

The IMILAST project: The variability of cyclogenesis, cyclolysis, system and track density in the Southern Hemisphere associated with different tracking methods

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In this study we compare a set of ten different cyclone track datasets for the Southern Hemisphere (SH) in terms of the spatial and temporal variability of some important mid-latitude storm characteristics: cyclogenesis (birth), cyclolysis (decay), system density and track density (based on the location of a storm track at its mid-life). The major zone of interest is 30-70°S and includes areas of activity around the Antarctic coast. The datasets for this comparison were provided by the IMILAST team and comprise sets of extratropical cyclones that were identified and tracked from 6-hourly ERA-Interim 1.5x1.5° global mean sea level pressure (and in one case 850 hPa geopotential height) over a period of at least 20 years. We restrict our analysis to SH summer (December-February) and winter (June-August). Despite large differences in a characteristic e.g. system density, between a given pair of individual methods there are large regions of similarity. The various methods treat cyclones over high topography in different ways (some exclude systems altogether) and this leads to much inconsistency over and around Antarctica. However some regions like the Ross Sea bear a similar signature in many methods as well as areas in the Southern and Indian Oceans. Likewise, the inter-annual variability shows regions of concordance over the hemisphere. In conclusion, despite the often large differences between the results from the various tracking methods, there are large regions of similarity in cyclone properties over the SH.