

# Overview of the Evolution toward a Possible El Niño\*

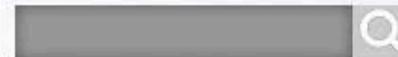
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39<sup>th</sup> Climate Diagnostics and Prediction Workshop  
St. Louis, Missouri

**\* 67% chance of one (as of Oct. 2014)**

# [ENSO Blog: http://www.climate.gov/news-features/departments/enso-blog](http://www.climate.gov/news-features/departments/enso-blog)



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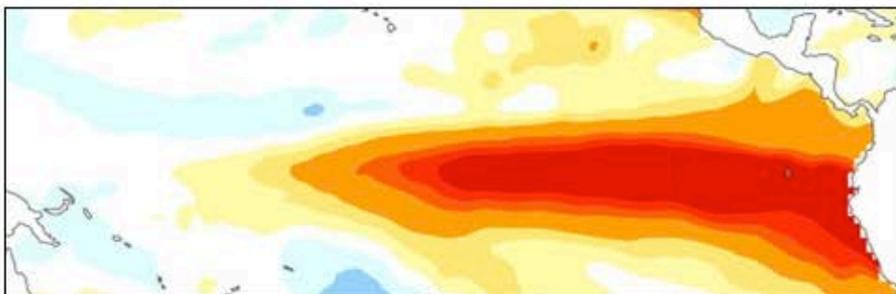
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## ENSO Blog



### ENSO Flavor of the Month

October 16, 2014

How El Niño is like different flavors of ice cream. *Seriously.*

[read more](#)

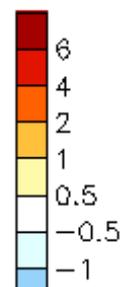
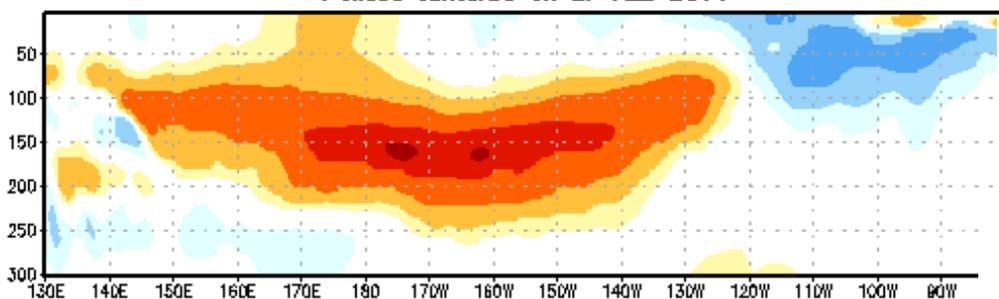
Thanks to Rebecca Lindsey/Climate.gov graphics team

# 6 March 2014

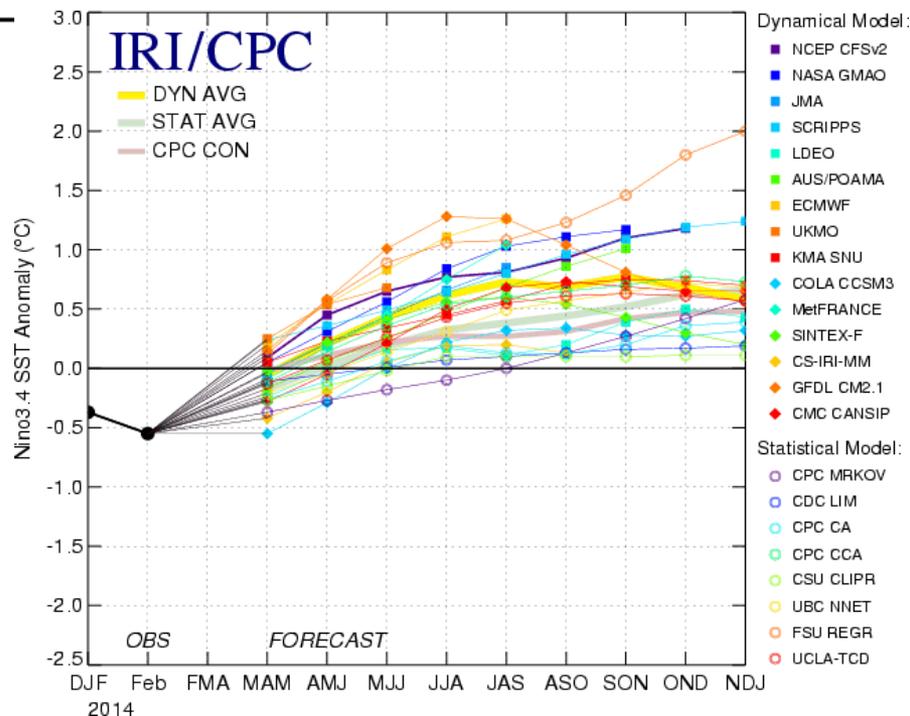
- El Niño Watch issued.
- Noted emergence of the downwelling phase of a Kelvin wave (March subsurface temps: largest positive anomaly since 1979 in GODAS)

