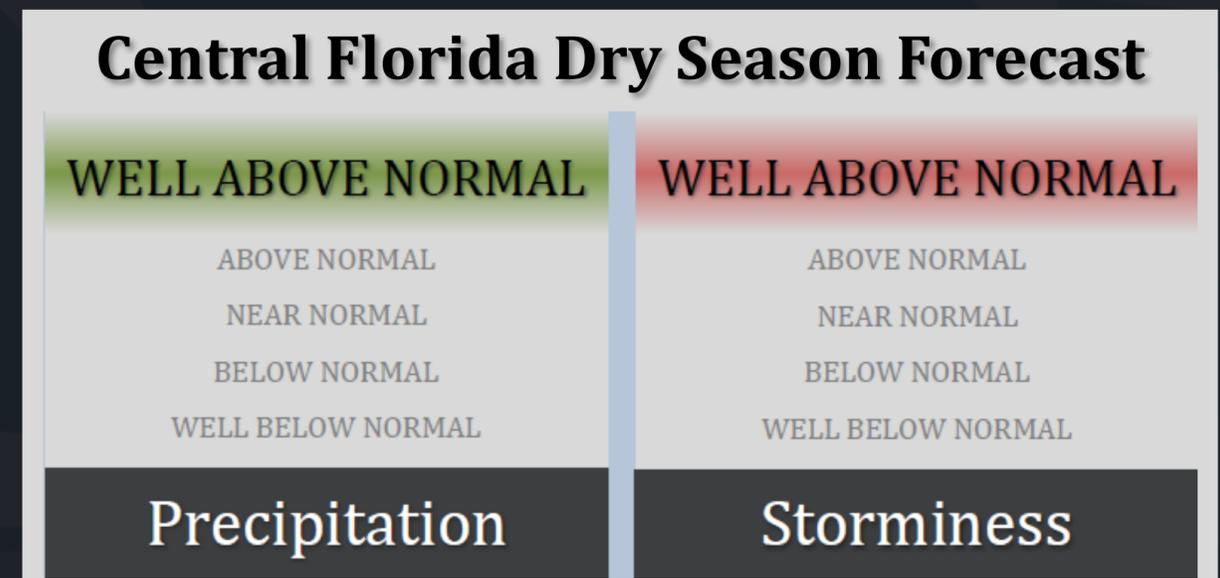


Florida El Niño Severe Weather Awareness

Talking Points

- Warmer waters over the eastern Pacific Ocean near the equator and the resulting influence on the atmosphere indicate a strong, and perhaps historic, El Niño this winter and upcoming spring
- Past strong El Niño events have been highly correlated with well above normal seasonal storminess across the Florida Peninsula between November and April
- An enhanced risk of severe weather is expected, bringing increased chances for strong-to-violent tornadoes and tornado outbreaks
- Much wetter than normal conditions are also favored, with increased chances for episodes of heavy rain and river flooding
- Given that the previous eight winters in Florida experienced storminess much below normal (with no strong-to-violent tornadoes), the likely transition to a very active season may come as a surprise to those who are unaware



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(Enhanced Fujita; EF) Tornado Damage Scale

EF Rating	Wind Speeds	Expected Damage
EF-0	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.
EF-1	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.
EF-2	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.
EF-3	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.
EF-4	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.
EF-5	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.

