

# *THE RISE OF THE GREAT PLAINS*

*Regional Opportunity in the 21<sup>st</sup> Century*



JOEL KOTKIN

*For decades, the Great Plains has been portrayed as a vast region better left to the Buffalo and forces of nature.*

*Far from dying, our research shows that the region is in the midst of a historic recovery.*

*The Great Plains enters the 21<sup>st</sup> century with a prairie wind at its back.*

Office of the President, Texas Tech University

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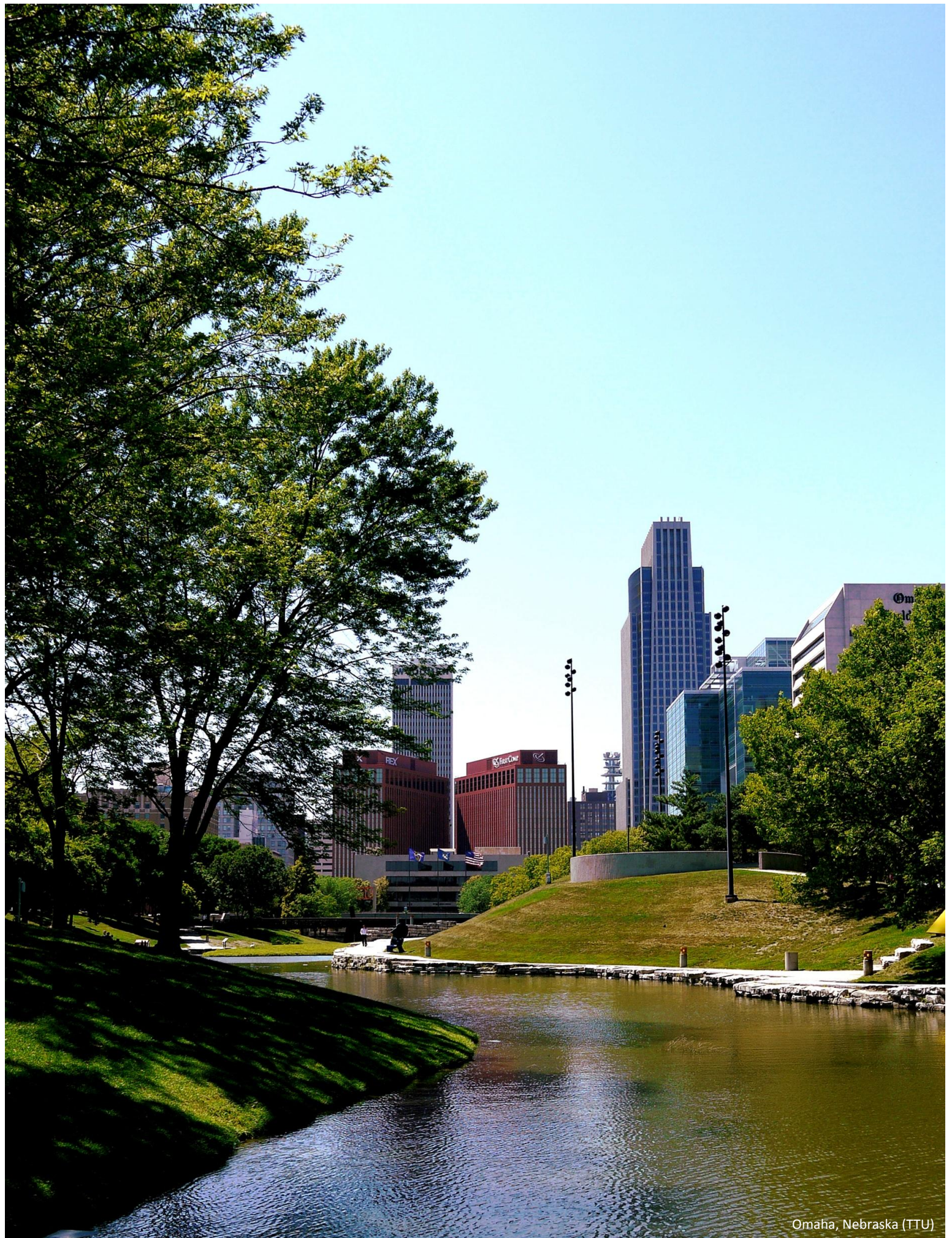
Cover photo by Cooper Ross, Insight Visual Media  
(Oklahoma City skyline, 2011)

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Omaha, Nebraska (TTU)



## Executive Summary

# The Rise of the Great Plains: Regional Opportunity in the 21<sup>st</sup> Century

*For much of the past century, the vast expanse known as the Great Plains has been largely written off as a bit player on the American stage. As the nation has urbanized, and turned increasingly into a service and technology-based economy, the semi-arid area between the Mississippi Valley and the Rockies has been described as little more than a mistaken misadventure best left undone.*

*Much of the media portray the Great Plains as a desiccated, lost world of emptying towns, meth labs, and Native Americans about to reclaim a place best left to the forces of nature. "Much of North Dakota has a ghostly feel to it," wrote Tim Egan in the New York Times in 2006. This picture of the region has been a consistent theme in media coverage for much of the past few decades.<sup>1</sup>*

*In a call for a reversal of national policy that had for two centuries promoted growth, two New Jersey academics, Frank J. Popper and Deborah Popper, proposed that Washington accelerate the depopulation of the Plains and create "the ultimate national park." They suggested the government return the land and communities to a "buffalo commons," claiming that development of The Plains constitutes, "the largest, longest-running agricultural and environmental miscalculation in American history." They predicted the region will "become almost totally depopulated."<sup>2</sup>*



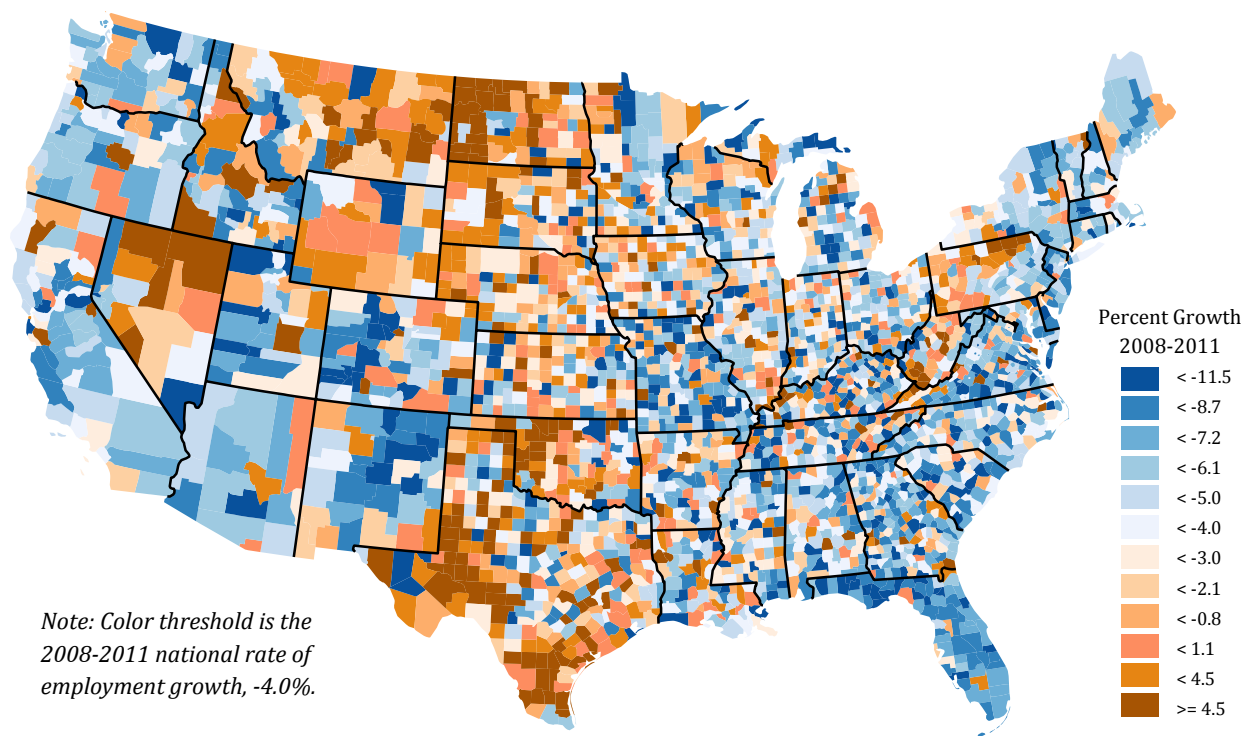
Fort Collins, Colorado (TTU)

*Our research shows that the Great Plains, far from dying, is in the midst of a historic recovery. While the area we have studied encompasses portions of thirteen states, our focus here is on ten core locations: North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, New Mexico, Colorado, Wyoming, and Montana.*

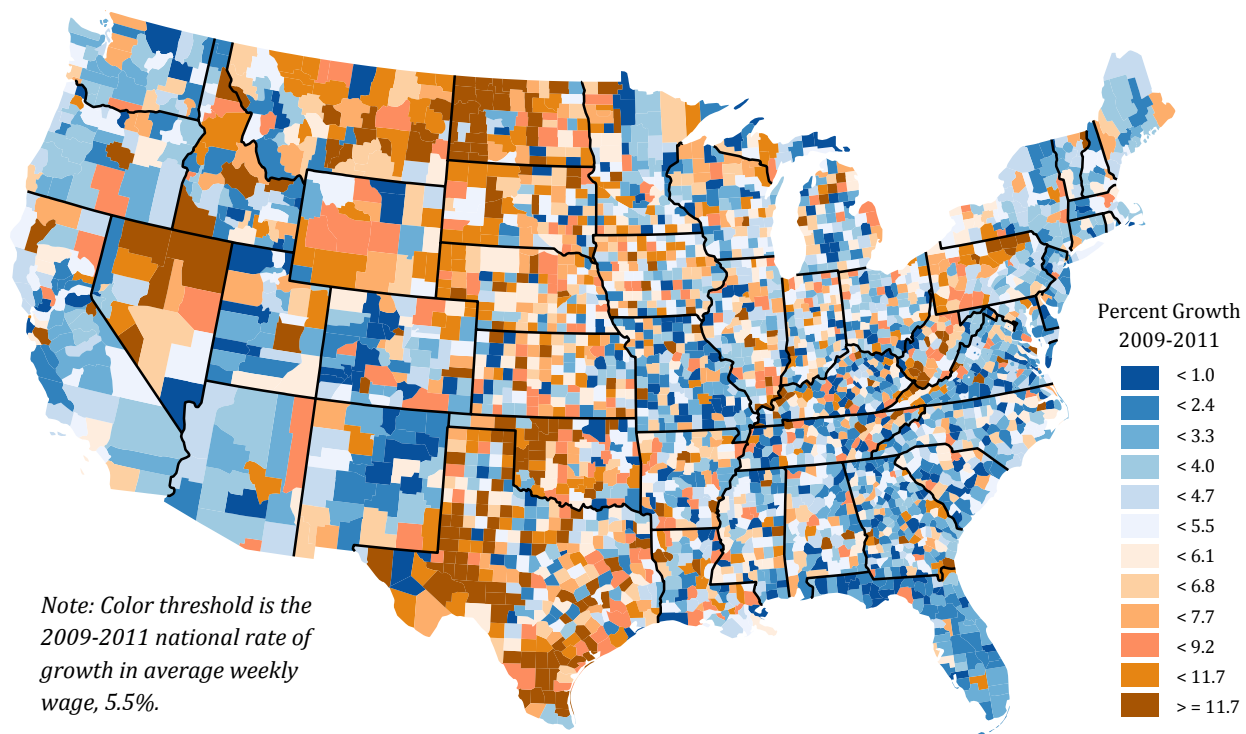
*Rather than decline, over the past decade the area has surpassed the national norms in everything from population increase to income and job growth. After generations of net out-migration, the entire region now enjoys a net in-migration from other states, as well as increased immigration from around the world. Remarkably, for an area long suffering from aging, the bulk of this new migration consists largely of younger families and their offspring.*

*No less striking has been a rapid improvement in the region's economy. Paced by strong growth in agriculture, manufacturing and energy — as well as a growing tech sector — the Great Plains now boasts the lowest unemployment rate of any region. North Dakota, South Dakota and Nebraska are the only states with a jobless rate of around 4 percent; Kansas, Montana, Oklahoma and Texas all have unemployment rates below the national average.<sup>3</sup>*

