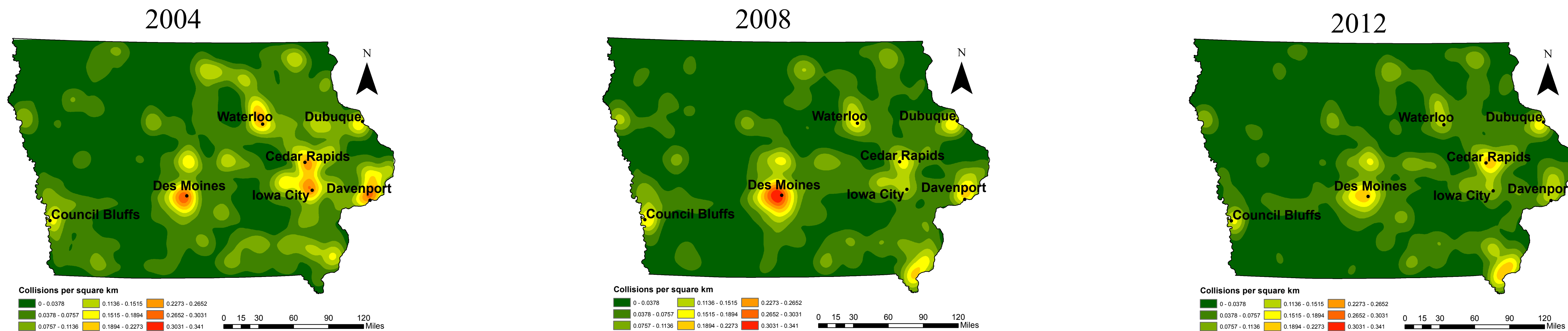


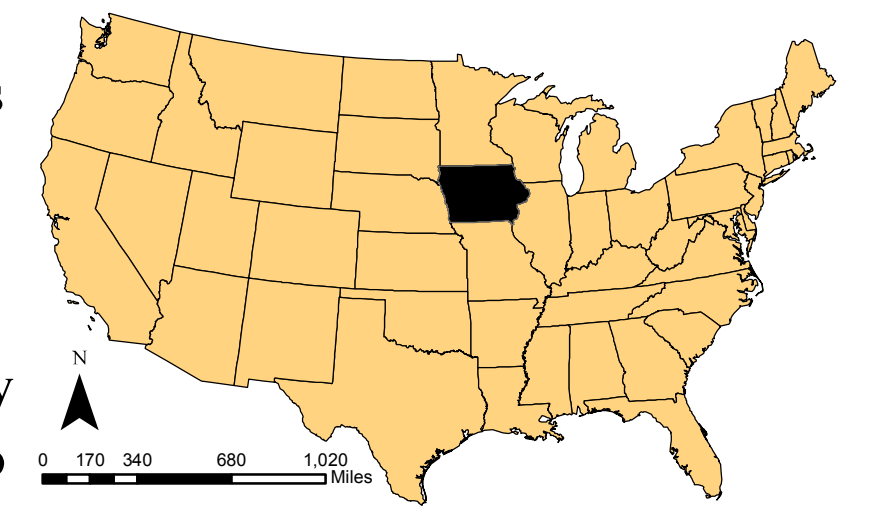
# Spatial and Temporal Patterns in Iowa Deer Collisions

## Long-term Changes in Annual Deer Crash Density



## Introduction

Every year deer-vehicle collisions cause hundreds of injuries and tens of thousands of dollars worth of property damage in the state of Iowa. Identifying the characteristics of areas vulnerable to deer collisions as well as longitudinal trends in deer crashes will help guide crash awareness and mitigation efforts. Many factors have been thought to contribute to deer crash risk.

