

Arctic Oscillation and Polar Vortex Analysis and Forecasts

March 27, 2023

Dear AO/PV blog readers:

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

For those who would like an early look on Mondays, we will be offering at a nominal price (US \$50) a PDF version of the upcoming blog, and we will be rolling out 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 neutral and is predicted to remain neutral to negative the next two weeks as pressure/geopotential height anomalies across the Arctic are currently mixed and are predicted to become increasingly positive especially in the North Atlantic sector of the Arctic the next two weeks. The North Atlantic Oscillation (NAO) is currently negative and is predicted to remain negative the next two weeks as pressure/geopotential height anomalies are currently positive and are predicted to remain positive across Greenland the next two weeks.
- The next two weeks predicted ridging/positive geopotential height anomalies centered across Greenland will favor troughing/negative geopotential height anomalies across Central and Eastern Europe with ridging/positive geopotential height anomalies mostly limited to Western Europe. This pattern favors the next two weeks normal to below normal temperatures across Central and Eastern Europe with normal to above normal temperatures across Western Europe including the United Kingdom (UK).
- The predicted general pattern across Asia this week is troughing/negative geopotential height anomalies in Central Asia bookended by ridging/positive geopotential height anomalies centered in Western and Eastern Asia. However next week troughing/negative geopotential height anomalies are predicted to expand across Northern Asia with ridging/positive geopotential height anomalies across Southern Asia. This pattern favors normal to above normal temperatures across Western and Eastern Asia with normal to below normal temperatures in Central Asia this week but then next week normal to below normal temperatures will spread across Siberia with normal to above normal temperatures across the remainder of Asia.
- The pattern predicted across North America the next two weeks is ridging/positive geopotential height anomalies centered near the Aleutians forcing troughing/negative geopotential height anomalies across the, Alaska much of Canada and the Western United States (US) with more ridging/positive geopotential height anomalies across the Eastern US. This pattern generally favors normal to below normal temperatures across Alaska, Western and Central Canada and the Western US with normal to above normal temperatures across the Canadian Maritimes and the Eastern US. However, this week strengthening Greenland blocking will force some lower geopotential heights in the Northeastern US along with normal to below normal temperatures.
- The influence of the large polar vortex (PV) disruption that began back in January will continue to influence Northern Hemisphere (NH) surface temperatures that will persist into April.

Plain Language Summary

If you can believe it, the major disruption of the polar vortex (PV) and is referred to as a major sudden stratospheric warming (SSW) from mid-February is still influencing the weather even into April. Relatively cold temperatures have become more widespread across Northern Europe and should continue. Northern Asia has been surprisingly quite mild but colder temperatures are predicted across Siberia for April (see **Figures**

6 and 9). Across North America it seems to be more what you see is what you get, no end in sight of the pattern that began in November – cold west and mild east.

Impacts

The dominant troposphere-stratosphere-troposphere (T-S-T) coupling event of this winter related to the major sudden stratospheric warming (SSW) has been of long duration beginning with a tropospheric precursor in early to mid-January, a minor SSW in late January, followed by a major SSW in mid-February and ending with warm/positive polar cap geopotential height anomalies (PCHs) “dripping” from the lower stratosphere to the surface starting in late February and lasting until at least mid-April (see **Figures i** and **ii**) and with a negative NAO or AO (see **Figure 1**).

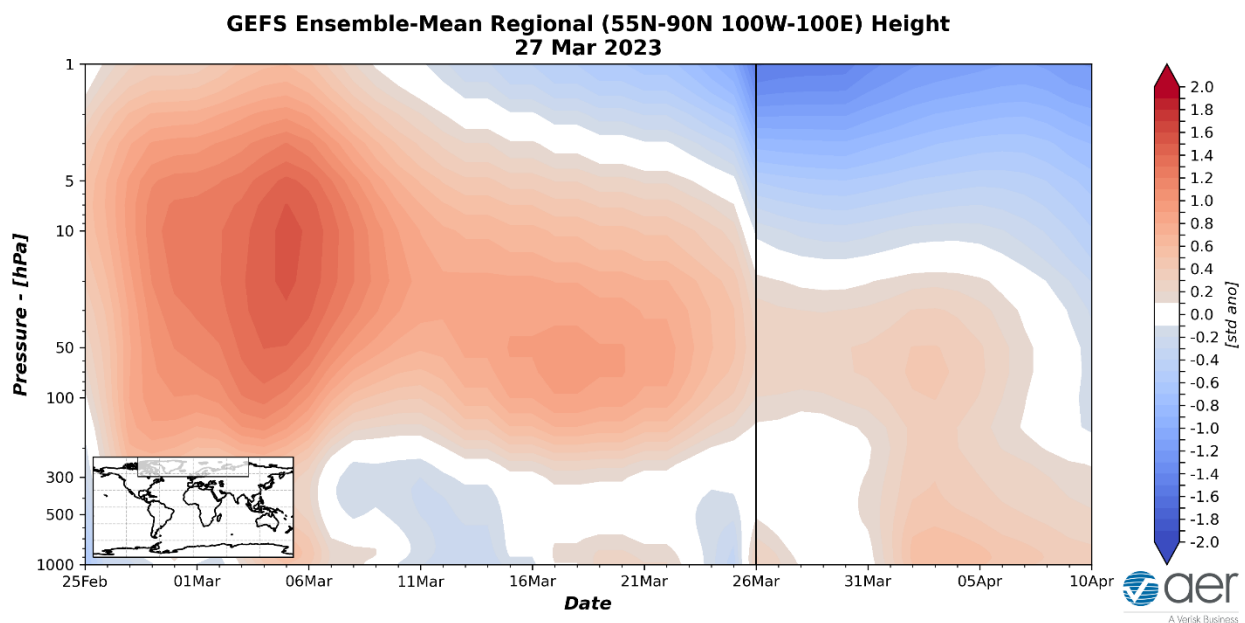


Figure i. Observed and predicted daily polar cap height (i.e., area-averaged geopotential heights poleward of 60°N) standardized anomalies limited to the North Atlantic sector (see insert). The forecast is from the 00Z 27 March 2023 GFS ensemble.

Both the pan-Arctic (**Figure 11**) and the North Atlantic regional PCHs suggest yet another “drip” of warm/positive PCHs from the stratosphere to the troposphere the last week of March (see **Figure i**). Such a long-range forecast is questionable but for now I see no reason not to expect some form of Greenland blocking/high pressure to continue for the foreseeable future favoring relatively cold temperatures in the US and Northern Europe and even the continued chance of snow especially at higher elevations.

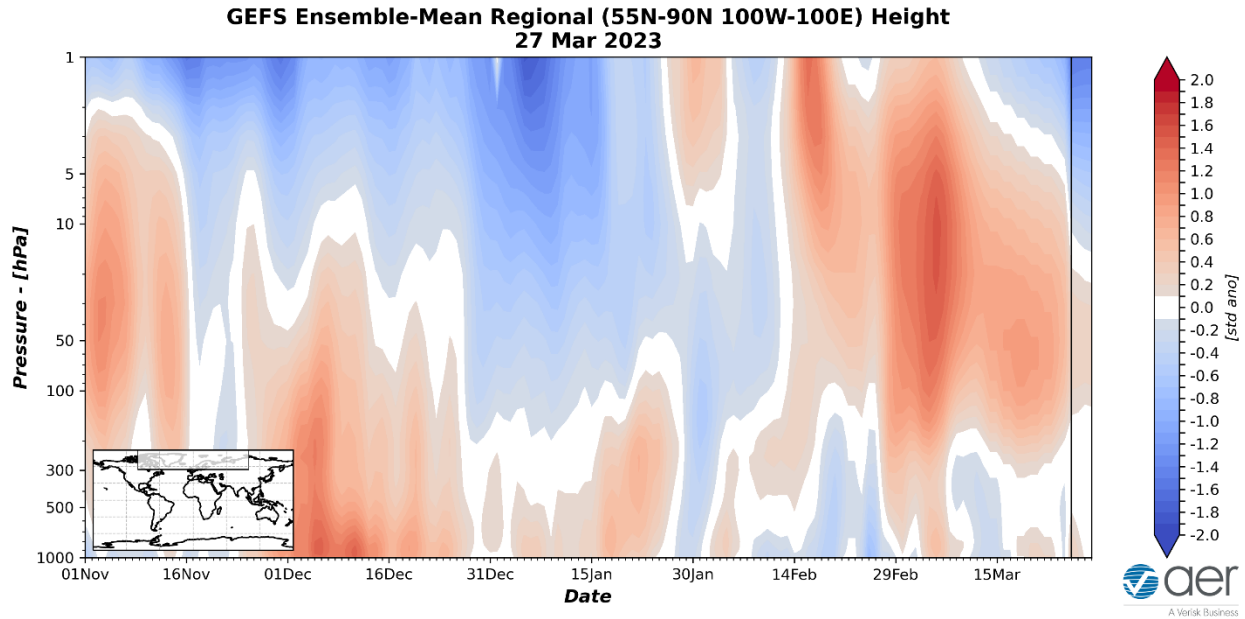


Figure ii. Same as **Figure i** but beginning 1 November 2022.

This has resulted in a classic looking response in the tropospheric circulation including ridging/positive geopotential height anomalies across Greenland with troughing/negative geopotential height anomalies across the mid-latitudes of the North Atlantic, Northern Europe and Northern Asia (see **Figure iii**). So, on one hand a very classical T-S-T coupling event and based on these metrics the most classically behaved since at least 2018.

