

# Arctic Oscillation and Polar Vortex Analysis and Forecasts

*February 2, 2026*

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. In late 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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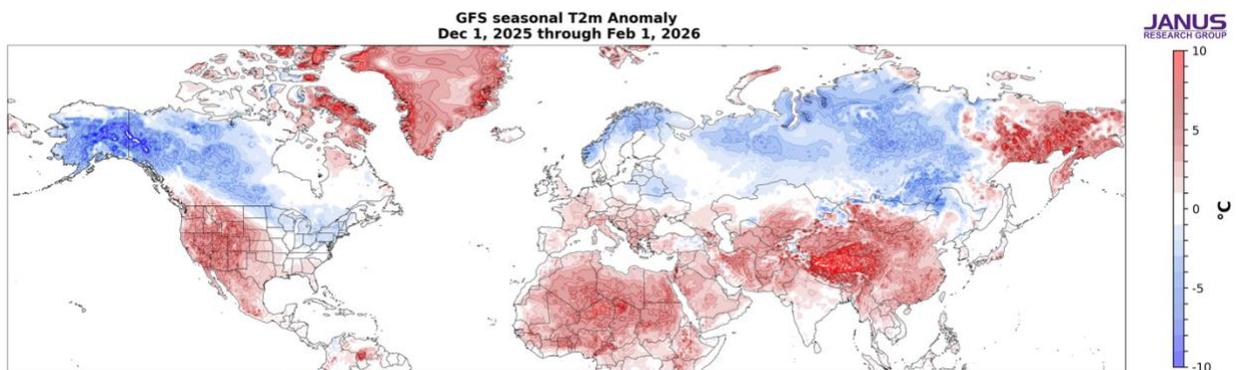
## Summary

- The Arctic Oscillation (AO) is currently negative and is predicted to remain negative into next week and then trend to neutral as pressure/geopotential height anomalies across the Arctic are currently mostly positive and are predicted to remain mostly positive to mixed the next two weeks. The North Atlantic Oscillation (NAO) is currently neutral with mixed pressure/geopotential height anomalies dominant across Greenland, and the NAO is predicted to remain mostly negative the next two weeks as pressure/geopotential height anomalies are predicted to turn mostly positive across Greenland the next two weeks.
- Ridging/positive geopotential height anomalies across Greenland will support troughing/negative geopotential height anomalies across Europe the next two weeks. This pattern will favor normal to below normal temperatures across Northern and Eastern Europe with including the United Kingdom (UK) with normal to above normal temperatures across Western and Southern Europe the next two weeks.
- Over the next two weeks ridging/positive geopotential height anomalies across Greenland and Eastern Siberia will support troughing/negative geopotential height anomalies across much of Northern Asia with more ridging mostly centered Southeast Asia. This pattern favors mostly normal to below normal temperatures across much of Northern and into Northeastern Asia with normal to above normal temperatures across Eastern Siberia and most of Southern Asia including the Tibetan Plateau.

- The general pattern across North America this week is ridging/positive geopotential height anomalies across Alaska, Western Canada and the Western United States (US) will support deep troughing/negative geopotential height anomalies across eastern Canada and the Eastern US. However next week ridging will become focused in Northeastern Canada as troughing becomes established in western North America. This pattern will support this week normal to below normal temperatures stretching across Central Canada and the Eastern US with normal to above normal temperatures across Alaska, Western Canada, the Western US and Northeastern Canada. Then next week temperatures will turn milder across much of eastern North America while temperatures cool across western North America.
- I have been discussing how the polar vortex (PV) can walk through three doors and therefore the weather. I have favored “rinse, lather, repeat” or repeated stretched PVs, however, a bigger PV disruption is predicted to occur, or is it really? My thoughts below.

## Plain Language Summary

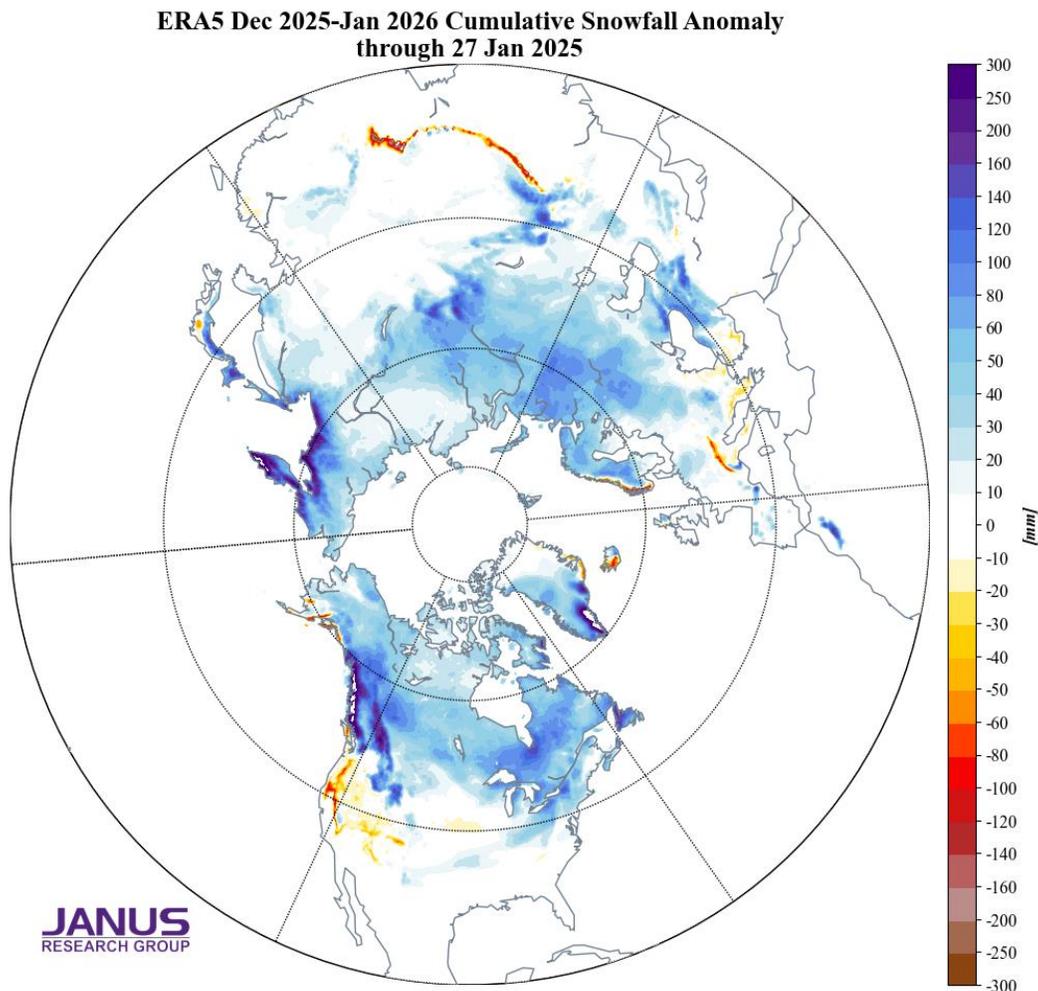
So far this winter, cold temperatures have dominated northern Scandinavia, parts of Eastern Europe, much of Russia, Alaska, much of Canada and the Northeastern US (see **Figure**). In contrast mild temperatures have dominated Western and Southern Europe, Western, Central and Eastern Asia, Eastern Siberia, Northeast Canada and much of the US (see **Figure**). The forecast for the next two weeks can be summarized as widespread cold both across Northern Eurasia including Northeastern Europe and eastern North America thanks to impressive high-latitude blocking (see **Figures 3 and 6**). The polar vortex (PV) has so far this winter been ping ponging between circular and strong, which favors relatively mild temperatures mostly in North America and Asia and stretched or more elongated that favors cold temperatures in East Asia and eastern North America. However a larger PV disruption is predicted for mid-February that is likely to lead to a pattern change across the Northern Hemisphere (NH). Possibly the largest change will be cooler temperatures in western North America and milder temperatures in eastern North America (see **Figure 9**). But at least for now not expecting this to be a permanent pattern change.



**Figure.** Estimate of the observed surface temperatures (°C; shading) from 01 Dec 2025 to 1 Feb 2026 based on GFS initializations and the GFS forecast from the 2 Feb 2026 run.

## Impacts

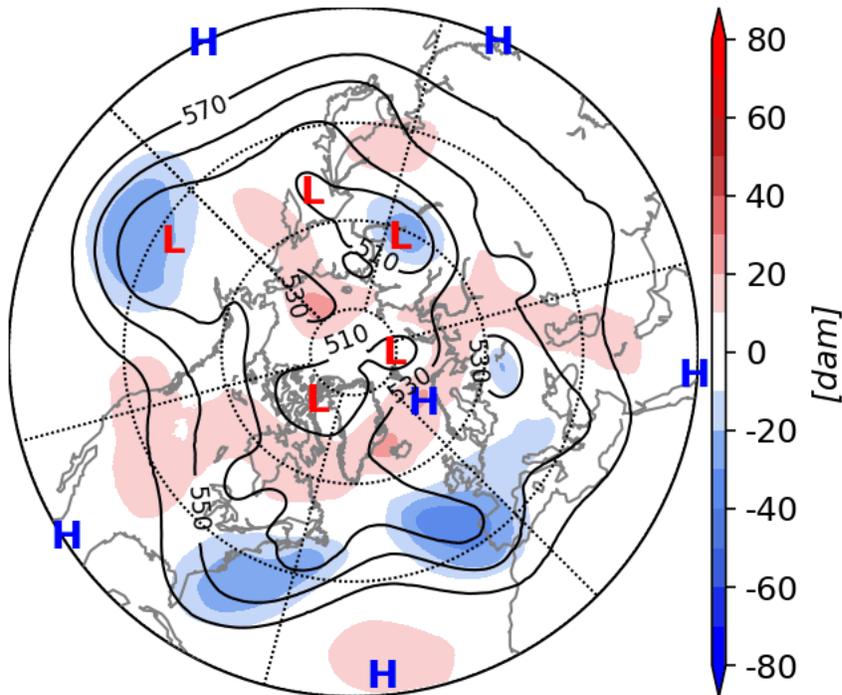
I show an update to the Northern Hemisphere snowfall in **Figure i**, once again thanks to my colleague Karl Pfeiffer. This plot is an update from the 19 Jan 2026 blog. Above normal snowfall remains impressively widespread across the high latitudes of the Northern Hemisphere (NH) continents. well above normal snowfall in general along the coast of East Asia but especially Japan and Kamchatka. But also includes much of Russia with a local maximum around Moscow, much of Canada, especially the higher elevations. But the biggest changes occurred at lower latitudes with positive anomalies in China, Europe and especially the Eastern US. This plot does not even include the blizzard in the Carolinas from this weekend. Snow cover extent is close to normal now but was above normal a few days ago with two big positive anomalies in the Eastern US and China but the the Chinese anomaly is now mostly gone. The regions that stand out for below normal snowfall are the Alps, the Tibetan Plateau and the Western US. But snow conditions should improve in the Western US, the Alps and possibly the Tibetan Plateau.



