

The IMILAST project: Evaluation and climatology of explosive developments in ERA Interim

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Extratropical cyclones are one of the most important features in the mid-latitudes. Cyclones which undergo strong intensification within a short time range are of special interest due to their low predictability and hence difficulties in issuing timely early warnings. Cyclones with deepening rates of at least $(24 \cdot \sin\phi / \sin 60^\circ)$ hPa in 24 hours are denoted in the literature as explosive cyclogenesis/developments or simply as bombs. This corresponds to a deepening of 24 hPa in 24 hours at a reference latitude 60° N. For the North Atlantic/Europe region, the vast majority of these bombs achieve their maximum deepening rates over the North Atlantic Ocean. Nevertheless, these fast moving systems can reach Western Europe with outstanding wind strength, causing widespread damage and often human fatalities. Recent examples of such storms are Klaus (24.01.2009) and Xynthia (28.02.2010). Within the IMILAST intercomparison project, Northern Hemisphere cyclones were identified using multiple identification and tracking methods. This enables an evaluation and comparison of bomb climatologies for recent climate conditions based on a comprehensive dataset, which is the special focus here. All tracking approaches were applied to the ERA Interim dataset with 1.5° resolution for the period from January 1989 to March 2009. First, track and evolution of Klaus are compared exemplary amongst the methods. Second, the climatologies of track densities of bombs as well as distributions of their life time and mean core pressure are analysed and compared to the climatology. Finally, the obtained characteristics of bombs (e.g. the relation between the number of bombs vs. total number of cyclones identified, lifetimes displacement velocities, distribution of intensity parameters) are compared among the different approaches and analysed for seasonality. First results show that the number of bombs varies significantly between approaches. This fact is associated with the length of cyclone tracks, which may be quite different depending on the approach.