**Forecast Sea-Level Pressure Anomaly
Mar 2023
Issued 27 Mar 2023**

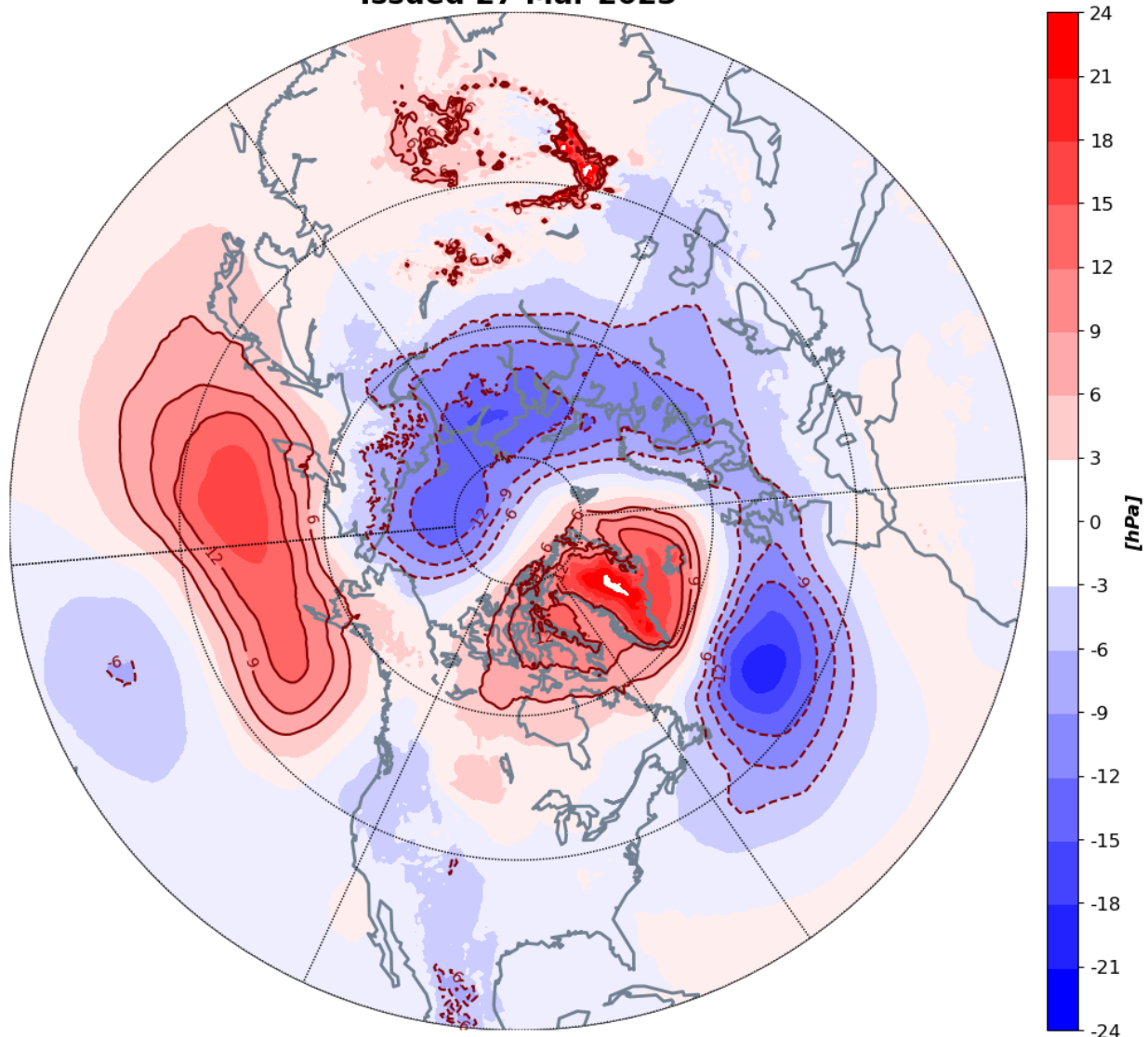


Figure iii. Sea level pressure anomalies estimated for March 2023 from the GFS operational initialized and forecast from 00Z 27 March 2023.

However, as I discussed in the previous blog, the surface temperature response has been somewhat muted or damped relative to the pressure/geopotential height response especially across Asia. Though temperatures have been below normal across Northern Europe and along the North Slope of Asia overall temperatures have been well above normal across Eurasia (see **Figure iv**). And to me it is just mind boggling how much warmer temperatures have been across Northern Asia post the SSW than pre the SSW. Siberia is the region most sensitive to PV variability and typically the greatest negative departures from normal temperatures following an SSW is across Siberia (see **Figure v** from [Butler et al. 2017](#)). Despite that the sea level pressure response in

the North Atlantic and Eurasia in March 2023 resembles the composite average following all SSWs, the temperature anomalies do not.

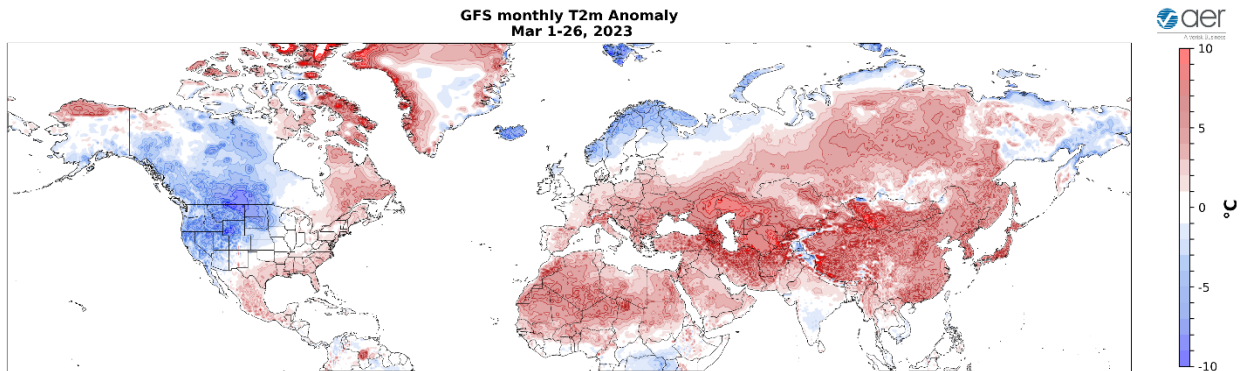


Figure iv. Observed surface temperature anomaly ($^{\circ}\text{C}$; shading) from 1 – 26 March 2023

Across North America the response to the SSW seems to have had strong interference from ridging near the Dateline which has focused winter in western North America from start to finish and has made any cold and snow fleeting in the Eastern US. The SSW has salvaged the New England ski season with a strong finish but like Eurasia, the impacts are quite limited. Why has the pattern been so persistent in North America is another head scratcher for me. Yes, I agree that La Niña favored this pattern, but I think the strong persistence and the lack of variability for five months now and possibly a sixth is quite puzzling for me.

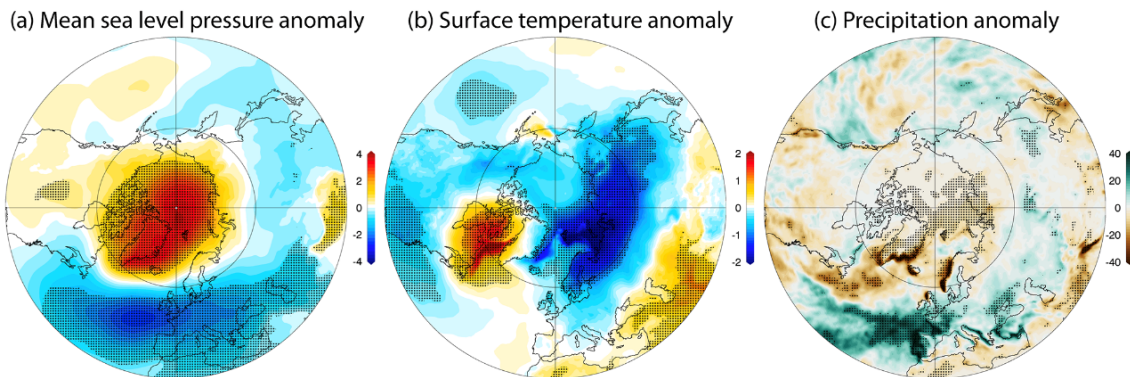


Figure v. Composites of the 60 days after historical SSWs in the JRA-55 reanalysis for (a) mean sea level pressure anomalies (hPa), (b) surface temperature anomalies ($^{\circ}\text{C}$), and (c) precipitation anomalies (mm). The stippling indicates regions that are significantly different from the climatology at the 95 % level. Figure and caption from Butler et al. 2017.

As can be seen from **Figures ii** and **11** another drip is predicted for early April and maybe you can make the argument one occurred this weekend. This will reinforce

Greenland blocking and bring relatively colder temperatures to parts of Europe and Northern Asia. One change is that cold temperatures across Siberia are predicted to be more widespread in early April than they have been in March (but I will believe it when I see it). Across North America it looks like more of the same - relatively cold in the West and milder in the East.

When it comes to understanding climate variability and creating accurate long-range forecasts the devil is in the details. It is intuitive to make composites of historical patterns but rarely does any single event follow a generalized average where the event-to-event differences or peculiarities are averaged out. Also rarely does one forcing such as ENSO or the PV explain most of the observed variability of any one season. An intuitive and innate lesson that is worth being reminded of often.

Wednesday Update

Models are mostly consistent with their forecasts from Monday with another robust drip of warm/positive polar cap geopotential height anomalies (PCHs) from the lower stratosphere to the surface the end of the week and into early April (see **Figure vi**). This may be the last of the drips as the GFS is predicting that PCHs will turn cold/negative in the lower stratosphere the second week of April, pretty much ending the T-S-T coupling event that began over three months earlier.

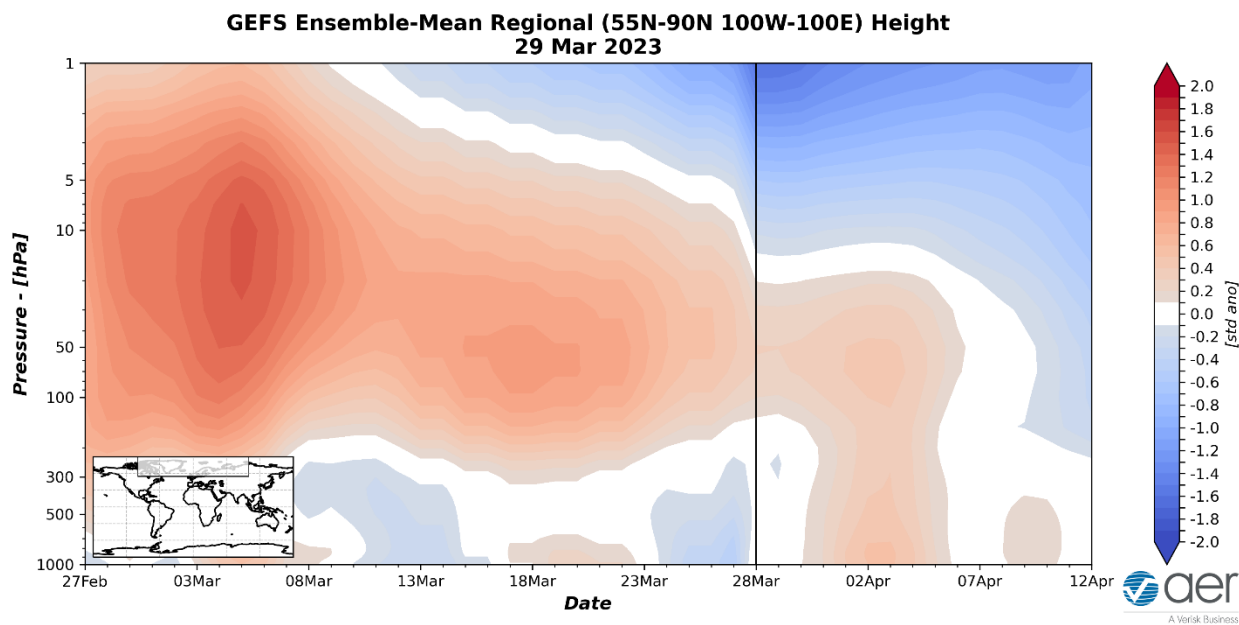


Figure vi. Observed and predicted daily polar cap height (i.e., area-averaged geopotential heights poleward of 60°N) standardized anomalies limited to the North Atlantic sector (see insert). The forecast is from the 00Z 29 March 2023 GFS ensemble.

