



Development of an Ontario Disease  
Surveillance and Outbreak Detection  
System for ***Porcine reproductive and  
respiratory syndrome virus (PRRSV)*** and  
its application to other non-reportable  
diseases of swine

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# Disease Surveillance Project

## Objective

Expand & develop a regional disease surveillance system based on the Ontario Swine Health Advisory Board (OSHAB) PRRSV ORF5 (envelope glycoprotein) sequence database

The project includes:

- Disease surveillance & mapping with consideration given to confidentiality
- Development of a procedure for the Ontario swine industry to investigate & communicate about emerging & re-emerging (non-reportable) diseases



# Disease Surveillance Project

## Producer Participation Agreement

- **The team:** OSHAB veterinary project coordinator, project researchers & associated veterinarian(s)
- **“I agree that the AHL may share the results of the PRRSV testing of my herd including sequencing with the team”**
- **My veterinarian may share clinical, production and location information about my herd with the team**
- **Ontario Pork allowed to release farm's Premises ID, location information & coordinates**

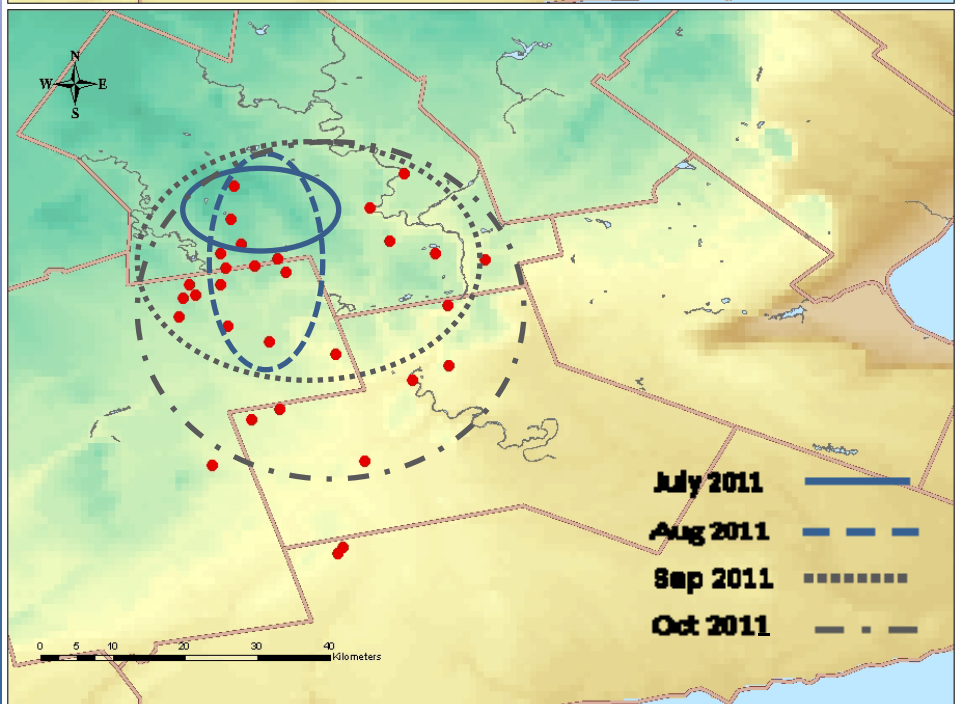
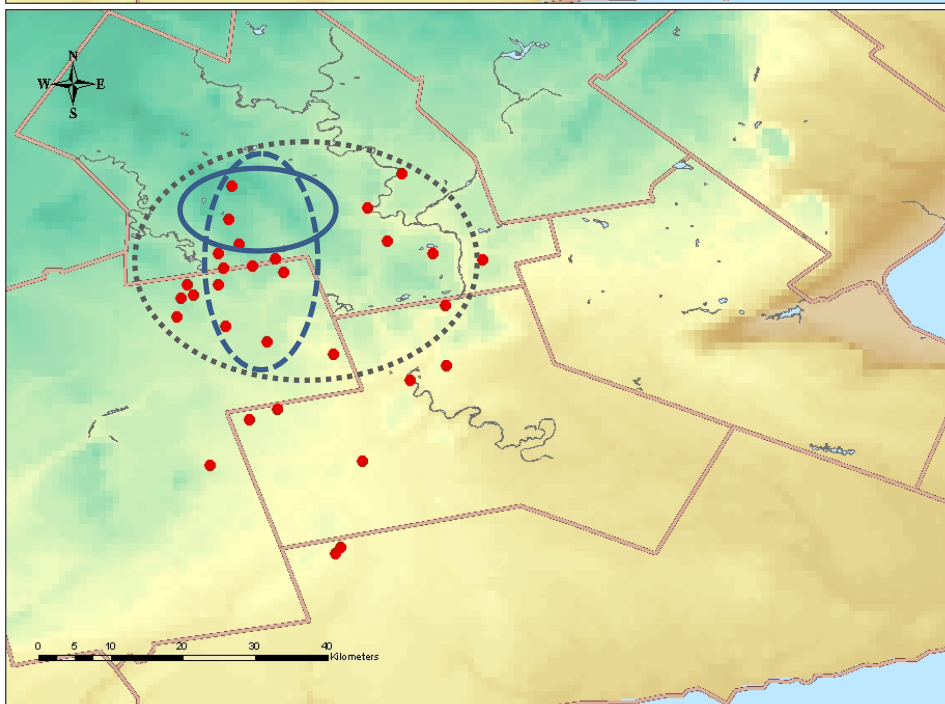
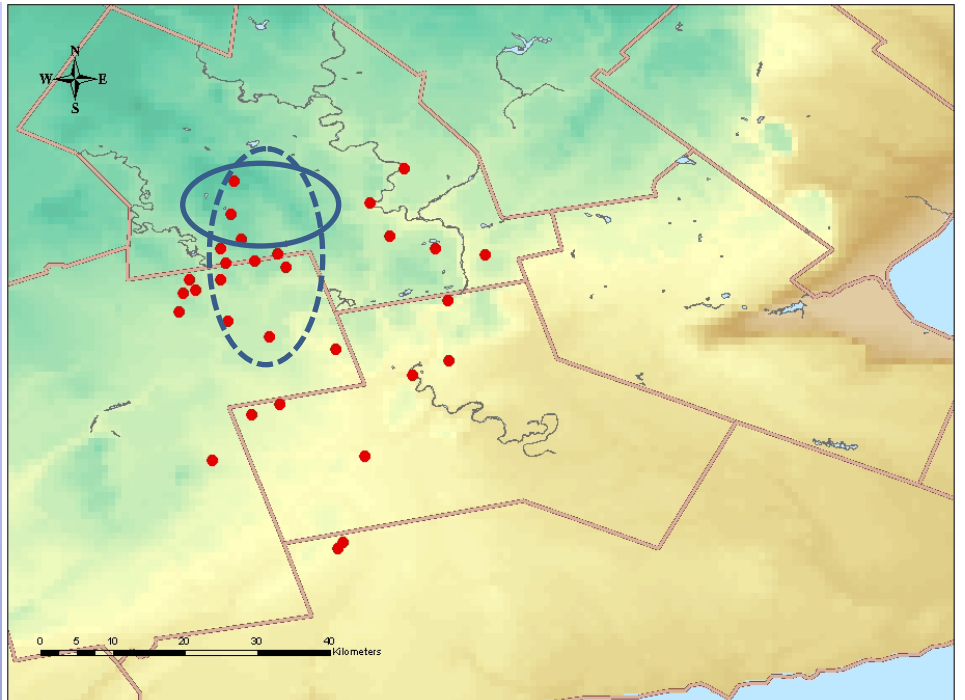
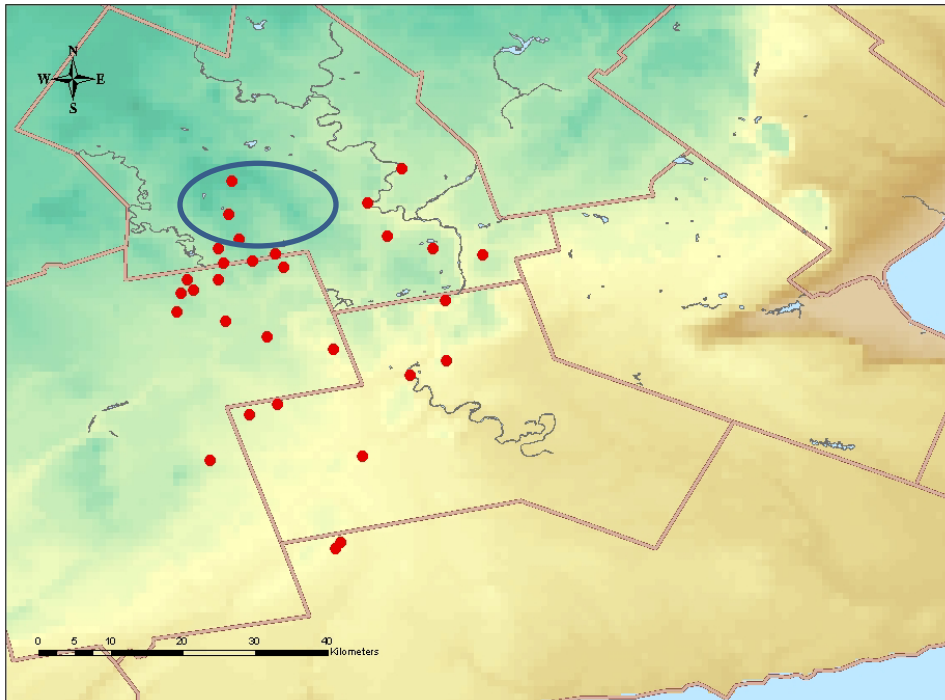


