Kurzfassungen der Meteorologentagung DACH
Berlin, Deutschland, 14.–18. März 2016
DACH2016-158

NAO variations and climate change signals from a Self-Organizing Map perspective

E. Rousi, H. Rust, and U. Ulbrich
Freie Universität Berlin, Meteorology, Germany (efi.rousi@met.fu-berlin.de)

North Atlantic Oscillation (NAO) is a basic variability mode of the Northern Hemisphere and it has been long recognized to be significantly affecting the weather and climate of Europe. During the last decades, an eastward shift of the NAO centers of action along with a strengthening of the NAO index and a tendency to more positive values, have been noticed. For these reasons, further studying and understanding of the changing NAO pattern is considered important.
Here, we attempt to capture the different spatial characteristics of the NAO using Self-Organizing Maps (SOMs). SOM is an unsupervised Neural Network approach which appears to be very useful in pattern recognition, since it maps large, multivariate datasets onto a 2-dimensional array of patterns. It can be viewed as a clustering algorithm with an additional topology for the cluster centers. One of the advantages of SOM is that the resulting nodes represent physical patterns of synoptical situations which self-organize in the final array.
We use daily anomalies of 500hPa geopotential height over the Northern Hemisphere, from the ECHAM5 General Circulation Model, for a reference period (1971-2000) and a future period (2071-2100). Results will contain the final SOMs, visualizing different shadings of the typical NAO pattern, along with statistical characteristics regarding the frequency of occurrence of the two NAO phases in present and future simulations.