EF-0 to EF-1
Most Florida Tornadoes

EF-2 to EF-3
Rare Florida Tornadoes

EF-4
Only 4 documented!
04/15/58: Polk
04/04/66: Pinellas, Polk, Osceola



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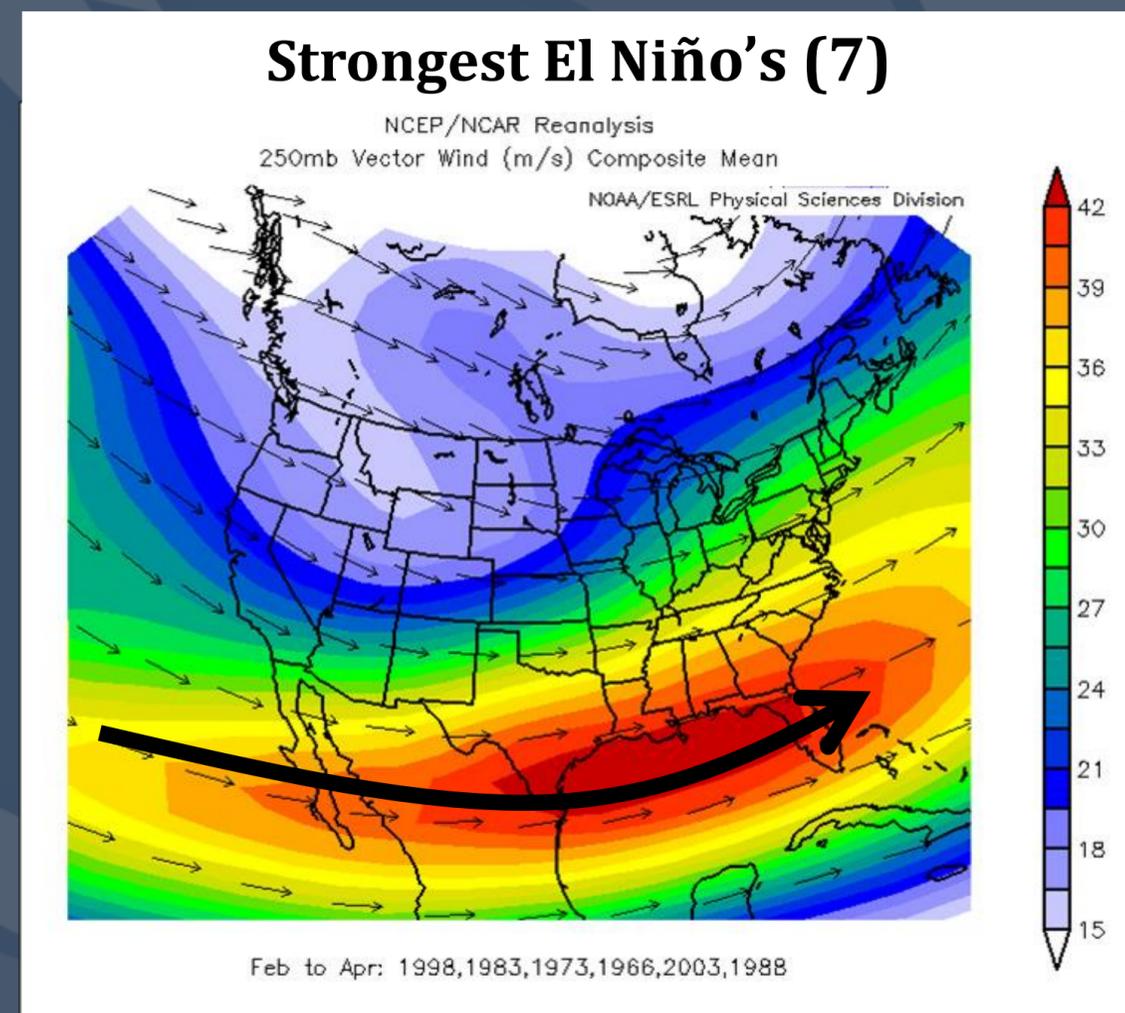
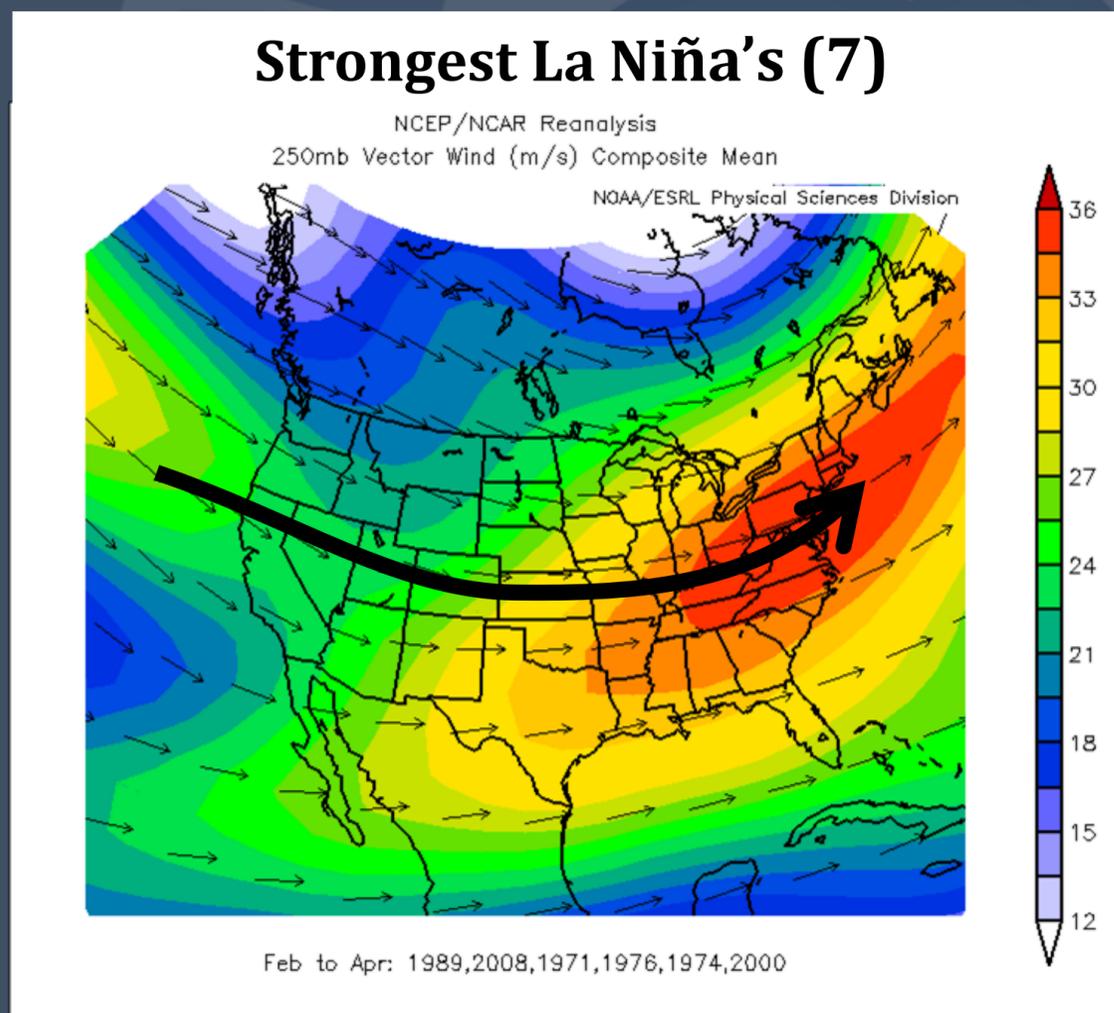
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Jet Stream & Winter Storminess