# Disease Surveillance Project

## The AHL may:

1. Prepare a comparative PRRSV ORF5 sequence analysis, including my farm, as well as that of other farms, as requested by the attending veterinarian
2. May prepare a comparative PRRSV ORF5 sequence analysis of my farm to that of other farms that are clients of other veterinarians participating in the OSHAB PRRSV ORF5 Sequence Database project
3. Share the laboratory report(s) from my herd with the Team

All this information will be kept confidential by the Team and used only for summary purposes to assess & report on the appearance & movement of PRRSV strains (at the county level) to the industry & to assist in the investigation of the routes of PRRSV transmission.



**July 2011** ————  
**Aug 2011** - - - -  
**Sep 2011** ······  
**Oct 2011** - . - .

<b>OSHAB Ontario PRRSV ORF5 Sequence Database Comparison Report</b>				
<b>Previous Case #</b>				
<b>Case</b>	<b>Date received</b>	<b>Referring Vet</b>	<b>Clinic Name</b>	
G11-026#7-132	3/25/2011			
<b>Previous cases with % sequence homology equal to or greater than 98.0%</b>				
<b>Cases</b>	<b>% homology</b>	<b>Date received</b>	<b>Referring Vet</b>	<b>Clinic Name</b>
G10-101#3-132	100	12/17/2010		
G10-104#8-132	100	12/9/2010		
G10-104#1-132	100	12/13/2010		
G10-098#4-132	100	11/24/2010		
G11-001#5-112	99.3	1/6/2011		



## Sequence homology versus PRRSV ORF5 RFLP typing patterns

- The OSHAB sequencing report can be used to identify and map the premises with identical PRRSV ORF5 sequence homology
- Sequence homology is the most accurate method to compare viruses
- PRRSV ORF5 RFLP typing patterns are most useful for monitoring “within a herd” e.g. the introduction of new viruses
- “PRRSV ORF5 RFLP typing is not adequate for large scale-genetic analysis”



## Components of the first module

- **Submission form**
- **Definitions**
- **Reports**



**AHL CASE #**

SAMPLES TAKEN: Date: \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_/ (yy/mm/dd) Date sent: \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_/ (yy/mm/dd)