**Figure i.** Snowfall anomalies ( $^{\circ}\text{C}$ ; shading) from 1 Dec 2025 to 27 Jan 2026. The data based on ERA5 reanalysis.

As has been my habit all winter, I first discuss the two-week forecast for the mid-tropospheric circulation, which helps set the table for what I am expecting with the PV and our weather. Once again, for most of the two weeks the mid-tropospheric circulation is characterized by low pressure centered near the North Pole and high-pressure ridging floating around the mid- to high-latitudes (see **Figure ii**). This week will be a continuation of what we have observed for much of the winter high pressure centered over western North America, the North Atlantic sector of the Arctic and Eastern Siberia briefly extending to the North Pole. Coupled with the high pressure centers are low pressure centers over eastern North America, East Asia and the Urals. However next week the high-pressure ridging breaks down in Eastern Siberia and western North America signaling at least a pause and possibly a complete breakdown of the the dominant circulation pattern of this winter. Instead high-latitude blocking becomes focused near Greenland.

### Initialized 00Z 500 hPa HGT/HGTa 02-Feb-2026



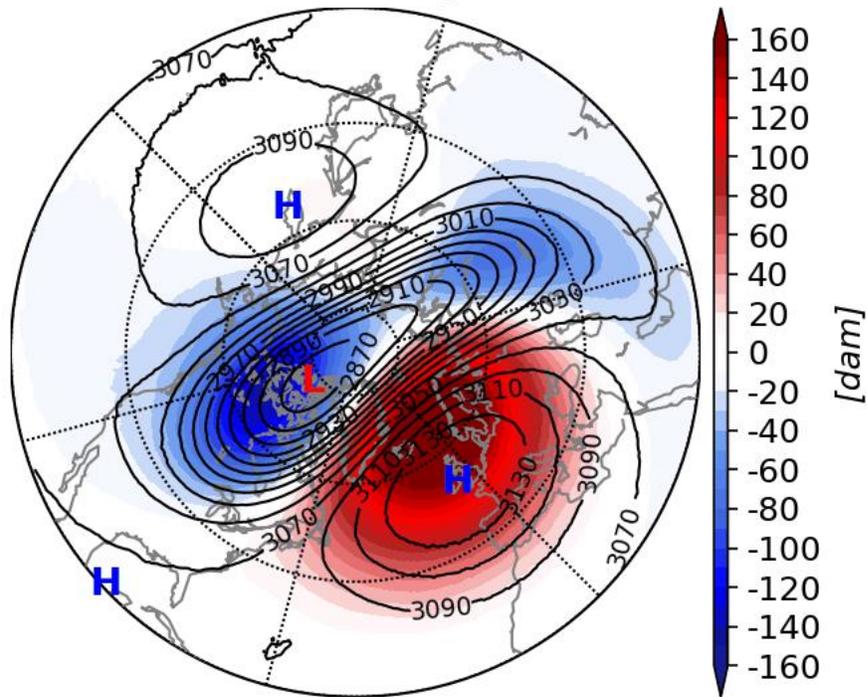
**Figure ii.** Initialized 500 mb geopotential heights (dam; contours) and decameter anomalies (dam; shading) across the Northern Hemisphere for 19 Jan 2026 and forecasted from 02 Feb 2026 to 17 Feb 2026. The forecasts are from the 00Z 02 Feb 2026 GFS model ensemble.

Strong Ural/Barents-Kara Seas ridging never really materialized as first predicted. I think this resulted in two changes to the forecast. I think this has tampered down the more bullish model forecasts of a sudden stratospheric warming (SSW - defined as a reversal of the wind from westerly to easterly at 60°N and 10 hPa) and even a PV split. A bigger PV disruption is likely but whether it crosses the threshold of an SSW remains still in doubt. I peaked at the EPS weeklies

and it has really backed off the idea of an SSW. I think what complicates what is going on is the strong high latitude blocking that became established the second half of January. As my collaborator and I wrote in a recent paper - [Francis et al. 2026](#), what happens in the troposphere can influence or obfuscate variability in the stratosphere and it could be that the PV disruption looks more impressive (either in reality or the model forecasts) than it really is because the high latitude blocking is introducing “speed bumps” sort of speak to the PV from below. Because as I show below the upwelling wave energy from the troposphere really is not that impressive. That is why I think it is prudent to be skeptical of the more extreme PV forecasts.

With that as an introduction clearly all the models are predicting a larger PV disruption than what we have seen all winter (not including November). As seen in **Figure iii** (and also **Figure 12a**) the PV has an elongated shape in appearance for this week. The PV has a “split” appearance this week, a character trait or signature of a more extreme stretched PV. This is consistent with the model forecasts of one more outbreak of extreme cold in the US over the weekend. But then at least in this animation there is a true and clear PV split with two distinct and independent PV centers in mid-February.

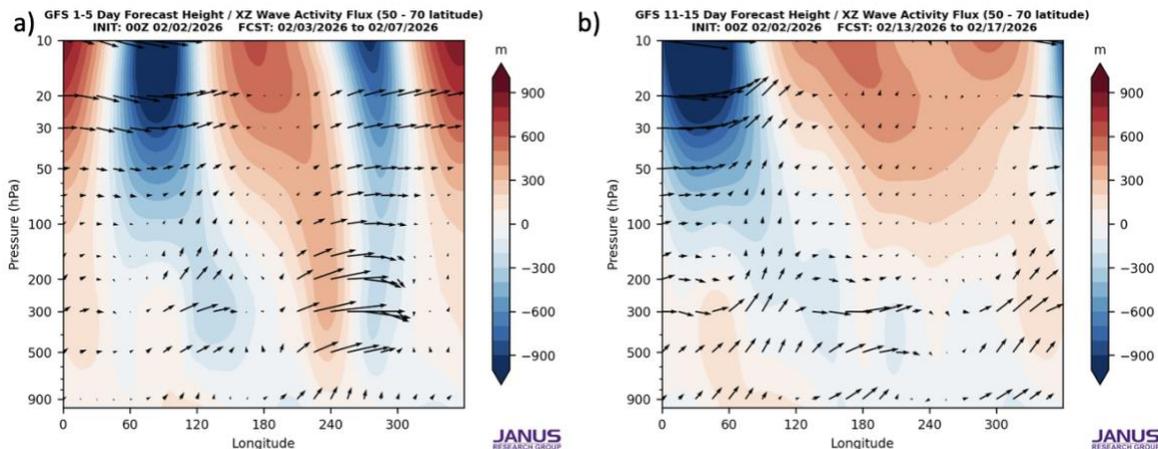
### Initialized 00Z 10 hPa HGT/HGTa 02-Feb-2026



**Figure iii.** Forecasted average 10 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere for 02 Feb 2026 and forecasted from 03 Feb 2026 to 17 Feb 2026. The forecasts are from the 00Z 02 Feb 2026 GFS model ensemble.

Most ensembles don't predict a PV split or a real brief PV split, though there are more often predicted in the operational runs. In addition the high pressure in the polar stratosphere is not predicted to settle close to the North Pole but rather across Northern Canada (**Figure iii** and also see **Figure 12b**). Rather than your classical SSW or PV split for now I am approaching this PV disruption as a Canadian Warming. And as from our recent paper [Agel et al. 2025](#) Canadian warmings overwhelmingly transition to either SSWs or stretched PVs. So I am certainly not ruling out an official SSW.

And as I have been routinely doing, looking at the wave diagnostics in **Figure iva** continues to display wave reflection this week. Once again this week, wave energy goes up and east over Asia, reflects off the stratospheric PV and then heads down and east over North America where the energy is re-absorbed amplifying the standing wave over North America and delivers cold air from the Arctic south, east of the Rockies. There is westward wave tilt with height over Asia and an eastward wave tilt with height over North America that is a classic signature of wave reflection. This signature of wave reflection is typical of stretched PVs.

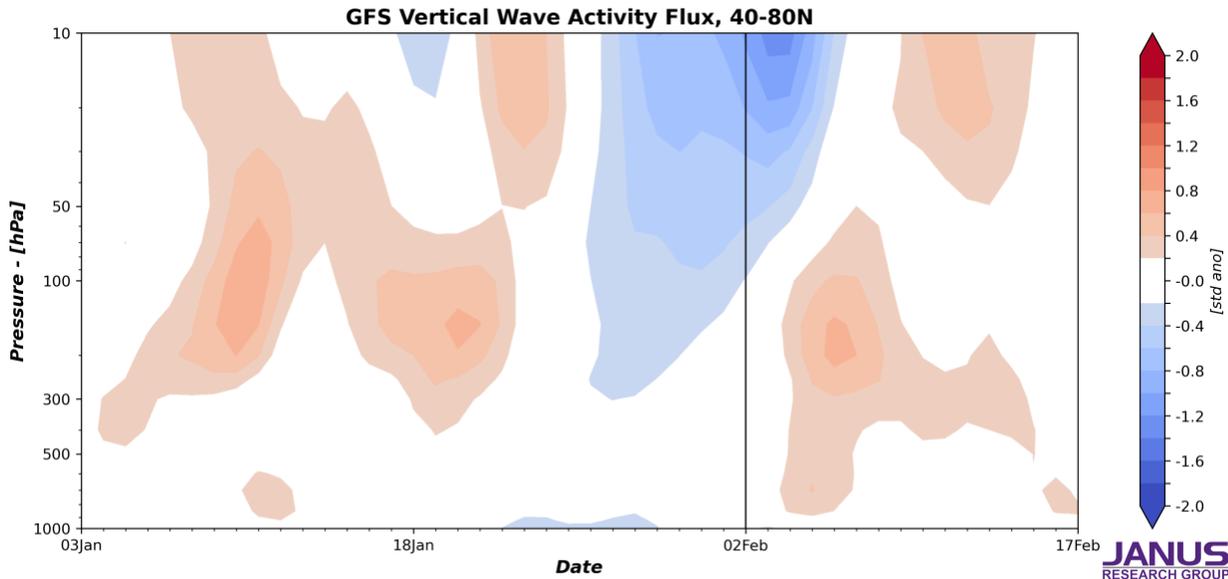


**Figure iv. a)** Predicted longitude-height cross section of geopotential eddy height anomalies (shading) and wave activity flux (vectors) for 3 February through 7 February 2026 **b)** same as **a)** but forecast from 13 February through 17 February 2026. The forecast is from the 00Z 2 February 2026 GFS operational.

