

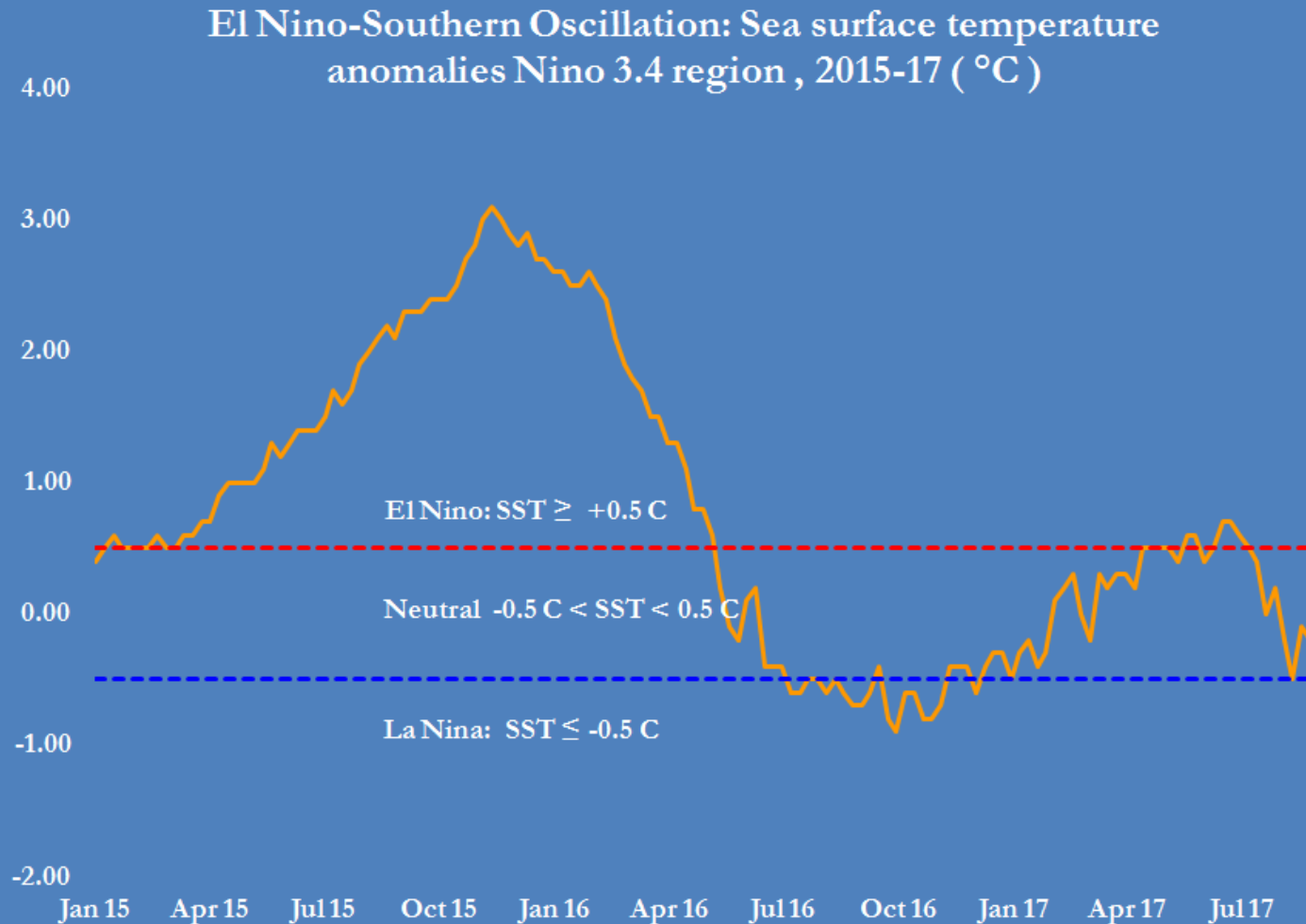
# El Nino-Southern Oscillation

## Selected indicators

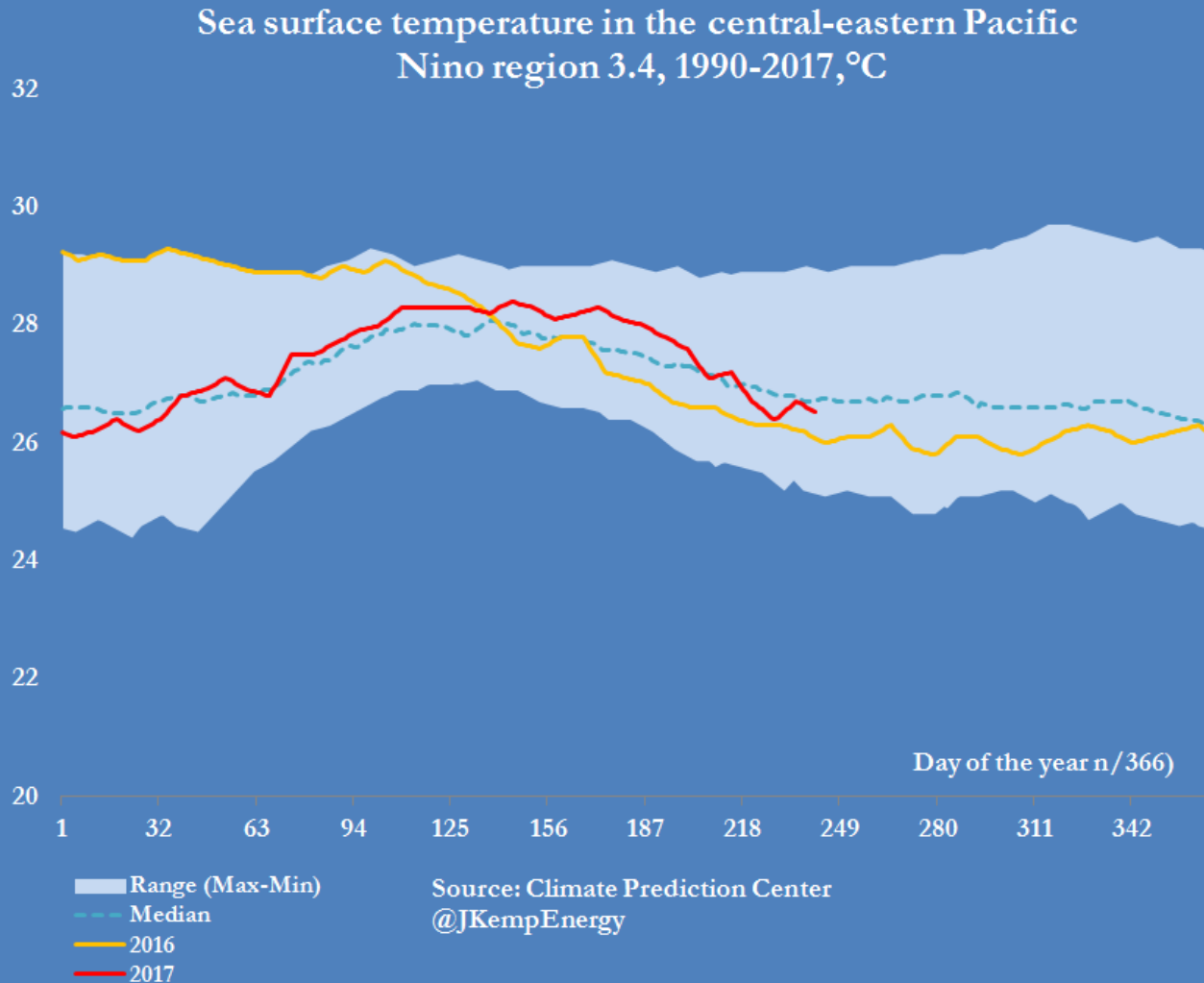
**JOHN KEMP**  
**REUTERS**

Data for the week centred on 30 August 2017

# Sea surface temperatures in central-eastern Pacific are cooling rapidly and were -0.2C below seasonal average last week