It does look like this final “drip” will result in possibly a more classical tropospheric response than “drips” earlier this winter. There is robust Greenland blocking predicted

coupled with troughing/negative geopotential height anomalies across Europe, Northern Asia and eastern North America including the Eastern US (see **Figure vii**). And unlike much of the winter ridging is predicted for the Western US

GEFS 11-15 Day Forecast 500 hPa Anomaly
INIT: 00Z 03/29/2023 FCST: 04/09/2023 to 04/13/2023

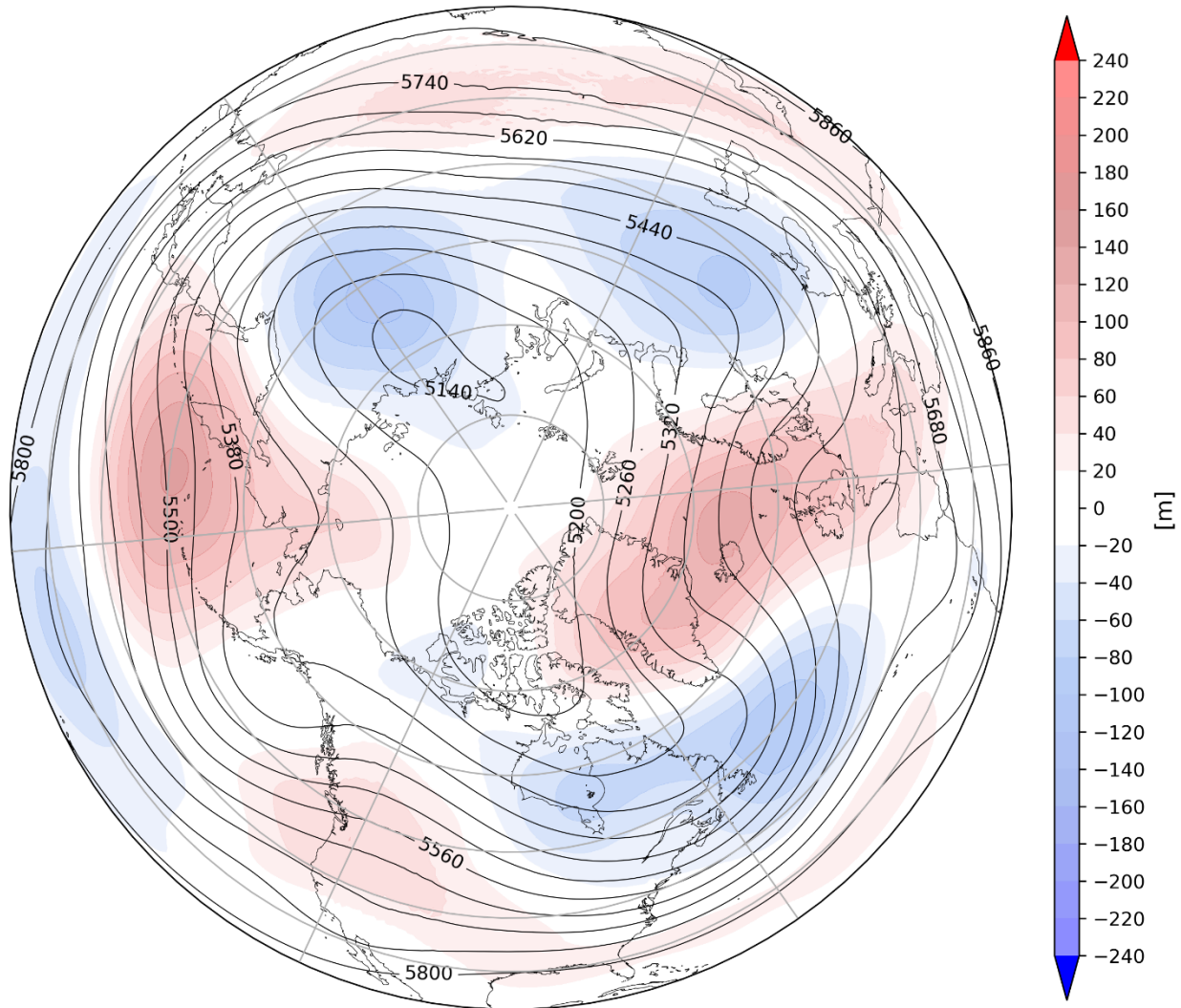


Figure vii. Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere from 9 – 13 April 2023. The forecasts are from the 00z 29 March 2023 GFS ensemble.

The tropospheric circulation anomalies should support relatively cold temperatures in parts of Europe, Siberia and eastern North America with relatively mild temperatures for the Western US and Western Canada (see **Figure viii**). This is a temperature pattern reversal from much of the winter. And at least based on the weather model forecasts this new pattern should persist into at least into mid-April.

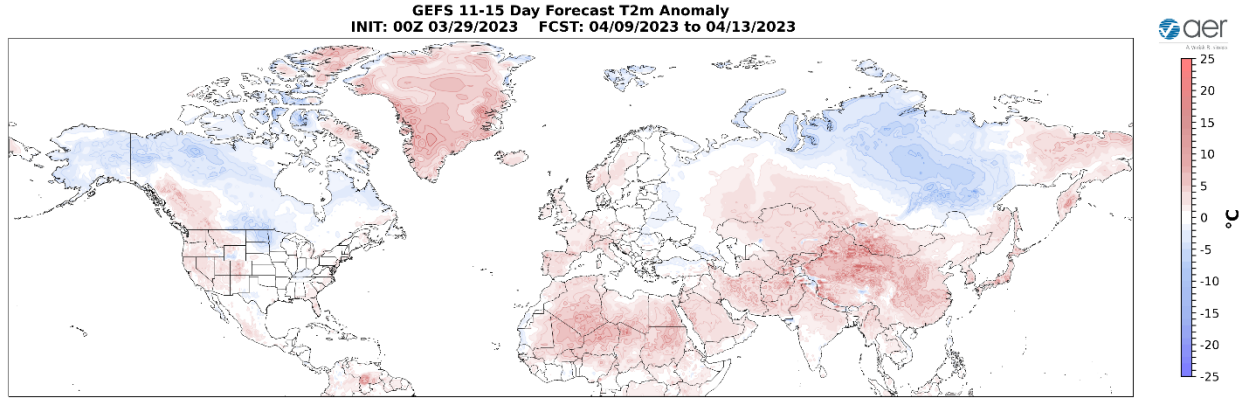


Figure viii. Forecasted surface temperature anomalies ($^{\circ}\text{C}$; shading) from 9 – 13 April 2023. The forecast is from the 00Z 29 March 2023 GFS ensemble.

Recent and Very Near Term Conditions

The AO is predicted to straddle neutral this period (**Figure 1**) with mixed geopotential height anomalies across the Arctic with mixed geopotential height anomalies across the mid-latitudes of the NH (**Figure 2**). With positive but weak geopotential height anomalies across Greenland (**Figure 2**), the NAO is predicted to remain negative this period.

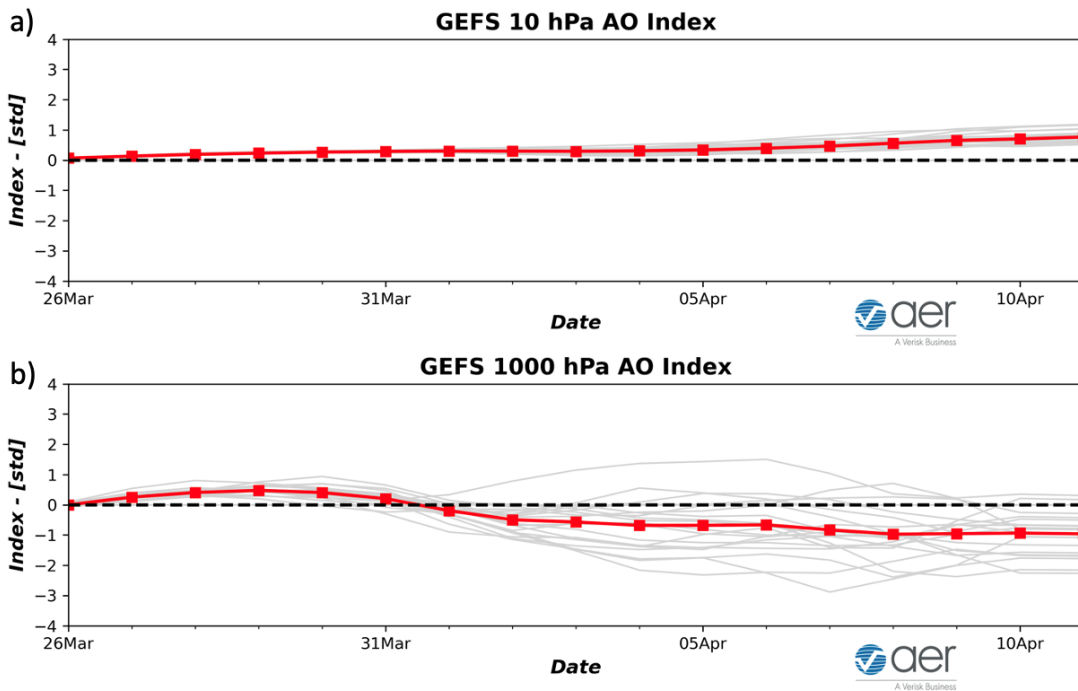


Figure 1. (a) The predicted daily-mean AO at 1000 hPa from the 00Z 27 March 2023 GFS ensemble. (b) The predicted daily-mean near-surface AO from the 00Z 27 March 2023

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.