However for the the second period shown in **Figure ivb** there is no obvious wave reflection and no eastward tilting waves over North America. Instead the wave energy only goes up leading to absorption of the wave energy in the PV and hence a larger PV disruption.

One reason I am skeptical of the forecasts of a large PV disruption a true PV split is because of today's vertical Wave Activity Flux (WAFz) from the troposphere to the stratosphere or poleward heat transport in the stratosphere has been relatively quiet this season (**Figure v**). More recently it has gotten more active but the pulse of upward WAF last week followed by negative (downward) anomalies this week, which is often a signature of wave reflection or a stretched PV. All in all wave reflection/stretched PV for this week seems solid. But then we have another pulse

of upward WAF the second week of February is really underwhelming. Certainly the model bait and switch from predicted Ural ridging to Ural troughing has been leading to this predicted pulse getting weaker and weaker with time. Will it still be enough to trigger an SSW? Normally I would say no but maybe as I discussed above it is possibly getting an assist from the high-latitude blocking.



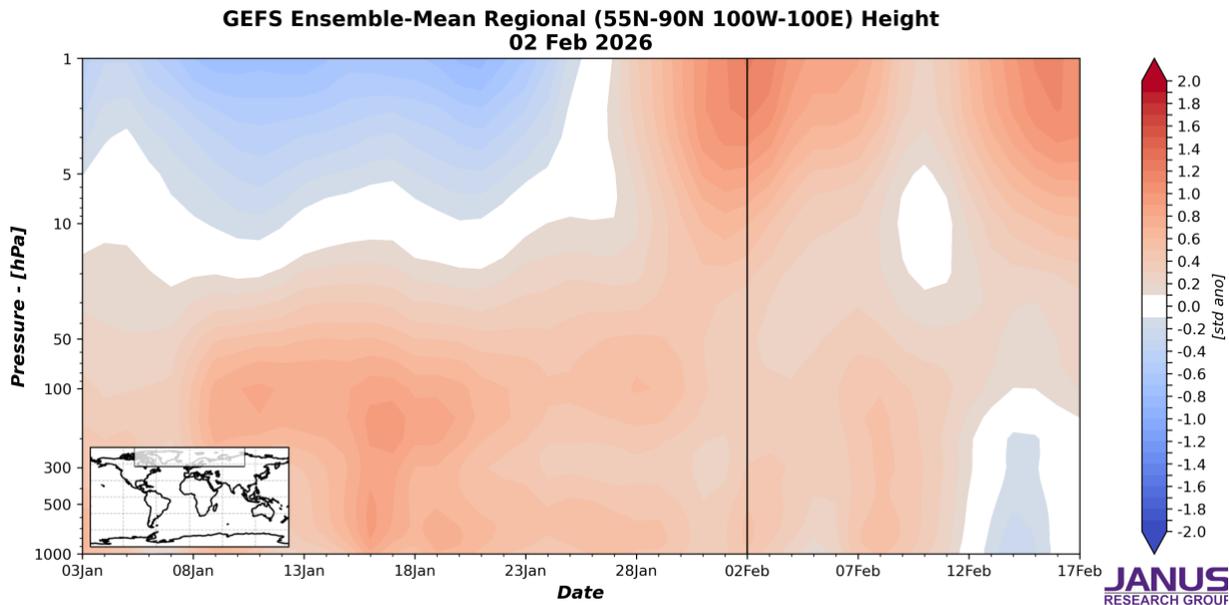
**Figure v.** Observed and predicted daily vertical component of the wave activity flux (WAF) standardized anomalies, averaged poleward of 40-80°N. The forecast is from the 00Z 02 Feb 2026 GFS ensemble.

Last week I presented February 2010 and February 2018 as possible analogs. But the change from last week in the polar cap geopotential height anomalies (PCHs) (see **Figure 11**) has me thinking February 2010 is no longer a good analog. In February 2010 the warm/positive PCHs were vertically stacked from the surface through the mid-stratosphere at the time of the PV split. From **Figure 11** the PCHs are no longer vertically stacked but rather warm/positive PCHs in the stratosphere with cold/negative PCHs exist in the troposphere, which is more typical of SSWs and what was observed in February 2018 (not shown). For now I am not jumping on February 2018 as a good analog either, especially if an SSW does not verify.

Interestingly we have Greenland blocking before the SSW-like disruption or the cart before the horse. It seems that the Greenland blocking could be related to the last time the eastward tilting waves became westward tilting over North America resulting in the large warming in the North Atlantic sector in the polar stratosphere at the end of January (see **Figure vi**). The warm/positive PCHs over Greenland at least appear to descend to the surface the second week of February resulting in the predicted Greenland blocking (see **Figure 5**).

Putting this all together kind of reminds me of the Canadian warming (and may have also crossed the threshold into SSW territory) from early December where Greenland blocking preceded the

descent of warm/positive PCHs from the PV disruption or again putting the cart before the horse. With that event what followed next was a stretched PV.



**Figure vi.** Observed and predicted daily polar cap height (i.e., area-averaged geopotential heights poleward of 60°N) standardized anomalies limited to the North Atlantic sector (see insert). The forecast is from the 00Z 02 Feb 2026 GFS ensemble.

In conclusion as I have been doing all winter I will end doing my best Monty Hall from “Let’s Make a Deal” impression. The three doors are: door number one - the reflective layer in the stratosphere that gave rise to the stretched PV also protects the PV from subsequent upwelling energy from the troposphere and allows the PV to strengthen. The second door is, though there is short-term strengthening of the PV, high-latitude blocking resumes its assault on the PV and we see more stretched PVs and/or Canadian Warmings (that often transition to stretched PVs) until finally there is knockout punch and a true sudden stratospheric warming (SSW) either in January or February. And finally, the third scenario is that the stretched PVs just keep repeating for much of the winter punctuated or separated by a relatively strong PV and or Canadian warmings.

It might seem with the model forecasts, a possible split PV door number two is the prohibitive favorite at this point. But I am not convinced. As we showed in Agle et al. and I discuss with the three doors a Canadian warming can transition to either an SSW or a stretched PV. So assuming I am correct to frame this larger PV disruption more as a Canadian warming that could be a precursor to yet another stretched PV. Also as I have written previously in the blog, a Greenland blocking is a surprisingly good predictor of another stretched PV about two weeks later. But as I have also written previously, SSWs are also a very supportive environment of a stretched PV.

As far as Europe, so far the cold in Northeastern Europe has been having a hard time penetrating into Northwestern Europe. I would expect that to change next week as Greenland blocking

peaks. But since the Greenland blocking as far as I can tell is not coupled to an SSW, once again I think the Greenland blocking will be transient and therefore the cold in Western Europe.

I have since the late fall favored door number three or what I like to call a “rinse, lather, repeat” PV and weather pattern for the foreseeable future. Basically, alternating stretched PVs and relaxation to a more circular PV and oscillating or alternating cold and mild periods for East Asia and or North America, that can feature some wild temperature swings. Eventually the pattern could transition to either door number one, persistently strong PV or door number two, a major SSW. I believe that door number one can be disregarded for the remainder of the winter (28 Feb).

Clearly there is a pattern change coming mid-February with milder in eastern North America but should be focused in Canada more so than the Eastern US. As shown in **Figure iv**, wave reflection is predicted to be absent in mid-February that supports amplification of the North American standing wave, i.e., western ridge and eastern trough. The absence of wave reflection would support just the opposite, i.e., western trough and eastern ridge. In addition it is predicted to turn colder in the Arctic which teleconnects with cold in western North America. So I do believe that the pattern will finally be more supportive of snow so desperately needed in the Western US in mid-February.

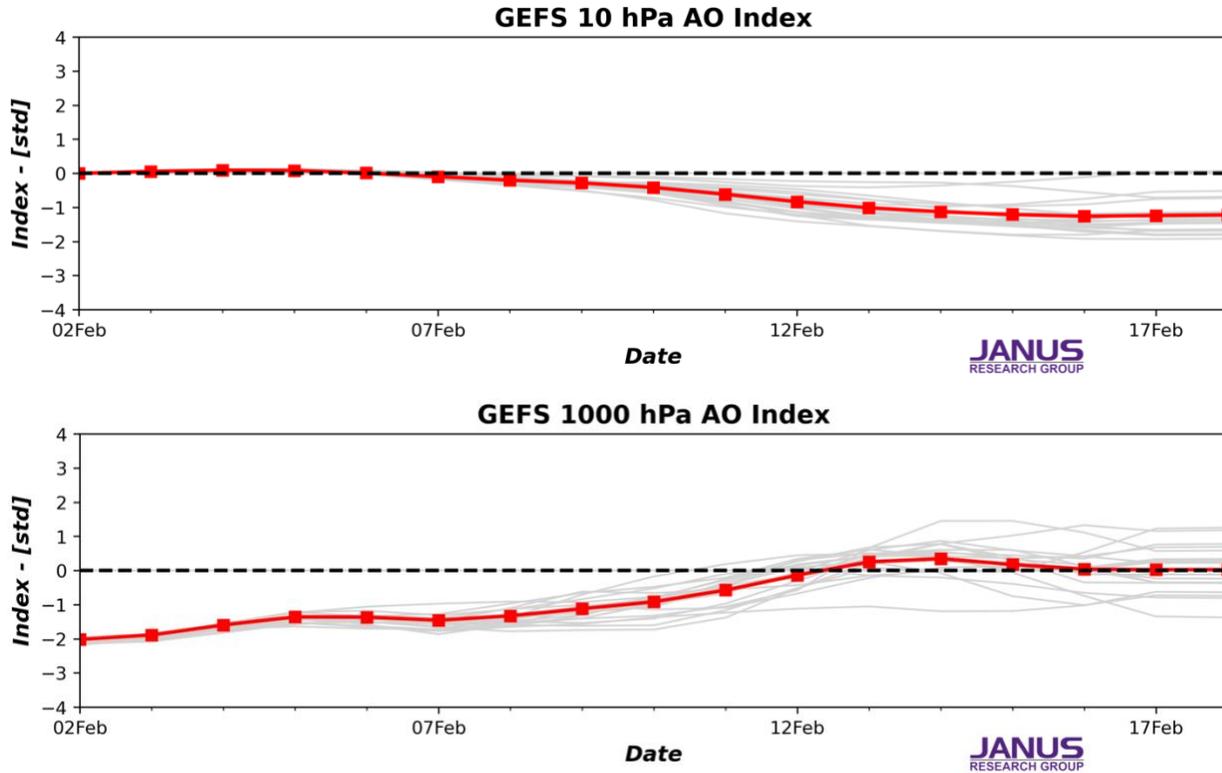
I also often write that pattern transitions are often not smooth but a bit of back and forth or two steps forward, one step back, so I could see the pattern for mid-February become the dominant pattern in March but still I am watching for yet one more and possibly last stretched PV at the end of February. This is strongly based on the predicted Greenland blocking and a Canadian warming (if I am correct) that are often precursors to a stretched PV.

