LETTERS TO THE EDITOR


Dear Editor:

The purpose of this letter is twofold: first to comment on a recently published paper in the Agronomy Journal dealing with the simulation of solar irradiance and second to provide suggestions on manuscripts of this nature.

When one evaluates the work of another, one must be very careful to interpret the original work correctly as the results of this interpretation will reflect both on the original authors as well as those who do the interpretation. In the paper by Ball et al. (2004), there is a serious misrepresentation of the results of Weiss et al. (2001). Weiss et al. (2001) evaluated 14 versions of the Bristow and Campbell (1984) model used to predict solar irradiance on a daily basis. They found, in their nomenclature, that Model 2 was the best model and used only this model in their subsequent analysis. However, Ball et al. (2004) compared Model 5 from Weiss et al. (2001) and, in addition, didn’t follow the same protocols used in the development of Model 5 in their evaluation. In addition, they used this model beyond the study area where the empirical coefficients were developed. So it is no surprise, given that the wrong model was evaluated, protocols not followed, and the model was used in areas where the empirical coefficients were not valid, that the model attributed to Weiss et al. (2001) performed poorly. Also, Ball et al. (2004) state “Although one of the models evaluated by Weiss et al. (2001) was used successfully to predict radiation at several independent sites after including a bias correction factor, the applicability of this approach to other regions is doubtful.” Their assumption is incorrect. A manuscript describing such an approach and applicable to a wide range of locations has recently been published (Weiss and Hays, 2004).

Two general observations about papers that propose algorithms for simulating solar irradiance. First, please provide the source of the data used in the study. This information may be used to develop new or evaluate existing algorithms. In addition, the information provides recognition to those who maintain a network or database or to individual researchers who provide these data. Second, it might be helpful to separately evaluate simulated results for high and low solar elevation angles, as the errors associated with each elevation angle class will be different. Presenting a single value as a measure of agreement (such as in root mean square error) between observed and simulated values of solar irradiance does not reflect the seasonal response of the algorithm, which may be important when dealing with natural or managed ecosystems.

Received 27 Apr. 2004

References


Reply

Dear Editor:

We appreciate the opportunity to clarify any misunderstanding Dr. Weiss and other readers may have of our recent manuscript (Ball et al., 2004). One of our goals was to evaluate relatively simple methods for determining daily solar irradiances, as the errors associated with each elevation angle class will be different. Presenting a single value as a measure of agreement (such as in root mean square error) between observed and simulated values of solar irradiance does not reflect the seasonal response of the algorithm, which may be important when dealing with natural or managed ecosystems.

Two general observations about papers that propose algorithms for simulating solar irradiance. First, please provide the source of the data used in the study. This information may be used to develop new or evaluate existing algorithms. In addition, the information provides recognition to those who maintain a network or database or to individual researchers who provide these data. Second, it might be helpful to separately evaluate simulated results for high and low solar elevation angles, as the errors associated with each elevation angle class will be different. Presenting a single value as a measure of agreement (such as in root mean square error) between observed and simulated values of solar irradiance does not reflect the seasonal response of the algorithm, which may be important when dealing with natural or managed ecosystems.

Received 27 Apr. 2004


Dear Editor:

The purpose of this letter is twofold: first to comment on a recently published paper in the Agronomy Journal dealing with the simulation of solar irradiance and second to provide suggestions on manuscripts of this nature.

When one evaluates the work of another, one must be very careful to interpret the original work correctly as the results of this interpretation will reflect both on the original authors as well as those who do the interpretation. In the paper by Ball et al. (2004), there is a serious misrepresentation of the results of Weiss et al. (2001). Weiss et al. (2001) evaluated 14 versions of the Bristow and Campbell (1984) model used to predict solar irradiance on a daily basis. They found, in their nomenclature, that Model 2 was the best model and used only this model in their subsequent analysis. However, Ball et al. (2004) compared Model 5 from Weiss et al. (2001) and, in addition, didn’t follow the same protocols used in the development of Model 5 in their evaluation. In addition, they used this model beyond the study area where the empirical coefficients were developed. So it is no surprise, given that the wrong model was evaluated, protocols not followed, and the model was used in areas where the empirical coefficients were not valid, that the model attributed to Weiss et al. (2001) performed poorly. Also, Ball et al. (2004) state “Although one of the models evaluated by Weiss et al. (2001) was used successfully to predict radiation at several independent sites after including a bias correction factor, the applicability of this approach to other regions is doubtful.” Their assumption is incorrect. A manuscript describing such an approach and applicable to a wide range of locations has recently been published (Weiss and Hays, 2004).

Two general observations about papers that propose algorithms for simulating solar irradiance. First, please provide the source of the data used in the study. This information may be used to develop new or evaluate existing algorithms. In addition, the information provides recognition to those who maintain a network or database or to individual researchers who provide these data. Second, it might be helpful to separately evaluate simulated results for high and low solar elevation angles, as the errors associated with each elevation angle class will be different. Presenting a single value as a measure of agreement (such as in root mean square error) between observed and simulated values of solar irradiance does not reflect the seasonal response of the algorithm, which may be important when dealing with natural or managed ecosystems.