Supplementary material

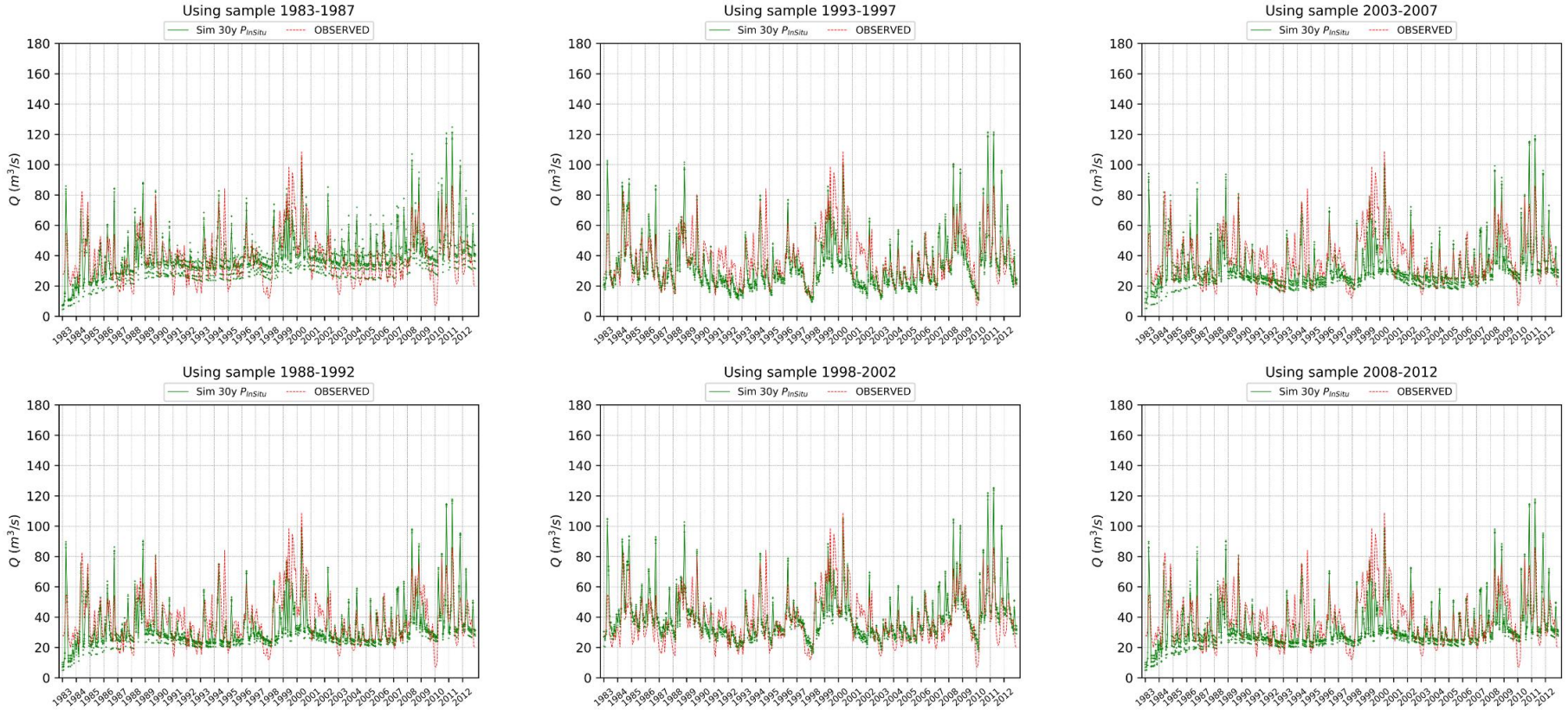

Figure S1. Observed and simulated Coello River discharge with 30 years (1983-2012) of In-Situ precipitation (Sim 30y $P_{In-Situ}$) for all calibration samples (1983-1987, 1988-1992, 1993-1997, 1998-2002, 2003-2007, 2008-2012).