SUBMITTED BY:  Veterinarian  Owner  Agent BILL:  Veterinarian  Agent

Clinic No.		Pig Owner Name (max. 40 characters)	
Clinic		Production System	
Address		Affected Herd Site Address (line or street name/#)	
County	Postal Code		
Veterinarian		Premises ID	
Phone	Fax	County	Postal Code
Email		Email	

<p><b>Previous AHL Case #</b></p> <p>_____</p> <p><b>Change in Sow Herd Status</b></p> <p><input type="radio"/> Naive to clinical outbreak</p> <p><input type="radio"/> Naive to subclinically infected</p> <p><input type="radio"/> Serologically positive - virus negative to clinical outbreak % seropositive before outbreak _____</p> <p><input type="radio"/> Serologically positive - virus negative to subclinically infected % seropositive before infection _____</p> <p><input type="radio"/> Serologically positive - virus positive to outbreak</p> <p><input type="radio"/> Other _____</p> <p><b>Change in Growing Pig Herd Status</b></p> <p><input type="radio"/> Spread of infection from primary sow site or nursery</p> <p><input type="radio"/> Endemic infection to outbreak</p> <p><input type="radio"/> Other _____</p>	<p><b>Date Outbreak Started:</b> _____/_____/_____/ (yy/mm/dd)</p> <p><b>Date of Infection:</b> _____/_____/_____/ (yy/mm/dd) Date of infection is: <input type="checkbox"/> Known <input type="checkbox"/> Suspected</p> <p><b>Date Form was Filled:</b> _____/_____/_____/ (yy/mm/dd)</p> <p>Was any section of this herd (or the source herd) exposed with a PRRSV during the last 6 months prior to outbreak?</p> <p><input type="checkbox"/> yes, modified live</p> <p><input type="checkbox"/> yes, inactivated/autogenous</p> <p><input type="checkbox"/> yes, homologous exposure</p> <p><input type="checkbox"/> yes, other _____</p> <p><input type="checkbox"/> no</p> <p><b>History:</b> (eg treatments, vaccinations, management pertaining to this case)</p>
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Production class	Inventory <sup>a</sup> Number	Mortality in the last 7 days prior to sub- mission <sup>a</sup>		Increase in morbidity over average since the start of outbreak or infection <sup>b</sup>			
		N dead	% dead	Off-feed	Respiratory	Diarrhea	Other
Gilts							
Sows							
Suckling pigs							
Nursery pigs							
Finisher pigs							
Boars							
<b>Total born in the last 7 days</b>		N mummies & stillbirths	% mummies & stillbirths				
<b>Sows aborted</b>		N sows aborted	% sows aborted				

<sup>a</sup> Provide numbers. "N dead" is preferred. Use "% dead" if it is easier to obtain than "N dead". <sup>a</sup> These numbers are:  Known  Estimates

<sup>b</sup> Indicate "YES" by ticking appropriate box. For "Other", provide 1-word description for each of other signs in appropriate production class.

**Extra Information:**



## Major components

- Veterinarian
- Client (location, ownership)
- Change in PRRS status
- Dates (submission, start of clinical break, suspected date of infection)
- Inventory (herd type and herd size, and denominator for mortality)
- Mortality and morbidity
- History and extra information

# Change in herd status and definitions

- Unit of interest is **premises** (site)
- Herds are entered in the database because of a confirmed PRRSV infection on the site
- Infection detected due to:
  - Clinical outbreak on the site
  - Monitoring on the site
  - Clinical outbreak on adjacent site
  - Monitoring on adjacent site
- Initial herd serological status might influence severity

# Definitions

- **Clinical outbreak**

- Defined as appearance of clinical signs suggestive of PRRS in any age class on this premises (site)
- Date of clinical outbreak – date when PRRS was first suspected based on clinical signs on this site