- There is a direct relationship between the presence of a strong El Niño and increased winter storminess in Florida, mainly due to a southward shift in the position of the jet stream over North America. Increased storminess brings a greater potential for severe weather with significant societal impacts



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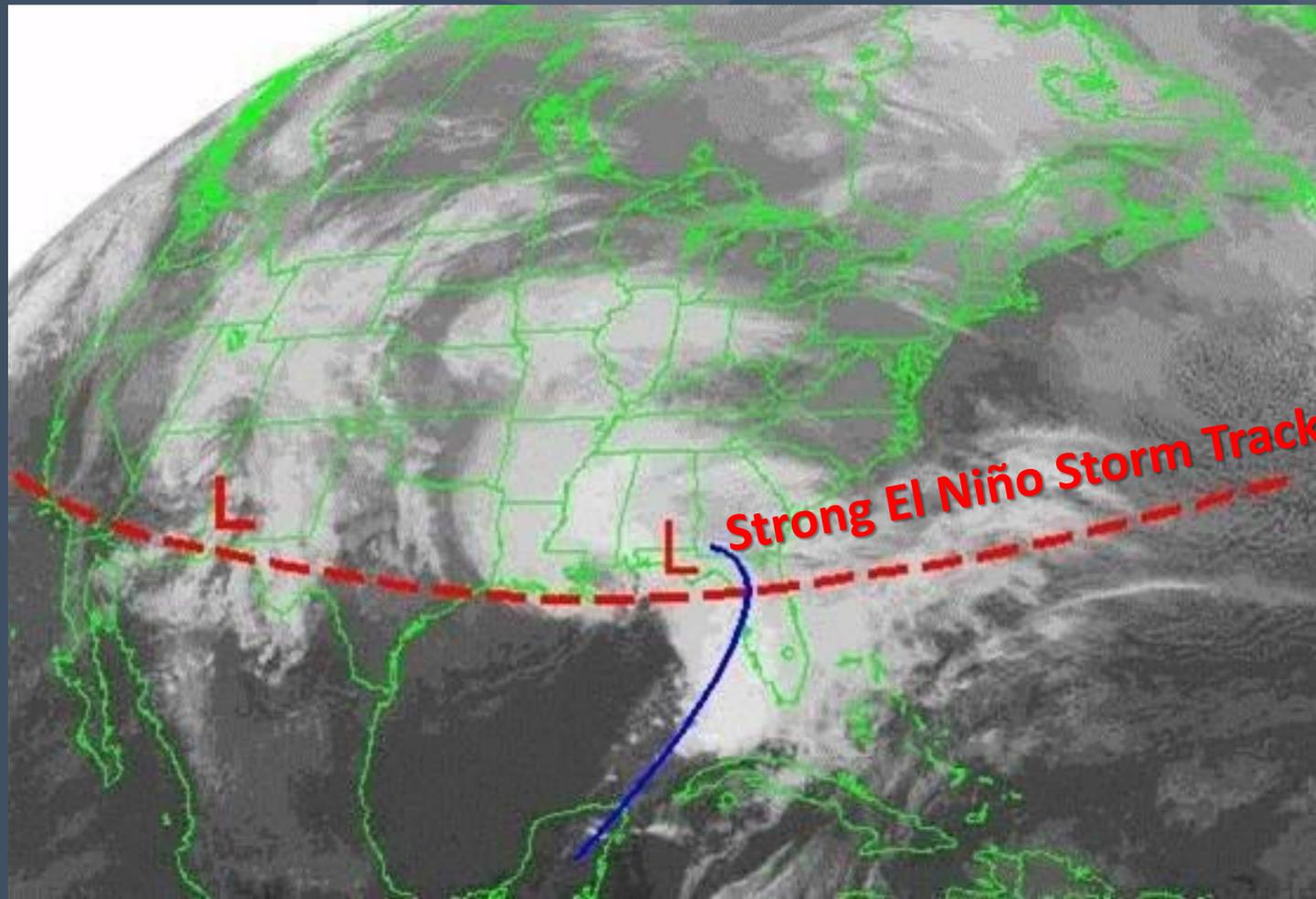
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Florida El Niño Severe Weather Awareness

El Niño Sets the Large-Scale Environmental Stage!

