

**REFERENCES****EVALUATING GEWEX CSES'  
SIMULATED LAND-SURFACE WATER  
BUDGET COMPONENTS**

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**References**

Fekete, B. M., C. J. Vorosmarty and W. Grabs, 2000. Global, Composite Runoff Fields Based on Observed River Discharge and Simulated Water Balances. *GRDC Report 22*. Also available on line [www.grdc.sr.unh.edu/html/Data/runoff.zip](http://www.grdc.sr.unh.edu/html/Data/runoff.zip).

Gibson, J. K., P. Kallberg, S. Uppala, A. Hernandez, A. Normura and E. Serrano, 1997. ERA description. *ECMWF Re-Analysis Project Report Series 1*, 72pp.

Henderson-Sellers, A., P. Irannejad, A.J. Pitman and K. McGuffie, 2003. Predicting Land-surface Climates - Better Skill or Moving Targets? *GRL*. (submitted)

Henderson-Sellers, A., A.J. Pitman, P. Irannejad and K. McGuffie, 2002. Land surface simulations improve atmospheric modelling. *EOS*, 83(13), p. 145 and 152.

Henderson-Sellers, A., K. McGuffie and A.J. Pitman, 1996. The Project for the Intercomparison of Land-surface Parameterization Schemes: 1992-1995. *Climate Dyn.*, 12, 849-859.

Henderson-Sellers, A., A.J. Pitman, P. K. Love, P. Irannejad and T. H. Chen, 1995. The Project for Intercomparison of Land-surface (PILPS): Phase 2 & 3. *Bull. Amer. Meteor. Soc.* 73, 1962-1970.

Huffman, G. J., R. F. Adler, B. Rudolf, U. Schneider and P. R. Keehn, 1995. Global precipitation estimates based on a technique for combining satellite-based estimates, rain gauge analysis, and NWP model precipitation information. *J. Clim.*, 8, 2810-2823.

Irannejad, P., S. Sharmeen and Henderson-Sellers, 2003. Importance of land-surface parameterisation for latent heat simulation in global atmospheric models. *GRL*. (submitted)

Kanamitsu, M., W. Ebisuaki, J. Woolen, S. Yang, J.J. Hnilo, M. Fiorino and G.L. Potter, 2002. NCEP/DOE AMIP-II Reanalysis (R-2). *Bull. Amer. Meteor. Soc.*, 83, 1631-1643.

Kistler, R., E. Kalnay, W. Collins, S. Saha, G. White, J. Woollen, M. Chelliah, W. Ebisuzaki, M. Kanamitsu, V. Kousky, H. van den Dool, R. Jenne, and M. Fiorino, 2001. The NCEP-NCAR 50-Year Reanalysis: Monthly Means CD-ROM and Documentation. *Bull. Amer. Meteor. Soc.*, 82, 247-268.

Legates, D. R. and C. J. Willmott, 1990. Mean Seasonal and Spatial Variability in Gauge-Corrected, Global Precipitation. *Int. J. Climatol.*, 10, 111-127.

Liang, X., D. P. Lettenmaier, E. F. Wood and S. J. Burges, 1994. A Simple hydrologically Based Model of Land Surface Water and Energy Fluxes for GSMs. *J. Geophys. Res.*, 99(D7), 14, 415-14,428.

Nijssen, B., R. Schnur and D. P. Lettenmaier, 2001. Global retrospective estimation of soil moisture using the VIC land surface model, 1980-1993. *J. Climate*, 14(8), 1790-1808.

Phillips, T.J., A. Henderson-Sellers, P. Irannejad, K. McGuffie and H. Zhang, 2002. AMIP II diagnostic subproject 12: Land-surface processes and parameterisations (a joint AMIP/PILPS project). Accessible online at <http://www-pcmdi.llnl.gov/pilps3/proposal/>.

Robock, A. et al., 2003. Evaluation of the North American Land Data Assimilation System over the Southern Great Plains during the warm season. *J. Geophys. Res. - Atm.* (submitted).

Wood, E. F., D.P. Lettenmaier, X. Liang, D. Lohmann, A. Boone et al., 1998. The Project for Intercomparison of Land-surface Parameterization Schemes (PILPS) Phase 2(c) Red-Arkansas river basin experiment: 1. Experiment description and summary intercomparisons. *Global and Planetary Change*, 19, 115-135.