Weak ridging/positive geopotential height anomalies across Greenland will support troughing/negative geopotential height anomalies across Central and Eastern Europe with ridging/positive geopotential height anomalies across Western Europe (Figures 2). This favors normal to below normal temperatures across Scandinavia, Central and Eastern Europe with normal to above normal temperatures across Western Europe including the UK (Figure 3). The predicted pattern across Asia this week is ridging/positive geopotential height anomalies across Western and Eastern Asia sandwiching troughing/negative geopotential height anomalies across Central Asia this period (Figure 2). This pattern favors widespread normal to above normal temperatures across Western and Eastern Asia with normal to below normal temperatures in Central Asia but mostly in Western and Central Siberia (Figure 3).

GEFS 1-5 Day Forecast 500 hPa Anomaly
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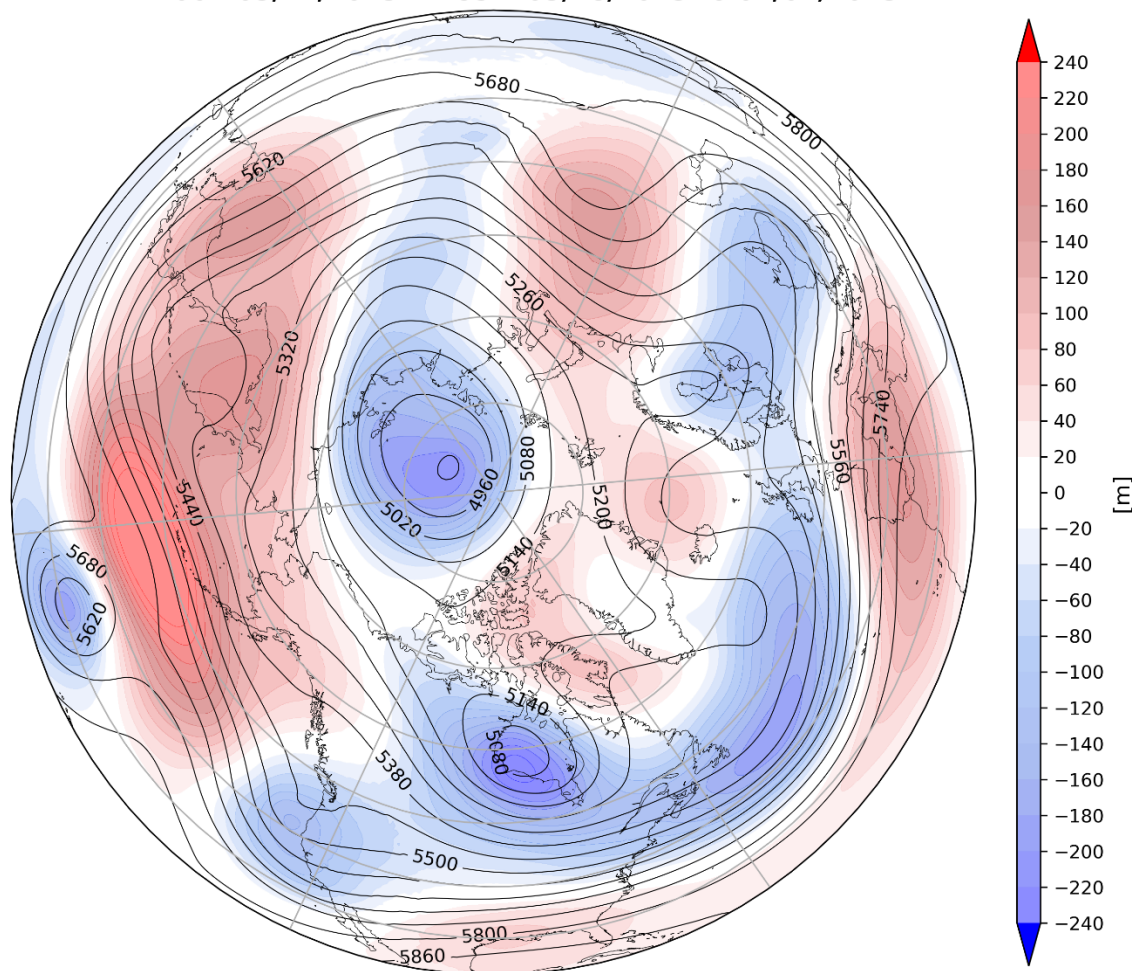


Figure 2. Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere from 28 March – 1 April 2023. The forecasts are from the 00z 27 March 2023 GFS ensemble.

The pattern this week across North America is ridging/positive geopotential height anomalies centered in the Aleutians and Alaska forcing troughing/negative geopotential height anomalies across Canada and the Western US with ridging/positive geopotential height anomalies centered in the Southeastern US this period (**Figure 2**). This pattern will favor normal to below normal temperatures across much of Canada and the Western and Northern US with normal to above normal temperatures across Alaska, the Canadian Maritimes and the Southeastern US (**Figure 3**).

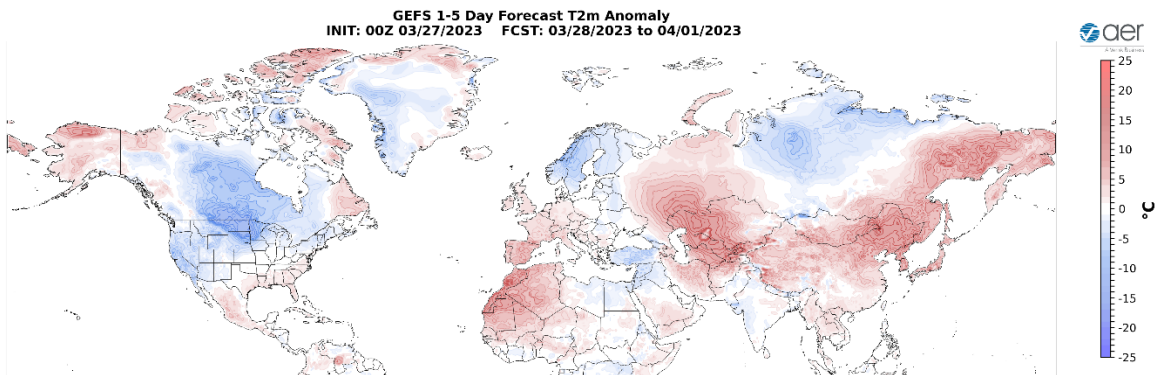


Figure 3. Forecasted surface temperature anomalies ($^{\circ}\text{C}$; shading) from 28 March – 1 April 2023. The forecast is from the 00Z 27 March 2023 GFS ensemble.

Troughing and/or cold temperatures will support new snowfall across northern Scandinavia and Siberia while mild temperatures will support widespread snowmelt across Northern Europe, the Alps and Asia (**Figure 4**). Troughing and/or cold temperatures will support new snowfall across Northern and Eastern Canada and California while mild temperatures will support snowmelt in Alaska, Canada and the US (**Figure 4**).

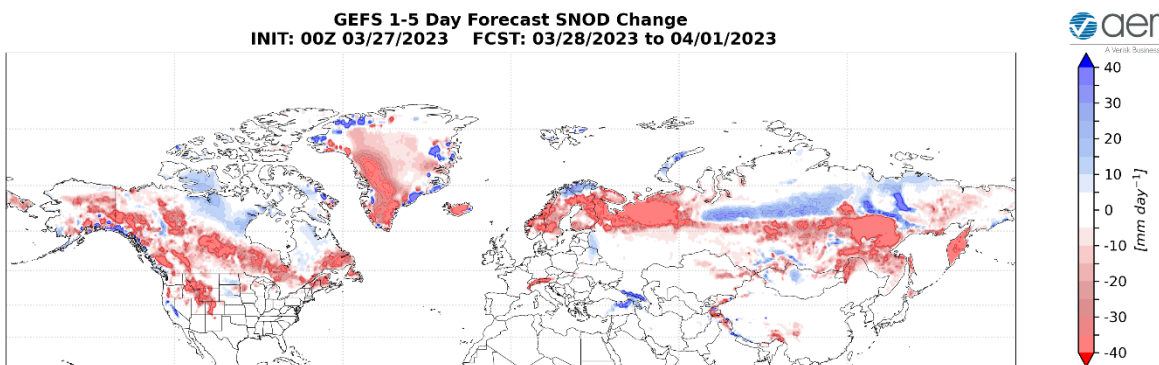


Figure 4. Forecasted snow depth changes (mm/day; shading) from 28 March – 1 April 2023. The forecast is from the 00Z 27 March 2023 GFS ensemble.

Near-Term

1-2 week

With mixed geopotential height anomalies across the Arctic but positive across the North Atlantic sector of the Arctic and with mixed geopotential height anomalies across the mid-latitudes this period (**Figure 5**), the AO should remain neutral to negative this period (**Figure 1**). With predicted positive pressure/geopotential height anomalies across Greenland (**Figure 5**), the NAO will likely be negative this period.