*A map of areas with the most rapid job growth over the past decade and through the Great Recession would show a swath of prosperity extending across the high plains of Texas to the Canada/North Dakota border. Rises in wage income during the past ten years follow a similar pattern.<sup>4</sup> The Plains now boasts some of the healthiest economies in terms of job growth and unemployment on the North American continent.<sup>5</sup>*

**EMPLOYMENT GROWTH, 2008-2011**

Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

**GROWTH IN AVERAGE WEEKLY WAGE, 2009-2011**

Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

*Of course, this tide of prosperity has not lifted all boats. Large areas have been left behind — rural small towns, deserted mining settlements, Native American reservations — and continue to suffer widespread poverty, low wages and, in many cases, demographic decline.*

*In addition, the region faces formidable environmental and infrastructural challenges. Most prominent is the continuing issue of adequate water supplies, particularly in the southern plains. The large-scale increase in both farming and fossil fuel production, particularly the use of hydraulic fracking, could, if not approached carefully, exacerbate this situation in the not so distant future.*

*Inadequate infrastructure, particularly air connections, still leaves much of the area distressingly cut off from the larger urban economy. The area's industrial economy and rich resources are subject to a lack of sufficient road, rail and port connections to markets around the world. Yet despite these challenges, we believe that three critical factors will propel the region's future.*

***First**, with its vast resources, the Great Plains is in an excellent position to take advantage of worldwide increases in demand for food, fiber and fuel. This growth is driven primarily by markets overseas, particularly in the developing countries of east and south Asia, and Latin America.*

*As these countries have added hundreds of millions of middle class consumers, the price and value of commodities has continued to rise and seem likely to remain strong, with some short-term market corrections, over time.*

***Second**, the rapid evolution and adoption of new technologies has enhanced the development of resources, notably oil and gas previously considered impractical to tap. At the same time, the Internet and advanced communications have reduced many of the traditional barriers — economic, cultural and social — that have cut off rural regions from the rest of country and the world.*

***Third**, and perhaps most important, are demographic changes. The late Soichiro Honda once noted that “more important than gold or diamonds are people.”<sup>6</sup> The reversal of outmigration in the region suggests that it is once again becoming attractive to people with ambition and talent. This is particularly true of the region's leading cities — Omaha, Oklahoma City, Tulsa, Kansas City, Sioux Falls, Greeley, Wichita, Lubbock, and Dallas-Fort Worth — many of which now enjoy positive net migration not only from their own hinterlands, but from leading metropolitan areas such as Los Angeles, the San Francisco Bay Area, New York and Chicago.<sup>7</sup> Of the 40 metropolitan areas in the region, 32 show positive average net domestic migration since 2008.*

*Together these factors — resources, information technology and changing demographics — augur well for the future of the Great Plains. Once forlorn and seemingly soon-to-be abandoned, the Great Plains enters the 21<sup>st</sup> century with a prairie wind at its back.*



## THE GREAT PLAINS







Wind turbines and wheat near Montezuma – southwestern Kansas (TTU)

## Part One

# The New Great Game: The Great Plains in Global Perspective

With the rise of the information age, it has been widely argued that the application of “brains” to abstract concepts, images and media, would establish dominion over the “brawn” of producers. Starting with Daniel Bell’s *The Coming of Post Industrial Society* in 1973, a future was imagined in which societies were oriented not around resources or machines; reality, Bell suggested, “is a game between persons”.<sup>8</sup> Futurists such as Japan’s Taichi Sakaiya heralded the end of the “petroleum age”, and the rise of a “knowledge value revolution,” that would replace the old resource-based and industrial paradigms.

Written decades before the rise of social media, these accounts were prophetic, yet they may well have underestimated the continuing critical nature of raw materials and manufacturing. In Sakaiya’s case this reflected his contention that, since resources were inherently “finite”, value would necessarily migrate towards a post-industrial economy based on images, information, fashion and ideas. In his estimation, Japan’s “greatest advantage”, ironically, lay with its lack of natural resources.<sup>9</sup> This view is also endorsed by pundits such as Thomas Friedman, who cite the experience of east Asian countries such as Taiwan and Japan and those in Scandinavia as suggesting that a lack of natural resources actually sparks innovation and economic health, while too great a concentration generally hinders progress.<sup>10</sup>

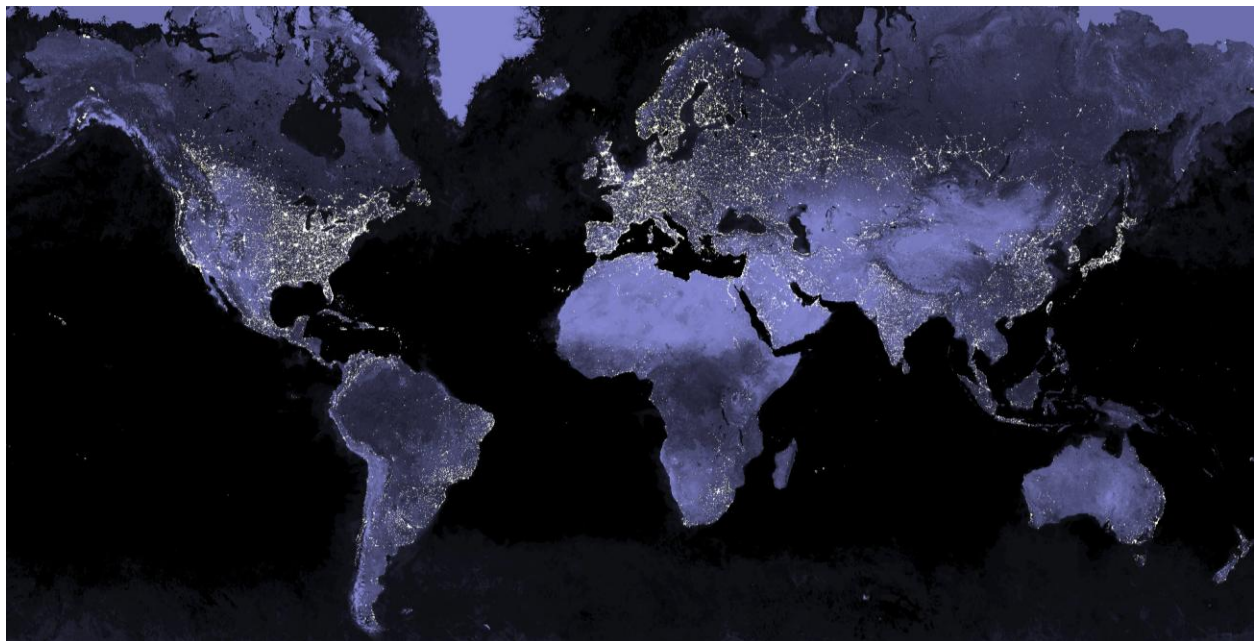


Yet this approach rests upon many false, or exaggerated, claims. For one thing, it is increasingly clear that we are far from the end of the “petroleum age” or even the industrial era. Since the onset of the new century, the most sustained growth in the world has taken place not in the financial or information capitals, but in those regions that produce *things*. These include emerging manufacturing centers such as China, the energy economies in the Persian Gulf, and those areas that produce both, like Brazil. In the high income world, the same pattern exists, particularly relating to resource rich countries such as Norway, Australia and Canada. Even Germany, the strongest European player, has thrived almost exclusively due to its remarkable industrial exports.<sup>11</sup>

Indeed, it may well be that possessing basic resources and the ability to produce products determines the primary loci of

economic growth. As the world’s population grows and its middle class expands, the demand for raw materials and manufactured goods seems likely to continue to expand. Energy consumption itself, according to the International Energy Agency, could rise as much as 50% by 2030, with over 84% of that increase being met by fossil fuels.<sup>12</sup>

The exploration and the conquest of resources have shaped economic history throughout time. It fueled the growth of great empires from the Athenians and the Chin Dynasty to the Mongol Khans.<sup>13</sup> Later, Portugal, Spain, the Netherlands and the United Kingdom achieved global prominence by gaining control over large, resource-rich regions. Between the mid-16<sup>th</sup> and late 18<sup>th</sup> century, Europe’s domain spread from three million to over seven million square kilometers, with greatly expanded access to both foodstuffs and mineral riches.<sup>14</sup>



Earth at Night (NASA/GFCS)

Today we are seeing something of a 21<sup>st</sup> century version of the late 19<sup>th</sup> century “great game” in which the leading powers struggled for control of resources in the then largely undeveloped land masses of central Asia. Today this region once again has become a key focus of global competition among advanced economies. Resource competition also extends to regions including Africa<sup>15</sup>, South America, the Middle East, Southeast Asia<sup>16</sup>, and the Arctic.<sup>17</sup> Since the fall of the Soviet Union, this unfolding conflict has engaged several protagonists, including Europe, Japan, Korea and, most powerfully, China.<sup>18</sup>

Some assert that this new scarcity regime hurts the United States. It is assumed that America’s resource base has already been developed and approaches exhaustion. This thinking informs the prediction of “steady American decline” by researchers at the Singapore Ministry of Trade and Industry, among many others.<sup>19</sup>

These assumptions are well off the mark. Unlike most of its major competitors, the United States remains extraordinarily resource rich. Its per capita endowment of raw materials is far richer than that of its prime competitors, including the European Community, India, China, or Japan.<sup>20</sup> Only the Russian Federation is equally well-endowed: its own Siberian periphery that was first conquered in the great period of Russian expansion between the 16<sup>th</sup> and mid-19<sup>th</sup> Centuries remains one of the greatest resource regions on the planet.<sup>21</sup>

The primacy of resources lies, as many economists acknowledge, in their relative scarcity and unequal pattern of distribution. Industrial powers can rise and fall with new technologies; they can become too dependent on their ability to export a large proportion of their manufactured goods or services, as can be seen most recently in Japan’s declining fortunes. Lacking enough resources, a country like Japan also finds itself vulnerable to rising commodity prices, while reaping little from the high prices.<sup>22</sup>

In contrast, the United States has thrived through its unique combination of both natural resources and human capital. In the 19<sup>th</sup> century, the country employed its vast agricultural and mineral resources to fund its industrialization. At the same time, the abundance of land resources, notably on the Great Plains, allowed the country to absorb millions of new immigrants who were able to feed the industrializing east and much of the world.<sup>23</sup>

Efficient, resource poor states, such as Germany and Japan, both before and after the Second World War, or China today, can challenge and even supplant more entrenched competitors for short periods of time. But ultimately, even the most efficient technological regime must feed its people, power its industry, find the materials to make its most critical products, and finance its educational infrastructure.

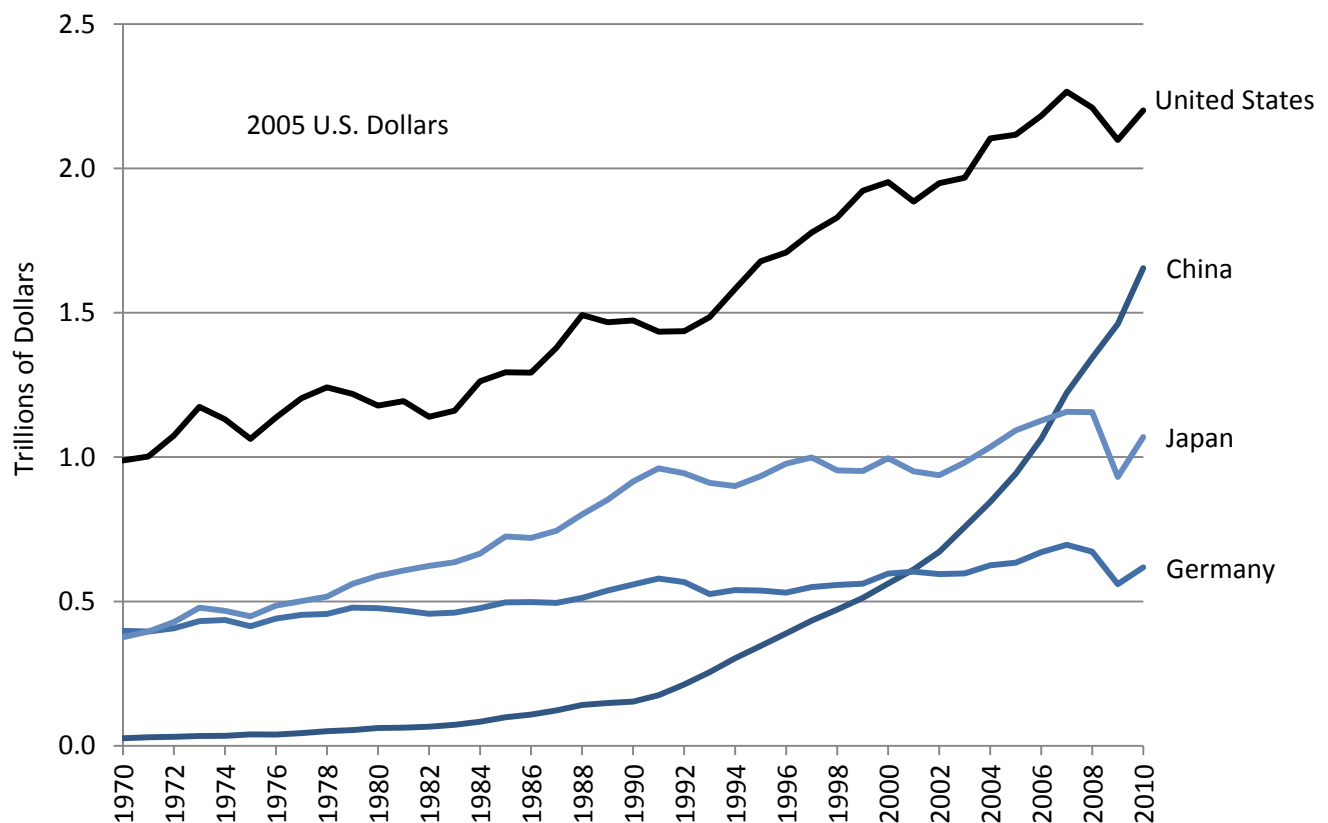
*...the United States has thrived through its unique combination of both natural resources and human capital.*

