El Niño & Expected Florida Severe Weather

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ONE BAY Resilient Communities
Working Group Meeting
February 5, 2016
El Niño & Expected Florida Severe Weather

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El Nino StoryMap
https://goo.gl/ELtRrp
What is El Niño?
El Niño is Spanish for...

“The Niño”
What is El Niño?

Warm Water
The Cycle of El Niño/La Niña

- Natural Cycle
- El Niño typically strongest during the winter
- To be classified as an El Niño, the water temperature must be \( \geq +0.5 \) degree departure from normal for 3 months

Water temperature departure from normal in degrees Celsius
• During the 1600s, South American fishermen noticed cycles of unusually warm, nutrient poor water, resulting in poor fishing.

• El Niño means The Little Boy, or Christ Child in Spanish.
  • chosen based on the time of year (around December) when the warm waters events occurred.
How Water Temperature Influence Fishing
El Niño Changes Location of Jet Stream
El Niño vs La Niña Jet Stream Location

Jet stream over Florida with more active weather

Jet stream north of Florida with less active weather
Wintertime
El Niño pattern

- Low pressure
- Polar Jet Stream
- Extended Pacific Jet Stream, amplified storm track
- Warm
- Wet
- Dry
Comparison of Winter Storm Tracks
Violent Tornadoes in Florida

Tornadoes F2 and Greater in Florida 1973-2003

= F2 and greater
Expected Florida River Flood Events per Year

- Strong El Nino
- Moderate El Nino
- Weak El Nino
- Neutral Conditions
- Weak, Moderate, and Strong La Nina
Probability of Flooding for Specific Locations

Probability of River Flooding Dec 1 - Apr 30

*Data 1950-2014

- Strong El Niño Years
- All Other Years
January 9, 2016 Cape Coral Tornado

- EF-2 Tornado (132 mph)
- Path 3.4 miles long
- 182 yards wide
- 3 injuries
- 178 structures damaged
- $5.5 million in damage
New Construction, Moved in 1 Month Ago
January 15, 2016 Fort Myers Tornado Warning

Tornado Warning
Valid until January 9th, 2016 at 7:15 PM EST

Impact Statistics
- Population: 428,537
- Area: 395 square miles
- Miles of interstate: 19
- Miles of railroad: 20
- Public Schools: 99
- Hospitals: 6
- Airports: 2
- National Parks: 0

Storm Information
- Moving to the East at 40 MPH
- Hail up to .75 inches in diameter
- Tornado Radar Indicated
Wireless Emergency Alert

- FCC/FEMA Initiative
- Free
- Available since 2012
- Cell phones auto enrolled
- Limited to 90 characters
- All phones connected to a tower within the warning receive message at same time
Wireless Emergency Alert

NWS Alerts Limited to

<table>
<thead>
<tr>
<th>Warning Type</th>
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<tbody>
<tr>
<td>Tsunami Warning</td>
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<tr>
<td>Tornado Warning</td>
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<tr>
<td>Extreme Wind Warning</td>
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<td>Flash Flood Warning</td>
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<td>Hurricane Warning</td>
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<td>Typhoon Warning</td>
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<td>Blizzard Warning</td>
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<tr>
<td>Lake Effect Snow Warning</td>
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<td>Dust Storm Warning</td>
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Some of the Other Alerts
- Presidential Alert
- Immediate Evacuation Warning
- Civil Emergency Message
- Law Enforcement Warning
- Shelter in Place Warning
- 911 Outage Emergency
Jan 17, 2016 Sarasota F2 Tornado – 127 mph

2 injuries
Jan 17, 2016 Duette F2 Tornado – 127 mph

2 fatalities, 4 injuries
Central Florida Tornado Outbreak
February 23, 1998

Tornadoes: 12
Deaths: 42, Injuries: 259, Damage: $107.3 million
Potential for historic El Niño this winter and upcoming spring, even stronger than the 1997/98 El Niño

- increased chances for strong-to-violent tornadoes and tornado outbreaks
- increased chances for episodes of heavy rain and river flooding

Given that the previous eight winters in Florida experienced storminess much below normal, the likely transition to a very active season may come as a surprise to those who are unaware
Increased Winter/Spring Severe Weather

