within the algal mats (Stevenson and Glover 1993, Stevenson 1996). Urban wastewater discharge is often an important source of flow in streams during summers when stream flows are naturally low. Urban wastewater discharge supplements flows in these streams. Thus, urban wastewater discharge with associated nutrients may stimulate benthic algae in watersheds with such discharges, but plankton develop in streams in which urban wastewater discharge is low and poultry house nutrient enrichment is high. Development of planktonic algae in streams can decrease water transparency and aesthetics of the streams.

Filamentous green algae - Spring 2007

FGA cover was significantly related to poultry house density (PHD) (p<0.001) and percent urban land use (p<0.001) (**Figure 2.25**).

$$sqr(FGA)=0.288+1.515*ln(PHD)+1.220*ln(PCURB)$$

The square root of FGA cover is represented by sqr(FGA). The amount of variation in the square root of FGA cover explained by this model is 24.91 percent (i.e. r^2=0.249). Although the percent of agricultural land use was positively related to FGA cover, it was not after effects of poultry house density were accounted for. Watershed area was not significantly related to FGA cover.

FGA cover was more highly correlated with P concentrations than N (**Table 2.2**). FGA cover also was more highly correlated with TP than with soluble or dissolved fractions of phosphorus (SRP, TDP). Both Cladophorales and FGA cover were similarly and significantly correlated to P concentrations (p<0.05) (Table 2.2, Figure 2.25). The square root of FGA cover (sqr(FGA)) was significantly related to TP concentration alone (p<0.001) in the following model:

$$sqr(FGA)=9.034+1.430*ln(TP)$$

The amount of variation in FGA cover explained by this model is 28.7 percent (i.e. r^2=0.287). The pattern in the FGA along the TP gradient in Figure 2.25 indicated a threshold in FGA cover. Results from this analysis will be presented below.

Benthic algal biomass as chlorophyll a/cm^2

Benthic algal biomass (chlacm2, µg chl *a*/cm^2) was significantly related to poultry house density (PHD, houses per mile^2, p=0.001) and percent urban land use (p<0.001) (**Figure 2.26**) in an analysis using forward stepwise multiple linear regression.

$$ln(chlacm2)=-1.024+0.560*ln(PHD)+0.706*ln(PCURB)$$

39.1 percent of the variation in ln(chlacm2) was explained by this model (i.e. r_{adj}^2=0.391). Agricultural land use was also related to benthic algal biomass, but not after variation associated with poultry house density was accounted for. Watershed area was also not related to benthic algal biomass.

Benthic algal biomass was significantly related to TP concentration (p<0.001) in the resulting model based on both simple linear regression and forward stepwise MLR. The following model explained 37.7 percent (i.e. r_{adj}^2=0.377) of the variation in benthic algal biomass: