Intercomparison of mid latitude storm diagnostics (IMILAST) – synthesis of project results

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The analysis of the occurrence of mid-latitude storms is of great socio-economical interest due to their vast and destructive impacts. However, a unique definition of cyclones is missing, and therefore the definition of what a cyclone is as well as quantifying its strength contains subjective choices. Existing automatic cyclone identification and tracking algorithms are based on different definitions and use diverse characteristics, e.g. data transformation, metrics used for cyclone identification, cyclone identification procedures or tracking methods. The project IMI-LAST systematically compares different cyclone detection and tracking methods, with the aim to comprehensively assess the influence of different algorithms on cyclone climatologies, temporal trends of frequency, strength or other characteristics of cyclones and thus quantify systematic uncertainties in mid-latitudinal storm identification and tracking.

The three main intercomparison experiments used the ERA-interim reanalysis as a common input data set and focused on differences between the methods with respect to number, track density, life cycle characteristics, and trend patterns on the one hand and potential differences of the long-term climate change signal of cyclonic activity between the methods on the other hand. For the third experiment, the intercomparison period has been extended to a 30 year period from 1979 to 2009 and focuses on more specific aspects, such as parameter sensitivities, the comparison of automated to manual tracking sets, regional analysis (regional trends, Arctic and Antarctic cyclones, cyclones in the Mediterranean) or specific phenomena like splitting and merging of cyclones. In addition, the representation of storms and their characteristics in reanalysis data sets is examined to further enhance the knowledge on uncertainties related to storm occurrence.

This poster presents a synthesis of the main results from the intercomparison activities within IMILAST.