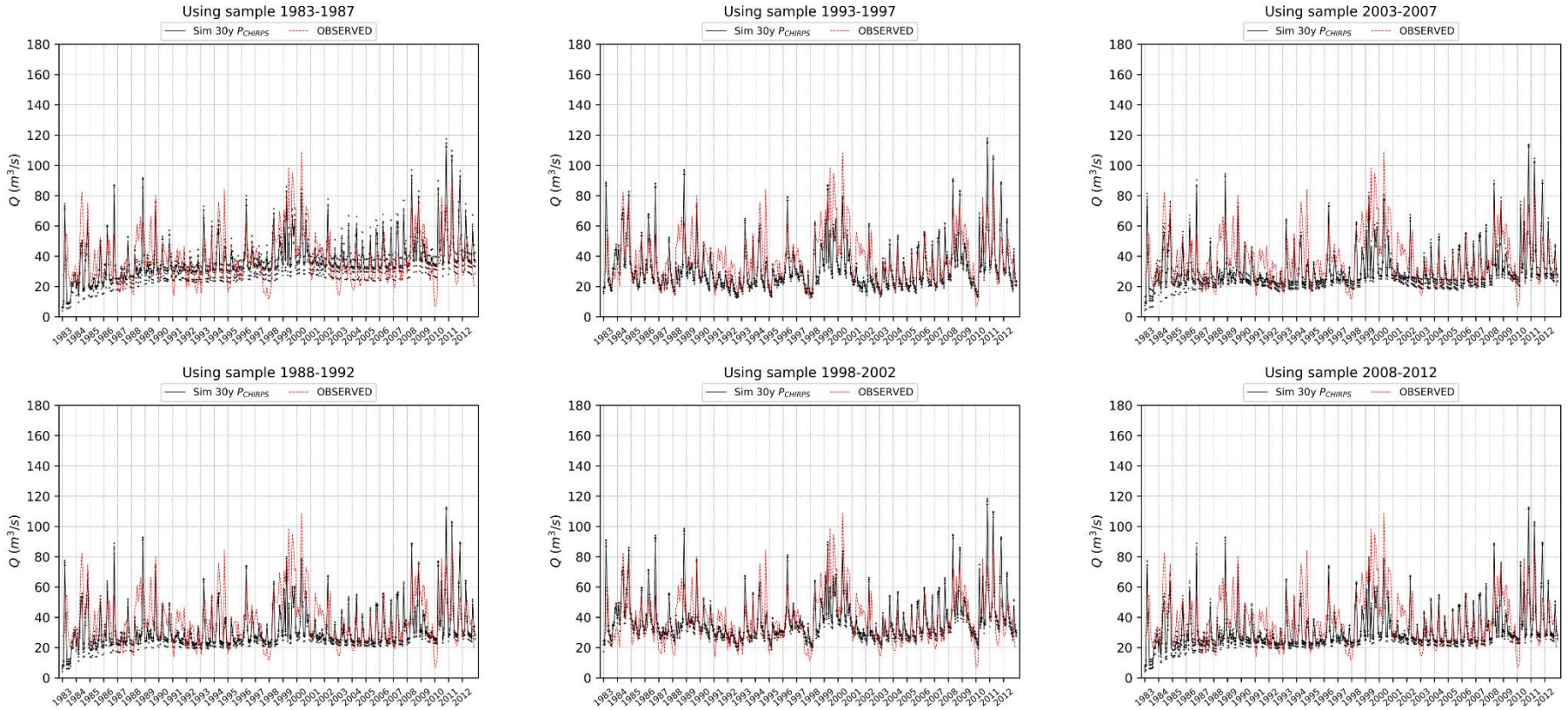

Figure S2. Observed and simulated Coello River discharge with 30 years (1983-2012) of CHIRPS precipitation (Sim 30y P_{CHIRPS}) for all calibration samples (1983-1987, 1988-1992, 1993-1997, 1998-2002, 2003-2007, 2008-2012).

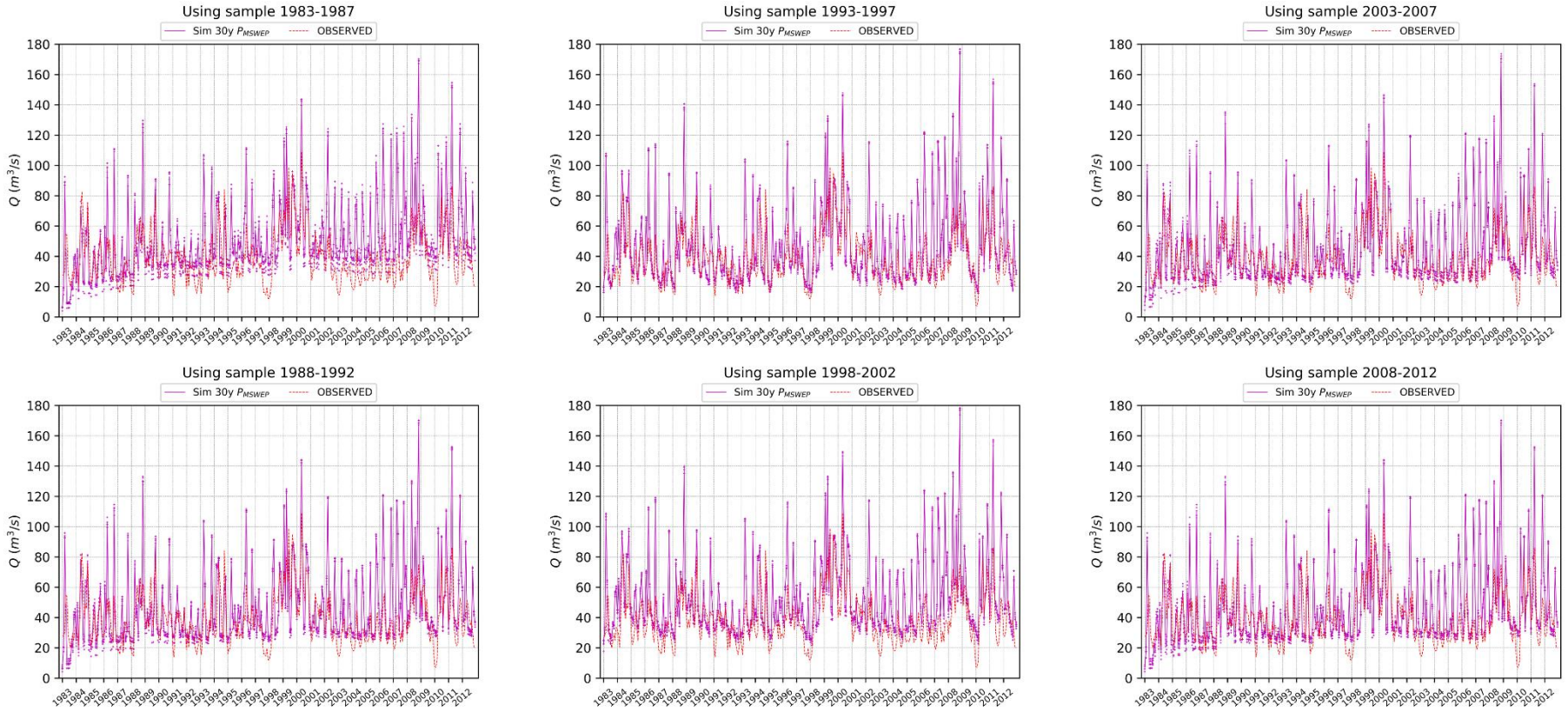

Figure S3. Observed and simulated Coello River discharge with 30 years (1983-2012) of MSWEP precipitation (Sim 30y P_{MSWEP}) for all calibration samples (1983-1987, 1988-1992, 1993-1997, 1998-2002, 2003-2007, 2008-2012).

