

# Climate predictive drivers for the Mediterranean region November 2018

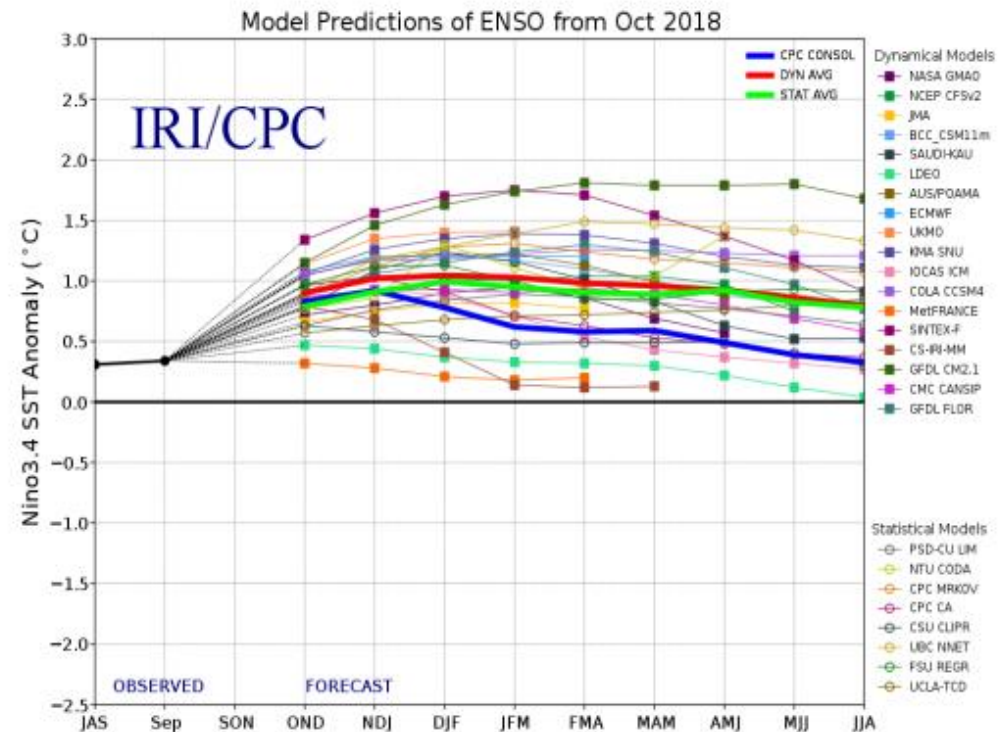
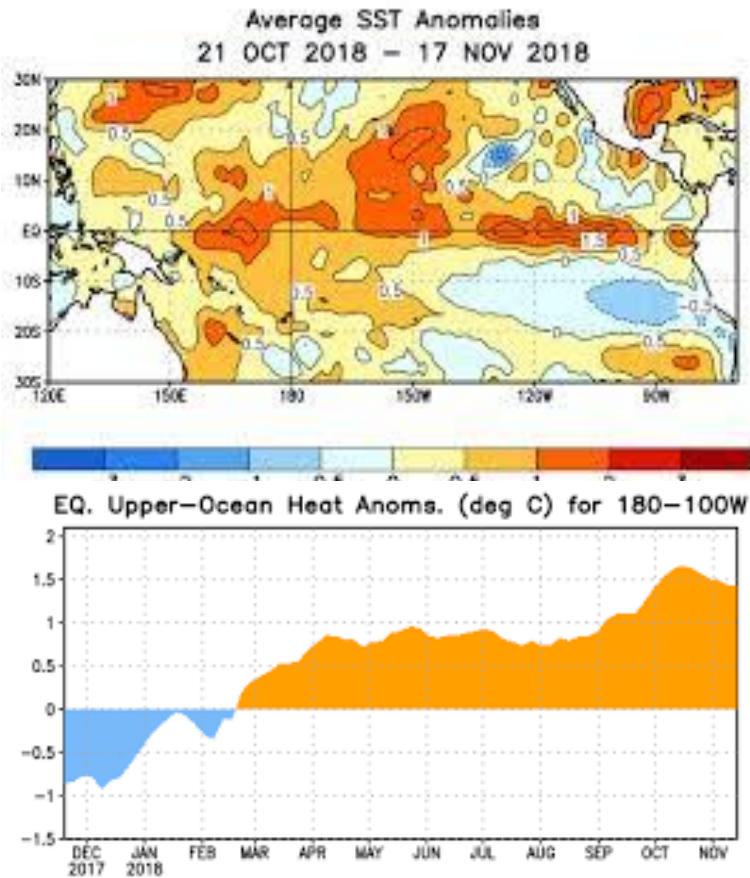
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# Overview

- SSTs
  - Tropical SSTs
    - ENSO
    - Tropical Atlantic Variability
  - North Atlantic
  - Decadal variability in oceans (PDO and AMO)
- Snow cover
- Arctic Sea ice
- Stratosphere (polar vortex and QBO)
- Land and Ocean Temperature
- Other factors: global warming
- Preliminary Conclusions

# ENSO

ENSO show weak signs of positive phase since. El Nino is favored to develop in the winter 2018-2019 with a probability of ~95%.