In the final estimate, tangible things still matter, even at the onset of the global information age. Indeed, technology increasingly allows for the expansion of the productive economy, as evidenced by ever-greater manufacturing and agricultural productivity, or by new breakthroughs in energy development — mostly pioneered in the United States — that have vastly expanded the nation's energy reserves. The much ballyhooed notions of “peak oil” and diminished agricultural capacity, popular among some

environmental theorists for generations, have proven very wide of the mark.

Largely underestimated, America's energy and agricultural production now are on the upswing, and there are signs of a nascent industrial rebound as well. Instead of an end to petroleum supplies, notes Balu Balagopal, senior partner and managing director at Boston Consulting Group, we simply are witnessing the end of “cheap oil.”<sup>24</sup>

### STILL A LEADER IN INDUSTRIAL OUTPUT: MINING, MANUFACTURING, AND UTILITIES OUTPUT



Source: United Nations Statistics Division, Trade Data.

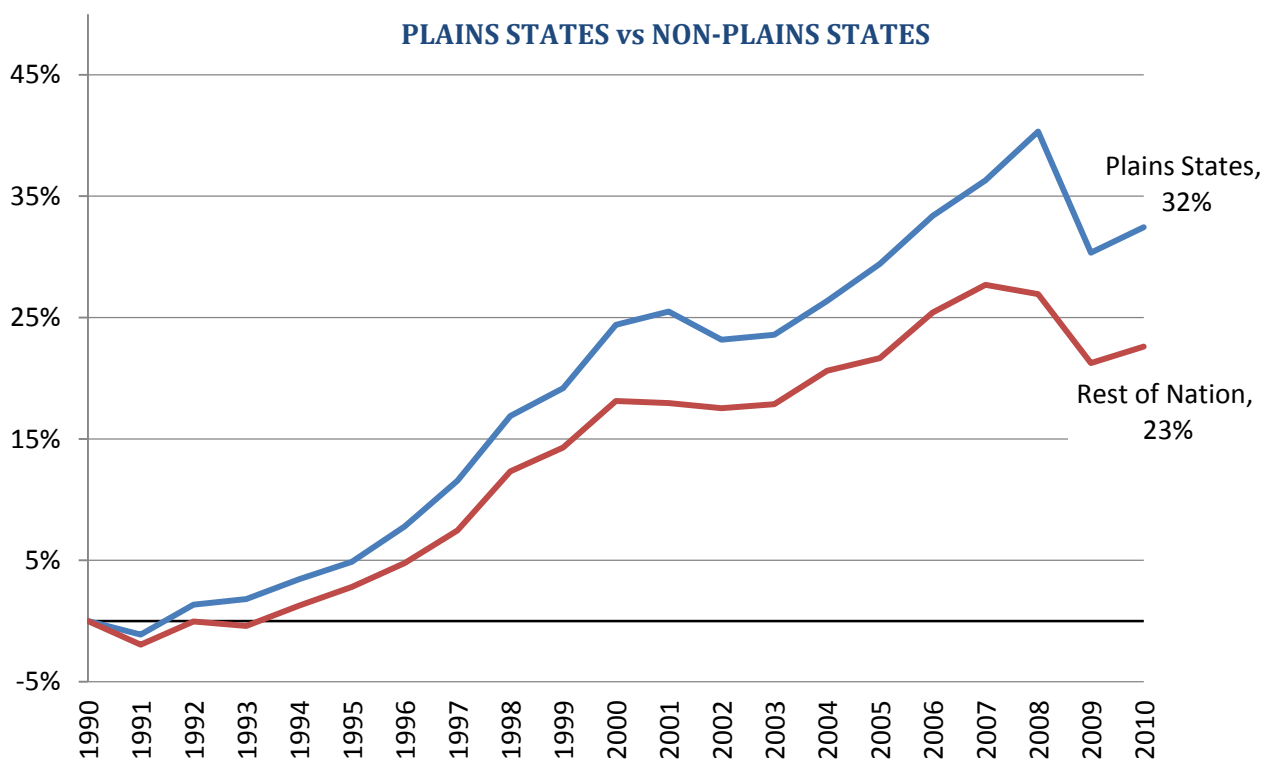
*In the final estimate, tangible things still matter, even at the onset of the global information age.*

This changing global picture presents an enormous opportunity for the Great Plains. A decade ago, a Fannie Mae study predicted a decline in resource extraction and agricultural employment, seeing the future largely in amenity rich “cappuccino” economies.<sup>25</sup> Yet the demographic growth of the Plains — accounting for nearly 25% of the nation’s food exports and 45% of its energy production — has ridden on the back of these sectors. The area also has enjoyed some growth in manufacturing, far outpacing the nation

and most other regions. One clear indicator of success: personal income growth has also been higher than that seen in the rest of the nation.<sup>26</sup>

The French historian Fernand Braudel once noted, “Living standards are always the question of the number of people and the total resources at their disposal.”<sup>27</sup> By this measure, the future for the people of the Great Plains — a relatively small number living amidst vast resources — may well be great indeed.

#### PERSONAL INCOME GROWTH: PLAINS STATES vs NON-PLAINS STATES



Source: U.S. Department of Commerce, Bureau of Economic Analysis.

*This changing global picture presents an enormous opportunity for the Great Plains.*





Wheat field near Wiley - southeastern Colorado (TTU)



## Part Two

# The Agricultural Opportunity

Historians, particularly in the modern era, tend to give little consideration to agriculture as a driver of national wealth and spur to urban growth. Yet surplus production, particularly of cash-crops, does much to explain the rise of such places as 17<sup>th</sup> century Holland or 18<sup>th</sup> century England.<sup>28</sup> Later on these countries, notably England, could maintain their expanding industrial base because of their ability to tap the agricultural fecundity of their colonies.<sup>29</sup>

Today, countries with large agricultural surpluses — Australia, Canada, Brazil, as well as the United States — possess intrinsic economic advantages over less well-endowed competitors. The attractiveness of agricultural assets is reflected by the fact that, according to the International Food Policy Research Institute (IFPRI), foreign investors sought or secured between 37 million and 49 million acres of farmland in the developing world between 2006 and mid- 2009.<sup>30</sup>

Of course, having a strong food resource base does not guarantee a strong overall economy: witness Argentina over the last century. But it does give a leg up to those countries that can use their agricultural surplus as a base for wider economic growth.<sup>31</sup>

The rise of the Great Plains as an agricultural area in the late 19<sup>th</sup> century reflects this truth. In the 1820s, federal officials expected the settlement of the frontier — widely dismissed as a wasteland — to take five hundred years. Yet Americans, noted historian David E. Nye, “rejected English notions, as expressed by Ricardo and Malthus, and instead embraced an expansive belief in resource abundance.”<sup>32</sup>

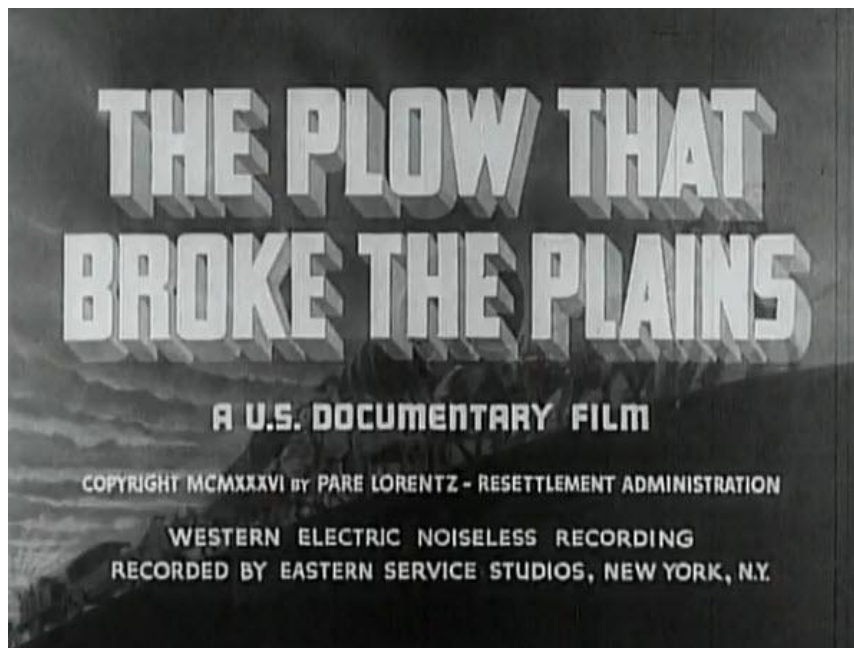
Over the 19th century America's new farmlands surpassed the total food producing areas of Germany and France combined. Between 1860 and 1910 the annual output of wheat grew from 173 million tons to 700 million, one sixth of the world total.<sup>33</sup> This bonanza created boom conditions not only in the countryside of the Plains, but in its cities as well. Omaha, for example, challenged Chicago as the largest livestock market and meatpacking center. Along with Kansas City, it became well known for nightlife and opportunities for masculine "hijinks."<sup>34</sup>

### ***Hard Times on the Plains***

The drama of this settlement was captured in the 1930s documentary, "[The Plow That Broke the Plains](#)." Yet by the time the famous documentary appeared, this productivity

had created too great a surplus of agricultural goods. Stiff competition had emerged from land-rich countries like Canada, Australia, and Argentina.<sup>35</sup> Except for a few periods, such as during the First World War, production routinely outstripped demand. Agriculture, once seen as a stable occupation, became progressively more subject to "boom and bust" patterns.<sup>36</sup>

Low prices, as well as often difficult natural conditions, drove many off the land and into bankruptcy, causing what Albert Romasco later dubbed "the poverty of abundance."<sup>37</sup> In North Dakota, the precarious conditions led the state to create an elaborate system of insurance, a state bank, and a state mill to protect farmers from the ravages of ever more unstable cycles, leading journalist John Gunther in the late 1940s to describe the state as being "as thoroughly socialized as Sweden."<sup>38</sup>



(U.S.D.A., Resettlement Administration, 1936)

*Between 1860 and 1910 the annual output of wheat grew from 173 million tons to 700 million...*

The dire situation on the Plains was magnified by looming environmental problems. Large swaths of the Central Plains, particularly in the south, appeared too “semi-arid”, according to a 1936 federal report, for intensive agriculture “suitable only for a humid region”. As early as the 1880s Nebraska and Kansas pioneers had suffered severe periods of drought. “Week after week,” an eyewitness reported, “the hot, burning sun blew in from the south. Day after day [it] continued. All fodder, small grain and corn were cut short.”<sup>39</sup>

By the 1930s, the region was suffering drought conditions that brought with them great clouds of moving soil. The “dust bowl” bankrupted thousands of farmers. Whole populations migrated to California and other far western states. The solutions that arose — subsidies and price supports — saved some farms, but once good times returned often dampened the

entrepreneurial spirit of farmers and townspeople. “Instead of Teddy Roosevelt’s exhortations toward a more strenuous effort lest the United States lose its world standing,” observed historian Donald Worster, “conservationists in the 1930s frequently maintained that it was too much strenuousness, not too little, that put the country on its back.”<sup>40</sup>

North Dakota historian Elwyn B. Robinson labeled the early settlement patterns of the plains as being marked by the “too much mistake,”<sup>41</sup> — too many small towns, too much production, and too many governments.<sup>42</sup> This notion of an over-extended region provided much of the rationale for the “buffalo commons” thesis popular towards the end of the 20<sup>th</sup> century.<sup>43</sup> Even though the farm economy was rescued,<sup>44</sup> the region indeed was becoming less important in the national scheme of things. Population dropped after 1930<sup>45</sup> in two-thirds of Great Plains counties.



