

Predictors of Mosquito Abundance in Stormwater Ponds in Delaware **Feb. 9, 2005**

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Our primary objective was to evaluate the relationship between different types of BMP's/wetlands, mosquito species, and their abundance in 4 different pond types: a) Retention ponds; b) detention ponds; c) CREP ponds; and d) constructed wetlands. Ancillary objectives included: 1) Determine the physical and biological attributes of good and poor mosquito habitats among the various types of stormwater catchments; 2) determine biotic factors that might influence mosquito abundance; and 3) where vector species occur, determine the species associations present.; and 4) establish the relationship between various water quality factors and mosquito abundance. Ultimately, we sought to find predictors of mosquito abundance in these stormwater ponds.

There are seasonal differences in larval mosquito abundance in stormwater ponds. Abundance is generally much elevated in August and September. Among the various pond types, detention ponds are generally much better producers of mosquitoes than other pond types, including retention ponds, wetlands, and usually, CREP ponds. Shallow retention ponds are more apt to have abundant mosquito subsites than steep ponds. Partially or fully shaded ponds are also more likely to exhibit an abundance of mosquitoes. Invertebrate predator numbers are inversely correlated with mosquito abundance. Water quality factors are difficult to quantify with respect to mosquito abundance, and statistical analyses at this date are incomplete. Nevertheless, orthophosphate appears to be positively correlated with overall mosquito abundance, while chloride ion presence appears to be inversely correlated.

With respect to vector species of concern, *Culex pipiens*, *Cx. salinarius*, *Cx. restuans*, *Aedes vexans*, and *Ochlerotatus sollicitans* appeared to have some associations with specific vegetation groups, including grasses, *Ludwigia*, duckweed, sedges, *Phragmites*, and rushes, depending upon species. Overall, ponds that are heavily vegetated around the periphery appear to have abundant mosquito activity. However, there were no statistically significant associations. Concerning mosquito-mosquito associations, *Culex pipiens* was very often associated with *Cx. salinarius*, while *Ae. vexans* was sometimes associated with *Oc. sollicitans*.

Even though mean mosquito abundance per dip may sometimes appear to be low, this is often misleading, because sites with low abundance or even zeroes drag down the overall means, as do seasonal periods of low abundance. From an operational standpoint, there were many times and sublocations where the abundance was high enough (> 10 per dip) to have triggered operational measures.