- Florida’s two deadliest tornado outbreaks
  - 2/22-23/98: 42 fatalities in Kissimmee
  - 2/02/2007: 21 fatalities in Lady Lake
- 1997-98 record rain and river flooding

Key Points

- El Niño’s don’t cause violent tornadoes in Florida, but they enable them
  - El Nino’s SET THE STAGE!
- Environmental conditions become more favorable, more often
February 22-23, 1998 11 p.m. – 3 a.m.
Osceola / Orange / Seminole Counties
42 fatalities (3 F3 Tornadoes)
February 2, 2007  1 a.m. – 3 a.m.
Lake / Volusia Counties
21 fatalities (2 EF3 Tornadoes)
La Niña vs. El Niño Tornadoes in Florida

Grey: Weak
Red: Strong-to-Violent
How Many Days of Violent Weather Can We Expect?

Pattern is most pronounced from January-April
Florida Societal Considerations

**Increasing Vulnerability**

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

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

**Time of Day**

Overnight Tornadoes

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

Most of the Tornado Deaths During El Nino Have Occurred Between 11PM and 5AM!
Some Tornadoes are Worse Than Others

Tornadoes 2008-2012 in Study Area (north central U.S.)

13% were EF2-EF5, 262 fatalities (97%)
87% were EF0-EF1, 7 fatalities (3%)

Local destruction shown below

Lady Lake Feb 2, 2007 – 21 killed, 76 injured
Kissimmee Feb 22-23, 1998 – 42 killed, 260 injured
We are going to ring the bell louder for the worst storms

Provide additional information within our warnings to allow all the various warning notification systems to ring the bell louder

Began October 1, 2015
Tornado Warning EF0 or EF1

BULLETIN - EAS ACTIVATION REQUESTED
TORNADO WARNING
NATIONAL WEATHER SERVICE DES MOINES IA
425 PM CDT WED JUN 12 2013

THE NATIONAL WEATHER SERVICE IN DES MOINES HAS ISSUED A

* TORNADO WARNING FOR...
  SOUTHWESTERN BREMER COUNTY IN NORTHEAST IOWA...
  CENTRAL BUTLER COUNTY IN NORTH CENTRAL IOWA...

* UNTIL 500 PM CDT

* AT 422 PM CDT...A SEVERE THUNDERSTORM CAPABLE OF PRODUCING A
  TORNADO WAS LOCATED NEAR ALLISON...AND MOVING EAST AT 20 MPH.

HAZARD...TORNADO AND QUARTER SIZE HAIL.
SOURCE...RADAR INDICATED ROTATION.
IMPACT...FLYING DEBRIS WILL BE DANGEROUS TO THOSE CAUGHT
          WITHOUT SHELTER. MOBILE HOMES WILL BE DAMAGED OR
          DESTROYED. DAMAGE TO ROOFS...WINDOWS AND VEHICLES
          WILL OCCUR. TREE DAMAGE IS LIKELY.

* LOCATIONS IMPACTED INCLUDE...
  CLARKSVILLE...SHELL ROCK...WAVERLY AND PLAINFIELD.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

TAKE COVER NOW. MOVE TO AN INTERIOR ROOM ON THE LOWEST FLOOR OF
A STURDY BUILDING. AVOID WINDOWS. IF IN A MOBILE HOME...A VEHICLE
OR OUTDOORS...MOVE TO THE CLOSEST SUBSTANTIAL SHELTER AND PROTECT
YOURSELF FROM FLYING DEBRIS.

&&

LAT...LON 4284 9240 4264 9250 4265 9255 4275 9288
                4289 9282
TIME...MOT...LOC 2125Z 280DEG 17KT 4279 9278

TORNADO...RADAR INDICATED
HAIL...1.00IN
Tornado Warning EF2 or Stronger

BULLETIN - EAS ACTIVATION REQUESTED
TORNADO WARNING
NATIONAL WEATHER SERVICE DULUTH MN
6:57 PM CDT THU AUG 29 2013

THE NATIONAL WEATHER SERVICE IN DULUTH MN HAS ISSUED A

* TORNADO WARNING FOR...
NORTHWESTERN AITKIN COUNTY IN EAST CENTRAL MINNESOTA...
EXTREME EAST CENTRAL CASS COUNTY IN NORTH CENTRAL MINNESOTA...