EQ. Subsurface Temperature Anomalies (deg C)

Pentad centered on 27 FEB 2014



Mid-Mar 2014 Plume of Model ENSO Predictions



- 50% Chance of El Niño developing in the summer or fall

**April/May 2014:**  
Media Gets Excited  
about a potentially  
large 1997-98 event  
.... only one problem

# El Niño Could Grow Into a Monster, New Data Show

By Eric Holthaus



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## EL NIÑO: IS 2014 THE NEW 1997?



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Like 3.7k Tweet 447 Share 56 Pin it

By [Ma Evelyn Castino Quilas](#) | May 20, 2014 2:46 PM EST

Int'l Business Times

National Aeronautics and Space Administration ([NASA](#)) has issued a warning regarding El Niño 2014 that will be most likely similar to the 1997 phenomenon.

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## How El Niño will change the world's weather in 2014

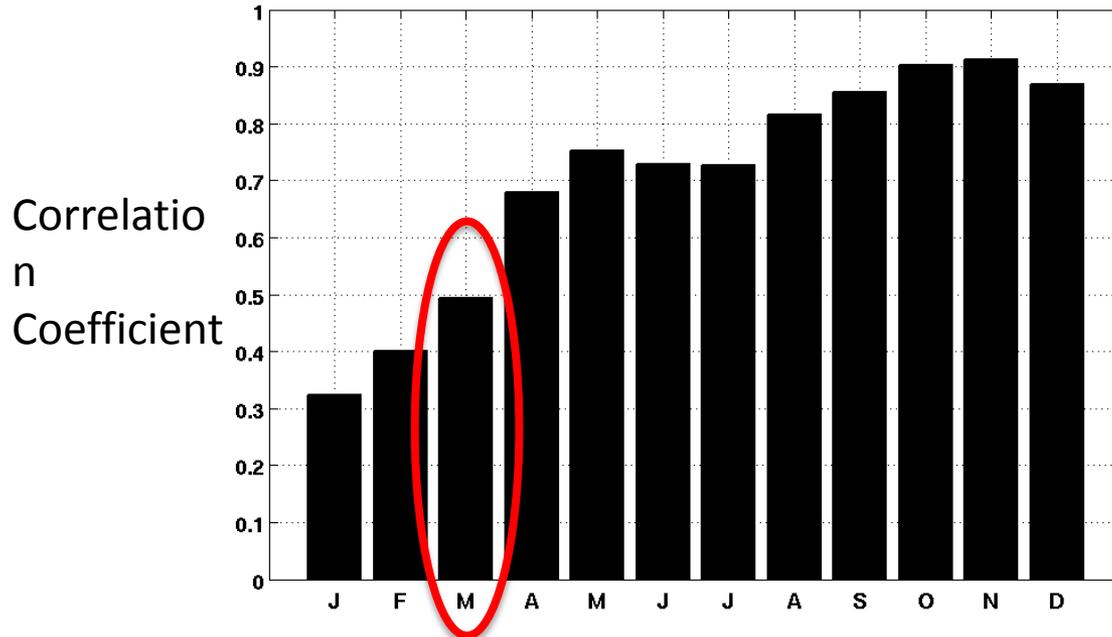
With a 90% chance of the global weather phenomenon striking this year, impacts both devastating and beneficial will be felt from India to Peru