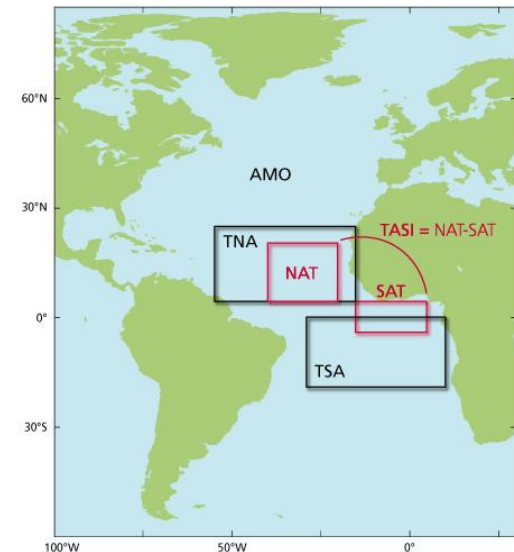
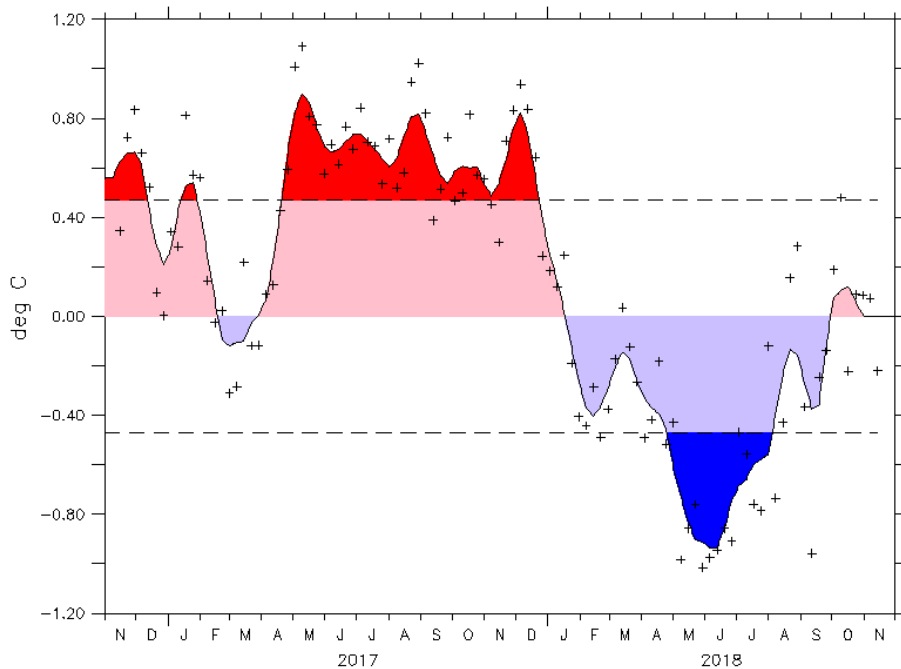
Source:

<https://iri.columbia.edu/news/november-climate-briefing-el-nino-odds-keep-climbing/>

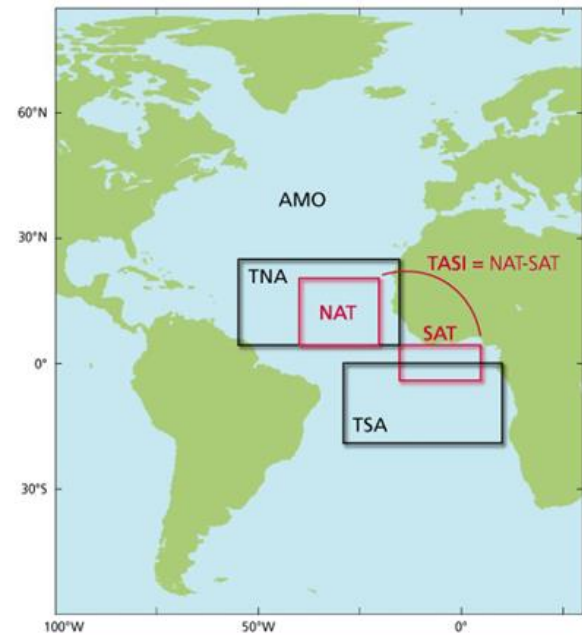
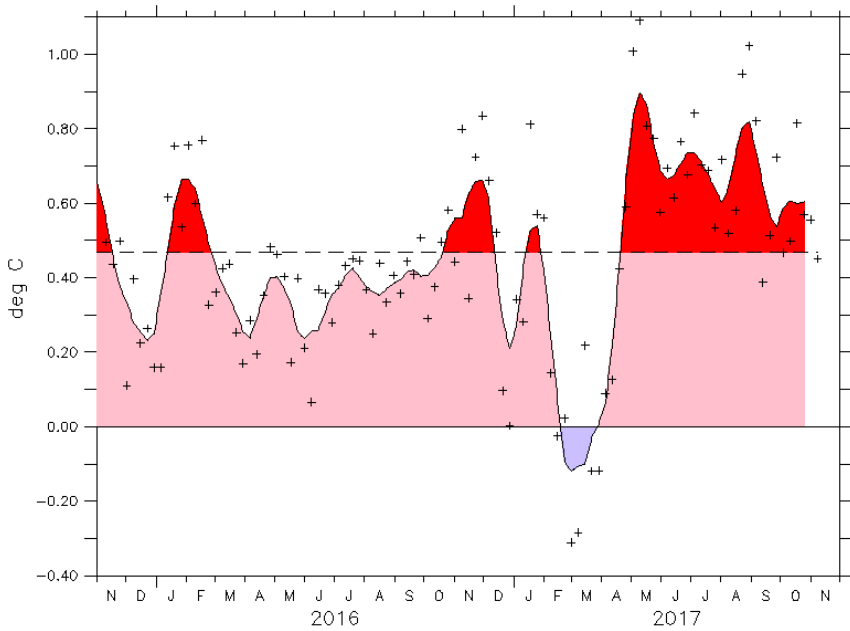
[http://www.cpc.ncep.noaa.gov/products/analysis\\_monitoring/enso\\_advisory/](http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/)