- Strong jet stream winds present much of winter/spring (generates enhanced lift)
- Low Pressure Systems track farther south reaching lower-latitudes (more frequent frontal passages; associated pre-frontal warm/moist air masses, squall lines, etc.)
- More opportunities for instability, moisture, and wind shear to come together across the peninsula to create environments favorable for severe thunderstorms



Key Points

- El Niño's don't cause violent tornadoes in Florida, but they enable them
- ✓ El Niño's SET THE STAGE!
- ✓ Environmental conditions become more favorable, more often



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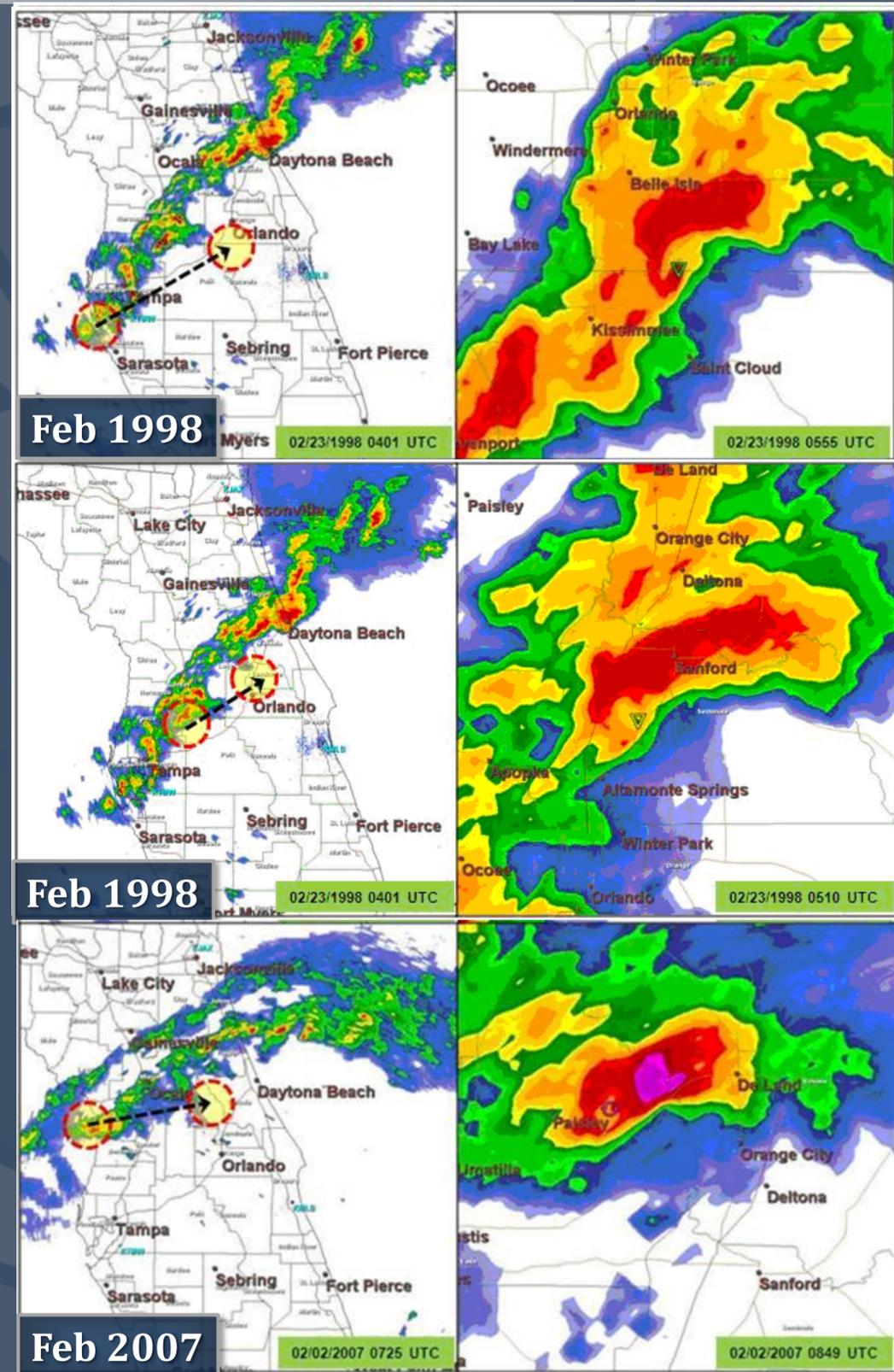
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Florida El Niño Severe Weather Awareness

