JANUS RESEARCH GROUP

Arctic Oscillation and Polar Vortex Analysis and Forecasts

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

Summary

- The Arctic Oscillation (AO) is currently negative as pressure/geopotential height anomalies across the Arctic are currently mostly positive and the AO is predicted to remain negative to neutral the next two weeks as pressure/geopotential height anomalies are predicted to remain mixed to positive the next two weeks. The North Atlantic Oscillation (NAO) is currently positive with mostly negative pressure/geopotential height anomalies across Greenland, and the NAO is predicted to trend negative the next two weeks as pressure/geopotential height anomalies are predicted to become mixed to mostly positive across Greenland the next two weeks.
- This week ridging/positive geopotential height anomalies are predicted to stretch from Scandinavia to Greenland favoring troughing/negative geopotential height anomalies across Central and Southern Europe. However next week as the ridging weakens across the northern North Atlantic so will the troughing across Europe. This pattern will favor normal to below normal temperatures widespread across Central and Southern Europe including the United Kingdom (UK) except for normal to above normal temperatures across Scandinavia and Northeastern Europe this week. However next week normal to above normal temperatures will become much more widespread across much of Europe including the UK.
- This week predicted ridging/positive geopotential height anomalies across the Laptev Seas and Western Asia will favor troughing/negative geopotential height anomalies across Siberia

and East Asia. However next week as the disrupted polar vortex center consolidates over the Urals and the Barents-Kara Seas this will support deepening troughing in that region with strengthening ridging downstream across East Asia. This pattern favors this week widespread normal to above normal temperatures across Western and Southern Asia with normal to below normal temperatures across Siberia and into Northeast Asia. Then next week normal to above normal temperatures will become much more widespread across much of Asia with the exception of normal to below normal temperatures across Eastern Siberia.

- Over the next two weeks predicted deep troughing/negative geopotential height anomalies in the Gulf of Alaska will support ridging/positive geopotential height anomalies widespread across North America with the exception of troughing/negative geopotential height anomalies along the West Coast of the United States (US) this week and the Eastern US next week. This patten will support widespread normal to above normal temperatures across much of Alaska, Canada and the US with the exceptions of normal to below normal temperatures limited to the Western US this week and then possibly the Eastern US next week. Here too the transitory troughing in the Eastern US may be a reflection of the PV disruption, though the main response is the deeper and longer duration troughing in the North Atlantic.
- We have an unprecedently early large polar vortex (PV) disruption predicted for mid-November, a clear delay from last week. Below I discuss how it can impact Northern Hemisphere (NH) weather in the coming weeks and maybe even months. Also shown is the final daily snow cover extent plot for October.

Plain Language Summary

The widespread warmth across the Northern Hemisphere (NH) this past summer and now the fall has continued into October (see **Figure**). However, a series of stretched polar vortex (PV) last month has led to some, albeit modest cooling in Siberia, East Asia and to an even lesser extent far Eastern Canada and New England (see **Figure**). Troughing in Western Canada has also resulted in more seasonable temperatures in Western Canada (see **Figure**). However, the very large PV disruption developing the next two weeks does favor an overall mild pattern across the NH continents (see **Figures 3, 6** and **9**). The relatively cool temperatures across Siberia of October 2026 remind me of last October, though not as impressive. Last October, cold temperatures across Siberia were a precursor for more widespread cold temperatures in winter, I expect something similar for this winter but maybe of smaller magnitude.

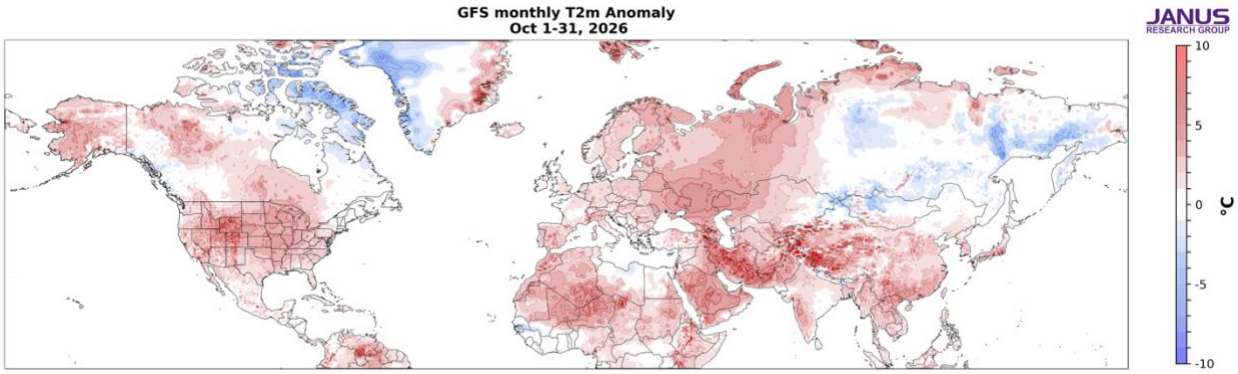


Figure. Estimate of the observed surface temperatures (°C; shading) from 01 Oct to 31 Oct 2026 based on GFS initializations and the GFS forecast from the 1 Nov 2026 run.

Impacts

Let me start off this week's blog with something that might sound like a downer and that is I don't know all that much more what might transpire in December than I did last week. I have always felt the first important trait of a long-range forecaster is humility and what I was trying to get across most emphatically is that I don't feel confident in what will transpire with the atmosphere through the end of the year and I don't believe any of the models do or other human meteorologists. Of course, I can only speak for myself and is not meant to judge any peer. We all have our strengths and weaknesses; everyone is trying their best to be as accurate as possible and that should be respected. But I think with this large polar vortex disruption or sudden stratospheric warming (SSW) it will be a marathon and not a sprint (in contrast to last November's SSW, which in the end was a sprint).

It seems what might have gotten the most attention from last week's blog is that November 2009 is the best analog for November 2026, but less attention was paid to how I started the blog and ended the blog. I started by acknowledging that a super El Niño favors a mild winter across North America and especially eastern North America. I don't know what the true probability is, I think that it is higher than 60 or even 70 and probably 80% but I don't think that it is 100% or very close to 100%. And I should make the distinction that I feel that the probability of a milder winter across all of Eurasia is lower than it is for North America. A great example is the most recent El Niño of 2023/24, which also interestingly featured two SSWs.

I am not an El Niño expert but from my experience in seasonal forecasting, El Niño drives the subtropical jet, and the polar vortex drives the polar jet but that doesn't exclude El Niño from also influencing the polar jet. The subtropical jet regulates precipitation, and the polar jet regulates the amount of Arctic air. And when the two converge, you can have cold and snowy winters in the Eastern US like 2002/03 or even more locally in 1987/88 and 2004/05 and even episodically during super El Niños of 1982/83 and 2015/16.

In the recent observational record we have only three super El Niños, 1982/83, 1997/98 and 2015/16. Both 1982/83 and 2015/16 featured a strong polar vortex November through February

with really no exception. There was a polar vortex (PV) disruption in January 1998 but didn't qualify as a major SSW (defined as the reversal of westerly to easterly winds at 10hP and 60°N). And the polar vortex was relatively strong in November 1997. This is an example I believe where if you just focus on the super El Niños, which have a small sample size, can lead you down the wrong path. It would be easy to conclude from just the three super El Niños, they favor a strong polar vortex and hence this winter would feature a strong polar vortex (PV). Yet so far that is not looking like a good forecast as shared by CPC. Though admittedly the PV could quickly recover and stay strong all winter long.

There are just not that many November SSWs in the recent record with the closest in the satellite era being November 2009 (and I am ignoring November 2025, which technically was an SSW but its impact on the tropospheric circulation in space and time was consistent with a PV stretch). Winter 2009/10 was not a super El Niño but in the past thirty years, it was the strongest behind the super El Niños of 1997/98 and 2015/16. The sample size of both strong El Niños and SSWs in November is really small. So, it seems to me the best analog for November 2026 is November 2009. Since I focus most strongly on the PV a general statement that I make should be considered within a Northern Hemisphere framework and not just on North America. As someone who weighs the behavior of the PV so heavily is there really another year than 2009 to consider? It is possible that people came away with the impression I am expecting a full repeat of winter 2010 but I was only referring to December 2009. There was a second SSW in February 2010 that was critical to tilting that winter cold in the Eastern US. It is my experience that a very early SSW does increase the odds of a second SSW later in the winter, but I have no idea if we will observe another SSW this winter. And this brings me back to the end of the Impacts section last week.

I went on to say that the whole snow-SSW-AO or even just the SSW-AO pathway is broken and hasn't really worked as expected since the winter of 2009/10. So I have very low confidence we will see a tropospheric response like we saw in December 2009 (and February 2010 as well). The whole point of the blog last week was to open up readers' minds to what is possible this winter and I think that the SSW lowers our confidence in the forecasts through the end of 2026 and really nothing more. I am certainly not trying to scream from the rooftops to expect a repeat of December 2009, especially in the Eastern US.

But if (and a big if) we get a classical stratosphere-troposphere coupling response to an SSW in December (or even January). I don't understand why high pressure ridging rather than being centered in Eastern Canada as predicted, is centered in Western Canada instead. We have examples of this during two of the three super El Niños in December 1997 and January 2016 (see **Figure i**). And If we do get a negative AO as often occurs following an SSW, January 2016 seems like a plausible model of what the mid-tropospheric circulation in December 2026 (or even January 2027) might resemble, especially across the North American sector. Now I would never want my support for what good happen in a month be solely dependent on the CFS, but the CFS forecast also shows a similar tropospheric pattern as January 2016.

