

# Arctic Oscillation and Polar Vortex Analysis and Forecasts

January 31, 2022

Dear AO/PV blog readers:

We have shifted the public release of the Arctic Oscillation/Polar Vortex blog to Wednesdays weekly through the winter season.

For those who would like an early look on Mondays, we will be offering at a nominal price (US \$25) a PDF version of the upcoming blog, and we will be rolling out in the coming weeks access to the datasets used in the production of this blog. At present we plan to make available in comma-separated values the timeseries of the Polar Cap Height and the timeseries of the Wave Activity Flux (vertical component), though we would appreciate to hear your suggestions for additional data of interest to you all.

Dr. Judah Cohen from Atmospheric and Environmental Research (AER) embarked on an experimental process of regular research, review, and analysis of the Arctic Oscillation (AO) and Polar Vortex (PV). This analysis is intended to provide researchers and practitioners real-time insights on one of North America's and Europe's leading drivers for extreme and persistent temperature patterns.

During the winter schedule the blog is updated once every week. Snow accumulation forecasts replace precipitation forecasts. Also, there is renewed emphasis on ice and snow boundary conditions and their influence on hemispheric weather. With the start of spring we transition to a spring/summer schedule, which is once every two weeks. Snow accumulation forecasts will be replaced by precipitation forecasts. Also, there will be less emphasis on ice and snow boundary conditions and their influence on hemispheric weather.

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*The AO/PV blog is partially supported by NSF grant AGS: 1657748.*

## ***Summary***

- The Arctic Oscillation (AO) is currently slightly positive and is predicted to remain mostly positive through mid-February with mostly negative pressure/geopotential height anomalies across the Arctic and mixed pressure/geopotential height anomalies across the mid-latitudes. The North Atlantic Oscillation (NAO) is also positive and is predicted to remain positive as

pressure/geopotential height anomalies are predicted to remain mostly negative across Greenland the next two weeks.

- This week, troughing/negative geopotential height anomalies across Greenland will favor ridging/positive geopotential height anomalies coupled with normal to above normal temperatures across Western Europe including the United Kingdom (UK) with troughing/negative geopotential height anomalies coupled with normal to below normal temperatures across Eastern Europe. However next week the persistence of troughing across Greenland will allow ridging/positive geopotential height anomalies coupled with normal to above normal temperatures to spread across most of Europe.
- The dominant pattern across Asia the next two weeks is troughing/negative geopotential height anomalies coupled with normal to below normal temperatures across Western but really mostly Southern Asia with ridging/positive geopotential height anomalies coupled with normal to above normal temperatures across Northern and Eastern Asia.
- The dominant pattern across North America the next two weeks is ridging/positive geopotential height anomalies coupled with normal to above normal temperatures in the Gulf of Alaska and along the west coast of North America forcing troughing/negative geopotential height anomalies coupled with normal to below normal temperatures across Central and Eastern Canada and the Central and Eastern United States (US).
- In the *Impacts* section I continue to discuss my expectations of a stretched polar vortex (PV; hint lots of stretching) and the related weather of the Northern Hemisphere (NH) for February.

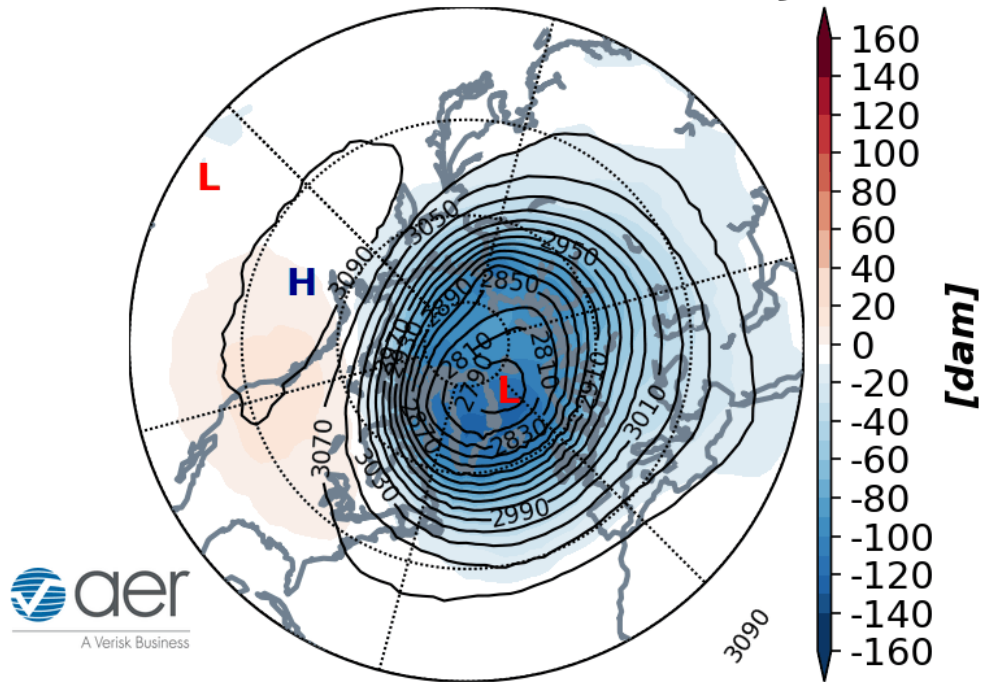
### ***Plain Language Summary***

I believe that repetitive stretched polar vortex events (PV; where the polar vortex becomes stretched like a rubber band or taffy) are becoming the dominant factor this winter across the Northern Hemisphere. These events contribute to a colder and snowier pattern in the Eastern US and parts of Asia but not Europe. There are signs that after a brief warmup a new stretched PV will persist the cold in the Eastern US in February. In contrast, European weather seems more sensitive to the strength of the PV, which despite being stretched is strong (as measured by the circulating winds around the PV center). I think the possibility of harsh winter weather across Europe is quickly dwindling.

### ***Impacts***

As I have been saying for a while, January in my opinion was all about the three stretched polar vortex (PV) events. And it looks like February might be as well. It seems to me that the GFS forecasts for the behavior of the PV have not been consistent lately but seem to mostly suggest another stretched PV second week of February (see **Figure i** and **Figure 13**).

## Initialized 00Z 10 hPa HGT/HGTa 31-Jan-2022



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**Figure i.** (a) Initialized 10 mb geopotential heights (dam; contours) and temperature anomalies ( $^{\circ}\text{C}$ ; shading) across the Northern Hemisphere for 31 January 2022 and forecasted from 1 – 16 February 2022. The forecasts are from the 00Z 31 January 2022 GFS model ensemble.

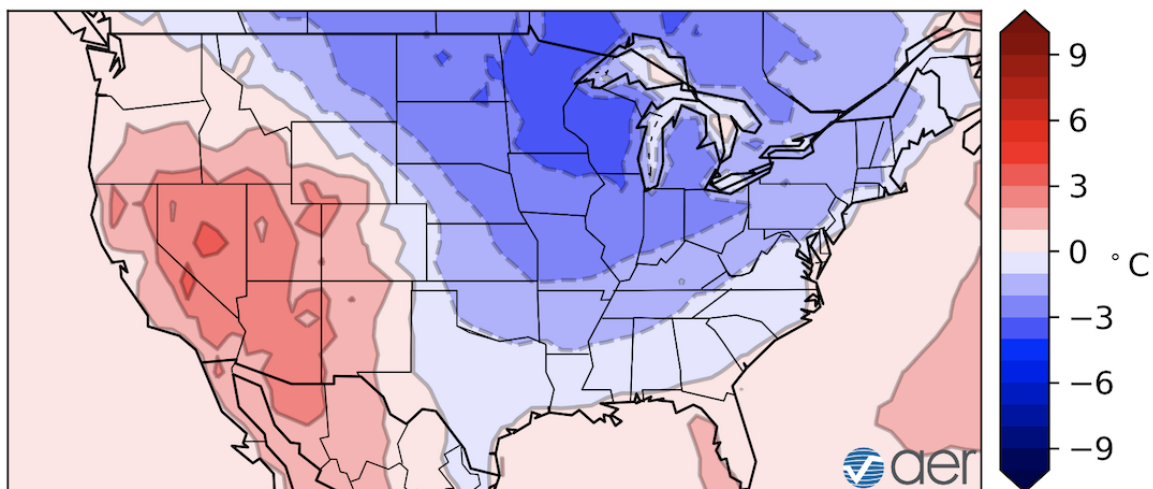
In addition to the behavior of the PV, I do think that persistence is becoming more important as we transition into February providing momentum to the dominating temperature and probably precipitation anomalies of recent weeks. That would include cold and snowy weather east of the Rockies in North America and parts of East Asia including China and Japan, mild and/or snowless in the Western US, for much of Europe with some exceptions including Scandinavia and the Eastern Mediterranean and much of Asia but especially Northern Asia including Siberia. The places that have been cold and snowy this month, eastern North America and parts of Central and East Asia are regions that our research has identified as relatively cold during and following stretched PV events. And though the PV keeps stretching, the PV is by all traditional metrics strong, and I think Northern Eurasia, including Europe and Siberia, is the region most sensitive to the strength of the PV. Therefore, temperature anomalies are more

sensitive to the strength of the PV and less so its shape. But admittedly I don't have the analysis to support this speculative claim.