“The Plow That Broke the Plains” (U.S.D.A.)

*By the 1930s, the region was suffering drought conditions that brought with them great clouds of moving soil.*

## *Environment of the Great Plains*

The environment of the Great Plains is well suited for agriculture with abundant flat terrain, good soils and a mid-latitude continental climate. While the northern states have a well-deserved reputation for cold winter temperatures, summer temperatures throughout the region are ideal for most traditional crops. With this temperature regime; corn, soybeans, sorghum, alfalfa and other crops can be grown throughout the Great Plains — the limiting factor is water.

Average annual precipitation on the Great Plains decreases in a very linear fashion from east to west. The eastern parts of the region generally have ample precipitation but the western plains can be very dry and precipitation is much less reliable. In eastern Colorado, western Kansas and the Texas High Plains, the dryness of the semi-arid climate can be offset in some places with irrigation from the Ogallala Aquifer — but this is only a temporary convenience. Over the next 50

years we are likely to see a continued decline in irrigated acreage as the aquifer is mined.

Despite this constraint, the Great Plains will continue to be one of the most important agricultural regions in the country. With the exception of the Nebraska Sand Hills and the high plains to the west, most of the central and eastern parts of the region score very high on the landscape productivity index — a general index that considers the agricultural potential of soils, terrain and climate. The productivity of the land is very high in the eastern parts of North and South Dakota, southeastern Nebraska, nearly all of Kansas, central Oklahoma and much of Texas. When this environment is coupled with modern farming technology, the region as a whole is among the best in the world. Food and fiber from the Plains have played a critical role in the economic development of the nation and will continue to do so for generations to come.

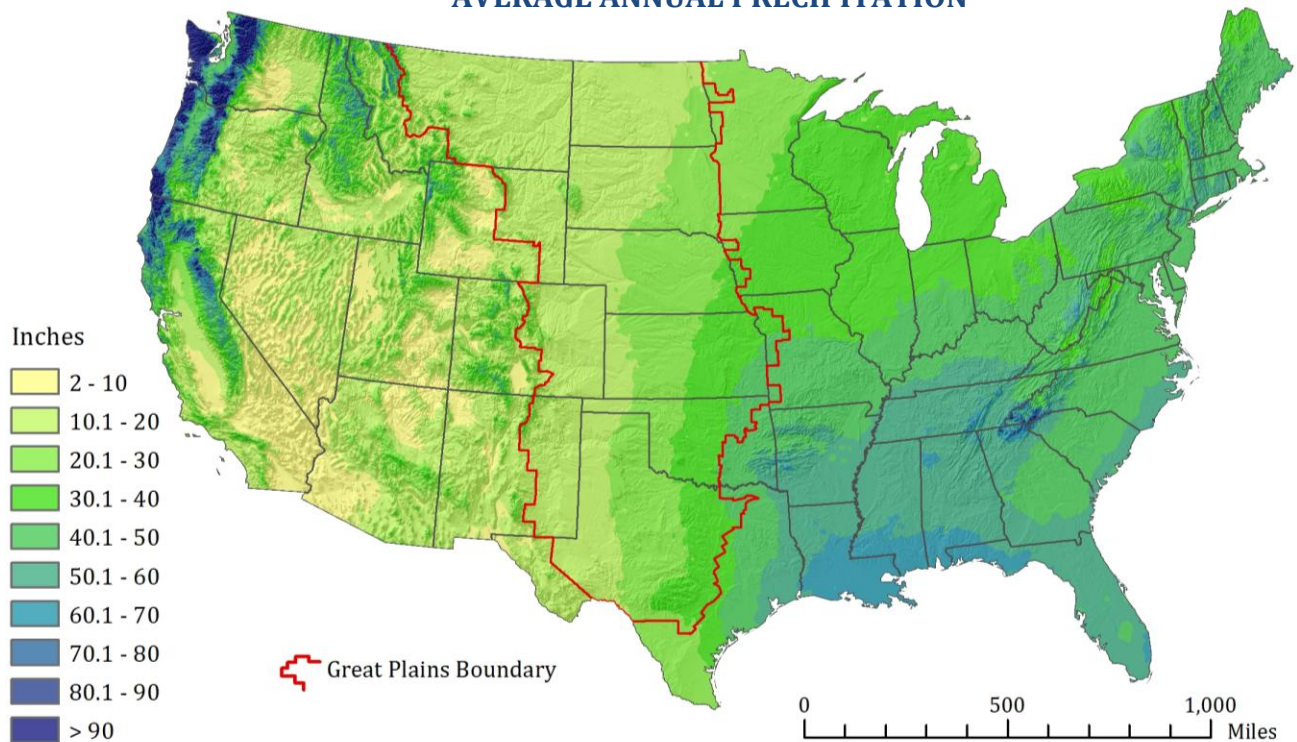


Wheat field - southeastern Colorado (TTU)

*Food and fiber from the Plains have played a critical role in the economic development of the nation and will continue to do so for generations to come.*

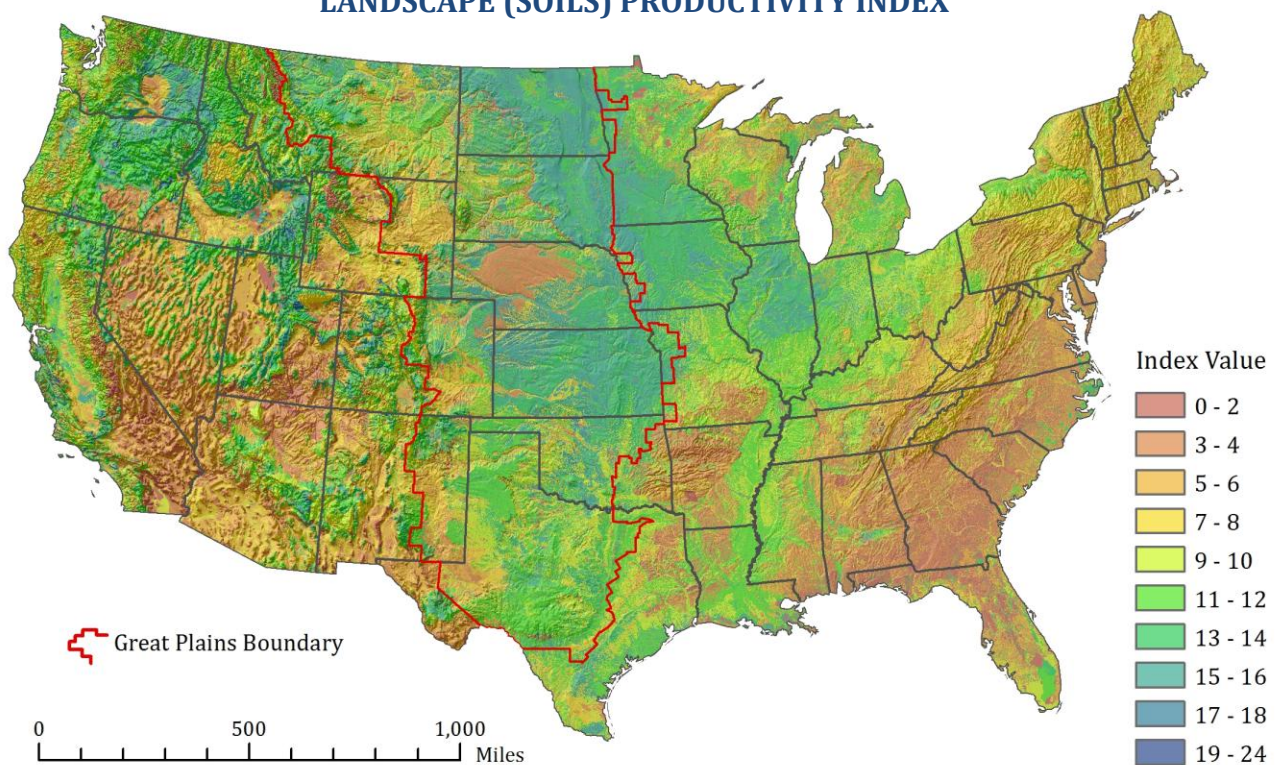


### AVERAGE ANNUAL PRECIPITATION



Source: PRISM Climate Group, Oregon State University.

### LANDSCAPE (SOILS) PRODUCTIVITY INDEX



Source: Schaetzl, R.J., F.J. Krist Jr., and B.A. Miller. 2012. A taxonomically based ordinal estimate of soil productivity for landscape-scale analyses. *Soil Science*.



## ***Rebound on the Farm***

By the early years of the new millennium, conditions in the agricultural economy began to gain new importance. Driven by increased demand for biofuels, shifting commodity markets, and the introduction of new crop varieties better suited to regional demands, plains farmers moved towards greater production of alternative crops, including soybeans and corn. 2010, for example, saw a record for the number of acres planted to soybeans nationwide, with the states of Kansas, Nebraska, North Dakota, and South Dakota seeing some of the biggest year over year increases.<sup>46</sup> This expansion has been led by agricultural exports. In 2011, the U.S. exported a record \$135

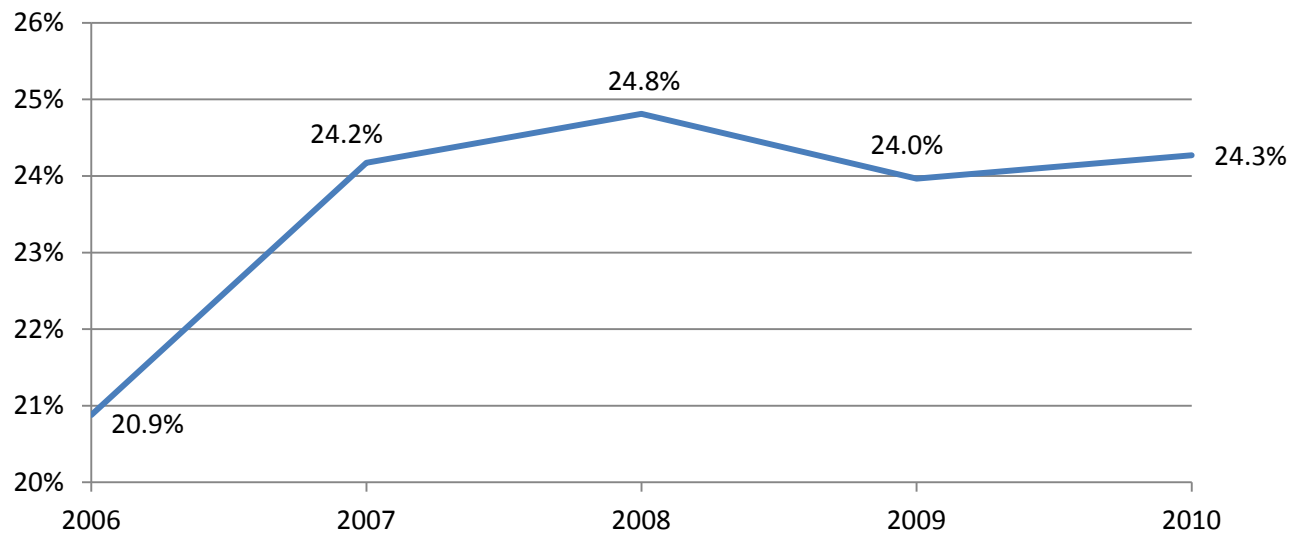
billion in agricultural products, with a net balance of \$47 billion, the highest in nominal dollars since the 1980s.

Much of this growth has been paced by demand from China, which accounts for the consumption of almost sixty percent of the world's soybean exports and forty percent of its cotton. The Plains produces both of these crops in abundance.<sup>47</sup> In contrast China, simply put, lacks the water and land resources to feed itself at its rising per capita level of consumption, effectively dropping the old Maoist goal of self-sufficiency.