90% chance of El Niño

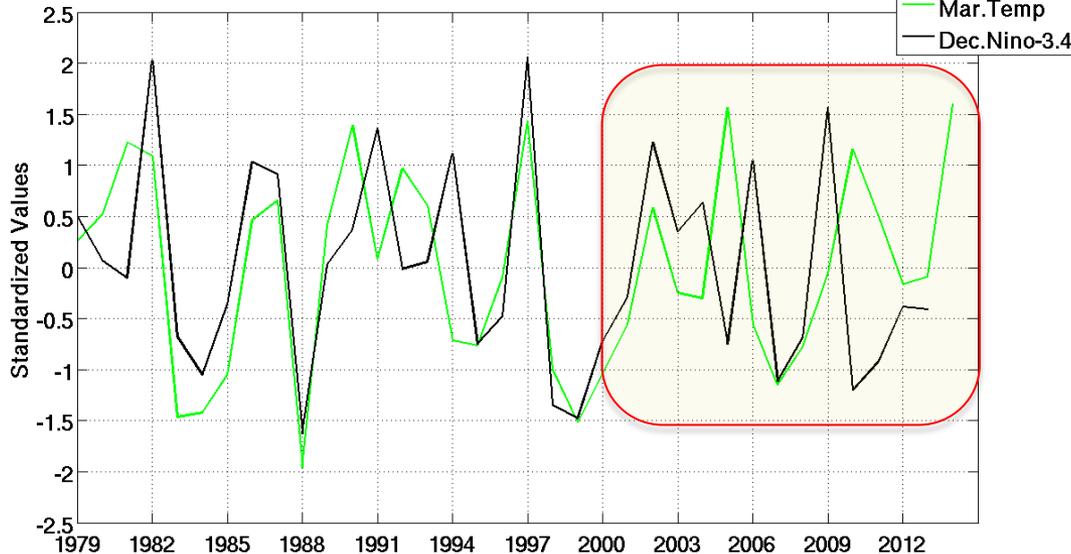


# How Well Does March Subsurface Temp relate to ENSO?

Correlation of Mthly Upper 300m Temp (180-100W) with December Nino3.4



Std. March Upper 300m Temp (180-100W) vs. Std. Dec Nino-3.4 SST



Talk on Thursday at 9:10am  
"Estimating the chance of El Niño from subsurface temperature anomalies"

# CPC/IRI ENSO Diagnostics Discussion

## Statements on ENSO strength:

**10 April:** Despite this greater model consensus, there remains considerable **uncertainty as to when El Niño will develop and how strong it may become.**

**8 May:** There remains uncertainty as to exactly when El Niño will develop and an even greater **uncertainty as to how strong it may become.** This uncertainty is related to the inherently lower forecast skill of the models for forecasts made in the spring.

**5 June:** If El Niño forms, the forecasters and most dynamical models, such as NCEP CFSv2, **slightly favor a moderate-strength event** during the Northern Hemisphere fall or winter. However, significant uncertainty accompanies this prediction, which **remains inclusive of a weaker or stronger event** due to the spread of the models and their skill at these lead times.

**10 July:** The chance of a **strong El Niño is not favored** in any of the ensemble averages for Niño-3.4. At this time, the forecasters anticipate El Niño **will peak at weak-to-moderate strength** during the late fall and early winter.

