

Flu at the County Fair



Andrew S. Bowman, MS, DVM, PhD, DACVPM



THE OHIO STATE UNIVERSITY
COLLEGE OF VETERINARY MEDICINE



Since 2010, there have been 465 reported infections with variant influenza viruses in the United States.



The majority of the cases had prolonged direct or indirect exposure to swine at agricultural fairs (i.e. exhibitors or their family)



Ohio county fair hogs to be destroyed after swine flu found

July 14, 2017

State officials have ordered the slaughter of nearly 300 hogs at a county fair in Ohio after at least two animals tested positive for swine flu.

Child Who Showed Hog At Henry County Fair Has Flu

A child who showed a hog at the Henry County Fair developed a confirmed case of Influenza A, which could be caused by the H1N2v virus. Four pigs became ill at the fair with what health department officials called swine flu. The animals tested positive for the H1N2v virus.

Influenza outbreak leads to slaughter of pigs at Franklin County Fair

Ferris Wheels, Funnel Cake, and...Swine Flu?

Pigs at county fairs can be a conduit for nasty new viruses.

MARYN MCKENNA AUG. 24, 2017 6:00 AM



Commercial swine

- ~66 million pigs
- large farms (~1000 pigs)
- all-in/all-out production
- limited human exposure

Exhibition swine

- ~1 million pigs
- small farms (~6 pigs)
- low population integrity
- high human exposure





Exhibition Swine

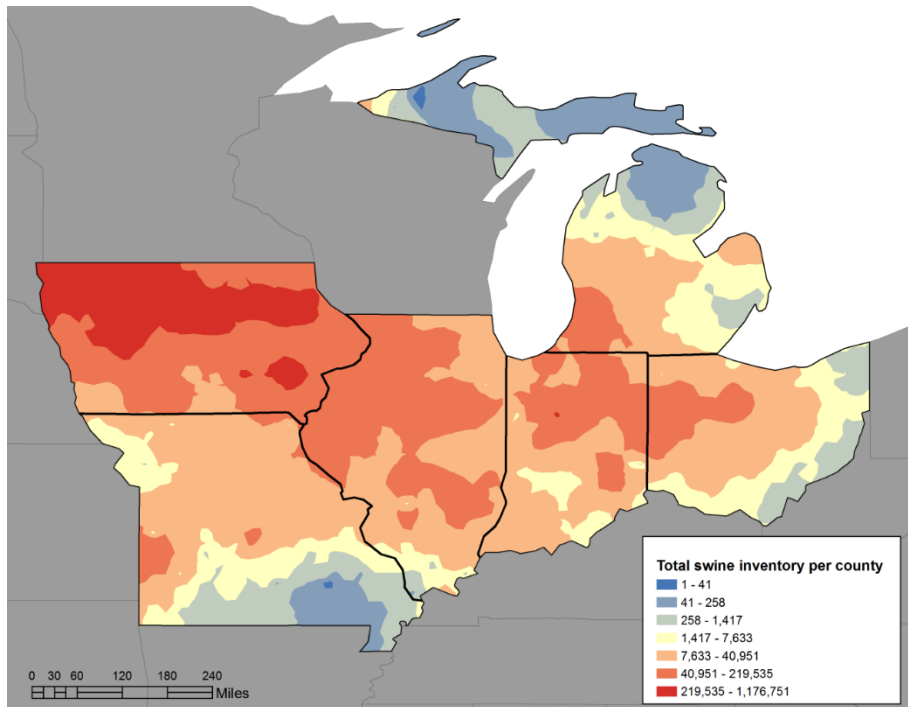


Unique swine-human interface

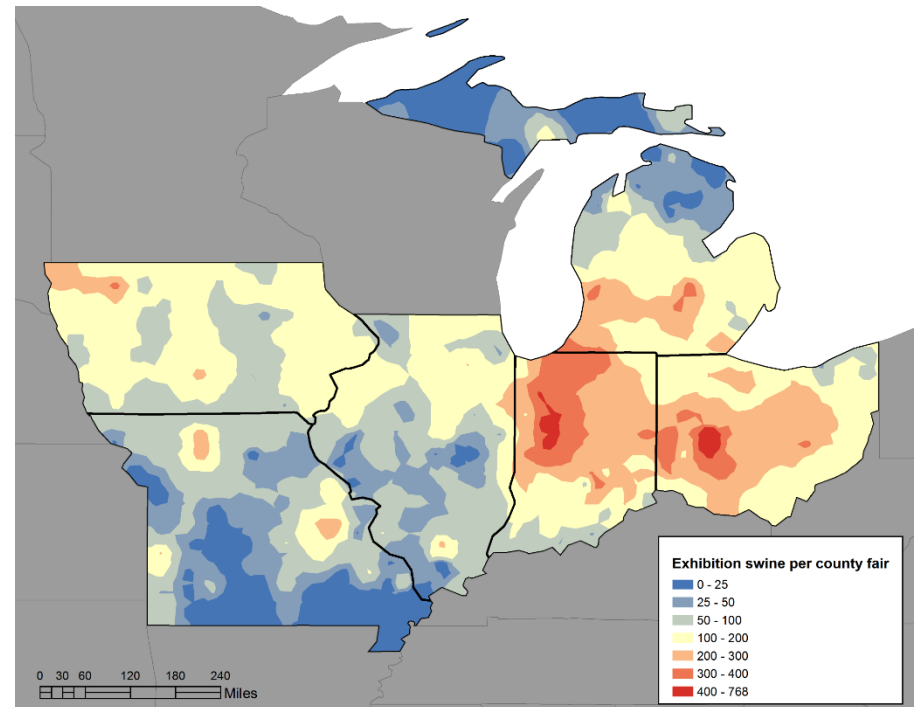
- Non-commercial swine (youth education programs)
- Multi-source pigs
- High people:pig ratio (~150 million people)
- Pigs and people comingled for a prolonged period of time



Total swine inventory



Exhibition swine per county fair



Lower concentration

Higher concentration



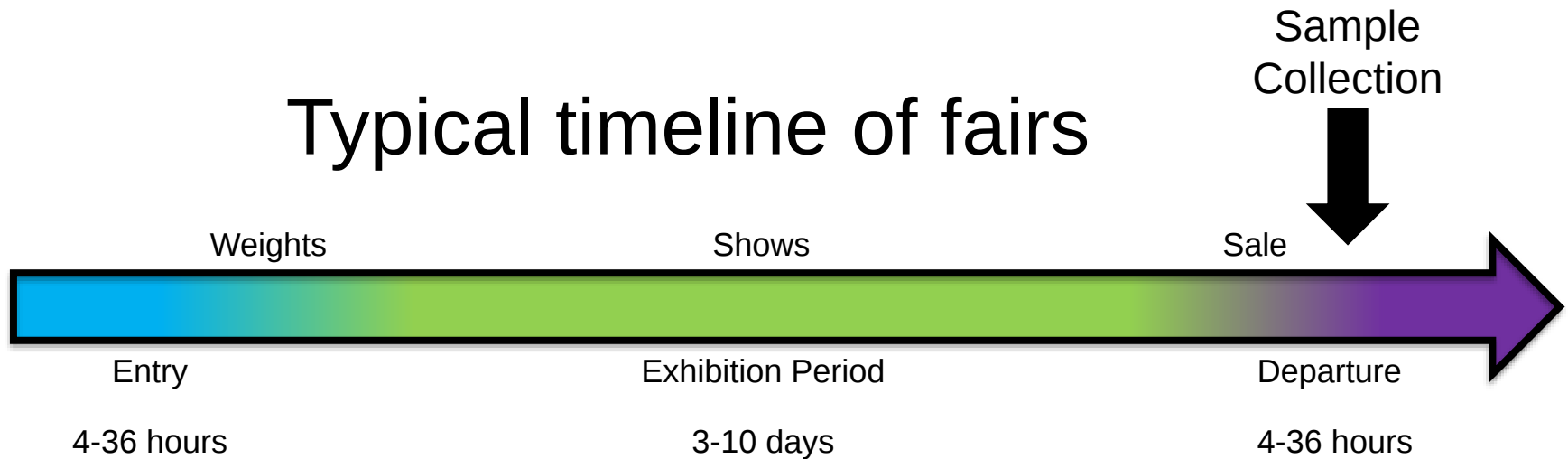
Since 2009, OSU AIEERP has been collecting nasal swabs from pigs at agricultural fairs in Ohio.

- Approximately 25% of fairs we visit have pigs that are shedding IAV.
- Most infected pigs are NOT displaying clinical signs at the time of sample collection.
- If a fair has 1 positive pig, likely that greater than 60% of the pigs are positive.





Typical timeline of fairs





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- American Association of Swine Veterinarians
- Centers for Disease Control and Prevention
- Council for State and Territorial Epidemiologists
- International Association of Fairs and Exhibitions
- Minnesota Center for Influenza Research and Surveillance
- National Assembly of State Animal Health Officials
- National Association of State Public Health Veterinarians
- National Pork Board
- National Swine Registry
- USDA, APHIS, VS
- USDA, NIFA, Youth & 4-H

National Assembly of State Animal Health Officials (NASAHO) National Association of State Public Health Veterinarians (NASPHV)

Measures to Minimize Influenza Transmission at Swine Exhibitions, 2013

It is estimated that 150 million people visit agricultural fairs each year in North America. Agricultural exhibitions provide valuable educational venues for the public. Equally important, the exhibition of swine is an important learning opportunity for thousands of youth exhibitors, 4-H and FFA members across the United States. Showing swine for these youth at their county or state fair is the culmination of many months of work dedicated to the care and training of their animal.

Pigs can be infected with human, swine and avian origin influenza A viruses. While rare, influenza A viruses can spread from pigs to people and from people to pigs, but it usually requires close contact between pigs and people. This has happened in different settings, including agricultural fairs. When people are infected with swine origin influenza A viruses, it is termed as a variant virus infection and denoted with a "v" after the subtype (e.g. H3N2v). In the past 5 years, cases of influenza A H1N1v, H1N2v and H3N2v have been associated with swine exhibitions. In 2011 there were 12 cases of H3N2v reported from 5 states. In 2012 there were a total of 309 cases of H3N2v identified in 12 states. The majority of cases reported exposure to pigs prior to onset of illness and were exhibitors and others in close contact with pigs at agricultural fairs. Sixteen of these individuals were hospitalized and one death was reported. Eleven of the 16 hospitalized cases, as well as the person who died, were people considered to be at high risk for complications from influenza infections. People at high risk include children younger than 5 years of age, people 65 years of age and older, pregnant women and people with certain long-term health conditions (like asthma, diabetes, heart disease, chronic respiratory disease, weakened immune systems, and neurological or neurodevelopmental conditions.)

These cases led to the formation of the Swine Exhibitions Zoonotic Influenza Working Group that has developed a set of measures to minimize influenza virus transmission between swine, from people to swine, and from swine to people at swine exhibitions. Influenza viruses are unpredictable and their impact and circulation can vary by year. It may not be possible to prevent all transmission of influenza viruses at swine exhibitions. The measures described here are offered for careful consideration depending on the needs of the specific exhibition and can be implemented in part or in total. They are not intended to supersede federal, state, or local regulations. These measures were formulated based on current evidence and the collective knowledge of the Swine Exhibitions Zoonotic Influenza Working Group. It is expected that this document will be updated regularly as additional information becomes available.

The suggested measures have been organized to address activities before, during, and after swine exhibitions. Measures are further divided into actions that may minimize risk to swine and risk to humans, although there is significant overlap between those two groups.



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Mitigation Strategies

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“Shorten the total time pigs are on the exhibition grounds, ideally exhibition swine should be on the exhibition grounds no more than 72 hours.”

-Measures to Minimize Influenza Transmission at Swine Exhibitions

Objective:

Validate the recommendation of limiting swine exhibitions to 72 hours to prevent zoonotic transmission of IAV-S.