So through the end of February still choosing door number three but just putting it slightly ahead of door number of two. But I consider both confidence and visibility as low. March will be interesting to watch as we try to figure out if and how the predicted strongest warm/positive stratospheric PCHs of the winter in mid-February couples with the surface. This could put Northern Europe and the Eastern US at risk for more cold but March cold and not January cold.

## **Near-Term**

### **This week**

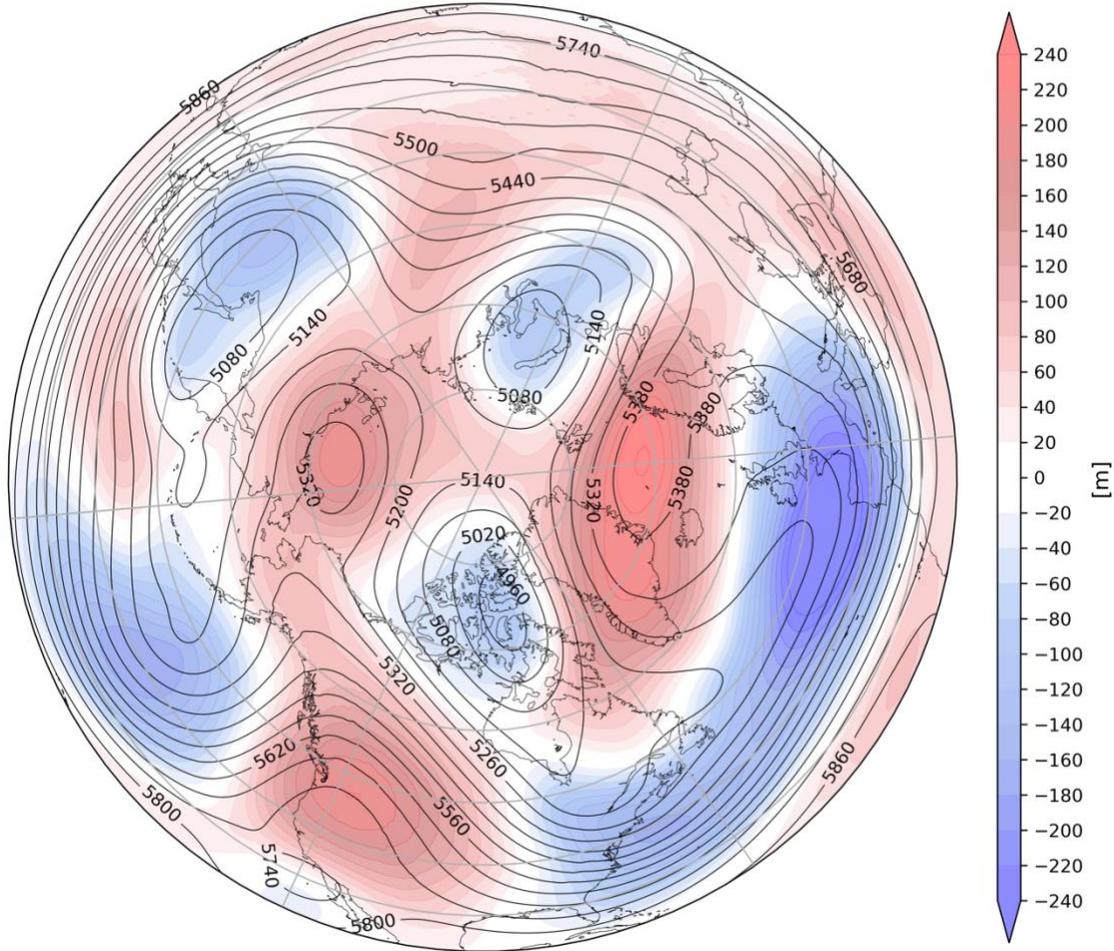
The AO is predicted to be negative this week (**Figure 1**) with mostly positive geopotential height anomalies currently across the Arctic and mixed geopotential height anomalies across the mid-latitudes of the NH (**Figure 2**). With predicted positive geopotential height anomalies across Greenland (**Figure 2**), the NAO is predicted to be negative this week.



**Figure 1.** The predicted daily-mean AO at a) 10 hPa and b) 1000 hPa from the 00Z 02 Feb 2026 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.

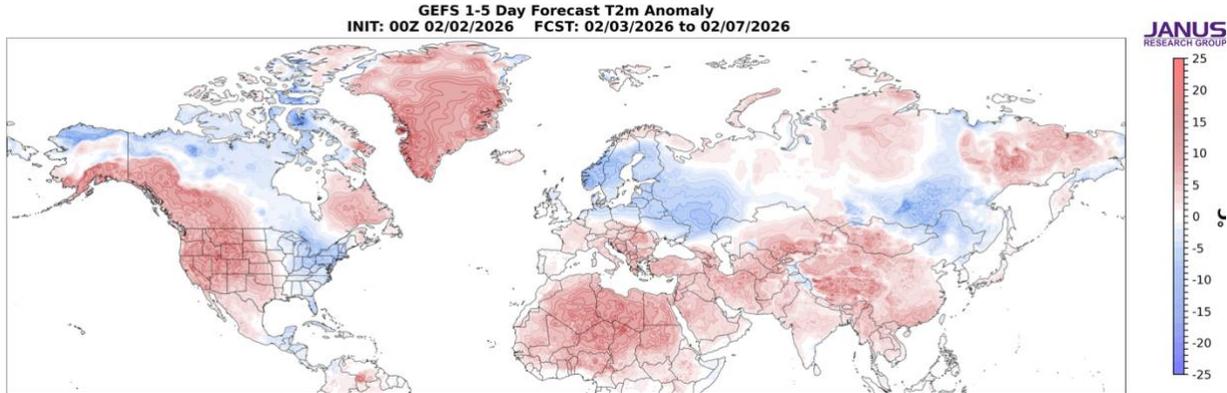
Ridging/positive geopotential height anomalies centered on Greenland will support widespread troughing/negative geopotential height anomalies across Europe (**Figure 2**). This pattern will support normal to below normal temperatures across Northern and Eastern Europe, however a more maritime flow will support normal to above temperatures across Western and Southern Europe while the UK will be close to normal this week (**Figure 3**). This week the general pattern across Asia is ridging/positive geopotential height anomalies across Greenland and Eastern Siberia supporting troughing/negative geopotential height anomalies across most of Northern Asia with more ridging across Central Asia this week (**Figure 2**). This pattern favors normal to below normal temperatures across much of Russia and Northeastern Asia with normal to above normal temperatures across Southern Asia and Eastern Siberia this week (**Figure 3**).

**GEFS 1-5 Day Forecast 500 hPa Anomaly**  
INIT: 00Z 02/02/2026 FCST: 02/03/2026 to 02/07/2026



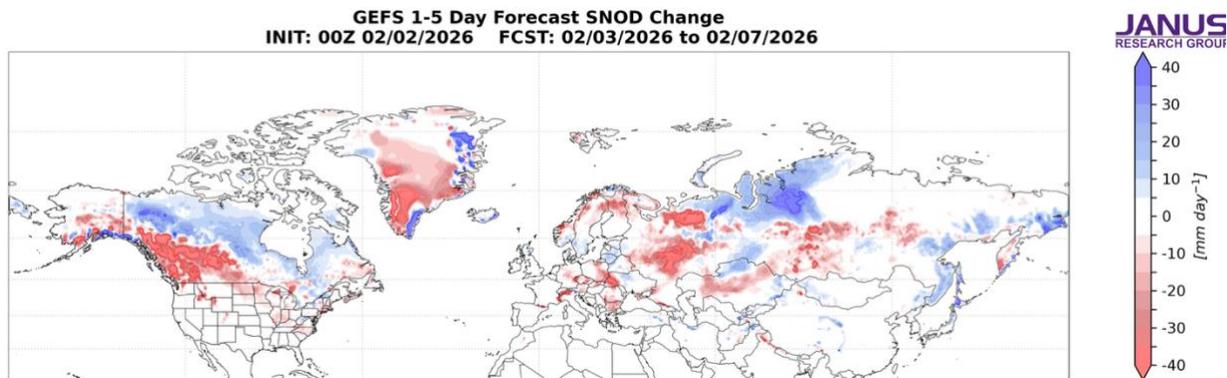
**Figure 2.** Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere from 03 Feb 2026 to 07 Feb 2026. The forecasts are from the 00Z 02 Feb 2026 GFS ensemble.

This week ridging/positive geopotential height anomalies in the Western US, Western Canada and Alaska will support troughing/negative geopotential height anomalies across Eastern Canada and the Eastern US this week (**Figure 2**). This pattern will favor normal to above normal temperatures across Alaska, Western and far Eastern Canada and the Western US with normal to below normal temperatures across Central and Southeastern Canada and the Eastern US this week (**Figure 3**).



**Figure 3.** Forecasted surface temperature anomalies ( $^{\circ}\text{C}$ ; shading) from 03 Feb 2026 to 07 Feb 2026. The forecasts are from the 00Z 02 Feb 2026 GFS ensemble.

Trouging and/or cold temperatures will support new snowfall across the Baltic States, Siberia and Northeast Asia and Japan while milder temperatures will support snowmelt across Central and Southeastern Europe, Western Russia and parts of southern Siberia this week (**Figure 4**). Trouging and/or cold temperatures will support new snowfall across Northern and Eastern Canada, and the higher elevations of West Coast Canada while milder temperatures will support snowmelt across parts of Alaska, Western Canada, the Southern Plains, the Southeastern US and the higher elevations of the Northwestern US this week (**Figure 4**).