# Tropical Atlantic Variability

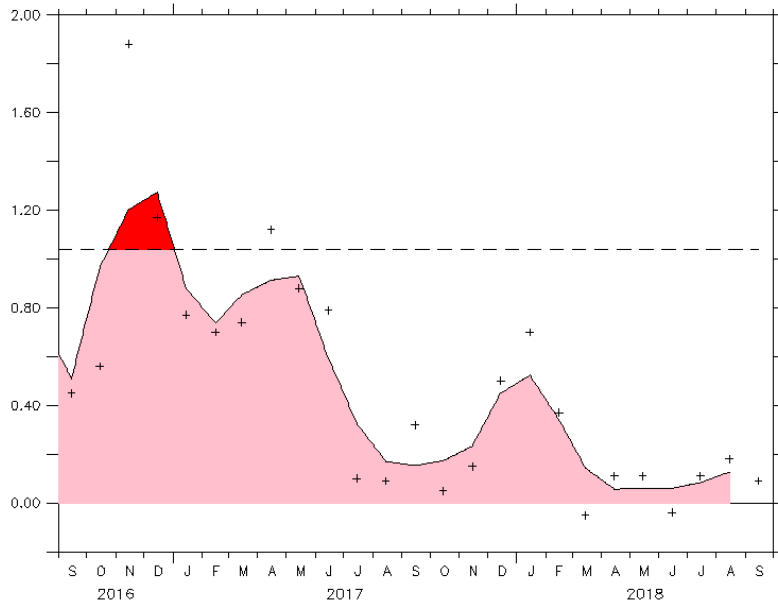
The TASI SST anomaly index is an indicator of the meridional surface temperature gradient in the tropical Atlantic Ocean. It is calculated as the difference of the NAT and SAT indices.



# NAT phase

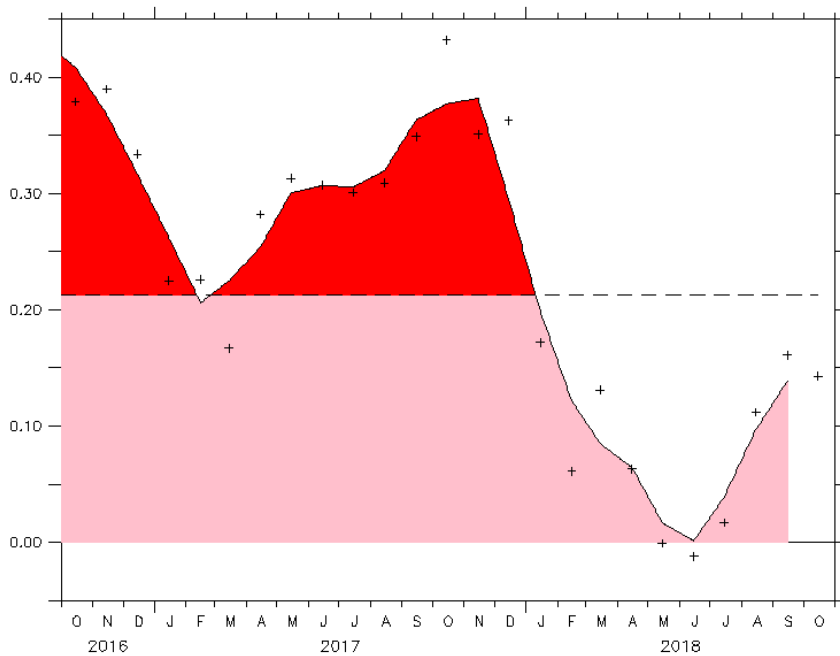


# PDO phase



Almost no signal.