Methods

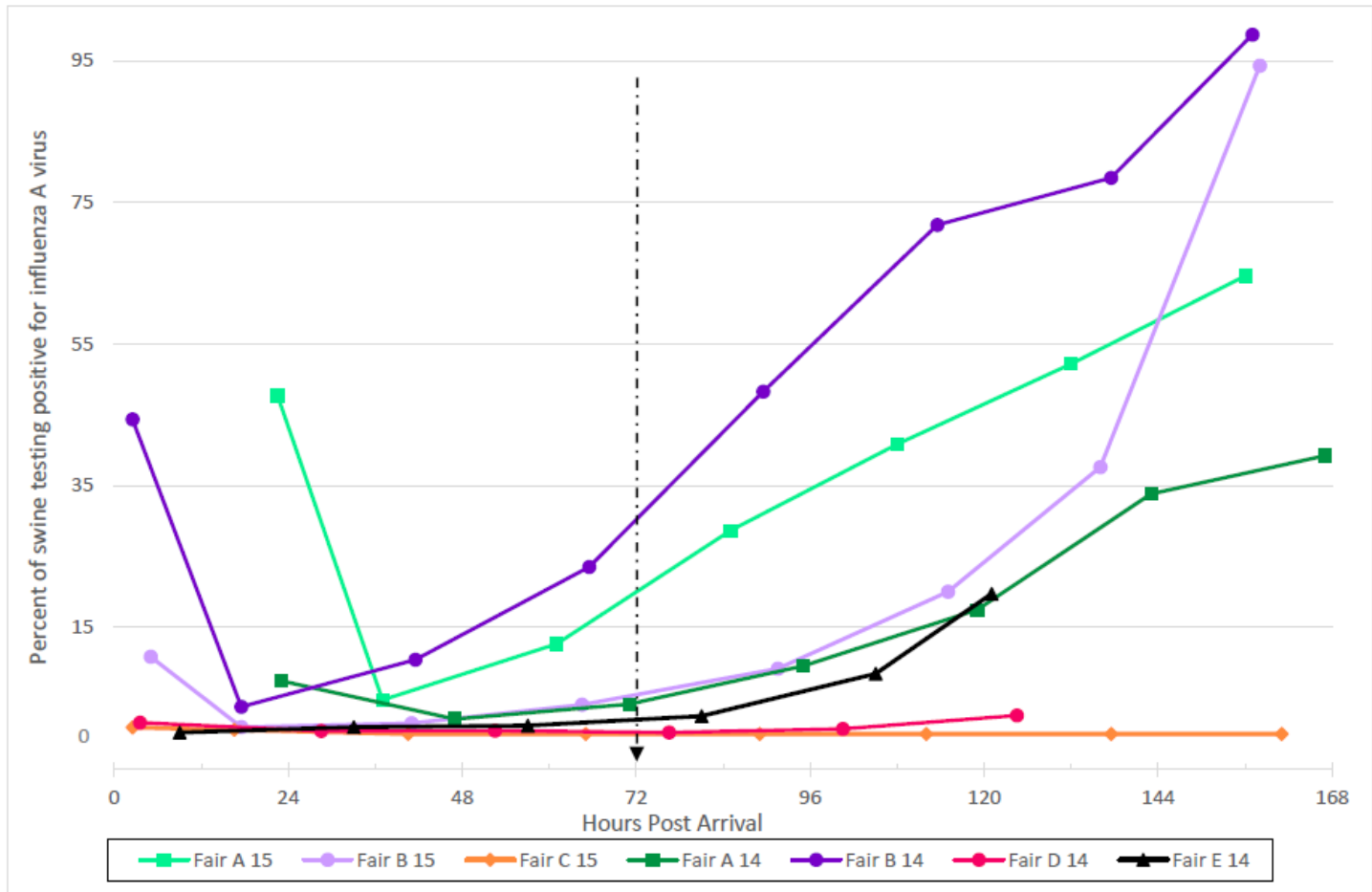
Sample every pig, every day at 8 fairs in 2014 (repeated in 2015).





Results

- 6,810 pigs sampled
- 948 (13.9%) were detected as positive during the course of study.
- IAV was detected in the pigs at 7 (44%) of the 16 fairs
 - Sustained IAV transmission at 5 of the 7
- Within those 5 events, the proportion of pigs testing positive for IAV at the conclusion of fairs was 49%.
- If the exhibitions had ended at 72 hours, the proportion of positive pigs would have been <18%.





18 H3N2v cases

- Linked to swine exposure at 7 fairs across Ohio and Michigan
- Six of the seven were participating in our CEIRS surveillance

Estimated IAV prevalence in the pigs at the six fairs was 77.5%.

Centers for Disease Control and Prevention

MMWR

Morbidity and Mortality Weekly Report

Weekly / Vol. 65 / No. 42

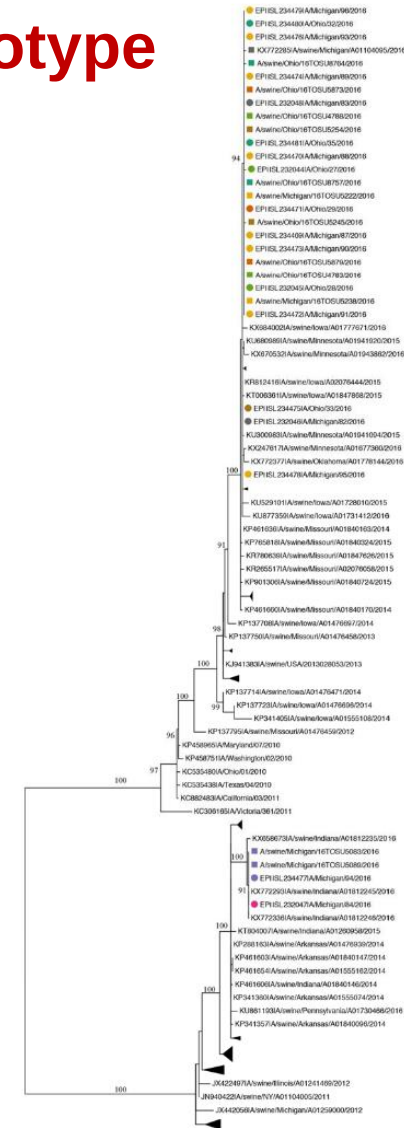
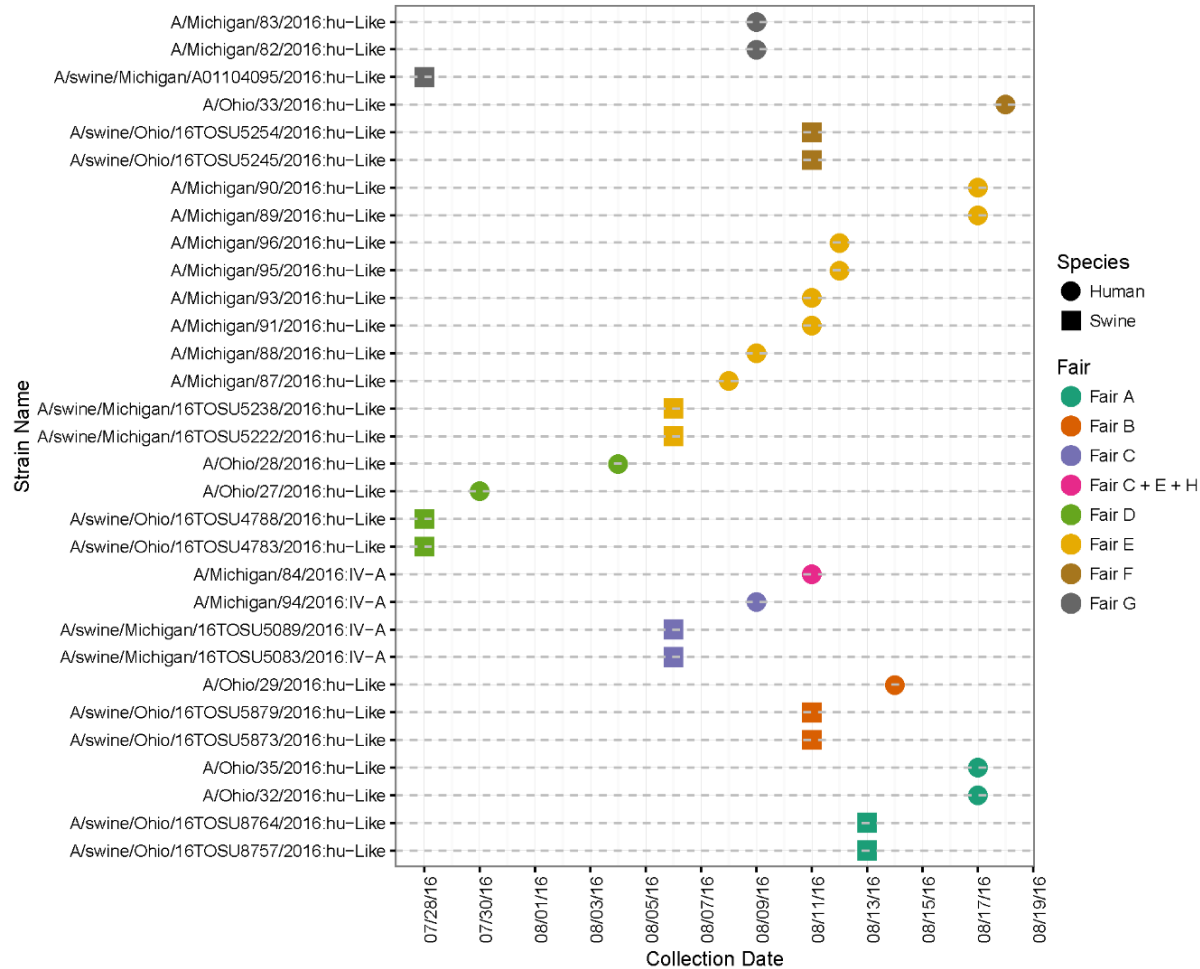
October 28, 2016

**Outbreak of Influenza A(H3N2) Variant Virus Infections Among Persons
Attending Agricultural Fairs Housing Infected Swine —
Michigan and Ohio, July–August 2016**

Rebekah S. Schicker, MSN, MPH^{1,2}; John Rossow^{2,3}; Seth Eckel, MPH⁴; Nicolas Fisher⁵; Sally Bidol, MPH⁴; Lilith Tatham, DVM⁵;
Janice Matthews-Greer, PhD⁴; Kevin Sohner, PhD⁵; Andrew S. Bowman, DVM, PhD⁶; James Avrill, DVM, PhD⁷; Tony Forshey, DVM⁸;
Lenee Blanton, MPH²; C. Todd Davis, PhD²; John Schiltz, DVM⁹; Susan Skorupski, DVM¹⁰; LaShondra Berman, PhD²; Yunho Jang, PhD²;
Joseph S. Bresee, MD²; Stephen Lindstrom, PhD²; Susan C. Trock, DVM²; David Wentworth, PhD²; Alicia M. Fry, MD²; Sietske de Fijter, MS⁵;
Kimberly Signs, DVM⁴; Mary DiOrio, MD⁵; Sonja J. Olsen, PhD²; Matthew Biggerstaff, MPH²