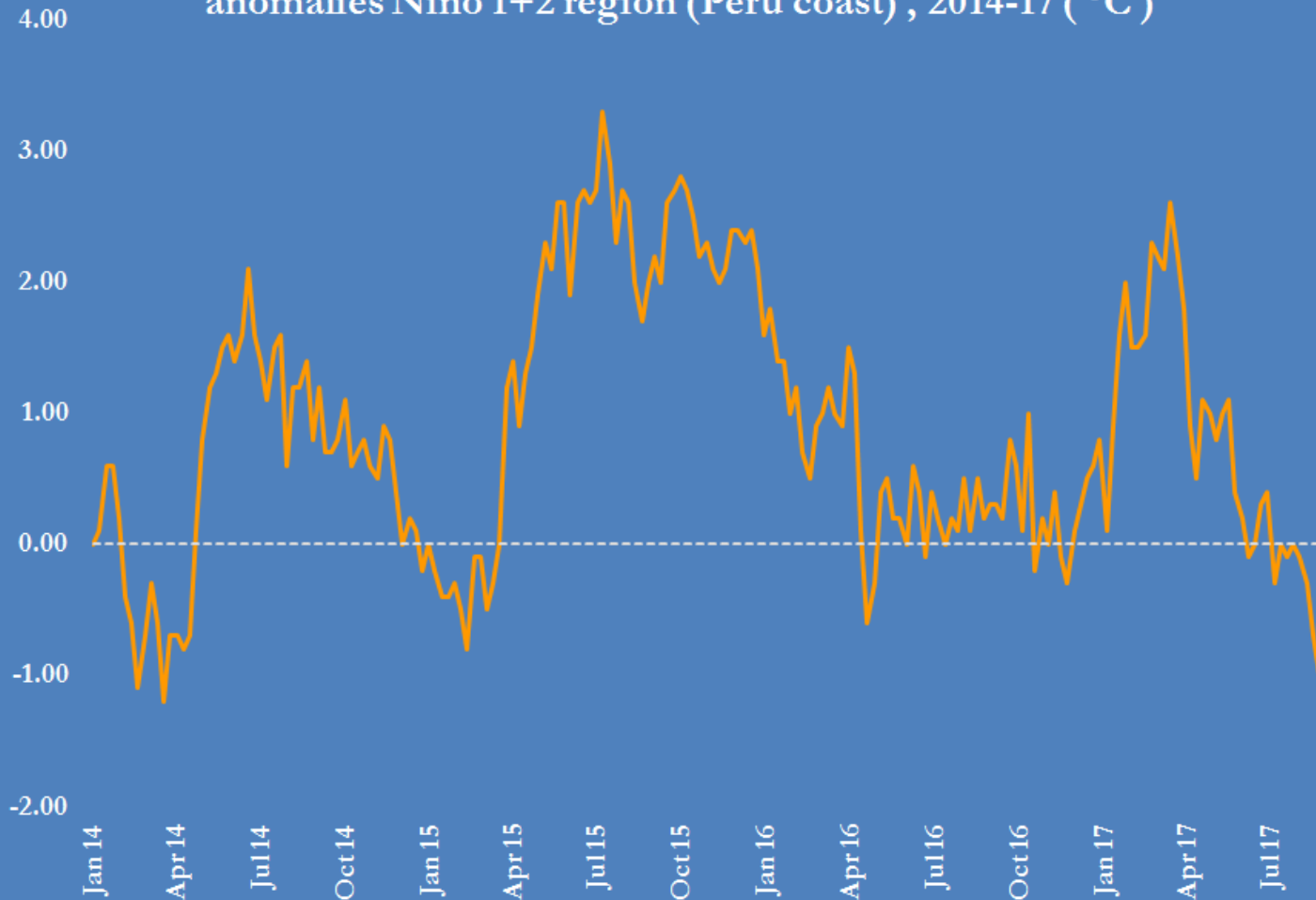


ENSO has swung rapidly from a mild warm phase to a slightly cool phase since the end of June  
Ocean temperatures have cooled much faster than normal for time of year



