Area Forecast Discussion: Kamchatka, Russia and St. Paul Island, AK
Date: Tuesday 25 March 2019
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Big Picture Perspective

The stratospheric polar vortex remains over Greenland for the majority of the forecast period with higher heights centered around Alaska, that may support the blocking ridge. As the forecast reaches the extended range there are hints in the GFS of a final warming event (last SSW of the winter season) occurring due to a decrease in the temperature gradient as the NH goes into the warm season. The AO is currently positive but is suggested to become negative, possibly associated with the SSW that may occur in the extended period. Currently the MJO is not active and is forecasted to remain this way with some certainty due to the agreement of GFS ensemble members. The persistent feature in the forecast is a blocking high pressure system situated over Alaska pushing to keep low pressure systems to the south and warm temperatures throughout the polar regions.

Extended Range: Day 7-10

The newly forming cyclone will start to rotate the southerly jet that was supporting the blocking ridge by become more easterly. At the same time, the jet extending farther into the Pacific will allow a cyclone to start forming to the south of the ridge in the poleward exit region. The combination of these things stops the ridge from building even more so the anticyclone will begin to weaken during the period. The southerly jet becoming more easterly will help the cyclone in the western Bering Sea to move northwestward towards the Kamchatka Peninsula, bringing some frozen precipitation with mixed precipitation behind it. Saint Paul Island will also stay dry during this period with slightly warmer than normal 850 mb temperatures. Kamchatka will be dry in the beginning of the period but will have some frozen or mixed precipitation towards the end of the period associated with the cyclone moving into the area.

Medium Range: Day 4-6

The weather in the eastern half of the Bering Sea and Alaska during this period will be dominated by blocking ridge which is forecasted to build throughout the period due to a southerly jet on the upstream side advecting lower planetary vorticity. This block will allow an anticyclone to develop over coastal Alaska and will restrict the numerous cyclones developing during the period to the western half of the Bering Sea. Meanwhile,

a strong cyclone over Kamchatka that was supported by the CVA in the poleward exit region will begin to weaken during the period as the jet streak starts extending farther into the Pacific. However, a deepening shortwave will increase in curvature as it moves into the poleward exit region, allowing another cyclone to form as the first cyclone breaks up. The first weakening cyclone will bring snow to the eastern half of the Kamchatka Peninsula associated with the low surface pressure and onshore flow. Saint Paul Island will stay dry throughout the period with positive 3-4 sigma 850 mb temperature anomalies due to the high pressure and southerly jet in the area.

Short Range: Day 0-3

Prior to the forecast period an omega block dominates the North Pacific keeping the majority of precipitation just south of the Bering Sea. Cyclonic wave breaking at the dynamic tropopause at the start of the forecast contributes to breaking the omega block allowing for a deep low pressure system to propagate northward as well as ridge building over Alaska. The low pressure occludes over Russia after being removed from the upper level forcing created by the jet stream circulation. As it occludes it loses its moisture source from the tropical Pacific as flow becomes more zonal just south of the system. At this same time a ridge continues to build with help from predominantly southerly wind advecting negative f and warm air. This feature brings warmer than average temperatures throughout the Bering Sea region as indicated by the 850-hPa temperature anomalies and 500-hPa height anomalies. Towards the end of the period, anticyclonic wave breaking occurs over Western Canada which acts to collapse the existing ridge. A digging trough develops upstream from Japan bringing in the possibility of precipitation towards the end of day 3.

Probabilistic Forecast

Kamchatka, Russia:

Day 0-3:

Max Temp:	2ºC (10th),	3ºC (50th),	4ºC (90th)
Min Temp:	-4ºC (10th),	-8ºC (50th),	-11ºC (90th)
Precip:	1 mm (10th),	2 mm (50th),	3 mm (90th)

Day 4-6:

Max Temp:	6ºC (10th),	8ºC (50th),	10ºC (90th)
Min Temp:	-1ºC (10th),	-2ºC (50th),	-3ºC (90th)
Precip:	3 mm (10th),	5 mm (50th),	8 mm (90th)

Day 7-10:
Max Temp: 3ºC (10th), 5ºC (50th), 8ºC (90th)
Min Temp: -2ºC (10th), -4ºC (50th), -5ºC (90th)
Precip: 4 mm (10th), 8 mm (50th), 9 mm (90th)

St. Paul Island, AK:
Day 0-3:
Max Temp: 1ºC (10th), 2ºC (50th), 3ºC (90th)
Min Temp: -1ºC (10th), 0ºC (50th), 1ºC (90th)
Precip: 4 mm(10th),8 mm (50th),10 mm (90th)

Day 4-6:
Max Temp: 2ºC (10th), 3ºC (50th), 4ºC (90th)
Min Temp: 0ºC (10th), 1ºC (50th), 1ºC (90th)
Precip: 3 mm (10th), 4 mm (50th), 5 mm (90th)

Day 7-10:
Max Temp: 0ºC (10th), 1ºC (50th), 2ºC (90th)
Min Temp: -2ºC (10th), -1ºC (50th), 0ºC (90th)
Precip: 3 mm (10th), 5 mm (50th), 8 mm (90th)