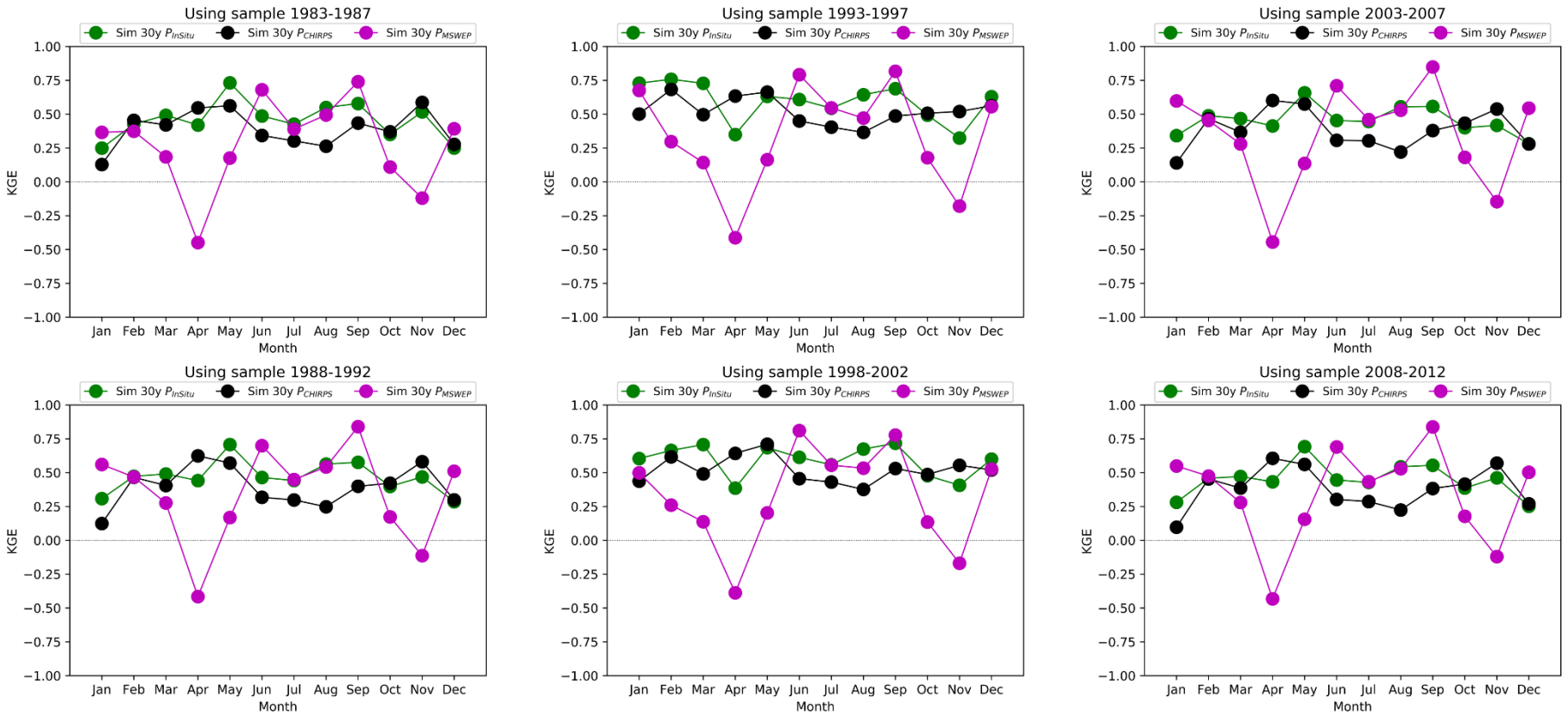

Figure S4. KGE performance metric for simulated river discharge for the complete time period of 30 years (1983-2012) using three different precipitation datasets (In-Situ, CHIRPS and MSWEP) in the Coello basin. Six independent samples of observed river discharge of 5 years (1983-1987, 1988-1992, 1993-1997, 1998-2002, 2003-2007 and 2008-2012) are used to calibrate model parameters, with the sample used for model calibration indicated in the header.

