

ENSO status:

A weak La Niña followed El Niño 2015-16.

What is next?

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¹ UCLA - JIFRESSE

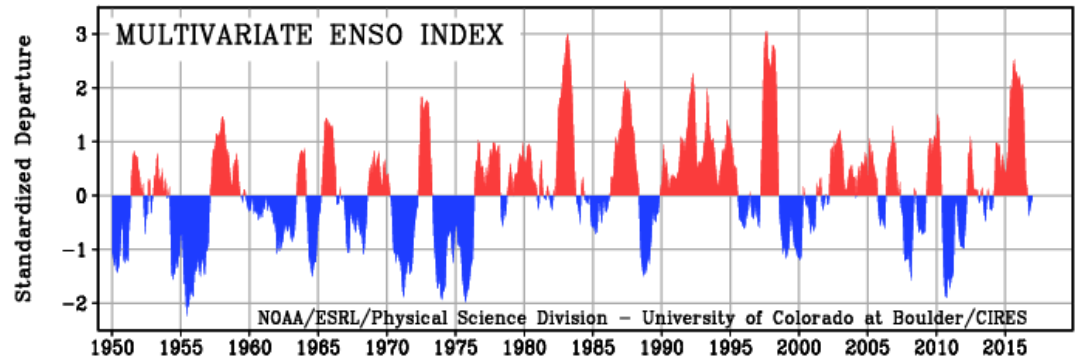
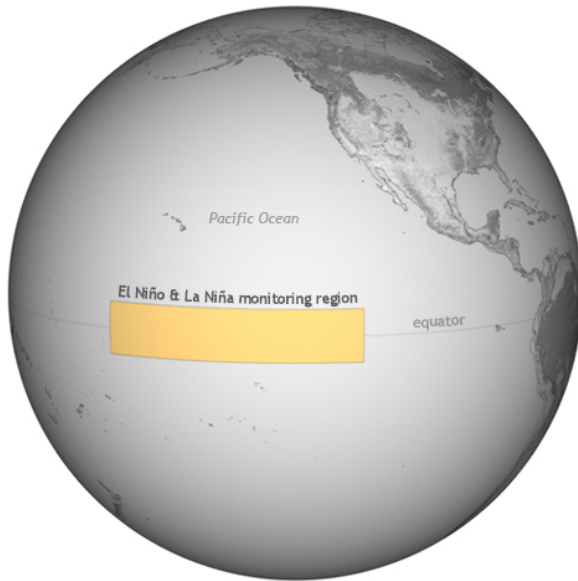
² Jet Propulsion Laboratory / California Institute of Technology

