño) and a cool phase (La Niña) and has profound influences on the atmospheric circulations over the Pacific Ocean, and consequently, the circulations over North America and other parts of the globe. Locally, research shows that there is a physical relationship between the state of ENSO and the mean position of the jet stream over North America during the winter and spring seasons. These shifts in the jet stream often influence central Florida in the form of increased/decreased rainfall, storminess, and seasonal temperatures depending on the state of ENSO.

The relationship between Florida weather and ENSO is not just a simple “one-to-one” relationship, however, as other weather patterns (teleconnections) including the North Atlantic Oscillation (NAO), Arctic Oscillation (AO), Pacific-North American teleconnection pattern (PNA) and Madden-Julian Oscillation (MJO) can also play a major role in Florida dry season weather. Even when El Niño/La Niña conditions are occurring over the equatorial pacific, these other teleconnections can act to enhance or suppress the impact of ENSO, or cause extreme variability on their own. Considerable uncertainty remains in longer range outlooks since these other oscillations are generally not predictable beyond 10 – 14 days.



**Fig 1.** ENSO guidance from the International Research Institute (IRI) for Climate and Society and the Climate Prediction Center (CPC). (a) Dynamical and statistical model plume of ENSO predictions. (b) ENSO forecast probabilities based off of a consensus between IRI and CPC forecasts.

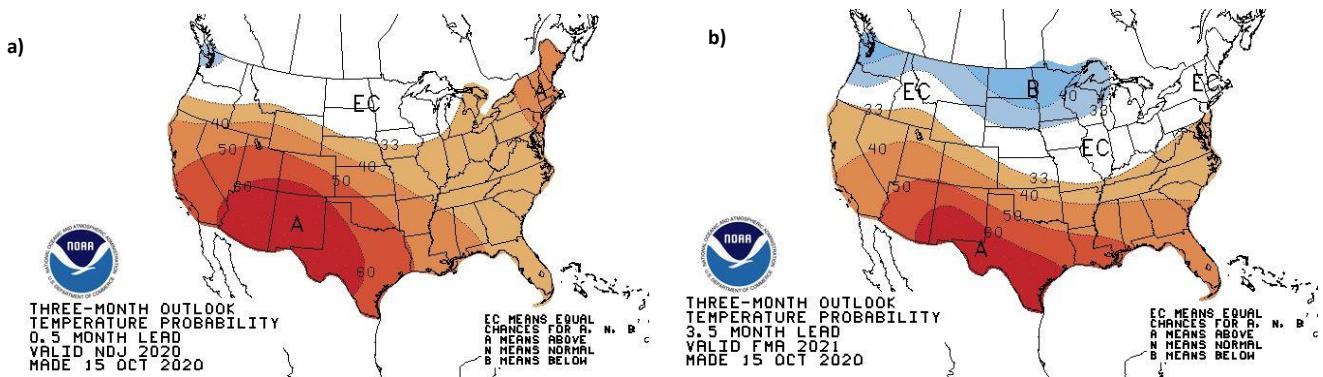
# Temperature

*Discussion* | The forecast for the 2020-2021 dry season (November-April) favors above normal temperatures across Central Florida, based on guidance from CPC (fig. 3) and the continuation of La Niña conditions through the winter and spring.

Local research suggests a smaller “warm” signal at the beginning of the season with greater chances of above normal temperatures occurring from February through April. While temperatures over both three-month periods are forecast to trend above normal, significant week-to-week and month-to-month variation is expected as other large-scale weather patterns can still overpower the influence of La Niña. It is important to remember that confidence in temperature forecasts for the dry season in Florida is typically lower compared to other seasonal forecast parameters (rainfall and storminess) when compared to ENSO state.

Hard freezes across Central Florida are most common in the months of December and January. Freezing conditions can occur during all ENSO states (table 1), and examination of analog years with moderate to strong La Niña conditions indicate the majority experienced freezes at some point during the winter months. Again, other shorter-term teleconnections like the NAO and AO will dictate the timing of any threat of a dry season freeze event.