Xie, P. P. and Arkin, P. A. 1997. Global precipitation: A 17-year monthly analysis based on gauge observations, satellite estimates, and numerical model outputs. *Bull. Amer. Meteor. Soc.*, 78, 2539-2558.0

## SPATIAL VARIABILITY OF ASSIMILATED SOIL-MOISTURE FIELDS

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### References

Bonan, G.B., 1996. Land Surface Model (LSM version 1.0) for ecological, hydrological and atmospheric studies: Technical description and user's guide NCAR Technical note, NCAR/TN-417+STR.

Famingleitti, J.S., Devereaux, A., Laymon, C.A., Tsegaye, T., Houser, P.R., Jackson, T.J., Graham, S.T., Rodell, M., van Oevelen, P.J., 1999. Ground-based investigation of soil moisture variability within remote sensing footprints during the Southern Great Plains 1997 (SGP97) Hydrology Experiment. *Water Resources Research*, 35(6), pp 1839-1851.

Grewal, M.S., and Andrews, A.P., 1993. Kalman Filtering: Theory and Practice, Printice-Hall Inc.

Jackson, T.J., 1999. Soil Moisture Mapping at Regional Scales Using Microwave Radiometry: The Southern Great Plains Hydrology Experiment. *IEEE Trans. Geosci. Remote Sens.*, Vol. 37, No. 5.

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## CMORPH: A NEW HIGH-RESOLUTION GLOBAL PRECIPITATION ANALYSIS SYSTEM

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### References

Ferraro, R. R., N. C. Grody and G. F. Marks, 1994. Effects of surface conditions on rain identification using the SSM/I. *Remote Sensing Reviews*, 11, 195-209.

Kummerow, C., Y. Hong, W.S. Olson, S. Yang, R.F. Adler, J. McCollum, R. Ferraro, G. Petty, D.B. Shin, and T.T. Wilheit, 2001. The evolution of the Goddard Profiling Algorithm (GPROF) for rainfall estimation from passive microwave sensors. *J. Appl. Meteor.*, 40, 1801-1820.

Miller, S. W., P. A. Arkin, and R. J. Joyce, 2001. A combined microwave/infrared rain rate algorithm. *Int. J. Remote Sensing*, 22, 3285-3307.

Turk, J., E. Ebert, H.-J. Oh, B.-J. Sohn, V. Levizzani, E. Smith and R. Ferraro, 2003. Validation of an operational global precipitation analysis at short time scales. *Preprints of the 12<sup>th</sup> Conference on Satellite Meteorology and Oceanography*, Long Beach, CA, 9-13 February, 2003.

Vincente, G. A., 1994: Hourly retrieval of precipitation rate from the combination of passive microwave and infrared satellite measurements. Ph.D. dissertation, Univ. Wisconsin, Madison, WI, U.S.A.

Weng, F.W., L. Zhao, R. Ferraro, G. Pre, X. Li and N.C. Grody, 2003. Advanced Microwave Sounding Unit (AMSU) cloud and precipitation algorithms, In Press, Radio Sci.

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## SOIL MOISTURE OBSERVATIONS FROM THE OKLAHOMA MESONET

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### References

Basara, J. B., and T. M. Crawford, 2000. Improved installation procedures for deep layer soil moisture measurements. *J. Atmos. Oceanic Technology*, 17, 879-884.

Basara, J. B., and K. C. Crawford, 2002. Linear relationships between root-zone soil moisture and atmospheric processes in the planetary boundary layer. *J. Geophys. Res.*, 107, (ACL 10) 1-18.

Brock, F. V., K. C. Crawford, R. L. Elliott, G. W. Cuperus, S. J. Stadler, H. L. Johnson, and M. D. Eilts, 1995. The Oklahoma Mesonet: A technical overview. *J. Atmos. Oceanic Technology*, 12, 5-19.

Illston, B. G. and J. B. Basara, 2003. Analysis of short term droughts in Oklahoma. *EOS, Trans., AGU*, 84, 157, 161.

Illston, B. G., 2002. Climatological influences on the seasonal variation of soil moisture using the Oklahoma Mesonet. M.S. Thesis, School of Meteorology, University of Oklahoma, 78 pp.