GEFS 6-10 Day Forecast 500 hPa Anomaly
INIT: 00Z 03/27/2023 FCST: 04/02/2023 to 04/06/2023

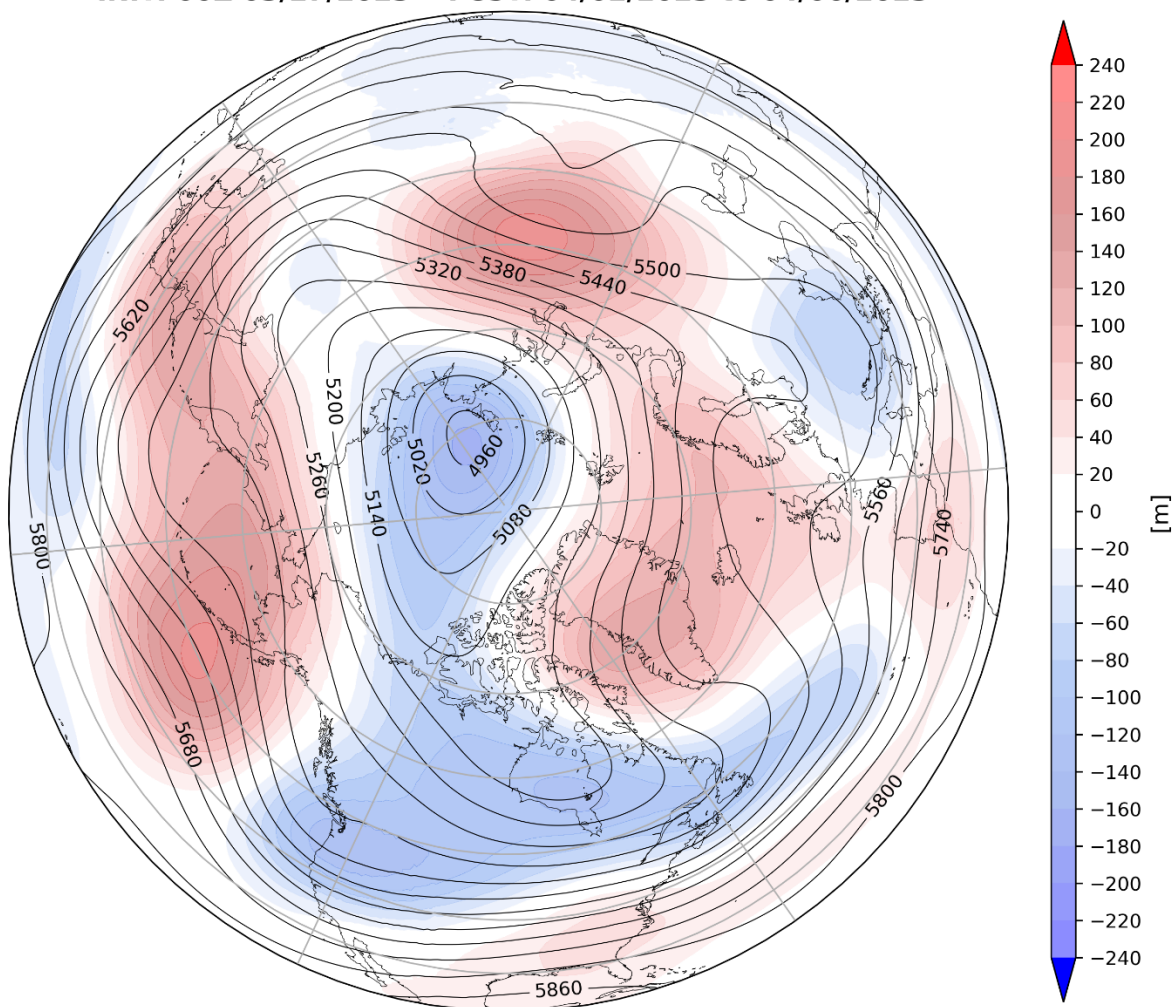


Figure 5. Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere from 2 – 6 April 2023. The forecasts are from the 00z 27 March 2023 GFS ensemble.

Ridging/positive geopotential height anomalies centered across Greenland will continue to support troughing/negative geopotential height anomalies across Central and Eastern Europe with ridging/positive geopotential height anomalies across Western Europe this period (**Figure 5**). This pattern should continue to favor normal to below normal temperatures across Northern, Central and Eastern Europe with normal to above normal temperatures across Western Europe including the UK (**Figures 6**). Troughing/negative geopotential height anomalies is predicted to persist in Central Asia sandwiched between ridging/positive geopotential height anomalies across Western and Eastern Asia this period (**Figure 5**). The pattern favors widespread normal to above normal temperatures across Western and the East Coast of Asia and Eastern Siberia with normal to below normal temperatures mostly limited to Central into Eastern Asia this period (**Figure 6**).

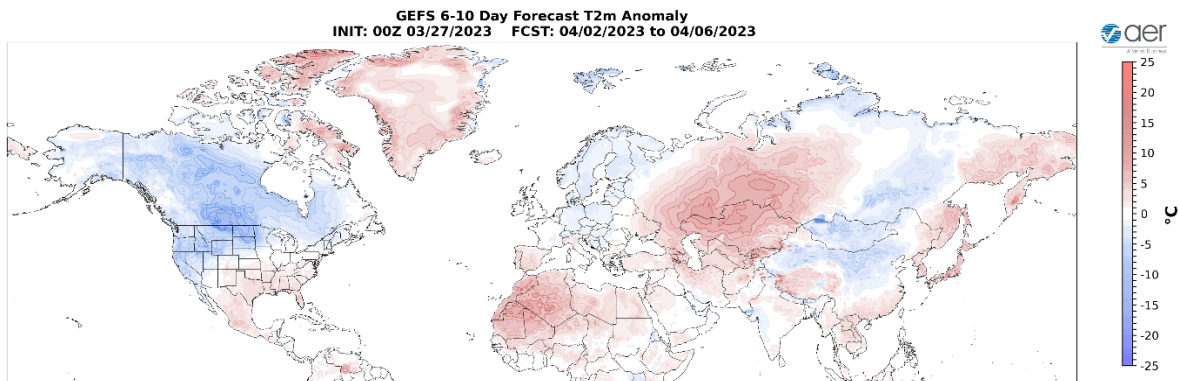


Figure 6. Forecasted surface temperature anomalies ($^{\circ}\text{C}$; shading) from 2 – 6 April 2023. The forecast is from the 00Z 27 March 2023 GFS ensemble.

Persistent ridging/positive geopotential height anomalies centered in the Aleutians will continue to anchor troughing/negative geopotential height anomalies in the Gulf of Alaska, much of Canada and the Western US with more ridging/positive geopotential height anomalies in the Southeastern US this period (**Figure 5**). This pattern favors widespread normal to above normal temperatures across Alaska, much of Canada and the Western and Northern US with normal to above normal temperatures around Baffin Bay and the Southern and Eastern US (**Figure 6**).

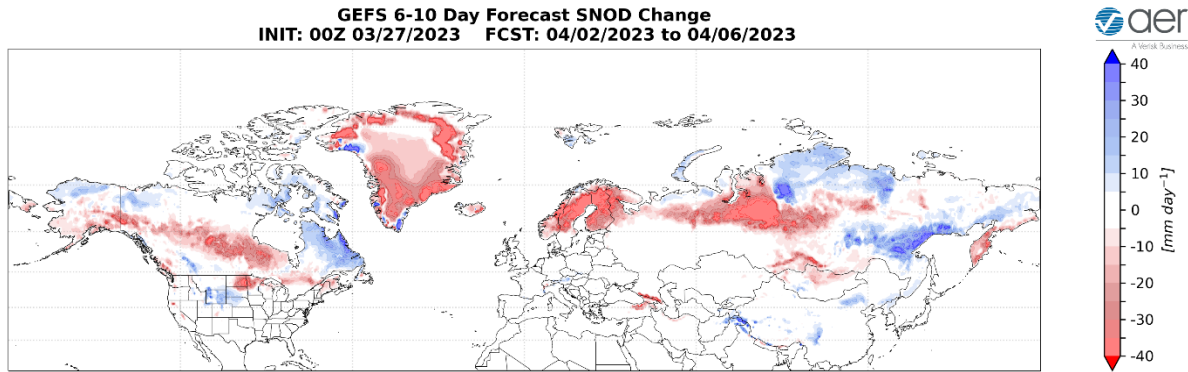


Figure 7. Forecasted snow depth changes (mm/day; shading) from 2 – 6 April 2023. The forecast is from the 00Z 27 March 2023 GFS ensemble.

Trouging and/or cold temperatures will support new snowfall across Siberia while mild temperatures will support snowmelt across the Northern Europe and Northern Asia (**Figure 7**). Trouging and/or cold temperatures will support new snowfall across northern Alaska, Northern Canada and the Western US while mild temperatures will support snowmelt across southern Alaska, Southern Canada and the Northern US (**Figure 7**).

3-4 week

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

GEFS 11-15 Day Forecast 500 hPa Anomaly
INIT: 00Z 03/27/2023 FCST: 04/07/2023 to 04/11/2023

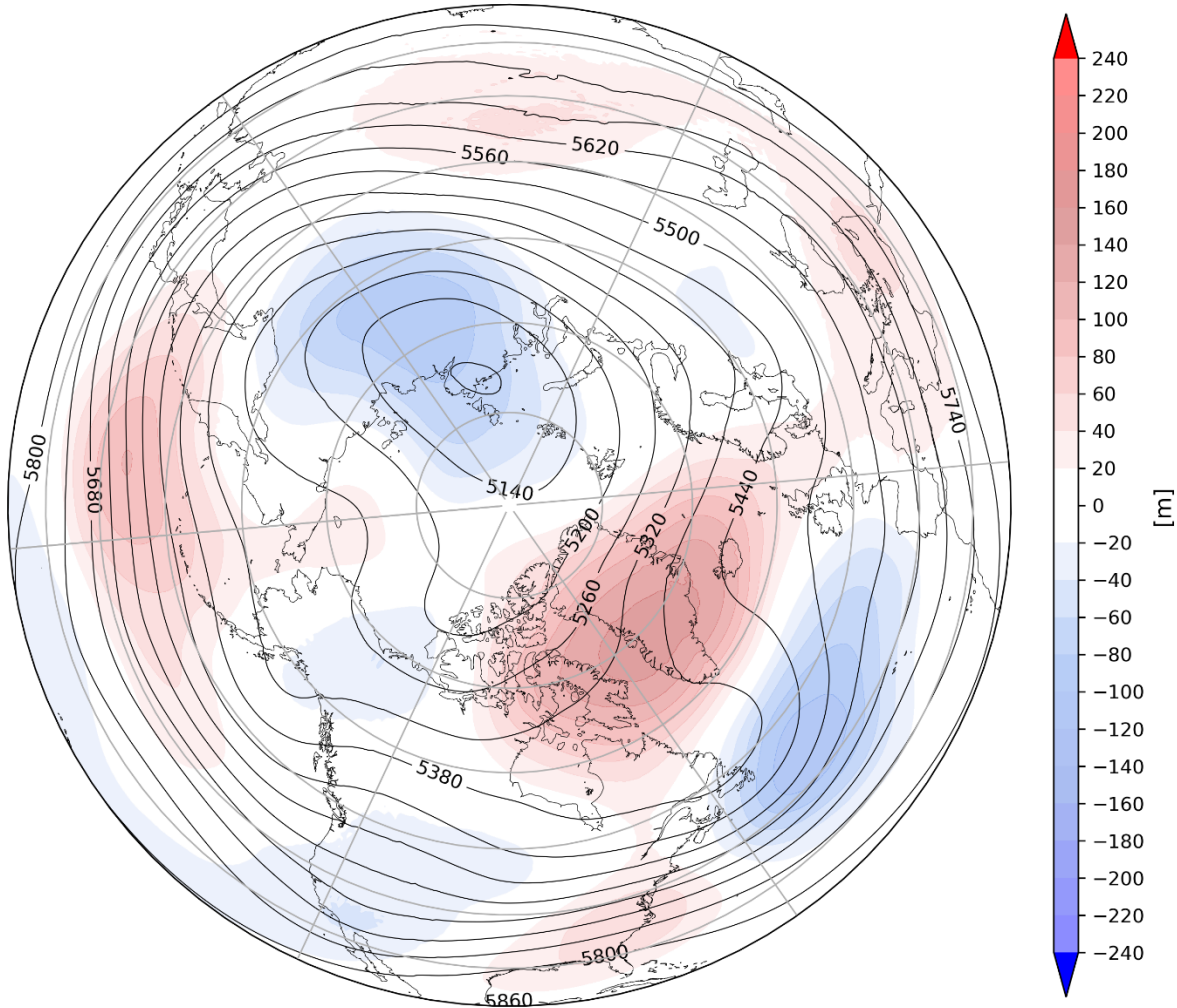


Figure 8. Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere from 7 – 11 April 2023. The forecasts are from the 00z 27 March 2023 GFS ensemble.

