Visualisation of the impact of the recently discovered NWP remapping problem for PPS 1.1.

Evaluating the impact of the NWP remapping problem (discovered 4 July 2007)on officially released polar CM-SAF products is not easy since it evidently requires a substantial reprocessing of CM-SAF products. However, we can get an idea of the importance by studying some of the results that recently have been produced at SMHI in relation to a study on the impact on e.g. the CFC product of using different NWP models. It was in this study that the problem was first discovered and also solved. Thus, we can use the results achieved here as an illustration of the importance of this problem.

Figure 1 below displays results of the fractional cloud cover product (CFC) summarised as monthly means during one full year (June 2004 to May 2005) and for three different versions concerning the used NWP model input for PPS. Results are compiled as area means over the Baltrad1km area (covering Scandinavia and parts of Central Europe) based on only a few NOAA overpasses per month (typically 6 overpasses). These results are valid for a correctly implemented PPS 1.1 version, thus without the discovered remapping problems (due to an error in the PPS grib configuration) for the GME model.

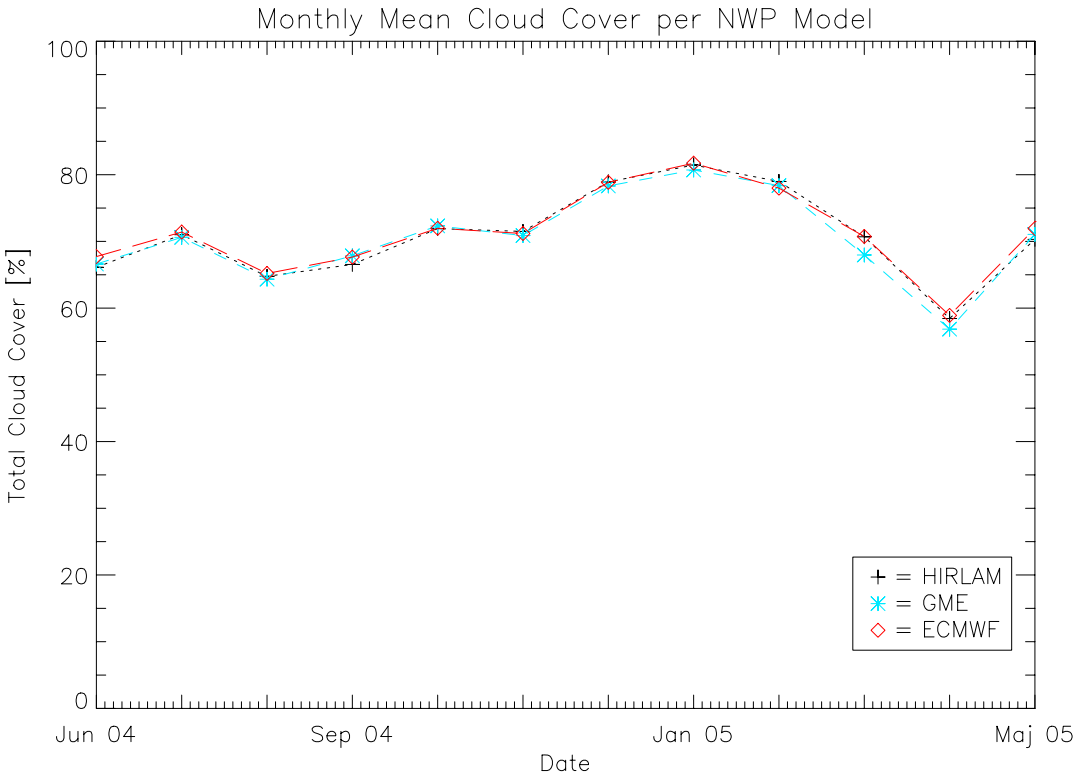

Figure 1. *Monthly mean cloud cover (the CM-SAF CFC product) over the Baltrad1km area in the period June 2004 to May 2005 computed from PPS 1.1 results using three different NWP input data sources; HIRLAM, GME and ECMWF.*

We notice that differences between the three curves are very small. This is very encouraging and shows that PPS results are generally only marginally sensitive to the chosen NWP model for defining essential PPS input data.

