

# Exploring the Impacts of Weather-Related Road Closures in North Carolina

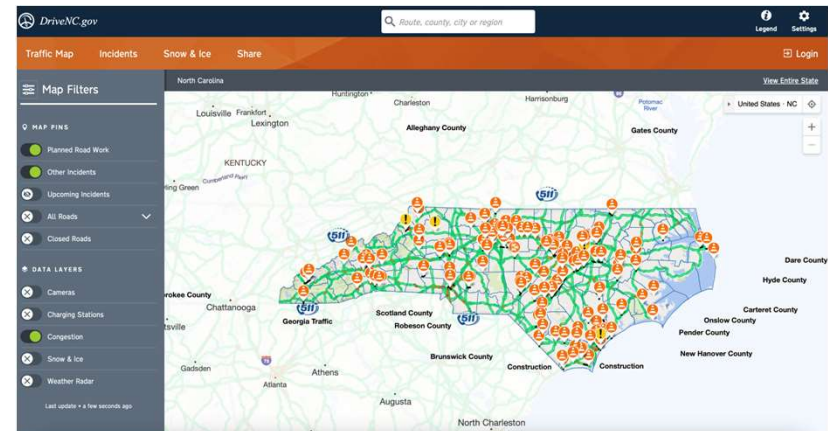
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## PROJECT AIM

Utilize the existing archive of weather-related road closures to analyze daily impacts to local travel on the statewide road network since 2016



## PROJECT BACKGROUND



Extreme weather can cause both short-term and long-term degradation of the road network



Road network disruptions can cause significant impacts to society



Extreme weather will become more frequent and intense (Kunkel 2020)



North Carolina displays high physiographical diversity and exposure to widely varied physical hazards

# ROAD NETWORK VULNERABILITY

“a susceptibility to *incidents* that can result in considerable reductions in road network *serviceability*” (Berdica 2002, 119)

Redundancy-availability and accessibility of alternative routes (network structure)

Quality of roadways

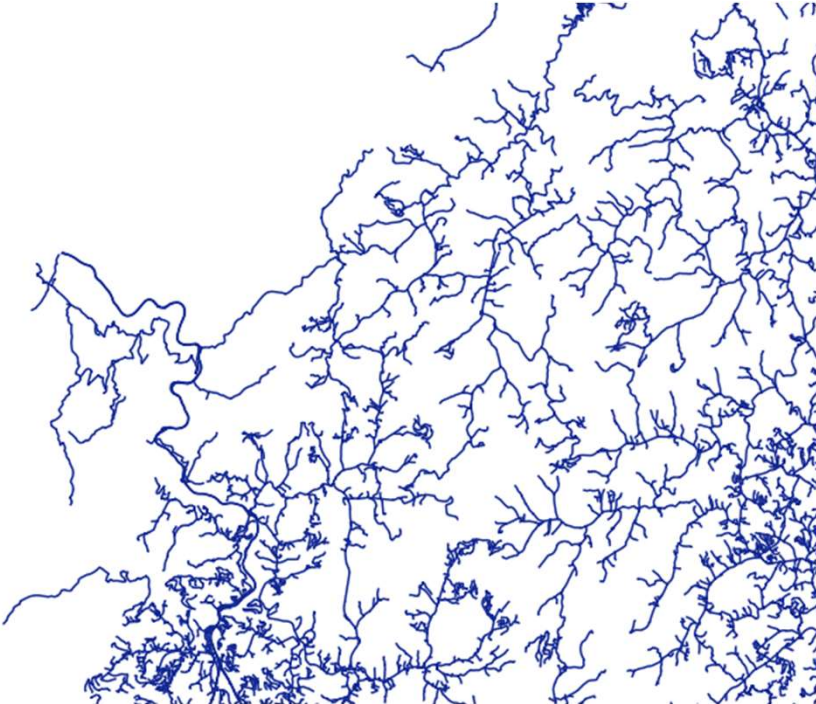
## N.C. Highway 12 Will Remain Closed Until Weather Conditions Improve

November 17, 2019 | Local News



Looking north from Mirlo Beach in Rodanthe around high tide on Sunday. Photo by Don Bowers.

