

# MFI STUDENT FELLOW

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## **Connecting Communities: Addressing the Digital Divide in Education and Healthcare**

Written by Lindsey Scheurer

*April 1, 2024*

In our rapidly growing digital economy, internet access is no longer a luxury but rather a necessity. The COVID-19 pandemic made this clearer than ever. Yet, some communities are still left with little to no access. The effects of this digital divide are increasingly apparent. According to the Division of Broadband and Digital Equity, the digital divide is the gap between those who have access to technology, the internet, and digital literacy training and those who do not. The digital divide has exacerbated already existing issues rural communities face. However, putting effort towards internet access in rural areas could reduce some of these obstacles. Two crucial necessities rural communities often lack are access to education and healthcare. Both can be improved and supported with internet access. In Wisconsin, 10.7% of households and businesses are without basic broadband service and 20.1% lack access to high-speed broadband service that is necessary for these uses (Public Service Commission of Wisconsin, 2023).

### **Education: Fostering Equity through Connectivity**

The Wisconsin Department of Public Instruction administers an annual survey on digital learning survey that tracks digital trends in public schools (Wisconsin Department of Public Instruction, 2024). Analysis of data spanning from the 2017-2018 survey to the 2022-2023 survey reveals a notable surge in the utilization of structured online classes, increasing from 25% to 70%. Recent survey findings indicate an increase in the adoption of educational technology and a shift in district priorities. This is predicted to only increase from here. With so many classes utilizing the internet, a gap in education and educational success appears between those with and those without internet access. Oklahoma State University conducted research to see if there really is a gap between those with high internet access at home and those without. They looked at math and English language arts (ELA) test scores and found that there is on average a 10% gap for each grade level between students with high and low internet access (Sestak et al., 2020). Along with an increase in technology use in schools, this gap is expected to widen further unless home internet becomes more accessible.

### **Healthcare: Bridging the Geographical Divide**

The Centers for Disease Control and Prevention (CDC) have highlighted that rural Americans face heightened risks of experiencing adverse health outcomes and mortality. This is largely attributed to the geographical distances separating them from healthcare services. To mitigate these challenges, telehealth services delivered through phone or video have emerged as a viable solution, enabling remote access to healthcare resources. Telehealth facilitates increased accessibility to specialty care and other medical services that are typically scarce in rural areas. Telehealth has become increasingly common since the COVID-19 pandemic and is now an integral part of medical care. However, the efficacy of telehealth is contingent upon reliable internet connectivity. Consequently, communities lacking proper internet access are unable to avail themselves of this vital healthcare resource, further exacerbating disparities in healthcare access.

## **Towards Comprehensive Solutions: Policy Interventions and Support Programs**

In Wisconsin, The Rural Broadband Expansion Grant Program was created in 2013 to provide broadband internet to underserved communities (Public Service Commission, 2023). From its creation in 2013 through February of 2023, 434 projects were supported statewide for about \$300 million in grants. While this has helped in expanding internet access, the original program mainly focused on improving pre-existing broadband rather than expanding it into completely unreached areas. In 2023 the broadband expansion grant program was changed to require providing grants to unserved areas. The definition of underserved was changed to specify that service must be available, reliable, and affordable defined by the Public Service Commission. Going forward, another option for Wisconsin to improve connectivity is through tax breaks for internet providers to incentivize them to assist with rural broadband internet expansion.

Additionally, the Wisconsin Lifeline Program provides discounts on phone, cell, and internet services for low-income residents. The program is a part the Federal Lifeline Program for Low-Income Consumers which serves all states, territories, commonwealth, and Tribal lands. Those eligible include participants of Medicaid, FoodShare, Federal public housing assistance, Veterans and Survivors Pension Benefit, Supplemental Security Income, or if your income is at or below 135% of the federal poverty line. This resource is highly underutilized with only 1 in 4 Americans who qualify participate (Universal Service Administrative Co, 2023). Aside from a lack of awareness of the program, one likely reason the Lifeline Program is underutilized is the excess amount of complicated yearly paperwork to prove eligibility for too little payoff. Currently, Lifeline discounts can range from \$7.25 - \$18.50 per month. In Wisconsin, where the average monthly phone service costs \$114 and internet service costs about \$74 per month, Lifeline services would only cover at most about 10% of the average bill. Such inadequacies emphasize the need for greater funding and enhanced dissemination of information regarding the program. Additionally, simplifying the eligibility process is essential to encourage broader utilization of this valuable resource.