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El Niño 2015-16: A Review

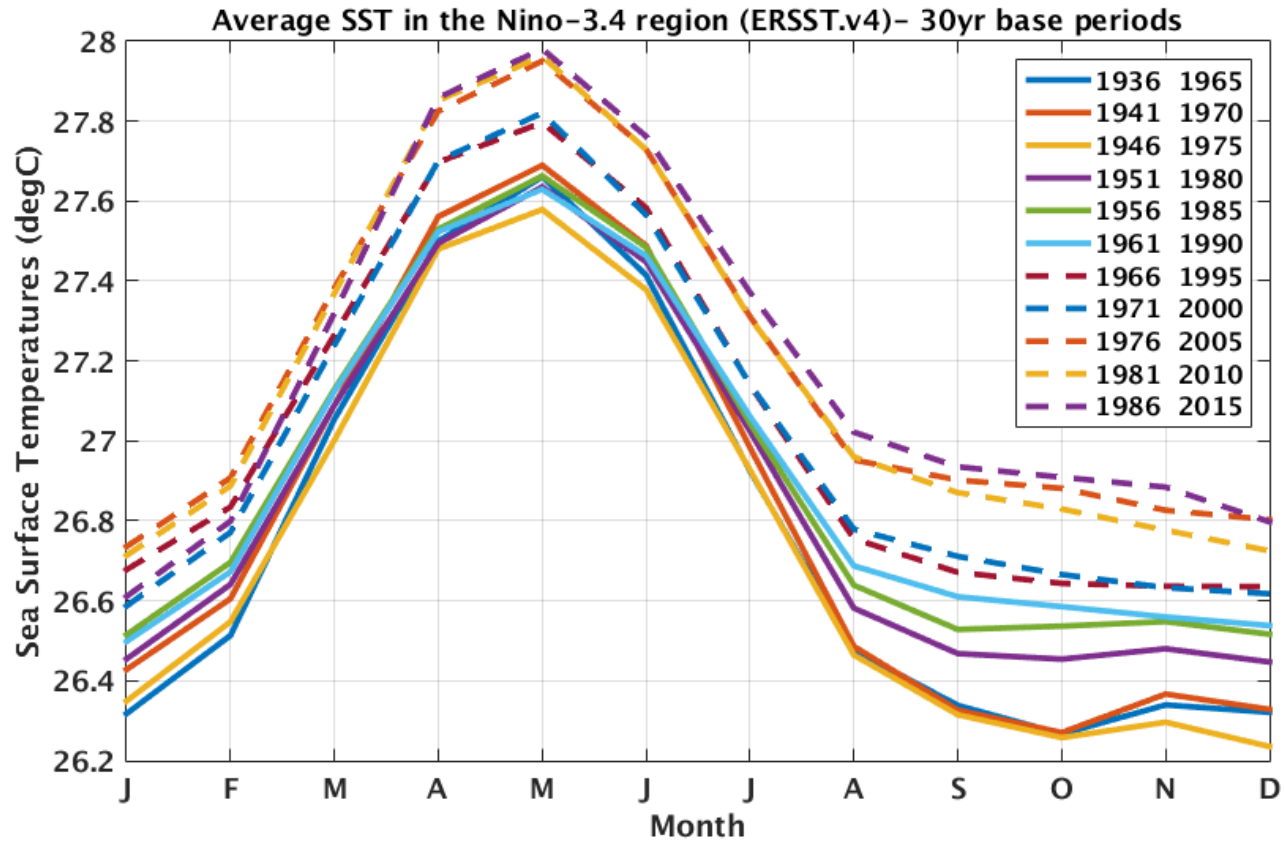
Developing from a small patch of warm water in the Pacific Ocean, this El Niño grew to among the largest ever recorded.



The highly anticipated 2014-15 El Niño event failed due to unusually strong easterly winds in the summer of 2014.