Large-Scale vs. Small-Scale environments

- Even when the large-scale environment becomes favorable, small-scale conditions must also come together for an outbreak of severe thunderstorms and tornadoes to occur

- ✓ Warm-fronts and other local boundaries focus thunderstorms and concentrate wind shear
- ✓ Individual thunderstorms can also form ahead of squall lines in the warmer and more humid air
- ✓ The threat of tornadoes, damaging wind, and large hail develops quickly. Movement is often fast resulting in threat areas which stretch over multiple counties for several hours
- ✓ The images to the right reveal the three deadliest “*tornadic thunderstorms*” in Florida within the modern radar era, resulting in **30% of all known tornado deaths in state history!**



Florida El Niño Severe Weather Awareness

Recent Events

Recent El Niño Tornado Impacts



February 22-23, 1998
11 p.m. – 3 a.m.
Osceola / Orange / Seminole
42 fatalities (3 F3s)

*The two deadliest
tornado outbreaks
in Florida history -
total of 63 lives lost*



February 2, 2007
1 a.m. – 3 a.m.
Lake / Volusia
21 fatalities (2 EF3s)

Other Recent Noteworthy El Niño Tornado Impacts

November 2, 1997; Midnight-1am
Volusia Co.
22 injuries (F3)

December 25, 2006; 1-3 pm
Volusia Co.
7 injuries (2 F2's)



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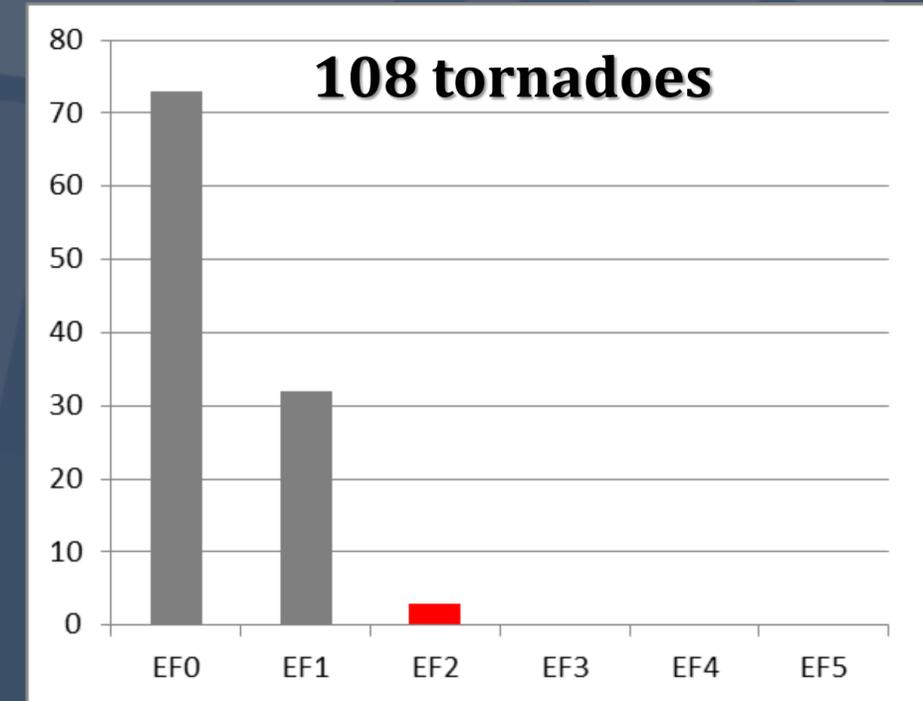
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Non-El Niño vs. El Niño: A Look Back...