# Sea surface temperatures off coast of Peru are -0.2C below average for time of year

El Nino-Southern Oscillation: Sea surface temperature anomalies Nino 1+2 region (Peru coast) , 2014-17 ( °C)

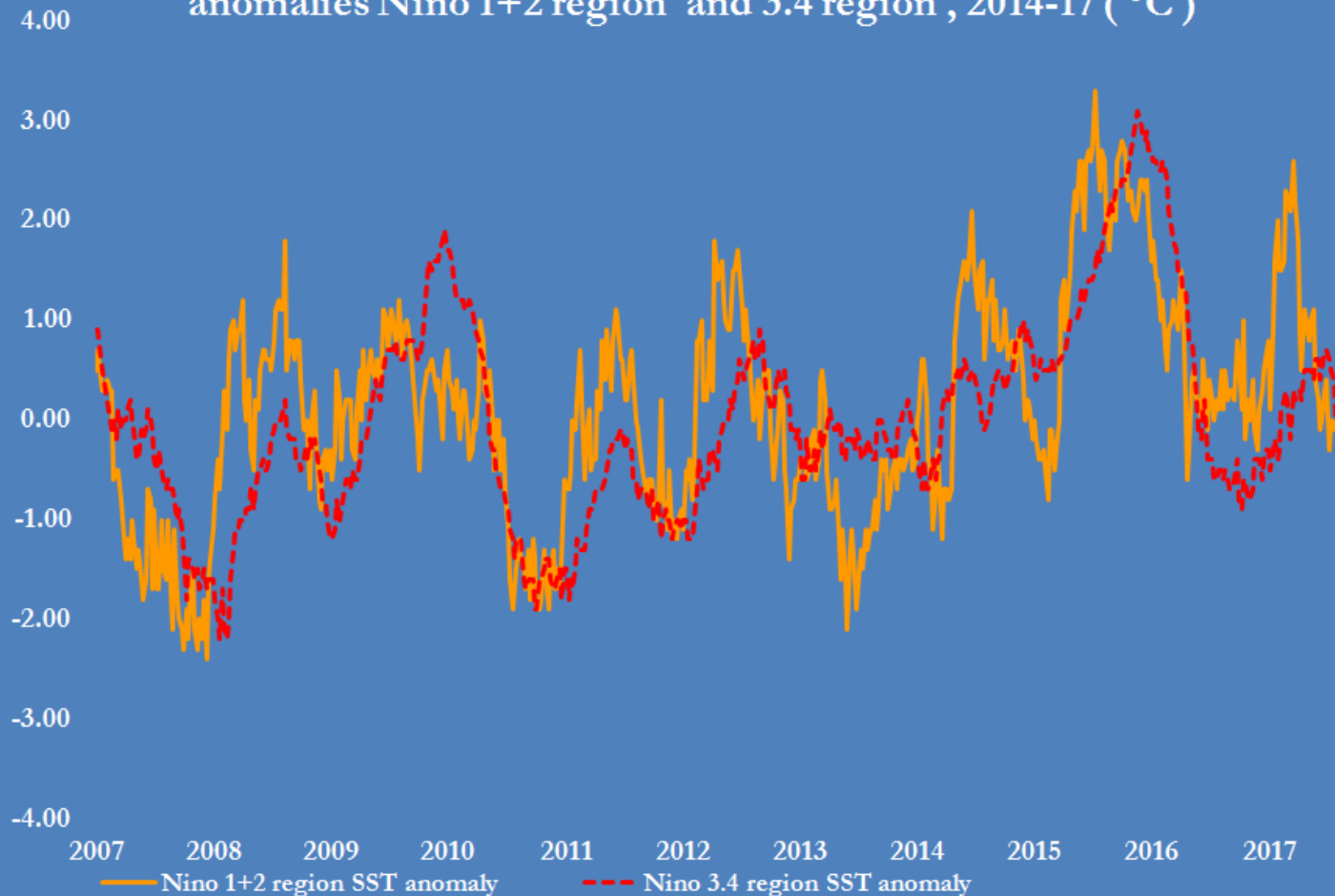


Source: US National Oceanic and Atmospheric Administration