**... August 7<sup>th</sup> forward: weak strength is favored**

# Early June 2014: Some folks remained *VERY* enthusiastic!

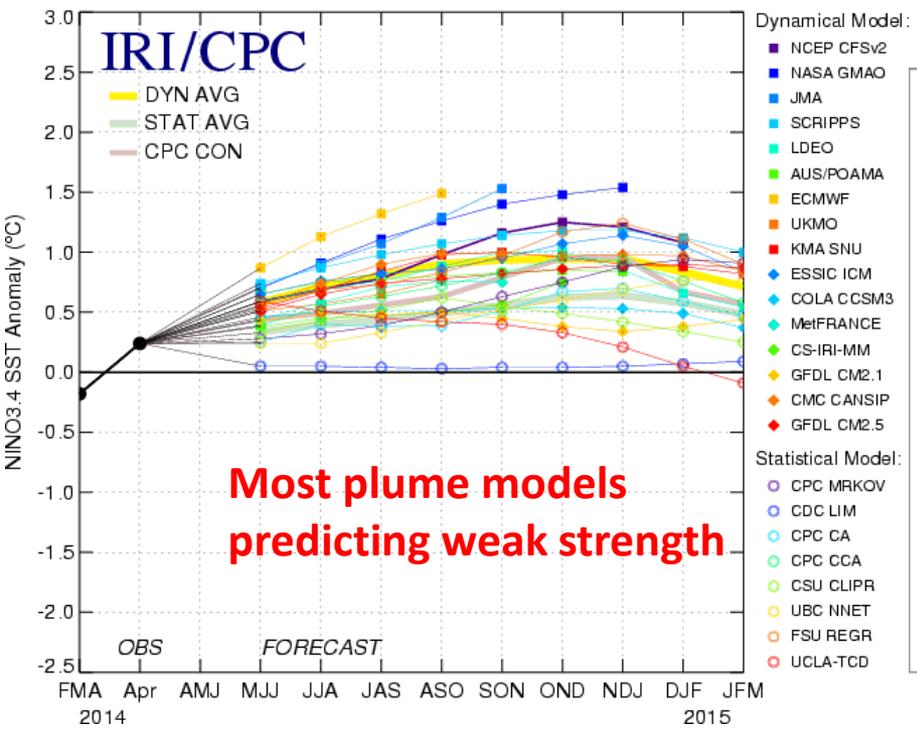
## El Niño Is Here

By Eric Holthaus

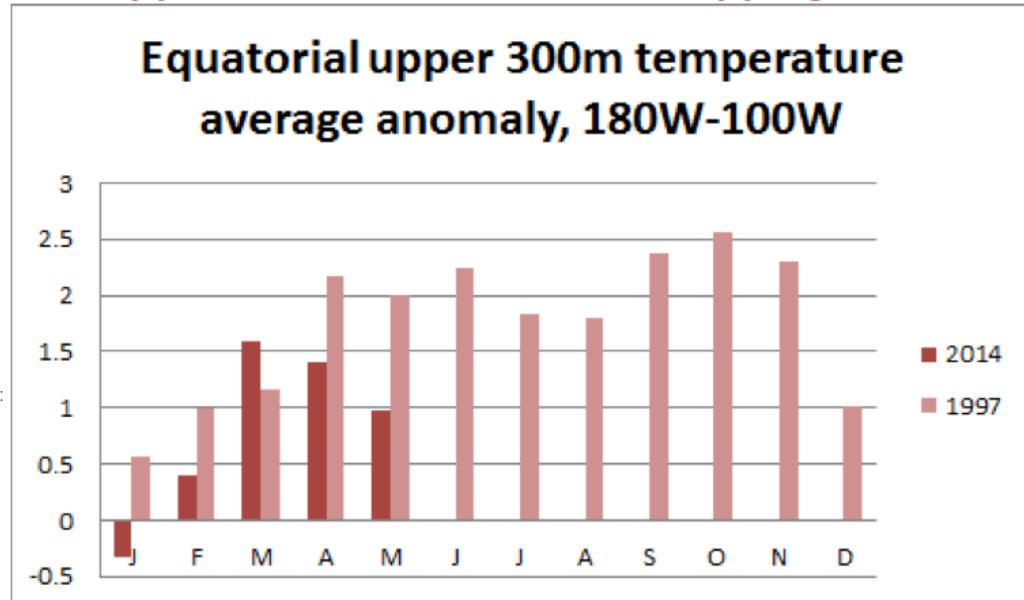


### Meanwhile,

Mid-May 2014 Plume of Model ENSO Predictions



### Upper Ocean Heat Content dropping....

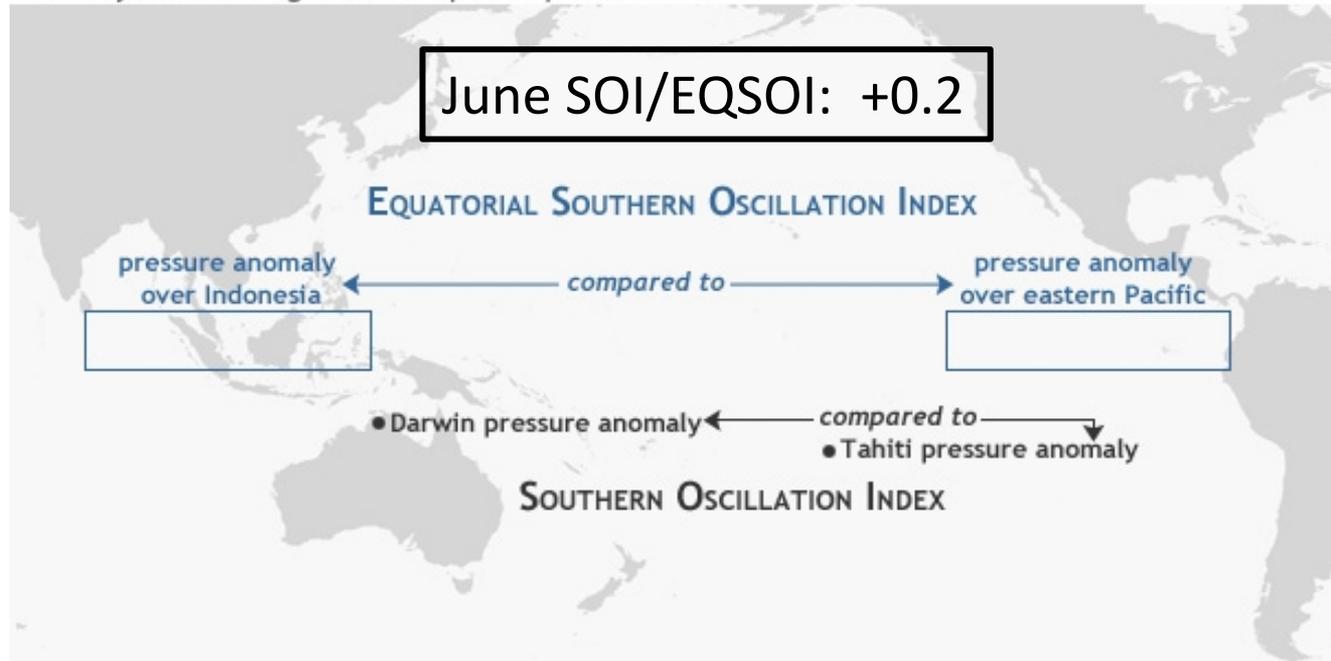


Emily Becker, June 5<sup>th</sup> ENSO Blog

10 July 2014

- EN... SO? The Southern Oscillation hadn't yet caught on.
- No clear tropical rainfall pattern resembling El Niño