Another theme that I keep coming back to this winter is the unusually long period when the stratosphere and troposphere have remained uncoupled and based on the latest forecasts this will likely continue into the foreseeable future (see **Figure 11**). I don't like to use an analog of one as a guide or model for the upcoming weather, but the one winter that I think showed the most similar type behavior is winter 2013/14 where like this winter polar cap geopotential height anomalies (PCHs) were mostly in the stratosphere but warm/positive in the troposphere. There were some brief periods where the stratosphere and troposphere did couple in winter 2013/2014 but it was the exception rather than the rule and this winter looks to be following a similar script. My current manuscript in review was a case study of winter 2013/14 and without that analysis I really don't think I could anticipate the twists and turns of this winter. The manuscript is technical so not for the faint of heart but if you think that there is more than La Niña impacting this winter's weather, then I suggest reading the archived manuscript [Cohen et al. 2022](#) and the [supplementary information](#) that go into detail about repeated stretched PV events in the absence of a sudden stratospheric warming.

I have been discussing all winter our machine learning model that was predicting a warmup in the Eastern US in early February but has been trending colder. Well, the latest forecasts from the model might be the coldest yet in the Eastern US during February with milder in the Western US for the middle of month. In **Figure ii**, I present the model forecast based on observed data through 26 January 2022 and is valid for the two-week period 10–23 February 2022. It shows a similar pattern that we observed in January with relatively warm in the Western US and cold in the Eastern US.

T2m anom Forecast | Issued: 26 Jan 2022  
Valid: 10-23 Feb 2022



**Figure ii.** AER machine learning model predicted surface temperature anomalies (°C; shading) for the US averaged 10 – 23 February 2022. Forecast based on observed data through 26 January 2022.

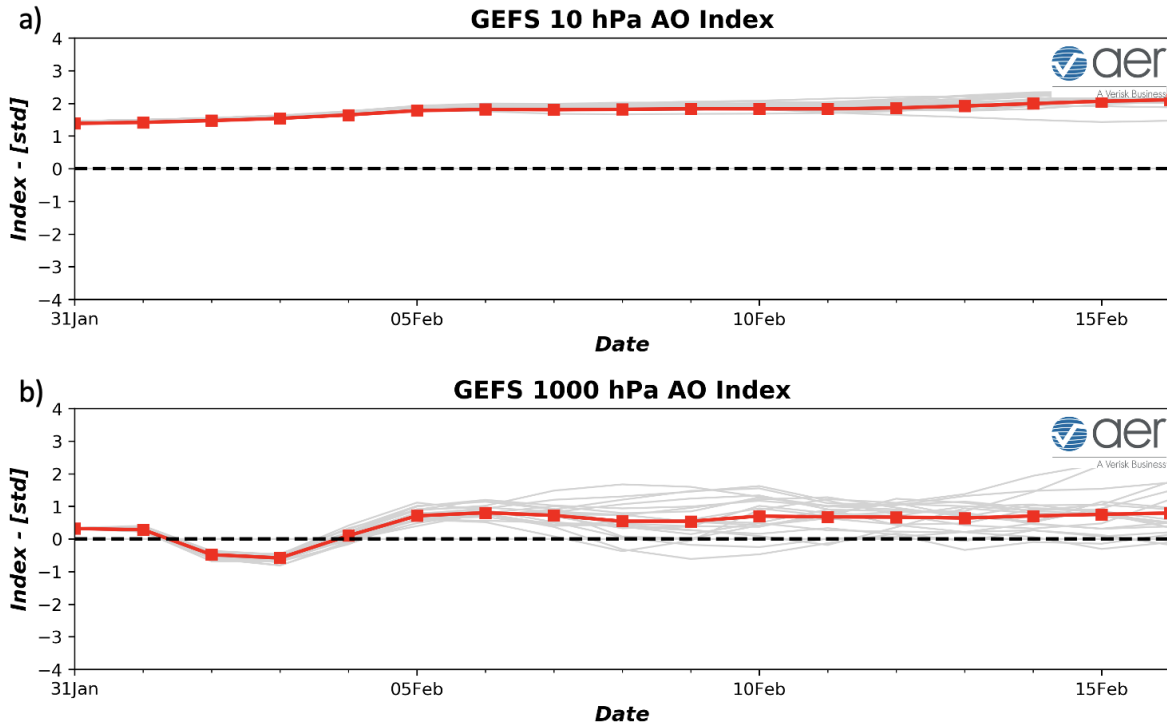
As far as Europe and East Asia not much new. I really think in order for widespread significant winter weather to occur in Europe, a larger disruption of the PV needs to occur, preferably a PV split, which is looking less and less likely. Any cold this winter in Europe can be attributed to North Atlantic ridging and based on the latest forecasts it becomes strung out much more favorable for a mild zonal or westerly flow much more so than a cold northerly flow (see **Figure 5**). I hate to say it, but I think it might be time to end any thoughts of meaningful winter weather for much of Europe. The strong PV could setup an early Final Warming this year that may through in a last-minute surprise as winter relents to spring. A couple of exceptions are Scandinavia and Southeastern Europe.

Central and East Asia should also be cold during stretched PV events. Snow cover is extensive in China accompanied by cold temperatures, and I have seen on Twitter the incredible snowfall and even record cold in Japan. I can see this pattern persisting in February.

I can't end the discussion without mentioning this weekend's blizzard in the Northeast. When I was in graduate school it was meteorological orthodoxy that for a classic nor'easter with heavy snowfall in the megalopolis of the I-95 corridor, a negative NAO and Greenland/blocking high pressure were required. And for meteorologists in the Northeastern US that is the first sign they look for when trying to anticipate or detect a possible nor'easter (for example see this [article](#) from The Weather Channel and this [second article](#) from Accuweather). In the runup to this weekend's blizzard there was neither a negative NAO nor Greenland blocking. What there was instead - a stretched PV. And this is not a unique instance where a stretched PV preceded a large snowstorm in the Eastern US. Other than today's blog as far as I know, no linkage or relationship between a stretched PV and Eastern US snowstorms has ever been discussed or even considered.

*1-5 day*

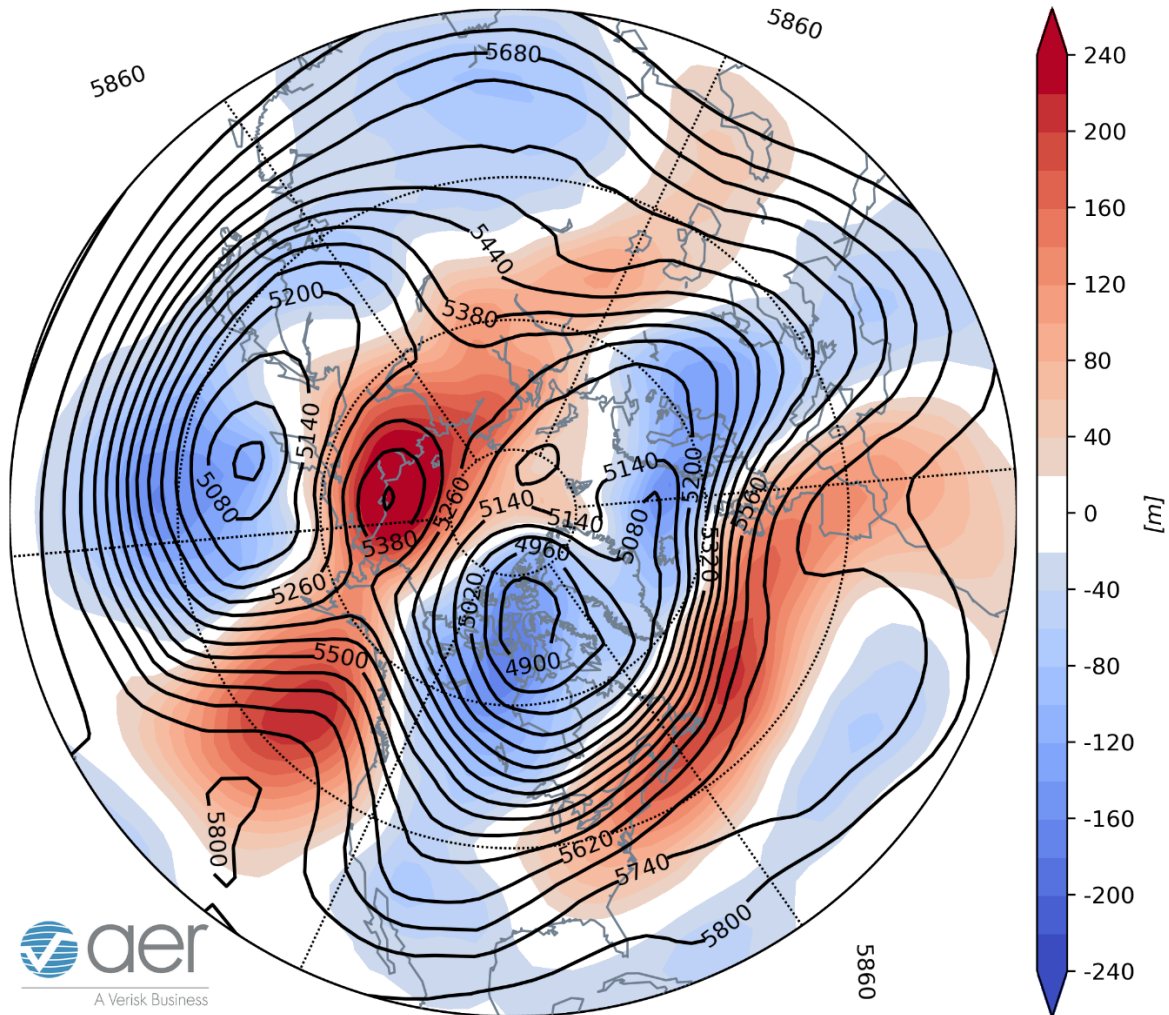
The AO is predicted start positive and deep briefly negative this week (**Figure 1**) as geopotential height anomalies are predicted to be mostly negative across the North Atlantic side of the Arctic but positive across the North Pacific side of the Arctic with mixed geopotential height anomalies across the mid-latitudes of the NH (**Figure 2**). And with weak but negative geopotential height anomalies predicted across Greenland (**Figure 2**), the NAO is also predicted to be slightly positive this week as well (**Figure 1**).