*Additional Information* | When trying to correlate the state of ENSO and seasonal temperature over Central Florida, one finds much less skill compared to precipitation and storminess. Other large-scale phenomena, including the North Atlantic Oscillation (NAO) and Arctic Oscillation (AO), play a significant role in the week-to-week weather patterns over the state. For instance, strongly negative (positive) phases of the AO often lead to colder (warmer) than normal weather across the eastern half of the United States, including Florida. The AO is not predictable beyond a few weeks, and there are no long-range outlooks available at this time.



**Fig 3.** Three-month temperature probability outlooks issued by the Climate Prediction Center (CPC). Temperature probabilities for (a) Nov-Dec-Jan and (b) Feb-Mar-Apr.

ENSO State	Daytona Beach		Orlando		Melbourne		Vero Beach		ENSO State
	≤ 32°F	≤ 28°F	≤ 32°F	≤ 28°F	≤ 32°F	≤ 28°F	≤ 32°F	≤ 28°F	
El Niño	4.4	0.9	2.2	0.6	1.9	0.4	1.6	0.2	El Niño
Neutral	4.5	1.0	2.0	0.5	2.1	0.5	1.8	0.4	Neutral
La Niña	6.1	1.2	3.3	0.5	2.6	0.4	2.4	0.4	La Niña

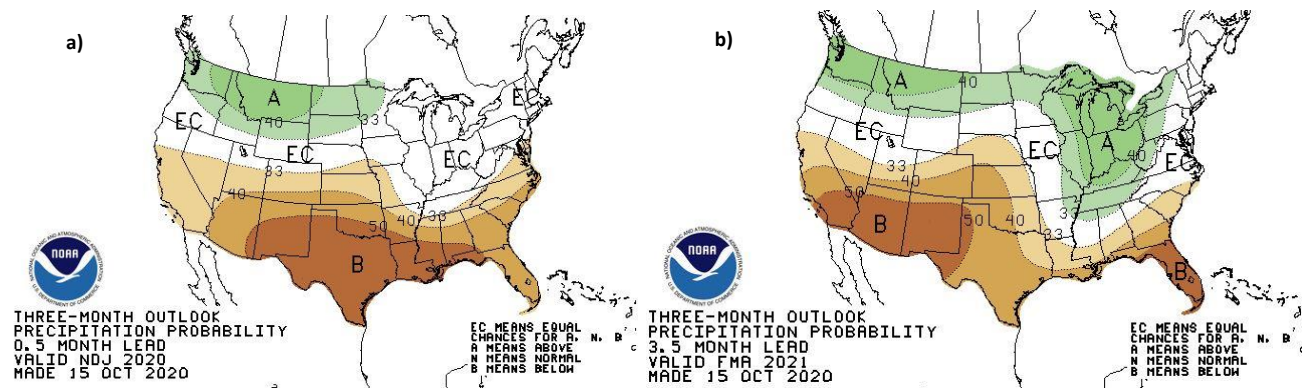
**Table 1.** Average number of days during the dry season when the minimum temperature reaches at or below freezing based on ENSO state using data from 1950 to 2010. A hard freeze is when minimum temperatures reached 28°F or lower.

# Precipitation

*Discussion* | The forecast for the 2020-2021 dry season (November-April) favors below normal precipitation across Central Florida, based on guidance from CPC (fig. 4) and the continuation of La Niña conditions through the winter and spring.

Local research shows that ENSO state has a greater correlation with precipitation patterns across the area, especially the stronger an El Niño or La Niña event becomes. With this La Niña likely to be a moderate to strong event, logistic regression and analog-based techniques support significantly higher chances of drier than normal conditions occurring throughout the entire dry season. This below normal precipitation outlook will lead to a higher likelihood of developing drought conditions and an increase in wildfire threat across the area, especially into the second half of the dry season (February-April).