7 Recent Years (Non-El Niño)

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

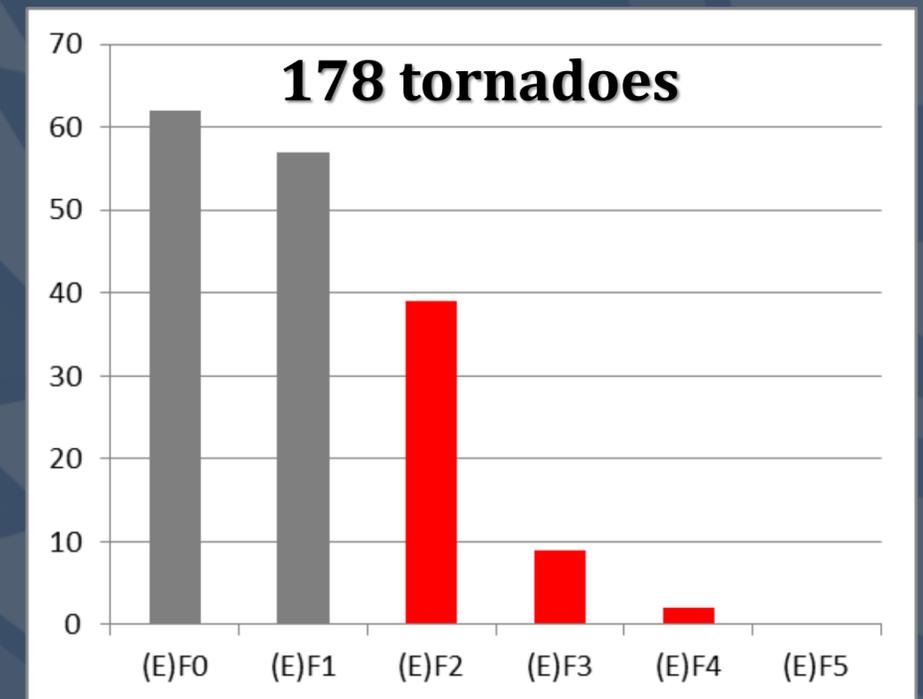
**Recent Years
(Nov. 1 - Apr. 30)**
2007-2008
2008-2009
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015



7 Strongest El Niño years

Above-normal
winter/spring
tornadoes during
El Niño years

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



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Non-El Niño Year vs. El Niño Year Tornadoes in Florida



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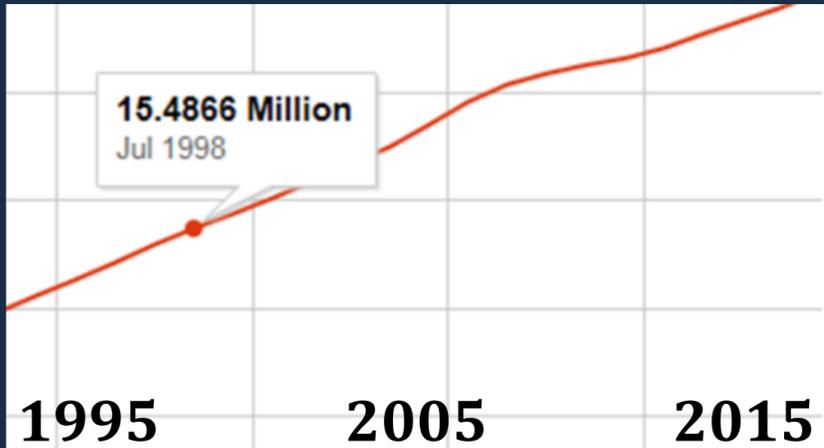
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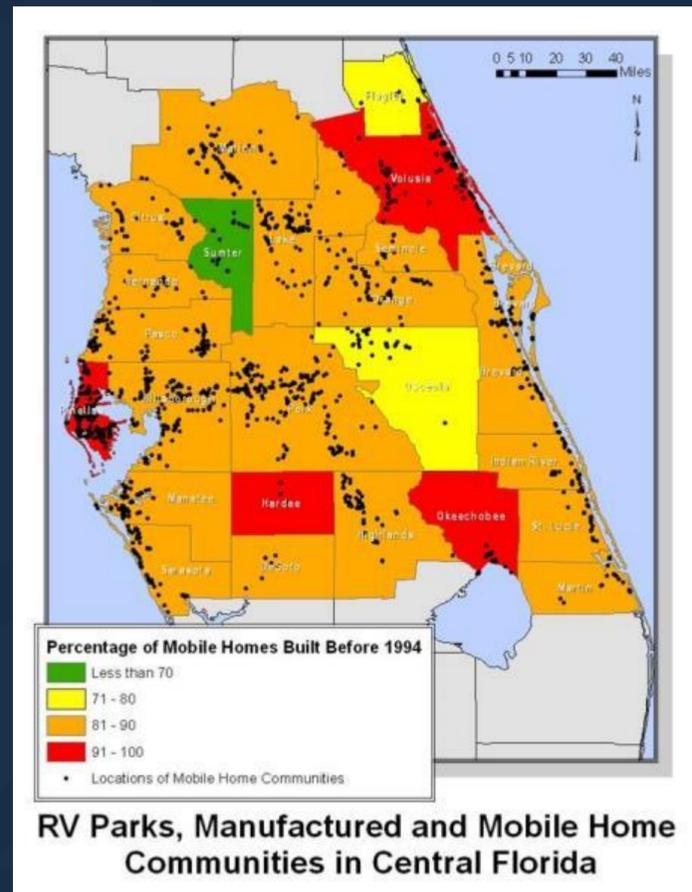
Are People Prepared?

