Simultaneous Dobson and Brewer observations of total ozone (TOZ) from the Solar and Ozone Observatory (SOO) of the Czech Hydrometeorological Institute (CHMI) at Hradec Kralove demonstrate systematic seasonal deviations. To eliminate these differences before trend estimations are performed it was necessary to create a representative data set of ozone effective temperature (TOef). Temperature at 100, 50 and 20 hPa pressure levels from radiosonde measurement performed by CHMI were combined with the ERA-40 and ERA-Interim re-analysis. By comparison with the ozone sounding profiles taken in Praha it was found out that the temperature at 20 hPa (T20) gives the best approximation of TOef.

Two independent methods of assimilation of the Dobson and Brewer data series were tested. The first comes from the multi-regression model (transfer function) which corrects the Dobson TOZ using the slant path ozone and T20 as the proxies. The second method is based on the absolute Langley Plot calibration of the Dobson spectrophotometer from SOO performed at the Izana Observatory in Spain and on adjustment of its calibration coefficients to the Brewer reference. The tests showed that both methods give fully equivalent results in reduction of the seasonal differences of TOZ to 0.5-1% that is well below the calibration threshold of the spectrophotometers. By means of the transfer function the assimilated data set of TOZ was created for Hradec Kralove of the 50-year period 1961-2010 that will be used for estimation of long-term changes of the ozone layer and their relation to the UT/LS dynamics over Central Europe.