* UNTIL 7:30 PM CDT

* AT 6:56 PM CDT...A CONFIRMED LARGE AND EXTREMELY DANGEROUS TORNADO WAS LOCATED 4 MILES WEST OF HILL CITY...NEAR HIGHWAY 200...AND MOVING SOUTHEAST AT 25 MPH.

THIS IS A PARTICULARLY DANGEROUS SITUATION.

HAZARD...DAMAGING TORNADO.

SOURCE...CONFIRMED TORNADO FROM TRAINED SPOTTERS.

IMPACT...YOU ARE IN A LIFE THREATENING SITUATION. FLYING DEBRIS MAY BE DEADLY TO THOSE CAUGHT WITHOUT SHELTER. MOBILE HOMES WILL BE DESTROYED. CONSIDERABLE DAMAGE TO HOMES...BUSINESSES AND VEHICLES IS LIKELY AND COMPLETE DESTRUCTION IS POSSIBLE.

* LOCATIONS IMPACTED INCLUDE...
HILL CITY...SWATARA...HAYPOINT AND BAIN.
HIGHWAY 200 WEST OF HILL CITY.
HIGHWAY 159 SOUTH OF HILL CITY.
QUADNA MOUNTAIN RESORT AREA.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

TO REPEAT...A LARGE...EXTREMELY DANGEROUS AND POTENTIALLY DEADLY TORNADO IS ON THE GROUND. TO PROTECT YOUR LIFE...TAKE COVER NOW. MOVE TO AN INTERIOR ROOM ON THE LOWEST FLOOR OF A STURDY BUILDING. AVOID WINDOWS. IF IN A MOBILE HOME...A VEHICLE OR OUTDOORS...MOVE TO THE CLOSEST SUBSTANTIAL SHELTER AND PROTECT YOURSELF FROM FLYING DEBRIS.

THIS STORM HAS A HISTORY OF PRODUCING TORNADOES. TAKE COVER IN A BASEMENT OR STORM SHELTER NOW!

&&

LAT...LON 4703 9377 4703 9359 4694 9335 4684 9342
4677 9361 4696 9386
TIME...MDT...LOC 2356Z 310DEG 22KT 4698 9370

TORNADO...OBSERVED
TORNADO DAMAGE THREAT...CONSIDERABLE
HAIL...1.75IN
Public Awareness and Safety

• Monitor local television and radio for severe weather situations

• Have multiple ways to receive timely weather warnings
  ✓ NOAA Weather radio
  ✓ Wireless Emergency Alert
  ✓ Reverse 911
  ✓ Smartphone App
Free FEMA App

http://www.fema.gov/mobile-app
What Can You Do?

Pick an employee who is into weather to be an Ambassador for a Weather Ready Nation [http://weather.gov/tampa/?n=wrn](http://weather.gov/tampa/?n=wrn).

The Ambassador will receive 1 or 2 Emails a month with resources to promote hazardous weather awareness and preparedness to those in your organization and can be a resource for your social media posts.
A Few of our Local Ambassadors

- Pinellas County Sheriff
- Port Tampa Bay
- Saint Pete Astronomy Club
- University of South Florida
- Valencia Lakes Home Owners Association
- WUSF Public Radio
- WRMD Telemundo Tampa
- Fox 13 WTVT-TV Tampa Bay
NWS Tampa Bay Social Media

http://weather.gov/tampabay

@NWSTampaBay

NWSTampaBay

NWSTampa
Be Prepared

Surviving the storm... it's everyone's responsibility.

El Niño Severe Winter Weather

With a strong El Niño weather pattern this year, the National Weather Service predicts an increased chance of severe weather in Florida over the winter with the threat of powerful thunderstorms, flooding, cold temperatures and tornadoes.

What is El Niño?

The name El Niño was originally given by fishermen off the west coast of South America to the warm current that appeared every year around Christmas. It is Spanish for "The Child" and — is the name climate scientists use for the occasional periods of warming in the Pacific Ocean that create havoc for global weather patterns. El Niño is known to intensify winter storms across the...