With proper implementation, the widespread availability of broadband internet and an enhanced Lifeline Program could significantly contribute to improving health, education, and fostering economic prosperity in Wisconsin's rural communities.

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## **Empowering the Heartland Harvest: The Potential of Venture Capital to Help the Midwest Adapt to Climate Changes**

Written by Mitchell Kocialkowski

*April 1, 2024*

The Midwest is crucial to the United States' standing as a global leader in agricultural production, making up 36% of agricultural operations in the United States (AgAmerica). This significance underscores the need for technological advancements to both mitigate and adapt to the effects of climate change. Although the current impacts of climate change are not catastrophic, they are progressively influencing our planet and industries, particularly agriculture. Changes in precipitation, increased temperatures, and extreme weather events have begun to challenge agricultural health and profitability. For instance, the USDA forecasts that rising temperatures could reduce crop yields in the Northwest by up to 40%. Strategies such as mesh coverings and micro-sprinklers have already been benefiting apple and cherry farmers in these regions. This op-ed explores how similar innovations might be adapted to benefit the Midwest, emphasizing the pivotal role of venture capital in fostering these technological transformations.

### **The Current State of Midwest Agriculture**

Climate change is visibly altering weather patterns, critically impacting Midwest agriculture. The region's primary – crops, corn, and soybeans – are under threat. Projections by the USDA indicate a decrease in corn yields of 25.4% and soybean yields of 43.4% in states like Kansas, Nebraska, and the Dakotas by 2036. Conversely, Illinois, Missouri, Iowa, and Wisconsin might see minor increases in yields (Nava, N. J., & Beckman, J., 2024). Figures 1 and 2 further emphasize the decrease in yields seen today. However, the real challenge lies in bolstering states poised for decline, where agriculture serves as a cornerstone of economic growth. Specialized technology tailored to the unique needs of each farm, from small family operations to large corporations, is essential.

### **The Promise of Precision and Extension Agriculture**

The USDA categorizes agricultural technologies into three groups: Site-Specific Analog Technologies, Conventional Precision Agriculture, and Digital Agriculture. Precision Agriculture and Digital Agriculture technologies transform previously subjective farming decisions into precise actions based on data analysis and variable rate technologies (VRT). Data from the USDA (Figure 3) highlights the increasing reliance on precision agriculture technology. From the map, it is clear states more inland place a larger emphasis on adapting these technologies. This approach not only increases efficiency but also lessens reliance on environmentally harmful practices. Farmers also spend time and money to consulting services, known as Extension Agriculture. While firms may provide such services, one of the more popular routes is through universities, such as Iowa State which pioneered the project. As we integrate more technology into farming, we must also consider its environmental footprint, given that many current technologies depend on fossil fuels.

## **Historical Context and Technological Evolution**

Over the past 50-70 years, farming tools have evolved dramatically. Today, many technological advancements focus on sustainability, which is exactly what the agricultural industry needs to preserve its practices. One such technology is artificial intelligence (AI) as it has the potential to further revolutionize this field, particularly in the role of Extension Agriculture. Imagine a database full of agricultural practices at a farmer's fingertips, helping them save time and money, thus making their farming practices more efficient. Furthermore, increasing reliance on renewable energy sources like solar and wind could significantly reduce greenhouse gas emissions associated with agricultural production.

