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The Arctic atmospheric state during the summer of 2007

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The summer of 2007 saw a new record minimum in Artic sea ice extent. In this presentation we will evaluate how the synoptic weather patterns that occurred in the Arctic during the summer of 2007 differed from those observed over the previous 50+ years. We will use the method of self-organizing maps (SOMs) to identify the primary synoptic weather patterns that characterize the Arctic summertime atmospheric state. We will then compare the frequency of occurrence of these weather patterns for all summers, since 1957, to the frequency of occurrence of these patterns for the summer of 2007. Our results indicate a statistically significant increase in weather patterns characterized by anticyclones over the Arctic Ocean and a statistically significant decrease in synoptic patterns characterized by cyclones over the Arctic Ocean. The implications of these changes for forcing the record minimum sea ice extent will be discussed. We will also consider the role that the anomalous sea ice / ocean state may have played in shaping the synoptic weather patterns that were observed during the summer of 2007.