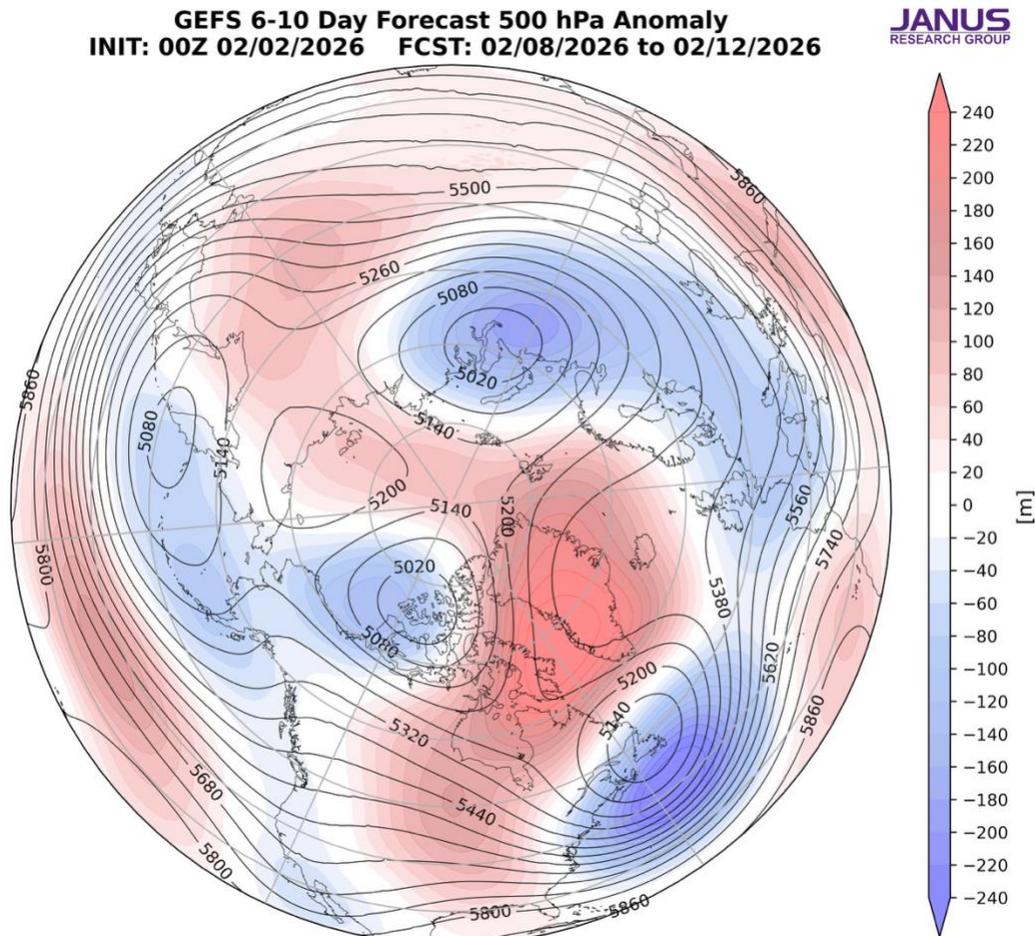


**Figure 4.** Forecasted snowfall ( $\text{mm}/\text{day}$ ; shading) from 03 Feb 2026 to 07 Feb 2026. The forecasts are from the 00Z 02 Feb 2026 GFS ensemble.

## Near-Mid Term

### Next week

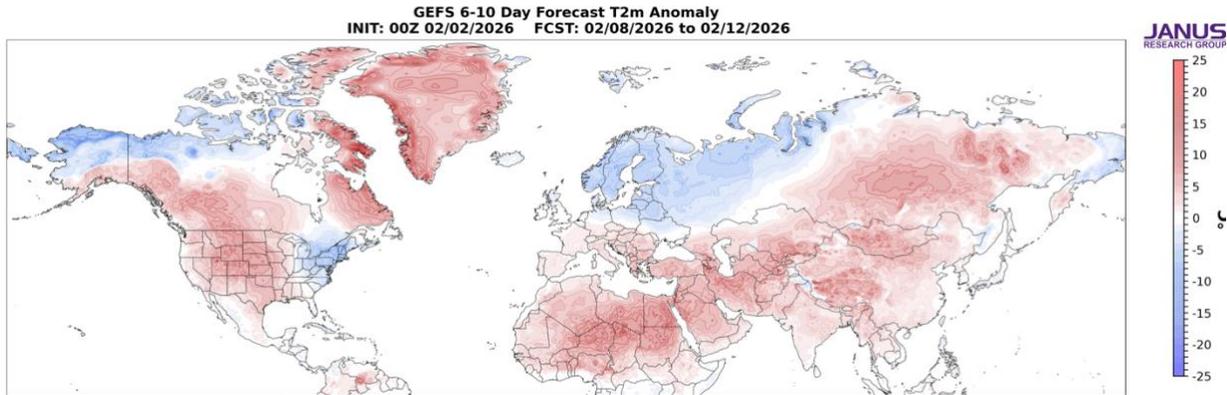
With geopotential height anomalies remaining mostly positive across the Arctic and with mixed geopotential height anomalies across the mid-latitudes this period (**Figure 5**), the AO will likely remain negative this period (**Figure 1**). With positive pressure/geopotential height anomalies across Greenland (**Figure 5**), the NAO will likely be negative this period.



**Figure 5.** Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere from 08 Feb to 12 Feb 2026. The forecasts are from the 00Z 02 Feb 2026 GFS ensemble.

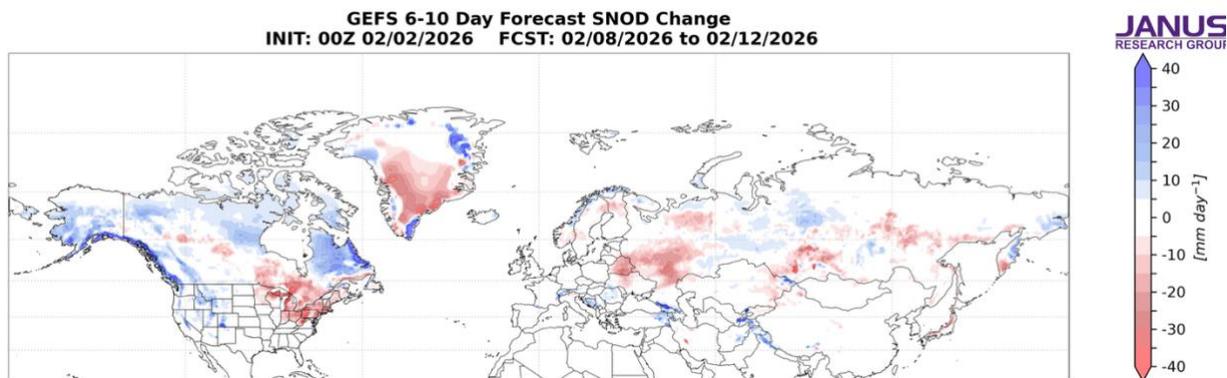
Persistent ridging/positive geopotential height anomalies across Greenland will support troughing/negative geopotential height anomalies across much of Europe this period (**Figure 5**). The pattern will support normal to below normal temperatures across Northern and Eastern Europe including the UK, however a mostly westerly flow will support normal to above normal temperatures across Western and Southern Europe this period (**Figure 6**). Across Asia ridging/positive geopotential height anomalies centered across Greenland and

The East Siberia Sea will support troughing/negative geopotential height anomalies across Northern Asia with more ridging/positive geopotential height anomalies across Central Asia (**Figure 5**). This pattern favors widespread normal to above normal temperatures widespread across much of Asia with normal to below normal temperatures limited to Western Russia and parts of Northeastern Asia this period (**Figure 6**).



**Figure 6.** Forecasted surface temperature anomalies ( $^{\circ}\text{C}$ ; shading) from 08 Feb to 12 Feb 2026. The forecasts are from the 00Z 02 Feb 2026 GFS ensemble.

This will be a week of transition as ridging/positive geopotential height anomalies will start sliding east into the interior of North America with troughing/negative geopotential height anomalies coming on shore in western North America this period (**Figure 5**). This pattern will favor normal to above normal temperatures across southern Alaska, much of Canada and much of the US with normal to below normal temperatures mostly limited to the northern Alaska, northwestern Canada and the Northeastern US (**Figure 6**).



**Figure 7.** Forecasted snowfall rate (mm/day; shading) from 08 Feb to 12 Feb 2026. The forecasts are from the 00Z 02 Feb 2026 GFS ensemble.