**Figure 1.** (a) The predicted daily-mean AO at 1000 hPa from the 00Z 31 January 2022 GFS ensemble. (b) The predicted daily-mean near-surface AO from the 00Z 31 January 2022 GFS ensemble. Gray lines indicate the AO index from each individual ensemble member, with the ensemble-mean AO index given by the red line with squares.

This week, troughing/negative geopotential height anomalies across Greenland will contribute to ridging/positive geopotential height anomalies across Western Europe with troughing/negative geopotential height anomalies across Eastern Europe this period (**Figures 2**). This pattern will result in normal to below normal temperatures across Northern and Eastern Europe with normal to above normal temperatures across Western and Southern Europe (**Figure 3**). This week, a quasi-omega block pattern is predicted across Asia with ridging/positive geopotential height anomalies dominating Northern and Eastern Asia with troughing/negative geopotential height anomalies in Western Asia and Central and Southeastern Asia (**Figure 2**). This pattern favors widespread normal to above normal temperatures across much of Western and Northern Asia with normal to below normal temperatures across Central and Southeastern Asia (**Figure 3**).

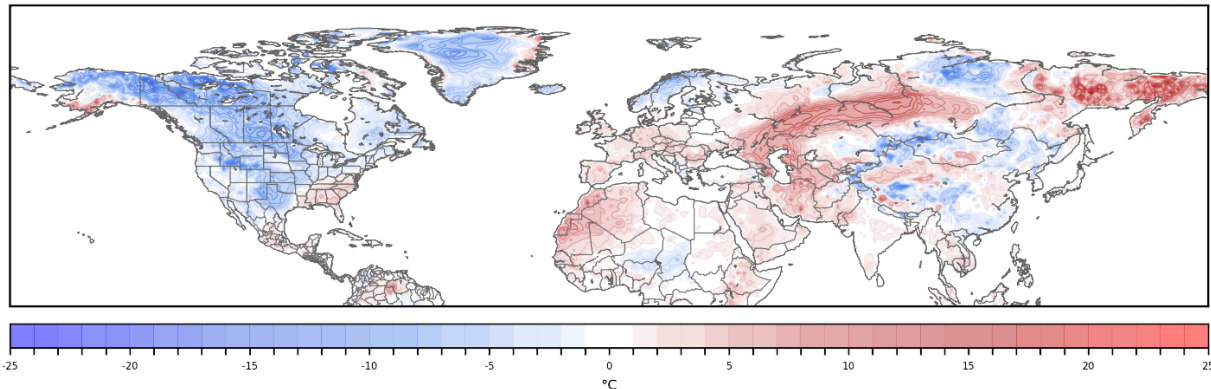
**GEFS 1-5 Day Forecast 500 mb GPH/GPH Anomaly**  
**INIT: 00Z 01/31/2022 FCST: 02/01/2022 to 02/05/2022**



**Figure 2.** Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere from 1 – 5 February 2022. The forecasts are from the 00z 31 January 2022 GFS ensemble.

This week, the predicted pattern across North America is ridging/positive geopotential height anomalies in the Gulf of Alaska and along the east coast of North America which will tag team to contribute to troughing/negative geopotential height anomalies across the interior of Canada and the US (**Figure 2**). This will favor normal to below normal temperatures across Alaska, much of Canada and the Western and Central US with normal to above normal temperatures in the Southern and Eastern US (**Figure 3**).

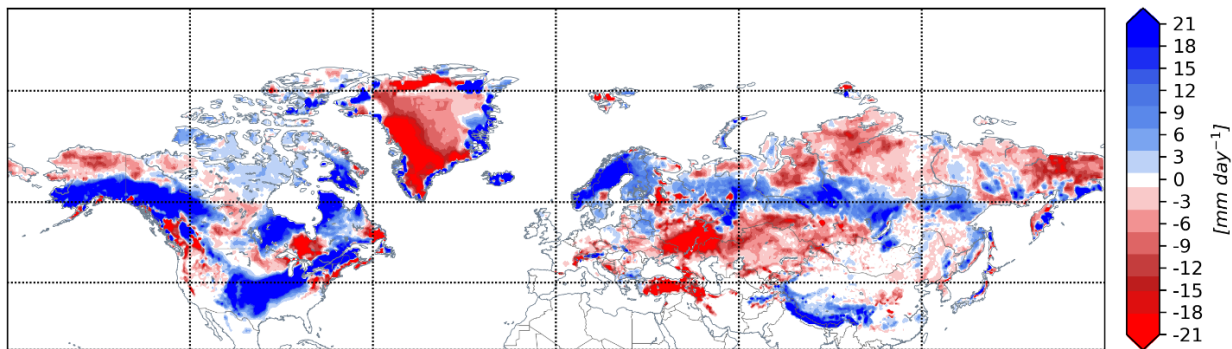
**GFS 1-5 Day Forecast T2m Anomaly**  
**INIT: 00Z 01/31/2022 FCST: 02/01/2022 to 02/05/2022**



**Figure 3.** Forecasted surface temperature anomalies (°C; shading) from 1 – 5 February 2022. The forecast is from the 00Z 31 January 2022 GFS ensemble.

Trouthing and/or cold temperatures are predicted to support new snowfall across Scandinavia, Central Asia and the Tibetan Plateau while mild temperatures promote snowmelt in Eastern Europe, Northern, Western and Central Asia (**Figure 4**). Trouthing and/or cold temperatures are predicted to support new snowfall across Southern Alaska, Northern and Western Canada and possibly from the Southern Plains into the Saint Lawrence River valley and Northeastern US while mild temperatures promote snowmelt in the Western US and the Northeastern US (**Figure 4**). Lots of uncertainty with the snowfall forecast in the Northeastern US.