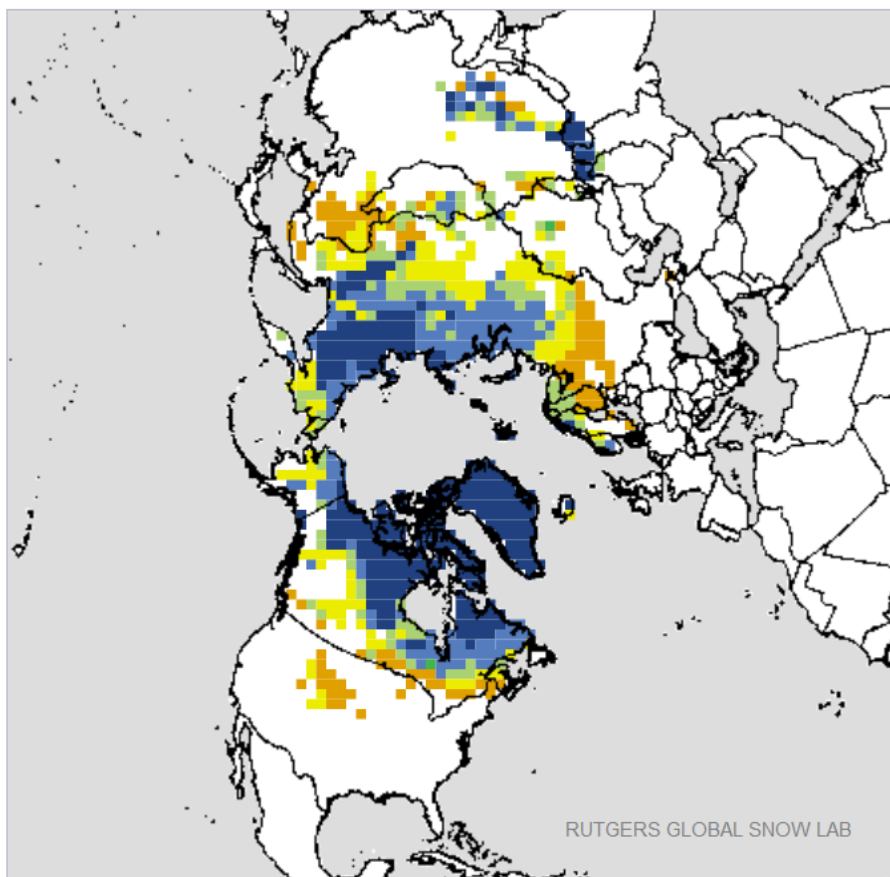
# AMO phase



Weakening signal.

# Snow-cover signal

Monthly Snow - October 2018

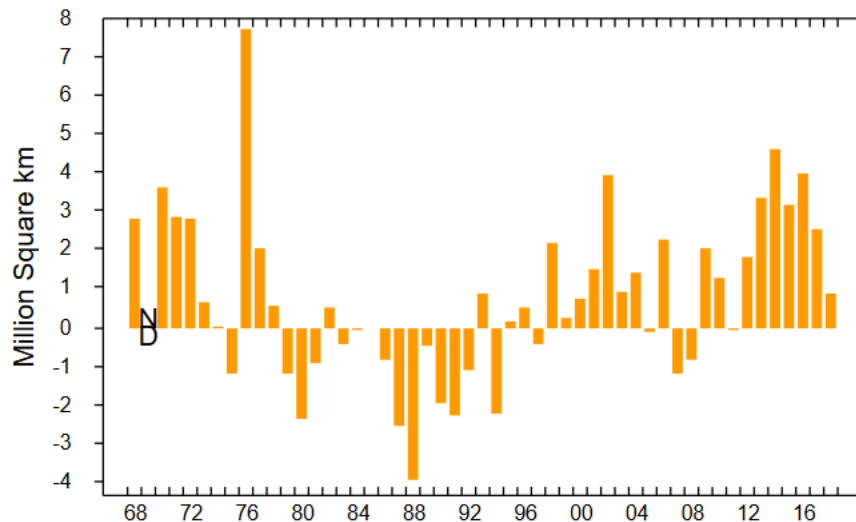


Slightly positive AO/NAO is favored in the winter 2017-2018

Source: Rutgers University (USA)

<http://climate.rutgers.edu/snowcover>

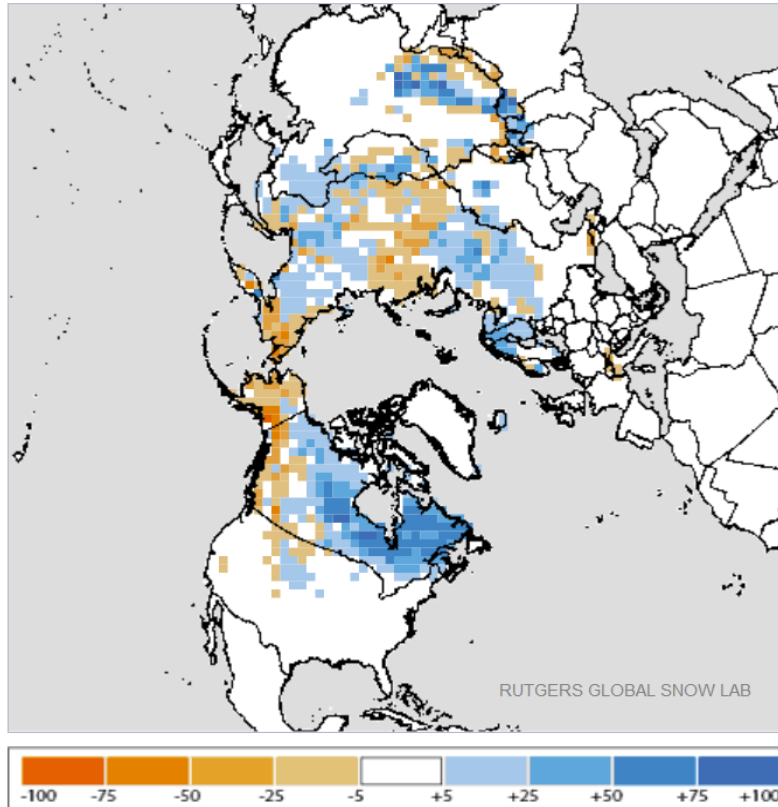
Eurasian Snow Cover Anomalies  
1967-2018 October



