

## “Should I build my barn in the top of the hill or in the bottom of the hill?”

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### Key Points:

- Swine sites located in areas with higher slope showed reduced incidence of PRRS virus breaks.
- The conclusion above took into consideration swine density of the area, herd size, geographical location (“area effect”) and production system.

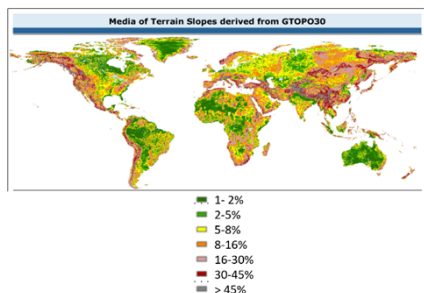
### How did the idea come up?

During a meeting with a swine producer, managers and veterinarians, a question was brought up on whether new swine sites should be built in “the top of the hill” for cases where this is an option. A literature search revealed that the effect of land altitude in the occurrence of disease outbreaks had never been explored for PRRS.

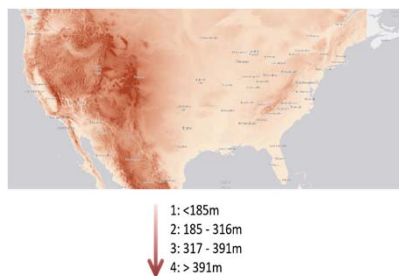
### What did we do?

Using readily available data from the Swine Health Monitoring Project, we used PRRS incidence data over time (2009-2016) from over 700 swine breeding herds to investigate the question posed by the producer.

Data on PRRS incidence, number of years the site was sharing data, herd size and geographical location were extracted from the SHMP database. To gather information on altitude of the farms, two rasters describing terrain elevation were obtained:



**Figure 1.** Slope raster; source: FAO, GeoNetwork



**Figure 2.** Altitude raster (m above sea level), constructed in ArcMap v.10.2.2

### What did we find?

The results from our final model (that accounted for swine density in the area, herd size, geographical area and production system) showed that swine sites located in areas with slopes of 9% or higher were “protected” from PRRS breaks compared to sites located in a terrain of <2% slope. In other words, they showed a lower incidence rate for PRRS.

The altitude of the terrain, measured as meters above sea level (absolute number), was not statistically significant in the final model (did not seem to be an important factor in PRRS incidence).

### What does it mean?

It is difficult to interpret the results of this project in the light of airborne transmission because movement of air and virus survivability and transmission are determined by a complex combination (interaction) of wind direction and speed, humidity and temperature, as well as positioning of neighboring swine sites.

However, it is reasonable to hypothesize that being located (or not) in a slope is a proxy for other risk factors for PRRS including distance to main roads and traffic of transport vehicles used both for transportation of live animals and deliveries of industry necessary supplies.