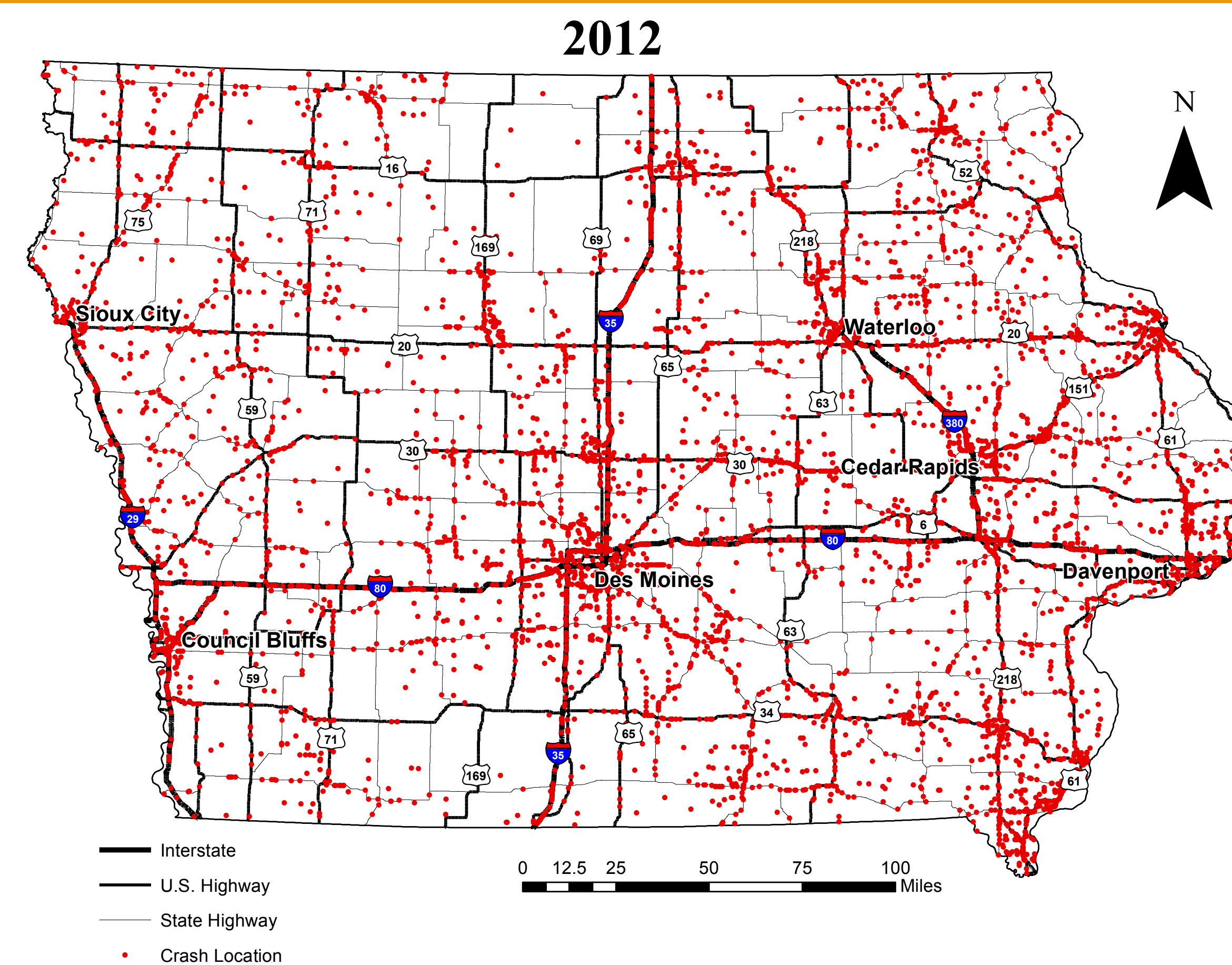
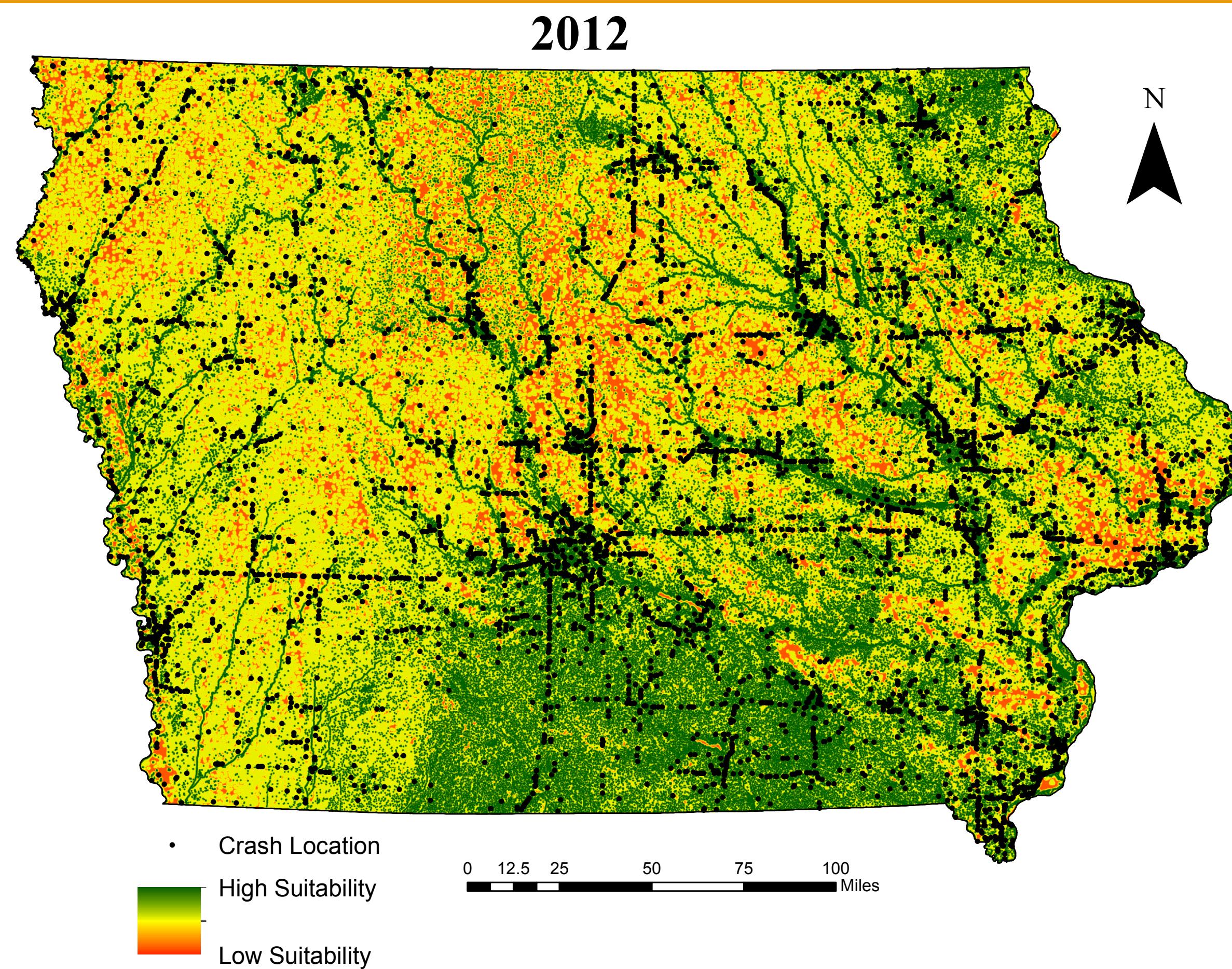