The same plot as in Figure 1 but with the incorrectly configured PPS 1.1 version is displayed in Figure 2 below. We notice immediately that results based on GME data are now deviating significantly, especially for some seasons (summer and winter). Maximum deviations are found for August 2004 (+11 %) and for February-March 2005 (+8 %). This is logical in the sense that it is in these seasons we should expect the largest surface temperature differences between the studied region and the corresponding misprojected region (i.e., a region in the southern Pacific Ocean close to the Antarctic). For the spring and autumn seasons temperature differences are much smaller and, consequently, the impact on PPS results is much smaller.

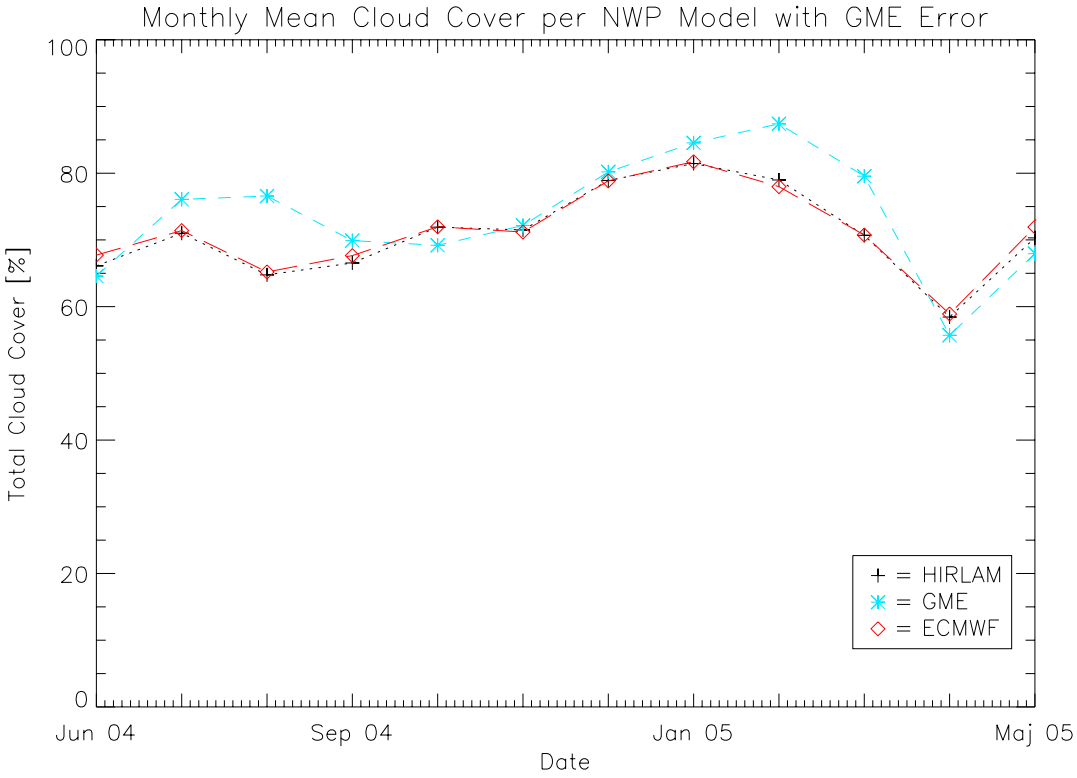

Figure 2. *Monthly mean cloud cover (the CM-SAF CFC product) over the Baltrad1km area in the period June 2004 to May 2005 computed from PPS 1.1 results using three different NWP input data sources; HIRLAM, GME and ECMWF. However, notice that PPS results are here calculated using an incorrect remapping of GME model fields.*

Conclusions: With an incorrect NWP configuration of PPS version 1.1 we will get a serious error in the seasonal variation of cloudiness. Errors appear to become significant (potentially more than 10 % in cloud amount units for some seasons) which calls for a reprocessing of PPS results.

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