Session: C5 Poster: M196B

Updated climate divisions for Alaska

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Alaska is vast geographically, located at high latitudes, surrounded on three sides by oceans and has complex topography, therefore encompassing several climate regions. While climate zones exist, there has not been an objective analysis to identify regions of homogeneous climate variability. In this study we use cluster analysis on a robust set of weather observation stations in Alaska to develop climate divisions for the state. Similar procedures have been employed in the contiguous United States and other parts of the world. Cluster analysis was performed on station temperature and precipitation with missing temperature periods filled with adjusted AVHRR surface temperature. The analysis combining the cluster results and human-expert refinement yielded 13 climate divisions in Alaska. Lines were then drawn encompassing the clustered stations following major topographic features. These divisions include the Arctic (bounded by the Brooks Range to the south), a west coast region along the Bering Sea, and three regions in the Interior separated by topography. Divisions south of the Alaska Range were: an area around Cook Inlet, coastal and inland areas along Bristol Bay, south-central coastal areas, the Aleutians, and three in southeast Alaska. Gridded downscaled temperature and precipitation data was employed to validate the division boundaries through correlation analysis. Additional correlation analysis was also employed to investigate if stations correlated better with other division averages than their own. These tests all support the climate divisions found based on our methodology.