**GEFS 1-5 Day Forecast SNOD Change**  
**INIT: 00Z 01/31/2022 FCST: 02/01/2022 to 02/05/2022**



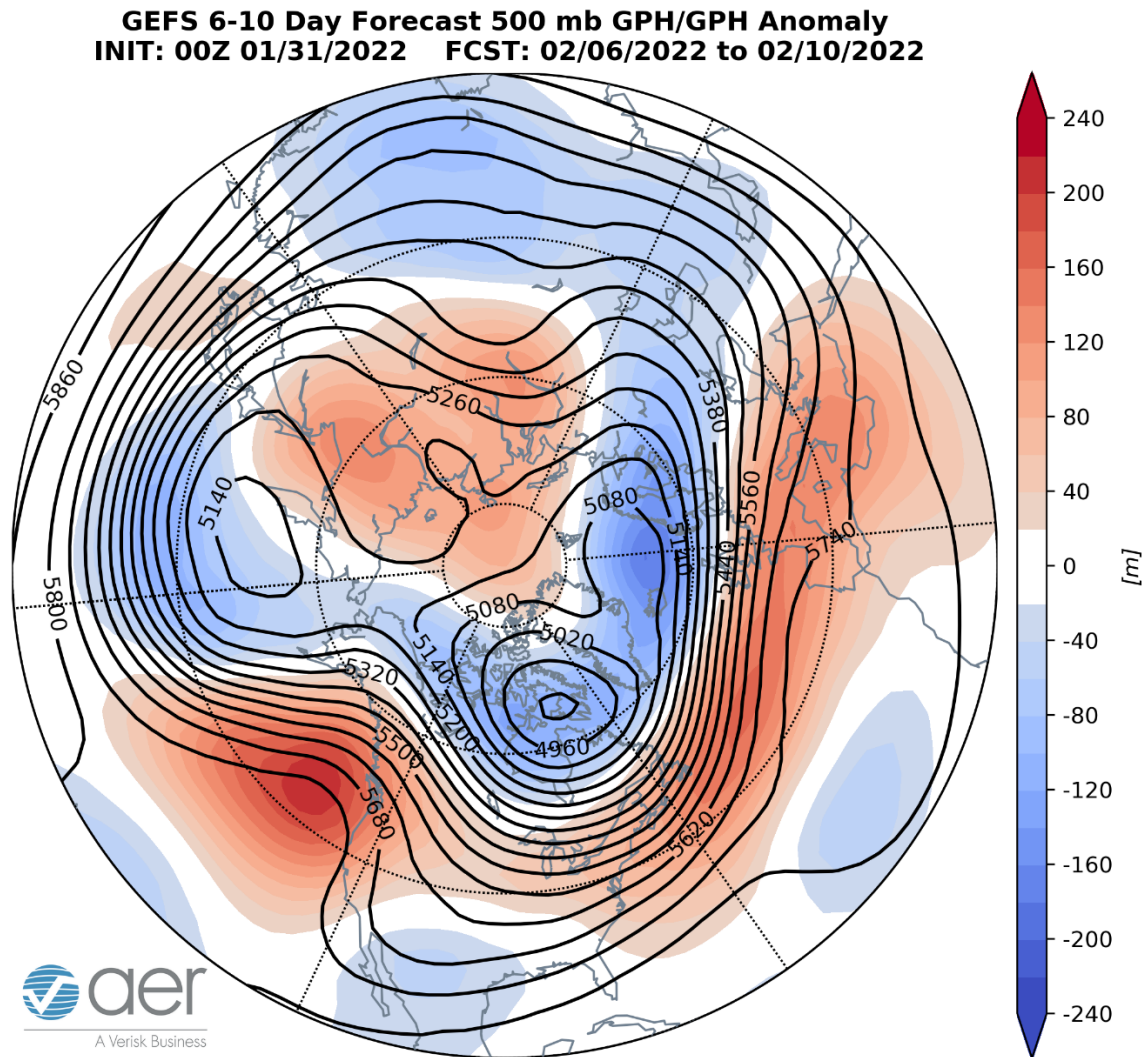
**Figure 4.** Forecasted snow depth changes (mm/day; shading) from 1 – 5 February 2022. The forecast is from the 00Z 31 January 2022 GFS ensemble.

Mid-Term

6-10 day



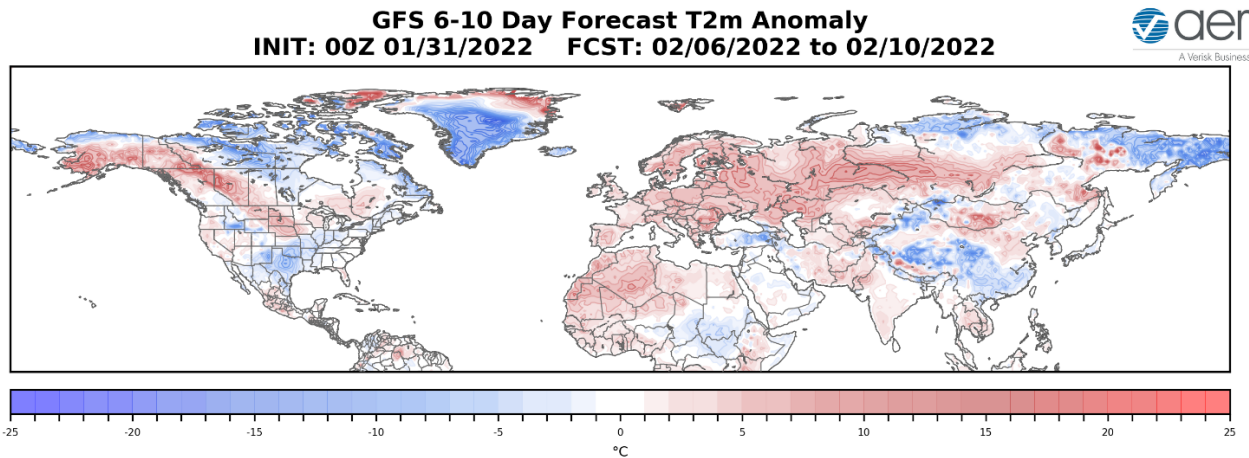
The AO is predicted to remain positive this period (**Figure 1**) with mostly negative geopotential height anomalies spread across the Arctic with mixed geopotential height anomalies across the mid-latitudes of the NH (**Figure 5**). And with weak and mostly negative geopotential height anomalies across Greenland (**Figure 5**), the NAO is predicted to remain positive this period.



**Figure 5.** Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere from 6 – 10 February 2022. The forecasts are from the 00z 31 January 2022 GFS ensemble.

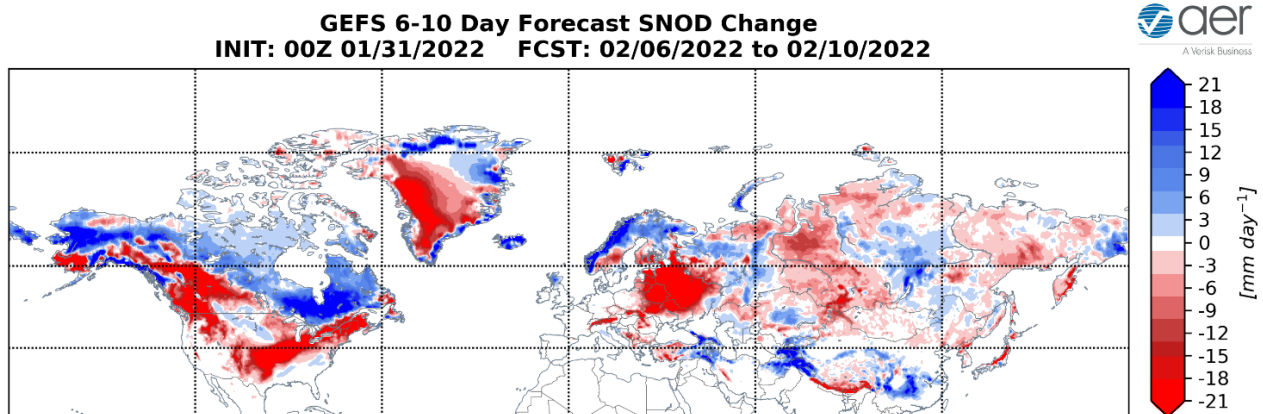
Persistent troughing/negative geopotential height anomalies across Europe will support widespread ridging/positive geopotential height anomalies across Europe (**Figures 5**). This will result in normal to above normal temperatures across almost all of Europe including the UK with normal to below normal temperatures limited across Northern Scandinavia and Turkey due to northerly flow (**Figure 6**). Ridging/positive geopotential

height anomalies are predicted to dominate much of Northern Asia with troughing/negative geopotential height anomalies across Southern Asia this period (**Figure 5**). This pattern favors normal to above normal temperatures across much of Northern Asia with normal to below normal temperatures limited to parts of Southeastern Asia and far Eastern Siberia (**Figure 6**).



**Figure 6.** Forecasted surface temperature anomalies ( $^{\circ}\text{C}$ ; shading) from 6 – 10 February 2022. The forecasts are from the 00Z 31 January 2022 GFS ensemble.

Ridging/positive geopotential height anomalies are predicted to persist across Alaska, and the Gulf of Alaska this period helping to anchor troughing/negative geopotential height anomalies across Canada and the US east of the Rockies with more ridging/positive geopotential height anomalies along the east coast of North America (**Figure 5**). This will favor normal to above normal temperatures across Alaska, Western Canada and the Western US with normal to below normal temperatures in Central and Eastern Canada and the Central and Eastern US except Florida (**Figure 6**).