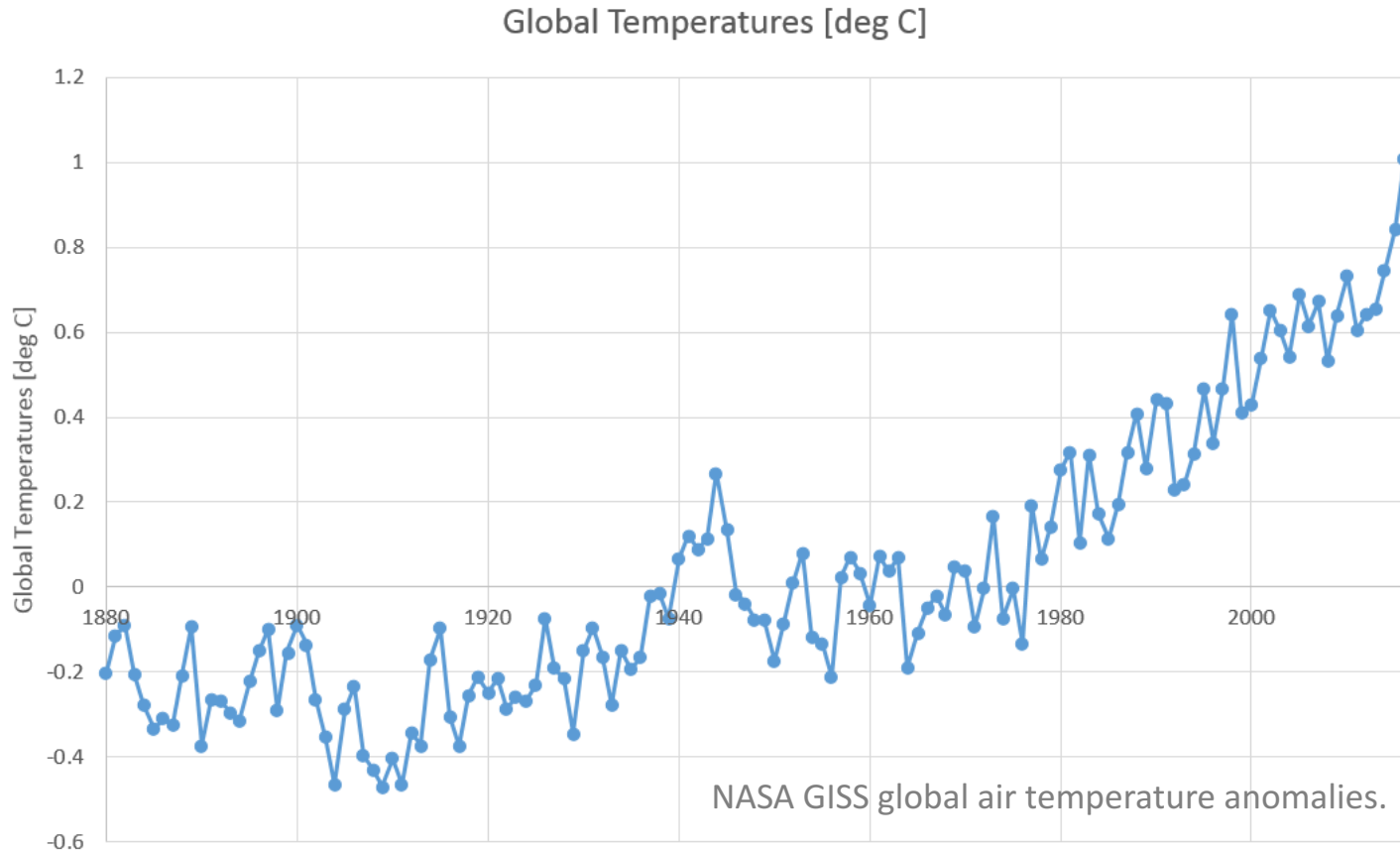
El Niño - Historical



<http://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/enso.shtml>



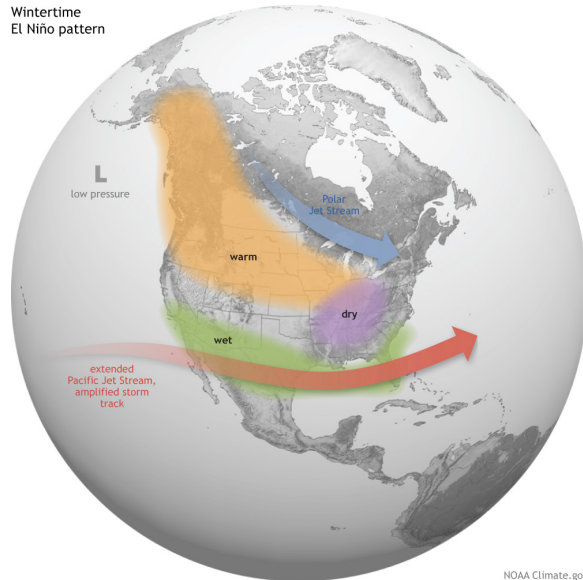
El Niño 2015-16 & Global Temperature



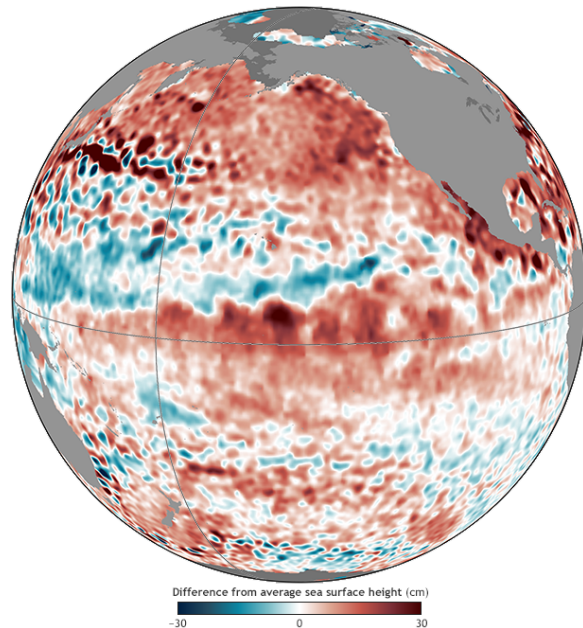
El Niño 2015-16 helped release heat from the sub-surface of the ocean, resulting in the 2016 global air temperature anomaly being substantially warmer ($\sim +1^{\circ}\text{C}$) than the previous 2001-2010 average ($\sim +0.6^{\circ}\text{C}$).



Wintertime
El Niño pattern



NOAA Climate.gov



El Niño 2015-16 on North America

During winter El Niño features a strong jet stream and storm track across CA and the Southern U.S., and less stormy conditions across the northern part of the country.

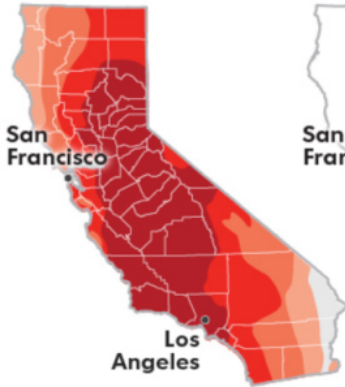