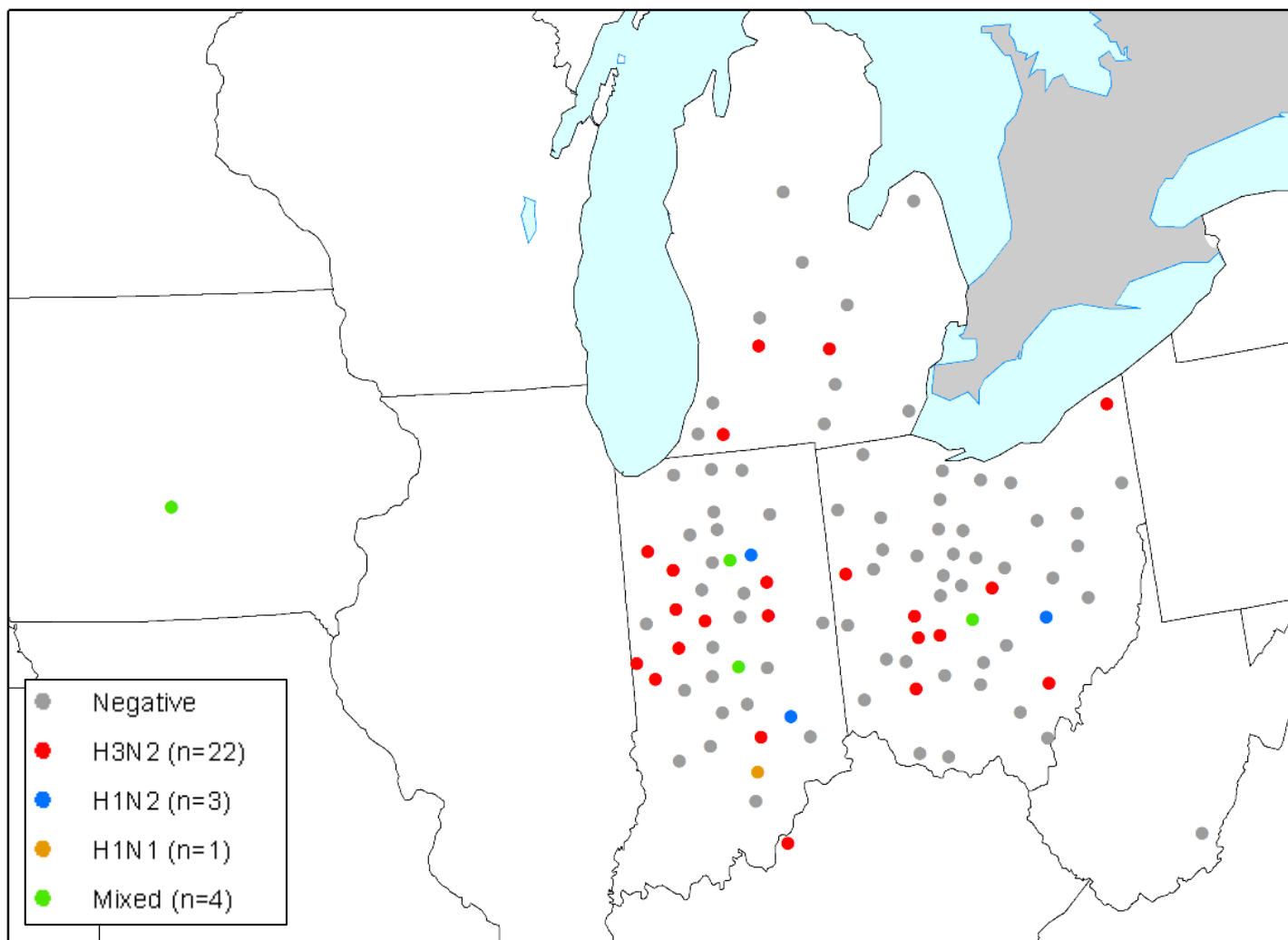


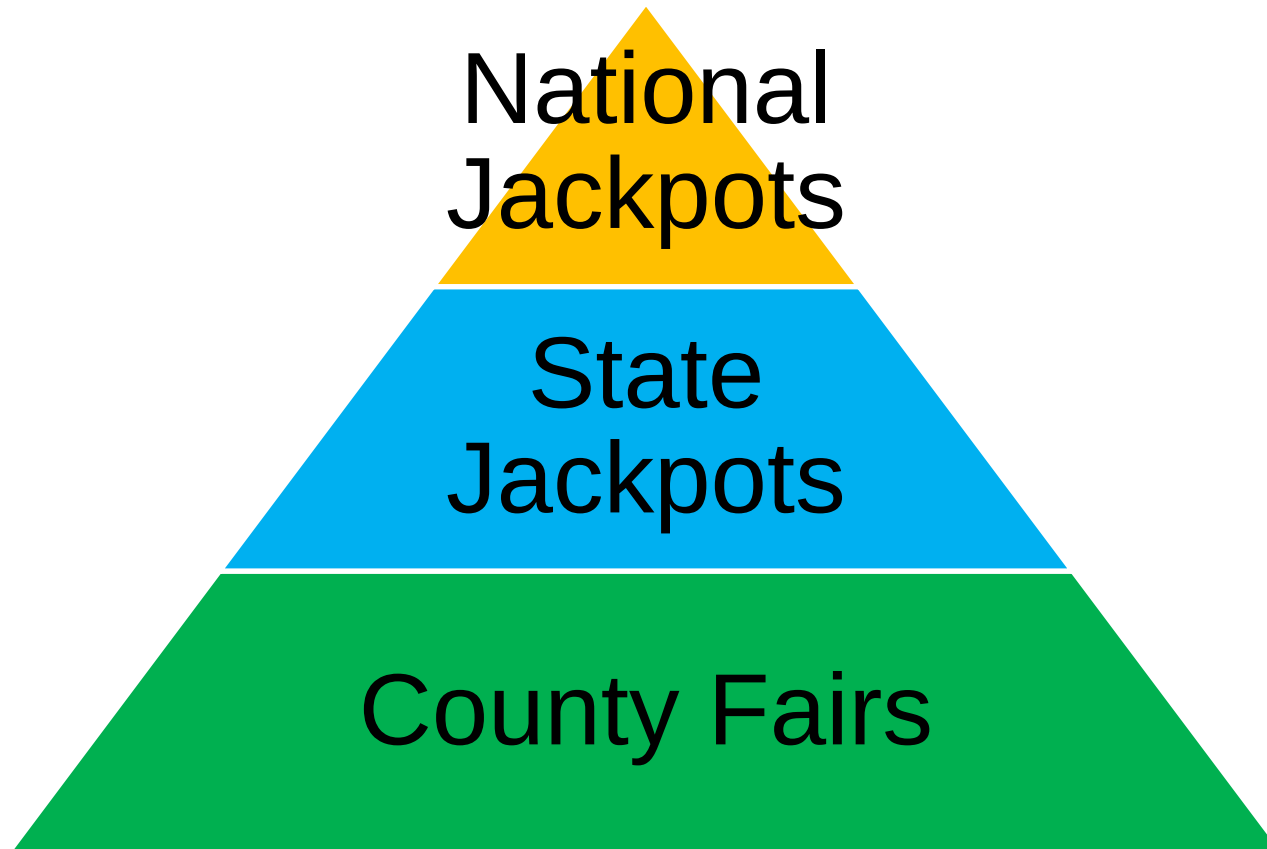
1st documented zoonoses from this genotype



Human-like H3

Cluster IV A







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Jackpot Shows

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**INDIANA
JUNIOR
SWINE
CIRCUIT**

MAIN EVENT/ IJSC KICKOFF		SATURDAY APRIL 29, 2017
NEW LOCATION HUNTINGTON COUNTY		
JUDGES:		
BARROWS - RYAN WATIE		
GILTS - MIKE FISCHER		
SHOWMANSHIP:		
FRIDAY EVENING		
FOR TRIPLE POINTS		
ENTRY:		
\$25.00/HEAD		
REGISTRATION:		
FRIDAY EVENING		
SATURDAY: 7:00-9:00 AM		
PAYOUT:		
GRAND.....	\$1000.00	
RESERVE.....	\$750.00	
3RD.....	\$500.00	
4TH.....	\$250.00	
5TH.....	\$100.00	



**THE SUMMER
JACKPOT
SHOW**

REAL MCCOY GENETICS

TWO BIG SHOWS • ONE BIG DAY



SHOW **Pig PLANET**

JACKPOT SHOW

OPEN TO THE WORLD - OVER \$40,000 IN PRIZE MONEY - IJSC SANCTIONED SHOW

**LIGHT EM' UP
SHOWPIG
BATTLE**

WHEN

June 11th

Check-in from 8-9a.m.

Show begins at 9:30a.m. with Showmanship



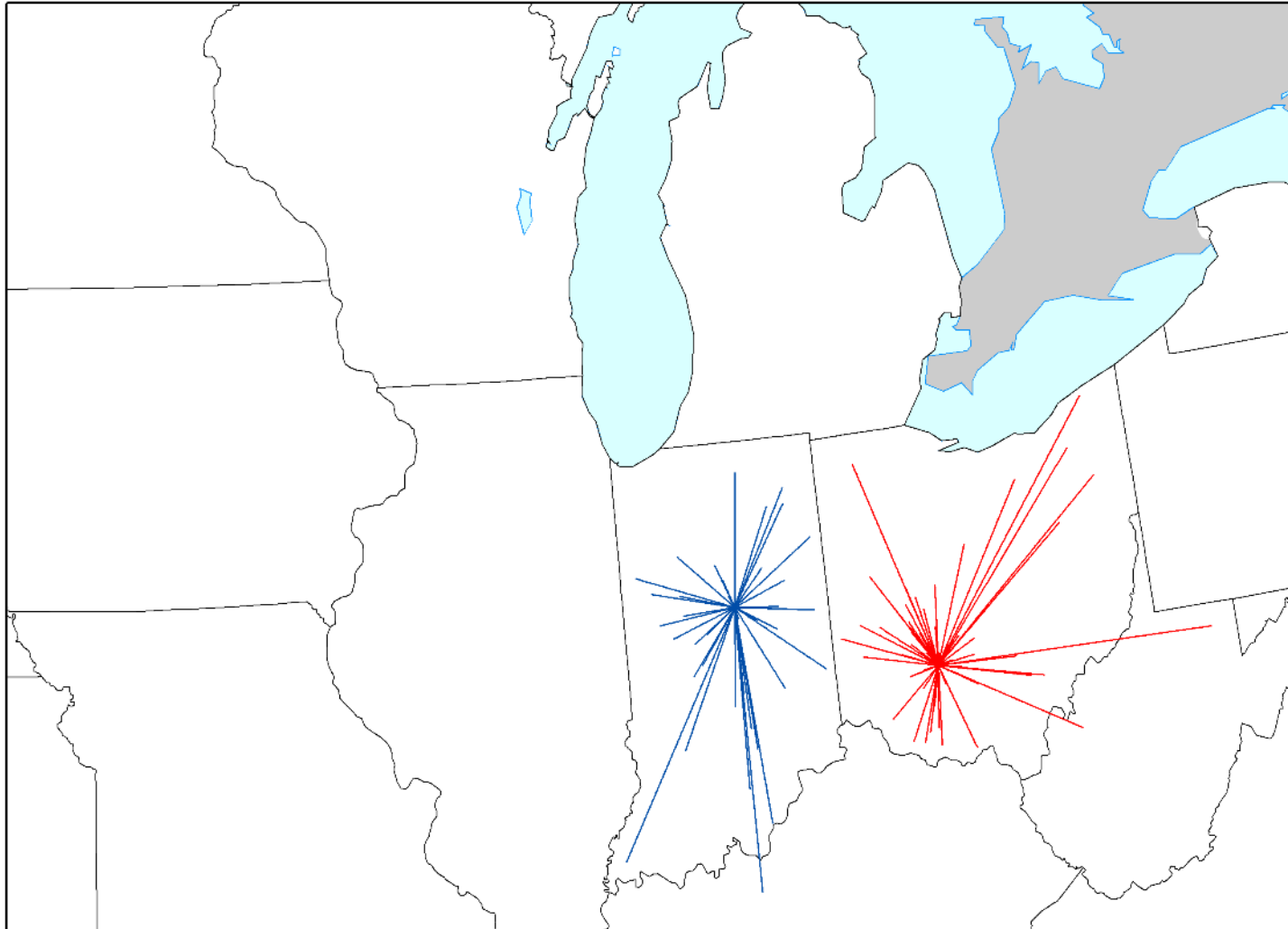
Agricultural Fairs

Restricted to local residents
Long duration (~ one week)
Public in attendance
Age 9-18
Limited movements
Education project focused

