

Title: Further development of an integrated mapping service to support regional control & elimination of PRRS virus - **NPB #12-174**

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Industry Summary:

There are approximately 20 regional PRRS projects in the United States in various stages of progress. Each coordinator has their own approach to the challenges of mapping the region, many depending on the assistance of a pharmaceutical company. The goal of this project was to develop and provide a mapping service for regional coordinators who choose to participate. The database was developed in Oracle and ArcGIS was used to develop the map. Maps are viewed in either ArcReader or ArcGIS online. Participating regional projects include N212MN, Wisconsin and Pennsylvania as well as the national PRRS incidence project involving 19 production systems with 372 sites and approximately 1.2 million sows. A common legend was developed and is available to all participating regions. This service has grown to become the Swine Health Monitoring Project (SHMP) that is a disease monitoring service for the industry and has become a valuable resource for the National Pork Board.

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Scientific Abstract:

There are approximately 20 regional PRRS projects in the United States in various stages of progress. Each has its own approach to the challenges of mapping the region, many depending on the assistance of a pharmaceutical company. The goal of this project was to develop a mapping service that will be available to coordinators who choose to participate. The database was developed in Oracle and ArcGIS was used to develop the map. Maps are viewed in either ArcReader or ArcGIS online. Participating regional projects include N212MN, Wisconsin and Pennsylvania as well as a national PRRS incidence project involving 19 production

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systems with 372 sites and approximately 1.2 million sows. A common legend was developed and made available to all participating regions. This system is available for any regional coordinator to use. This service has grown to become the Swine Health Monitoring Project (SHMP) that serves the needs of the industry and is a valuable resource for the National Pork Board.

Introduction: There are approximately 20 regional PRRS projects in the United States in various stages of progress. Each has its own approach to the challenges of mapping the region. The first challenge a regional coordinator faces is how to get the maps done. Most coordinators accept the support offered by a pharmaceutical firm and a few make their own. There has been no uniform set of symbols for codifying status of herds, no standard for geographic background, no consistent scale and no consistent understanding on how maps can be shared within and across regions. The goal of this project was to develop a mapping service that was made available to coordinators who choose to participate. In turn, this project has grown to become the Swine Health Monitoring Project and expanded to include PED. As such, this project has strengthened the capacity of the swine industry to manage disease surveillance, control and elimination projects.

Stated Objectives from original proposal:

1. Further develop a mapping service available to any regional PRRS control project in United States that is attempting to control / eliminate PRRS and is seeking technical assistance.
2. Integrate additional features as a support for regional PRRS control programs in the USA.
3. Link location with diagnostic lab results such that real time PRRS surveillance is achieved.

Materials & Methods:

Objective 1 – Mapping service - We capture GPS location of all known pig sites and use ARC GIS to compose maps. Location and PRRS status of farms is only shown on maps for producers who have signed the participation agreement. For use within the region, maps incorporate a standard template with color denoting the PRRS status of the site if the owner has agreed to participate. Shape of the symbol denotes type of production at the site. Maps with names of owners are used with great discretion and not distributed. Maps are posted at BaseCamp web site with username and password for access.

Objective 2 – This system is currently operational and is focused on implementing and evaluating the performance in regional PRRS control initiatives. Key features are:

- The program uses Oracle relational database to store all data. The information is secure and compartmentalized based on the user's credentials. The data connection is web-based and the mapping is conducted through Arc GIS online. The user has access to 9 map views including road and satellite images.
- Password protected access for authorized users based on acceptance of conditions of use and statements of confidentiality. Administrative control limits the access of individual users to a specific project (or projects), for example a PRRS control project in a specific region
- Use of multiple layers of spatial data. Within the same project, both user data (e.g. farm locations recorded by participating veterinarians or companies as well as public data can be displayed on selected backgrounds.
- Users from one project (e.g. Wisconsin) cannot visualize farms in other projects (e.g. Pennsylvania) unless authorized.
- Ability to view (but not edit) all farm data related to a system (e.g., company or practice) limited to authorized organization members.

Objective 3 – As a prototype, UMN diagnostic lab data were linked via premises ID to the map database. As new lab results became available, they could be linked to the map. This has not been integrated

into the system however because at present, the lab data require a veterinarian's review to understand the relevance and importance of specific lab data.

Results:

This service has grown to become the Swine Health Monitoring Project (SHMP) that serves the needs of the industry and is a valuable resource for the National Pork Board.

Participating regional projects include N212MN, Wisconsin and Pennsylvania. Arc GIS is the mapping program being used with maps being delivered to projects through the password protected web site called BaseCamp. ArcGIS online is also available to participating systems in the SHMP. This project includes 372 sow sites totaling approximately 1.2 million sows.

Discussion:

The aim of this project was to implement and evaluate a mapping and information management tool that we developed with a long term vision of how the veterinary profession can more effectively harness technological advances. The system provides at modest cost, a uniform and integrated platform to support independent efforts to control disease and strengthens the ability of the US swine veterinary community to address current and future health challenges.

We have used Oracle to develop the database for storing the data on a secure server and we used ArcGIS to develop and portray the maps. We use either ArcReader or ArcGIS online to view and manipulate the maps.

We are working with three coordinators for regional projects who are using the mapping program in addition to a national Swine Health Monitoring project involving 19 production systems. This service serves the needs of the industry and has become a valuable resource for the National Pork Board.