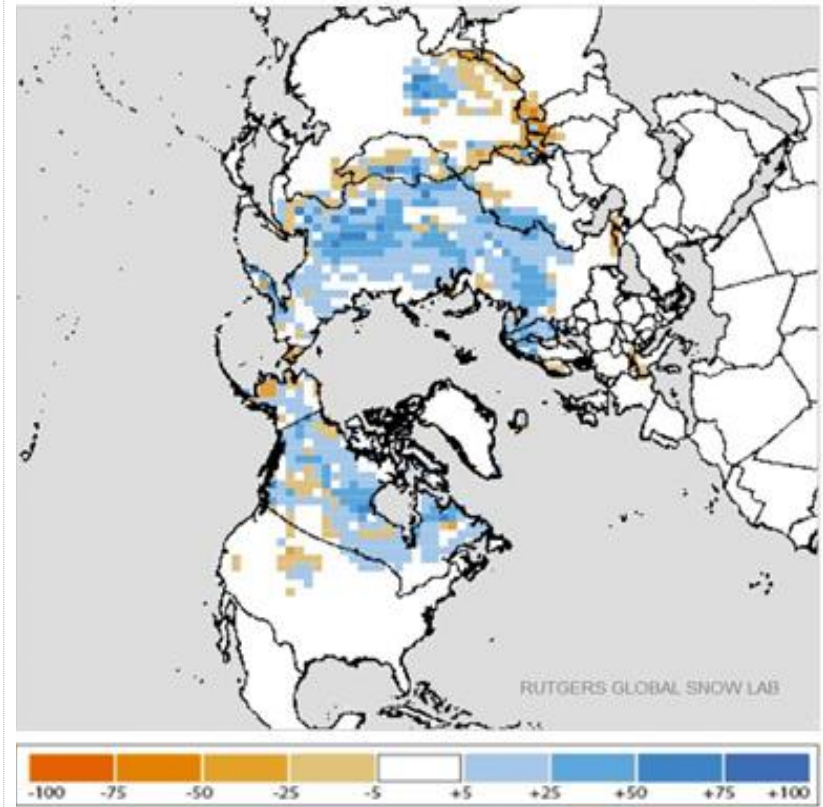


# Snow-cover signal

Departure from Normal - October 2018



Departure from Normal - October 2017



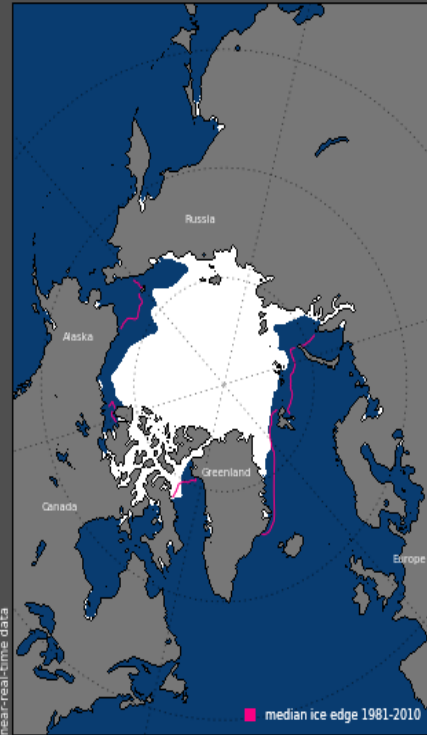
Source: Rutgers University (USA)

<http://climate.rutgers.edu/snowcover>

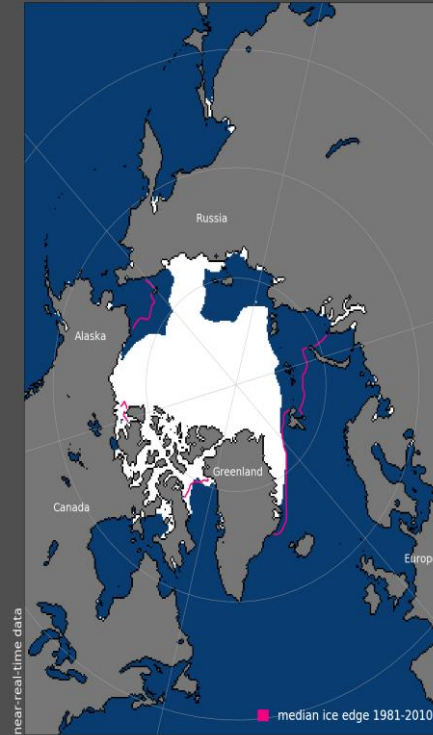
Extended snow cover over the Southern Siberia seems consistent with slightly positive AO/NAO.