*Additional Information* | The relationship between ENSO and rainfall is perhaps the most straightforward and statistically significant of all weather parameters. In general, during the Florida dry season, substantial rainfall is only provided by passing extratropical disturbances in the westerlies or by stalled frontal boundaries. During an El Niño event, the number of extratropical systems is often increased over Florida and the Gulf of Mexico leading to above average rainfall. Likewise, during a La Niña event, rainfall is often lower than normal due to a limited number of extratropical systems impacting the state.



**Fig 4.** Precipitation probability outlooks issued by the Climate Prediction Center (CPC). Precipitation probabilities for (a) Nov-Dec-Jan and (b) Feb-Mar-Apr.

## Storminess

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*Discussion* | The forecast for the 2020-2021 dry season (November-April) is for below average storminess across the state, due to the expected continuation of La Niña conditions through the winter and spring. However, even during a La Niña pattern, individual storm systems can still occur, bringing an increased threat of hazardous weather, including severe thunderstorms and tornadoes.

*Additional Information* | This forecast attempts to estimate the number of extratropical low pressure systems that will impact the state during a given dry season. There is a very strong relationship between ENSO and winter storminess and severe weather in Florida. Extratropical cyclones can produce excessive rainfall, severe thunderstorm winds, tornadoes, damaging straight-line winds, dangerous marine conditions, coastal flooding, and beach erosion. The number of extratropical low pressure systems passing near or over the state often increases during El Niño episodes due a southward shift in the position of the jet stream over North America.

## Preparedness Advice

While seasonal storminess is forecast to be below normal, individual storm systems can still bring an enhanced risk of hazardous weather, including severe thunderstorms and tornadoes. We've put together some safety information for you and your family to help prepare for when the next storm strikes.

### BE AWARE: PREPARE!

- ✓ Monitor local television, radio, and the internet for severe weather situations
  - Severe weather threats are typically identified a few days in advance, with more specific information about the most likely time(s) and location(s) of impact provided one day in advance
- ✓ Have an all-hazards plan in place
  - Every person and/or family should have an all-hazards plan that includes multiple ways to receive severe weather warnings and knowing what to do when one is issued
- ✓ Have multiple dependable ways to receive timely weather warning alerts
  - Ensure that you have a NOAA Weather Radio (programmed, with fresh batteries) and/or the Wireless Emergency Alert feature on your cell phone (or NWS warnings relayed by text message from Emergency Management, Media, or another reliable app)
  - Can save lives, especially with dangerous, nighttime tornadoes

### BEFORE / DURING THREAT

- ✓ If living in a mobile home, RV, or boat:
  - Make plans to stay with family or friends and leave before the threat for severe weather arrives
  - If you can't leave, identify the closest sturdy shelter such as a clubhouse or laundry room and go there immediately if a warning is issued for your location
- ✓ Identify your shelter location and "safe place" in advance of a threat
  - Small interior room on the lowest floor of your home or business, far from windows
  - Ensure everyone in your family or business is aware of the location
- ✓ Words of advice from those who have survived tornadoes
  - "Putting on your shoes, placing your charged cell phone in your pocket, making good use of any kind of helmet and/or pillow to protect your head, and holding tightly to one another" (these actions must be done quickly and prior to the arrival of a tornado)
- ✓ If a tornado warning is issued for your location:
  - Take immediate action and move to your shelter, remain in place until the threat passes

## Helpful Links

**Teleconnection Guidance & Forecasts from the Climate Prediction Center (CPC)**  
[ENSO](#) | [AO](#) | [NAO](#) | [PNA](#) | [MJO](#)

**CPC Guidance (Temperature, Precipitation, Drought, Hazards)**  
[1-Month Outlook](#) | [3-Month Outlook \(~90 Days\)](#)  
[U.S. Drought Information](#) | [U.S. Hazards Assessment](#) (out to 2 weeks)

**National Weather Service Melbourne, FL Research**  
[ENSO and Climate](#) | [Storminess](#) | [Severe Weather](#) | [Rainfall](#) | [Temperature](#)

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Issued: October 26, 2020  
Next Forecast Issuance: January 2021**