# NETWORK STRUCTURE



Rural Road Network

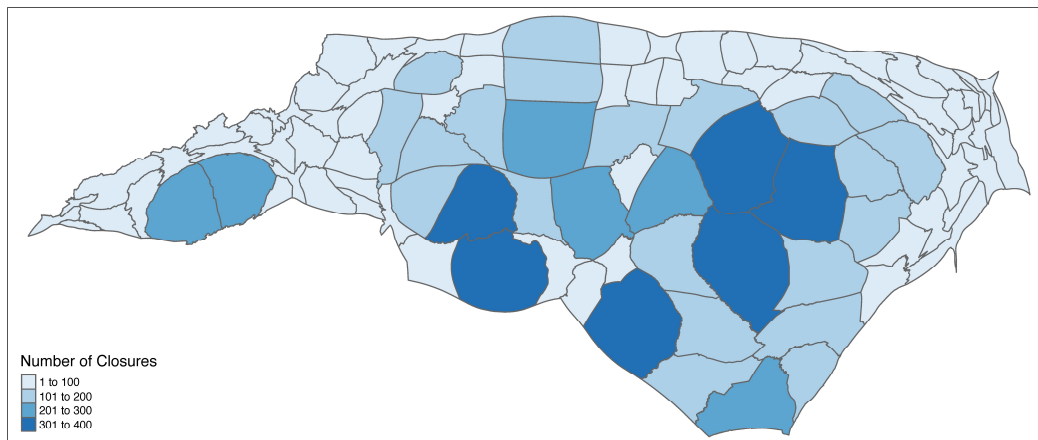


Urban Road Network

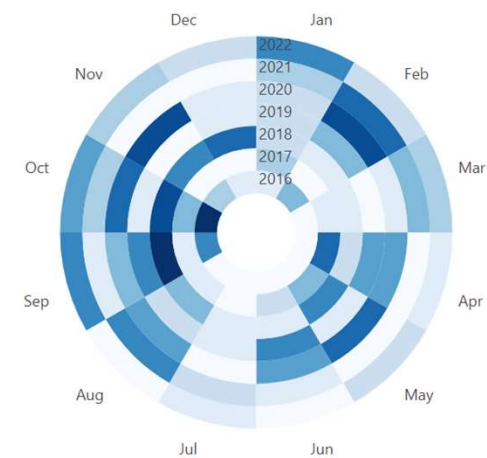


# TIMS DATA

Tracks incidents that **last longer than 15 minutes** and result in “severe or unusual delay in traffic”, including road closures.



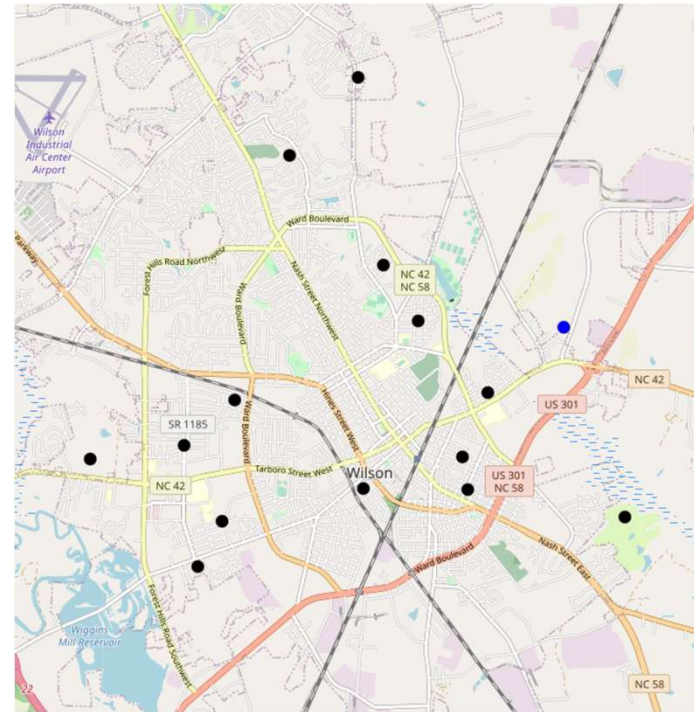
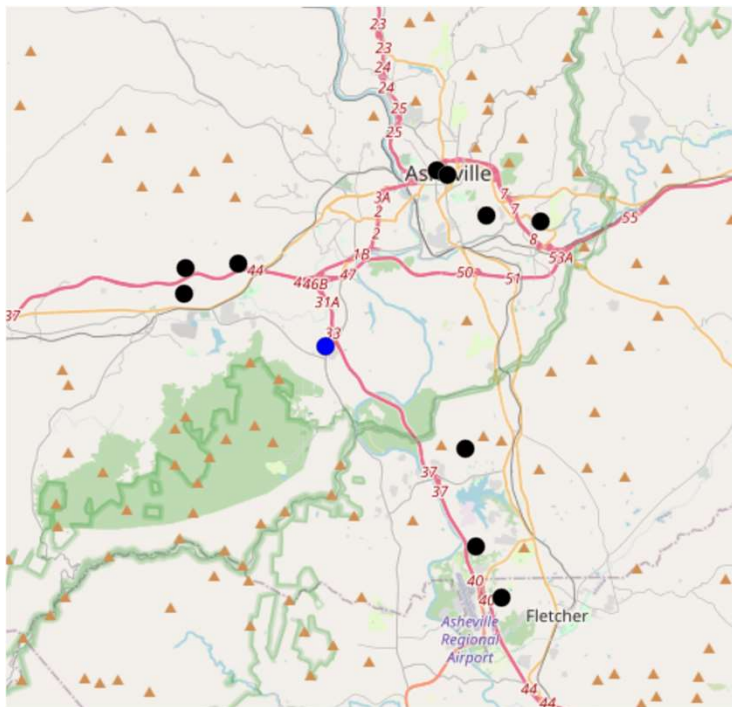
Road Closures since 2016 by County