For example, it has been hypothesized that roads intersecting prime deer habitat carry a greater risk of deer-collision. It is also thought that deer collisions are more likely to occur along major roadways and in populated areas. Deer crash risk may also vary seasonally as a result of changes in deer behavior. This project is intended to identify spatial and temporal trends in deer crash locations. The data obtained from this project can be used to design more effective crash reduction efforts.



## Deer Habitat Suitability and Crash Location

## Major Roads and Crash Location



## Methods

Land cover data for the entire state of Iowa was used to create a map of suitable deer habitat using methodology adapted from Roseberry and Woolf (1998). Prime deer habitat was defined as areas with minimal distances between patches of canopy, foraging area and water. All 2012 deer collision locations were then plotted against the habitat map and trends were visually assessed. Trends in road location and deer crash points were assessed by plotting 2012 crash point data against major roads in Iowa. To assess seasonal associations in deer crashes, 2012 crash point data was divided up by the month in which the crash occurred. January, April, July and October crash points were selected and hot spot maps were created for these months using the kernel density tool and a standardized scale. Longitudinal trends in annual deer crash incidence were assessed by creating kernel density maps of all deer crashes that occurred during the years 2004, 2008 and 2012.

## Conclusion

This study provides insight into many interesting trends in Iowa deer collisions. The habitat suitability analysis revealed that many crashes appear to occur in areas of high habitat suitability. The roadway based analysis indicates that many crashes occur along major roadways such as Interstates, U.S. highways, and state highways. Seasonal mapping of crash densities revealed exciting temporal trends. Crash densities appear to be highest during the fall which may be associated with deer behavioral changes during the mating season. Crash densities are lowest during the spring and summer. The data also show long-term trends yearly in crash density. It seems that from 2004-2008 crash density decreased in Eastern Iowa, while it increased near Des Moines. From 2008-2012 overall deer crash densities pointedly decreased statewide. These long-term patterns may be indicative that deer crash incidence is declining. Overall, the results of this study have a wide range of applications. According to the data presented here, deer crash awareness and mitigation efforts should be focused in areas of prime deer habitat along major roadways. Deer crash education efforts should also be intensified during the fall when crashes are more likely.

## Seasonal Changes in Deer Collision Density