Jackpot Shows

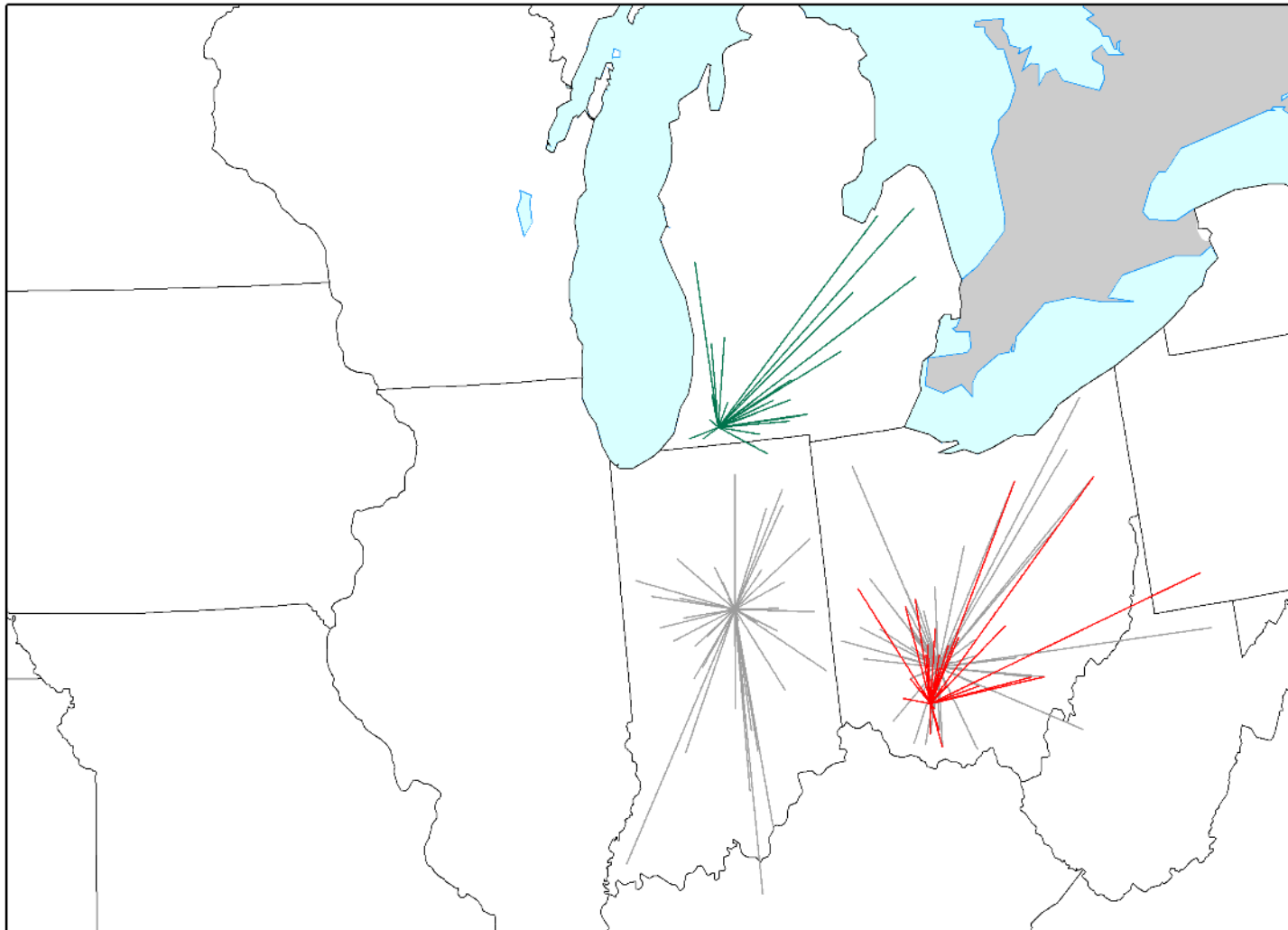
Open to everyone
Short duration (~2 days)
Limited attendance
Wider age range of exhibitors (3-21)
Frequent movement
Competition focused





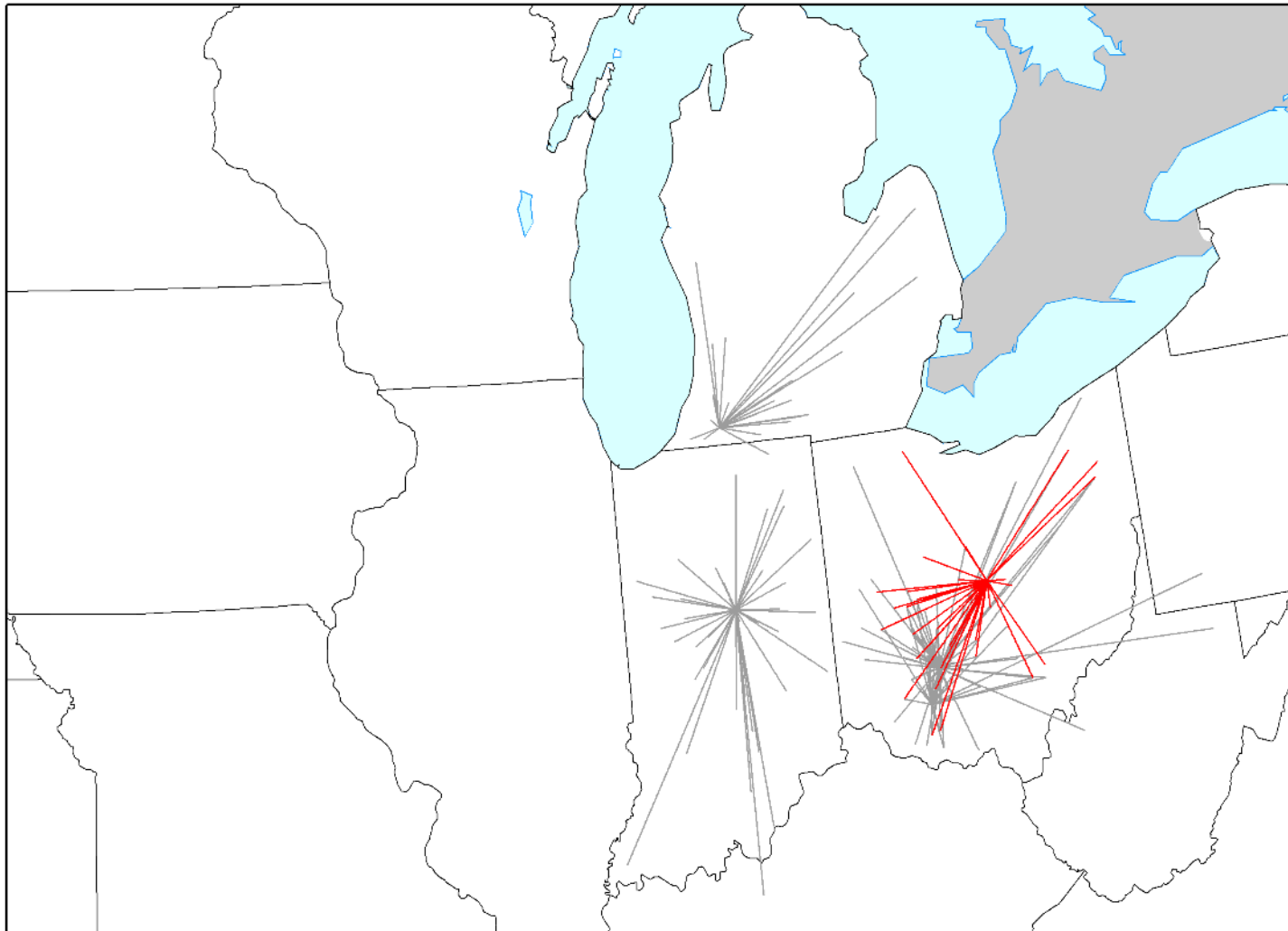


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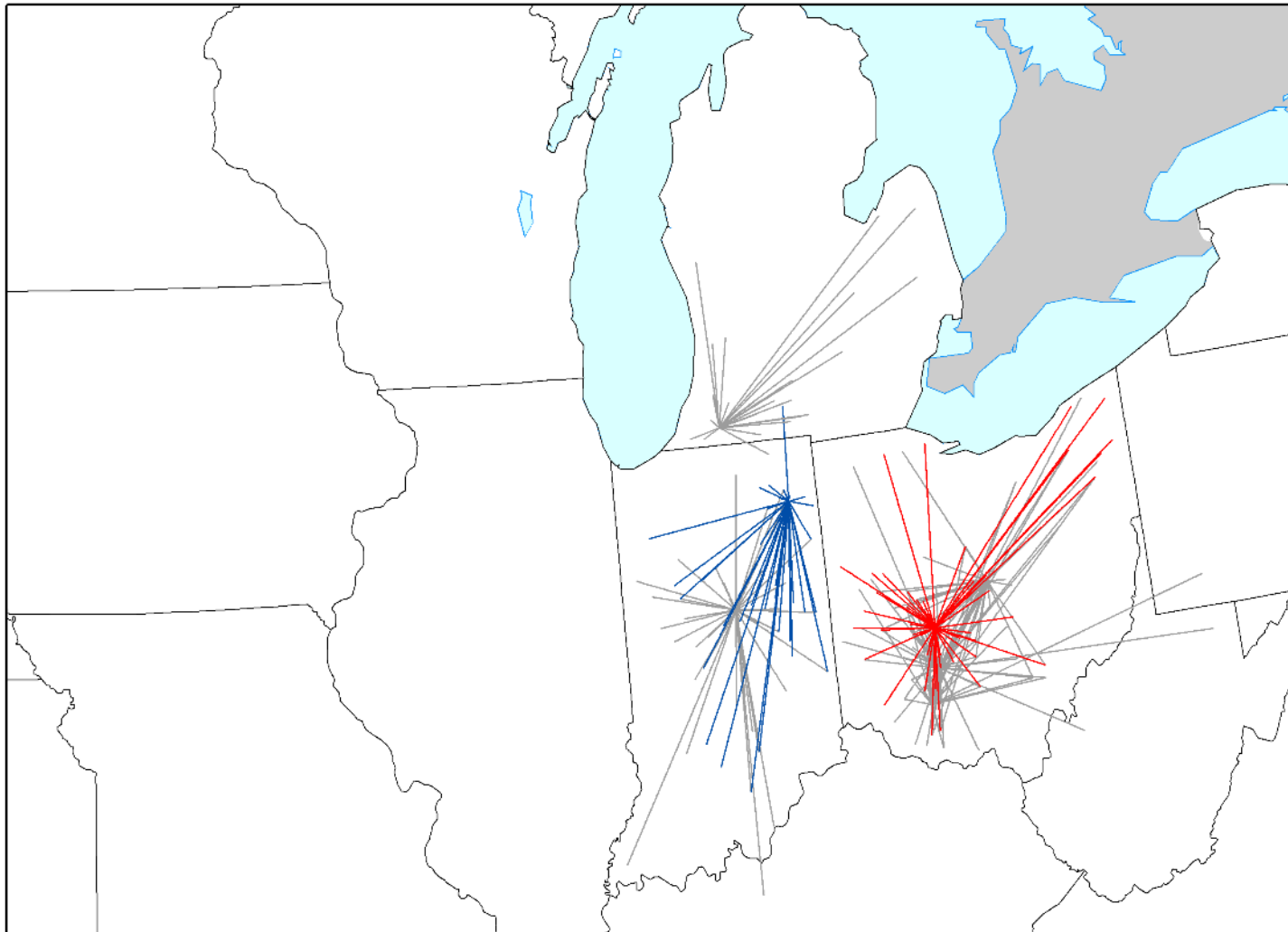


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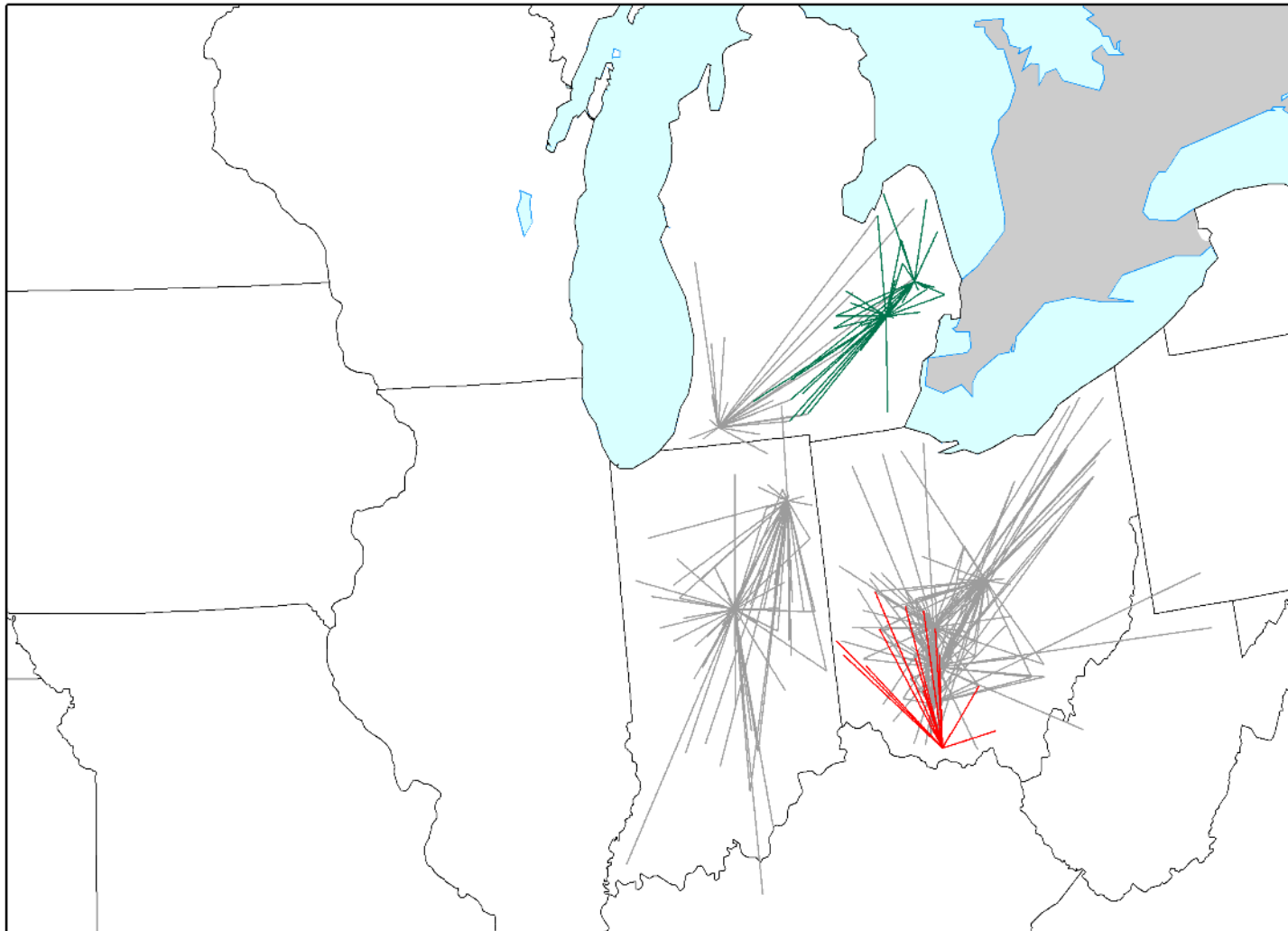