Road Closures by Month by Year

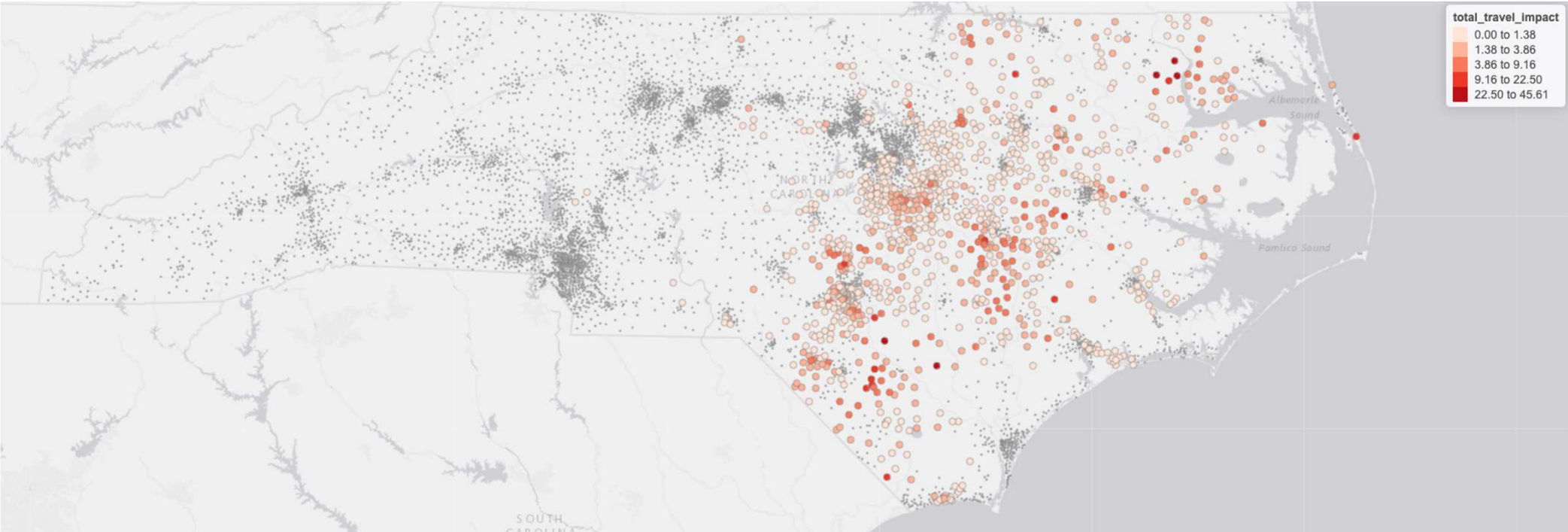
# SAFEGRAPH DATA

- Helps isolate local travel

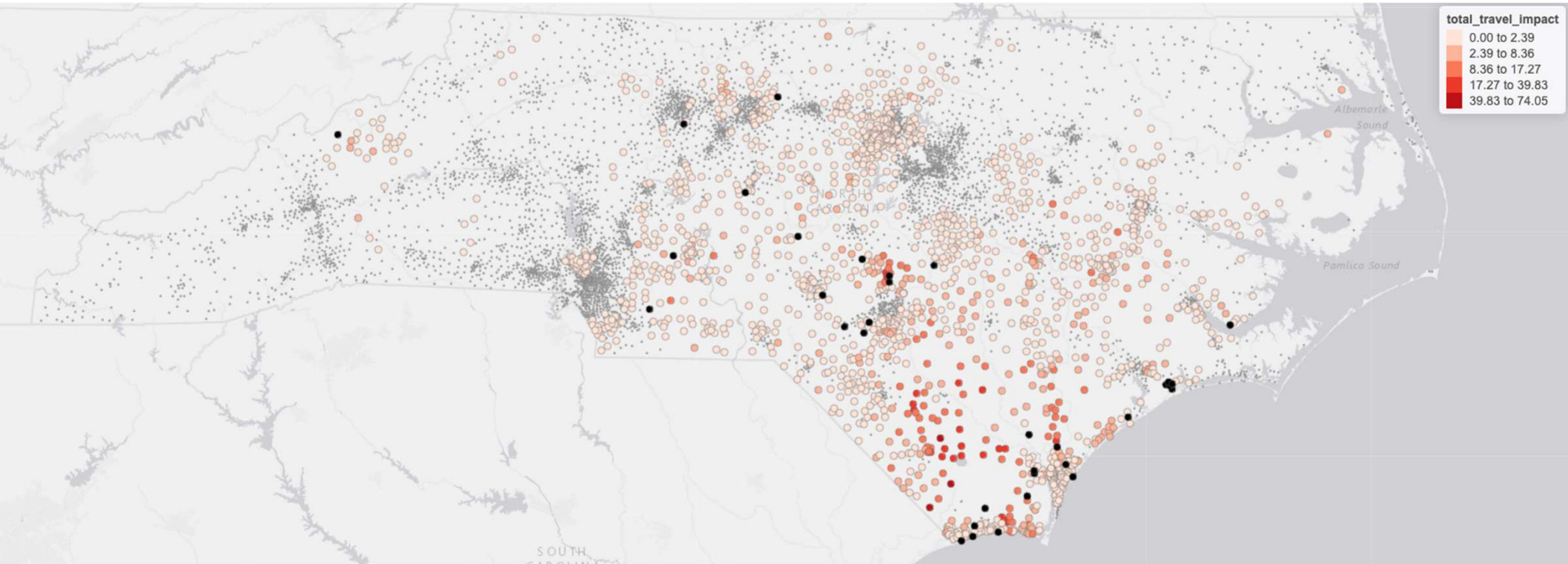




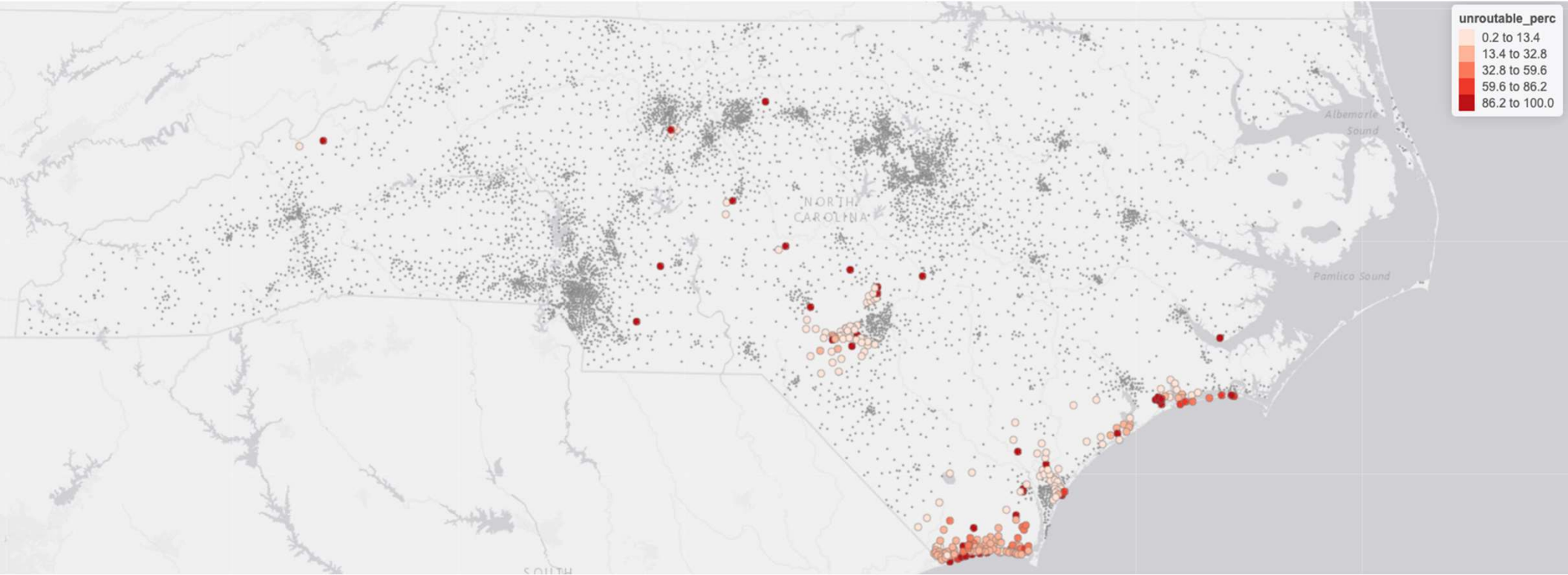
# RESULTS- HURRICANE MATTHEW



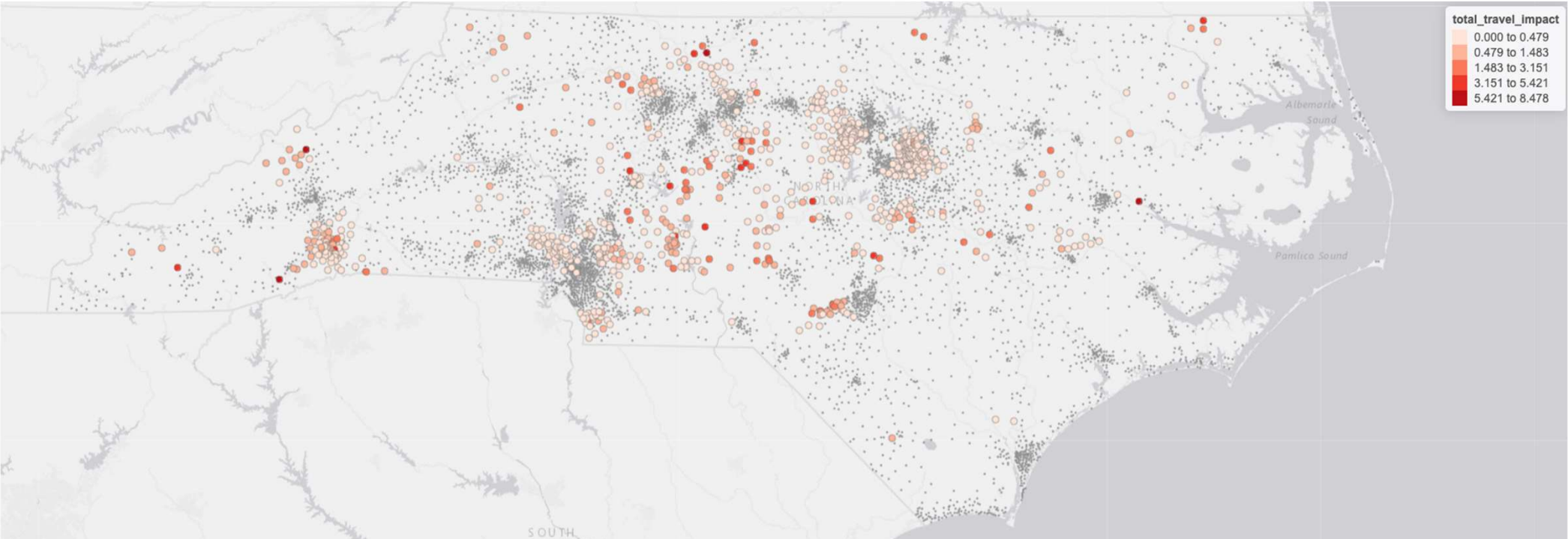