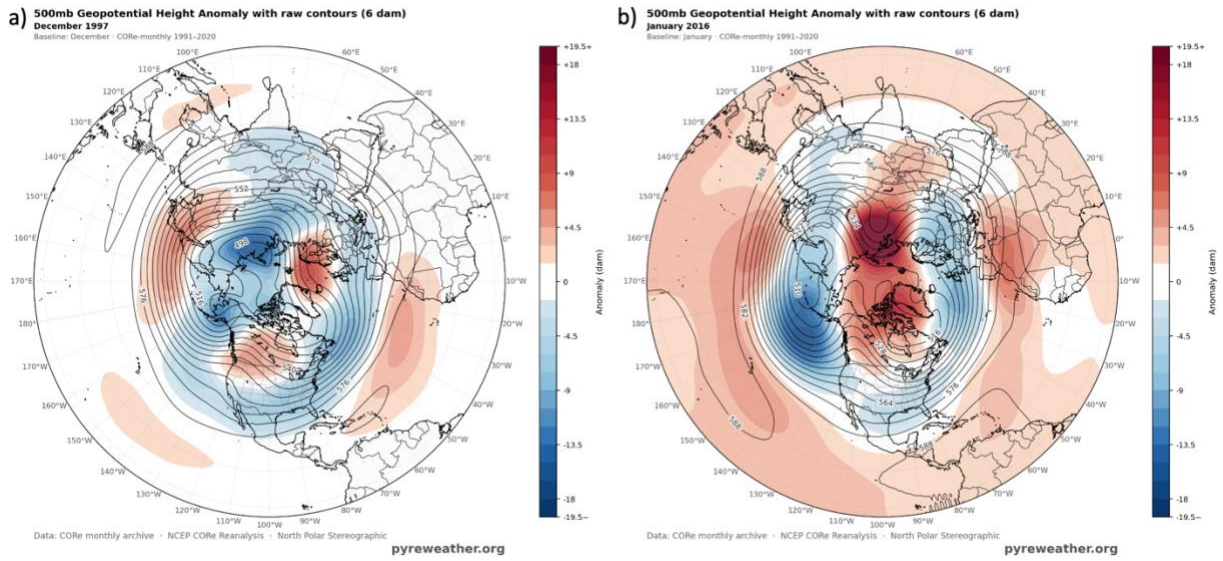


Figure i. Observed average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere for **a)** December 2009 and **b)** January 2016. The plot created at https://app.pyreweather.org.

Interestingly the CFS is predicting a fairly canonical response to the SSW with Greenland blocking and a negative AO/NAO temperature pattern across the NH with the deepest and most widespread cooling across northern Eurasia but does include the Eastern US (see **Figures 14** and **15**). As I wrote in the previous paragraph, I never want the CFS as my strongest support or argument (I guess I can't emphasize it enough) but I think it does illustrate what is possible.

I also wanted to offer my own two cents or thinking about some ideas thrown around on social media and even just the media – 1) the PV disruption is of short duration and that should limit its impact on our weather and 2) it may not couple to the surface at all.

First, about the PV disruption will be short. Many of you may have already noticed the central date (the first day easterly winds are measured at 10hP and 60°N) is getting pushed off and is now predicted to come in parts. As a side note, when events get delayed in the atmosphere, there inevitably needs to be questioned, so maybe a major SSW isn't a lock as first thought. But regardless this doesn't look to me to be a relatively short disruption. And regardless, I believe that the quicker the PV recovers the quicker the main impacts will reach the surface.

Second, I have often written in the blog when SSWs are likely there is an immediate impact and a delayed impact. I believe that we are already seeing the immediate impact in the two-week forecasts. During all of October a strong ridge of high-pressure across western Eurasia and a deep low-pressure trough in East Asia and then very quickly in November the pattern is predicted to flip (see **Figure ii**), this despite strong boundary forcings that should reinforce the western ridge/eastern trough pattern. What I believe is the reason behind this very rapid transition is the reflection of the main PV center consolidating over the Barents-Kara Seas and the Urals (see **Figure iii**). Also, not as deep we are seeing troughing develop across the mid-latitudes of the

North Atlantic and even for a short period into eastern North America (see better in **Figure 13b**). These regions of troughing seem to align with the PV center location and associated troughing in the stratosphere and is the immediate impact of the SSW. This is likely of relatively short duration and is only the appetizer with the main course still to follow. I do think there will be more influence from the SSW on the troposphere later on. It may not come in the form or pattern related to a negative AO, but the SSW is almost certainly going to increase the likelihood of severe winter weather in one or more regions across the NH. I really can't recall an SSW that didn't eventually. Sometimes the delay is so long it happens in spring and no one notices anymore. This will not be the case with a November SSW.

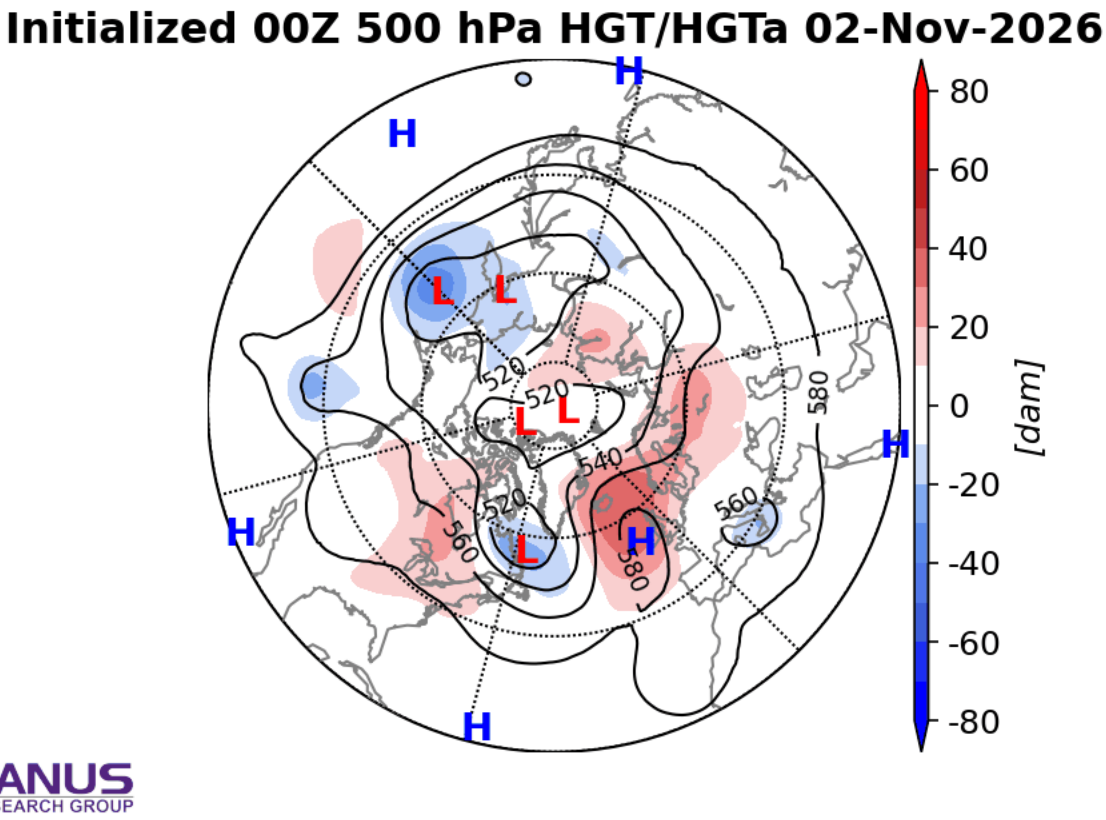


Figure ii. Initialized 500 mb geopotential heights (dam; contours) and decameter anomalies (dam; shading) across the Northern Hemisphere for 2 Nov 2026 and forecasted from 3 Nov to 17 Nov 2026. The forecasts are from the 00Z 2 Nov 2026 GFS model.

Looking at the latest PV animation in **Figure iii**, first up we have stretched PV this week. This stretched PV is the last phase of the PV before entering into the SSW and is associated with some impressively early cold in Siberia (possibly up to 30°C below normal) and eventually East Asia this week and possibly a whopper of a snowstorm in eastern Siberia/Kamchatka! Often the most extreme cold across East Asia is leading up to the SSW and not following the SSW, so will be interesting to see if this holds true with this event or not. This is consistent with a Ural Block triggering the SSW with a negative AO being the response to the SSW. The stretched PV does

manifest as two PV centers, but this is not a PV split. Both PV splits and stretched PVs are forced by wave-2 forcing from the troposphere, where the main wave energy in the troposphere is associated with two waves circling the NH. But as wave-1 energy takes over and dominates the tropospheric wave energy (where the main wave energy in the troposphere is associated with one large wave circling the NH) the PV transitions into a displaced PV type of SSW. The troposphere is noisy so there are many waves active at any given time, but the dominant waves are seen more clearly in the stratosphere.

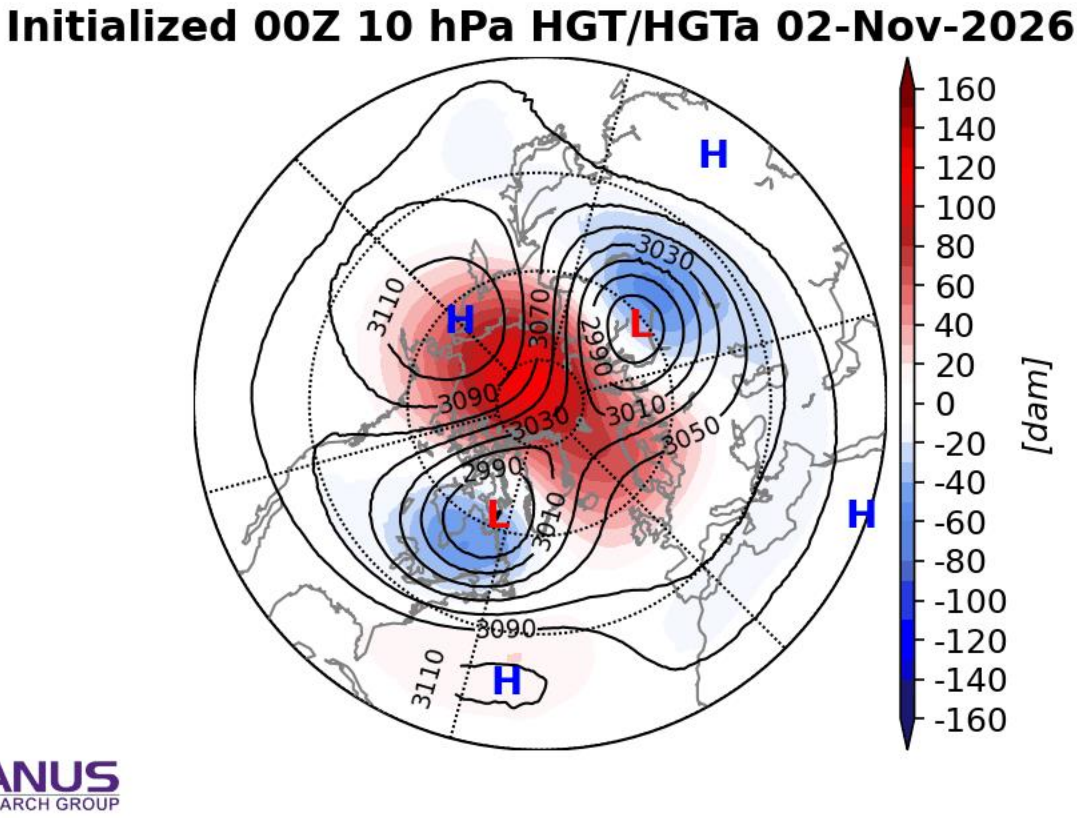


Figure iii. Initialized 10 mb geopotential heights (dam; contours) and decameter anomalies (dam; shading) across the Northern Hemisphere for 3 Nov to 17 Nov 2026. The forecasts are from the 00Z 2 Nov 2026 GFS model.