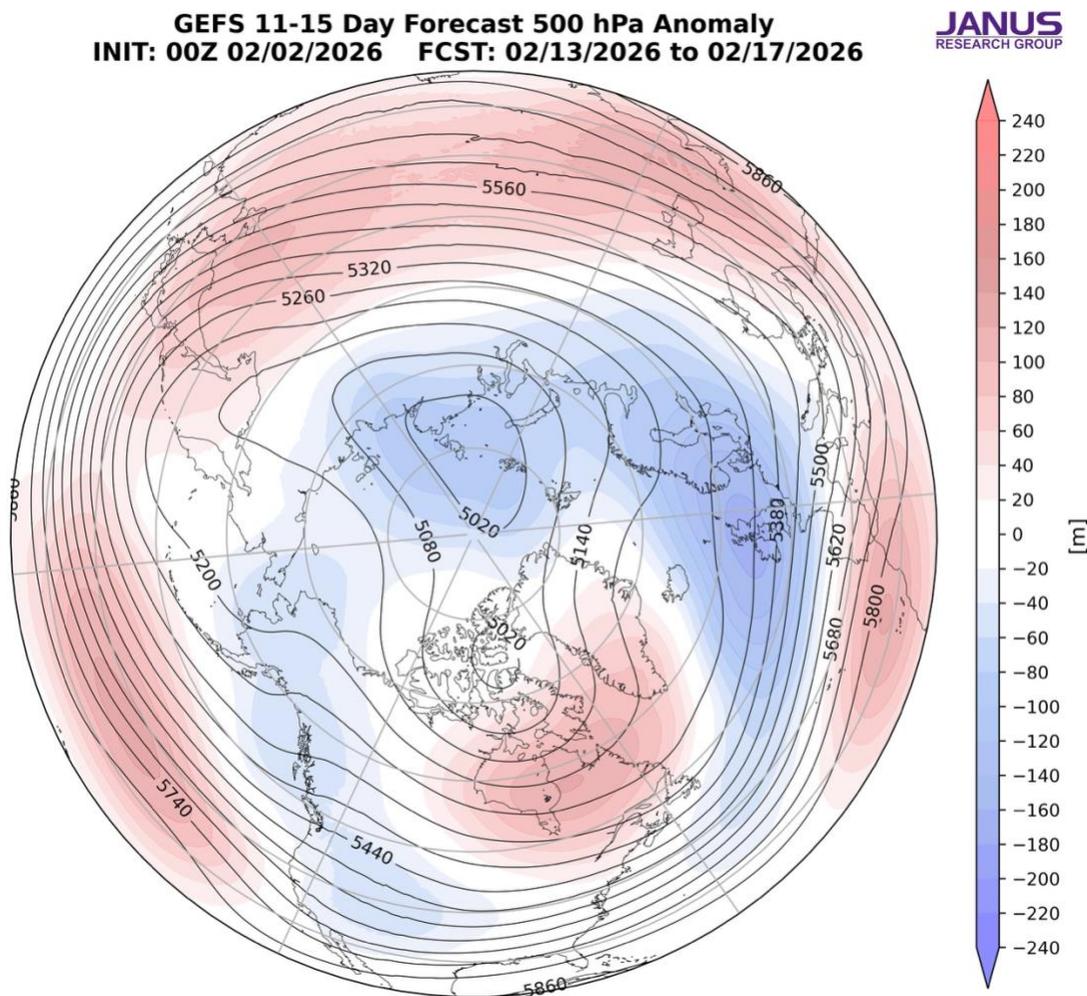
Troughing and/or cold temperatures will support new snowfall in the Alps, Turkey, parts of Siberia and Central Asia while milder temperatures will support snowmelt in Eastern Europe, parts of Western Russia and Southern Siberia this period (**Figure 7**). Troughing and/or cold temperatures will support new snowfall in Alaska, Western and Northern Canada and the higher

elevations of the Western US while milder temperatures will support snowmelt in Southeastern Canada and the Northeastern US this period (**Figure 7**).

## Mid Term

### Week Two

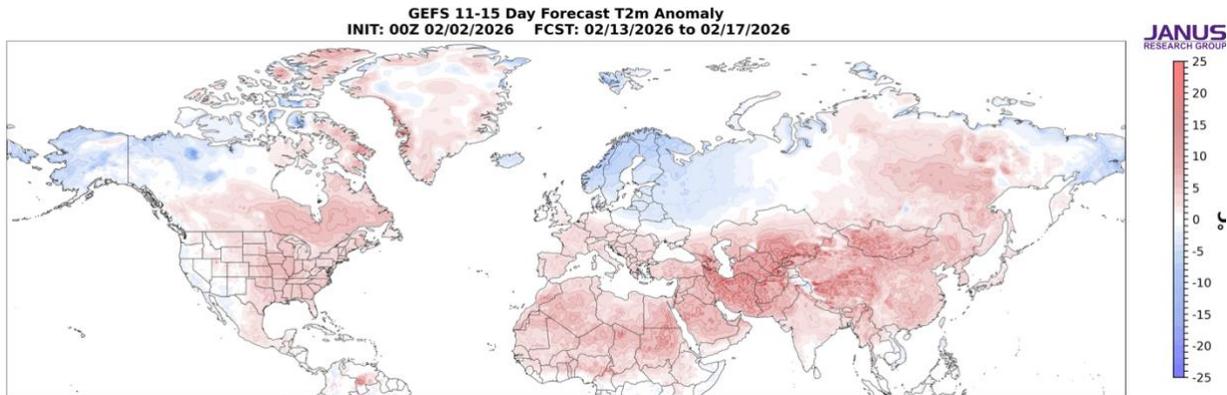
With predicted mostly mixed geopotential height anomalies across the Arctic and mixed geopotential height anomalies across the mid-latitudes this period (**Figure 8**), the AO will likely be close to neutral this period (**Figure 1**). With predicted positive pressure/geopotential height anomalies across Greenland (**Figure 8**), the NAO will likely remain negative this period.



**Figure 8.** Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere from 13 Feb to 17 Feb 2026. The forecasts are from the 00Z 02 Feb 2026 GFS ensemble.

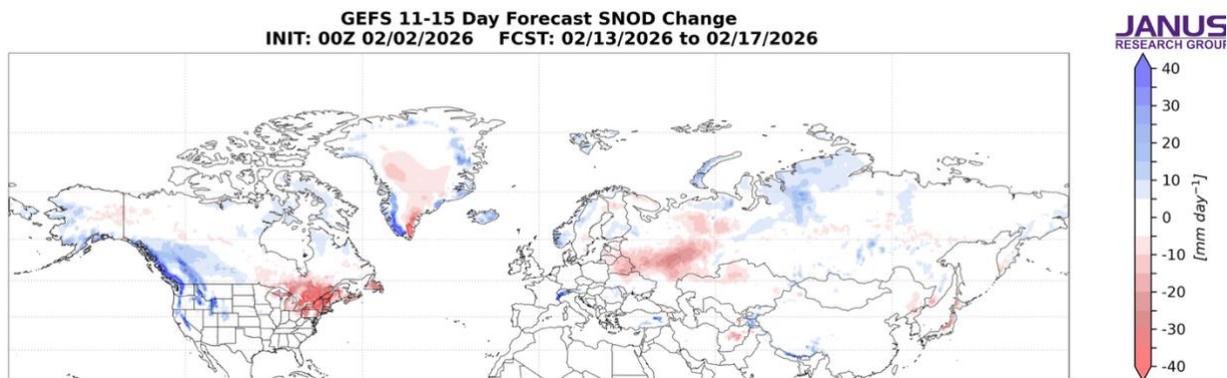
Persistent ridging/positive geopotential height anomalies across Greenland will continue to support troughing/negative geopotential height anomalies across much of Europe this period

(**Figure 8**). This pattern should favor normal to below normal temperatures across Northern and Eastern Europe while a milder westerly flow will support normal to above normal temperatures across Western and Southern Europe including the UK this period (**Figures 9**). Yet again this period ridging/positive geopotential height anomalies centered across Greenland will support troughing/negative geopotential height anomalies across Northern Asia with more ridging across Southern Asia (**Figure 8**). This pattern favors normal to below normal temperatures across Northern Asia with normal to above normal temperatures across Central and Southern Asia including the Middle East and the Tibetan Plateau this period (**Figure 9**).



**Figure 9.** Forecasted surface temperature anomalies ( $^{\circ}\text{C}$ ; shading) from 13 Feb to 17 Feb 2026. The forecasts are from the 00Z 02 Feb 2026 GFS ensemble.

Ridging/positive geopotential height anomalies is predicted to consolidate across Northeast Canada while troughing/negative geopotential height anomalies becomes more established in western North America this period (**Figure 8**). This pattern supports normal to below normal temperatures across Alaska, Western Canada and the Western US with normal to above normal temperatures across Central and Eastern Canada and the Eastern US this period (**Figure 9**).



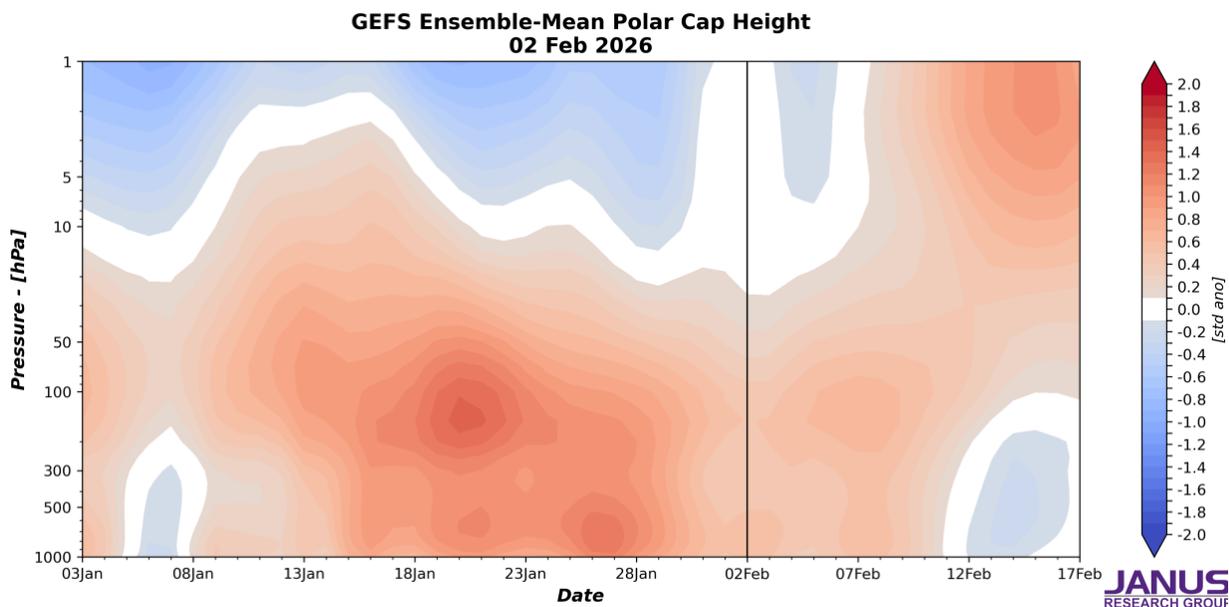
**Figure 10.** Forecasted snowfall (mm/day; shading) from 13 Feb to 17 Feb 2026. The forecasts are from the 00Z 02 Feb 2026 GFS ensemble.

Trounging and/or cold temperatures will support some possible new snowfall in parts of Scandinavia, the Alps, parts of Siberia and Central Asia while milder temperatures will support snowmelt in parts of the Baltic States, Western Russia and Southern Siberia this period (**Figure 10**). Trounging and/or cold temperatures will support new snowfall in western Alaska, Western Canada and the higher elevations of the Western US while milder temperatures will support snowmelt in Southeastern Canada and the Northeastern US this period (**Figure 10**).