Increasing Vulnerability



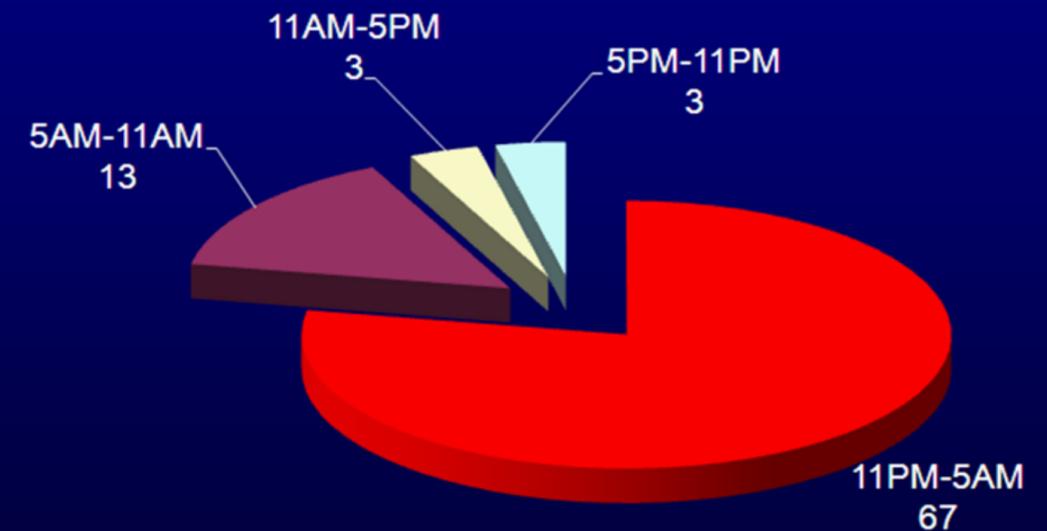
- 4.7 million new residents since 1998 outbreak!
- Many unaware of Florida (winter) severe weather risks

- High percentage of mobile homes
- Much lower threshold for damage
- High winter occupancy
- Greater casualty rate



Time of Day

Most of The Tornado Deaths During El Nino Have Occurred Between 11PM and 5AM!



Hourly Distribution of 86 \geq F2 Tornado Deaths During 11 Strongest El Niño's Since 1950

Overnight Tornadoes

- Favored time period
- Lower perception of threat
- Decreased awareness (asleep)



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Florida El Niño Severe Weather Awareness

Public Weather Outlook (24-hr prior); Watch (2-6 hr prior); Warning (20-min prior)



- Storm Prediction Center (SPC) **high-visibility outlooks will be issued during times of increased overnight risk of strong tornadoes** (“pre-watch” period)

- ✓ SPC will issue a Public Severe Weather Outlook (PWO) following the 3pm or 8pm EST Day 1 Convective Outlook when a 10 percent or greater probability of significant tornadoes is expected to occur at night (“enhanced” threat or greater, with EF2 or greater)

Understanding Severe Thunderstorm Risk Categories

THUNDERSTORMS (no label)	1 - MARGINAL (MRGL)	2 - SLIGHT (SLGT)	3 - ENHANCED (ENH)	4 - MODERATE (MDT)	5 - HIGH (HIGH)
No severe* thunderstorms expected	Isolated severe thunderstorms possible	Scattered severe storms possible	Numerous severe storms possible	Widespread severe storms likely	Widespread severe storms expected
Lightning/flooding threats exist with all thunderstorms	Limited in duration and/or coverage and/or intensity	Short-lived and/or not widespread, isolated intense storms possible	More persistent and/or widespread, a few intense	Long-lived, widespread and intense	Long-lived, very widespread and particularly intense
• Winds to 40 mph • Small hail	• Winds 40-60 mph • Hail up to 1" • Low tornado risk	• One or two tornadoes • Reports of strong winds/wind damage • Hail ~1", isolated 2"	• A few tornadoes • Several reports of wind damage • Damaging hail, 1 - 2"	• Strong tornadoes • Widespread wind damage • Destructive hail, 2" +	• Tornado outbreak • Derecho

* NWS defines a severe thunderstorm as measured wind gusts to at least 58 mph, and/or hail to at least one inch in diameter, and/or a tornado. All thunderstorm categories imply lightning and the potential for flooding. Categories are also tied to the probability of a severe weather event within 25 miles of your location.