## **The Role of Venture Capital**

Venture capital is crucial for economic growth and technological advancement, yet the Midwest currently experiences a shortfall in such investments (Figure 4). Given the region's agricultural output and its vulnerability to climate change, it should be a focal point for investment. There are three issues currently plaguing the acquisition of precision agriculture, as listed by Office, U.S.G.A, including high up-front acquisition costs and farm data sharing and ownership issues. Precision agriculture technologies, like VRT, can mitigate climate change effects and enhance sustainability. The principle of ESG (Environmental, Social, Governance) investing aligns perfectly with the need for sustainable farming practices, ensuring efficient use of resources and reducing waste. Companies that focus their resources on agtech will benefit from these relationships and could indirectly pass savings onto farmers, thus decreasing the high up-front acquisition cost. When companies take this extra investment, they can scale up their business, allowing them to increase production and decrease their price. If there is a substantial investment in the Midwest, it would also increase the competition between the agtech companies, further driving down the price. So, venture capital can enable technological advancements tailored to the needs of farms facing changing conditions in the Midwest, while also decreasing the barrier to entry for farmers by driving down the price of technological advancement. Increased investment in AI-powered agtech may also alleviate concerns about data privacy through developments in data security.

Increased venture capital in the Midwest can empower the adoption of cutting-edge agricultural technologies, enhancing crop yields and promoting sustainable practices. By leveraging both AI and human expertise, we can provide farmers with the tools they need to adapt to and thrive in a changing climate. Moreover, educating farmers on best practices and the implementation of new technologies remains vital, with AI potentially serving to complement traditional extension services, offering rapid, cost-effective solutions to the challenges posed by climate change.



Figures

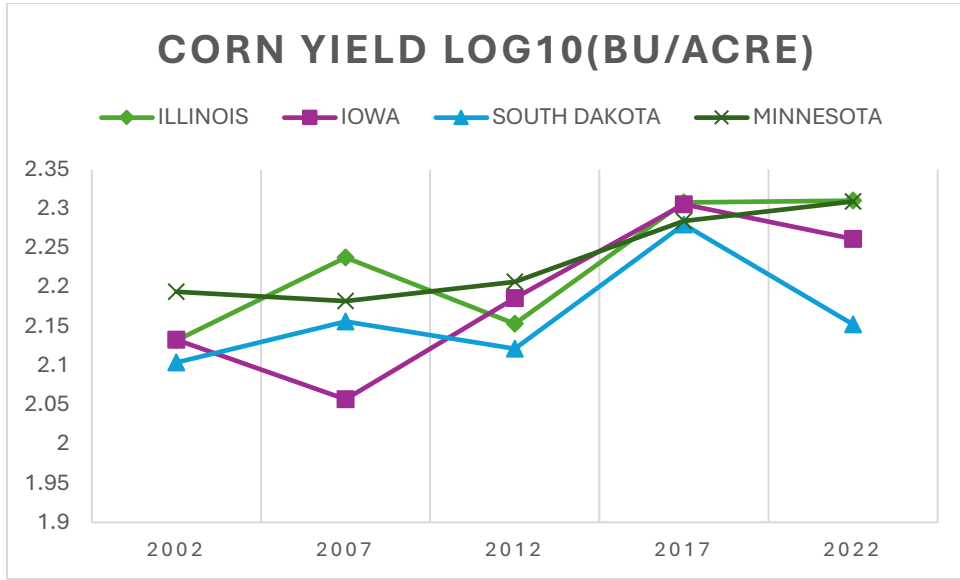


Figure 1 (USDA/NASS QuickStats Ad-hoc Query Tool)