Since October ended over the weekend, I will end the Impacts section with the final plot of daily Siberian snow cover extent of the year in **Figure iv**. As has been the case of late the snow cover extent does a late month swoon that will keep the final numbers lower than what was expected. We should know soon the official monthly total. It looks to be close to either side of normal. But regardless of the monthly total, the pattern itself seemed close to optimal to disrupt the PV.

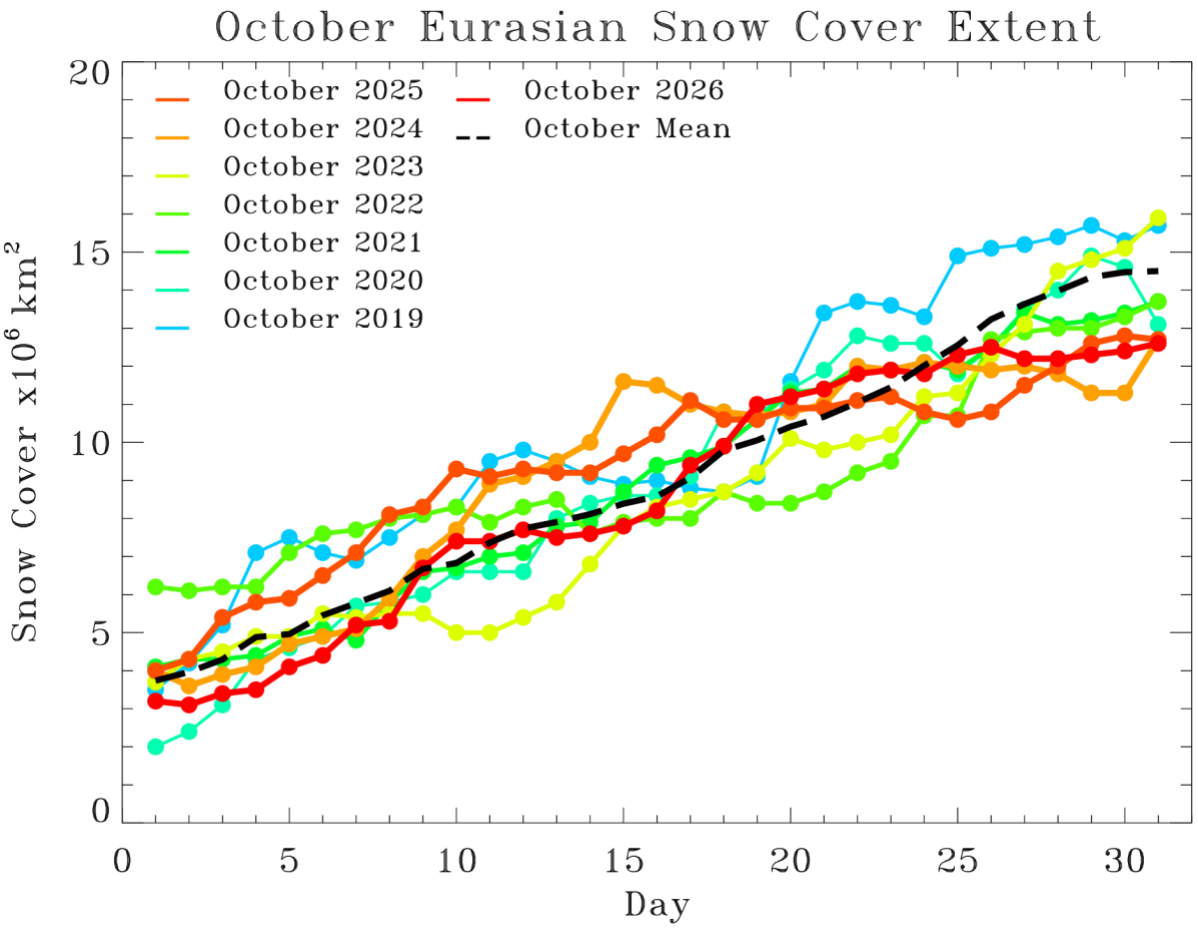


Figure iv. Daily Eurasian snow cover extent from 2019 through 2026. Octobre 2026 shown in red. The long-term mean shown as a black dashed line.

Again I have to thank my Janus colleagues John Galantowicz and Karl Pfeiffer, without whose assistance this plot would not be possible!

Finally I see on social media how the super El Niño is in full control of our weather and the Gulf of Alaska trough with widespread ridging across North America and a mild pattern especially east of the Rockies is locked in. But the upcoming pattern predicted for the next two weeks is completely consistent with the place in the cycle of troposphere-stratosphere-troposphere coupling that I outlined last week that favors an overall mild pattern across the NH. We would observe a very mild pattern in eastern North America during the commencement of the SSW up until the PV recovery regardless of the phase of ENSO. Also it seems to me that the predicted MJO phase also favors this exact pattern., So I do think it is difficult to attribute the pattern for the first half of November to just one phenomenon. So I am for one am a bit wary of claiming we are all aboard a runaway freight train called a super El Niño and the path forward is unstoppable.

Similarly I see claims that the SSTs in the equatorial Pacific are too warm and too far east to allow anything but a deep trough along the west coast of North America but I don't see why

wave energy convergence related to the SSW couldn't eventually pull the whole ridge trough pattern further west and it wouldn't take much to resemble December 1997, January 2016 or the CFS forecast for December. I am claiming this is the most likely outcome, but probabilities of this scenario should be considered trivial and therefore be ignored.

My dad was always fond of saying you get what you pay for so I will leave you with the real reason all of you pay top dollar for access to the blog. Now I am completely spit balling here and I have given this about 30 seconds of thought, but when I look at predicted tropospheric pattern, the surface temperatures and the eventual configuration of the PV, it looks totally consistent with a Canadian Warming. And I won't try to be as cute as I was in early October, a Canadian Warming strongly suggests a stretched PV is to follow. Something all of us can ponder over the coming week.

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 increasingly positive geopotential height anomalies across Greenland (**Figure 2**), the NAO is predicted to be trend negative this week.

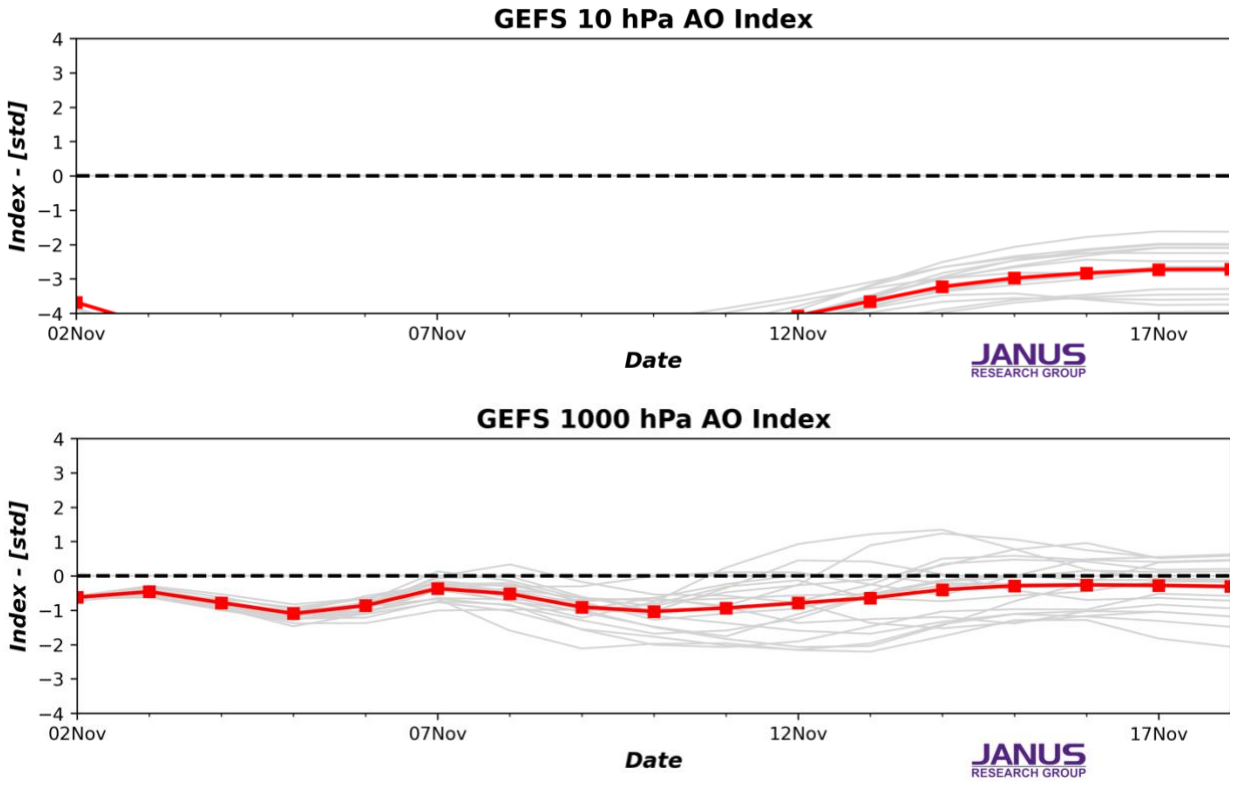


Figure 1. The predicted daily-mean AO at **a)** 10 hPa and at **b)** 1000 hPa from the 00Z 2 Nov 2026 GFS ensemble. Gray lines indicate the AO index from each individual

ensemble member, with the ensemble mean AO index given by the red line with squares.

Ridging/positive geopotential height anomalies stretching from Scandinavia to Greenland are predicted to support troughing/negative geopotential height anomalies across Central and Southern Europe this week (**Figure 2).** This pattern will support widespread normal to below normal temperatures across much of Europe including the UK except for normal to below normal temperatures across Scandinavia, the Balkans and Turkey this week (**Figure 3**). This week the general pattern across Asia is ridging/positive geopotential height anomalies centered across the Laptev Sea and the Urals forcing troughing/negative geopotential height anomalies across Siberia and into East Asia this week (**Figure 2**). This pattern favors widespread normal to above normal temperatures across Western and Southern Asia with normal to below normal temperatures across Siberia and into Northeast Asia this week **(Figure 3**).

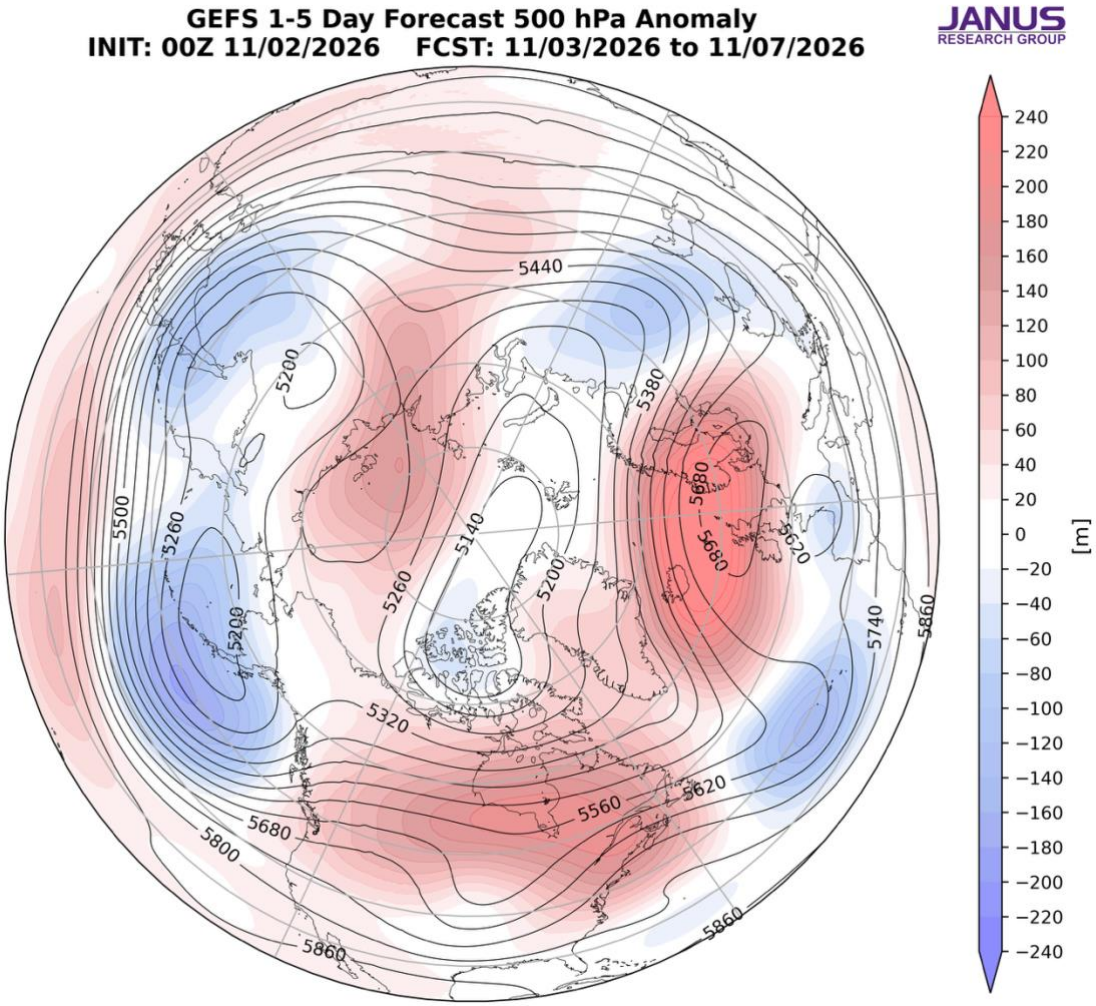


Figure 2. Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere from 3 Nov to 7 Nov 2026. The forecasts are from the 00Z 2 Nov 2026 GFS ensemble.

Predicted troughing/negative geopotential height anomalies centered in the Gulf of Alaska will force downstream ridging/positive geopotential height anomalies across much of North America this week (**Figure 2**). This patten will favor normal to above normal temperatures across Alaska, Canada and the US with the possible exception of normal to below normal temperatures limited to the Western US this week (**Figure 3**).

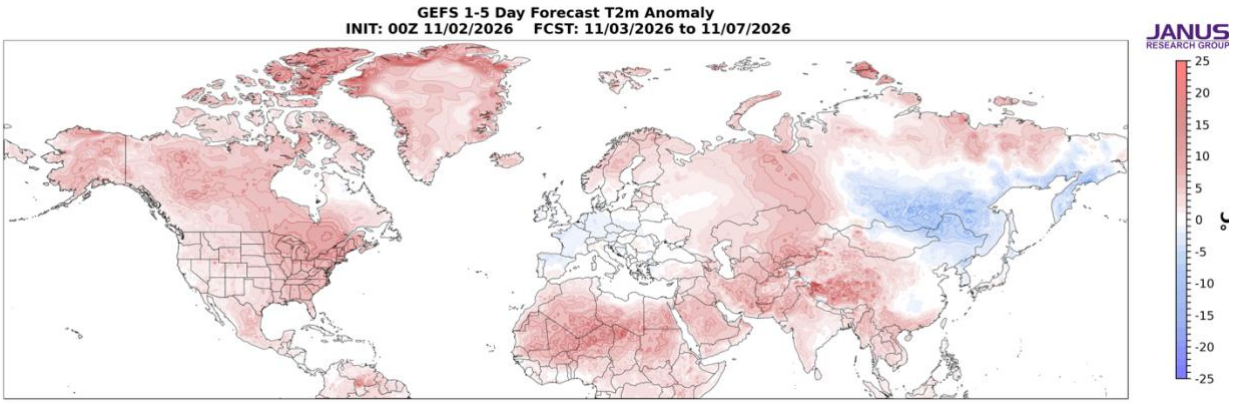


Figure 3. Forecasted surface temperature anomalies (°C; shading) from 3 Nov to 7 Nov 2026. The forecasts are from the 00Z 2 Nov 2026 GFS ensemble.

Troughing and/or cold temperatures will support new snowfall across northern Norway, Siberia and into Northeast Asia this week while mild temperatures will cause snowmelt in southwestern Siberia this week (**Figure 4**). Troughing and/or cold temperatures will support new snowfall across the Alaska panhandle, the west coast mountains of Canada and Northern Canada while mild temperatures will cause snowmelt in Central Canada this this week (**Figure 4**).

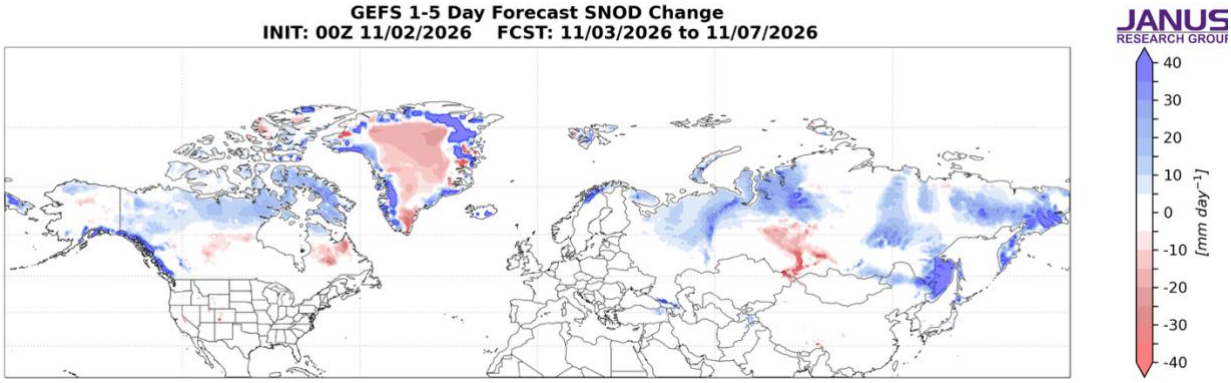


Figure 4. Forecasted snowfall (mm/day; shading) from 3 Nov to 7 Nov 2026. The forecasts are from the 00Z 2 Nov 2026 GFS ensemble.

Near-Mid Term

Next week

With geopotential height anomalies becoming mostly mixed across the Arctic and with mixed geopotential height anomalies across the mid-latitudes this period (**Figure 5**), the AO will likely remain close to neutral to slightly negative this period (**Figure 1**). With weak and mixed pressure/geopotential height anomalies across Greenland (**Figure 5**), the NAO will likely also trend towards neutral to slightly negative this period.

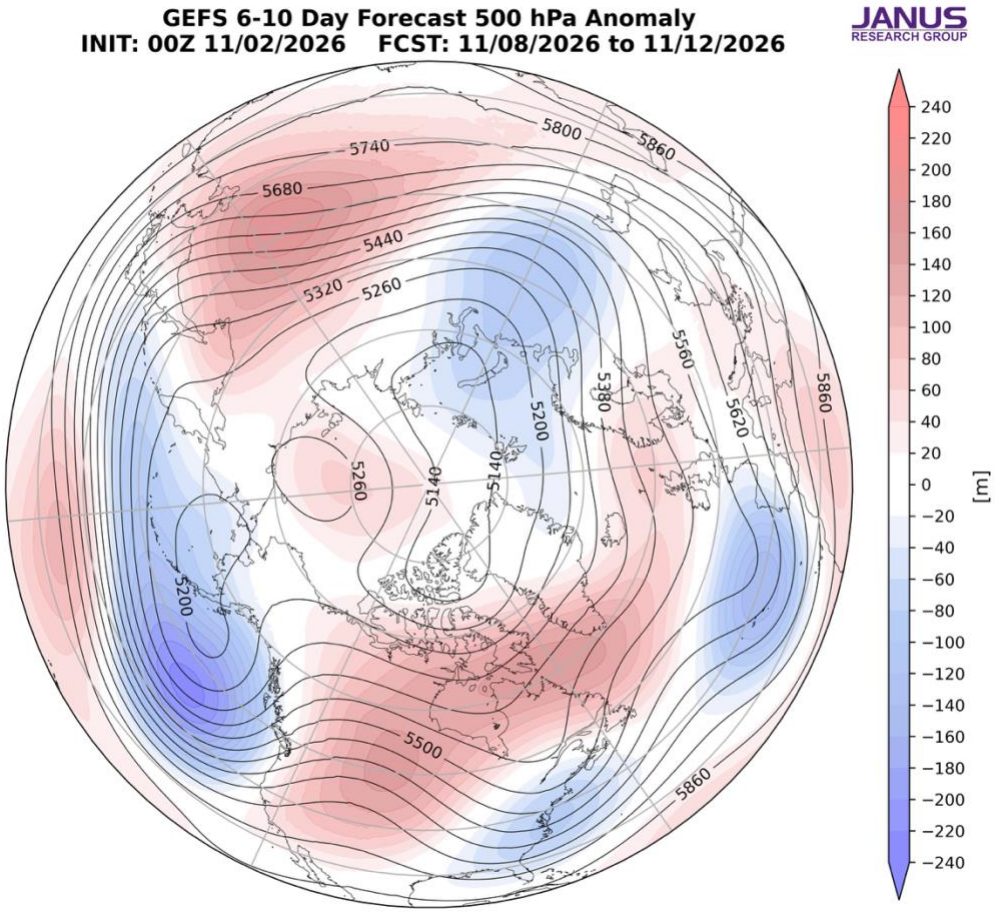


Figure 5. Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere from 8 Nov to 12 Nov 2026. The forecasts are from the 00Z 2 Nov 2026 GFS ensemble.