@JKempEnergy

# Cooler water from Peru coast has spread west on the equatorial current and lowered temperatures in the central ocean

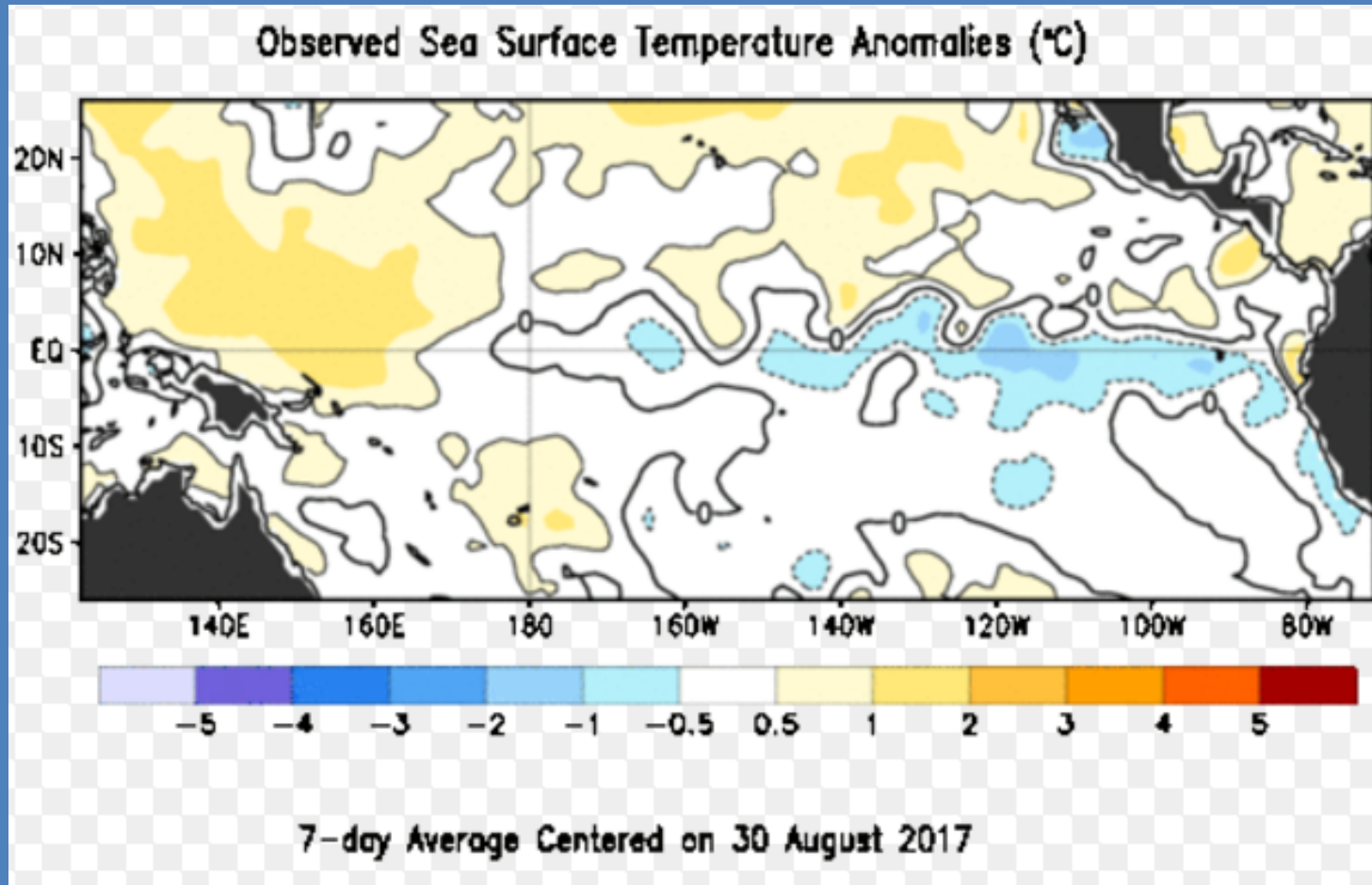
El Nino-Southern Oscillation: Sea surface temperature anomalies Nino 1+2 region and 3.4 region , 2014-17 ( °C )