Ridging/positive geopotential height anomalies centered across Greenland will continue to support troughing/negative geopotential height anomalies across Northern and Central Europe with ridging/positive geopotential height anomalies across Western and Southern Europe this period (**Figure 8**). This pattern should continue to favor normal to below normal temperatures across Northern and Central Europe with normal to above normal temperatures across Western and Southern Europe including the UK (**Figures 9**). Troughing/negative geopotential height anomalies is predicted to become more widespread across Northern Asia with widespread ridging/positive geopotential height anomalies spread across Southern Asia this period (**Figure 8**). The predicted pattern favors widespread normal to above normal temperatures across much of Asia

and Eastern Siberia with normal to below normal temperatures widespread across Siberia this period (**Figure 9**).

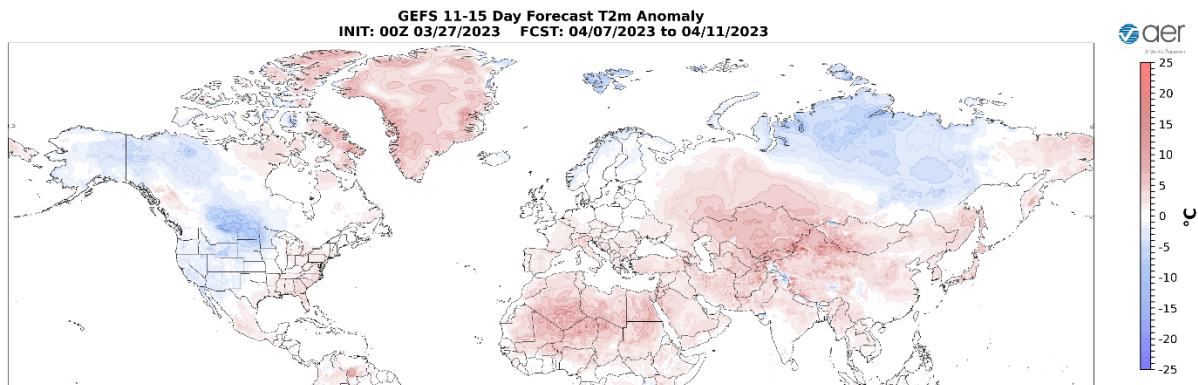


Figure 9. Forecasted surface temperature anomalies ($^{\circ}\text{C}$; shading) from 7 – 11 April 2023. The forecast is from the 00Z 27 March 2023 GFS ensemble.

Persistent ridging/positive geopotential height anomalies centered near the Aleutians will continue to anchor troughing/negative geopotential height anomalies across Alaska, Western Canada and the Western US with ridging/positive geopotential height anomalies across Eastern Canada and the Eastern US this period (**Figure 8**). This pattern favors widespread normal to below normal temperatures across Alaska, Western Canada and the Western US with normal to above normal temperatures across Northeastern Canada and the Eastern US (**Figure 9**).

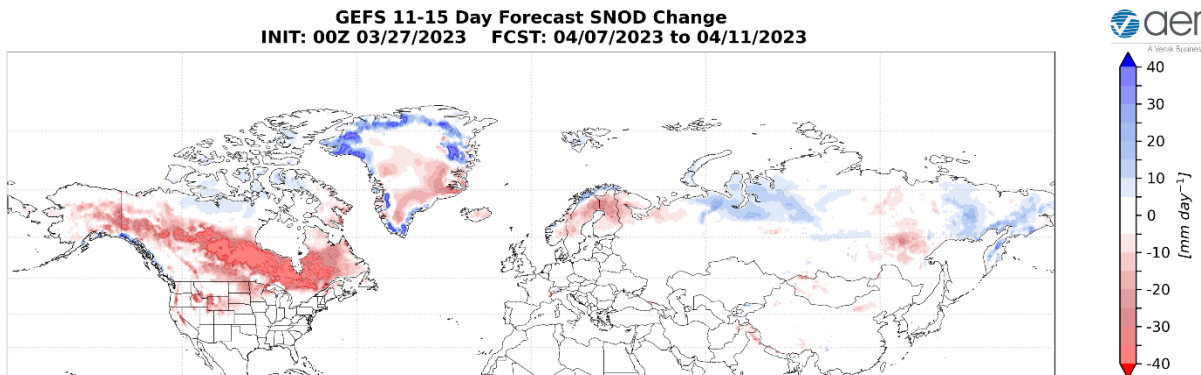


Figure 10. Forecasted snow depth changes (mm/day; shading) from 7 – 11 April 2023. The forecast is from the 00Z 27 March 2023 GFS ensemble.

Troughing and/or cold temperatures will support new snowfall across parts of Northern Scandinavia and Siberia while mild temperatures will support snowmelt across Scandinavia and East Asia (**Figure 10**). Troughing and/or cold temperatures will support new snowfall across the West Coast mountains of Canada while mild temperatures will support snowmelt across Canada and the Northern US (**Figure 10**).

Longer Term

30-day

The latest plot of the polar cap geopotential height anomalies (PCHs) currently shows normal to cold/negative PCHs in the mid to upper stratosphere, warm/positive PCHs in the lower stratosphere and near normal PCHs in the troposphere (**Figure 11**). The warm/positive PCHs in the lower stratosphere are predicted to propagate downward to the surface the very end of March and early April (**Figure 11**). This would be another “drip” of warm/positive PCHs from the stratosphere into the troposphere commonly observed following the major sudden stratospheric warming (SSW) back in mid-February (see **Figure 11**).

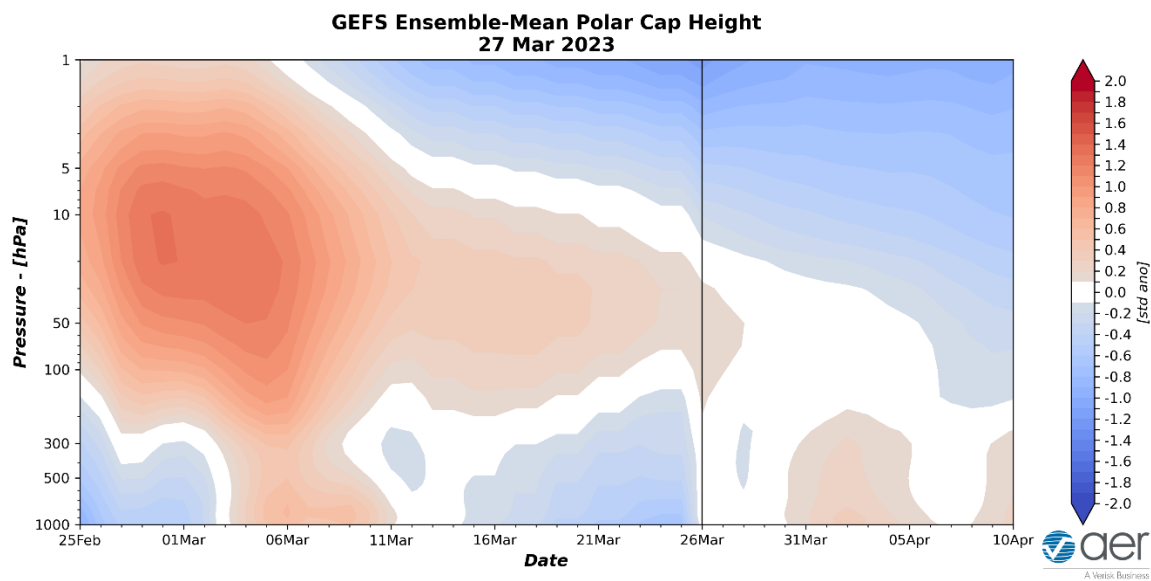


Figure 11. Observed and predicted daily polar cap height (i.e., area-averaged geopotential heights poleward of 60°N) standardized anomalies. The forecast is from the 00Z 27 March 2023 GFS ensemble.

The neutral PCHs in the lower troposphere this week (**Figure 11**) are consistent with the predicted near neutral surface AO (**Figure 1**). However, the AO is predicted to become negative next week (**Figure 1**) coinciding when the warm/positive PCHs in the lower stratosphere are predicted to drip into the troposphere all the way to the surface (**Figure 11**).

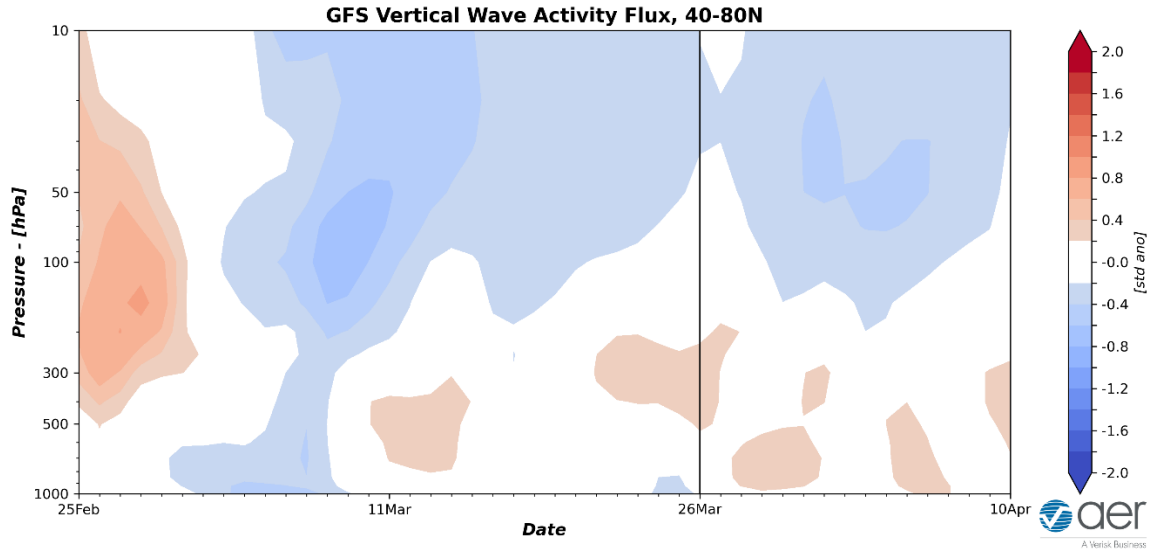


Figure 12. Observed and predicted daily vertical component of the wave activity flux (WAFz) standardized anomalies, averaged poleward of 40-80°N. The forecast is from the 00Z 27 March 2023 GFS ensemble.