Deepening troughing/negative geopotential height anomalies across the mid-latitude North Atlantic will support weak ridging/positive geopotential height anomalies across Europe this period (**Figure 5**). The pattern will support the spreading of normal to above normal temperatures across Europe including the UK with the best exception for normal to below normal temperatures Central Europe this period (**Figure 6**). Deepening troughing/negative geopotential height anomalies across the Urals will support strengthening downstream

ridging/positive geopotential height anomalies centered across east Asia including Siberia this period (**Figure 5**). This pattern favors widespread normal to above normal temperatures widespread across much of Asia but especially Central Asia with normal to below normal temperatures limited to Eastern Siberia and into far Northeast Aisa this period (**Figure 6**). I do think the deepening troughing centered over the Urals is a reflection of the PV center consolidating in the same region.

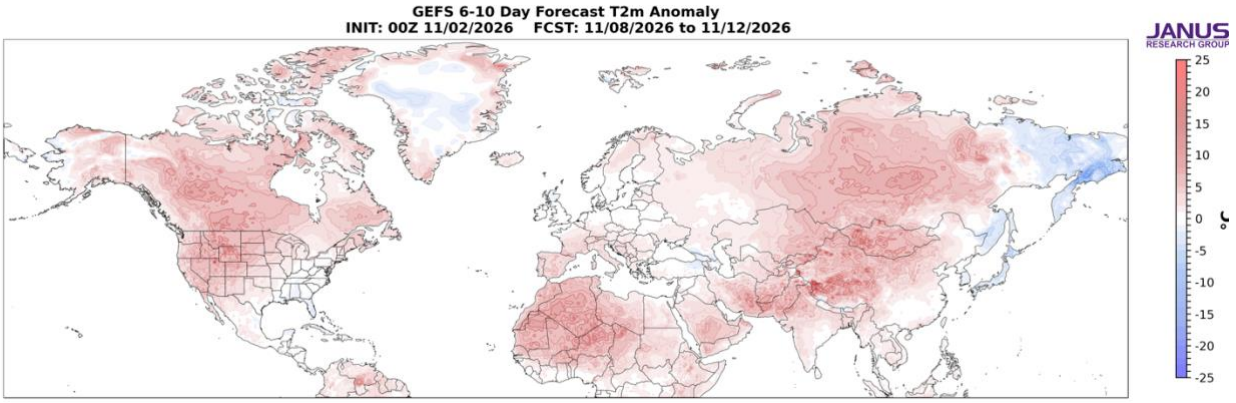


Figure 6. Forecasted surface temperature anomalies (°C; shading) from 8 Nov to 12 Nov 2026. The forecasts are from the 00Z 2 Nov 2026 GFS ensemble.

Predicted persistent deep troughing/negative geopotential height anomalies centered in the Gulf of Alaska will force downstream ridging/positive geopotential height anomalies across much of North America with the exception of troughing in the Eastern US this period (**Figure 5**). This pattern will favor widespread normal to above normal temperatures widespread across Alaska, much of Canada and the US with the possible exception of normal to below normal temperatures limited to the Eastern US this period (**Figure 6**). Albeit transient troughing in the Eastern US, I feel is likely also a reflection of the large PV disruption associated with the lowering stratospheric heights in the mid-latitude North Atlantic.

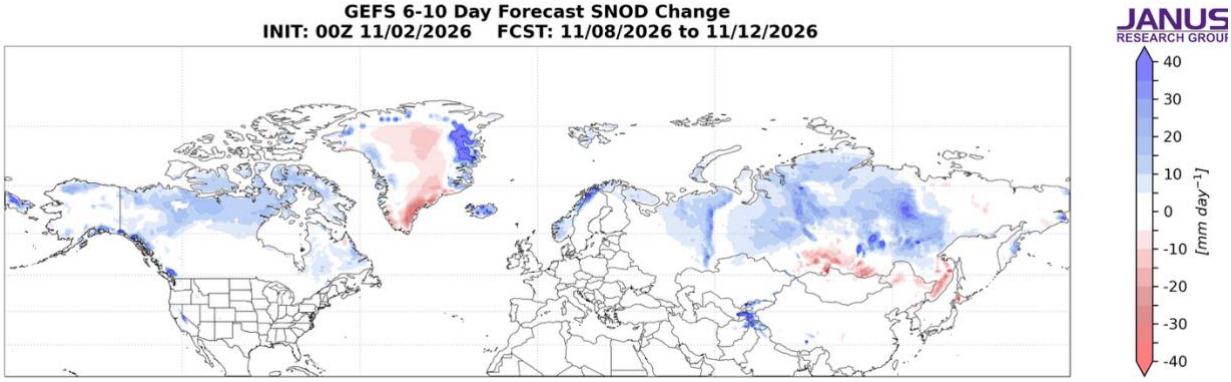


Figure 7. Forecasted snowfall rate (mm/day; shading) from 8 Nov to 12 Nov 2026. The forecasts are from the 00Z 2 Nov 2026 GFS ensemble.

Troughing and/or cold temperatures will support new snowfall across Northern Norway, the Urals, Northwestern Russia Siberia and Central Asia while warm temperatures will cause

snowmelt in Southern Siberia and Northeast Asia this period (**Figure 7**). Troughing and/or cold temperatures will support new snowfall across northern Alaska, Northern Canada, the west coast mountains of Canada and the Sierras this period (**Figure 7**).

Mid Term

Week Two

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

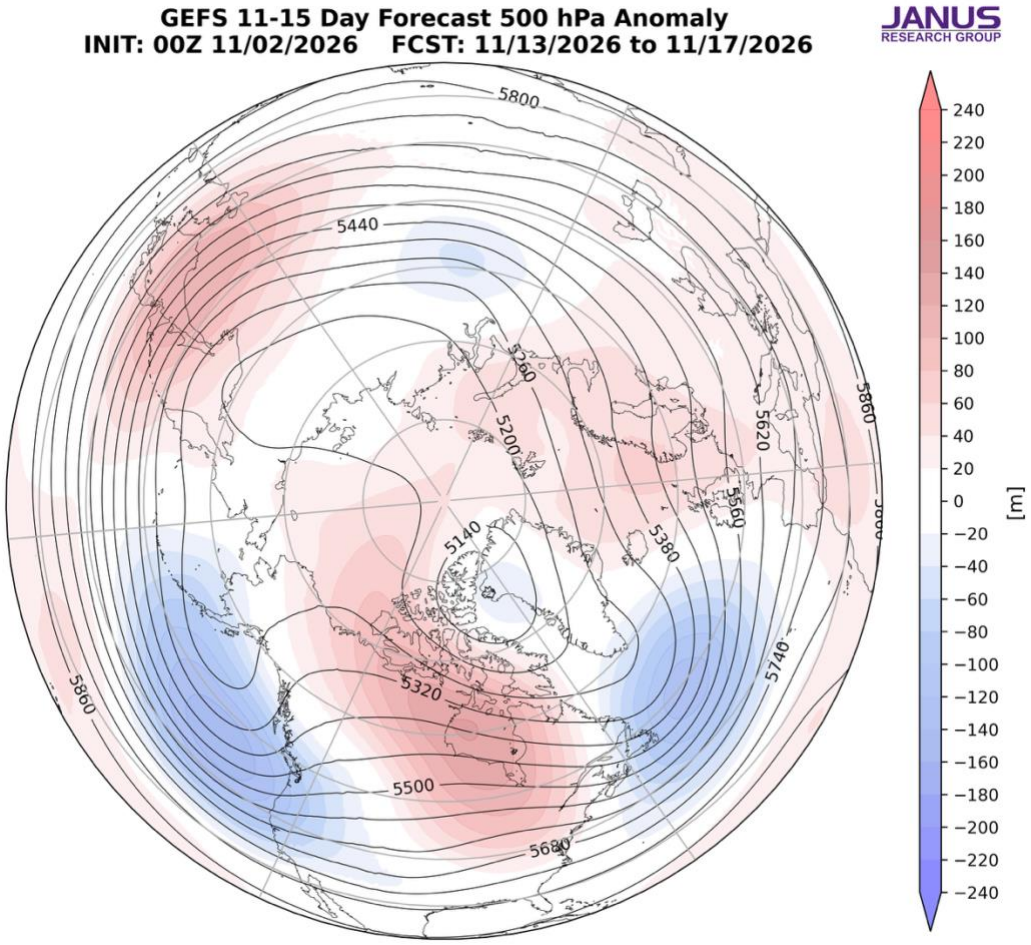


Figure 8. Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere from 13 Nov to 17 Nov 2026. The forecasts are from the 00Z 2 Nov 2026 GFS ensemble.

Deepening troughing/negative geopotential height anomalies across the mid-latitude North Atlantic will continue to build ridging/positive geopotential height anomalies across Europe this period (**Figure 8**). This pattern will favor widespread normal to below normal temperatures across much of Europe including the UK this period (**Figures 9**). Persistent troughing/negative geopotential height anomalies centered near the Urals will support downstream ridging/positive geopotential height anomalies across East Asia this period (**Figure 8**). This pattern favors widespread normal to above normal temperatures across most of Asia especially Central Asia with normal to below normal temperatures limited to Eastern Siberia this period (**Figure 9**).