However, since 2014, the unusual presence of an "anomalous ridge" off the west coast of North America has been blocking a path for wet storms to reach Southern California during the past winters.



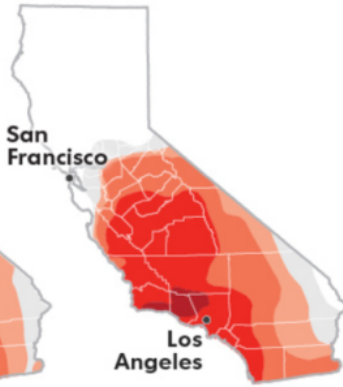
El Niño 2015-16 what meant for Cali?

● Exceptional ● Extreme ● Severe
● Moderate ● Abnormally dry

JAN. 12, 2016



JAN. 10, 2017



SOURCE National Drought Mitigation Center
Janet Loehrke, USA TODAY

It delivered much-needed rain and snow to parched California, but failed to end the state's historic 5-year drought.

According to the latest report from the U.S. Drought Monitor, 83.9% of the state of California remains in drought.

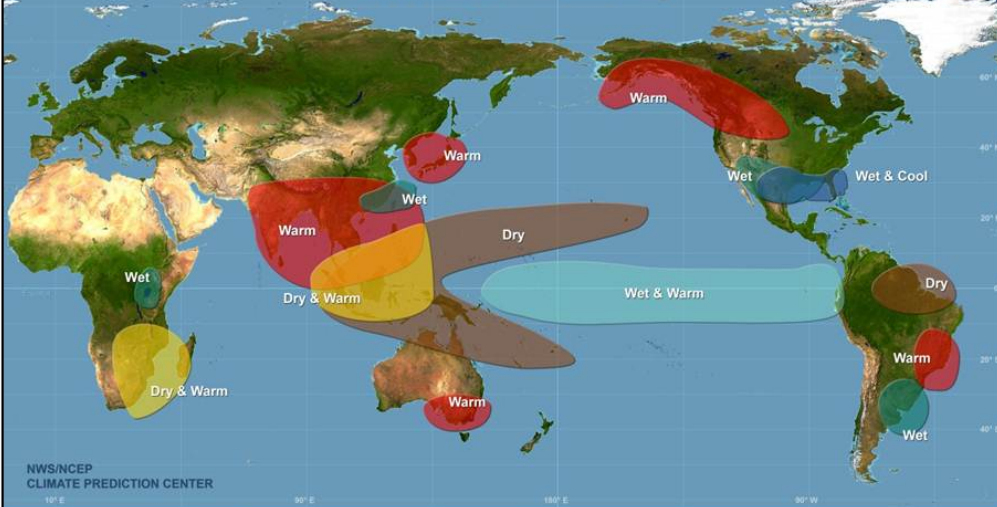
Flooding in Southern CA.
Mud flowing down CA's hillsides.
Intensifying erosion in Pacifica, CA.





