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Title: Model for Predicting Dissolved Oxygen Levels in Stratified Ponds Using Reduced Data Inputs

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Abstract: Previous attempts at the prediction of dissolved oxygen (D.O.) levels in ponds used for aquaculture have often relied on the assumption of homogeneous pond water quality over the water column depth. Using a previously-reported stratified temperature model as a basis for structure, the authors have modified a mass-balance model for the prediction of dissolved oxygen levels in shallow aquaculture ponds. The model has been updated with recent information concerning the behavior of pond phytoplankton throughout the diurnal cycle, rendering accurate predictions of D.O. levels in both stratified and fully-mixed ponds. In addition, the overall data inputs required by the model have been significantly reduced from those required by previous models. Simulations for sites in Northern California are presented, as well as for several sites located in various places around the globe, using the Pond Dynamics/Aquaculture Collaborative Research Support Program Database for input data. The strategies used for dealing with reduced data sets, and the associated assumptions made, are also presented.

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