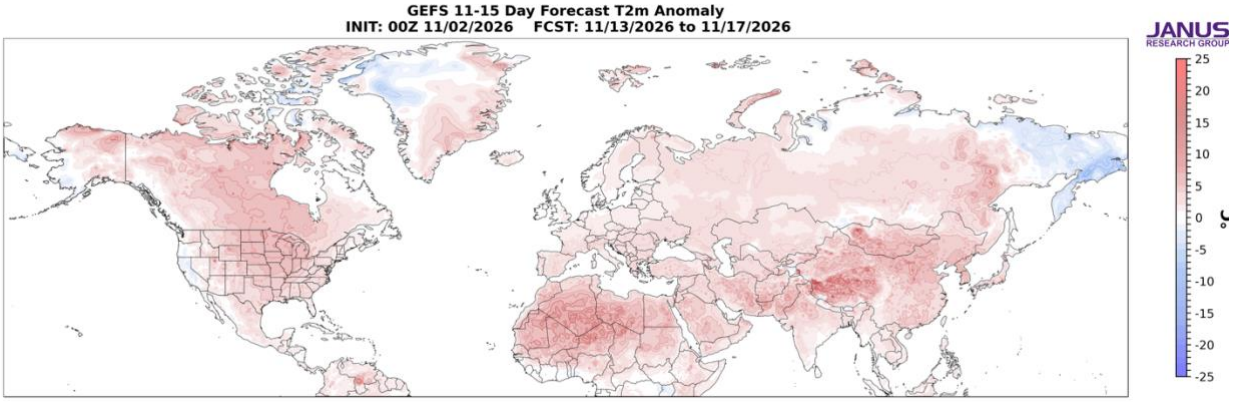


Figure 9. Forecasted surface temperature anomalies (°C; shading) from 13 Nov to 17 Nov 2026. The forecasts are from the 00Z 2 Nov 2026 GFS ensemble.

Persistent deep troughing/negative geopotential height anomalies centered in the Gulf of Alaska and extending into the west coasts of Canada and the Western US will support downstream ridging/positive geopotential height anomalies across much of North America this period (**Figure 8**). This pattern supports widespread normal to above normal temperatures across Alaska, much of Canada and the US, with possible exceptions of the west coasts of Canada and the US and northern Quebec this period (**Figure 9**).

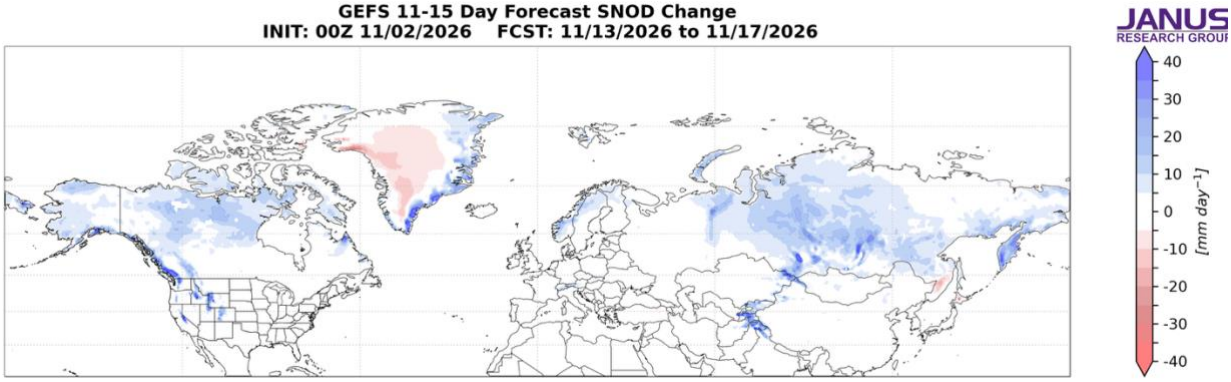


Figure 10. Forecasted snowfall (mm/day; shading) from 13 Nov to 17 Nov 2026. The forecasts are from the 00Z 2 Nov 2026 GFS ensemble.

Troughing and/or cold temperatures will support new snowfall across Norway, much of Siberia and Central Asia this period (**Figure 10**). Troughing and/or cold temperatures will support new snowfall across Alaska, Western and Northern Canada and the higher elevations of the Western US this period (**Figure 10**).

Longer Term

30–day

Today's polar cap geopotential height anomalies (PCHs) plot currently shows cold/negative PCHs limited to the lower troposphere with warm/positive PCHs throughout the stratosphere and mid- to upper troposphere (**Figure 11**). However, this week, the warm/positive PCHs in the stratosphere are predicted strengthen and eventually slowly descend into the lower troposphere.

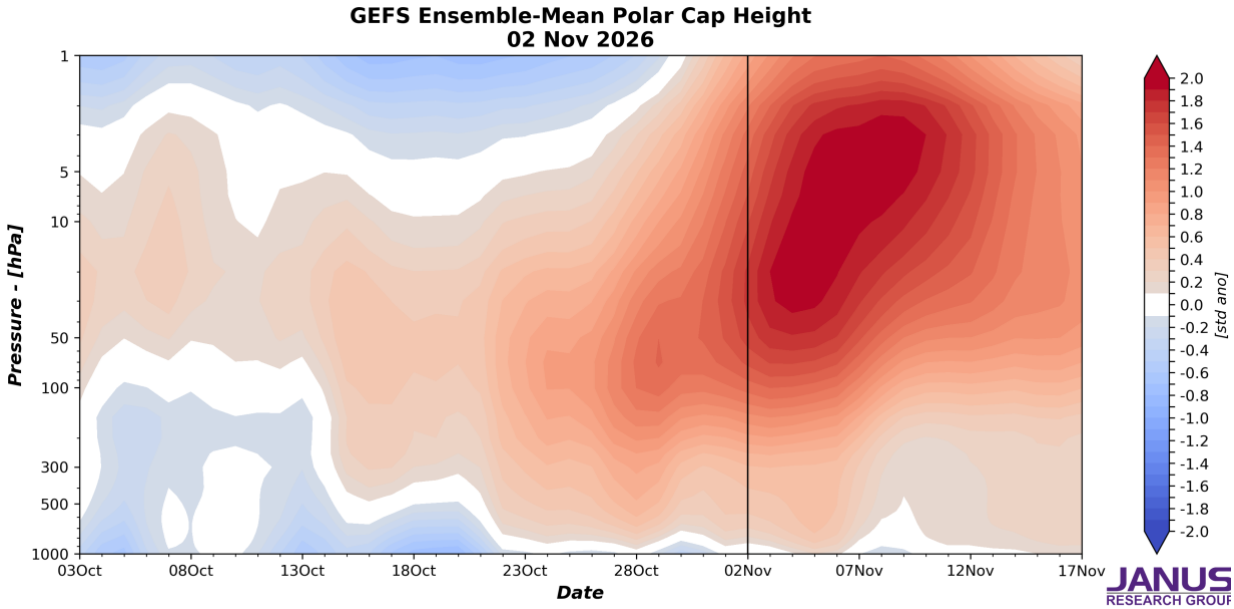


Figure 11. Observed and predicted daily polar cap height (i.e., area-averaged geopotential heights poleward of 60°N) standardized anomalies. The forecast is from the 00Z 2 Nov 2026 GFS ensemble.

This week the predicted cold/negative to neutral in the lower troposphere (**Figure 11**) are consistent with the predicted neutral surface AO (**Figure 1**). However, beginning next week when the warm/positive PCHs descend through the troposphere (**Figure 11**) the surface AO is predicted to trend slightly negative (**Figure 1**).

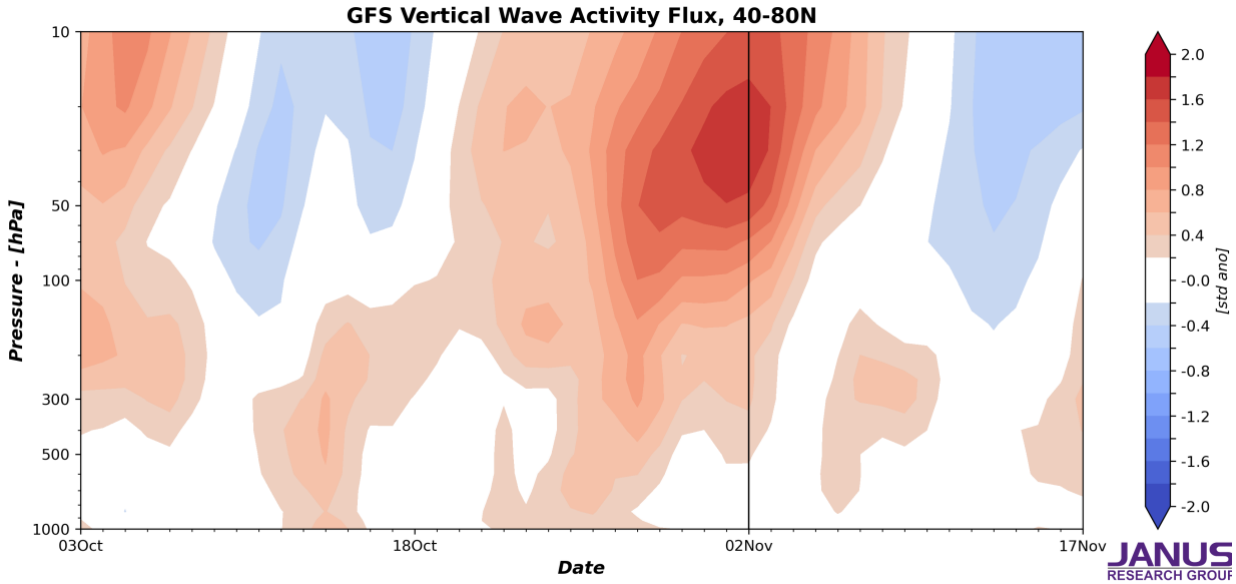


Figure 12. Observed and predicted daily vertical component of the wave activity flux (WAFz) standardized anomalies, averaged poleward of 40-80°N. The forecast is from the 00Z 2 Nov 2026 GFS ensemble.

The large positive (upward) pulse of vertical Wave Activity Flux (WAFz) from the troposphere to the stratosphere or poleward heat transport in the stratosphere is currently underway (**Figure 12**) that is triggering the large PV disruption visible in the warm/positive PCHs in the mid to upper stratosphere (**Figure 11**). All models including the GFS are predicting the earliest SSW on record over the next two weeks.