- **Infection**

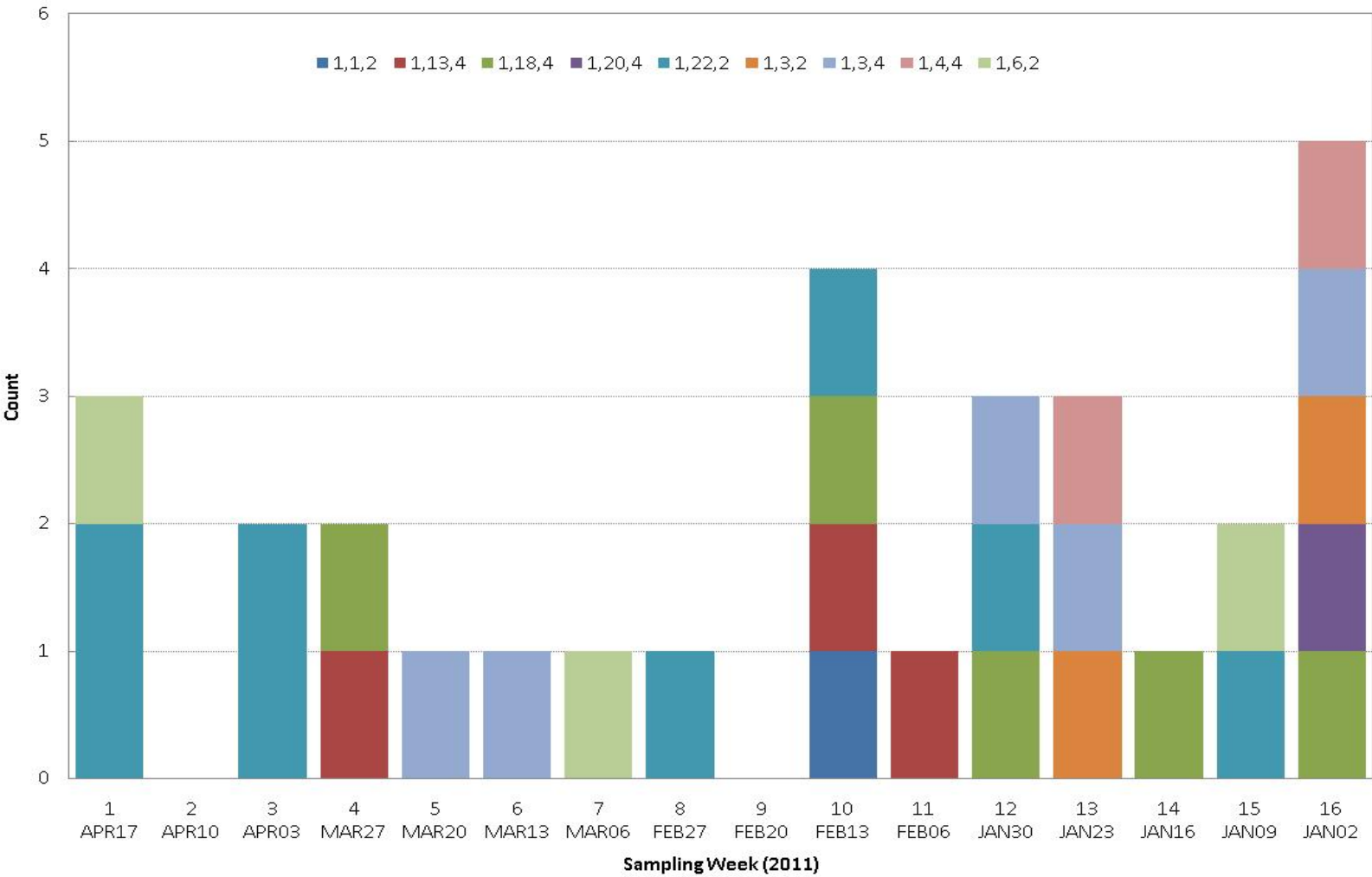
- Introduction or re-emergence of a virus within the site of interest
- Date when infection is suspected should be considered based on an appropriate combination of information from:
  - clinical outbreak on the site of interest and on other adjacent sites
  - diagnostic and epidemiological information on this site and on the adjacent sites



