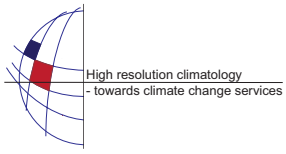
EMS Annual Meeting Abstracts
Vol. 7, EMS2010-324, 2010
10th EMS / 8th ECAC



A global dataset of self-calibrating Palmer Drought Severity Index dataset

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Global maps of monthly self-calibrating Palmer Drought Severity Index (scPDSI) have been calculated for the period 1901-2009 with a spatial resolution of $0.5° \times 0.5°$. The scPDSI is a convenient means of describing the spatial and temporal variability of moisture availability and is based on the more common Palmer Drought Severity Index. The scPDSI improves upon the Palmer Drought Severity Index by maintaining a consistent behaviour of the index over diverse climatological regions. This makes spatial comparisons of scPDSI values on continental scales more meaningful.

Potential evapotranspiration (PET) is one of the inputs to the Palmer Drought Severity Index. This scPDSI dataset uses the realistic Penman-Monteith estimate for PET rather than the commonly used Thornthwaite method. In this presentation, the impact of using either one of these PET-estimates in calculated actual evapotranspiration and in the scPDSI values is assessed.

The traditional Palmer Drought Severity Index assumes all precipitation to be in the liquid phase. To represent the impact of seasonal snow cover on the water budget, a simple snow accumulation and snow melt model is added to the waterbalance calculations on which the self-calibrating Palmer Drought Severity Index is based. The impact of this additional feature on estimates of the scPDSI is discussed.

By substituting climatological monthly mean values for PET, from the period 1961-1990, for the actual monthly means of potential evaporation, an estimate is made of the direct effect of climate change, and in particular the increase in temperature, on drought.

The scPDSI with these additional features (Penman PET and a simple snow-melt model) makes the calculations more realistic. It is hoped that they will be more widely used outside the United States, as the approach provides a very convenient means of online drought monitoring.