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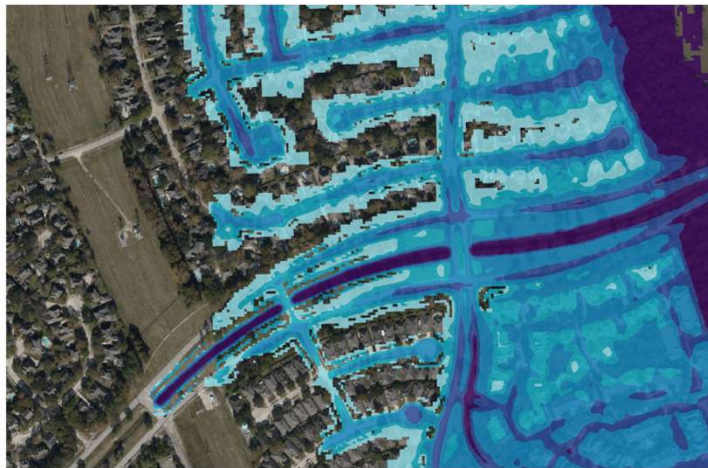


# RESULTS- FEB 7, 2020



## CONCLUSION FUTURE WORK

- A variety of events (both smaller and larger) can impact local travel across the state
- Simulating future events to identify important alternative routes



<https://firststreet.org/research-lab/published-research/wrr-combined-modeling-of-flood/>



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