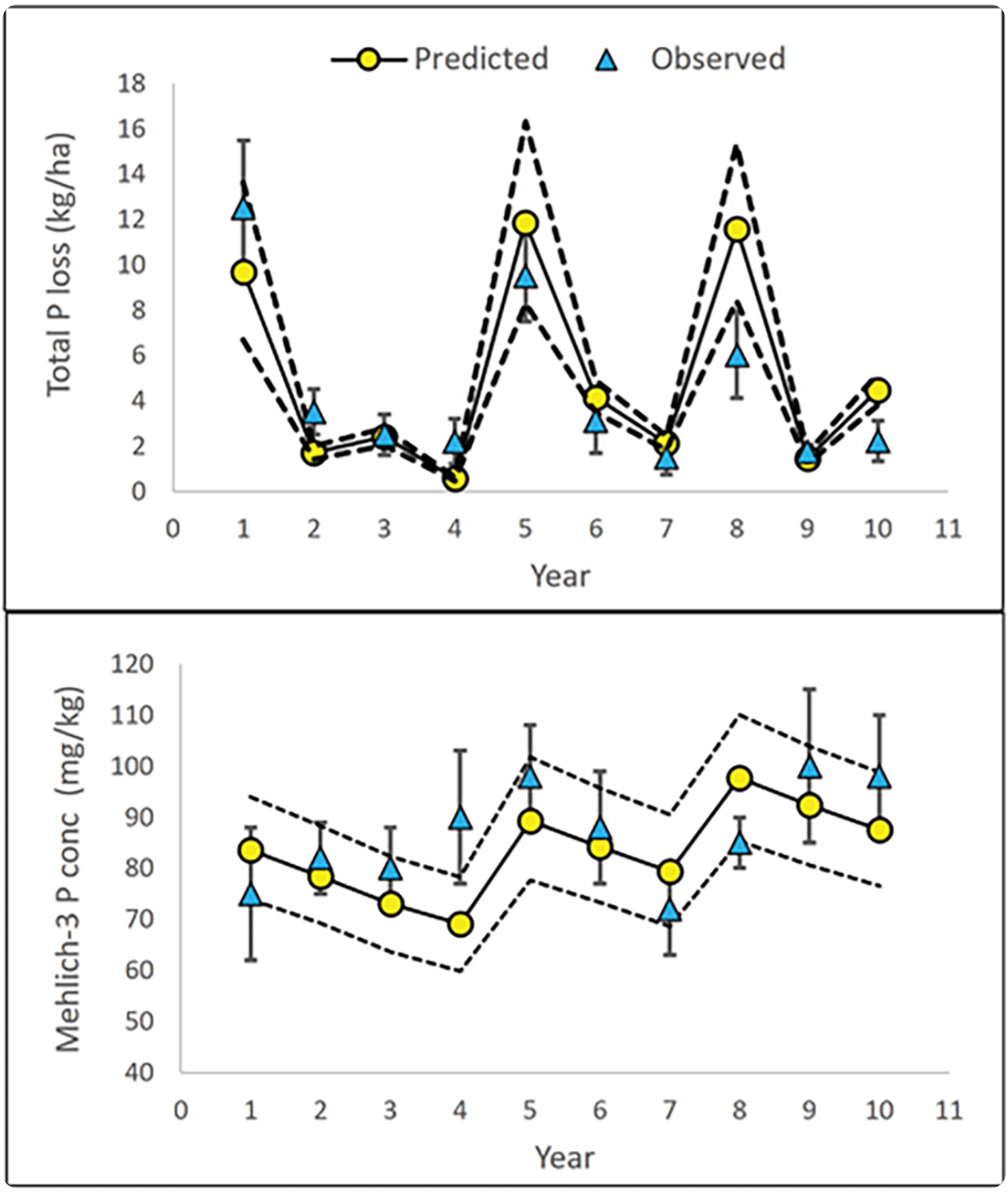
Science Societies

A better tool for predicting phosphorus loss

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Figures from APLE 3.0 showing both predicted and observed annual P loss (above) and soil test P (below), along with uncertainties in model predictions (dashed lines) and observed data (error bars). Model errors were assumed to be ± 25%. Image courtesy of Carl Bolster.

The Annual P Loss Estimator (APLE) is a spreadsheet model that predicts annual changes in soil test phosphorus (P) and P runoff from agricultural fields. It has been used by more than 800 users in 49 states and 56 countries since its release in 2012 to help guide management decisions to reduce the environmental impact of P application to fields.

As recently reported in the *Journal of Environmental Quality*, researchers have made several important updates to APLE. Users are now able to estimate runoff within APLE using the Curve Number method; in previous versions, runoff had to be estimated outside the model. Moreover, APLE now uses Monte Carlo simulations to calculate prediction uncertainties based on user-defined model input errors.

Using data from two research studies, the authors show how to use the new version of APLE. Results demonstrated that including reasonable estimates of model prediction uncertainty improved APLE's ability to predict field-scale P loss and changes in soil test P.

These updates have increased APLE's sophistication and utility. In keeping with the original intent, the revised version of APLE remains spreadsheet based, so users can run it without significant modeling experience.

Dig deeper

Bolster, C., & Vadas, P. (2022). Updates to the annual P loss estimator (APLE) model. *Journal of Environmental Quality*.**https://doi.org/10.1002/jeq2.20378**

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