Two ways of tracking the atmospheric part of ENSO

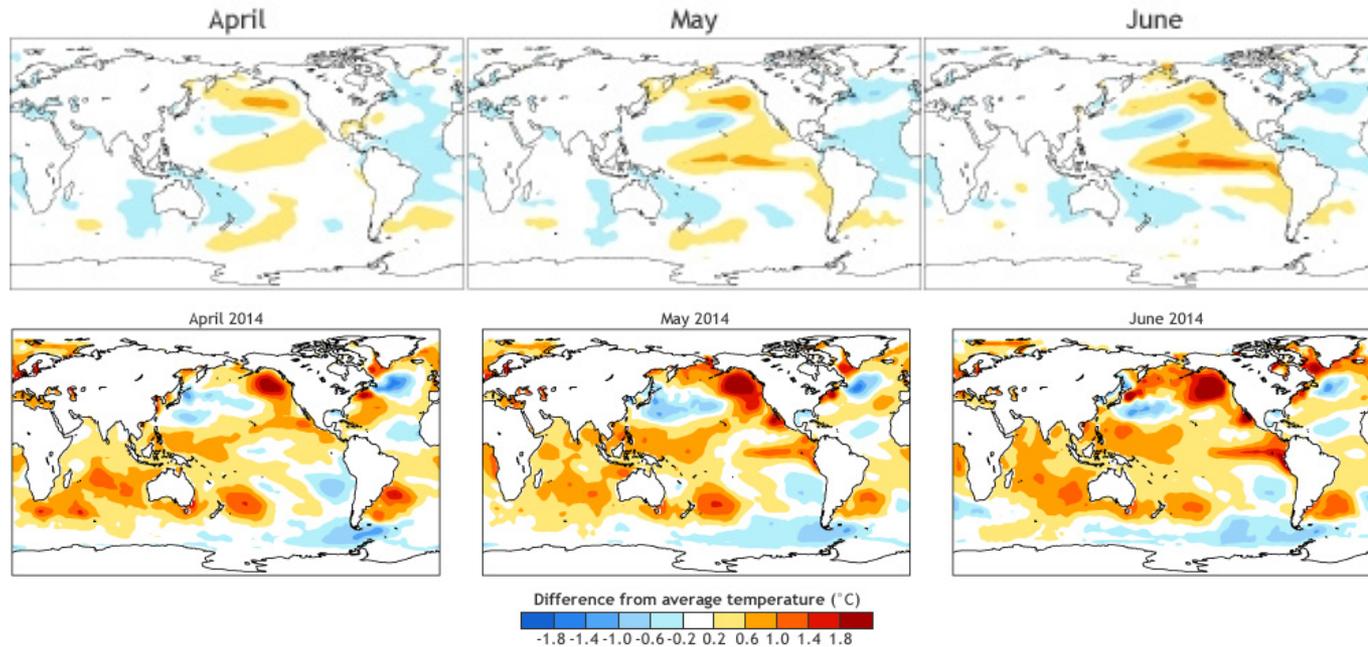


- At this point, chance of El Niño was about 70% during the Northern Hemisphere summer and was close to 80% during the fall and early winter.
- After this month, the probabilities began decreasing and onset timing was increasingly pushed off ...

# So why didn't we see coupling during the summer?

- We still don't know (needs more analysis).
- One idea put forth by the Bureau of Meteorology in Australia and explored further in 25 July ENSO blog post:

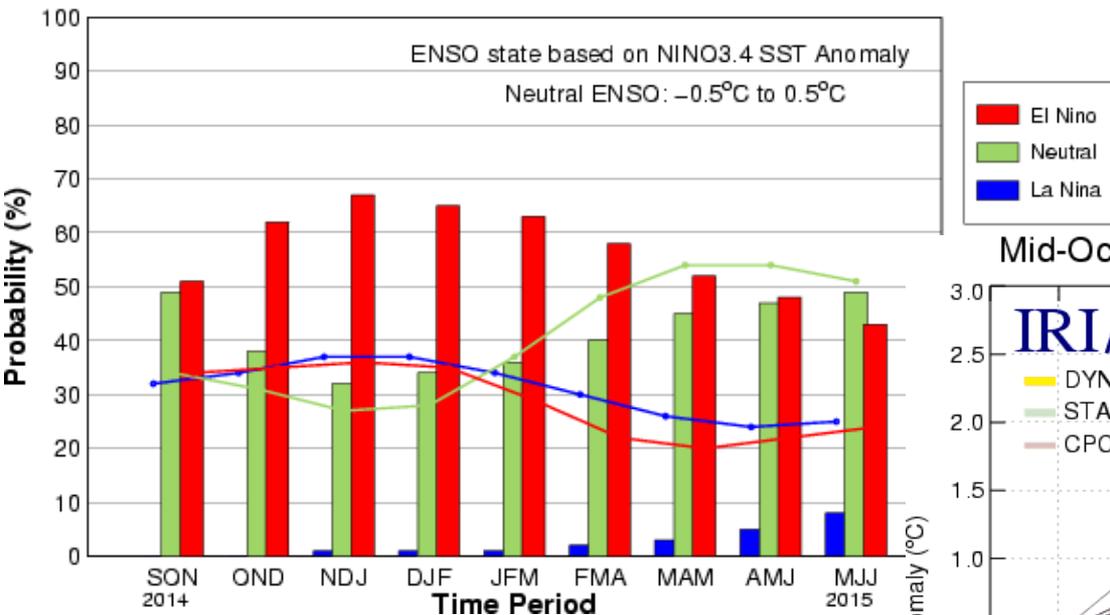
## Lagged Regression of SST anomalies onto winter Niño-3.4



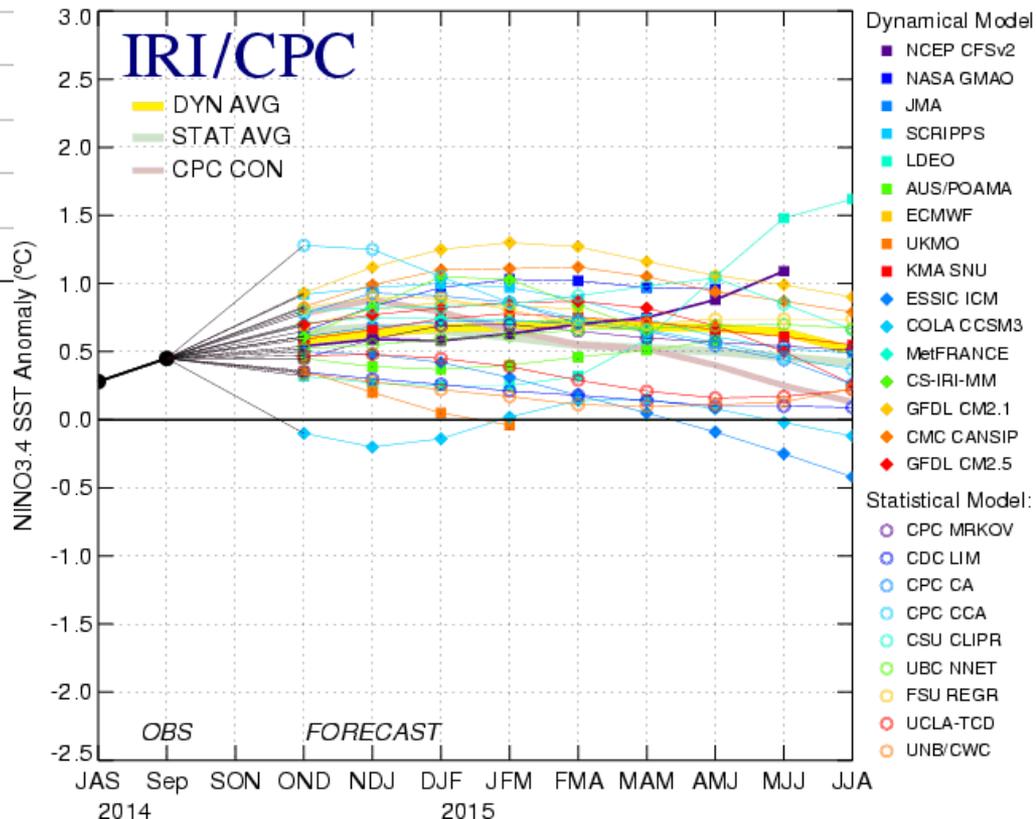
# Currently

- El Niño is favored to begin in the next 1-2 months and last into the Northern Hemisphere spring 2015 (9 October 2014)