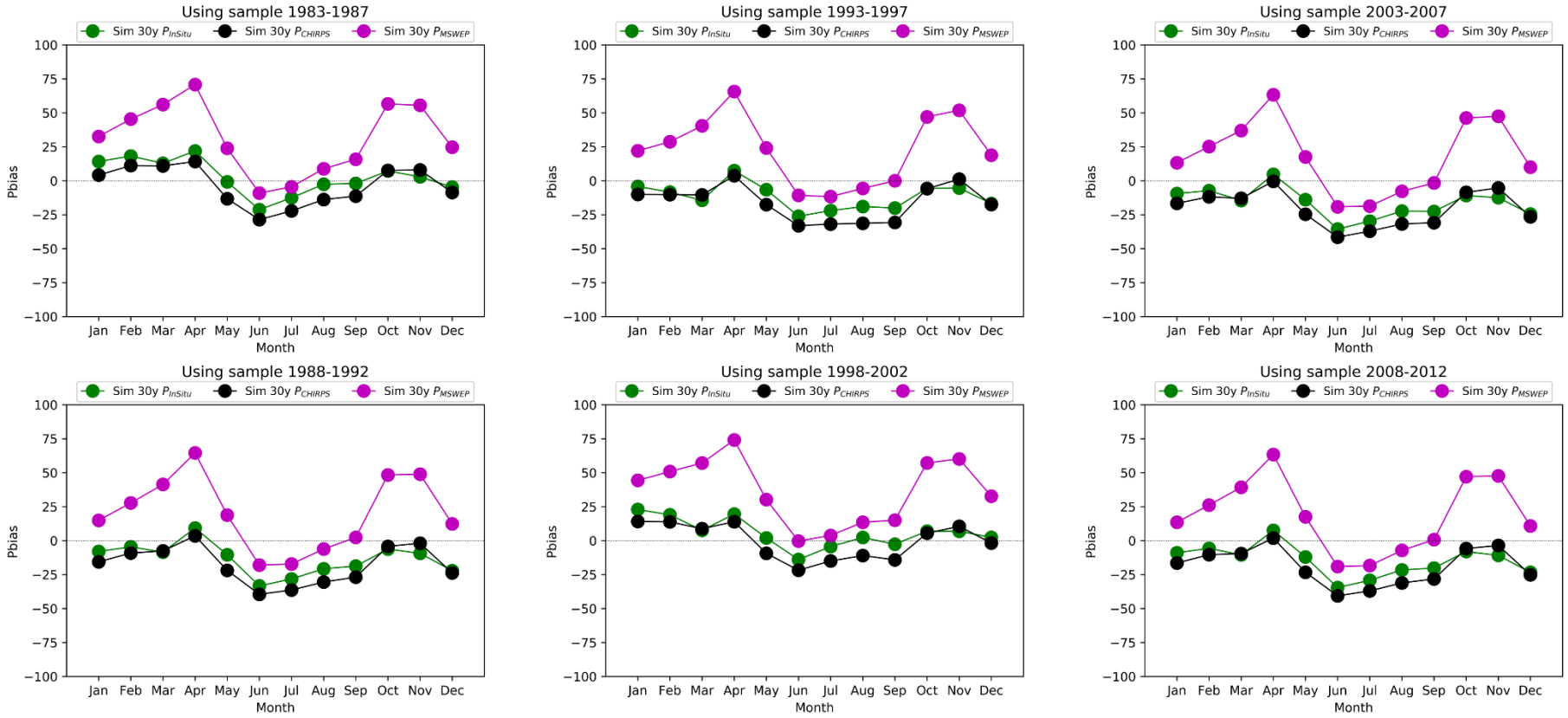

Figure S5. Pbias performance metric for simulated river discharge for the complete time period of 30 years (1983-2012) using three different precipitation datasets (In-Situ, CHIRPS and MSWEP) in the Coello basin. Six independent samples of observed river discharge of 5 years (1983-1987, 1988-1992, 1993-1997, 1998-2002, 2003-2007 and 2008-2012) are used to calibrate model parameters, with the sample used for model calibration indicated in the header.

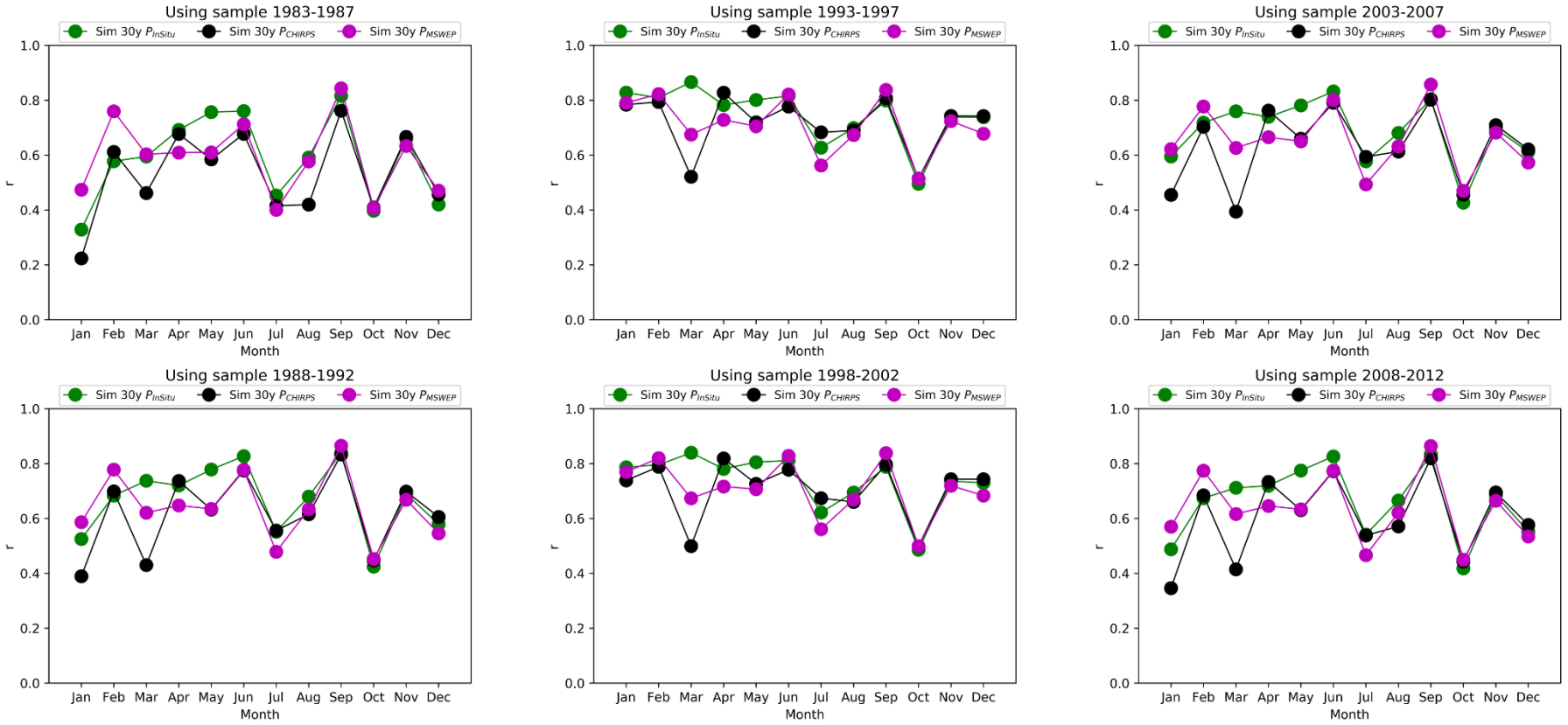

Figure S6. Pearson correlation, r performance metric for simulated river discharge for the complete time period of 30 years (1983-2012) using three different precipitation datasets (In-Situ, CHIRPS and MSWEP) in the Coello basin. Six independent samples of observed river discharge of 5 years (1983-1987, 1988-1992, 1993-1997, 1998-2002, 2003-2007 and 2008-2012) are used to calibrate model parameters, with the sample used for model calibration indicated in the header.

