Correlation between areas of high poultry population density and those of high disease prevalence using geographic information systems.
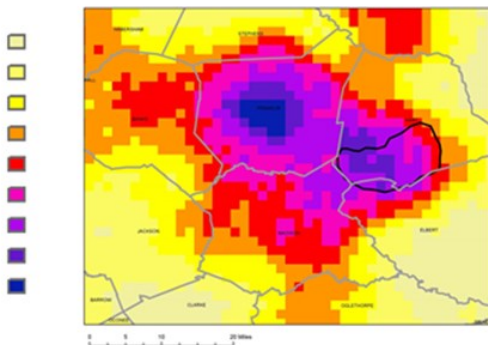
In 2006, we used GIS to analyze the non-human factors involved in LT epidemiology and found that proximity of farm A to another farm, and of farm A to a major road significantly increased the probability farm A breaking with LT. We again decided to use GIS, this time to better understand our disease hot zones.

A hot zone is one of concentration of specific disease findings. In GA, we have identified such zones for LT and MS over the past 10 years. Farm with cases of disease within these zones tend to repeat within the duration of an outbreak and repeat over several outbreaks. These Zones have been helpful in the management and containment of contagious poultry diseases. The goal of this study was to determine whether our zones of high poultry density and our zones of high disease prevalence overlapped.
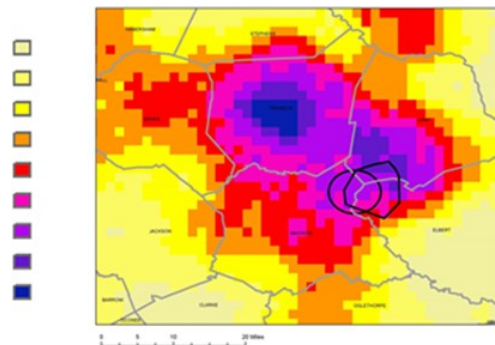
Using GIS, we used a Point Density function to draw a grid on the map. Each grid square is a raster cell. A neighborhood is defined around each raster cell. The number of farms (points) that falls within the neighborhood is totaled and divided by the area of the neighborhood and assigned to the raster cell. We defined the population field as the number of houses, so that the program would weigh several houses heavier than one house on a farm. For NE GA, the program identified 2 areas of very high poultry density, one in Hart county and one in Franklin county. Our hot zone for LT is in SW Hart county and intersects with the Hart county LT hot Zone. Our MS hot Zone barely overlaps with the highest density area of Hart county. It is interesting that the Franklin county density area has never been associated with high disease prevalence. In another part of the study, when looking at breeder farm concentration, we identified a zone of high concentration in Banks county, which has never been associated with a high prevalence of MS .

Farm density is one factor potentially making contagious disease difficult to control. Biosecurity is especially critical in such areas. There are factors favoring spread in the Hot Zones. There are factors preventing introduction and/or spread in the other zones of high density. Further work is needed to identify those factors as they may help us in Hot Zone disease control.

NE GA High density area (all farms) with VLTHZ

NE GA High Density (All Farms) area with MSHZ

One the images, the dark purple areas are those of high broiler farm density. The crescent shape area on the map on the left is a LT hot zone. On the map on the right, the 2 smaller round zones are the MS hot Zones (see text)

Dr. Louise Dufour-Zavala

Tours and Visitors

L-R: Cris Young, Robert Cobb, Dr. Louise Dufour-Zavala and Mike Giles

Mr. John Foster

- August 21st: Dr. Louise Dufour-Zavala hosted Avian Influenza meeting

- August 24th: Len Chappell presented at a depopulation meeting at PDRC in Athens

- August 25th: Dr. Doug Waltman and Len Chappell met with Doug Collins

- August 25th: John Foster co-owner of WCON radio station visited our lab

- August 27th: Rafael Rivera with USPEA had brief visit with Dr. Zavala

- August 28th: Local Senators visited and toured GPLN

Dr. Waltman hosting our Senate tour

Doug Collins At Jackson EMC

GPLN Events

- August 19th GPLN Annual Meeting

- August 20th GPLN Employee Field Day

- August 28th Mrs. Bobbie Pass 51 years retirement party

Donna Standridge, Elisa Castaneda and Belinda Pham muscling the tug of war rope

Mrs. Bobbie Pass

Iyen Omoruyi celebrates 5 years with GPLN

Freddie Smith and Zach Baker grilling chicken for the annual meeting