# Arctic Sea Ice

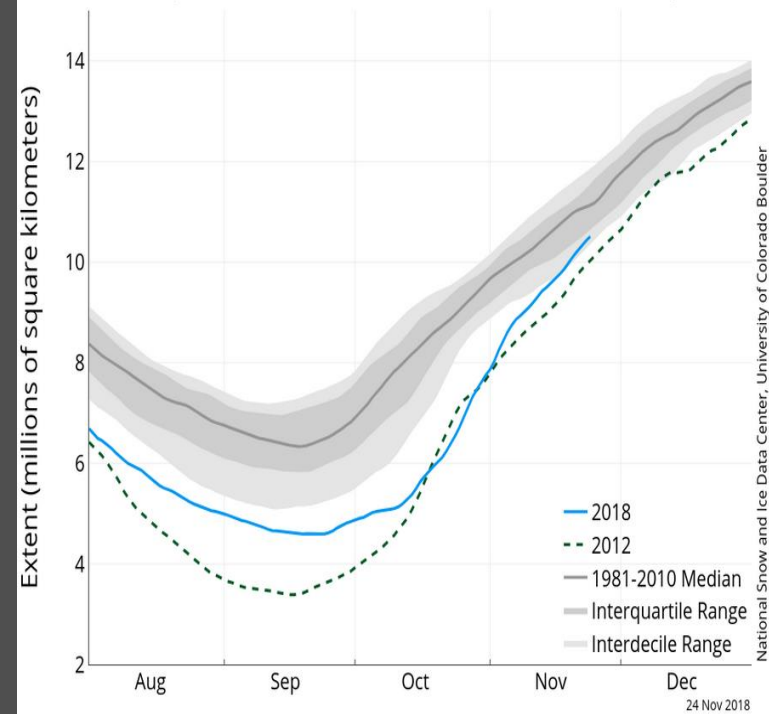
Sea Ice Extent, Oct 2017



Sea Ice Extent, Oct 2018



Arctic Sea Ice Extent  
(Area of ocean with at least 15% sea ice)



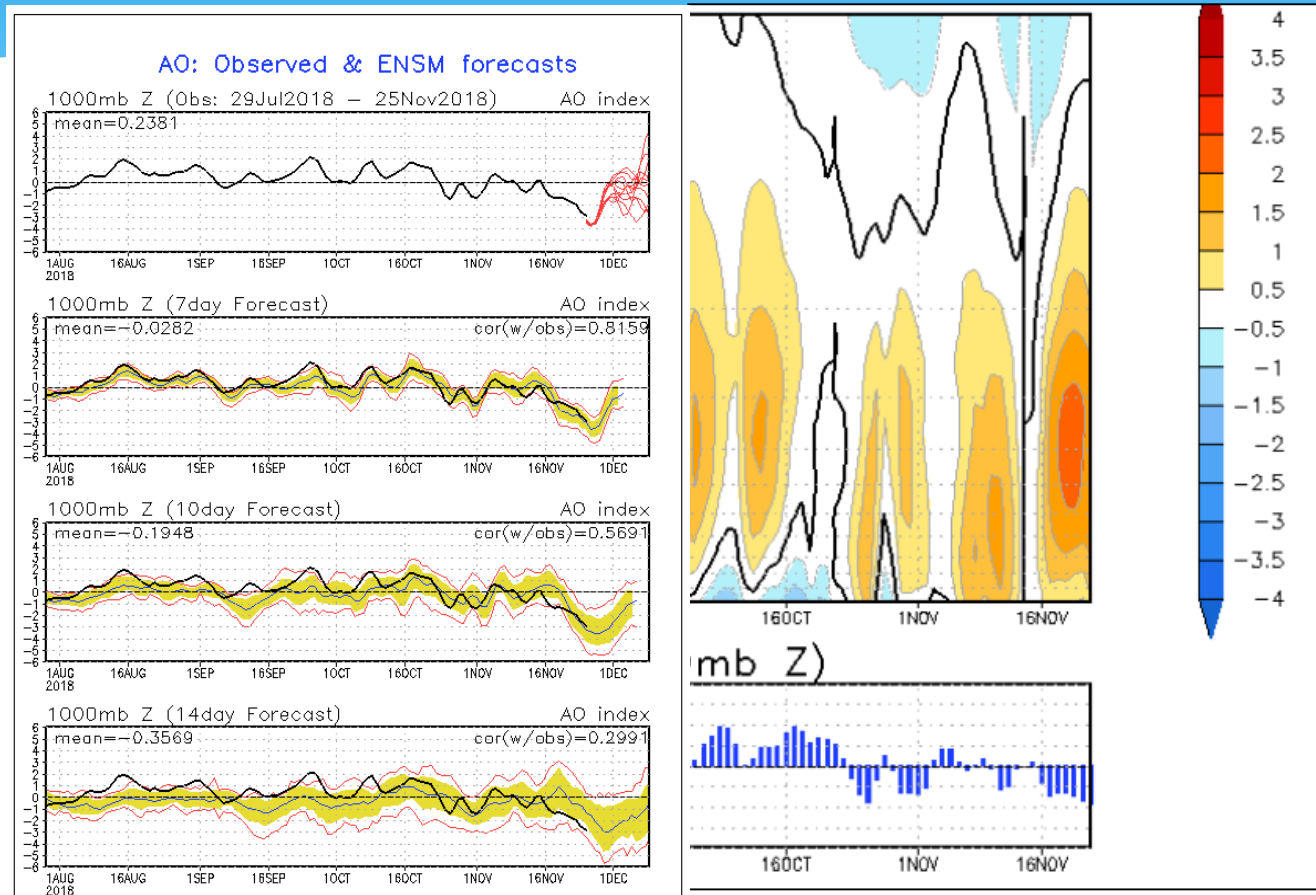
Source: NSIDC (USA)

[http://nsidc.org/data/seaice\\_index/](http://nsidc.org/data/seaice_index/)

Negative anomalies in the ice extent over Arctic regions are usually related to favorable conditions for atmospheric blockings over the Northern Hemisphere.

# Conditions in the stratosphere

Possible tendency towards strong Polar vortex in December

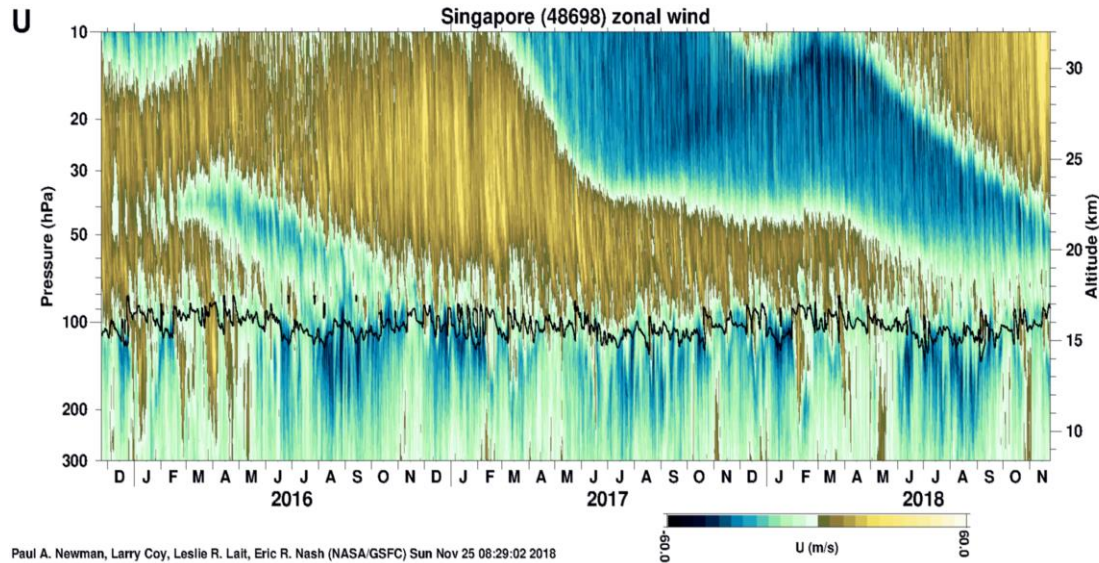


Source: CPC (USA)

[http://www.cpc.ncep.noaa.gov/products/precip/CWlink/daily\\_ao\\_index/hgt.shtml](http://www.cpc.ncep.noaa.gov/products/precip/CWlink/daily_ao_index/hgt.shtml)

Stronger polar vortex is consistent with zonal circulation prevalence over the NH in winter (i.e. mild conditions over Europe). However, we do not know if the strong polar vortex will persist into the winter.

# Conditions in the stratosphere QBO phase

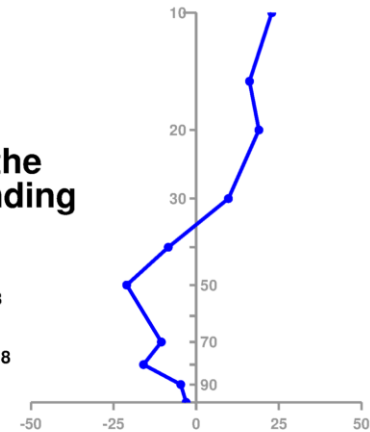


Paul A. Newman, Larry Coy, Leslie R. Lait, Eric R. Nash (NASA/GSFC) Sun Nov 25 08:29:02 2018



**QBO is in the  
West. Descending  
phase**

Singapore RAOB  
zonal wind (m/s)  
Sunday, 00Z  
November 25, 2018



Source: NOAA

<https://www.esrl.noaa.gov/psd/data/climateindices/list/>

[https://acd-ext.gsfc.nasa.gov/Data\\_services/met/qbo/qbo.html](https://acd-ext.gsfc.nasa.gov/Data_services/met/qbo/qbo.html)

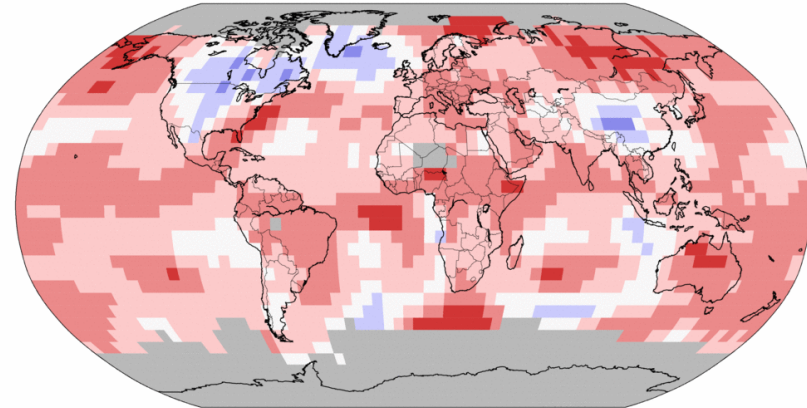
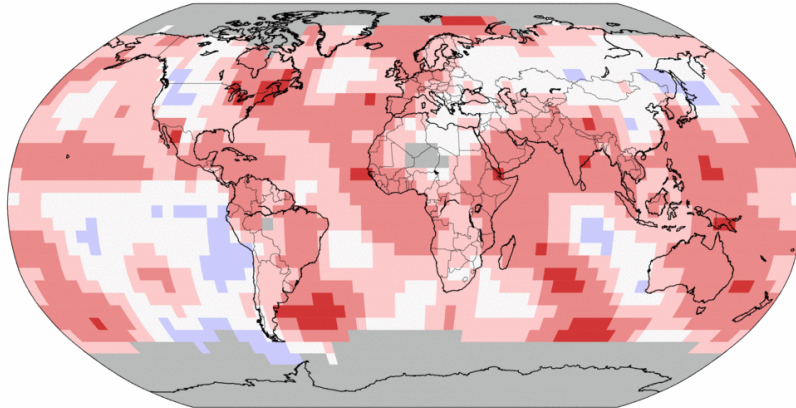
# Land and Ocean Temperature