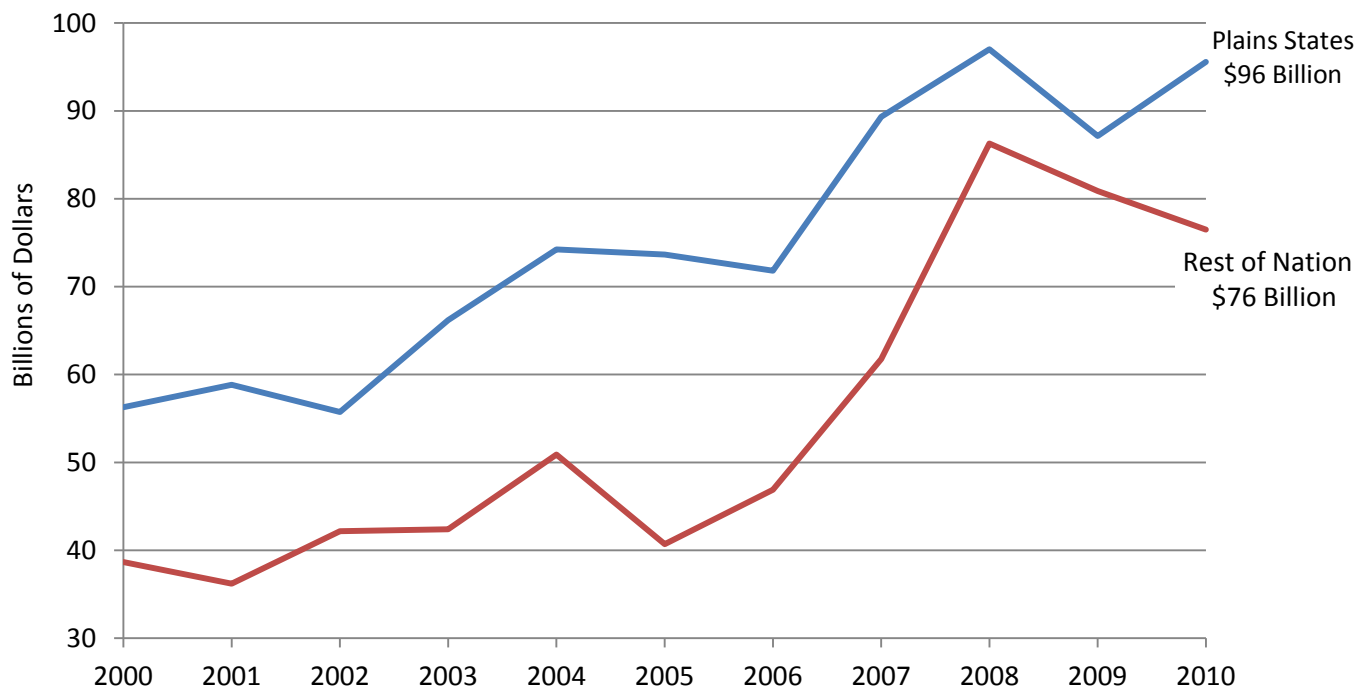


Belle Fourche – western South Dakota (TTU)

*In 2011, the U.S. exported a record \$135 billion  
in agricultural products...*

**SHARE OF U.S. AGRICULTURAL EXPORTS FROM GREAT PLAINS STATES**

Source: U.S.D.A., Economic Research Service.

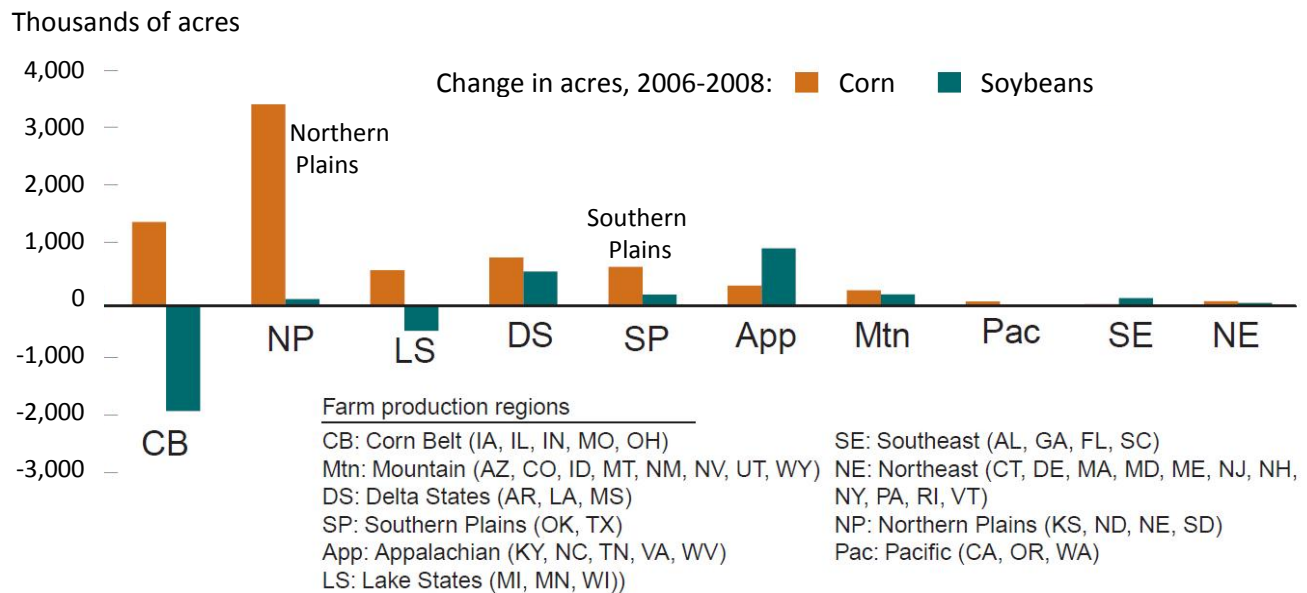
**VALUE OF U.S. AGRICULTURAL PRODUCTION, 2000-2010**

Source: U.S.D.A., Economic Research Service.

Corn is another key crop demanded by China.<sup>48</sup> Its production has been on the rise throughout the plains, also driven by the increased demand for ethanol feedstock. According to the U.S.D.A., between 2000 and 2009, national ethanol production rose from 1.6 billion gallons to 10.8 billion gallons, almost all of which

was produced from corn.<sup>49</sup> The plains and particularly the northern plains (ND, SD, NE, and KS) saw major increases in acres devoted to corn during the latter part of the decade. While the chart below only covers the change from 2006 to 2008; it reflects part of a larger and continuing trend.<sup>50</sup>

### CHANGE IN CORN PRODUCTION, 2006-2008



*Note: Regional differences suggest that not all increases in corn acreage came out of soybeans. Comparing changes in harvested acres at a finer geographic scale provides a better indication of whether farmers shifted land between crops.*

*Source: U.S.D.A., Economic Research Service using U.S.D.A. National Agricultural Statistics Service's Crop Production Summaries.*

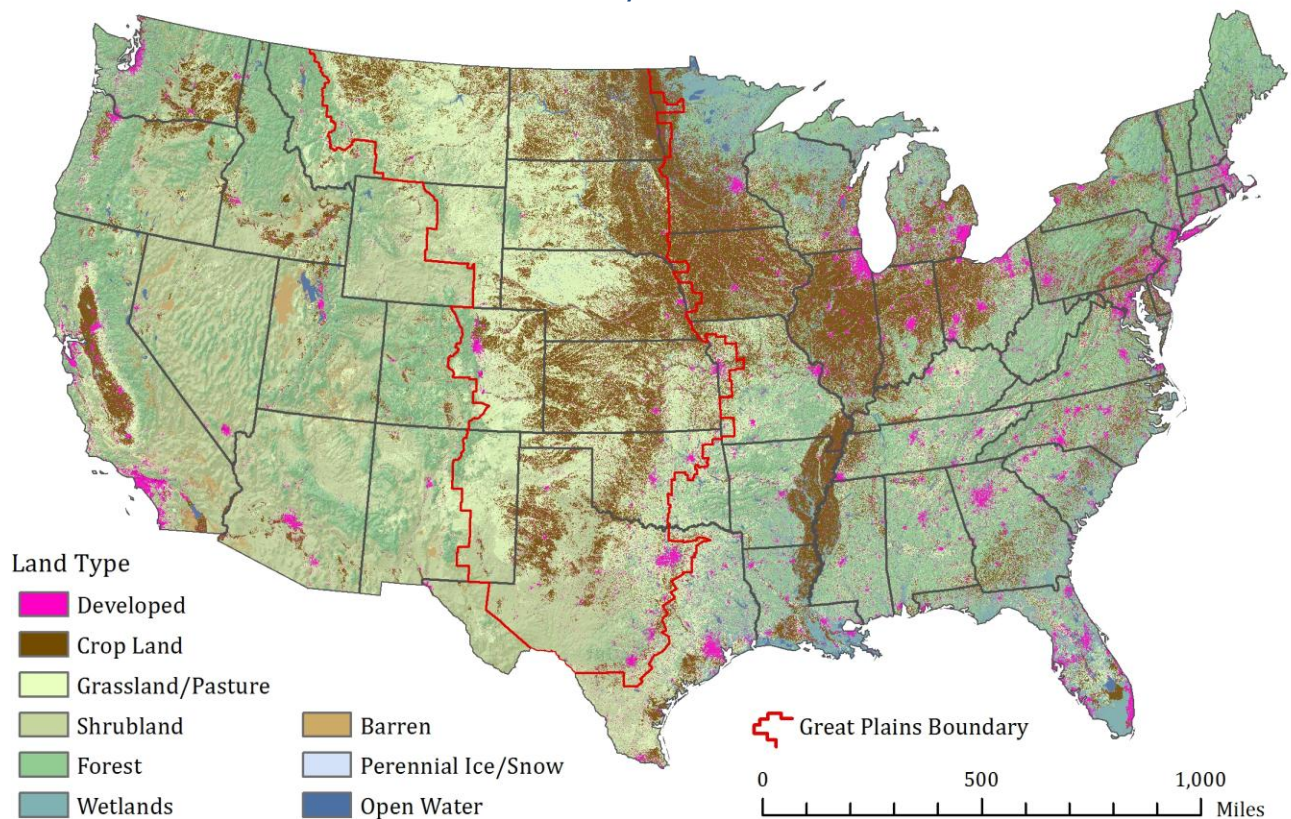
*Once considered "a great American desert" unfit for the plow, farms and ranches of the ten plains states now cover more than 790,000 square miles, an area larger than Mexico.*

Once considered "a great American desert" unfit for the plow, farms and ranches of the ten plains states now cover more than 500 million acres,<sup>51</sup> or over 790,000 square miles, an area larger than Mexico, the world's 14<sup>th</sup> largest country.<sup>52</sup> This vast area is currently broken up into over 600,000 individual farms and ranches.<sup>53</sup> As of 2010, agricultural producers on the plains held nearly 45 million cattle and calves, a number greater than the entire human population of the ten-state region (43.7 million). At the last U.S.D.A. count, farms and ranches in the plains sold crops and animals with a market value of \$82 billion.

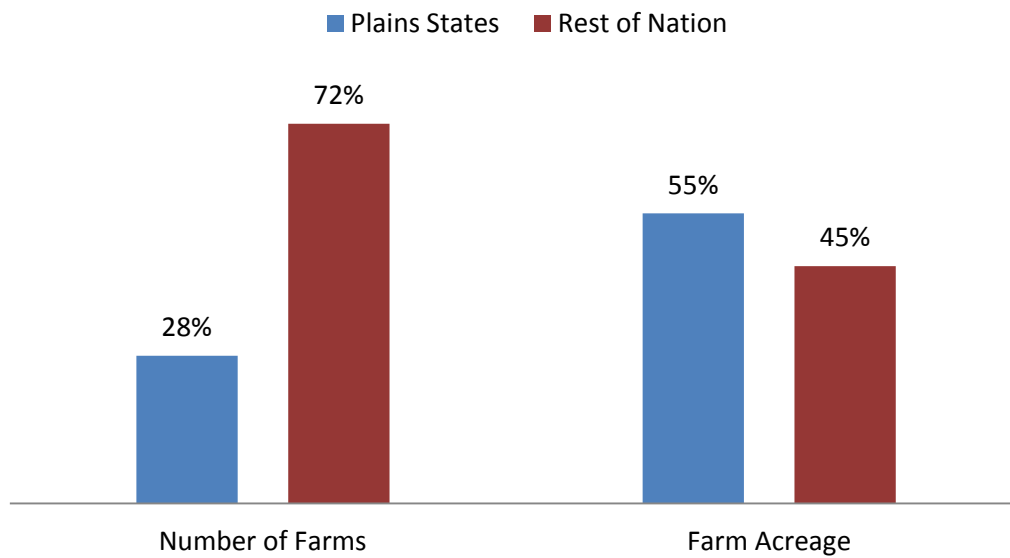
Farms and ranches in the plains states tend to be much larger than the national average of 418 acres. So it is not surprising to find that the region accounts for a majority, 55%, of the nation's 920 million acres of farm land.