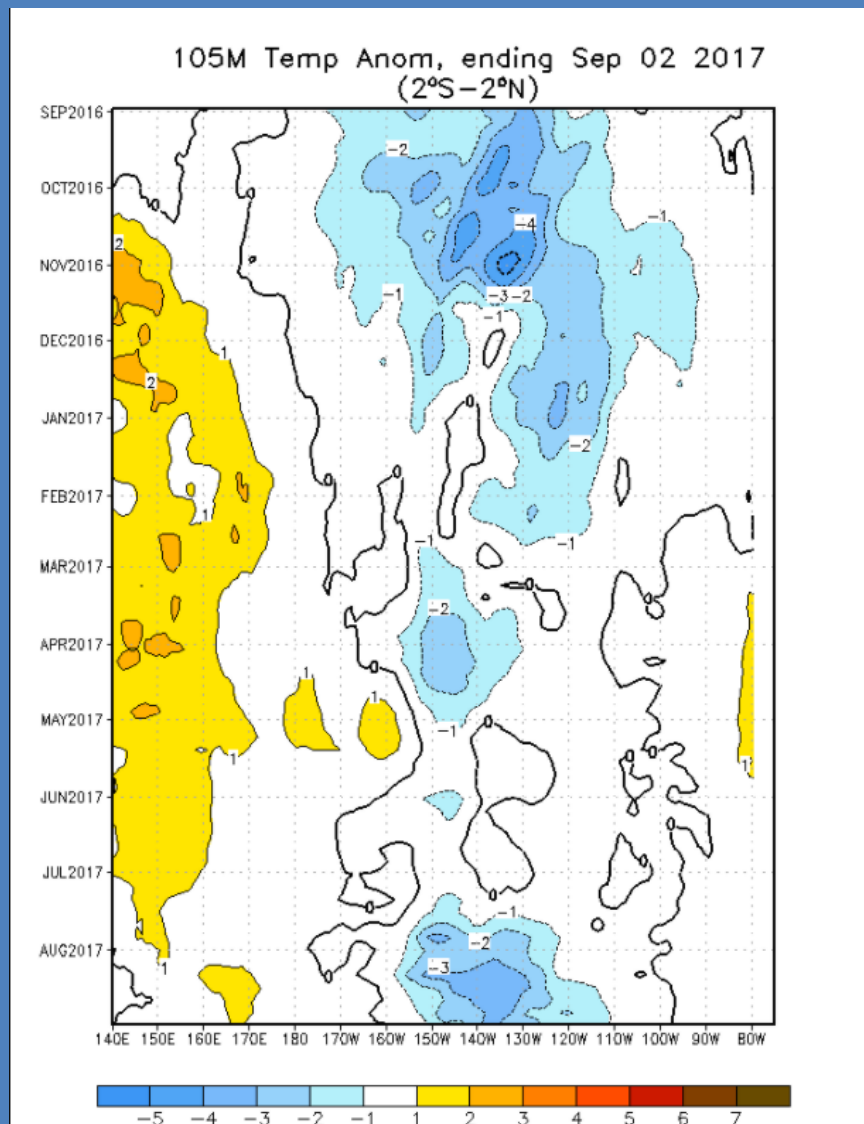
Source: US National Oceanic and Atmospheric Administration

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Sea surface temperatures throughout most of equatorial Pacific east of the dateline now below average (consistent with La Nina)