Reece, C. F., 1996. Evaluation of a line heat dissipation sensor for measuring soil matric potential. *Soil Sci. Soc. Am. J.*, 60, 1022-1028.

Robock, A., L. Luo, E. F. Wood, F. Wen, K. E. Mitchell, P. R. Houser, J. C. Schaake, D. Lohmann, B. Cosgrove, J. Sheffield, Q. Duan, R. W. Higgins, R. T. Pinker, J. D. Tarpley, J. B. Basara, and K. C. Crawford, 2003. Evaluation of the North American Land Data Assimilation System over the Southern Great Plains during the warm season. *J. of Geophysical Research - Atmospheres*, in review.

Shafer, M. A., C.A. Fiebrich, D. S. Arndt, S. E. Fredrickson, and T. W. Hughes, 2000. Quality assurance procedures in the Oklahoma Mesonet. *J. Atmos. Oceanic Tech.*, 17, 474-494.

Starks, P. J., 1999. A general heat dissipation sensor calibration equation and estimation of soil water content. *Soil Sci.*, 164, 655-661.

**GLOBAL PRECIPITATION  
OBSERVATIONS FROM THE  
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**GLASS WORKSHOP ON THE PILPS  
CARBON EXPERIMENT**

**6-7 May 2003  
Gif sur Yvette, France**

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**References**

Ferraro, R.R. and G.F. Marks, 1995. The development of SSM/I rain-rate retrieval algorithms using ground-based radar measurements. *J. of Atmospheric Oceanic Technology*, 12, 755-770.

Hsu, K., X. Gao, S. Sorooshian, and H.V. Gupta, 1997. Precipitation estimation from remotely sensed information using artificial neural networks. *J. Applied Meteorology*, Vol. 36(9), 1176-1190.

Hsu, K., H.V. Gupta, X. Gao, and S. Sorooshian, 1999. Estimation of physical variables from multiple channel remotely sensed imagery using a neural network: application to rainfall estimation. *Water Resources Research*, 35(5), 1605-1618.

Janowiak, J.E., R.J. Joyce, and Y. Yarosh, 2000. A real-time global half-hourly pixel resolution infrared dataset and its applications, *Bull. Amer. Meteor. Soc.*, 82, 205-217.

Kummerow, C., W. Barnes, T. Kozu, J. Shiue, and J. Simpson, 1998. The tropical rainfall measurement mission (TRMM) sensor package. *J. Atmospheric Oceanic Technology*, 15, 809-816.

Kummerow, C., J. Simpson, O. Thiele, W. Barnes, A.t.c. Cgang, E. Stocker, R.F. Adler, A. Hou, R. Kakar, F. Wentz, P. Ashcroft, T. Kuzu, Y. Hong, K. Okamoto, T. Iguchi, H. Kuroiwa, E. Im, Z. Haddad, G. Huffman, B. Ferrier, W.S. Olson, E. Ziper, E.A. Smith, T.T. Wilheit, G. north, T. Krishnamurti, and K. Nakamura, 2000. The status of the tropical rainfall measuring mission (TRMM) after two years on orbit. *J. Applied Meteorology*, 39, 1965-1982.

Sorooshian, S., 1997. Precipitation estimation from remotely sensed information using artificial neural network models, *GEWEX News*, Vol 7, No 2, 1, 7-8.

Sorooshian, S., K. Hsu, X. Gao, H.V. Gupta, B. Imam, and D. Braithwaite, 2000. Evaluation of PERSIANN system satellite based estimates of tropical rainfall. *Bull. Amer. Meteor. Soc.*, 81, 2035-2046.

Sorooshian, S., X. Gao, K. Hsu, R.A. Maddox, Y. Hong, H.V. Gupta, and B. Imam, 2002. Diurnal variability of tropical rainfall retrieved from combined GOES and TRMM satellite information. *Journal of Climate*, 15(9), 983-1001.

**References**

Viovy, N. 2002. Coupling chemistry and physics in the terrestrial biosphere: PILPS-C1 experiment. *GEWEX News*, Vol 12, No 3 p 8.

Willmott C.J. 1981 On the validation of models. *Physical geography* 2(2): 184-194.