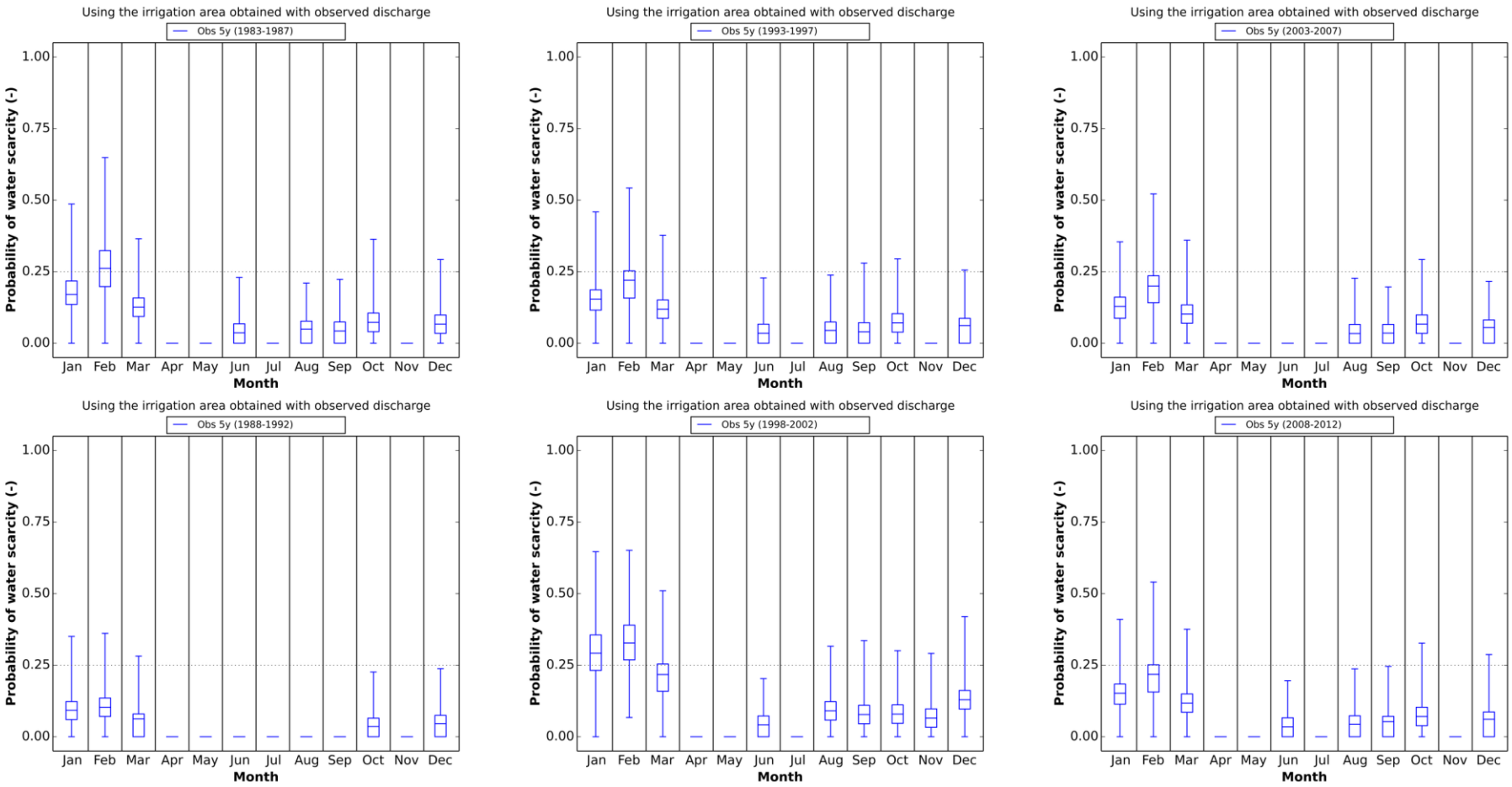

Figure S7. Probability of water scarcity using the irrigation area obtained with the observed river discharge of 5 years (Obs 5y) and the reference surface water availability. Boxplots show the median, interquartile range and minimum-maximum range.