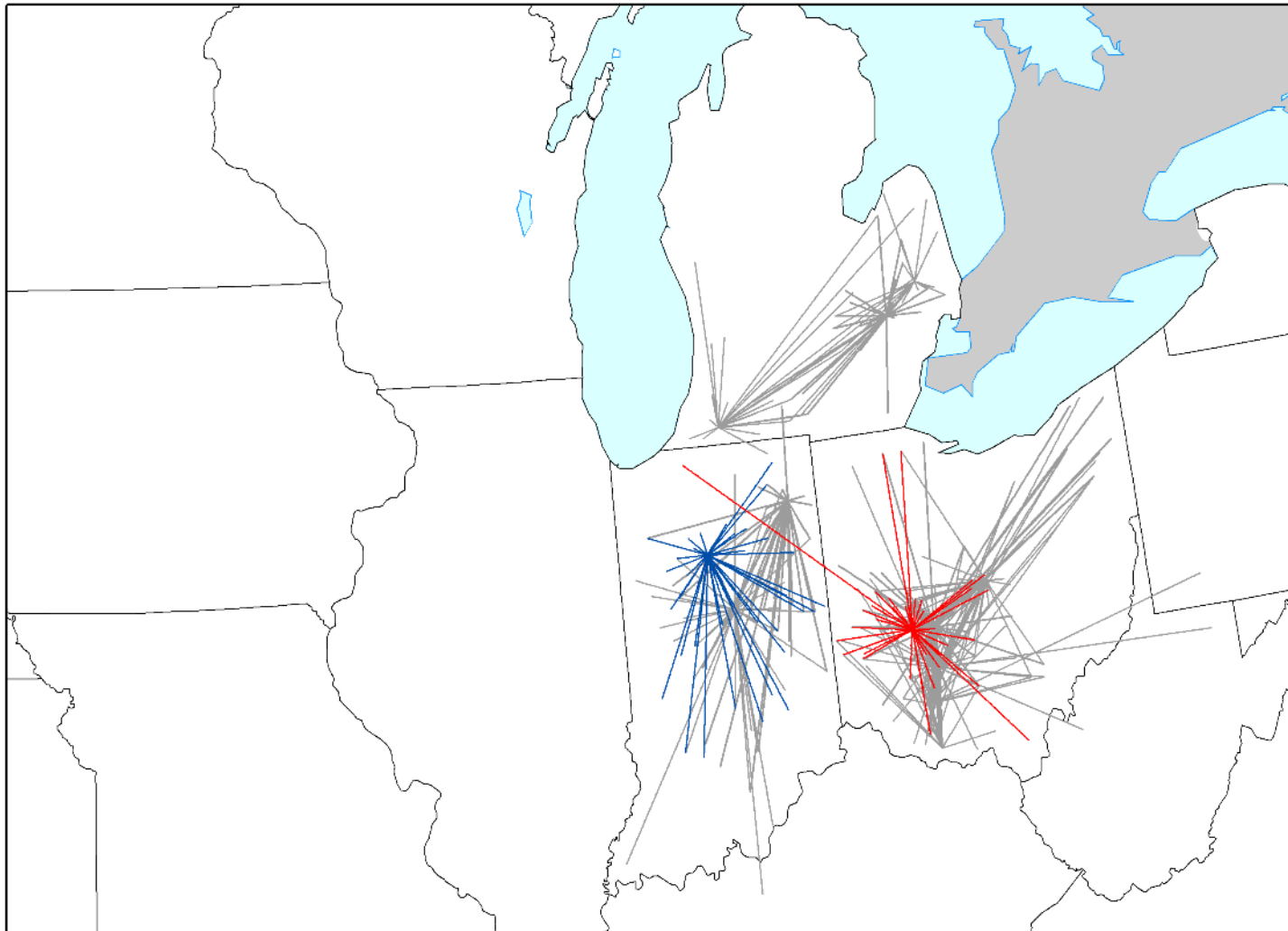
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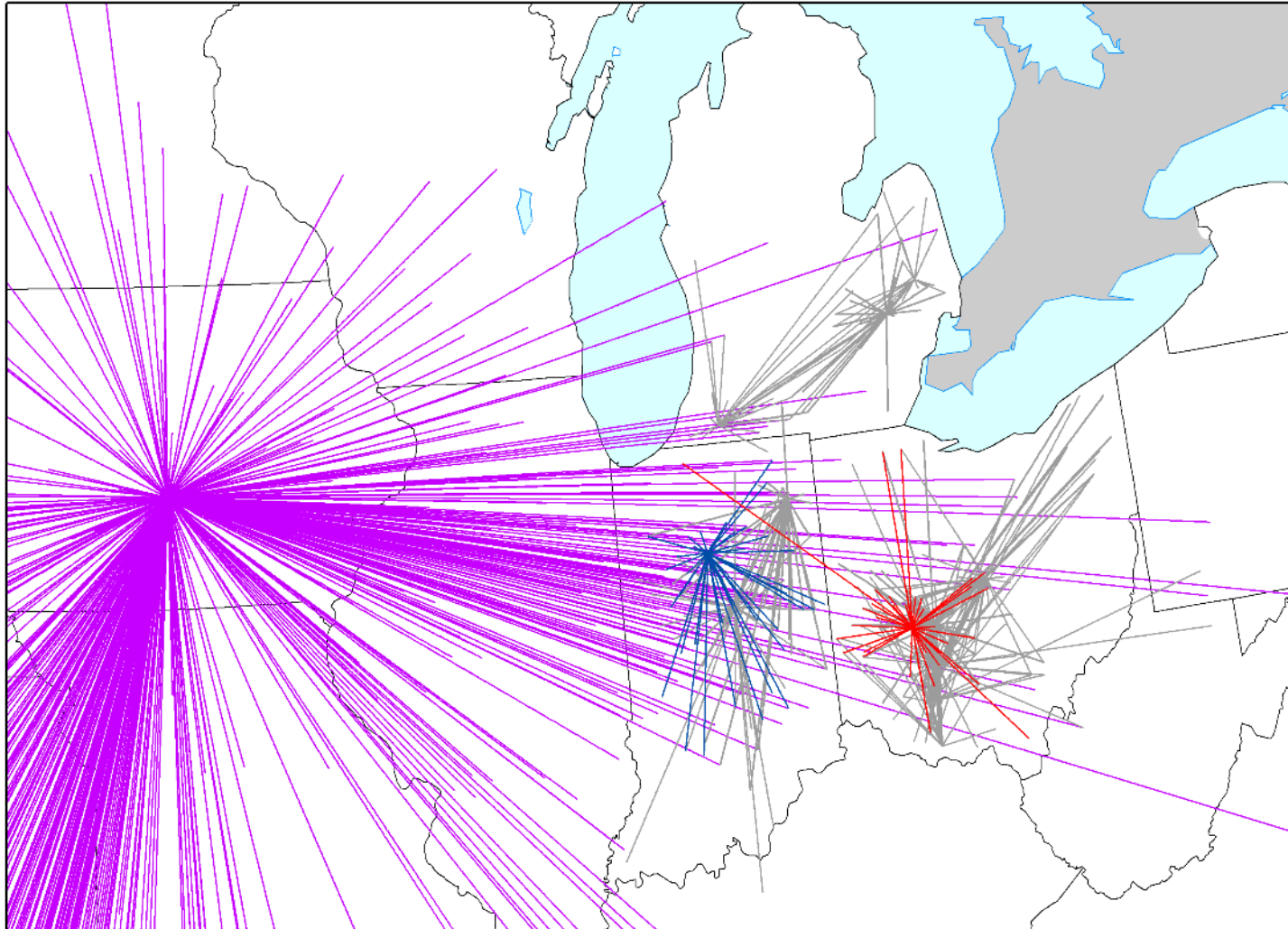