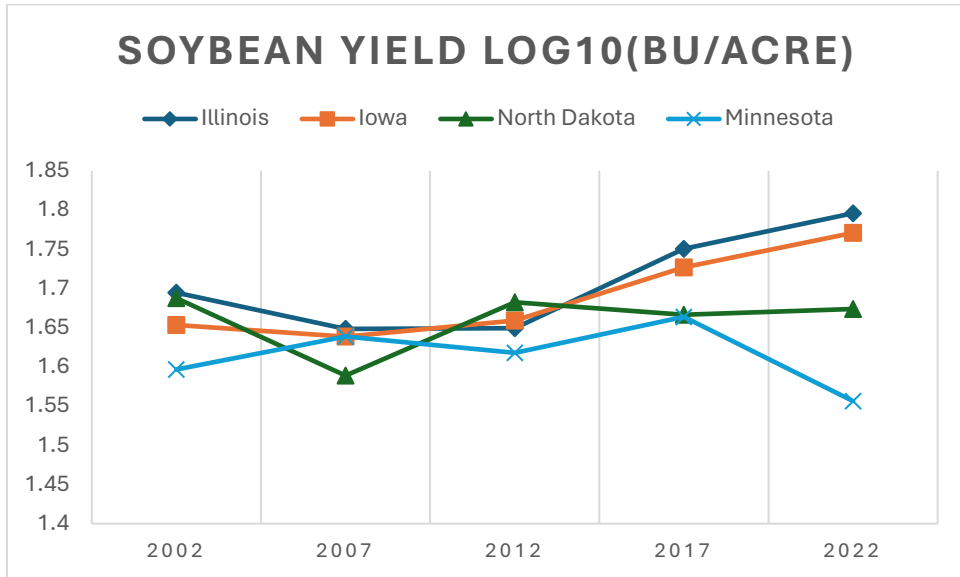


Figure 2 (USDA/NASS QuickStats Ad-hoc Query Tool)

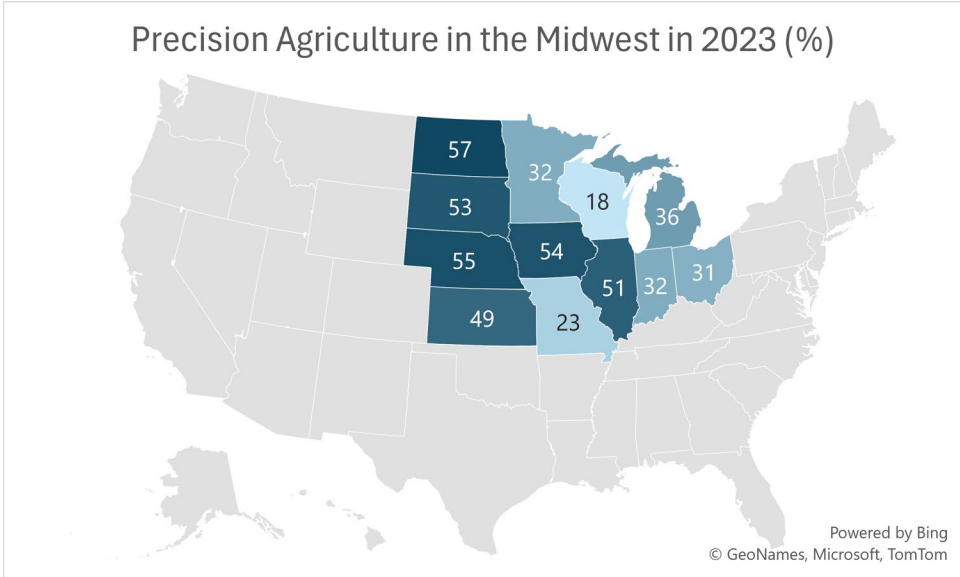


Figure 3 (USDA/NASS QuickStats Ad-hoc Query Tool)