# Sub-surface temperatures remain close to average



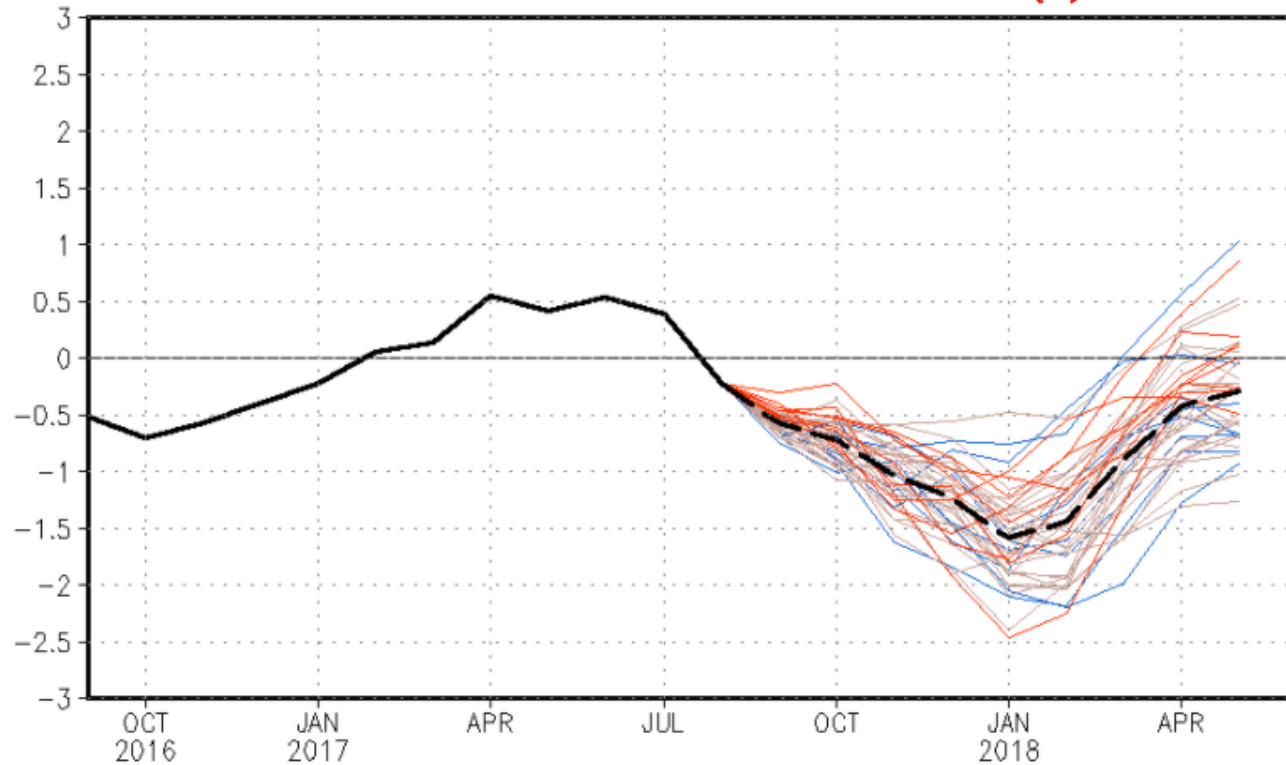
# ENSO cold phase: U.S. government projection shows sea surface temps in central-eastern Pacific below average through end of 2017



NWS/NCEP/CPC

Last update: Mon Sep 4 2017  
Initial conditions: 25Aug2017-3Sep2017

CFSv2 forecast Nino3.4 SST anomalies (K)



