

## Spatial distribution of sow sites enrolled in the Swine Health Monitoring Program (SHMP)

### Introduction

The swine health-monitoring program (SHMP) includes sow sites from about 15 States. Veterinarians currently share diagnostic results for PRRSv and / or PEDv. The objective of this first report is to show spatial distribution of participating sow sites by pathogen.

### Materials and methods

A codified dataset constituted by geographical locations of sow sites that are enrolled in the SHMP to share PRRS, PED or PRRS/PED diagnostic information, was used to assess spatial distribution of sites. Using the software R,<sup>1</sup> and the packages ggplot2,<sup>2</sup> maps,<sup>3</sup> and MASS,<sup>4</sup> a spatial distribution of sow sites was assessed by conducting a 2d kernel density estimation (kde2d).<sup>4</sup> Briefly, kde2d evaluates the occurrence intensity of geographical points, i.e. sites, in a given unit of space by approximating its probability density function. This function represents the distribution of site location (latitude and longitude), and its influence distance (bandwidth) in the space.<sup>4-6</sup> A kde2d was run for sites that share PRRS, PED and all sites enrolled in the SHMP.

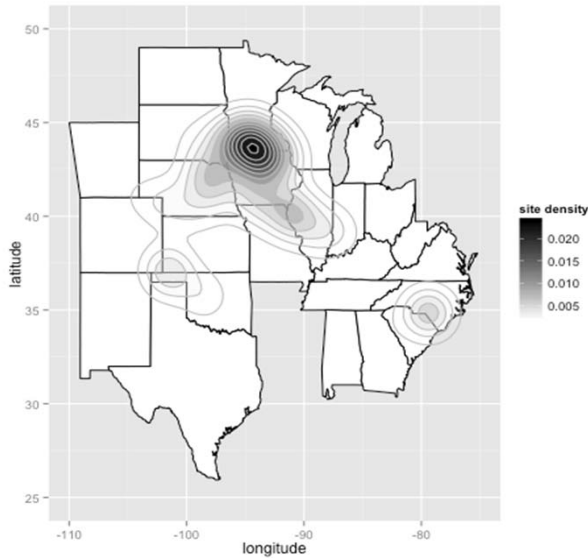
### Results

#### 1. Sites that share PRRS-status

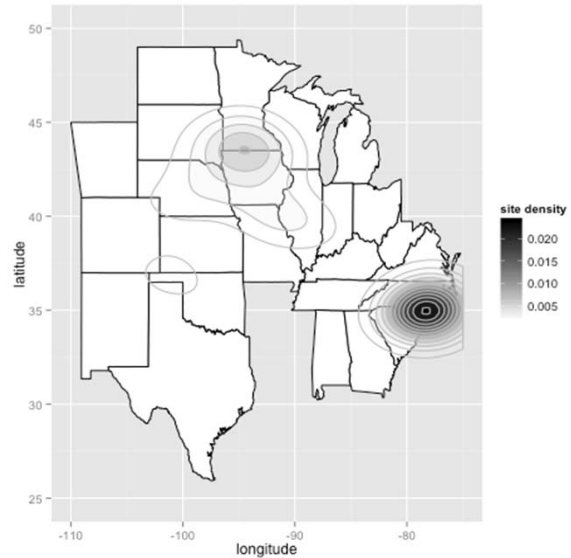
As of 3/1/2015, there were 405 sites that share their geographical locations and PRRS-status. Site density distribution (>0.02) indicates aggregation of sow sites located in the Midwest (Fig 1).

#### 2. Sites that share PED-status

As of 3/1/2015, there were 714 sites that share their geographical locations and PED status. Site density distribution (>0.02) indicates aggregation of sow sites located in the Southeast (Fig 2).



**Figure 1:** Kernel density estimation for sites enrolled in the SHMP that share PRRS diagnostic information



**Figure 2:** Kernel density estimation for sites enrolled in the SHMP that share PED diagnostic information

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