## October 2017

## October 2018

Land & Ocean Temperature Percentiles Oct 2017  
NOAA's National Centers for Environmental Information  
Data Source: GHCN-M version 3.3.0 & ERSST version 4.0.0

Land & Ocean Temperature Percentiles Oct 2018  
NOAA's National Centers for Environmental Information  
Data Source: GHCN-M version 3.3.0 & ERSST version 4.0.0



Wed Nov 15 07:09:05 EST 2017



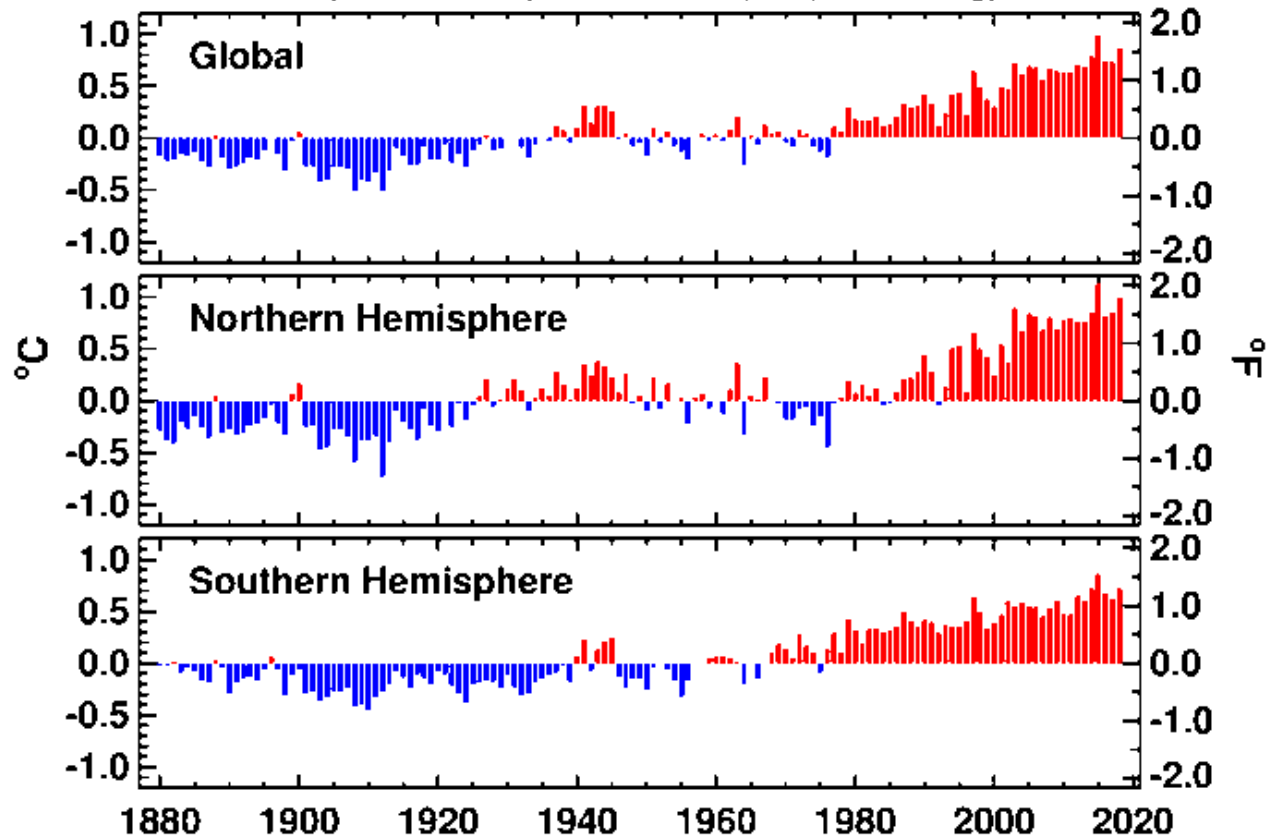
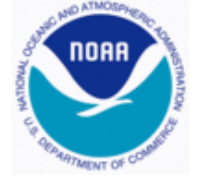
Fri Nov 16 11:48:59 EST 2018

# Global warming

## October Land & Ocean Surface Mean Temp Anomalies

NCEI/NESDIS/NOAA

Analysis is based upon Smith et al. (2008) methodology.



<https://www.ncdc.noaa.gov/sotc/global/201810>

# Observed drivers of predictability

Phenomenon/Mechanism/factor	Atmospheric blocking events in Atlantic/European area	Zonal circulations	Stratospheric warmings	NAO phase	Shifts in the jet stream position/intensity over Atlantic/European area
Weak/moderate El Nino	Enhanced in the 2nd part of the winter		yes		yes
Normal NAT SST index		normal trade winds			
Positive AMO? Transition to negative AMO?	-				
PDO	-				
May SST		slightly enhanced		slightly positive	Northward over Europe?
Normal snow cover extent in Eurasia					
Reduced Arctic sea ice concentration	enhanced	less frequent	yes	negative	yes
Strong polar vortex?				positive (in the first part of the winter)?	Northward over Europe?
Transition to					

# Preliminary Conclusions

- Observed drivers offer few clues for the future winter (DJF)
- El Nino is favored in the next winter by model ensemble (favoring stratospheric warming in the 2<sup>nd</sup> part of the winter with associated severe weather in the NH)
- AO/NAO phase may change sign on sub-seasonal scale