Warm Episode Relationships

December - February



El Niño 2015-16 @World

Severe drought in places like Colombia, Bolivia, or Ethiopia.

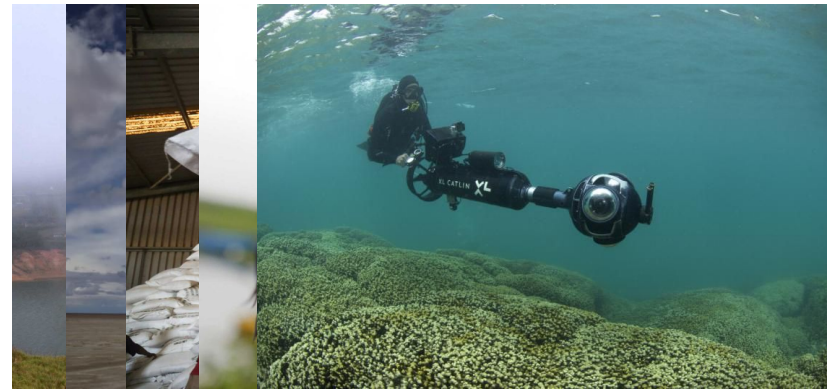
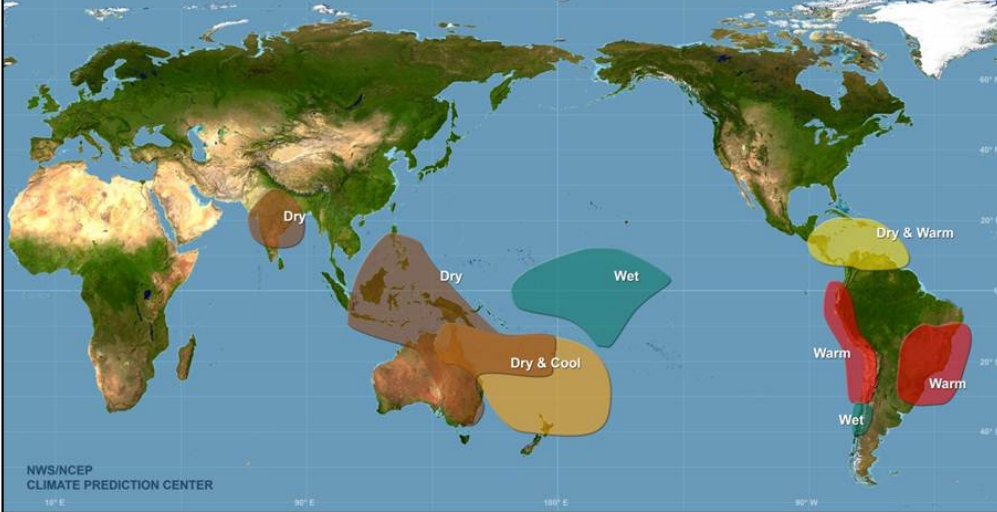
Output of fisheries declined by 1.96% in the Philippines.

Signs of coral bleaching off Hawaii.