The Vertical Wave Activity Flux (WAFz) from the troposphere to the stratosphere or poleward heat transport in the stratosphere has been below normal WAFz since late February and is predicted to remain weak for the next two weeks (**Figure 12**). Below normal WAFz will allow the highly disrupted stratospheric PV to strengthen represented by predicted cold/negative mid to upper to mid-stratospheric PCHs for next two weeks (**Figure 12**).

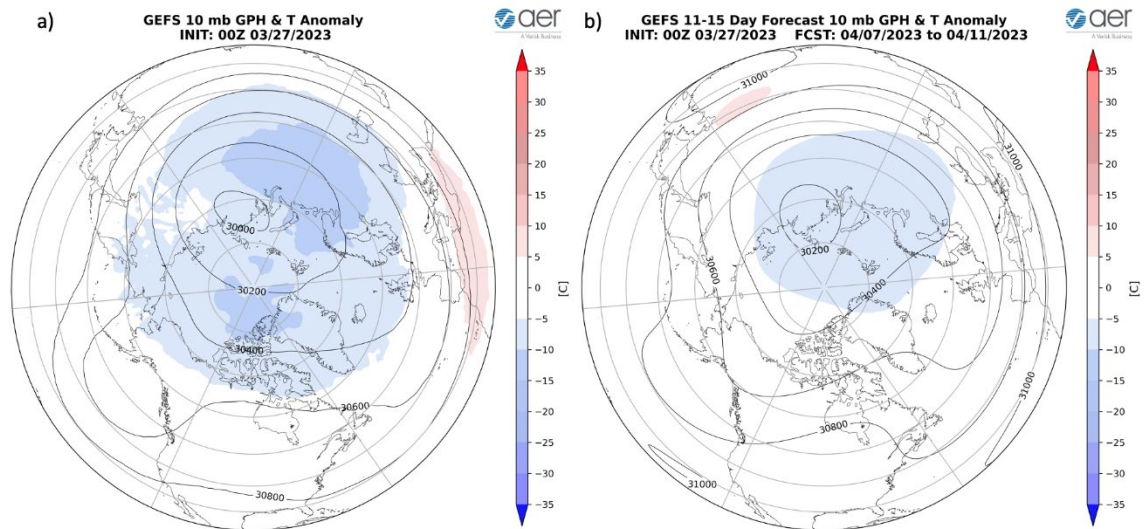


Figure 13. (a) Initialized 10 mb geopotential heights (dam; contours) and temperature anomalies (°C; shading) across the Northern Hemisphere for 27 March 2023. (b) Same

as (a) except forecasted averaged from 7 – 11 April 2023. The forecasts are from the 00Z 27 March 2023 GFS model ensemble.

The extended period of below normal WAFz has allowed the stratospheric PV to reconstitute itself with the PV center over Siberia (**Figure 13a**) with relatively cold temperature anomalies across the Arctic. Meanwhile ridging is mostly absent in the polar stratosphere (see **Figure 13a**). The less active WAFz predicted the next two weeks will allow the PV to persist a while longer, with the PV center remaining in a position over the Laptev Sea/Northern Siberia coupled with relative cold temperatures over the Arctic (see **Figure 13b**). However, the return of the sun over the Arctic will weaken the PV leading to the Final Warming (**Figure 13**) despite the lack of WAFz.

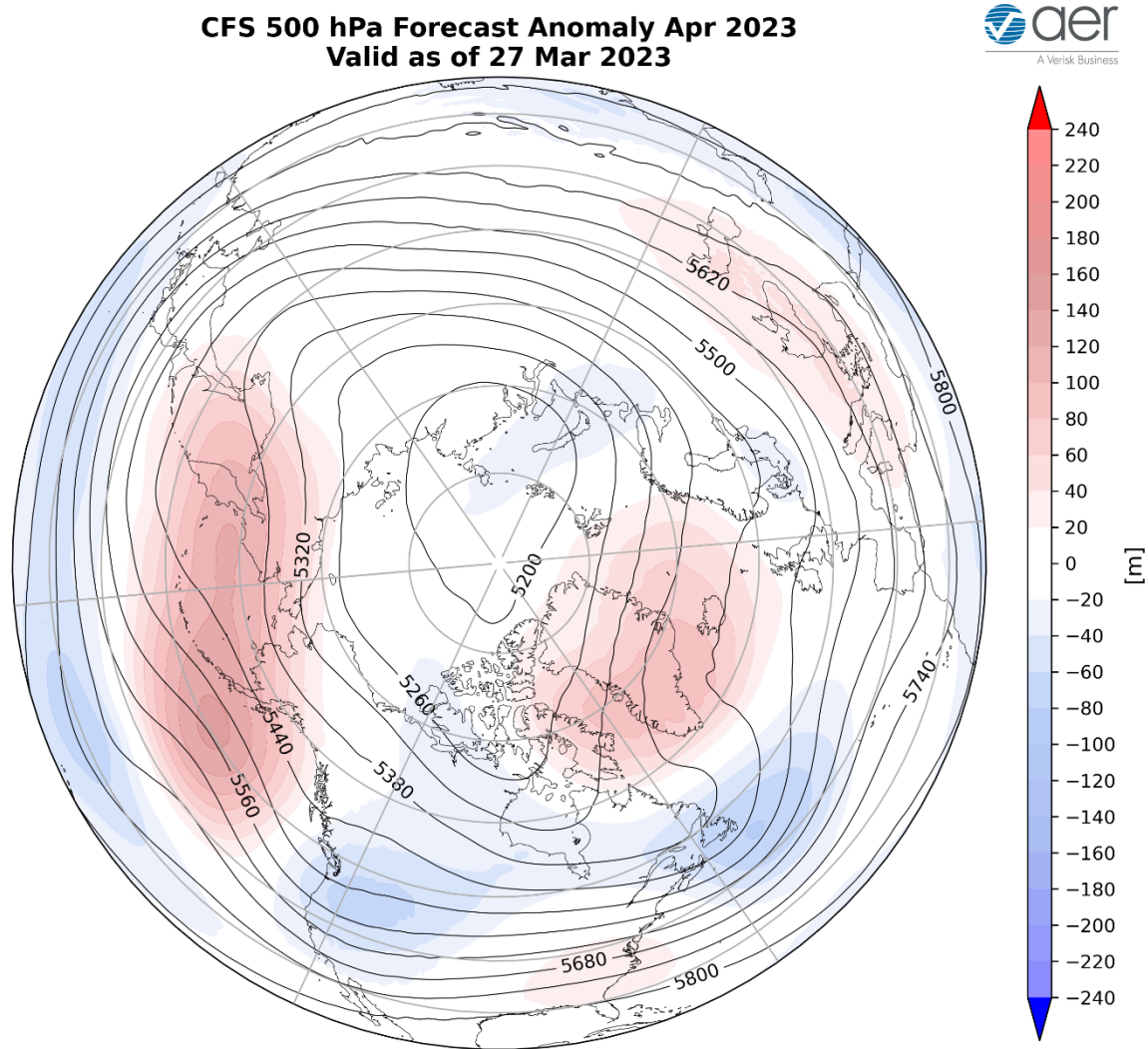


Figure 14. Forecasted average 500 mb geopotential heights (dam; contours) and geopotential height anomalies (m; shading) across the Northern Hemisphere for April 2023. The forecasts are from the 00Z 27 March 2023 CFS.

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

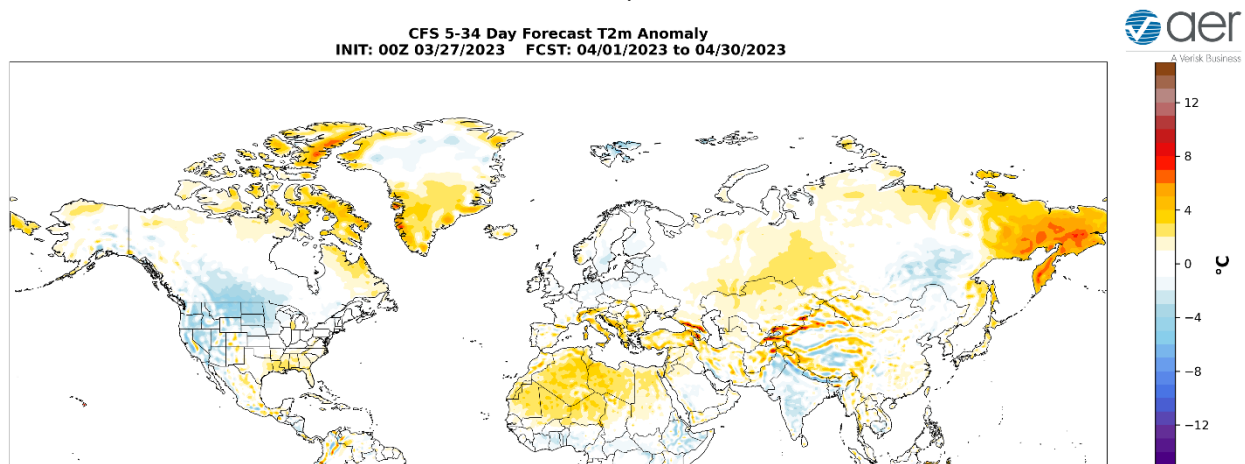


Figure 15. Forecasted average surface temperature anomalies ($^{\circ}\text{C}$; shading) across the Northern Hemisphere for April 2023. The forecasts are from the 00Z 27 March 2023 CFS.

Boundary Forcings

Arctic Sea Ice

Arctic sea ice, which remains below normal (see **Figure 16**). The regions of below normal sea ice is distributed throughout the Arctic.