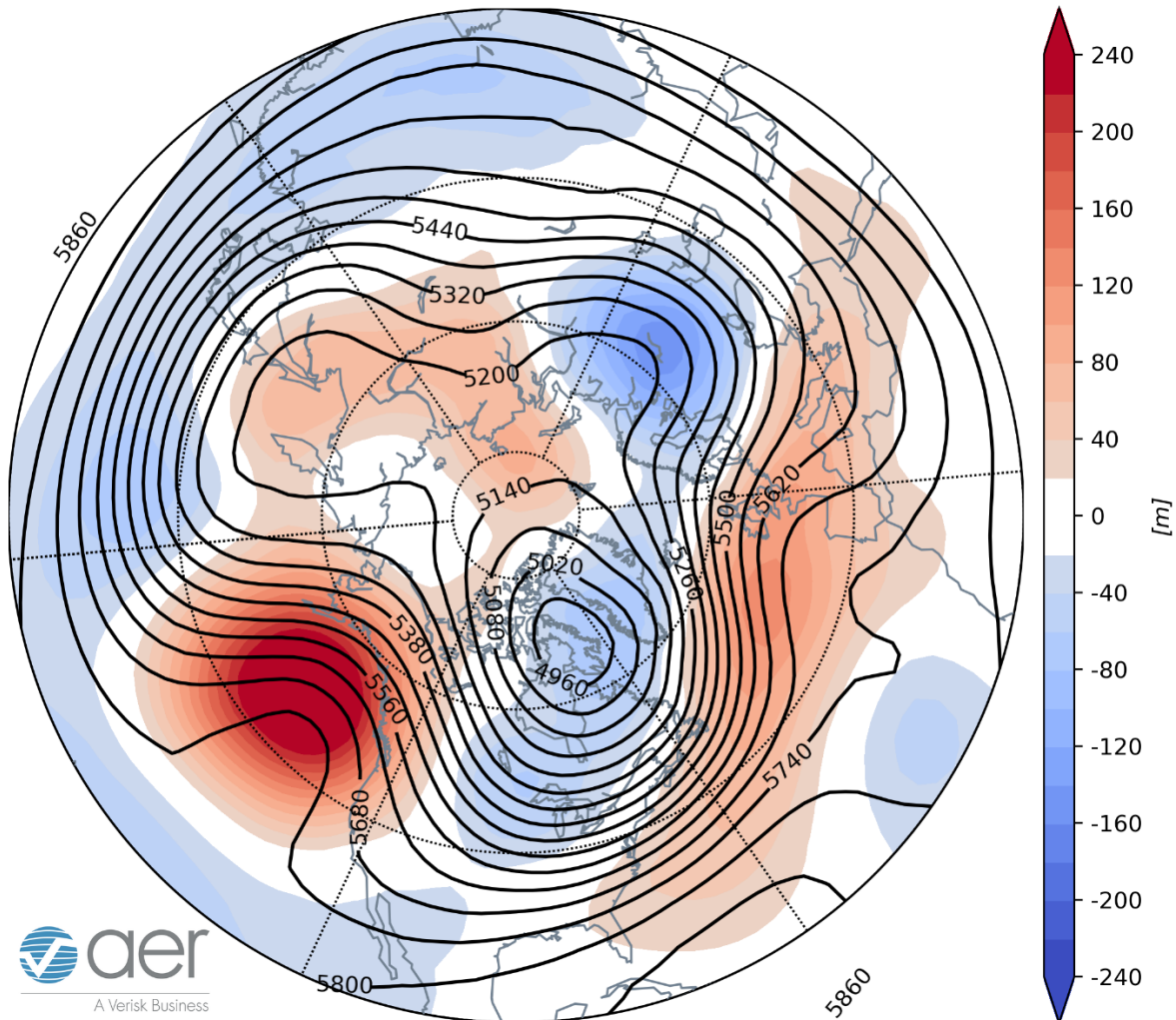
**Figure 7.** Forecasted snow depth changes (mm/day; shading) from 6 – 10 February 2022. The forecast is from the 00Z 31 January 2022 GFS ensemble.

Trouching and/or cold temperatures are predicted to support new snowfall across Scandinavia and the Tibetan Plateau while milder temperatures promote snowmelt across Eastern Europe and scattered throughout Asia (**Figure 7**). Trouching and/or cold temperatures are predicted to support new snowfall across Alaska, Northern and Eastern Canada, while milder temperatures promote snowmelt across Southern Alaska, Western Canada and the Northern and Eastern US (**Figure 7**).

*11-15 day*

Negative geopotential height anomalies are predicted to remain widespread across the Arctic with mixed geopotential height anomalies across the mid-latitudes of the NH (**Figure 8**), therefore the AO should remain positive this period (**Figure 1**). With predicted mostly negative but weak pressure/geopotential height anomalies across Greenland (**Figure 8**), the NAO is forecasted to remain positive this period.

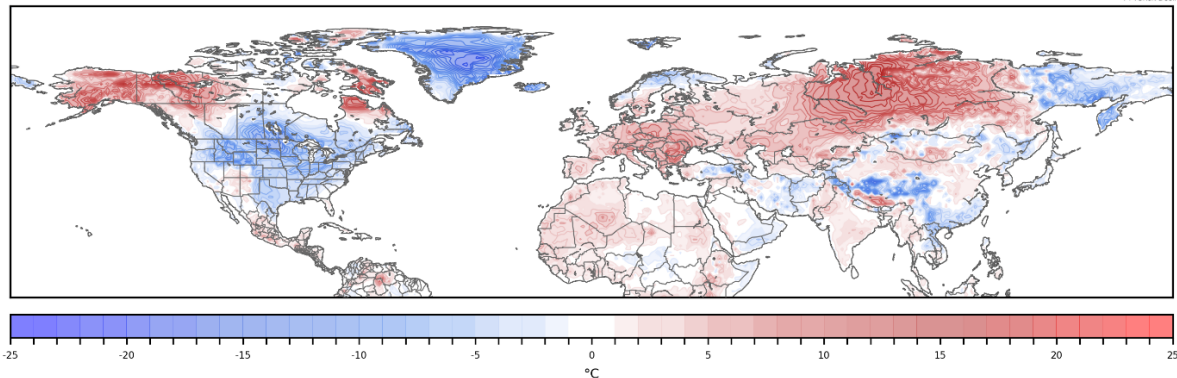
**GEFS 11-15 Day Forecast 500 mb GPH/GPH Anomaly**  
**INIT: 00Z 01/31/2022 FCST: 02/11/2022 to 02/15/2022**



**Figure 8.** Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere from 11 – 15 February 2022. The forecasts are from the 00z 31 January 2022 GFS ensemble.

Persistent troughing/negative geopotential height anomalies across Greenland will continue to support ridging/positive geopotential height anomalies across much of Europe this period (**Figure 8**). This pattern favors more normal to above normal temperatures across much of Europe including the UK with normal to below normal temperatures limited across Northern Scandinavia and Turkey due to northerly flow (**Figures 9**). Ridging/positive geopotential height anomalies are predicted across much of Northern Asia favoring troughing/negative geopotential height anomalies across Southern Asia this period (**Figure 8**). This pattern favors normal to above normal temperatures across much of Northern Asia with normal to below normal temperatures limited to parts of Southeastern Asia and far Eastern Siberia this period (**Figure 9**).

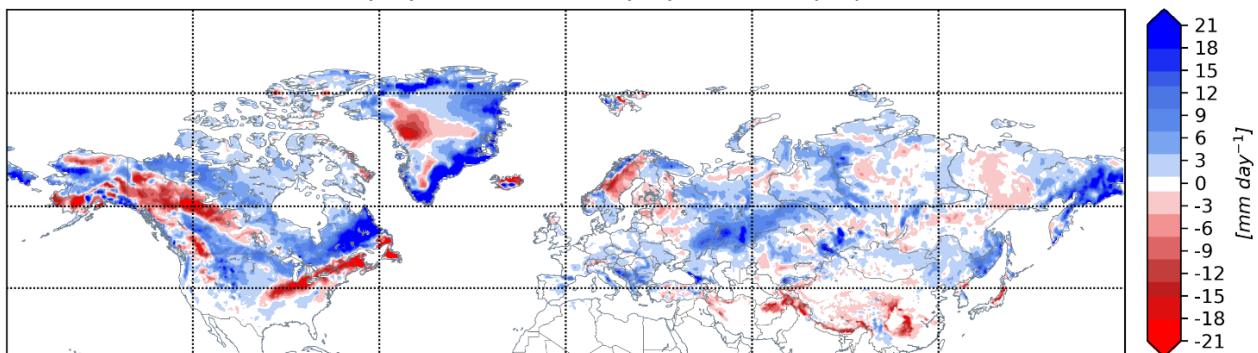
**GFS 11-15 Day Forecast T2m Anomaly**  
**INIT: 00Z 01/31/2022 FCST: 02/11/2022 to 02/15/2022**



**Figure 9.** Forecasted surface temperature anomalies (°C; shading) from 11 – 15 February 2022. The forecasts are from the 00z 31 January 2022 GFS ensemble.

Ridging/positive geopotential height anomalies are predicted to strengthen in the Gulf of Alaska and spreading into the west coast of North America anchoring troughing/negative geopotential height anomalies in eastern North America this period (**Figure 8**). This pattern favors normal to above normal temperatures across Alaska, Northern and Western Canada and the Western US with normal to below normal temperatures in Southern and Eastern Canada and the Central and Eastern US except for Florida (**Figure 9**).

**GEFS 11-15 Day Forecast SNOD Change**  
**INIT: 00Z 01/31/2022 FCST: 02/11/2022 to 02/15/2022**



**Figure 10.** Forecasted snow depth changes (mm/day; shading) from 11 – 15 February 2022. The forecast is from the 00Z 31 January 2022 GFS ensemble.