## Longer Term

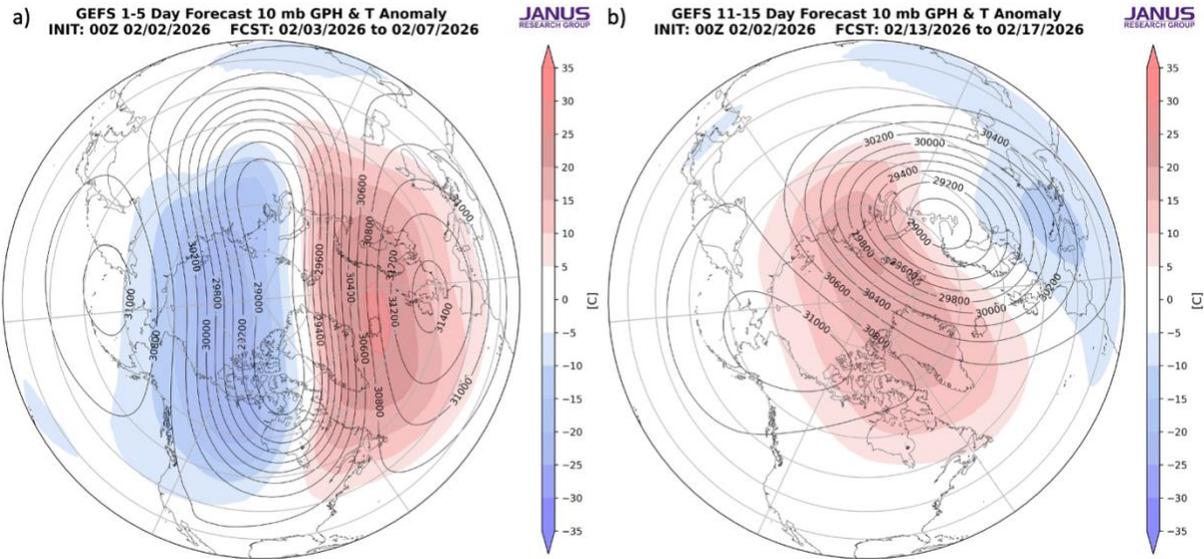
### 30-day

Today's polar cap geopotential height anomalies (PCHs) plot shows warm/positive PCHs in the mid to lower stratosphere and throughout the troposphere with cold/negative PCHs in the upper stratosphere (**Figure 11**). Then next week cold/negative PCHs in the upper stratosphere are predicted to eventually flip warm/positive while PCHs in the troposphere are predicted to do the opposite and flip cold/negative.



**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 02 Feb 2026 GFS ensemble.

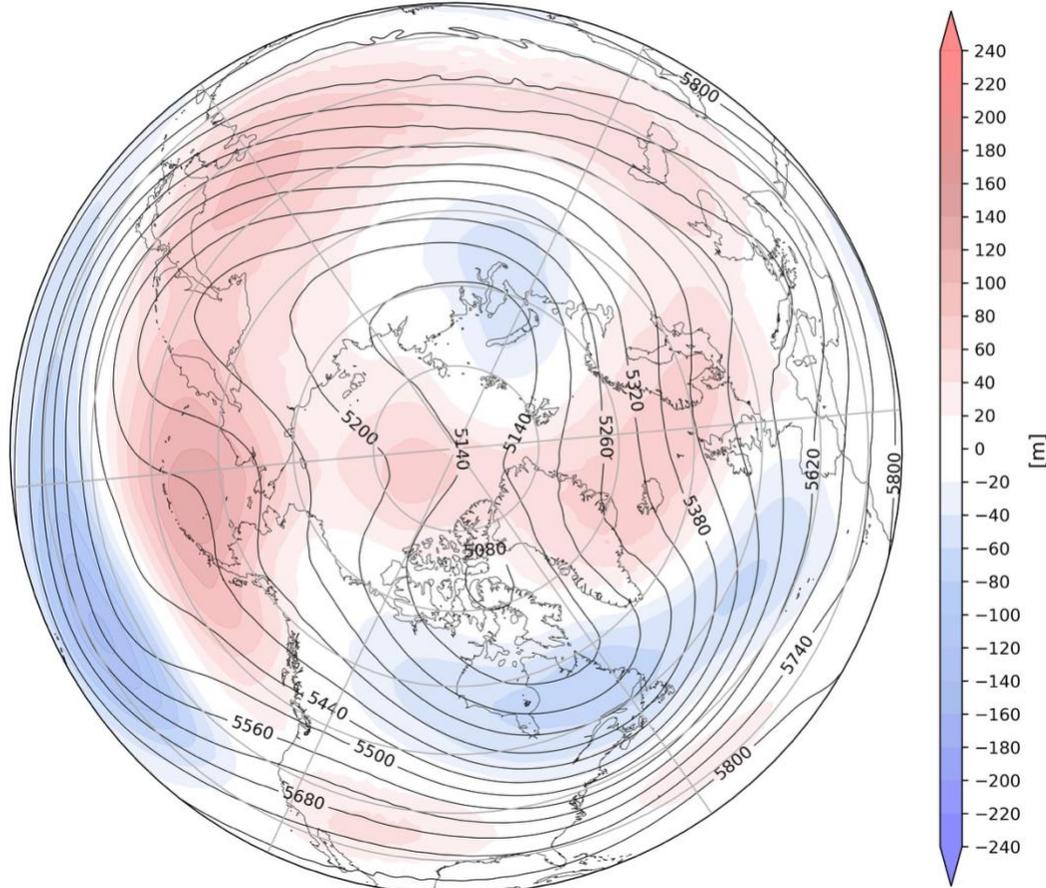
The predicted warm/positive PCHs in the lower troposphere this week (**Figure 11**) are consistent with the predicted negative AO this week (**Figure 1**). Then next week the forecast of cold/negative PCHs in the lower troposphere mid-February (**Figure 11**) are consistent with a neutral and possibly positive AO (**Figure 1**) second week of February.



**Figure 12.** (a) Predicted 10 mb geopotential heights (dam; contours) and temperature anomalies ( $^{\circ}\text{C}$ ; shading) across the Northern Hemisphere averaged for 3 Feb to 7 Feb 2026. (b) Same as (a) except forecasted averaged from 13 Feb to 17 Feb 2026. The forecasts are from the 00Z 2 February 2026 GFS model ensemble.

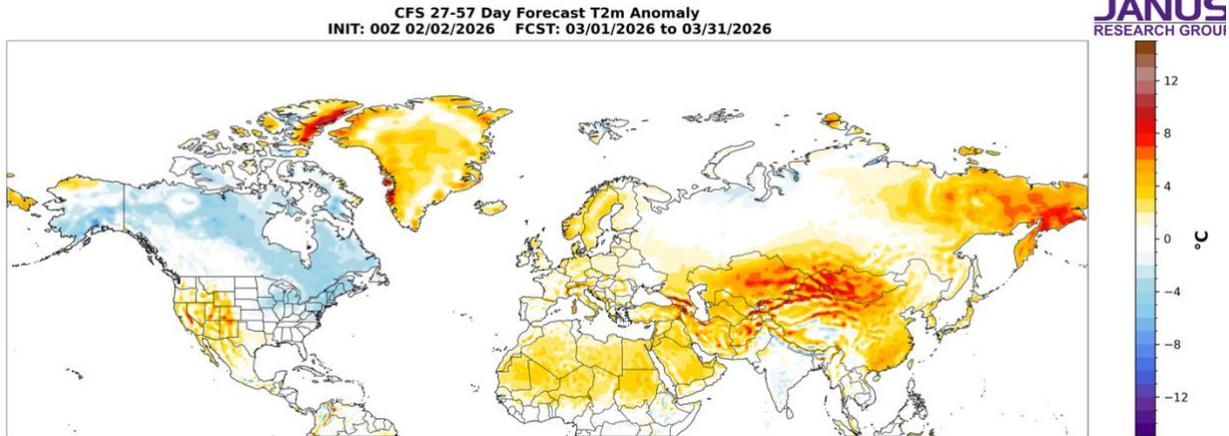
This week the polar vortex (PV) is predicted to be elongated in shape from the Urals to central North America with two PV centers with one center over the Urals and the other center over Canadian archipelagos with relatively cold temperatures focused from the stretching from Siberia to western North America and with high pressure centered near the Dateline and relatively warm temperatures across the North Atlantic sector in the polar stratosphere (**Figure 12a**). This is not a split PV but rather the elongated shape in appearance, signals yet another stretched PV that favors relatively cold in Asia and North America east of the Rockies. Then during mid-February the two PV centers are predicted to consolidate into one center over the Barents-Kara Seas with high pressure centered over Alaska and into Northern Canada with cold temperatures over Europe with relatively warm temperatures stretching from Siberia to Eastern Canada in the polar stratosphere (**Figure 12b**). This resembles a bigger PV disruption that best resembles to me a Canadian Warming. The stratospheric AO in **Figure 1** this week is predicted to remain close to neutral but then turn negative next week.

**CFS 500 hPa Forecast Anomaly Mar 2026**  
**Valid as of 02 Feb 2026**



**Figure 13.** Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere for Mar 2026. The forecasts are from the 00Z 02 Feb 2025 CFS.

I include in this week's blog the monthly 500 hPa geopotential heights (**Figure 13**) and surface temperatures for February (**Figure 14**) from the Climate Forecast System (CFS; the plots represent yesterday's four ensemble members). I do want to emphasize unless I say otherwise, I find the CFS forecasts of low confidence and most often don't match my own thinking. The forecast for the troposphere is ridging across Greenland and Iceland, East Asia, the Dateline and the Western US with troughing across Northern Asia, Eastern Canada and the Eastern US (**Figure 13**). This pattern favors seasonable to relatively warm temperatures across Europe, Western, Southern and Central Asia, including the Middle East, eastern China the Tibetan Plateau, Pakistan and Afghanistan, Eastern Siberia and the Western US with seasonable to relatively cool temperatures across Northern Asia, southern Alaska, much of Canada and the Eastern US (**Figure 14**).