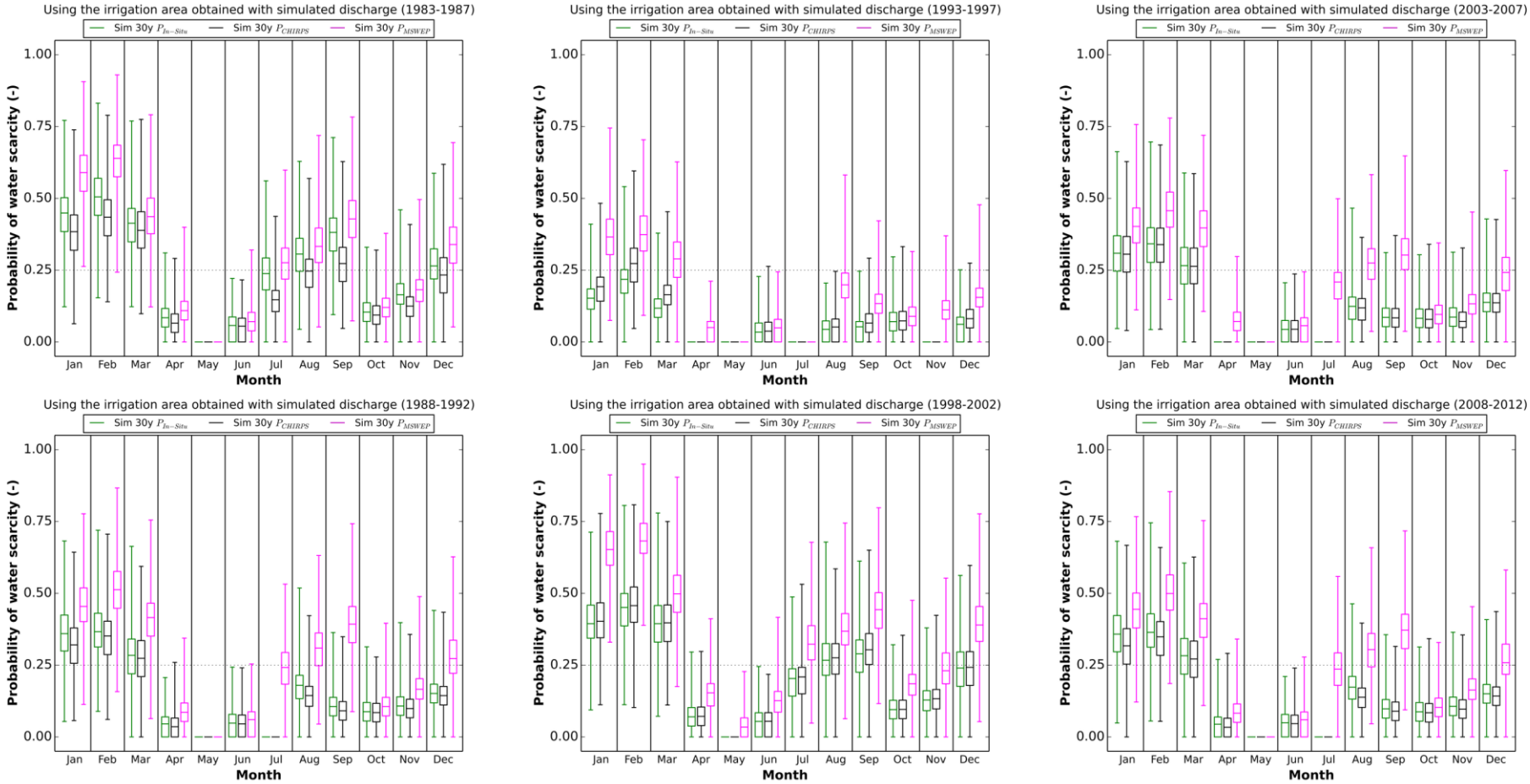

Figure S8. Probability of water scarcity using the irrigation area obtained with simulated river discharge information (Sim 30y $P_{In-Situ}$, Sim 30y P_{CHIRPS}, Sim 30y P_{MSWEP}) and the reference surface water availability. Boxplots show the median, interquartile range and minimum-maximum range.

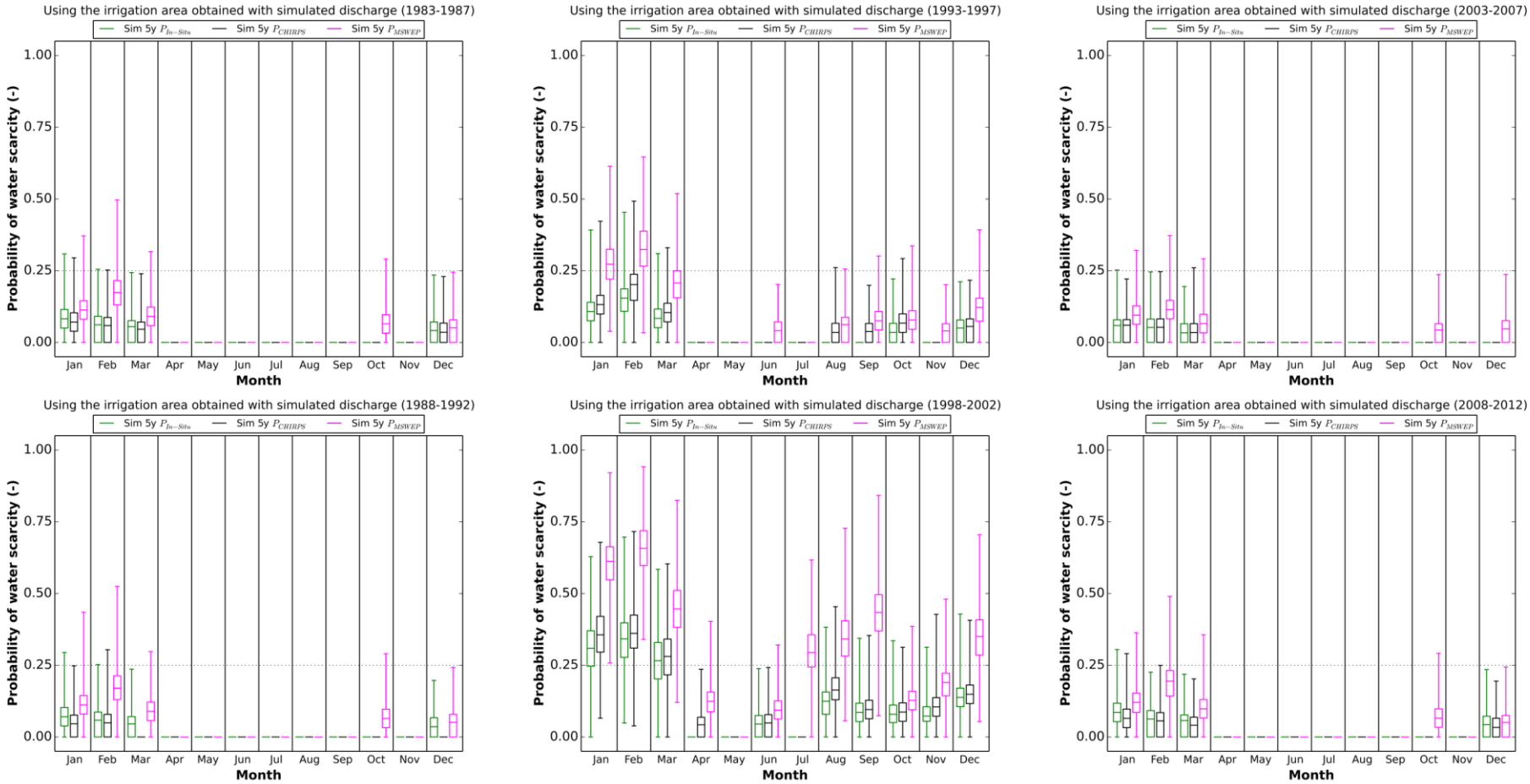

Figure S9. Probability of water scarcity using the irrigation area obtained with simulated river discharge information (Sim 5y $P_{In-Situ}$, Sim 5y P_{CHIRPS}, Sim 5y P_{MSWEP}) and the reference surface water availability. Boxplots show the median, interquartile range and minimum-maximum range.