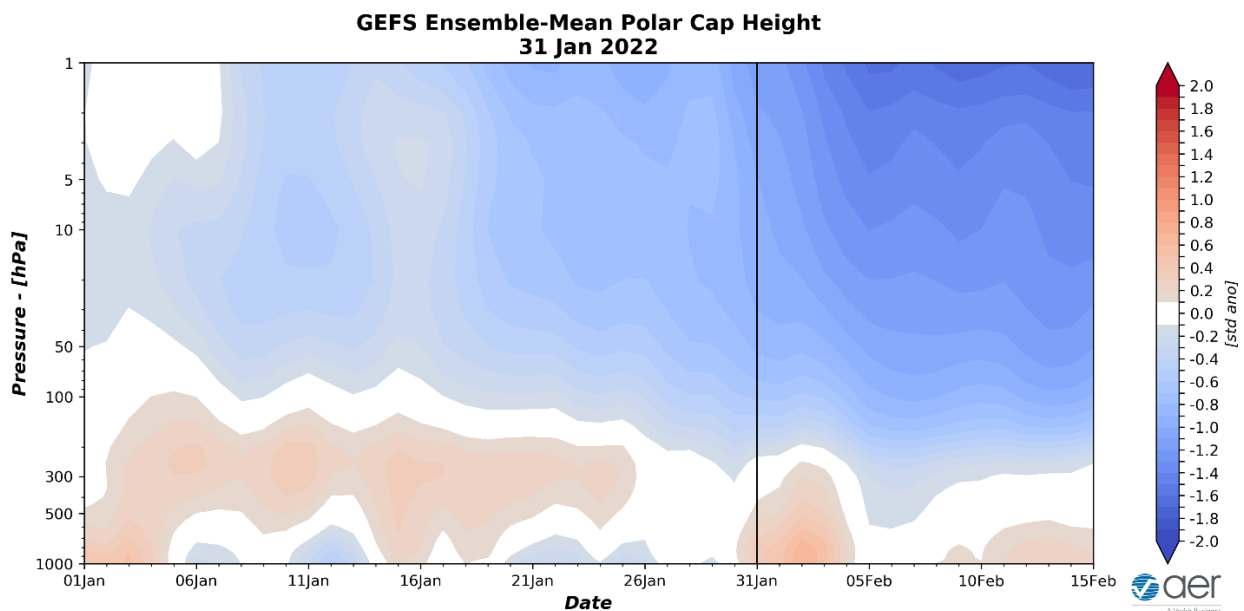
Troughing and/or cold temperatures are predicted to support possible new snowfall across northern Eurasia, the higher elevations of Southern Europe and the higher elevations of Central Asia while milder temperatures promote snowmelt across Scandinavia and Southern Asia (**Figure 10**). Troughing and/or cold temperatures are predicted to support possible new snowfall across western Alaska, much of Northern

and Eastern Canada and the Western and Central US while milder temperatures promote snowmelt across the Western and Southeastern Canada and the Northeastern US (**Figure 10**).

### Longer Term

#### 30-day

The latest plot of the polar cap geopotential height anomalies (PCHs) currently shows cold/negative PCHs throughout the stratosphere with warm/positive PCHs in the troposphere (**Figure 11**). The negative departures are predicted to deepen in the upper stratosphere next week while the warm/positive PCHs throughout the troposphere are also predicted to intensify into early February (**Figure 11**). End of last week the GFS predicted that the cold stratospheric PCHs were finally going to couple with the troposphere but the GFS has now backed off of this forecast. The highly unusual persistent state of the atmosphere where the stratosphere and troposphere are decoupled continues and when coupling resumes remains an open question to me. But maybe related to the Final Warming.

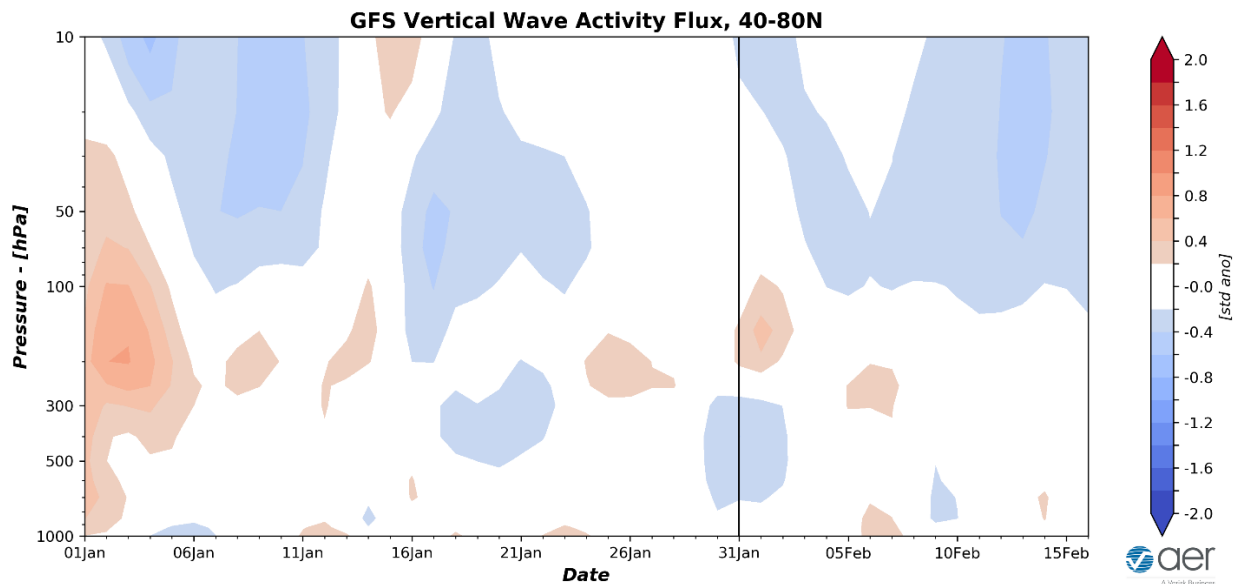


**Figure 11.** Observed and predicted daily polar cap height (i.e., area-averaged geopotential heights poleward of 60°N) standardized anomalies. The forecast is from the 00Z 31 January 2022 GFS ensemble.

The normal to above normal PCHs predicted early this week in the lower troposphere are consistent with the predicted brief negative surface AO this week (**Figure 1**). The PCH forecast continues to look strange today and suggests repetitive troposphere-

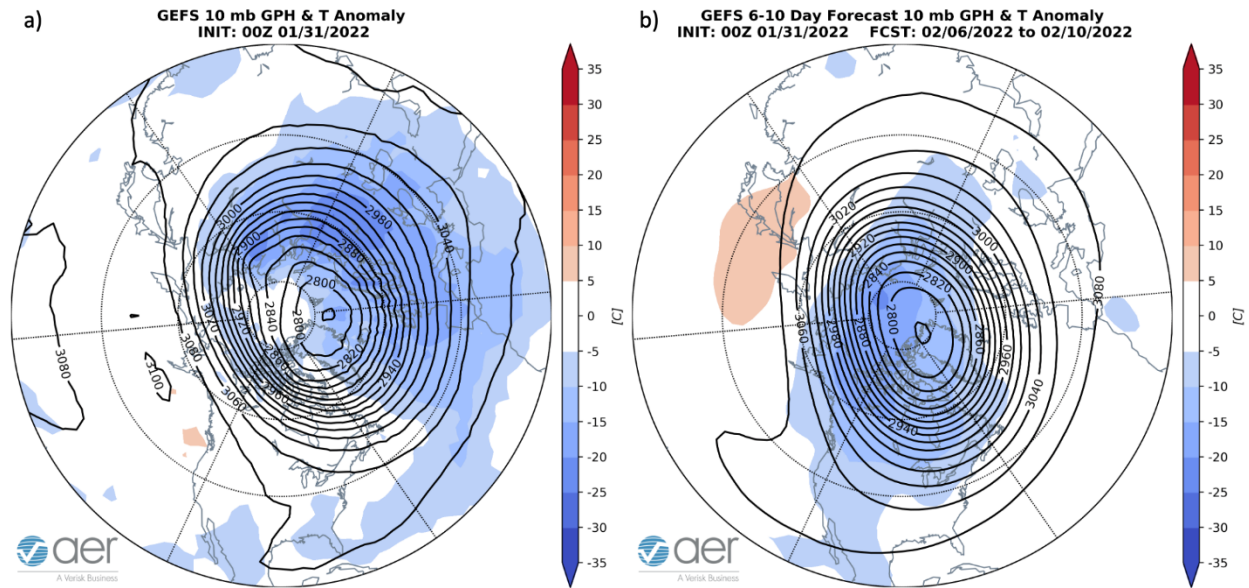
(very) low stratosphere-troposphere coupling events that are quite shallow and condensed in time. Regardless I believe that a stretched PV is the best way to understand stratosphere-troposphere coupling this month.