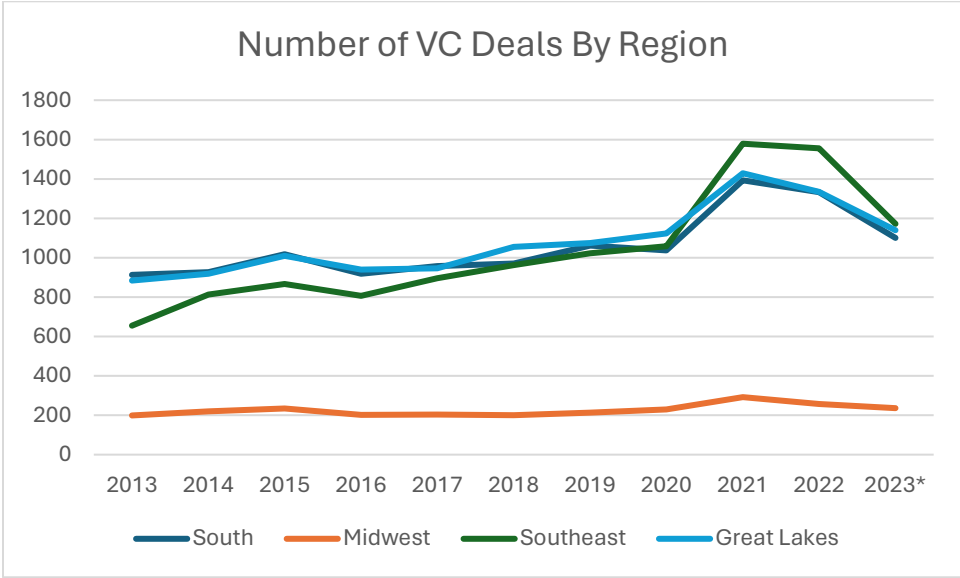


Figure 4 (PitchBook Data)

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## **A Deeper Dive into Social Capital at the County Level**

Written by Scott Rosendahl

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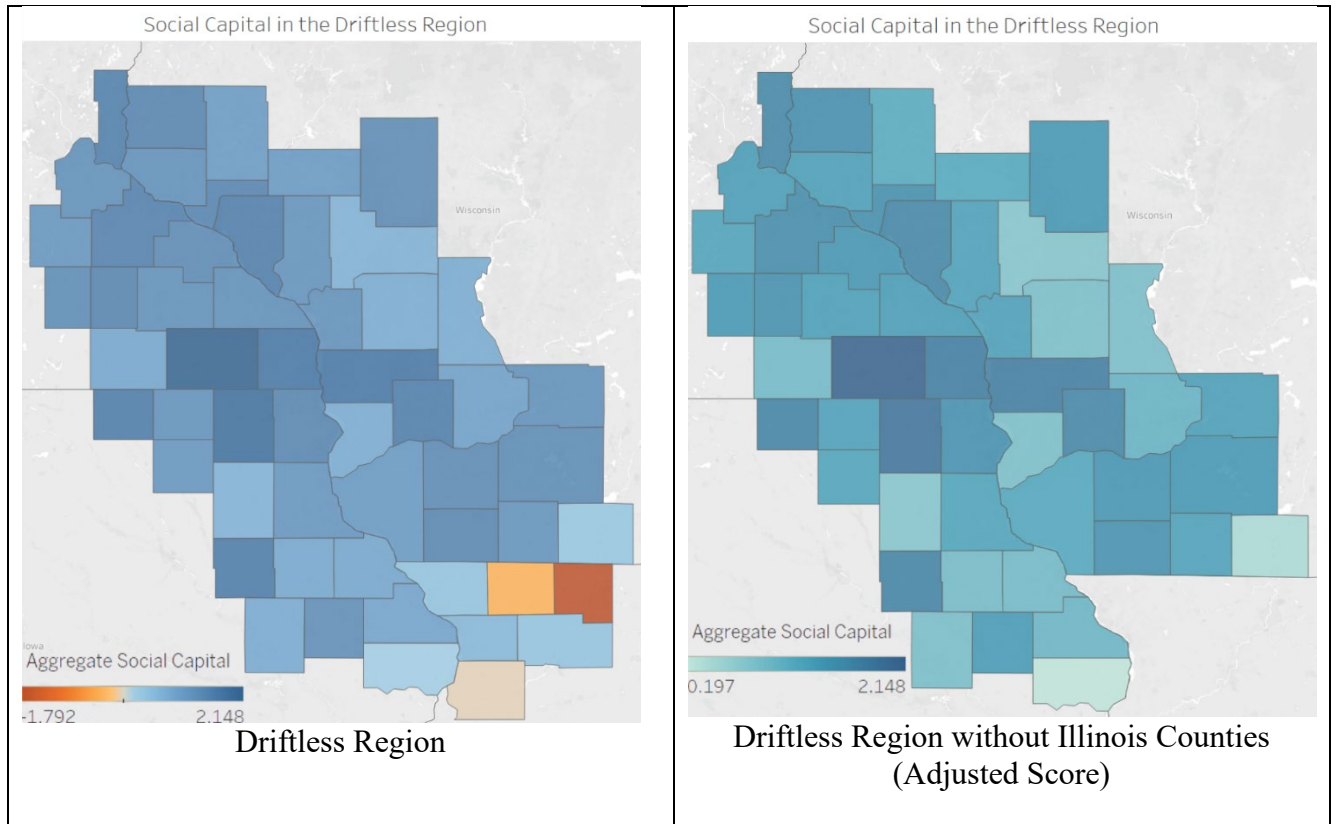
Social capital, the intangible network of relationships and trust within a community, serves as a crucial factor for economic growth and equality. Studies consistently demonstrate that regions with higher levels of social capital tend to experience greater economic prosperity. Social capital fosters collaboration, innovation, and resource-sharing, laying the foundation for entrepreneurial ventures and sustainable development. Conversely, areas with low social capital often face economic stagnation and widening inequality. Lack of trust impacts business confidence, hinders investment, and impedes collective action to address pressing social issues.