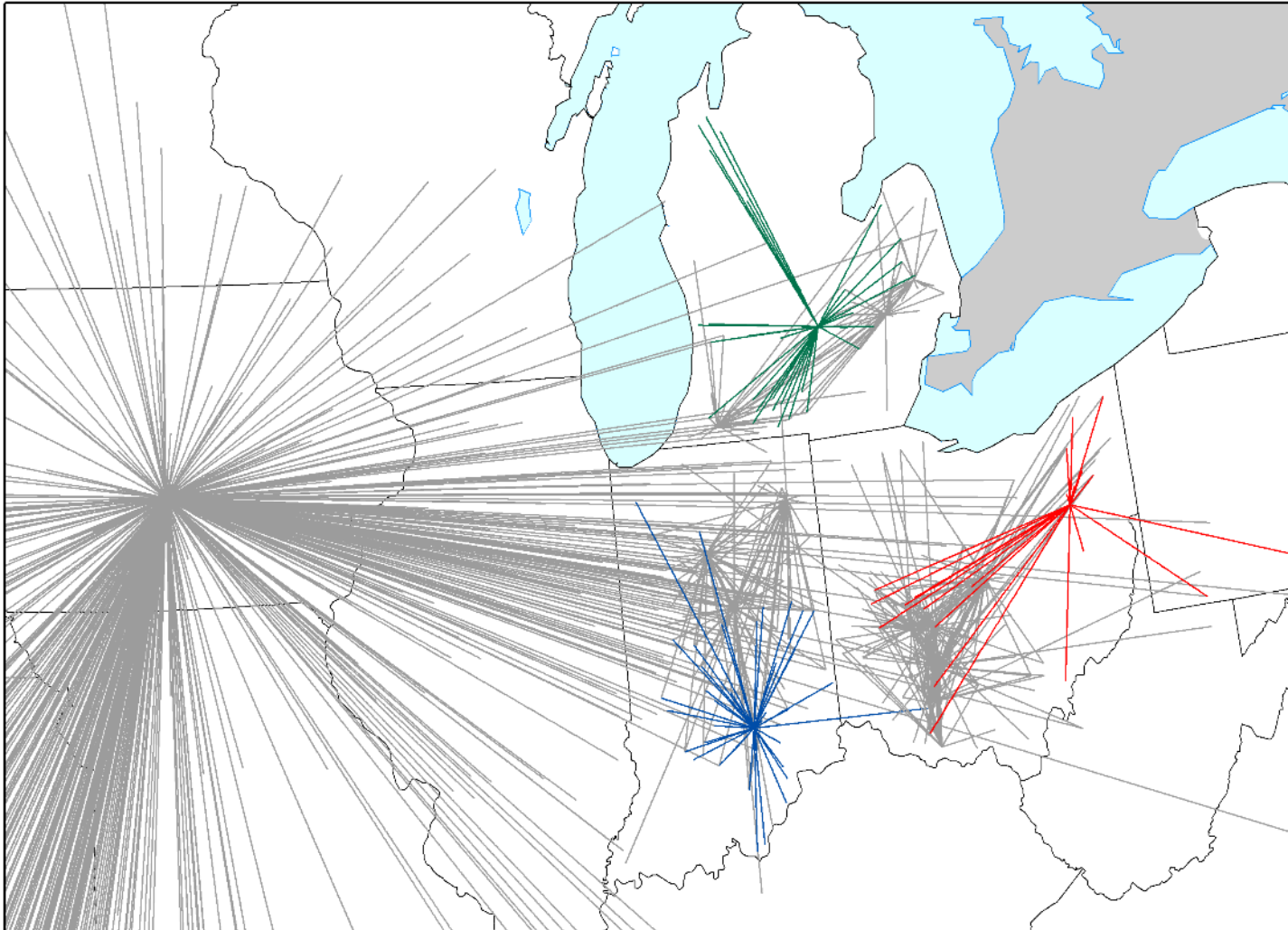


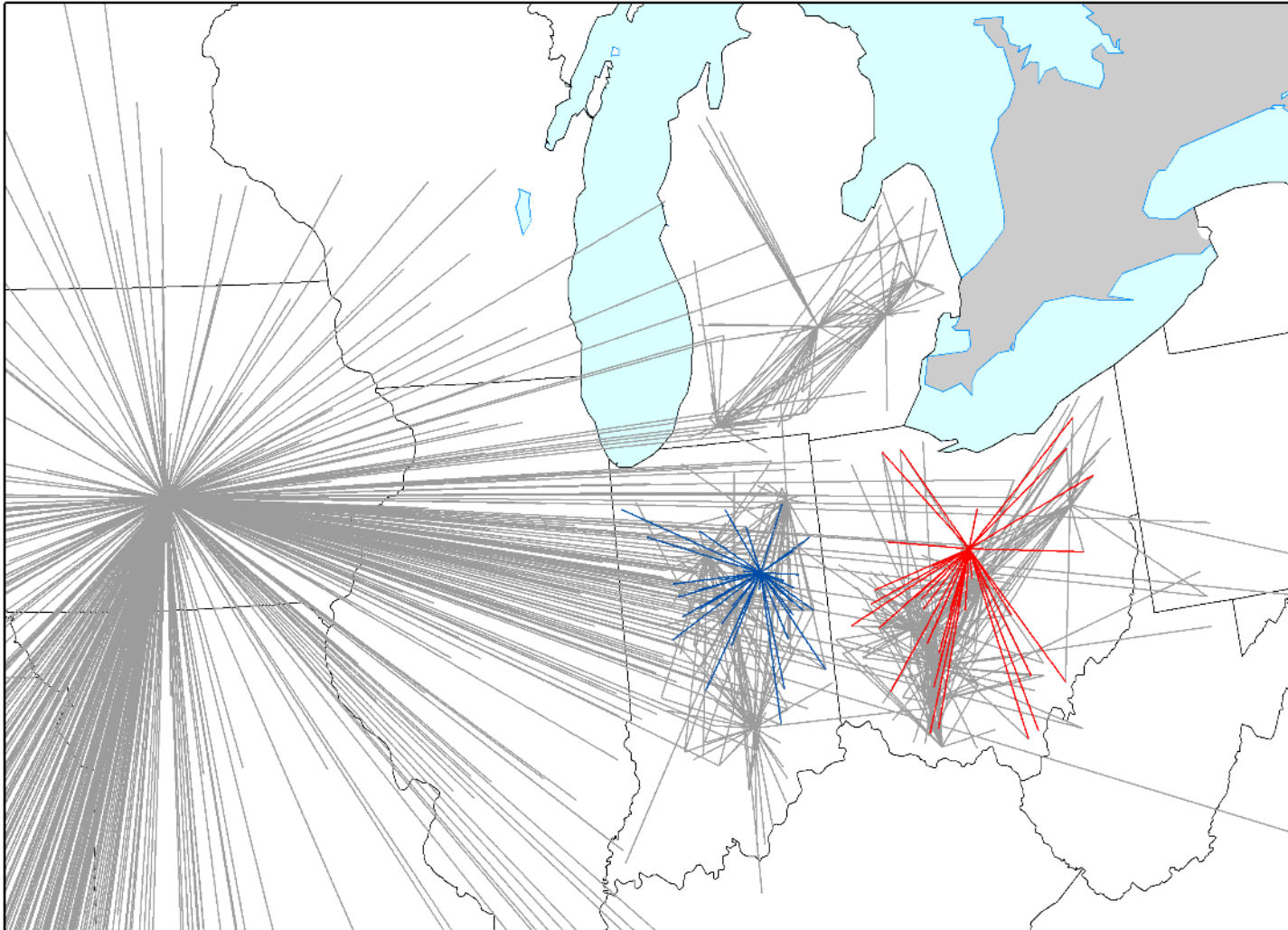
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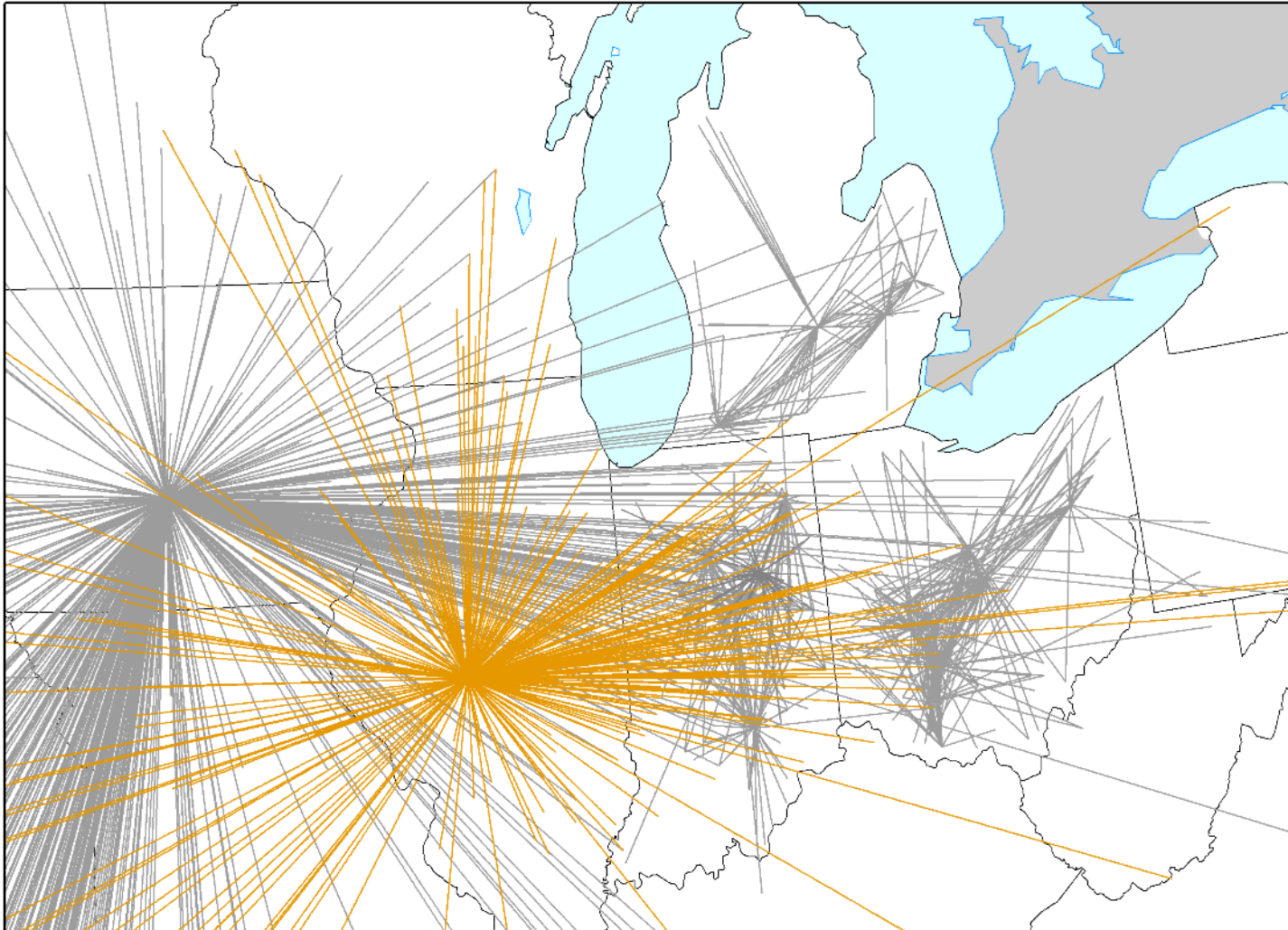






