



Trends and interannual variability of extra-tropical cyclones derived from different diagnostic methods

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One central effort of the IMILAST (Intercomparison of Mid Latitude Storm Diagnostics) project is to assess diagnostic method-induced differences with respect to basic scientific investigations on extra-tropical cyclone characteristics, like trends and variability. Will answers to scientific questions relevant to cyclone studies be sensitive to the specific identification and tracking method applied? Due to differences in the cyclone diagnostic methods used, one would not expect a one-to-one overlap for the identified cyclones. The inter-methods differences could also vary from one cyclone characteristic to another, or for a particular subset of cyclones. For example, the differences in absolute trends in cyclone statistics could be larger than relative measures, and bigger for weak-moderate cyclone statistics than for strong cyclone statistics, etc. and the multi-method spread could be dependent on the intensity of the subset of cyclones investigated.

This presentation focuses on basic trend behaviour and interannual variability of cyclones as diagnosed by different methods. In order to concentrate on inter-method differences, all participating methods have been applied to the same data set, the ERA-Interim reanalysis data for the period 1989-2008. Although a 20-yr period is too short to assess long term (e.g. anthropogenic) trends in cyclone activity, it is useful to see how different/similar the interannual variability and trends in cyclone activity are. Although trends in different cyclone parameters might be small for the period analyzed, an overall agreement of the trends and interannual variability diagnosed by the different methods would strengthen the applicability of those methods for addressing scientific questions. The inter-comparison of trends and variability will be presented for the northern and southern hemispheres, separately.

In general, the inter-methods differences are much less notable in the trend estimates than in the absolute values of cyclone statistics. It is also noted that the methods perform more similarly for the subset of strong cyclones than for weak-moderate cyclones. Discrepancies between the methods are smallest in the regions of identified significant trends, revealing that the basic findings remain robust between the methods. Similar results are achieved with respect to the capability of the methods to identify coherent patterns of the interannual variability.