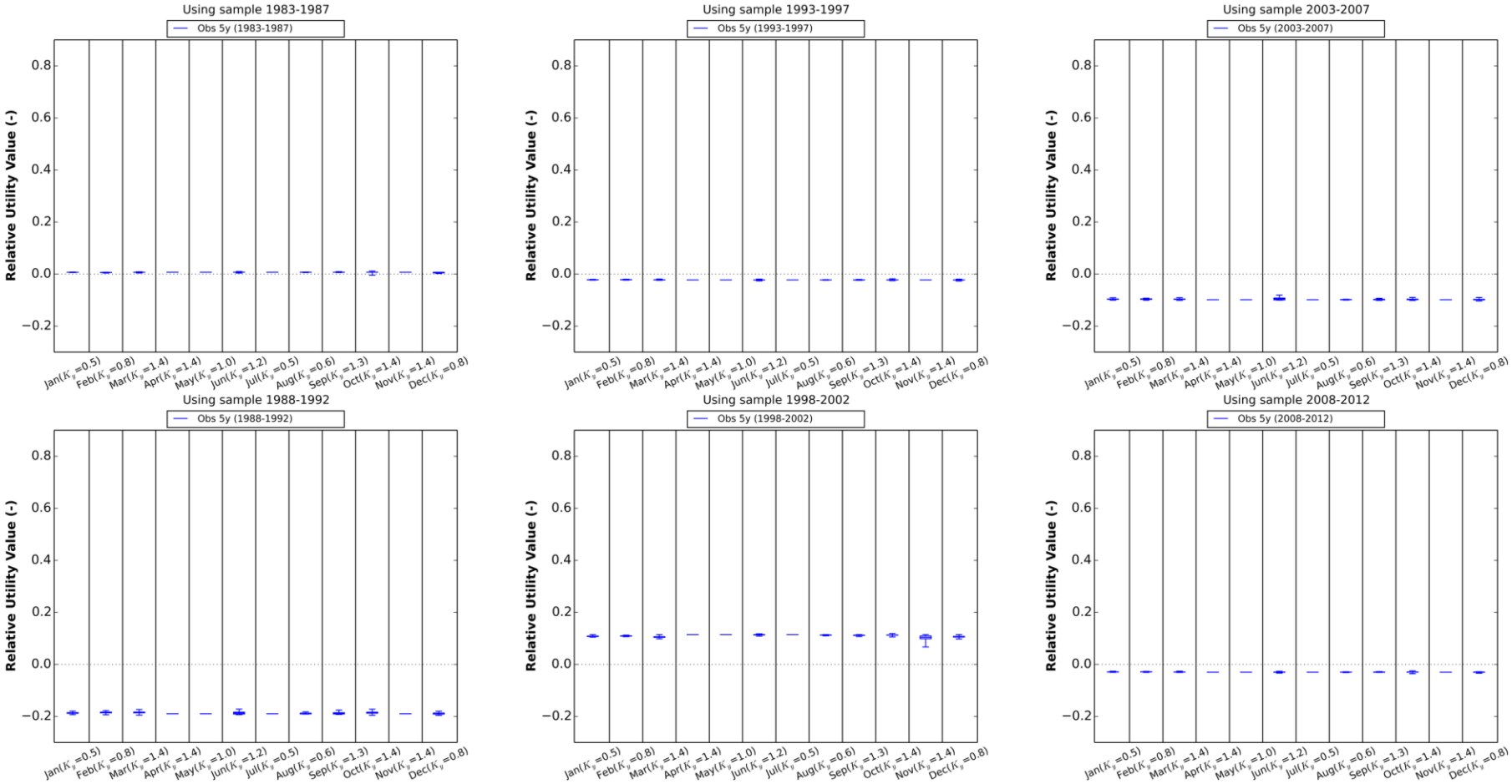

Figure S10. Relative Utility Value using observed river discharge of 5 years for water scarcity happening independently in one month. Ky is the sensitivity of the crop to water deficit. Boxplots show the median, interquartile range and minimum-maximum range.