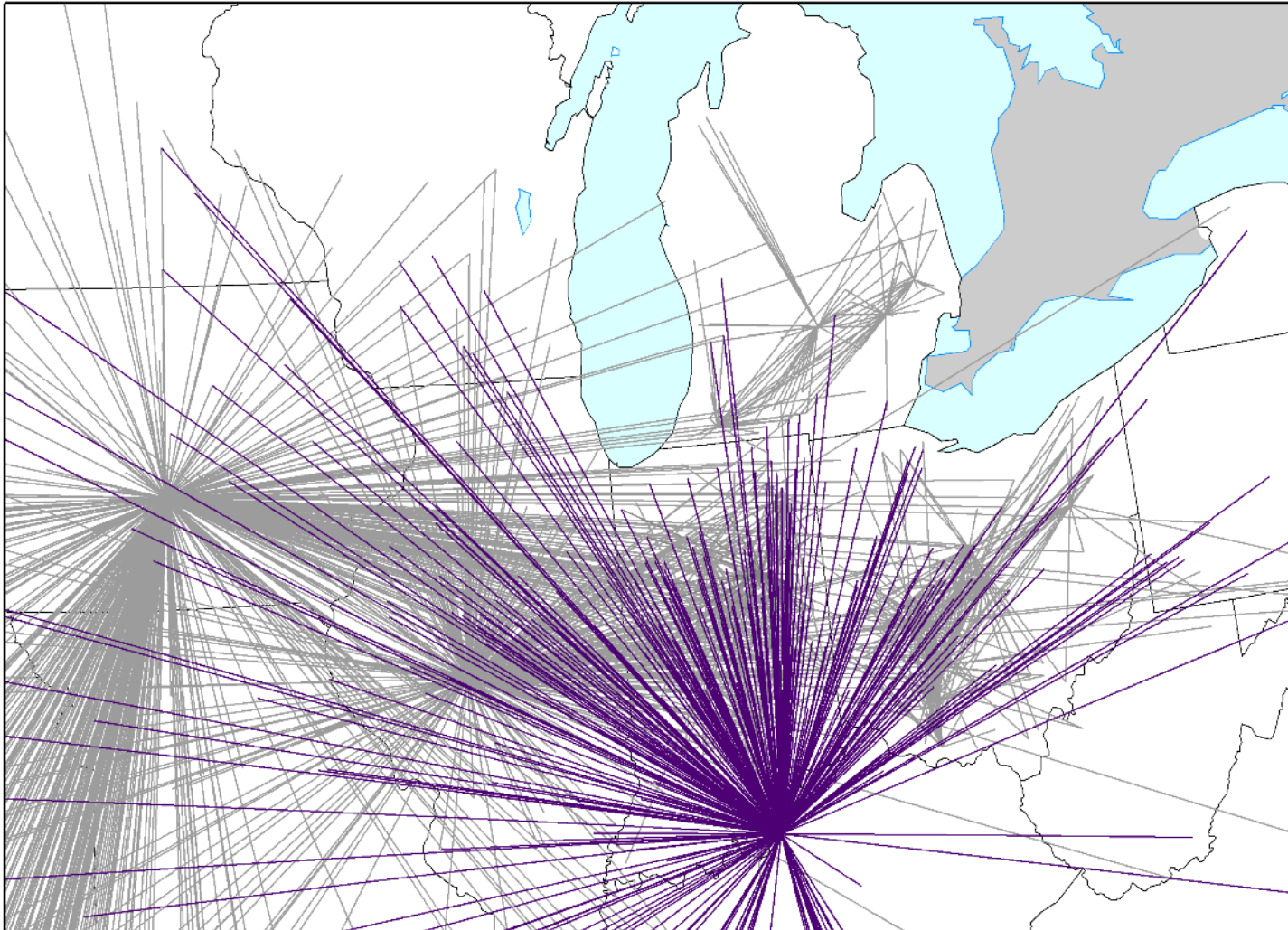




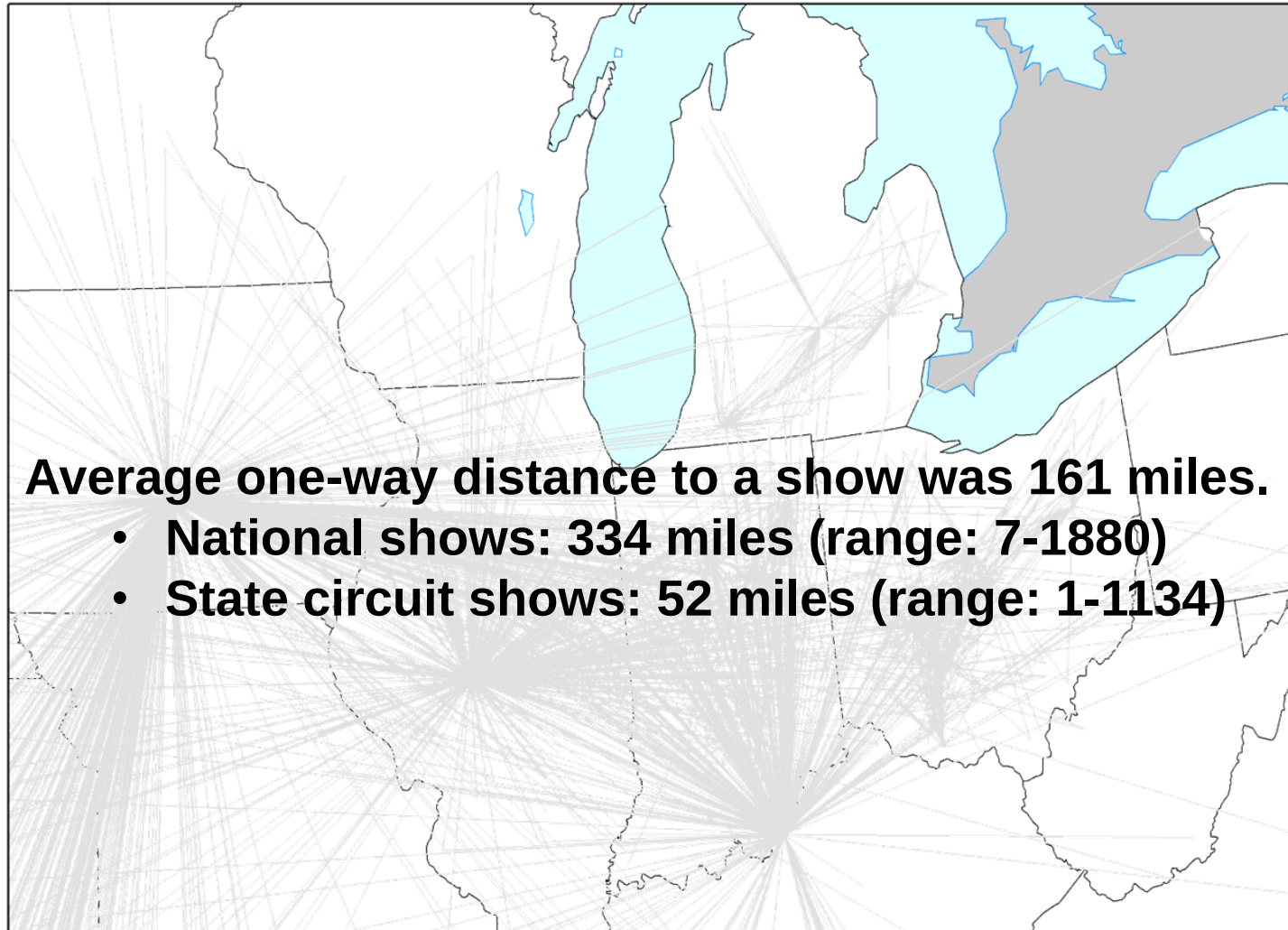


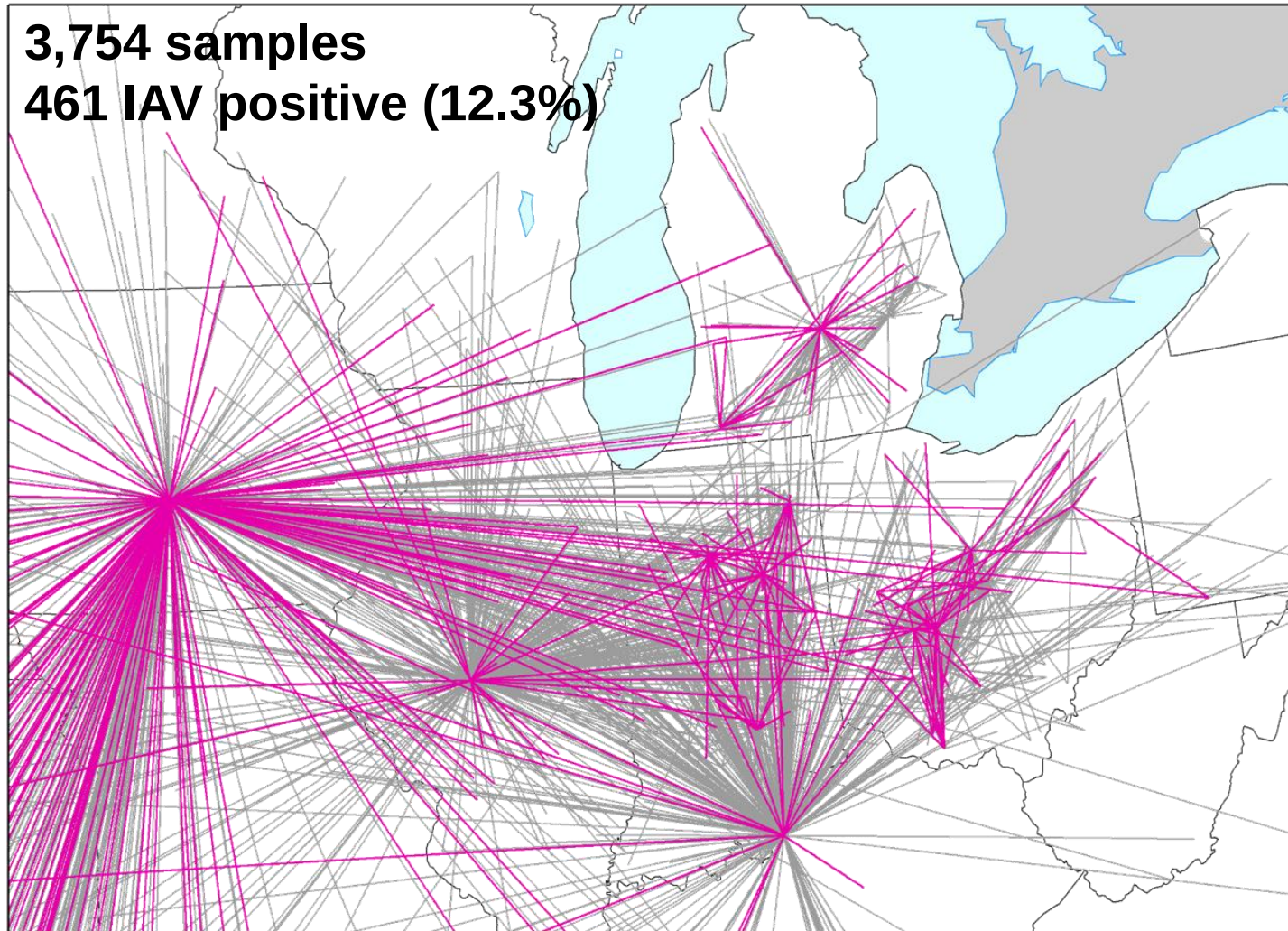


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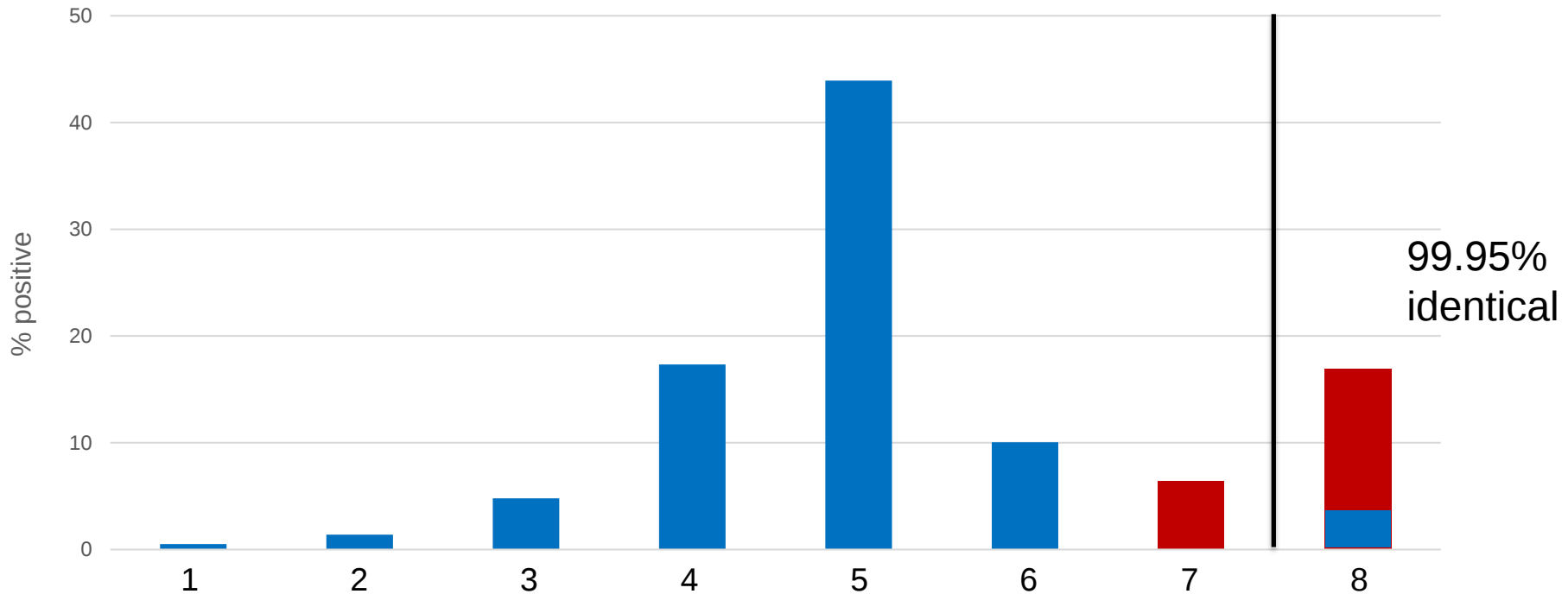




