The Siberian High: its relation with northern hemisphere temperature anomalies and the Arctic Oscillation

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The behavior of the sea-level pressure over the area that the seasonal Siberian High affects is examined. A 128-year time series of the sea-level pressure was constructed, as well as its spatial distribution, over the main Siberian High area (70˚E to 130˚E and 40˚N to 70˚N). A Principal Component Analysis (PCA) is used to identify the most significant factors that contribute to the prevailing pressure field patterns. The loadings of the Empirical Orthogonal Functions, are used to help define the physical processes that each PC represents. The first four PCs are dominated respectively by the mean pressure, the N-S pressure gradient, the E-W pressure gradient and the curvature of the pressure field. A new index of the Siberian High has been generated, using a linear model approach, and compared with the Arctic Oscillation. In addition, an investigation was carried out to detect regional teleconnection patterns. Surprisingly strong linkages are found between temperature anomalies over Canada and the pressure patterns (particularly the curvature of the pressure field) within the main Siberian High area.