Warm Episode Relationships

June - August



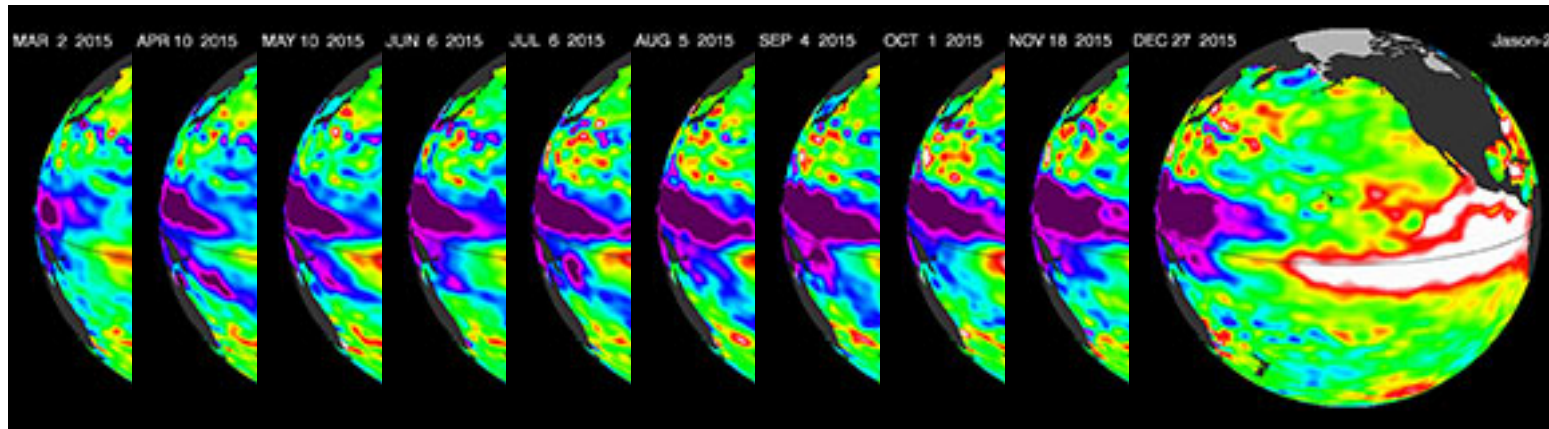
High Resolution Images can be found at:

<http://www.cpc.ncep.noaa.gov/products/precip/CWlink/ENSO/ENSO-Global-Impacts/>

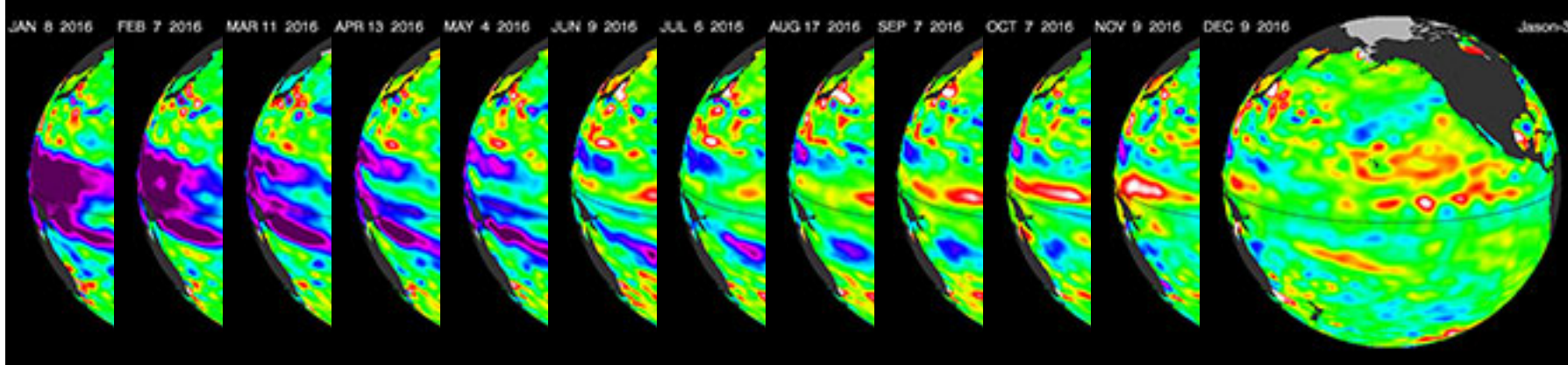
<https://sealevel.nasa.gov/news/38/el-nino-2015-16-as-california-waits-latin-america-is-hit-hard>