The vertical Wave Activity Flux (WAFz) from the troposphere to the stratosphere or poleward heat transport in the stratosphere is predicted to remain mostly below normal through mid-February (**Figure 12**). The negative WAFz anomalies predicted the next two weeks will continue to support a relatively strong PV through mid-February as suggested by the relatively cold stratospheric PCHs. Though again not all strong PVs are created equal, and I think a stretched polar vortex is what is most critical right now.



**Figure 12.** Observed and predicted daily vertical component of the wave activity flux (WAFz) standardized anomalies, averaged poleward of 40-80°N. The forecast is from the 00Z 31 January 2022 GFS ensemble.

Though zonally averaged WAFz has remained weak, a third stretched stratospheric PV and third of January looks to winding down with the PV centered near Svalbard and ridging centered south of the Aleutians. The previously stretched configuration of the PV is becoming more circular (**Figure 13**). However, the PV perturbation was relatively minor, allowing the PV to remain relatively strong resulting in a current positive stratospheric AO (**Figure 11**).

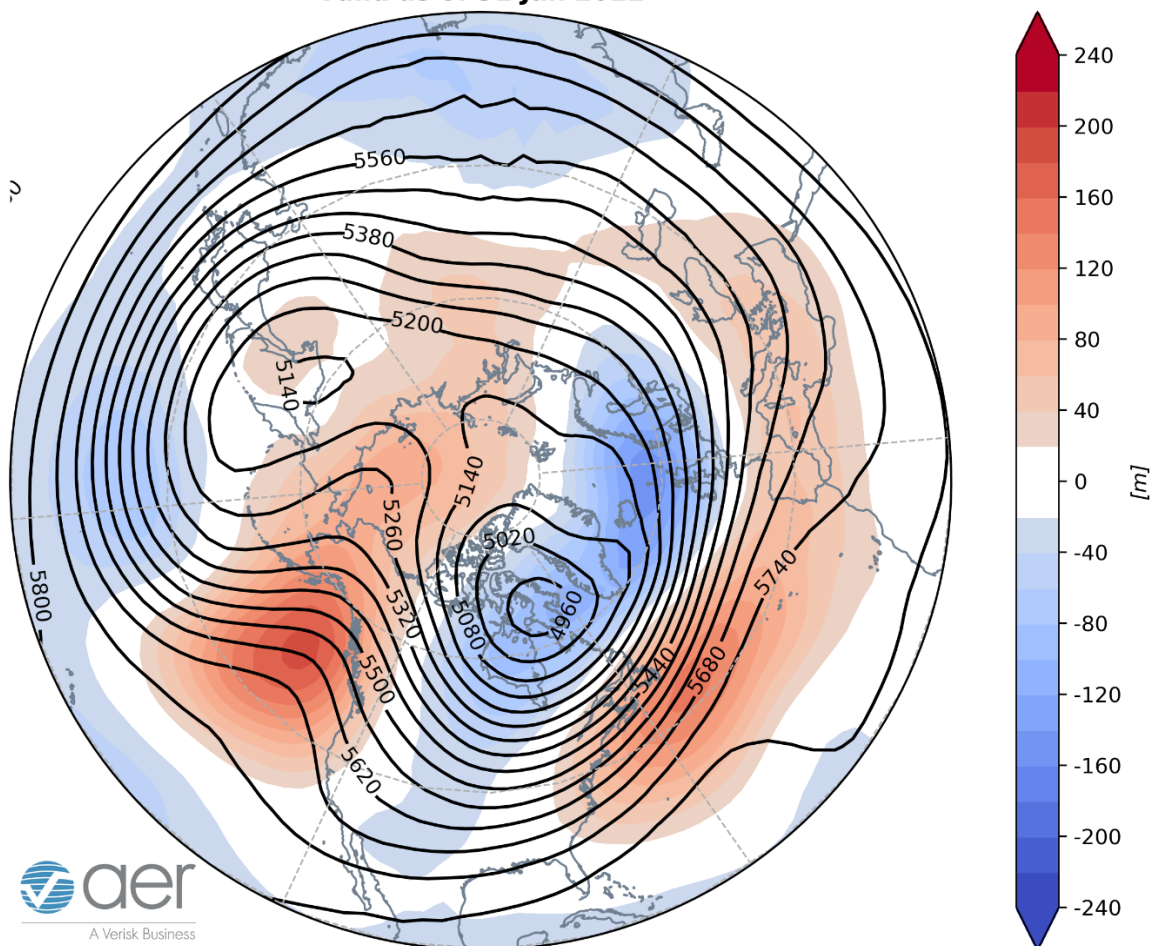


**Figure 13.** (a) Initialized 10 mb geopotential heights (dam; contours) and temperature anomalies ( $^{\circ}\text{C}$ ; shading) across the Northern Hemisphere for 31 January 2022. (b) Same as (a) except forecasted averaged from 10 – 16 February 2022. The forecasts are from the 00Z 31 January 2022 GFS model ensemble.

The below normal WAFz is predicted to allow the PV to strengthen and become quite strong with the PV remaining centered between the North Pole and Svalbard this week with a persistent positive stratospheric AO the next two weeks (**Figure 11**). However, the GFS is predicting yet another stretched PV event the second week of February with cross polar flow from Siberia to eastern North America with new warming propagating from Eastern Siberia towards Alaska (**Figure 13**). The strengthening stratospheric PV could still couple with the surface commencing a relatively mild period across the US sometime in February, but any signs of this remain elusive and time is running out to have a meaningful impact on the winter.



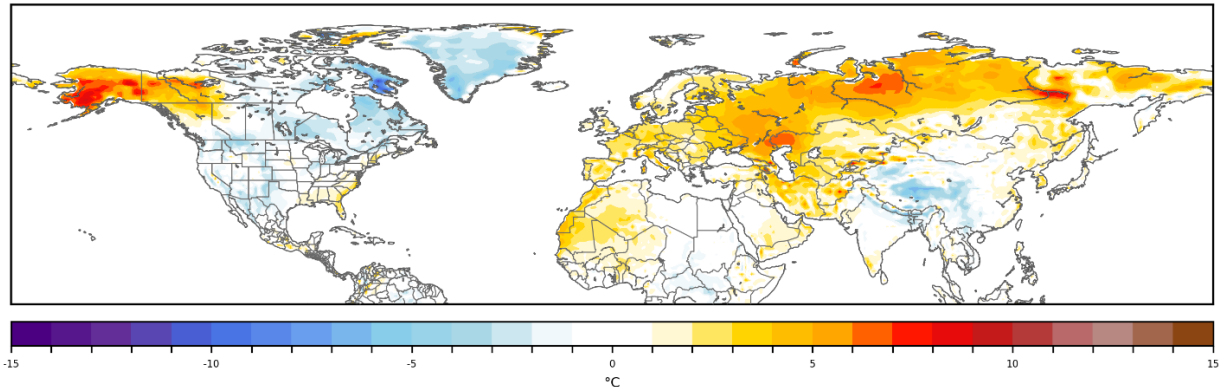
**CFS 500 hPa Forecast Anomaly Feb 2022  
Valid as of 31 Jan 2022**



**Figure 14.** Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere for February 2022. The forecasts are from the 00Z 31 January 2022 CFS.

I include in this week's blog the monthly 500 hPa geopotential heights (**Figure 14**) and surface temperatures for February (**Figure 15**) from the Climate Forecast System (CFS; the plots represent yesterday's four ensemble members). The forecast for the troposphere is ridging in the western North Atlantic, Southern Europe, Western Siberia, Eastern Siberia, Alaska and the Gulf of Alaska with troughing across Northern Europe, Central and Southern Asia and the interior of North America (**Figure 14**). This pattern favors seasonable to relatively warm temperatures across much of Europe, Western and Northern Asia, Alaska, Northwestern Canada and the Southeastern US with seasonable to relatively cold temperatures across Scandinavia, Southern and Eastern Asia, much of Central and Eastern Canada and much of the US (**Figure 15**).