While the majority of farms on the plains are small, the large operations control far more acreage. Through consolidation, even many family-run operations have expanded to sizes that would be considered significant elsewhere. With land prices increasing, the ability of smaller farmers to buy or rent land will be curtailed, favoring the largest, most cash rich operations in a position to continue their expansion.

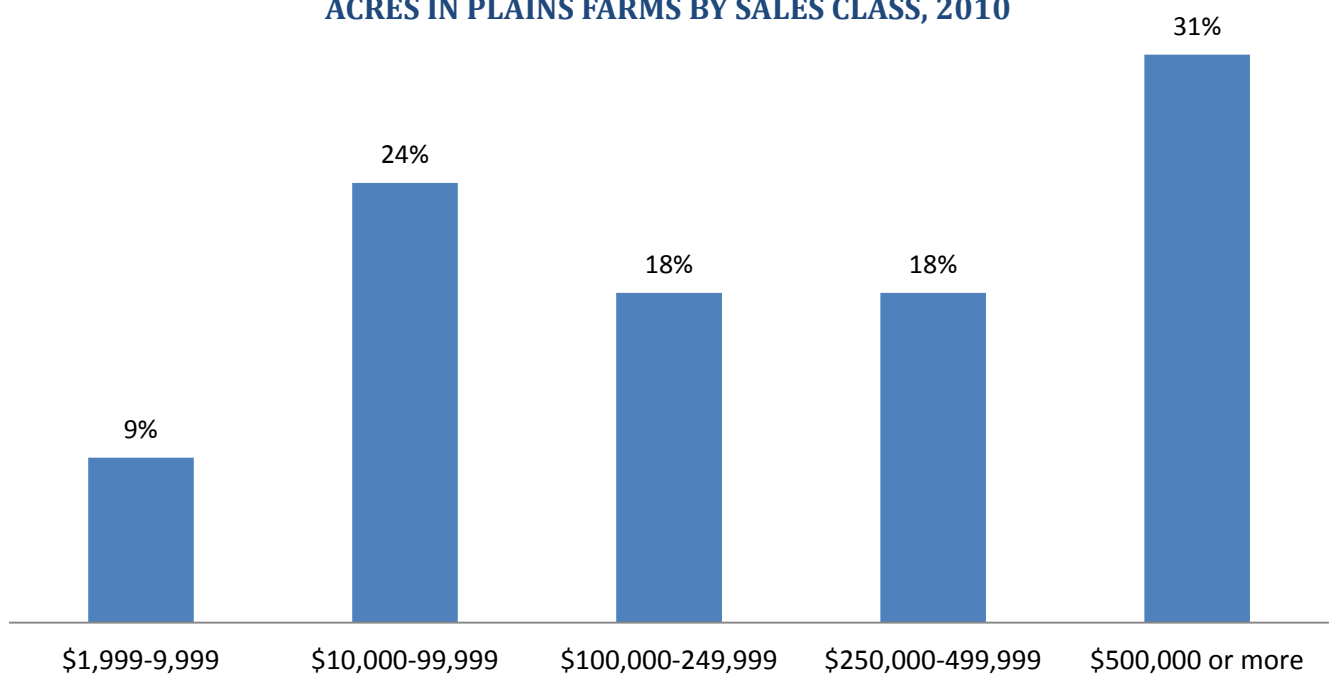
### LAND USE / LAND COVER



Source: U.S.D.A., National Agriculture Statistics Service, National Cropland Data Layer, 2011.

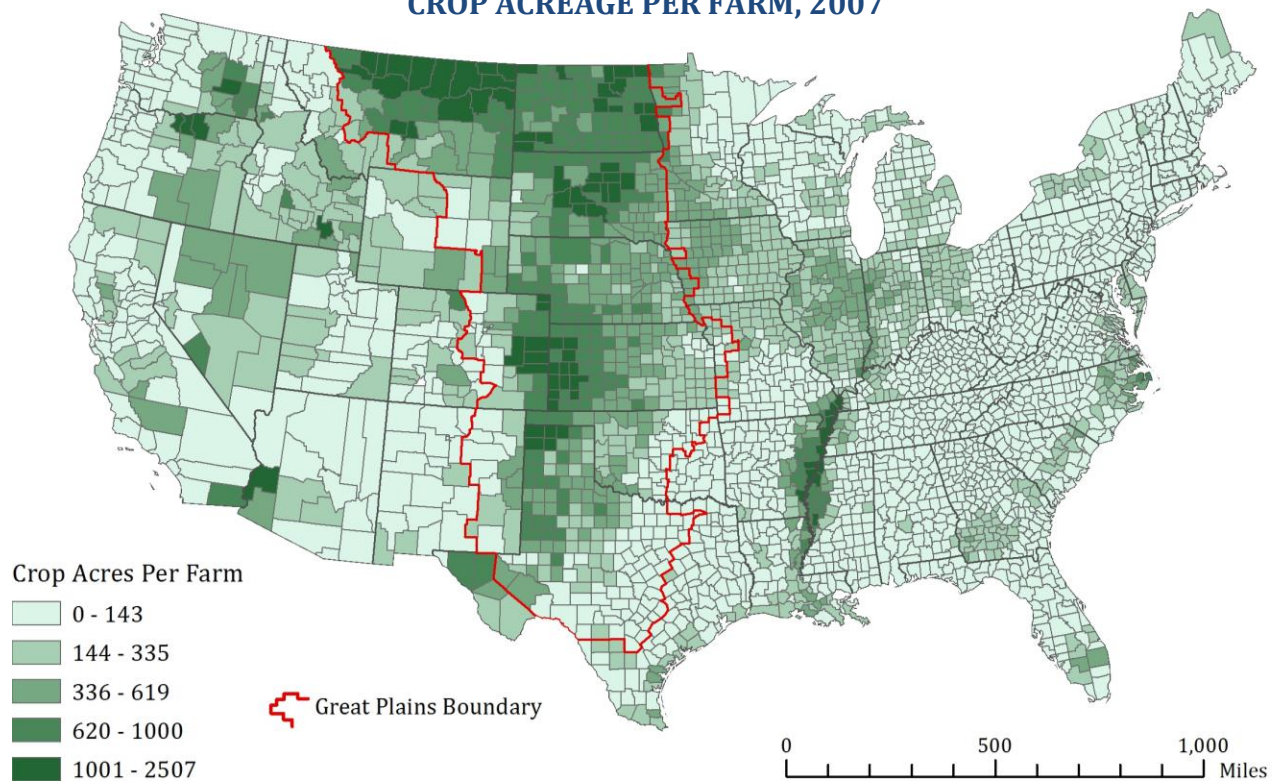
**GREAT PLAINS: FEWER FARMS BUT MORE ACRES**

Source: U.S.D.A., National Agricultural Statistics Service, "Farms, Land in Farms, and Livestock Operations 2010 Summary", February 2011.

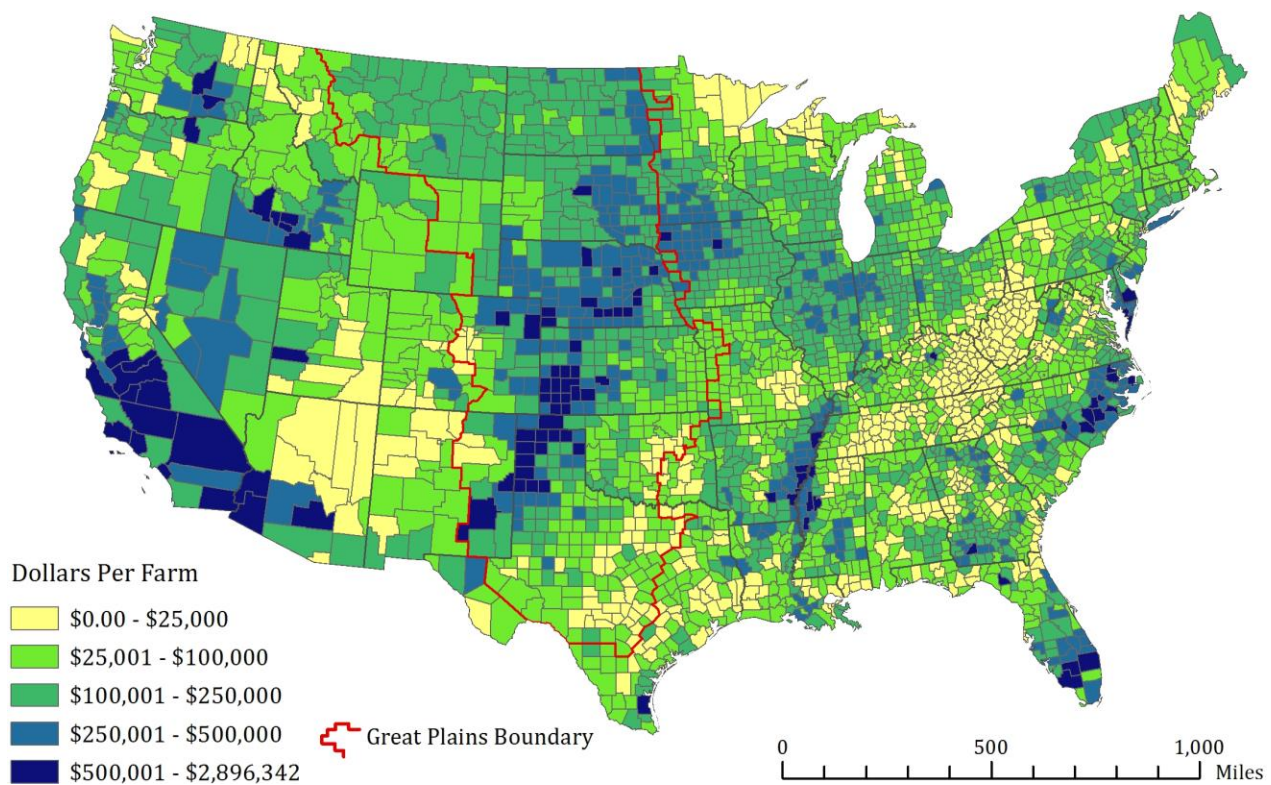
**ACRES IN PLAINS FARMS BY SALES CLASS, 2010**

Source: U.S.D.A., National Agricultural Statistics Service, "Farms, Land in Farms, and Livestock Operations 2010 Summary", February 2011.



**CROP ACREAGE PER FARM, 2007**

Source: U.S.D.A., National Agricultural Statistics Service, 2007 Census of Agriculture.

**AVERAGE PER-FARM MARKET VALUE OF PRODUCTS SOLD, 2007**

Source: U.S.D.A., National Agricultural Statistics Service, 2007 Census of Agriculture.



## ***Water on the Plains***

Of course, there is still a need for a greater emphasis on preserving the soils and water that sustain the region. Following the Dust Bowl tremendous strides have been made to reduce soil erosion, and modern soil conservation practices are widespread. Producers throughout the region are keenly aware that they are stewards of some of the most productive farm land in the world — especially in those areas that overlie the Ogallala (High Plains) Aquifer.

The Ogallala Aquifer covers 174,000 square miles of the Great Plains and it is widely used to support irrigated agriculture, especially in southern Nebraska, eastern Colorado, western Kansas and the Texas High Plains. While some have suggested that high rates of water use threaten the existence of agriculture on the Great Plains<sup>54</sup>, our analysis demonstrates that the region is fully capable of producing much of the nation's food and fiber well into the future.