El Niño 2015-16: Evolution



2014	-0.5	-0.6	-0.4	-0.2	0	0	0	0	0.2	0.4	0.6	0.6
2015	0.5	0.4	0.5	0.7	0.9	1.0	1.2	1.5	1.8	2.1	2.2	2.3
2016	2.2	1.9	1.5	1.1	0.6	0.1	-0.3	-0.5	-0.7	-0.8	-0.8	-0.7

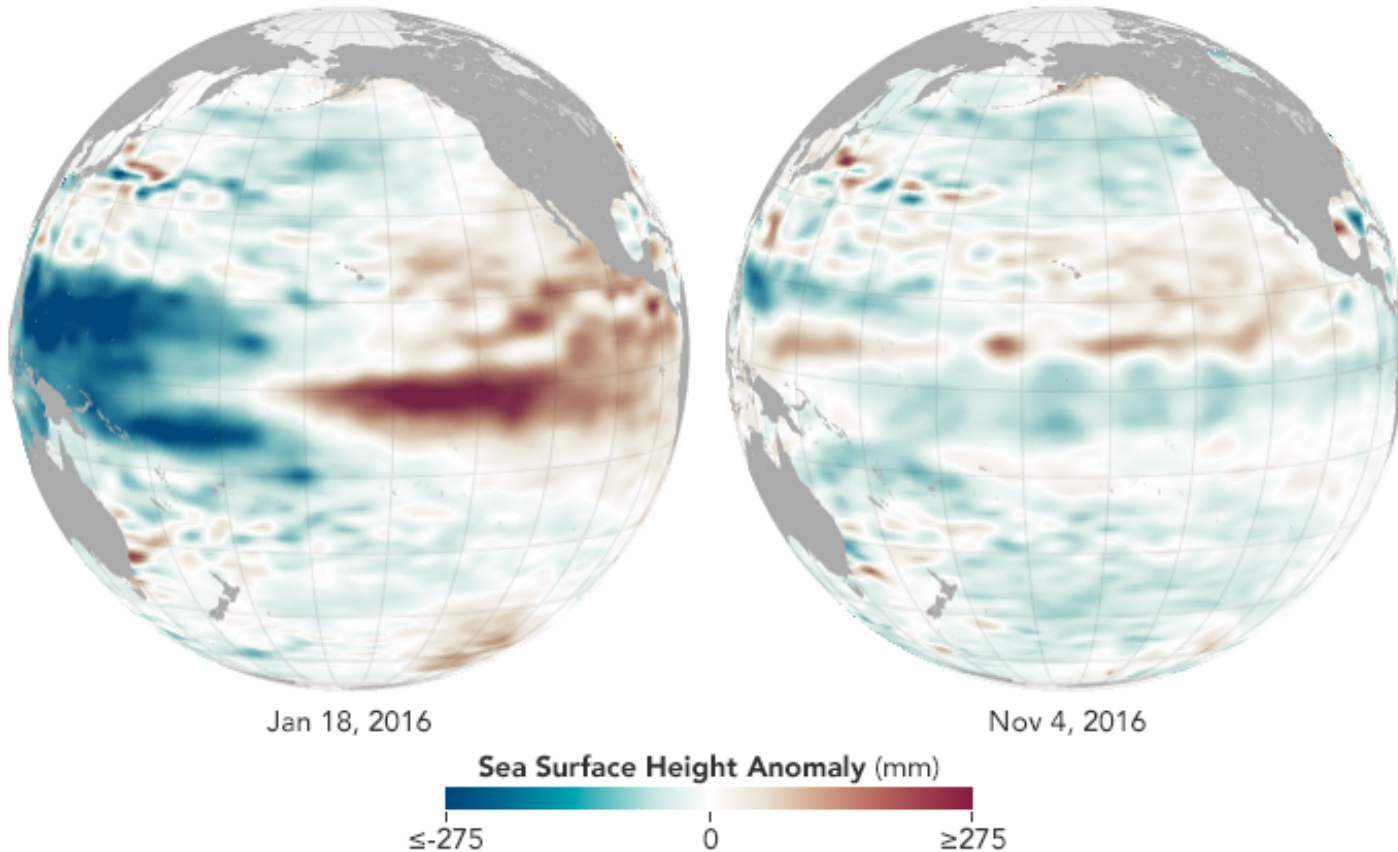


<http://sealevel.jpl.nasa.gov/>

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ensoyears.shtml



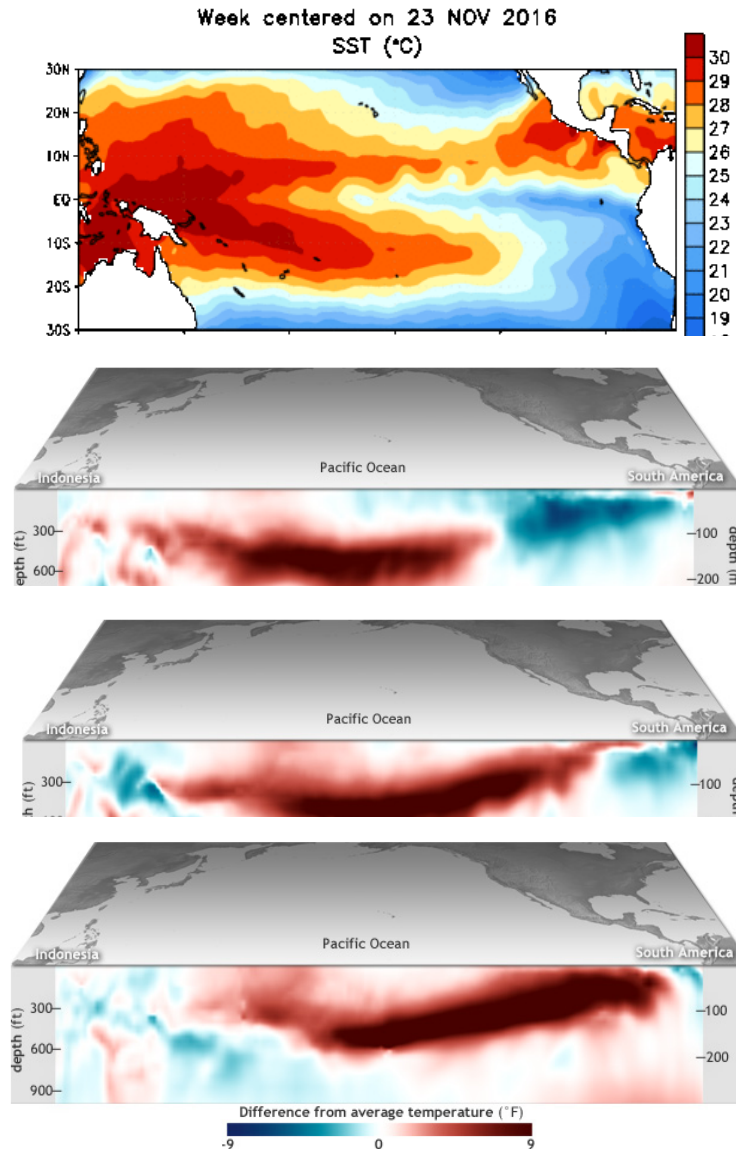
A weak and short-lived La Niña followed El Niño 2015-16.



The atmospheric conditions for La Niña to strengthen never fully came together.
La Niña conditions are no longer present.



ENSO Current Conditions: La Nada, For Now



Surface temperatures and cross-sections of the Pacific Ocean (top 300 m) shows ENSO-neutral conditions: "La Nada".

"La Nada," is the midpoint between El Niño and La Niña, when temperatures are near average in the Pacific Ocean.

In the past, four out of five weak La Niñas turned into El Niño the next year.



- El Niño 2015-16 was one of the strongest on record.
 - A weak La Niña emerged last August.
- The temperature anomaly in the North Pacific Ocean is also a key factor in winter storms.
 - Let's not forget the far-reaching impacts in many areas of the globe via teleconnections.
- La Nada for now, but conditions are now favorable for El Niño to emerge over the next six months.



Jet Propulsion Laboratory
California Institute of Technology

Thank you for your attention!

Tune in to NASA's El Niño Watch at:
<http://sealevel.jpl.nasa.gov/>

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