Early-Oct CPC/IRI Consensus Probabilistic ENSO Forecast

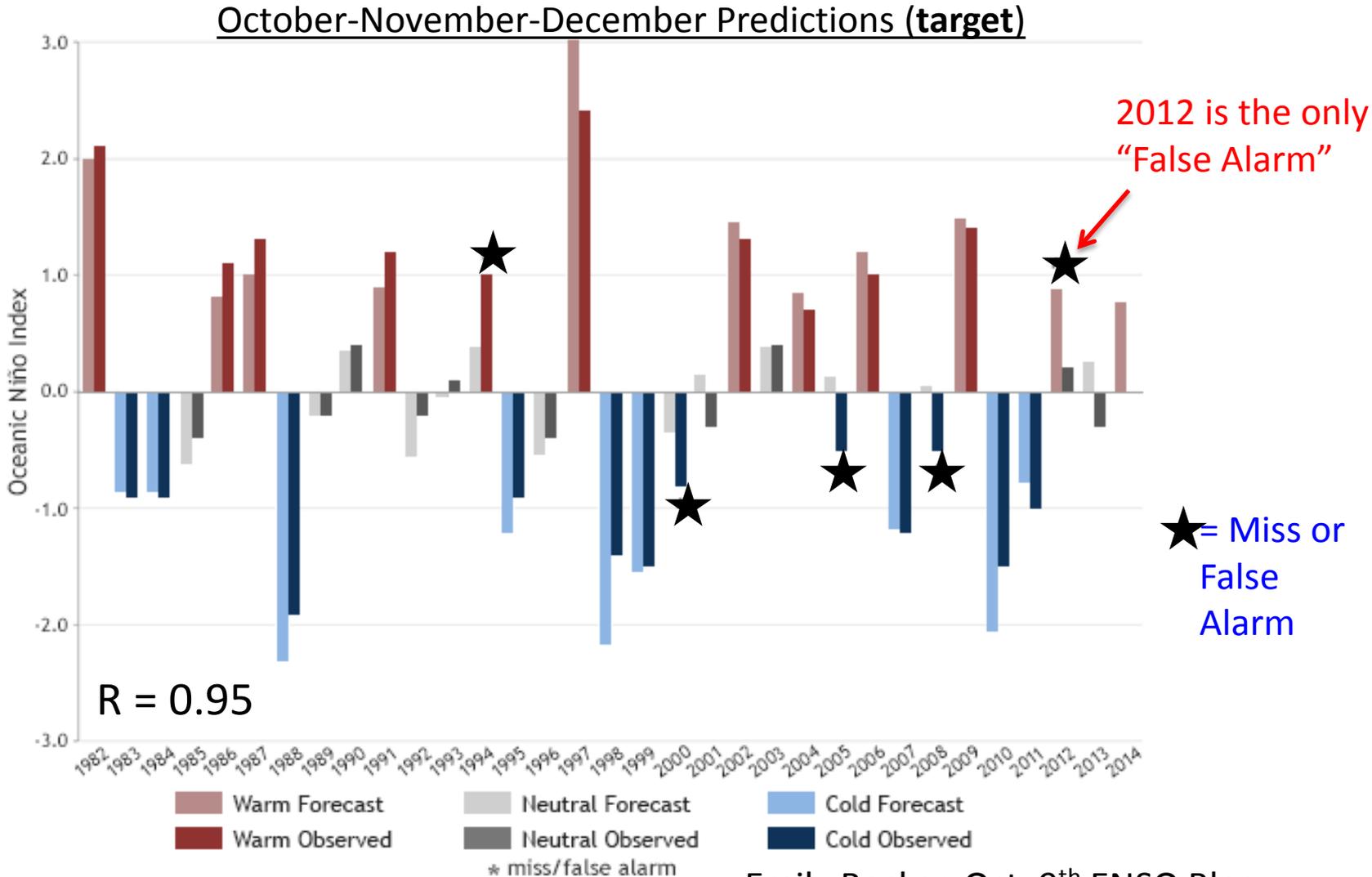


Mid-Oct 2014 Plume of Model ENSO Predictions



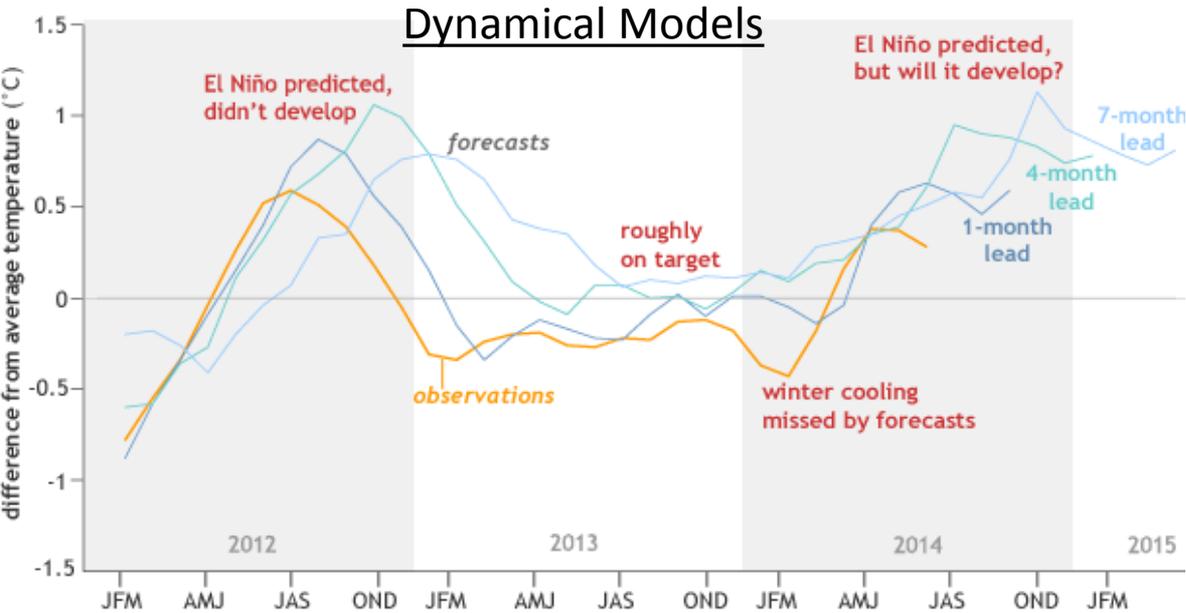
# At the moment, what is the historic skill for OND Niño-3.4?

- Examining 29 year of September (I.C.) hindcasts from the North American Multi-Model Ensemble (NMME) + 3 years of operational runs



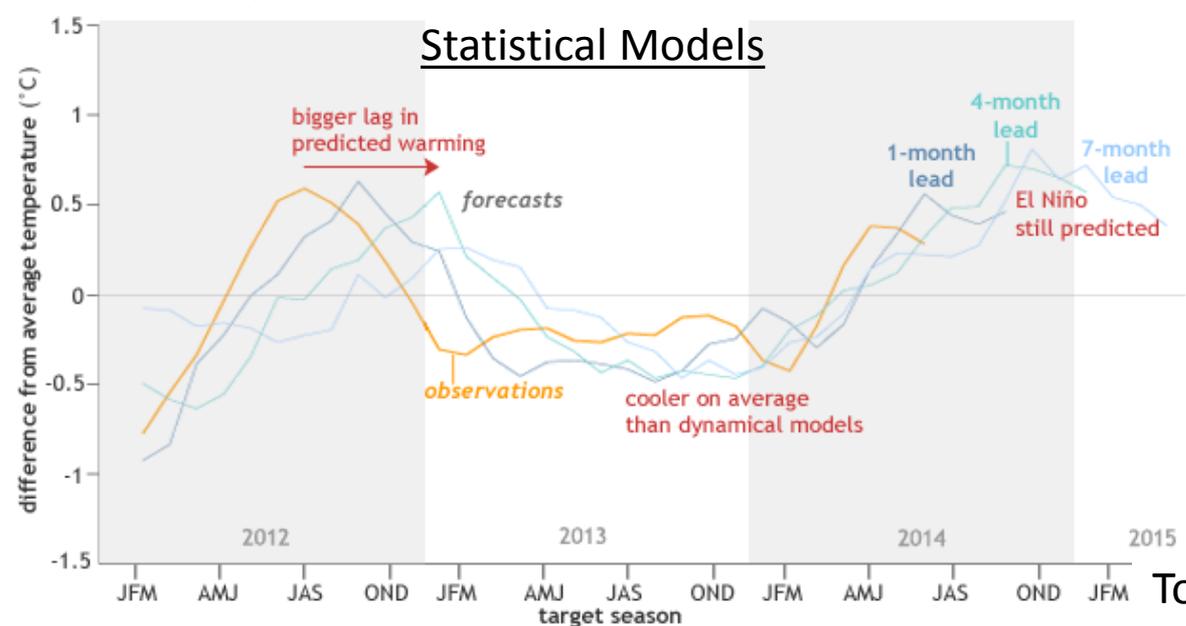
# How Good Have ENSO Forecasts been lately?

ENSO forecasts compared to observations: dynamic models



Model Type	Correlation Coefficient		
	Lead 1	Lead 4	Lead 7
<i>Dynamical</i>	0.89	0.60	0.14
<i>Statistical</i>	0.79	0.46	0.12

ENSO forecasts compared to observations: statistical models



Model Type	Mean Absolute Error		
	Lead 1	Lead 4	Lead 7
<i>Dynamical</i>	0.17	0.32	0.44
<i>Statistical</i>	0.22	0.29	0.31

## Wrap-Up

- El Niño Watch has been in effect since March 2014
- So far this year, CPC/IRI ENSO team predictions for the onset season of El Niño have been off the mark
- CPC/IRI ENSO team never favored a strong El Niño (despite the media stories)
- Currently, favoring El Niño onset in the next month or so, lasting into the Northern Hemisphere spring (weak strength)

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