Figure 16. Observed Arctic Sea ice extent on 26 March 2023 (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 slightly below normal and we continue to observe neutral conditions (**Figure 17**) and neutral conditions are expected through the spring. 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 South Pacific.

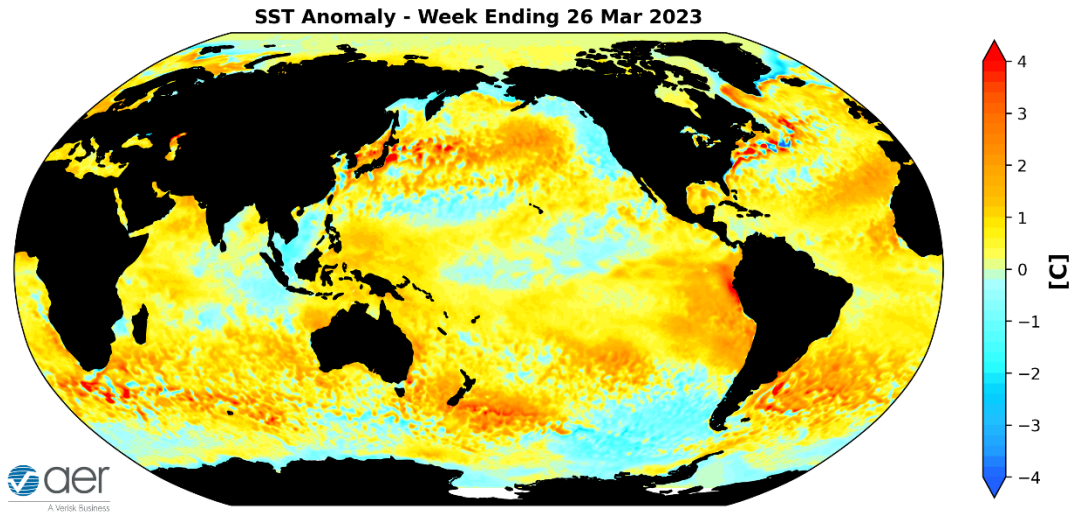


Figure 17. The latest weekly-mean global SST anomalies (ending 26 March 2023). Data from NOAA OI High-Resolution dataset.

Madden Julian Oscillation

Currently no phase of the Madden Julian Oscillation (MJO) is favored (**Figure 18**). The forecasts are for the MJO to remain weak before emerging into phase seven. Phase seven favors troughing near the Aleutians and ridging over North America. Seems that the MJO is not having influence on the weather across North America in the short term. But admittedly this is outside of my expertise.

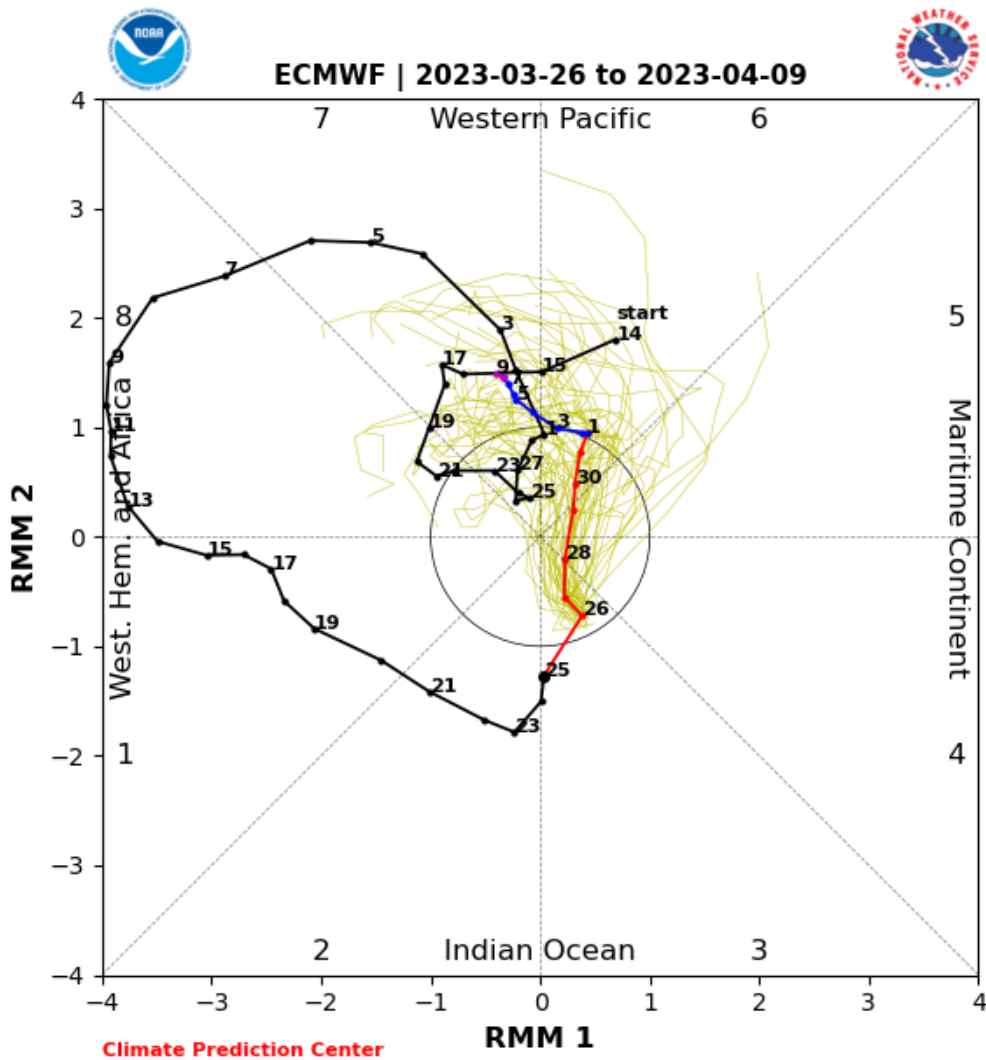


Figure 18. Past and forecast values of the MJO index. Forecast values from the 00Z 26 March 2023 ECMWF model. Yellow lines indicate individual ensemble-member forecasts, with the green line showing the ensemble-mean. A measure of the model “spread” is denoted by the gray shading. Sector numbers indicate 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/clivar_wh.shtml

Snow Cover

Snow cover extent (SCE) anomalies across the NH continued its seasonal decline this past week mostly. Eurasian snow cover continues to be below normal (see **Figure 19**). Snow cover is below normal in Eastern Europe and Western Asia. Snow cover is above normal in North America, especially in the Western US. I expect snow cover to

decrease in the coming weeks, but more slowly across the US with predicted colder weather.

Daily SCE Departure - March 26, 2023 (Day 85)

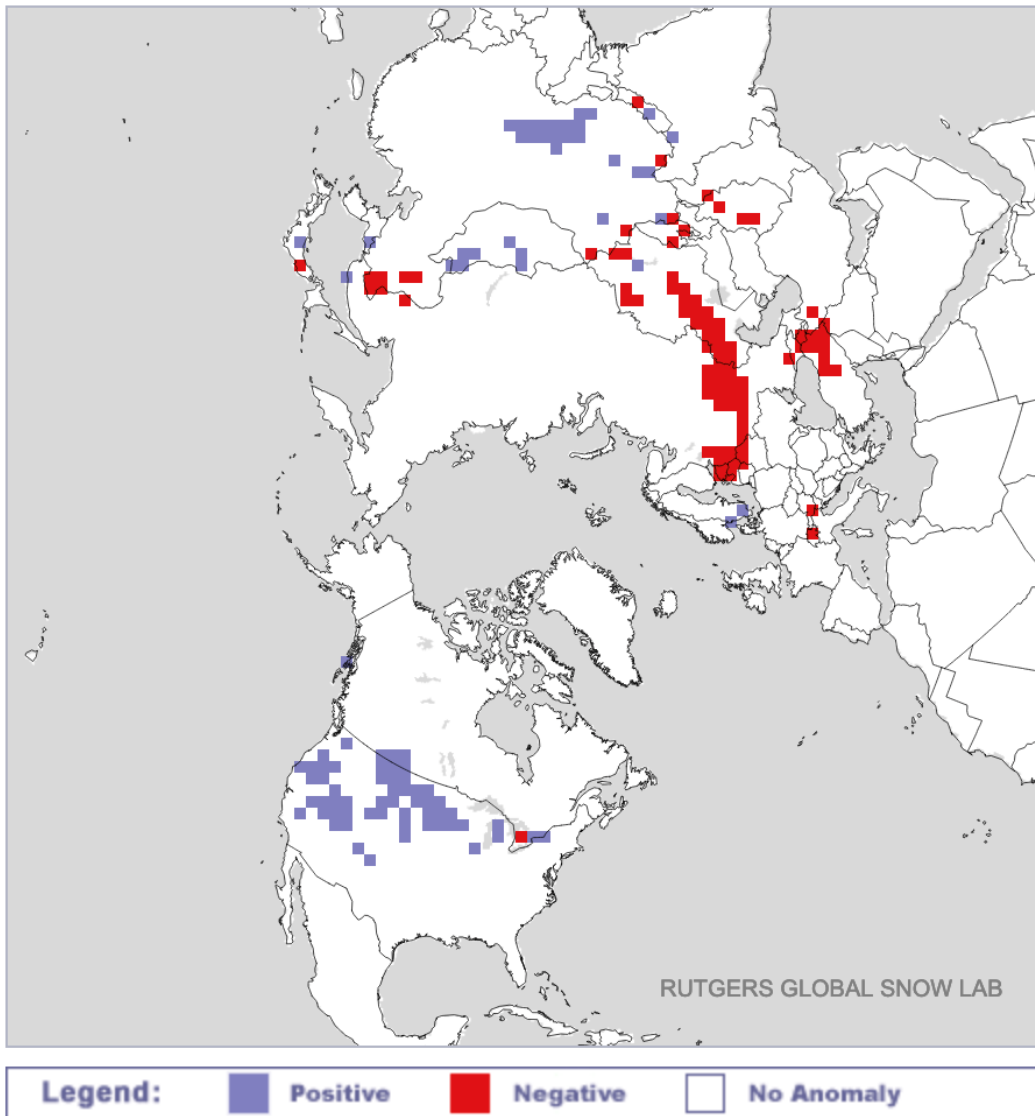


Figure 19. Observed North Hemisphere snow cover anomalies on 26 March 2023. Plot from <http://climate.rutgers.edu/snowcover/index.php>

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!