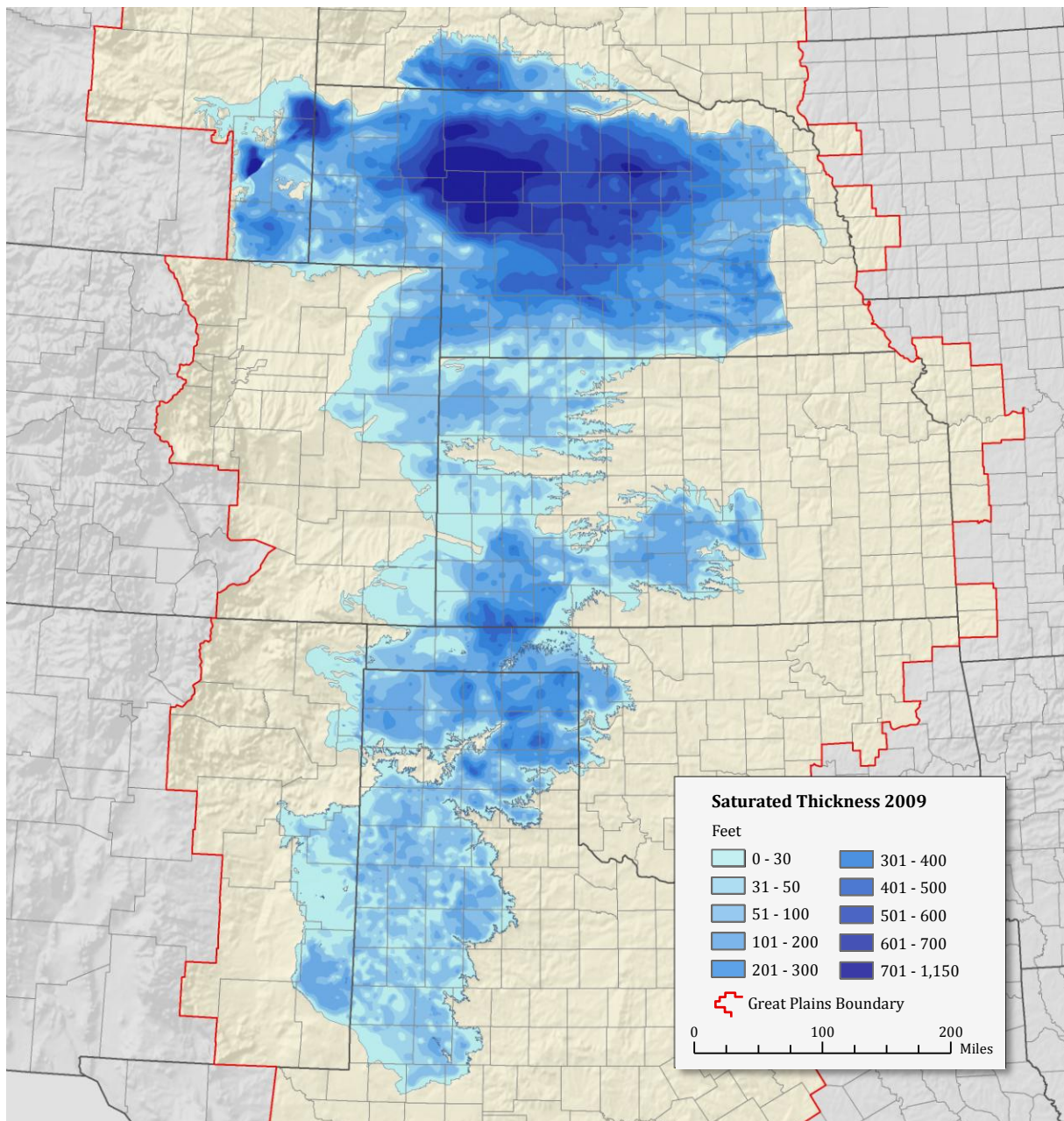
Center pivot irrigation near Alliance - western Nebraska (TTU)

*Producers throughout the region are keenly aware that they are stewards of some of the most productive farm land in the world.*

To understand the Ogallala Aquifer it is important to recognize that the characteristics of the aquifer vary widely across the region. In Nebraska, the aquifer is more than 1000 feet thick beneath the Nebraska Sand Hills and most of this region is blessed with ample recharge from rain and snow. While irrigated agriculture covers a

large swath of southern Nebraska along the Central Platte River Valley, rates of aquifer depletion have been modest.<sup>55</sup> Farther south and west — from eastern Colorado to western Kansas to the Texas High Plains — the aquifer is much thinner, recharge is minimal in the semi-arid climate, and the aquifer is being actively mined.

### OGALLALA AQUIFER: SATURATED THICKNESS 2009



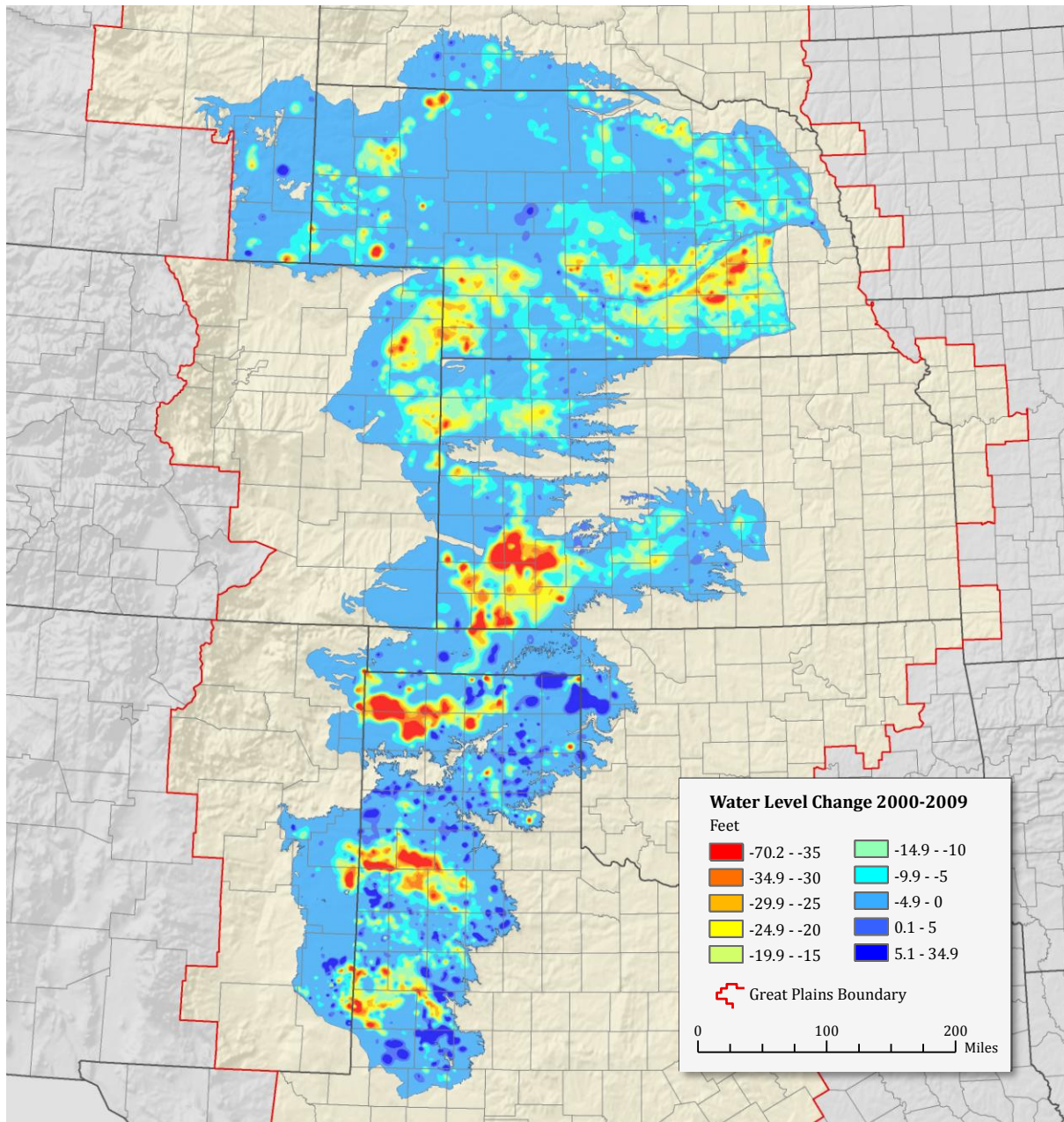
Source: Map created using data provided by the U.S. Geological Survey.



The map below shows the changes in the water level (or saturated thickness) measured between 2000 and 2009. The greatest water use

is associated with the irrigated agriculture in southern Nebraska, eastern Colorado, western Kansas and parts of the Texas High Plains.

### OGALLALA AQUIFER: WATER LEVEL CHANGE, 2000-2009



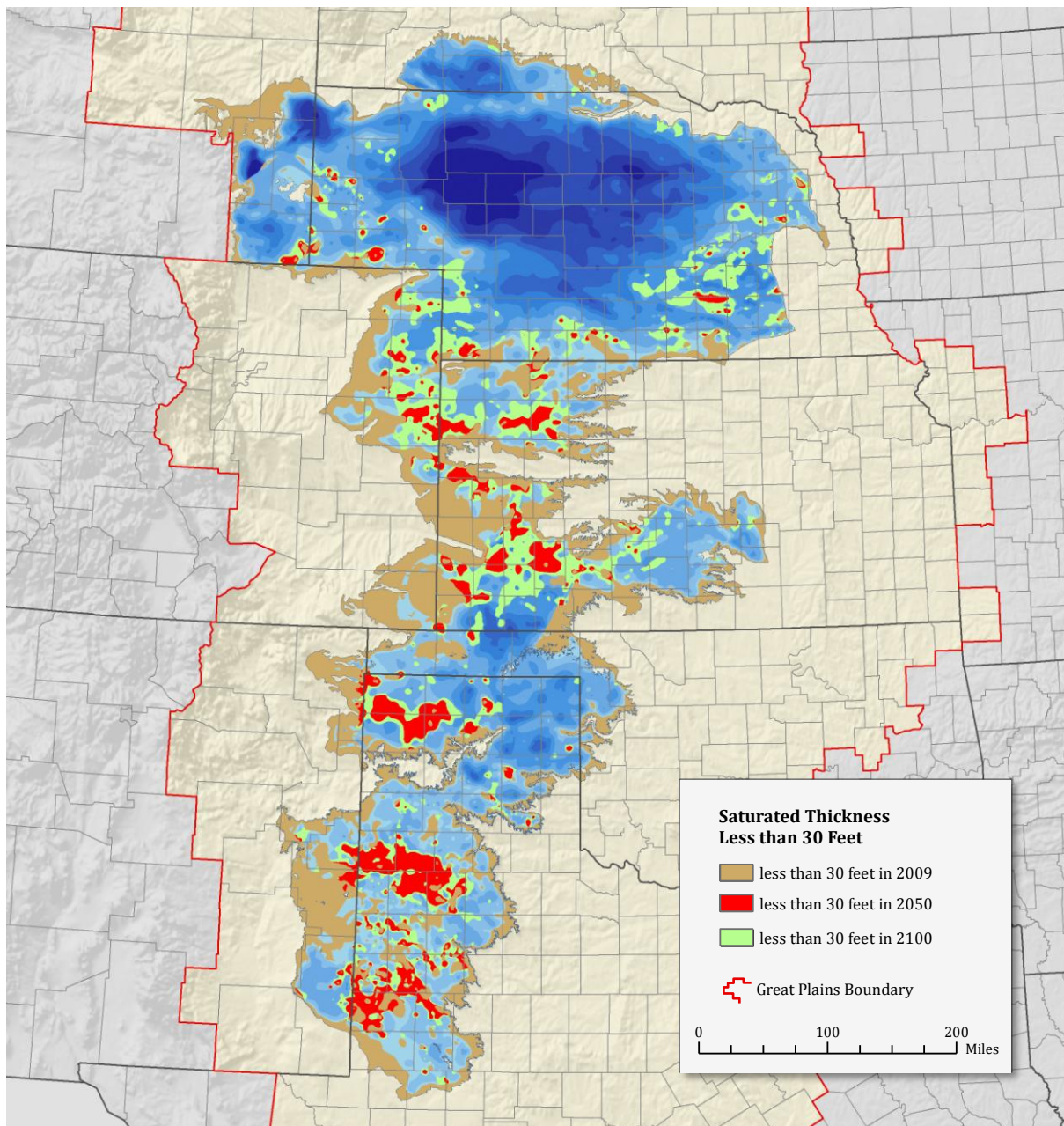
Source: Map created using data provided by the U.S. Geological Survey.