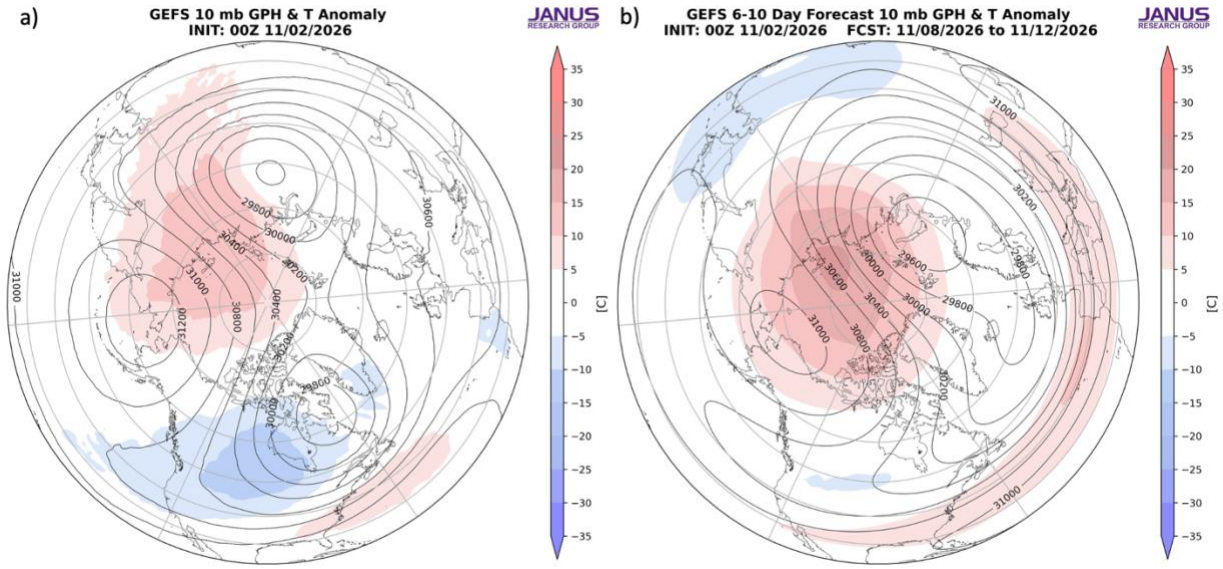


Figure 13. (a) Observed 10 mb geopotential heights (dam; contours) and temperature anomalies (°C; shading) across the Northern Hemisphere for 2 Nov 2026. (b) Same as

(a) except forecasted averaged from 8 Nov to 12 Nov 2026. The forecasts are from the 00Z 1 December 2025 GFS model ensemble.

Currently the polar vortex (PV) is elongated in shape, from Siberia to Canada, with one PV center over Western Siberia and a second in Baffin Bay with relatively cold temperatures focused on Canada and with high pressure centered near the Dateline with warm temperatures in the North Pacific sector of the Arctic and Siberia in the polar stratosphere (**Figure 13a**). To me this is a stretched PV and is forced by wave-2 in the troposphere. This is not a split PV, which can also be forced by wave-2. Then, during the second week of November the PV center is predicted to be centered in the Barents-Kara Seas with trailing troughing across the North Atlantic and into Eastern Canada with high pressure over Alaska and the Beaufort Sea and warming extending out of Asia and covering the Central Arctic in the polar stratosphere (**Figure 13b**). This resembles more of classical sudden stratospheric warming (SSW) configuration. This is looking at least initially as a displaced PV forced by wave-1 in the troposphere. The stratospheric AO in **Figure 1** this week is predicted to weaken from negative to off the charts negative this week with the unprecedented early strong disruption of the PV but climbing its way back on the plot in mid-November.

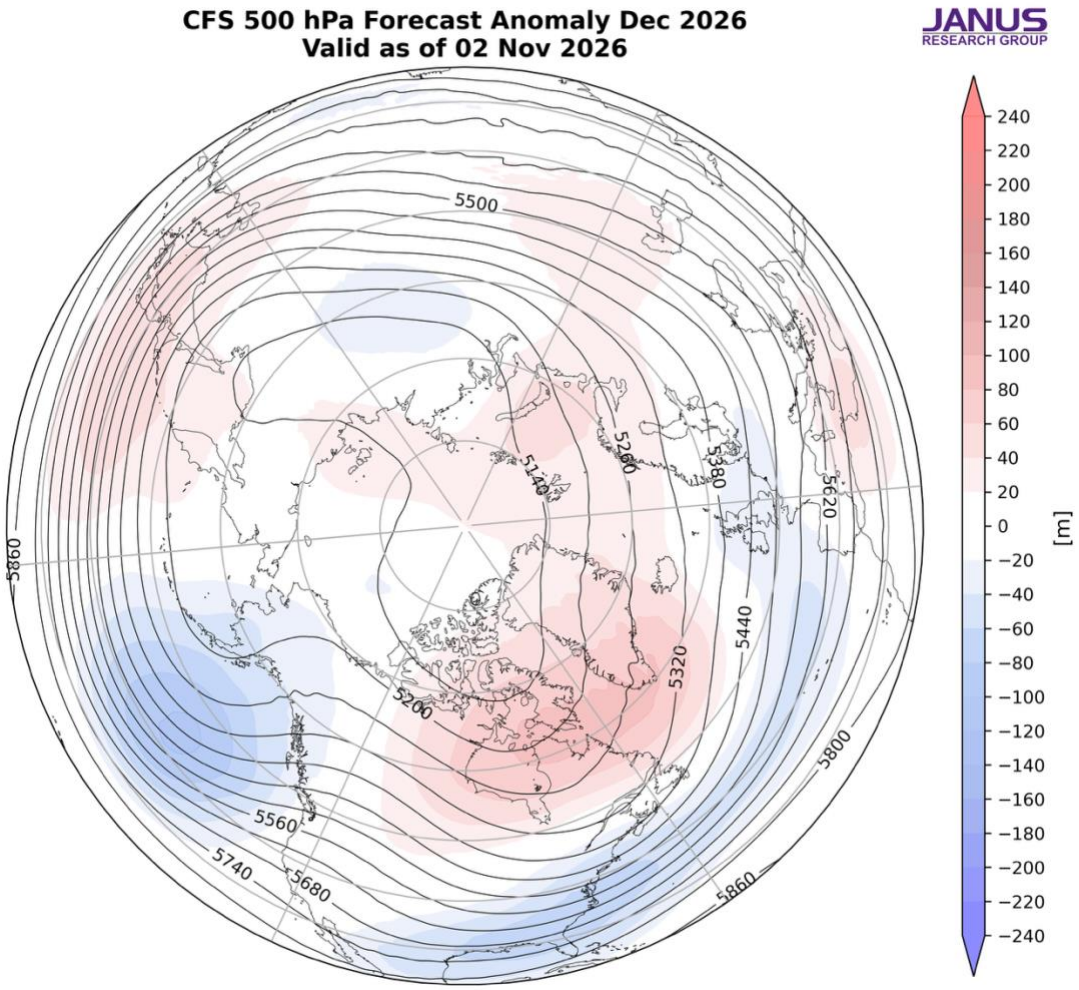


Figure 14. Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere for Dec 2026. The forecasts are from the 00Z 2 Nov 2026 CFS.

I include in this week's blog the monthly 500 hPa geopotential heights (**Figure 14**) and surface temperatures for December (**Figure 15**) 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 stretching across Hudson Bay and Greenland, across the Barents-Kara Seas and the Urals with troughing across the mid-latitudes of the North Atlantic into Europe, Siberia into East Asia, south of the Aleutians and the Eastern US (**Figure 14**). This pattern favors seasonable to relatively warm temperatures across Southern and Central Europe, the Southern half of Asia including the Arabian Peninsula, the Tibetan Plateau, Pakistan and Afghanistan, much of Canada and the Western US with seasonable to relatively cool temperatures across Northern Europe, much of Northern and into Northeastern Asia, Alaska, Northwestern Canada and the Eastern US (**Figure 15**).

This pattern clearly projects onto the pattern of the negative AO, following an SSW. This pattern is a plausible solution if the SSW couples to the troposphere as expected following an SSW.

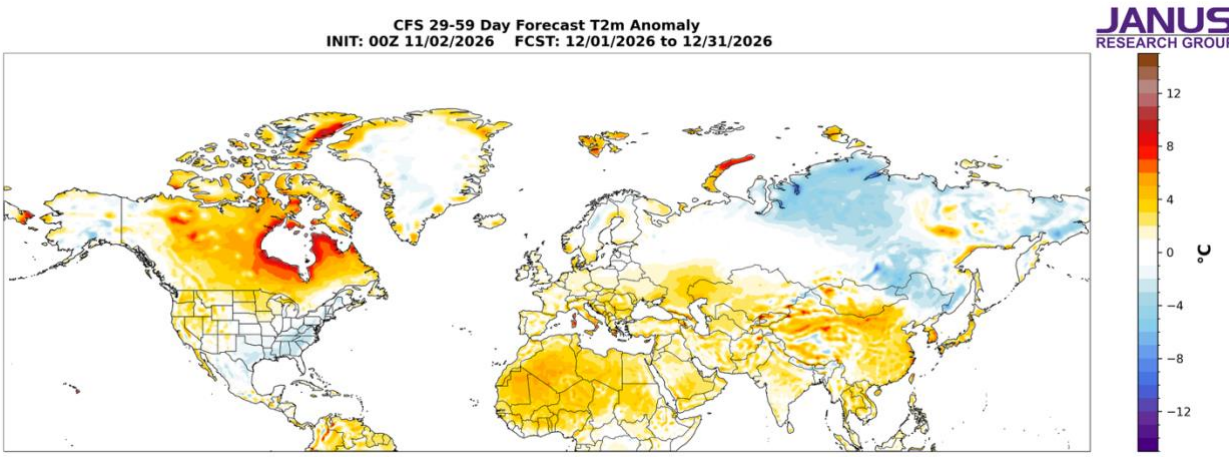


Figure 15. Forecasted average surface temperature anomalies (°C; shading) across the Northern Hemisphere for Dec 2026. The forecasts are from the 00Z 2 Nov 2026 CFS.

Boundary Forcings

Arctic Sea Ice

I am and will continue to watch Arctic sea ice. Current conditions are shown in **Figure 16**. 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. Sea ice has been growing a decent clip, but clearly more in the North Pacific sector than the North Atlantic sector and therefore 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. I believe that the lack of sea ice in the Barents-Kara Seas may have contributed to the record strong high-pressure Ural/Scandinavian blocking and the unprecedentedly early weak PV that so far resembles more of an SSW than the more common stretched PV this time of year.