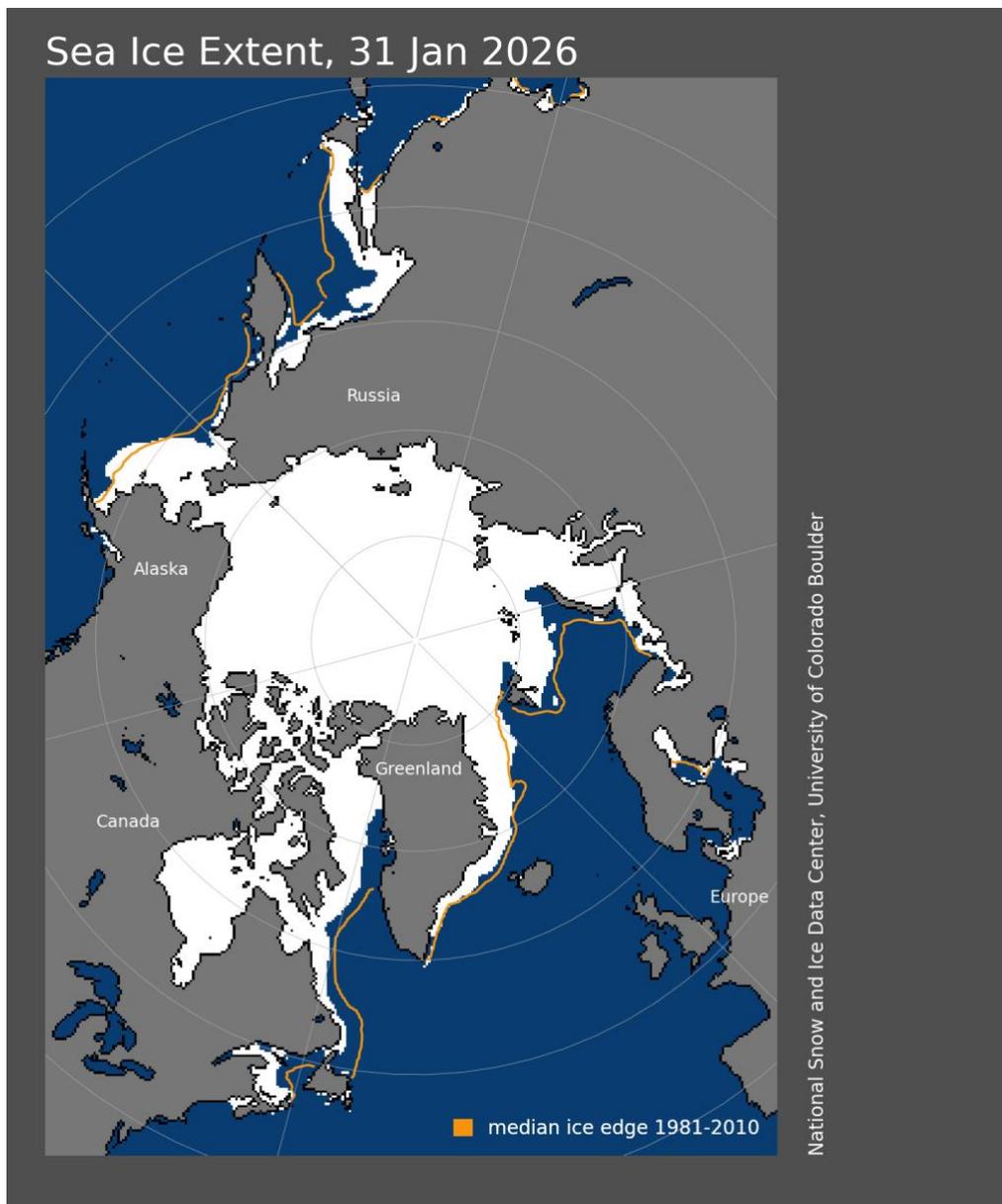


**Figure 14.** Forecasted average surface temperature anomalies (°C; shading) across the Northern Hemisphere for Mar 2026. The forecasts are from the CFS 00Z 02 Feb 2025.

## Boundary Forcings

### Arctic Sea Ice

I am and will continue to watch Arctic sea ice. Current conditions are shown in **Figure 15**. It has been shown that less sea ice in the North Atlantic sector of the Arctic weakens the polar vortex while less sea ice in the North Pacific sector strengthens the polar vortex. Arctic sea ice anomalies continue to show a strong focus or weighting of negative anomalies towards the North Atlantic sector relative to the North Pacific sector and this is a robust signal of an overall weaker PV this winter. The negative anomalies are distributed between the Eurasian sector, i.e., Barents Kara Seas and the North American sector, now mostly in Baffin Bay (see **Figure 15**). Therefore, I do think that low sea ice in the Barents-Kara Seas has supported Barents-Kara Seas blocking this past January but low sea ice near Greenland could be supporting blocking in the region as well. Negative sea ice anomalies have also appeared in the Bering Sea and the Sea of Okhotsk and could be a result of but also supporting blocking in the region.

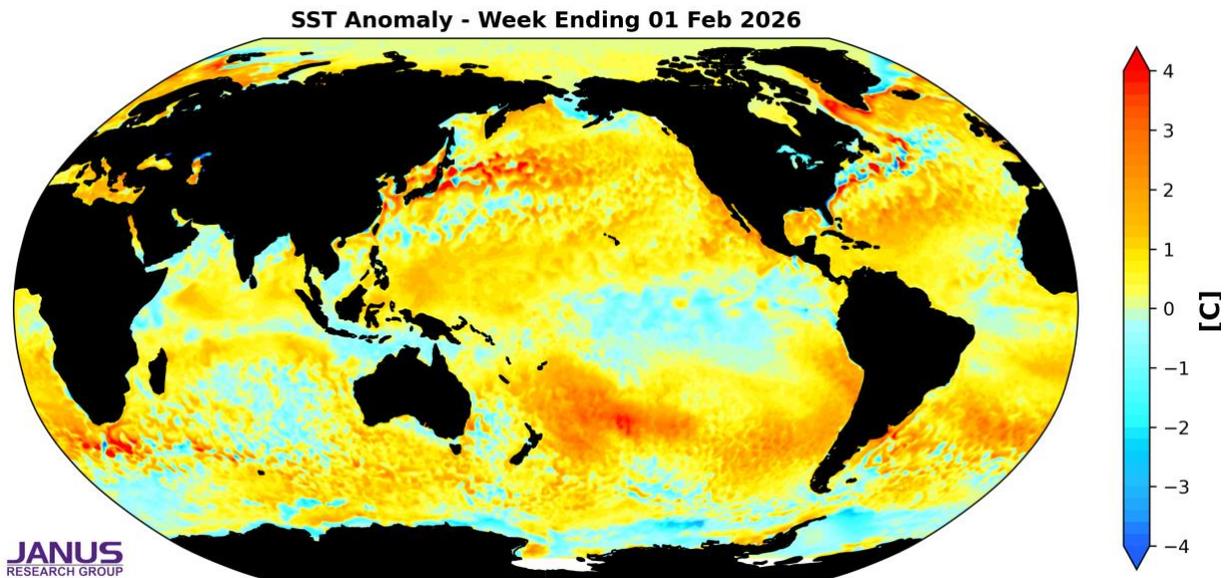


**Figure 15.** Arctic sea ice cover extent for 31 Jan 2026. White depicts ice covered areas and the orange contour the climatological extent of Arctic sea ice for the date. Plot taken from: <https://nsidc.org/sea-ice-today>

### SSTs/El Niño/Southern Oscillation

Equatorial Pacific sea surface temperatures (SSTs) anomalies are below normal, along the equatorial Pacific (**Figure 15**) consistent with La Niña conditions for much of the winter but current forecasts show some uncertainty but for now mostly favor weak La Niña conditions this winter. Observed SSTs across the NH remain well above normal especially in the North Pacific and much of the North Atlantic, though below normal SSTs exist regionally especially

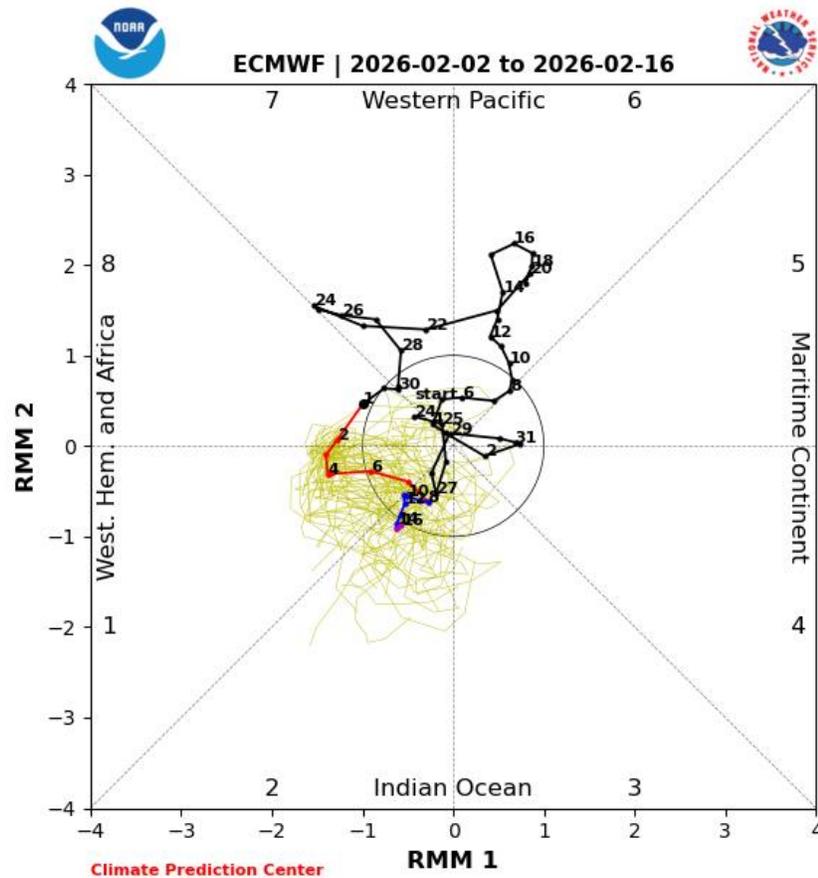
in the South Pacific. The very warm SSTs in both ocean basins could be supporting the predicted mid-ocean ridging in both basins.



**Figure 16.** The latest daily-mean global SST anomalies for week ending 01 Feb 2026.

### **Madden Julian Oscillation**

Currently the Madden Julian Oscillation (MJO) is currently in phase eight (**Figure 17**) and the forecasts are for the MJO to quickly move to phase one and then quickly weaken to where no phase is favored (**Figure 17**). Phases eight and one favor ridging in Canada and/or Greenland with troughing in the Eastern US. Therefore, it seems that the MJO could be having some influence on North American weather this week but less obvious moving into next week. But admittedly this is outside of my expertise.



**Figure 17.** Past and forecast values of the MJO index. Forecast values from the 00Z 02 Feb 2026 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 <https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/CLIVAR/ecmf.shtml>

### 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. [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!