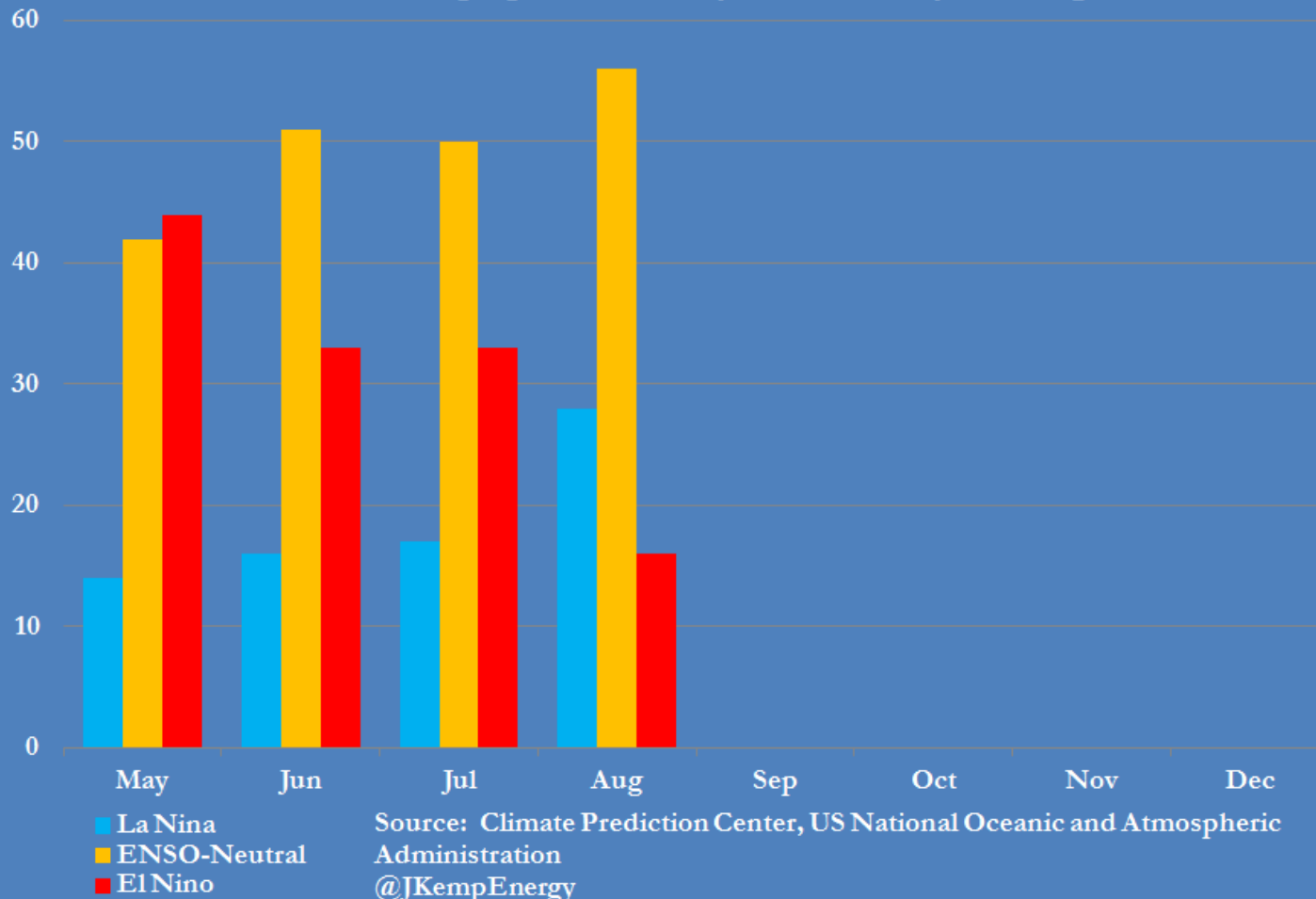
— Latest 8 forecast members  
— Earliest 8 forecast members  
— Other forecast members  
— Forecast ensemble mean  
— NCDC daily analysis

(Model bias correct base period: 1999–2010; Climatology base period: 1982–2010)



# U.S. government forecasts have shifted from bias towards El Nino to bias towards La Nina this winter

Forecast probability (percent) of El Nino or ENSO-Neutral conditions between Dec 2017 and Jan 2018 (official forecast)  
NOAA estimates prepared monthly between May and Aug 2017



# ENSO alternates regularly between warm and cool phases but duration and strength of phases is very irregular and hard to predict

El Nino-Southern Oscillation: Sea surface temperature anomalies Nino 3.4, 1990-2017 ( °C )