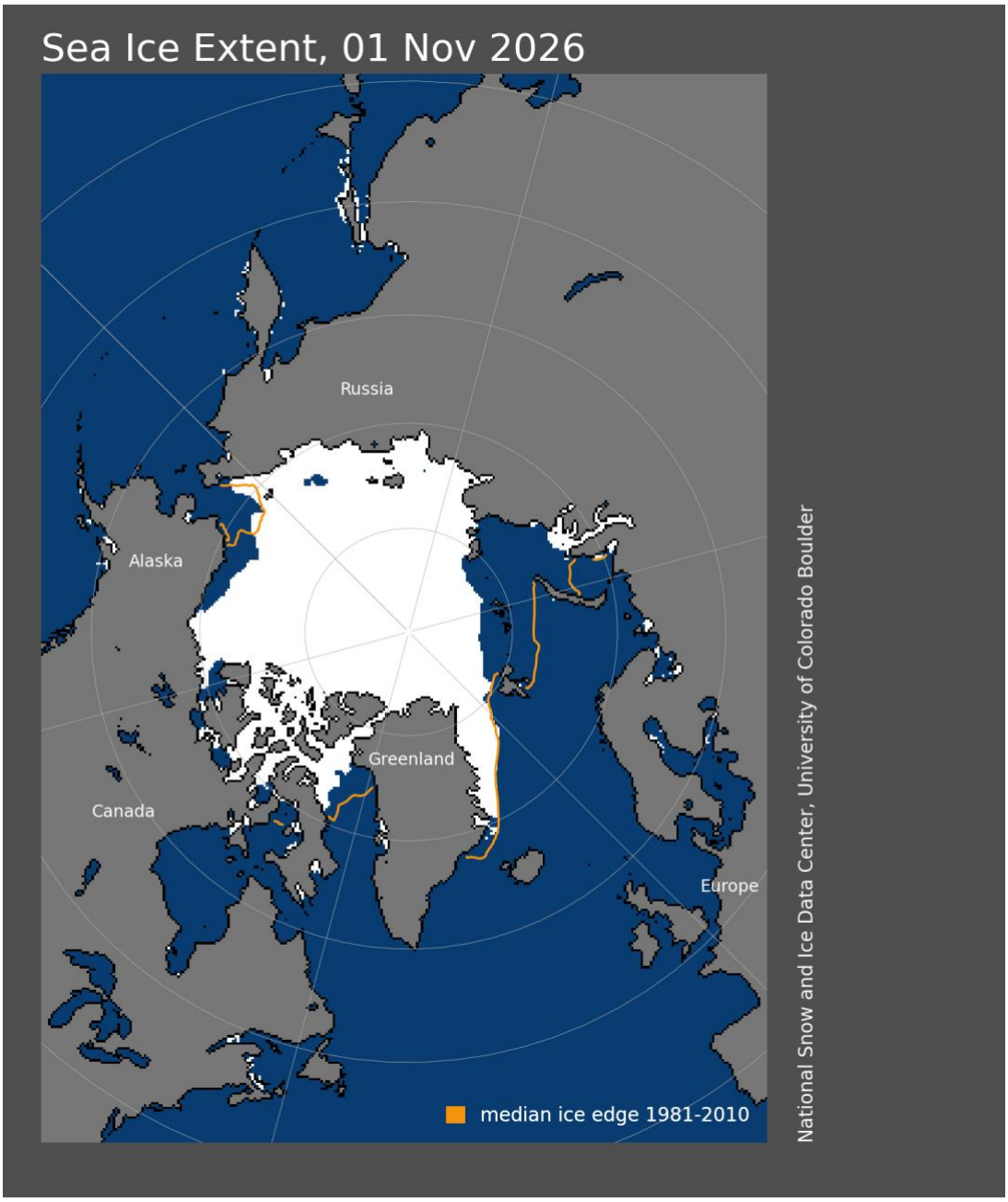


Figure 16. Arctic sea ice cover extent for 1 November 2026. White depicts ice covered areas and the orange contour the climatological extent of Arctic sea ice for the date. Plot taken from: https://nsidc.org/sea-ice-today

SSTs/El Niño/Southern Oscillation

Equatorial Central Pacific sea surface temperatures (SSTs) anomalies are well above normal, with the warming focused along the South American coast and out to the Dateline (see **Figure 17**), clear signs of El Niño conditions. In fact, "super" El Niño has been achieved contributing to the large attention in the media. The El Niño is likely close to its peak and is

expected to become the strongest El Niño on record. 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 Southern Ocean. The widespread above normal SSTs remain impressive. The SST pattern in the North Atlantic resembles the "tripole" pattern that is thought to favor a negative NAO.

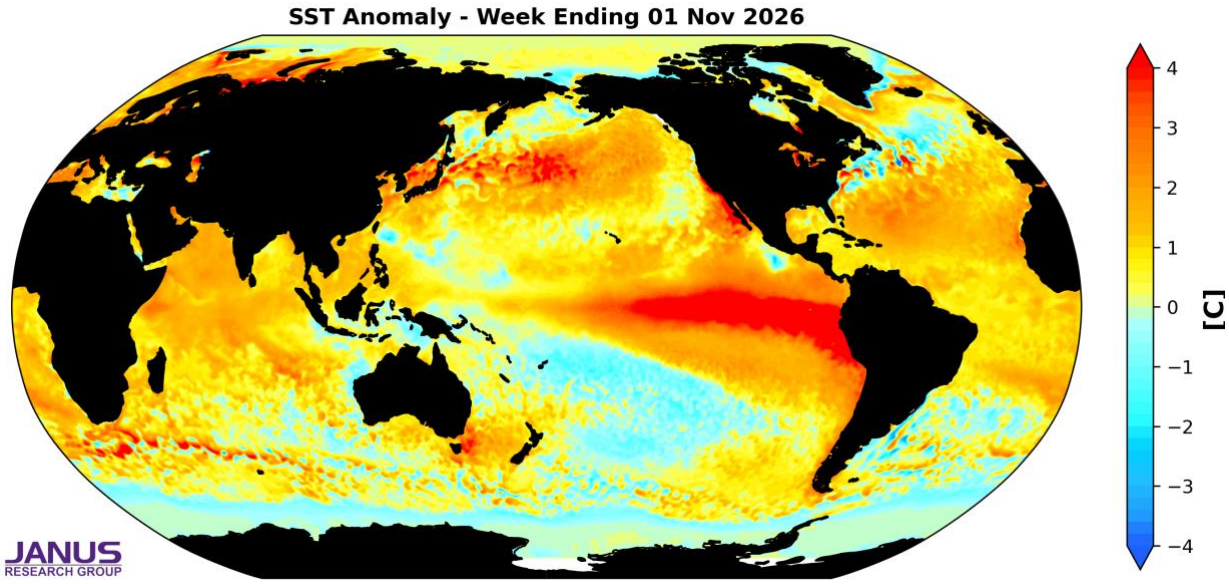


Figure 17. The latest daily-mean global SST anomalies for week ending 1 Nov 2026.

Madden Julian Oscillation

Currently the Madden Julian Oscillation (MJO) is weak but still in phase two (**Figure 18**), and the forecasts are for the MJO to strengthen in phase two and move into phase three and weaken again the next two weeks (**Figure 18**). Phases two and three mostly favor troughing in the Gulf of Alaska with ridging across Eastern Canada, therefore, it seems that the MJO is having influence on North American weather the next two weeks. But admittedly this is outside of my expertise.

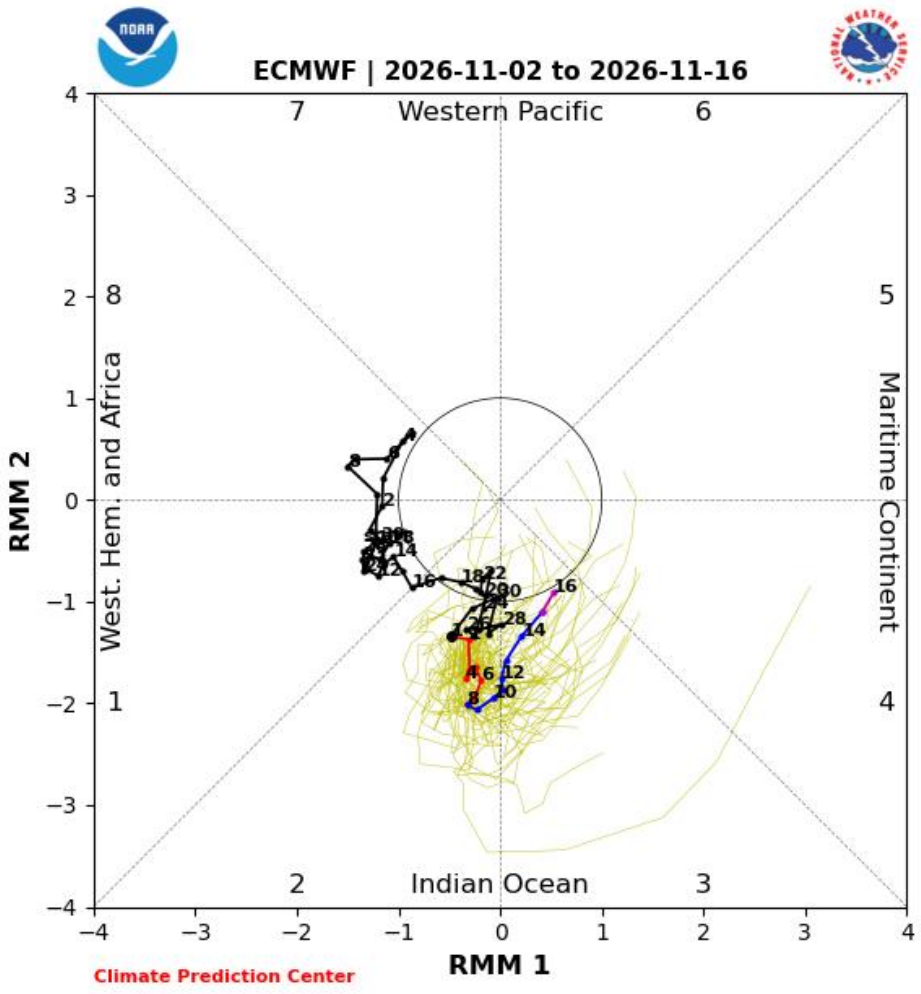


Figure 18. Past and forecast values of the MJO index. Forecast values from the 00Z 2 Nov 2026 ECMWF model. Yellow lines indicate individual ensemble-member forecasts, with the green line showing the ensemble-mean. A measure of the model 'spread' is denoted by the gray shading. Sector numbers indicate 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

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