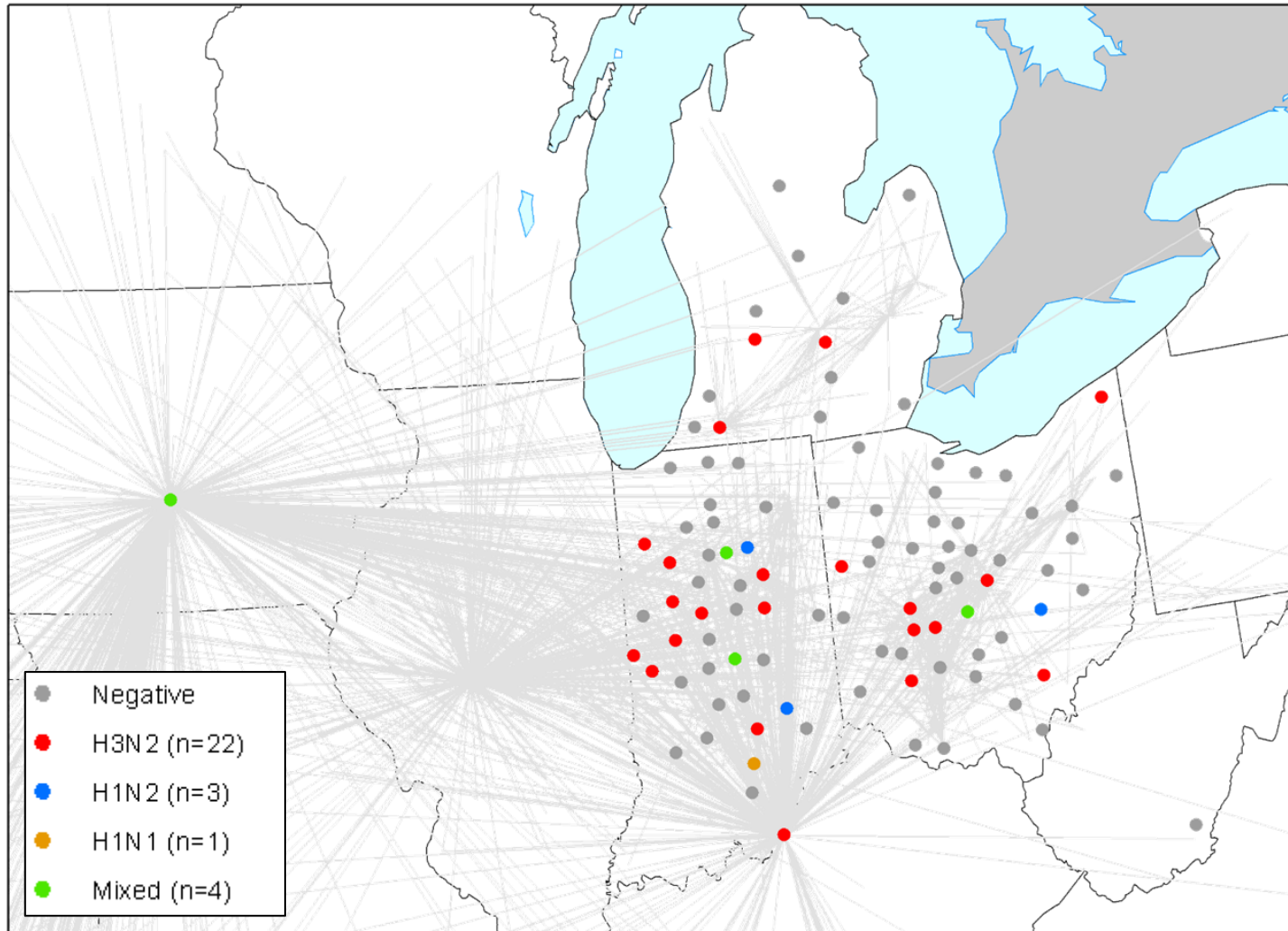




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Overall influenza A virus prevalence
144 out of 1,229 (11.7%)
H1N2 and H3N2



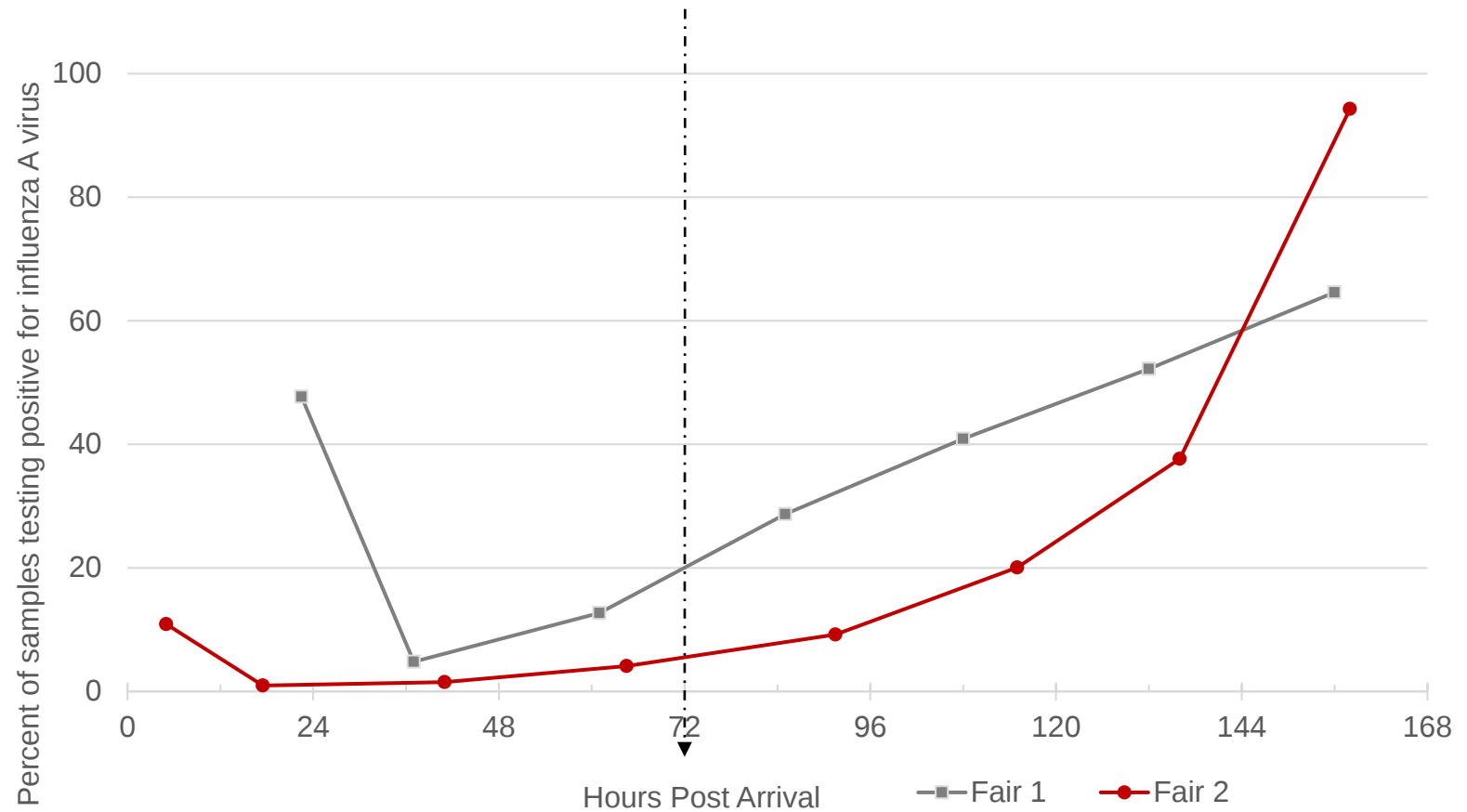


Exhibition swine are a highly mobile population of pigs.

- Shows create an extensive transmission network that allows for rapid and widespread dissemination of virus.
- Mechanism for dissemination of other emerging or high-consequence diseases in swine.

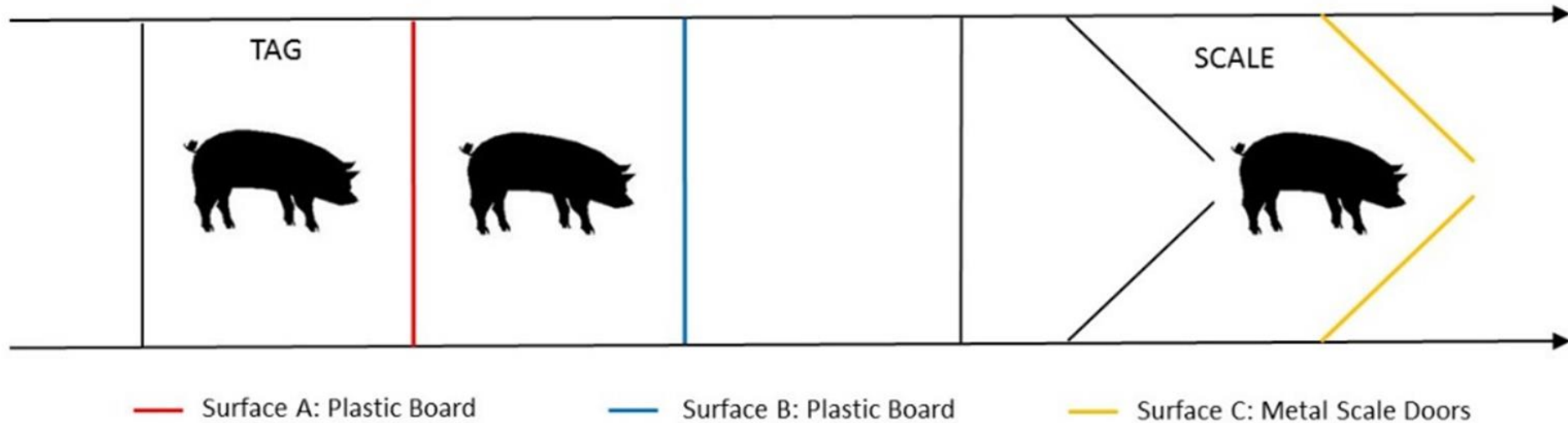


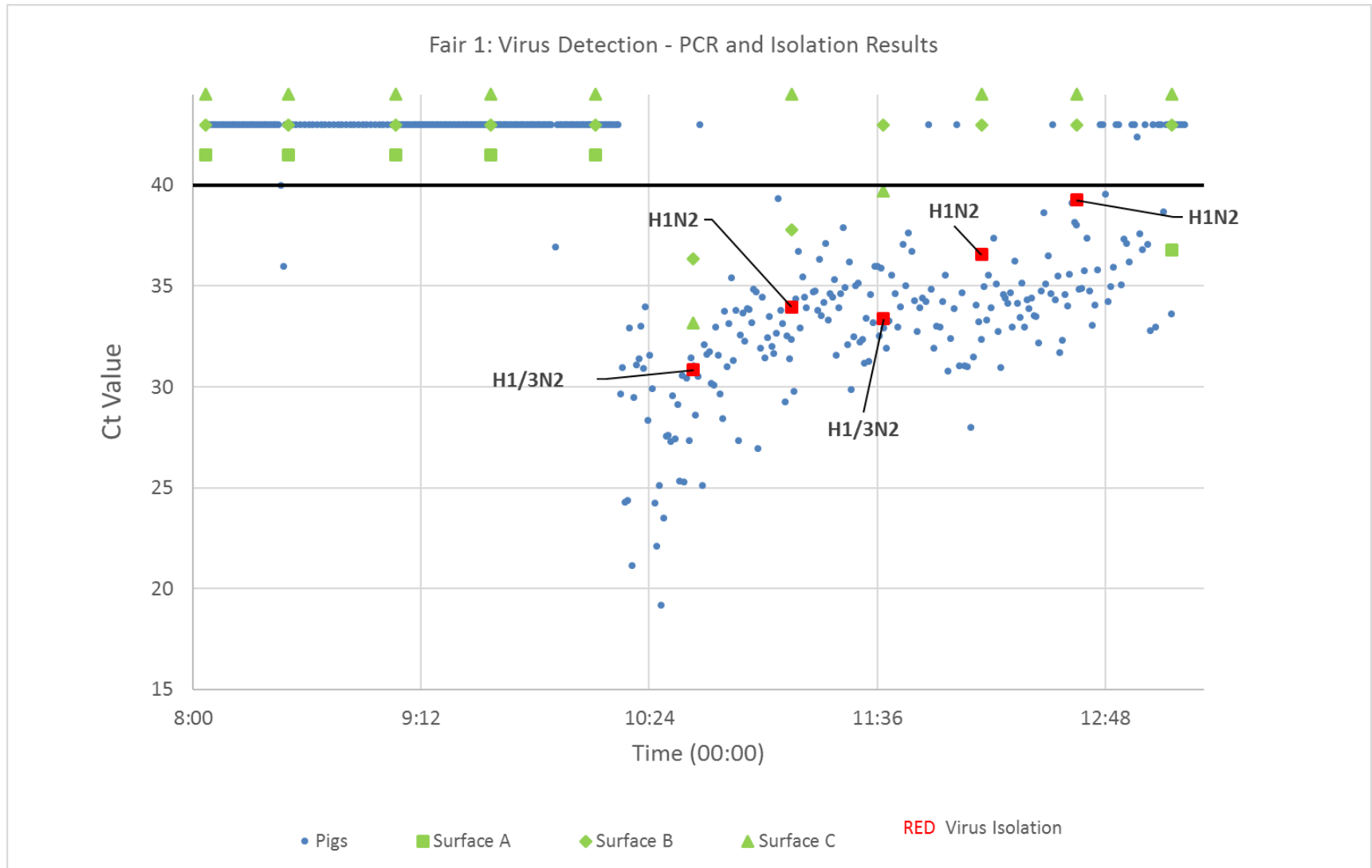
Fair 1 & 2: Virus Detection in Pigs via PCR - Duration of Fair





Fair 1: Chute Diagram











Acknowledgements

Special thanks to swine exhibitors and show organizers.

AIEERP team

Sarah Lauterbach

Josh Lorbach

Sarah Nelson

Collaborators

Sue Trock

Emily Eisenberg Lobelo

Joe Gregg

Dave Wentworth

Todd Davis

Amy Vincent

Mary Lea Killian

Martha Nelson

Funding

St. Jude Center of Excellence for
Influenza Research and
Surveillance



National Pork Checkoff

Council of State and Territorial
Epidemiologists

Centers for Disease Control &
Prevention