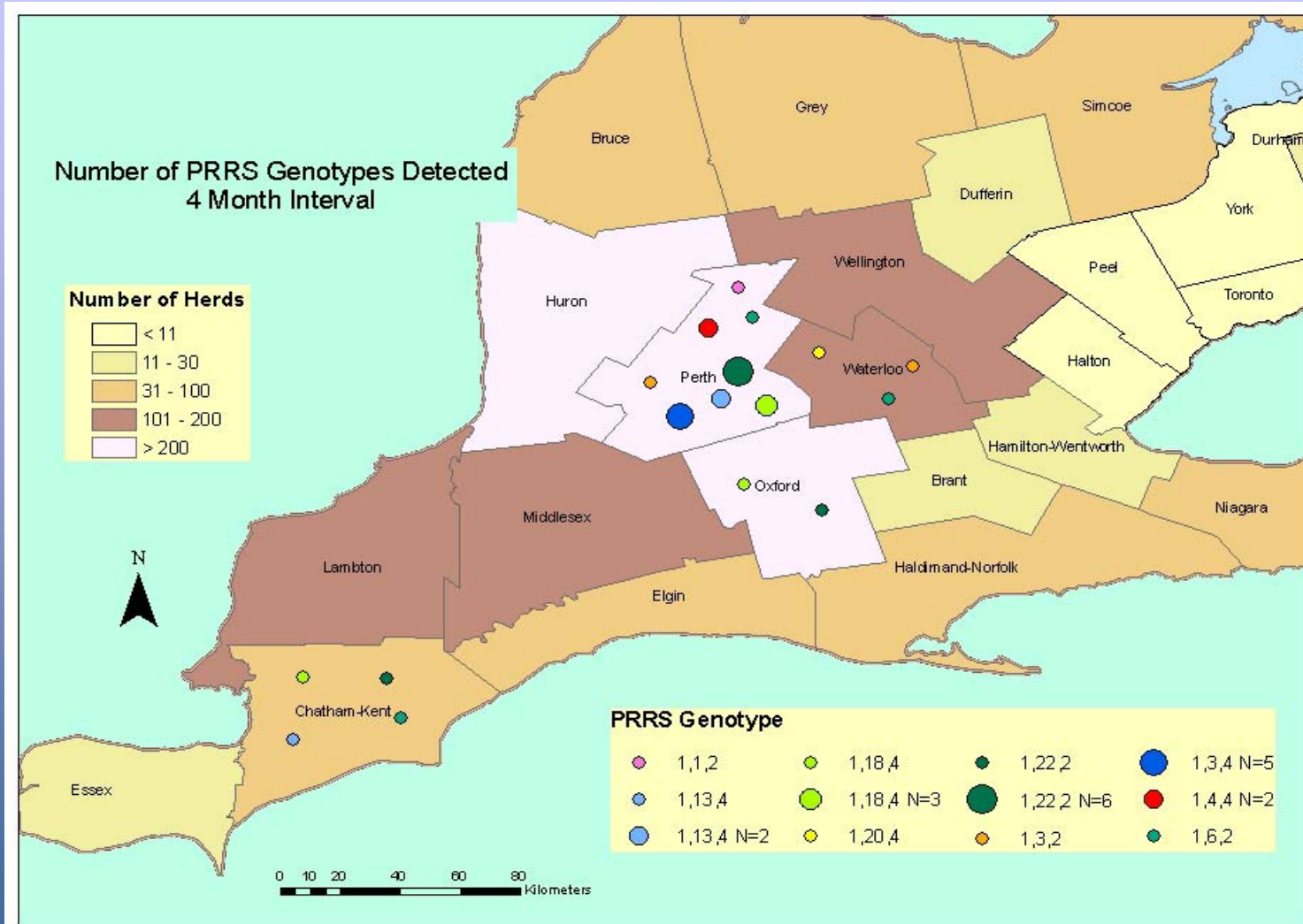
## Components of the weekly report

- 1) Timeline of recent and historical PRRSV outbreaks and infections
- 2) Spatial distribution of PRRSV genotypes
- 3) Reasons for submissions and demographics
- 4) Mortality
- 5) Morbidity
- 6) Validity assessment

# Temporal Distribution



# Spatial Distribution





# Funding for this project and supporting projects kindly provided by:



Developed with the financial and in kind support of OSHAB industry partners