



Evaluating the performance of CCD Satellite Rainfall Estimates over the Nile Basin

Doaa Amin (1)

(1) Doaa Amin, Nile Forecast Center, Ministry of Water Resources and Irrigation, Egypt (doaa_amin74@yahoo.com), (2) Yehia Kamal, Faculty of Engineering, Ain Shams University, Cairo, Egypt (Kyehia001@hotmail.com), (3) Mohamed Nour, Faculty of Engineering, Ain Shams University, Cairo, Egypt (mhmdnour2@gmail.com), (4) Mohamed Elshamy, Resources Planning and Management Project, Nile Basin Initiative, Egypt (meame_69@yahoo.com), (5) Ashraf El-Moustafa, Faculty of Engineering, Ain Shams University, Cairo, Egypt (elmoustafa010@yahoo.com)

Rainfall is probably the most important input to hydrologic models and the most uncertain of them as well. Rainfall has high variability in space and time in general, and over the Nile basin in particular due to the lack of adequate surface-based rainfall monitoring networks. Using satellite imagery provides a solution to develop rainfall estimates over the Nile basin in light of the shortage of the rainfall gauge data. In this paper, the rainfall estimate from a 10yr (1997-2006) continuous stream of real-time satellite data from the European METEOSAT satellite positioned over Africa has been evaluated through comparison with the gauge-based CRU rainfall data. The satellite estimate is based on the Cold Cloud Duration (CCD) technique utilizing the infra-red band imagery (i.e. a single channel) only. The common error measures Root Mean Squared Error (RMSE) and Mean Absolute Error (MAE) were used in this study as they give together a better picture about the performance. The evaluation is done on a monthly scale (5km x 5km). This paper also discusses the methodology of using a multi-spectral technique which uses more satellite imagery bands provided by the METEOSAT Second Generation Satellite (MSG) launched in 2005. It is expected that this method will give better rainfall estimates but this is subject to evaluation in subsequent work.