Florida El Niño Severe Weather Awareness

Public Awareness & Safety



- **Monitor local television and radio for severe weather situations**
 - ✓ Such evolving 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 the ability to receive timely weather warnings**
 - ✓ This can save lives, especially with dangerous, night-time tornadoes



- **Have a dependable audible-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 or Media, or another reliable app)



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Florida El Niño Severe Weather Awareness

Preparation & Taking Action

IF A THREAT FOR DEADLY TORNADOES EXISTS FOR YOUR LOCATION (ESPECIALLY OVERNIGHT):

- ✓ If living in a mobile home, RV, or boat, make plans to stay with family or friends. 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; [last resort \(link\)](#)
- ✓ Identify your shelter location and “safe place” in advance of a threat (i.e. small interior room on the lowest floor of your home or business, far from windows); ensure everyone is aware of the location
- ✓ Words of advice from those who have survived tornadoes include: “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 on to one another.” These actions must be done quickly and prior to the arrival of the tornado

Emergency Alert
System

Tornado Warning

IF A TORNADO WARNING IS ISSUED FOR YOUR LOCATION:

- ✓ Take immediate action and move to your shelter, remain in place until the threat passes



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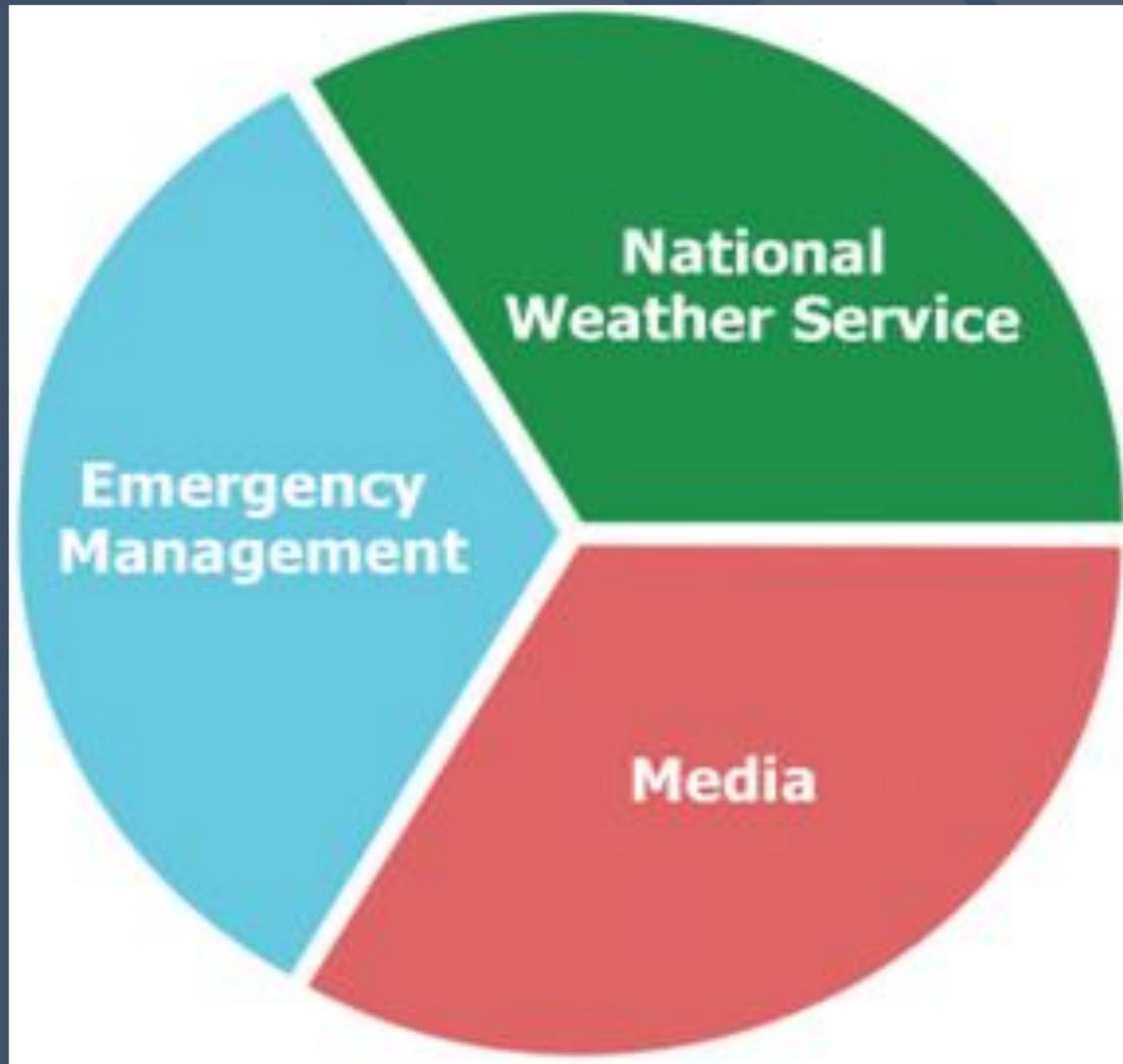


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Florida El Niño Severe Weather Awareness

Partnerships



- A strong partnership exists between the National Weather Service, Emergency Management, and Media
- ✓ By working together, these partners can deliver and share timely and accurate information ahead of, during, and after weather events to help minimize significant impacts to lives and property
- ✓ **Unified messages (verbal, textual and via social media) are critical for evoking desired public responses**