**CFS 1-28 Day Forecast T2m Anomaly**  
**INIT: 00Z 01/31/2022 FCST: 02/01/2022 to 02/28/2022**

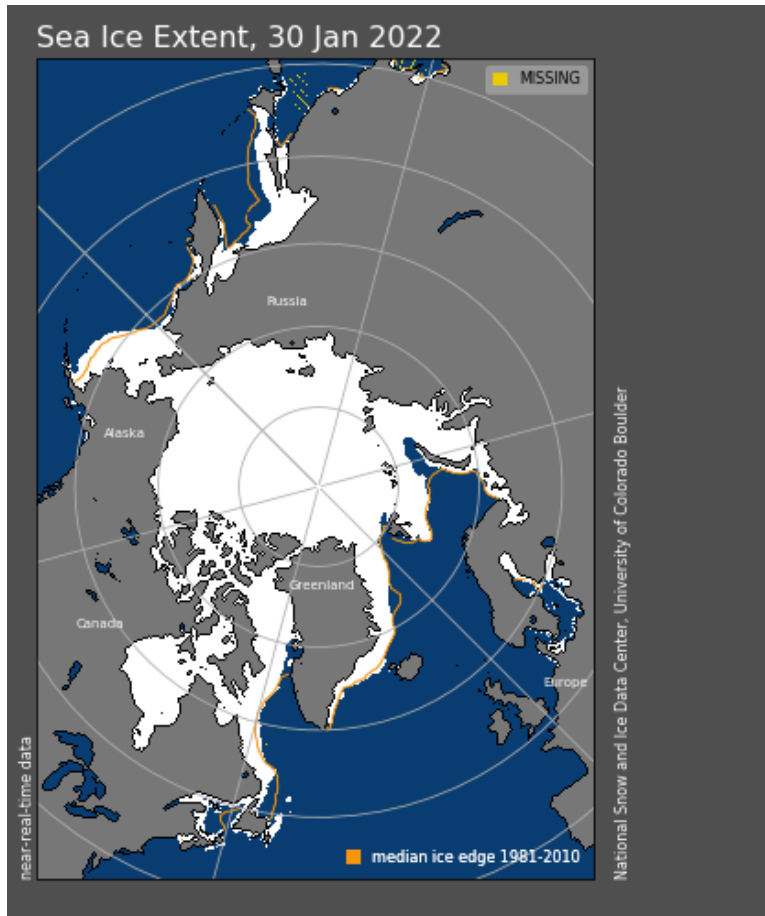


**Figure 15.** Forecasted average surface temperature anomalies (°C; shading) across the Northern Hemisphere for February 2022. The forecasts are from the 00Z 31 January 2022 CFS.

### *Surface Boundary Conditions*

#### Arctic Sea ice

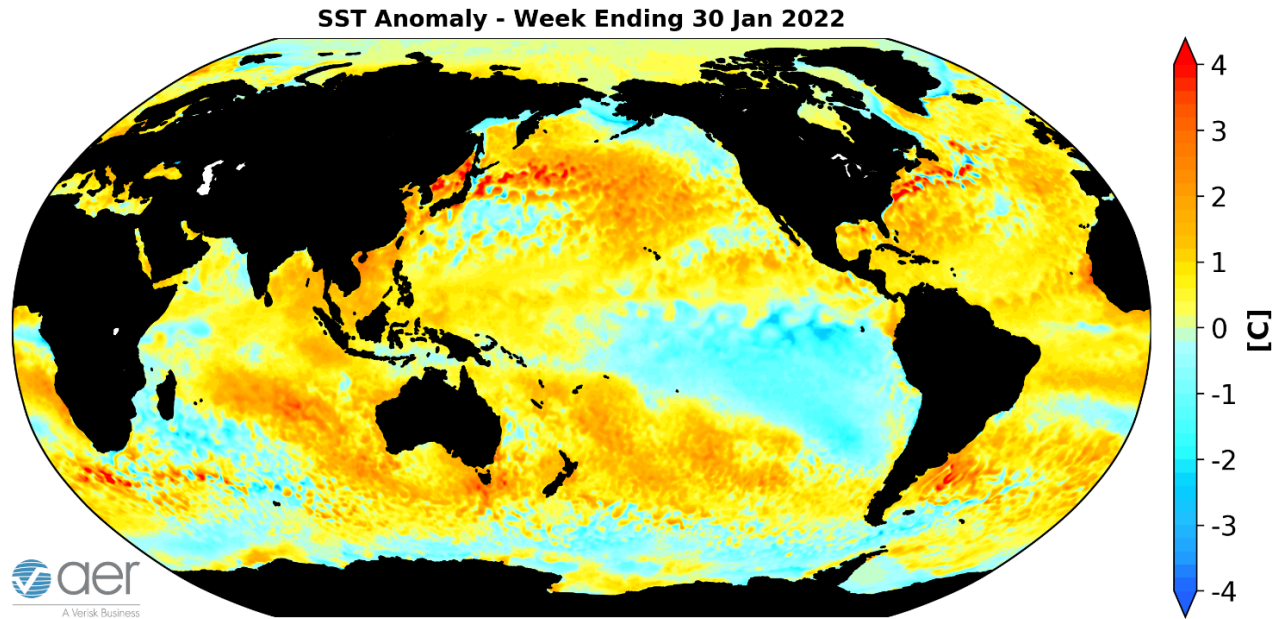
Arctic sea ice is growing but remains below normal mostly in Sea of Okhotsk and recently in the Barents Sea. Overall sea ice is relatively extensive compared to recent winters, though it remains relatively thin. In the Barents-Kara Seas extent is close to normal. Below normal sea ice in the Barents-Kara seas favors cold temperatures in Central and East Asia, however this topic remains controversial. Recent research has shown that the regional anomalies that are most highly correlated with the strength of the stratospheric PV are across the Barents-Kara seas region where low Arctic sea ice favors a weaker winter PV. Low sea ice in the Chukchi, Beaufort and Bering seas may favor colder temperatures across North America but has not been shown to weaken the PV.



**Figure 16.** Observed Arctic sea ice extent on 30 January 2022 (white). Orange line shows climatological extent of sea ice based on the years 1981-2010. Image from the National Snow and Ice Data Center (NSIDC).

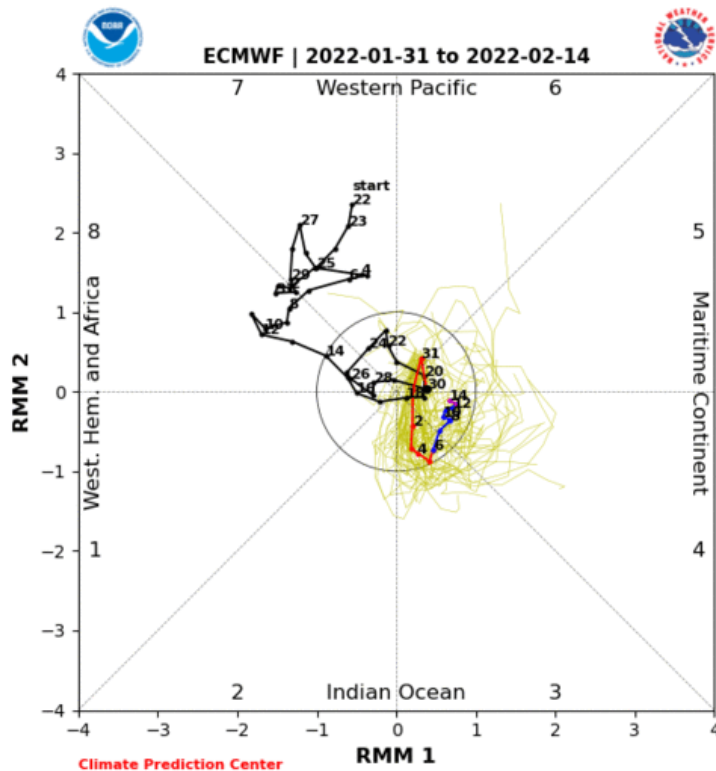
### *SSTs/El Niño/Southern Oscillation*

Equatorial Pacific sea surface temperatures (SSTs) anomalies are below normal and we continue to observe weak to possibly moderate La Niña conditions (**Figure 17**) and La Niña conditions are expected through the winter. Observed SSTs across the NH remain well above normal especially in the central North Pacific (west of recent years), the western North Pacific and offshore of eastern North America though below normal SSTs exist regionally especially in the North Pacific. Not my expertise but the SST pattern in the North Pacific are strongly resembling a negative Pacific Decadal Oscillation (PDO) pattern that favors colder temperatures across northwestern North America and milder temperatures across southeastern North America.



**Figure 17.** The latest weekly-mean global SST anomalies (ending 30 January 2022).  
Data from NOAA OI High-Resolution dataset.

Currently no phase of the Madden Julian Oscillation (MJO) is favored (**Figure 18**). The forecasts are for the MJO to remain weak where no phase is favored. Hard for me to see the MJO is having much influence on the weather. But admittedly this is outside of my expertise.



**Figure 18.** Past and forecast values of the MJO index. Forecast values from the 00Z 31 January ECMWF model. Yellow lines indicate individual ensemble-member forecasts, with the green line showing the ensemble-mean. A measure of the model “spread” is denoted by the gray shading. Sector numbers indicate the phase of the MJO, with geographical labels indicating where anomalous convection occurs during that phase. Image source: <http://www.atmos.albany.edu/facstaff/roundy/waves/phasediags.html>

## Get Detailed Seasonal Weather Intelligence with sCast

We appreciate your taking the time to read the public Arctic Oscillation blog from Dr. Judah Cohen and the AER Seasonal Forecasting team.

Dr. Cohen’s detailed monthly seasonal forecast, sCast, is also available for purchase. sCast provides a monthly 30-60-90-180-day outlook into temperature and precipitation, solar flux and wind anomalies across the globe, and regional population weighted cooling and heating degree forecasts for the US.

Our sCast principal engineer, [Karl Pfeiffer](#), can help you use sCast and other AER seasonal forecast products to deliver important, long-lead time weather intelligence to your business. Please reach out to Karl today!