The Midwest region has some of the highest overall measures of social capital. Minnesota and Wisconsin have the 2<sup>nd</sup> and 3<sup>rd</sup> highest scores, respectively. This fact holds particular interest for residents in the region near the borders of these two states – called the Driftless region.

The Driftless area is a geographic region encompassing mostly Wisconsin, Minnesota, and some parts of Iowa and Illinois. During the Quaternary/Pleistocene glaciation period, what has become the Driftless region was left mostly unscathed by advancing ice sheets, making the region exempt from the scouring and deposition that gave the surrounding area its geography. This may have been partially due to the fractured bedrock that underlies the region, allowing drainage from subglacial water that would have otherwise allowed glaciers to advance more easily.

The Driftless region is uniquely characterized by a highly eroded plateau and steep bluffs that surround river valleys. This allows for specific industries, like agriculture and mining, to have a strong hold on the region. Additionally, the bluffs provide natural barriers that limit the growth of cities. Finally, there are many cultural similarities throughout the Driftless area, such as Ho-Chunk ancestry, the strong presence of Norwegian and German heritage, and pockets of Amish communities. These factors provide an excellent control for determining differences across states and counties within the region. Noticeably, economic and cultural differences are still present but are diminished when compared to the differences between larger geographic areas.

Classifying which counties lie in the Driftless region is surprisingly challenging. Almost every source researched while creating this paper provided a slightly different list of what counties are considered part of the region, many of which had only a slight portion that contained geographic features flagship to the Driftless area. This issue was made even more challenging since many of these fringe counties, namely Winnebago County, were outliers in many of the variables being measured, significantly influencing overall state averages (in the case of Illinois, Winnebago county is one of only 6 counties being measured). The Driftless Area Magazine was eventually decided upon to classify which counties lie within the Driftless region and which do not. When making calculations, all counties that lie at least partially within the region have been included.



The social capital scores of all counties in the Driftless region show that three counties in Illinois (Whiteside, Winnebago, and Stevenson) are the only counties in the region that have negative social capital scores, meaning that every other county in the region is above the national average.

Examining social capital at the county level prompts questions about the influence of state-level factors, such as policies, on social capital dynamics. Variations in institutional health and median income across Iowa, Minnesota, and Wisconsin suggest potential impacts on overall social capital levels. Understanding these disparities can provide insights into underlying factors shaping social capital outcomes.

Institutional health, encompassing factors like voter turnout, trust in institutions, and civic engagement, emerges as a key determinant of social capital. Further research into state-wide trends and policies affecting institutional health is crucial for fostering stronger social capital and promoting growth and well-being in the Driftless region and beyond.