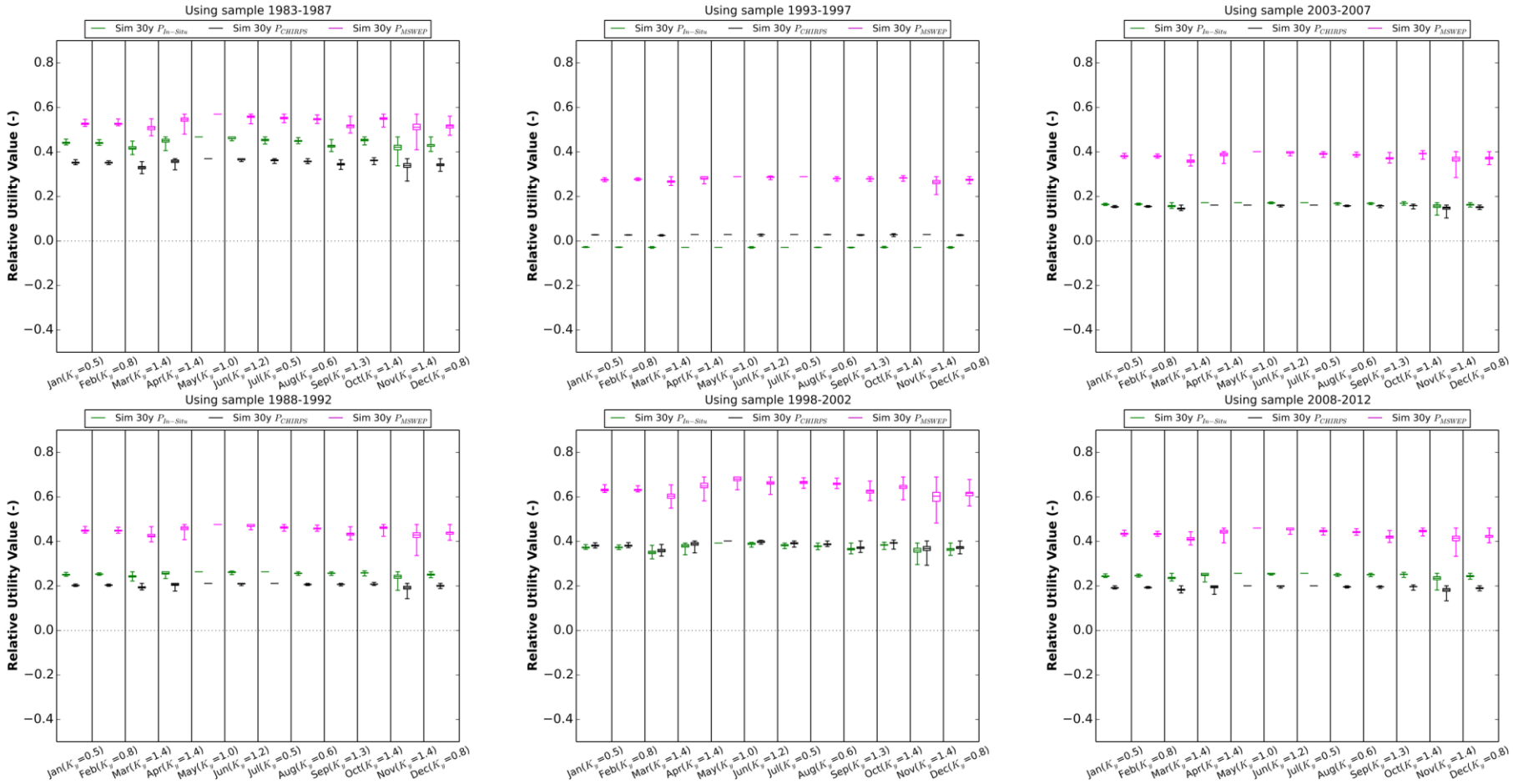

Figure S11. Relative Utility Value using simulated river discharge of 30 years for water scarcity happening independently in one month. Ky is the sensitivity of the crop to water deficit. Boxplots show the median, interquartile range and minimum-maximum range.

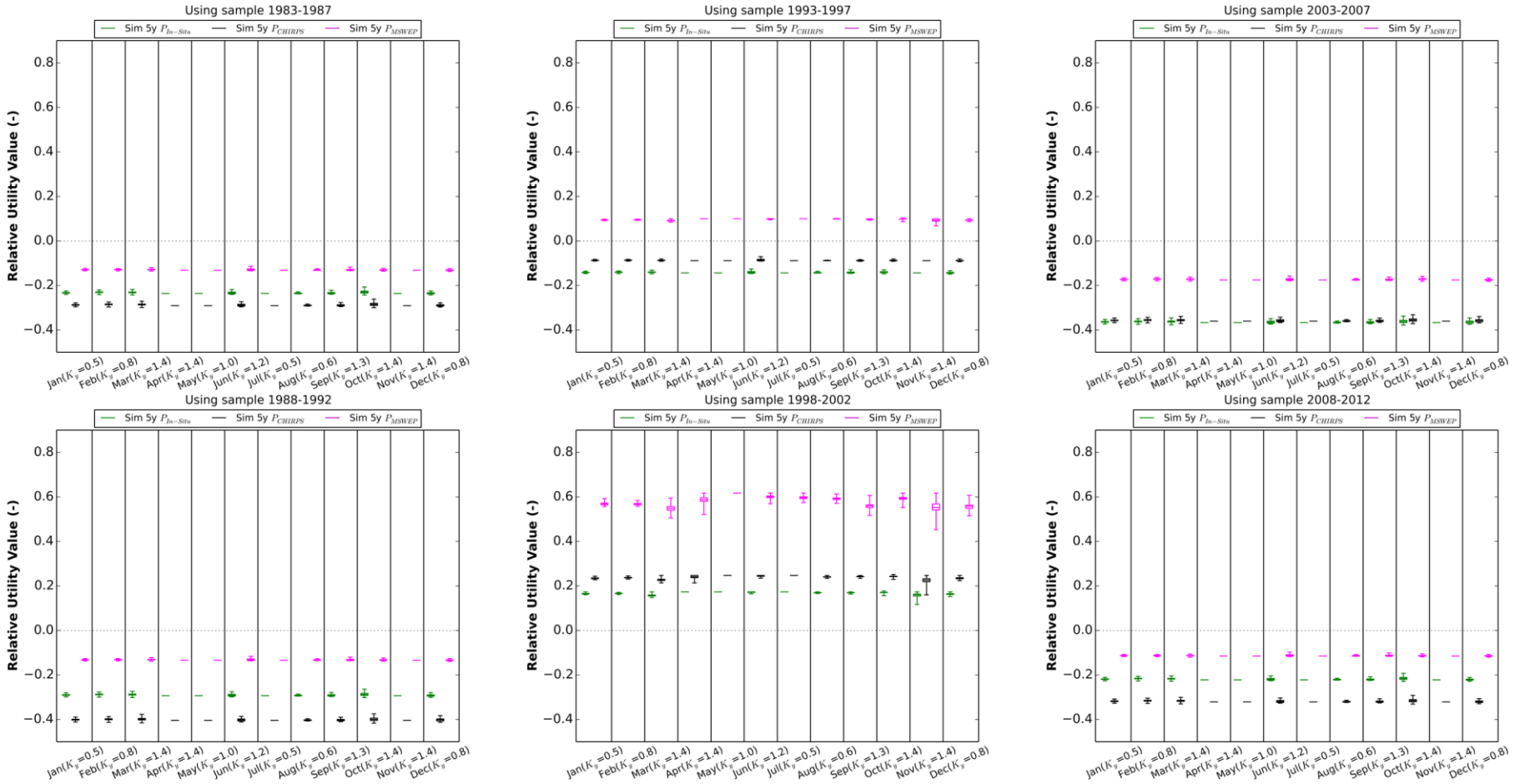

Figure S12. Relative Utility Value using simulated river discharge of 5 years for water scarcity happening independently in one month. Ky is the sensitivity of the crop to water deficit. Boxplots show the median, interquartile range and minimum-maximum range.