### Forecast Overview | October 2017

- Cooler than average sea surface temperatures in the eastern equatorial Pacific Ocean are expected to lead to weak La Nina-conditions during the fall and winter.
- Seasonal temperatures are expected to trend above normal, though considerable week-to-week and month-to-month variability is expected as other large scale weather patterns normally overwhelm a weak ENSO signal.
- Below normal seasonal precipitation may promote drought and condition the environment for an active wildfire season into the spring of 2018.
- While seasonal storminess is forecast to be below normal, any individual storm system can still bring an increased risk of hazardous weather, including severe thunderstorms and tornadoes.
- Continue to review your personal family all-hazards plan. Have multiple ways to receive severe weather warnings and know what to do when one is issued.

### 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 CPC 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, 2017 and April 30, 2018 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 ENSO Diagnostic Discussion from the Climate Prediction Center (CPC) indicates ENSO-neutral conditions were observed over the past month. For the upcoming fall and winter, weak La Niña conditions are favored.

During the month of September, surface water temperatures over the eastern equatorial Pacific Ocean warmed slightly, with anomalies near zero, however, subsurface temperatures became increasingly cooler, suggesting the recent surface warming will be short-lived. The latest 3-month (July through September) running mean of SST departures in the Niño 3.4 region was -0.1°C. As of October 9, the latest weekly SST departure in the Niño 3.4 region was 0.0°C. The consensus of ENSO prediction computer models indicates cooling over the next several months, favoring weak La Niña conditions (3-month average Niño-3.4 index less than or equal to -0.5°C) into the fall and winter of 2017 – 2018.

*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 2017 – 2018 dry season slightly favors above normal temperatures, based on guidance from CPC and the development of weak La Nina conditions during fall and winter.

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 often overwhelm a weak La Nina. It is important to remember that confidence in temperature forecasts is lower compared to other seasonal forecast parameters (rainfall and storminess).

Hard freezes across Central Florida are most common in the months of December and January. Freezing conditions can occur during all ENSO states (table 2), and examination of analog years with weak La Nina 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-Apr-May.](image)

<table>
<thead>
<tr>
<th>ENSO State</th>
<th>Daytona Beach</th>
<th>Orlando</th>
<th>Melbourne</th>
<th>Vero Beach</th>
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<td>≤ 28°F</td>
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<td>1.2</td>
<td>3.3</td>
<td>0.5</td>
</tr>
</tbody>
</table>

*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 2017 – 2018 dry season favors below average precipitation, based on guidance from CPC and the assumption of continued cool ENSO conditions through fall and winter.

Logistic regression and analog-based techniques support greater chances (50 – 55%) of drier than normal conditions occurring during the entire dry season. This is in line with the latest CPC forecast which also favors below normal precipitation. Drier than usual conditions during this time of year, when only about 1/3 of the area’s annual rainfall occurs, would promote drought and condition the environment for an active wildfire season into the spring of 2018.

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](image-url) Three-month precipitation probability outlooks issued by the Climate Prediction Center (CPC). Precipitation probabilities for (a) Nov-Dec-Jan and (b) Feb-Apr-May.
Storminess

Discussion | The forecast for the 2017 – 2018 dry season favors below average storminess for the state, based on the assumption of continued weak La Nina conditions through fall and winter. Based on the latest cool ENSO forecast, logistic regression guidance provides greater chances (50-60%) of below normal storminess throughout the dry season.

While seasonal storminess is forecast to be below normal, individual storm systems can bring an increased risk of hazardous weather, including severe thunderstorms and tornadoes. Keep up to date with daily Hazardous Weather Outlooks out to 7 days for Florida from the NWS office responsible for your area. The NWS Melbourne office produces a daily Graphical Hazardous Weather Outlook for east central Florida in addition to the 7-day text product as do most Florida NWS offices. For longer range outlooks the Climate Prediction Center provides a U.S. Hazards Assessment out to 2 weeks.

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 decreases during cool-neutral and La Niña episodes due a northward 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 increased 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.

- 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 the ability to receive timely weather warnings
  - Can save lives, especially with dangerous, nighttime tornadoes

- Have a dependable alerting feature or device
  - 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)

- If living in a mobile home, RV, or boat:
  - Make plans to stay with family or friends and leave before the 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