NOTICE OF PUBLICATION

Title: Secchi disk visibility and chlorophyll *a* relationship in aquaculture ponds

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Abstract: The application of Secchi disk visibility measurements (SDV) in modeling phytoplankton productivity and management in aquaculture ponds requires a quantitative treatment of the relationship between SDV measurements and chlorophyll *a* (chla) concentrations. Almazan and Boyd (1978) produced one such relationship for aquaculture ponds where phytoplankton was the major source of turbidity. However, in aquaculture ponds, organic matter, color of humic substances and inorganic materials like suspended clay may also be significant sources of turbidity. A majority of aquaculture ponds receive high inputs of organic matter in the form of food or organic fertilizers (Edwards, 1987; Schroeder et al., 1991; Chien, 1992). In such systems, non phytoplankton sources of turbidity can be significant and the Almazan and Boyd (1978) relationship may be inappropriate. Nath (1996) modified the Almazan and Boyd (1978) relationship to allow its applicability in waters with high algal turbidity by including a non algal turbidity parameter.

A method for estimating chla from SDV and for partitioning SDV has been proposed for natural freshwater systems (Bannister, 1974; Megard et al., 1980; Lorenzen, 1980). The linear relationship between the overall light extinction coefficient (k_w), the light extinction due to chla ($k_c c$, where k_c is the light extinction coefficient due to chla and c is the chla concentration) and the light extinction due to non-phytoplankton particulate and dissolved material (k_t) was expressed as (Bannister, 1974; Megard et al., 1980):

$$k_t = k_w + k_c c \qquad (1)$$

where k_t and k_w have units of m^{-1} and k_c has units $m^{-1}(mg.m^{-3})^{-1}$. The general applicability of this method to aquaculture has not been evaluated. The aim of this study was to evaluate the applicability of Bannister's approach (1974) to aquaculture ponds by partitioning sources of turbidity and determining the relative importance of phytoplankton and non phytoplankton turbidity.

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