**Climate
of the Past
Discussions**

Interactive comment on "Increasing cloud cover in the 20th century: review and new findings in Spain" *by* A. Sanchez-Lorenzo et al.

Anonymous Referee #1

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Review of: Sanchez-Lorenzo, Cabo, and Wild, Increasing cloud cover in the 20th century: Review and new findings in spain. April 2012

General Comment

This work serves as an excellent example of how to use historical weather and climate data to build and analyze a quasi-homogeneous time series of total cloud cover. The authors have found digitized historic climate data from various incarnations of the Spanish weather service (AEMET) and have developed a simple and appropriate routine to homogenize cloud data that was gathered using different formats. Their analysis shows that total cloud cover was increasing over spain from the late 1800's through the 1960's, and has been decreasing since. They also use principal component analysis to separate out climatologically similar regions. This work could (should) be used as a

template for looking farther into past climate records in many nations, as records have only been homogeneous across most national boundaries after the 1970's.

Specific Comments

1) Would it be possible to analyze the truly homogeneous stations in individual groups, and then to compare these sub-analyses to the single time series shown? I envision a plot consisting of the single curve at the top of Figure 4 along with time series of stations that only reported in tenths, oktas, or clear/overcast format. Showing agreement between these time series prior to homogenization would be helpful. This might be similar to Figure 2b, but with the 'true' TCC curve divided into multiple curves, each based on truly homogeneous data.

2) Spatial averaging (projecting stations onto a uniform grid, creating grid-box averages, then averaging grid-boxes) may help reduce bias in the time series. This may not be much of a factor, since the chosen stations are fairly well-distributed, but the current time series is slightly biased towards more densely sampled areas.

3) On page 1136 on line 26, you say that Warren et al uses 54000 stations, however that study actually only uses 5400 stations.

Interactive comment on Clim. Past Discuss., 8, 1133, 2012.