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Use of weekly weather clusters to control the cost of the winter service in Iceland

Daily cost data from the Icelandic Road Administration for 2011 - 2015 were analysed and compared to weather data using a new method. Using climate reanalysis for the period 1961 - 2010 six distinct clusters have been defined based on Hovmöller's method. It takes in account the large scale pattern of the 500 hPa around Iceland. Each week got sorted to its respective cluster and cost data for each of the clusters was calculated. The winter service cost is highly depended to the clusters, up to 6 times from the most favorable to the roughest one.

The 500 hPa is often referred to as a steering level to the weather systems of synoptic scale as the mid-latitude low pressures and ridges. On average, Iceland is situated on the eastern fringe of cold higher level trough over eastern Canada. This trough maintains an average WSW wind at this level over Iceland. Fluctuations are of all dimensions in both temporal and spatial fields. The formation, movements and dissipating of mid-latitude systems are strongly connected to the horizontal east propagating planetary Rossby waves near the level of 500 hPa. Depending also to the higher level coherent North Atlantic jet stream.

A multitude of circulation classification methods has been introduced in the literature. In the 1950's the Swedish meteorologist Ernst Hovmöller classified how to use weather types based on the circulation pattern for employing parameters such as temperature or precipitation. Recently, as reanalysis of standardized upper air data is available, there is again focus on such simple statistical methods for classification. It is shown that such a method is valuable for measuring effort and cost of winter service operations and it could benefit the cost probably better than use of widely supported winter-index.