To map the usable lifetime of the aquifer, the saturated thickness of the aquifer was divided by the average rate of water-level decline for the period from 2000 to 2009. Assuming that these rates of aquifer depletion extend into the future, it becomes obvious that irrigated agriculture is not sustainable in many parts of the region. This is

not to say that the aquifer will go dry — simply that water levels be drawn down to a level that cannot support large-scale irrigated agriculture. The Kansas Geological Survey suggests that the aquifer is effectively depleted for high-volume irrigation when the saturated thickness is reduced to about 30 feet.<sup>56</sup>

### OGALLALA AQUIFER: PROJECTED USABLE LIFETIME



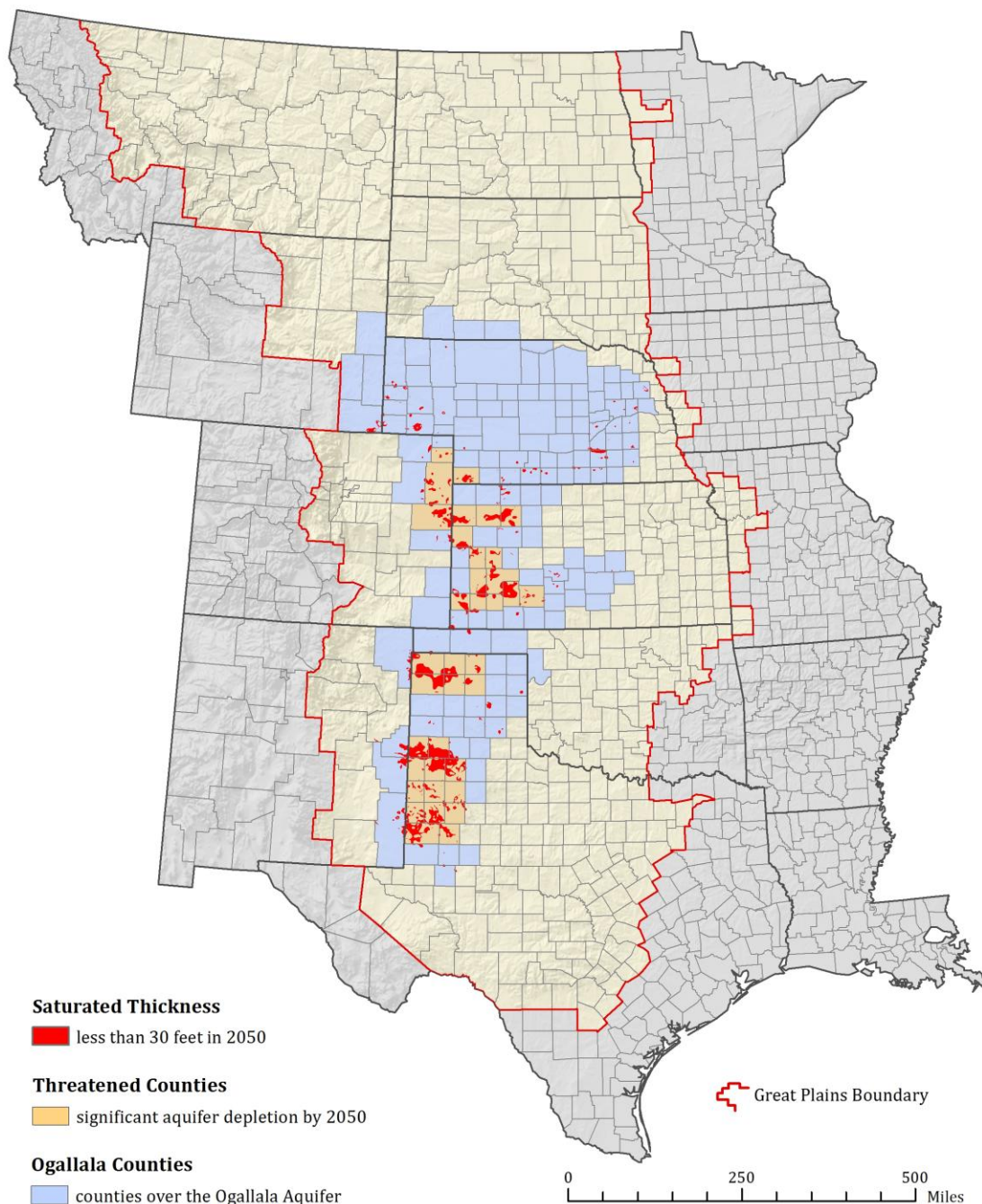
Source: Analysis based on water level data provided by the U.S. Geological Survey.

## Groundwater and Future of Agriculture on the Great Plains

The area covered by the Ogallala Aquifer represents only 23% of the Great Plains region. Of this, there is no significant threat to the aquifer in most of Nebraska and a large part of the aquifer area is already below 30 feet — with no significant

irrigated agriculture. Only in parts of eastern Colorado, western Kansas and the Texas High Plains do we find about 36 counties where aquifer depletion is a threat to irrigated agriculture.

### COUNTIES THREATENED BY AQUIFER DEPLETION



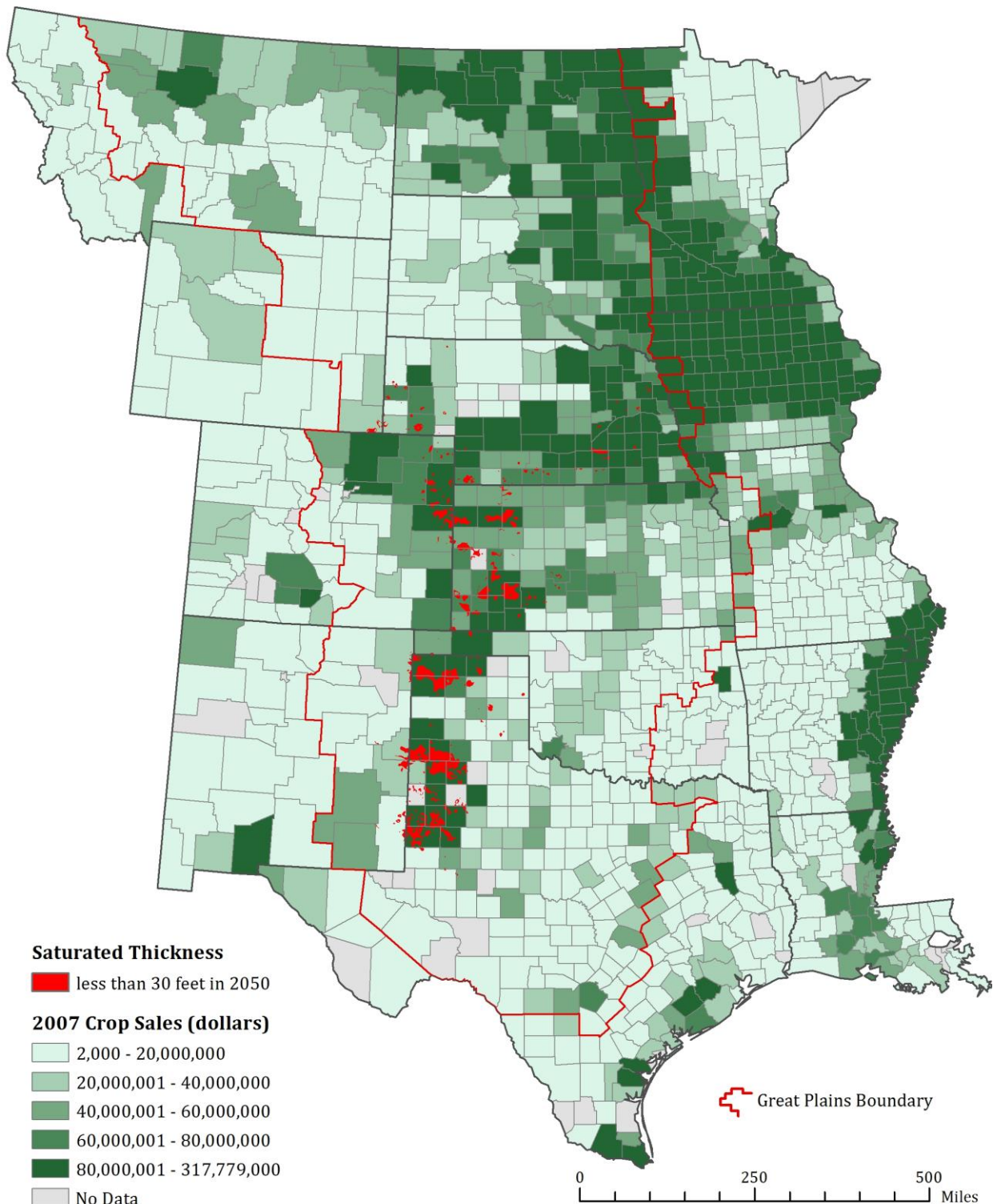
Source: Analysis based on water level data provided by the U.S. Geological Survey.



While these threatened counties produce some of the region's highest sales from crops; the

area represents a very small percentage of the total cropland on the Great Plains.

### OGALLALA AQUIFER DEPLETION AND CROP SALES



Source: U.S.D.A., National Agricultural Statistics Service, 2007 Census of Agriculture.



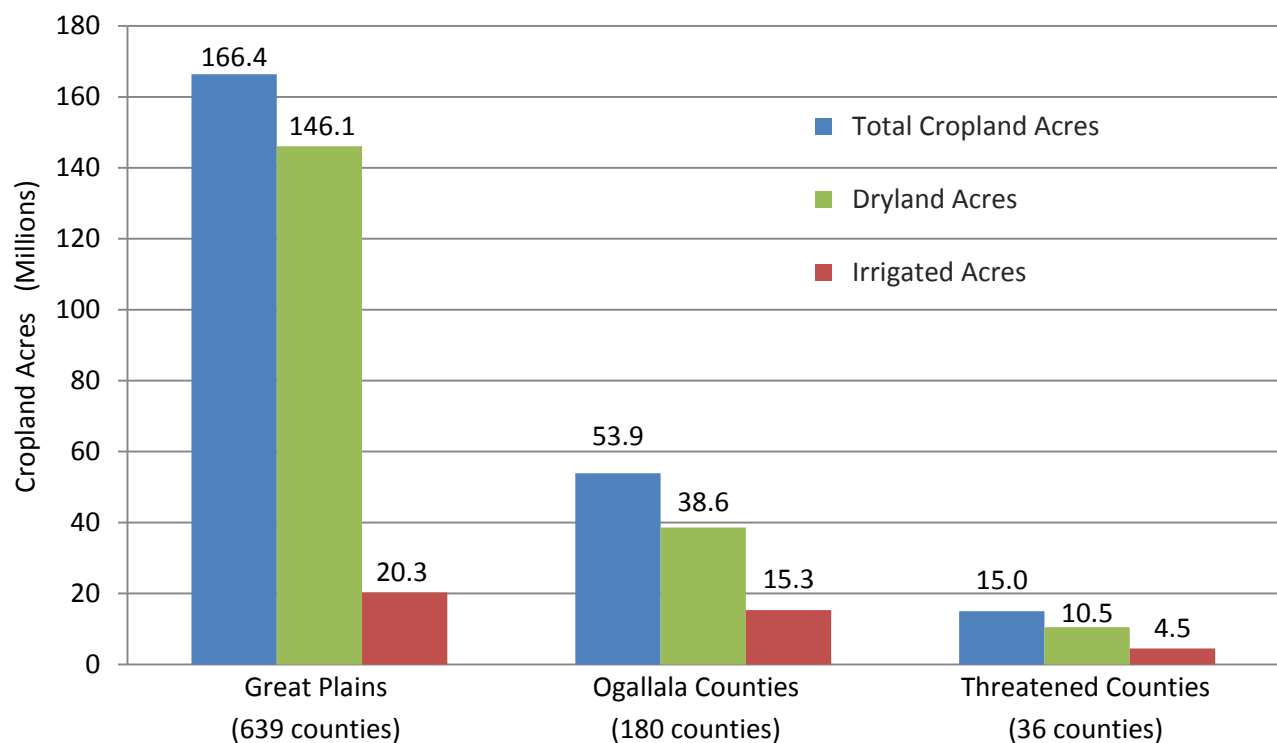
According to the 2007 Census of Agriculture (the most recent complete census), there were approximately 166.4 million acres of cropland on the Great Plains and only 20.3 million irrigated acres (including cropland and pasture). Based on these data, it is important to recognize that less than 12% of the cropland on the Great Plains is irrigated and more than 88% is dryland farming.

Moreover, if we consider the 180 counties that overlie the Ogallala Aquifer, there are about

53.9 million acres of cropland, but less than 15.3 million acres are irrigated. In other words, less than 30% of the cropland in counties overlying the aquifer is irrigated.

Lastly, there are only 4.5 million irrigated acres located in the 36 threatened counties — and not all of these irrigated acres are threatened. While this area represents about a third of the irrigated acreage that overlies the Ogallala Aquifer, it also represents less than 3% of the total cropland on the Great Plains.

### CROPLAND AND IRRIGATED ACRES, 2007



Source: U.S.D.A., National Agricultural Statistics Service, 2007 Census of Agriculture.

*It is important to recognize that less than 12% of the cropland on the Great Plains is irrigated...*

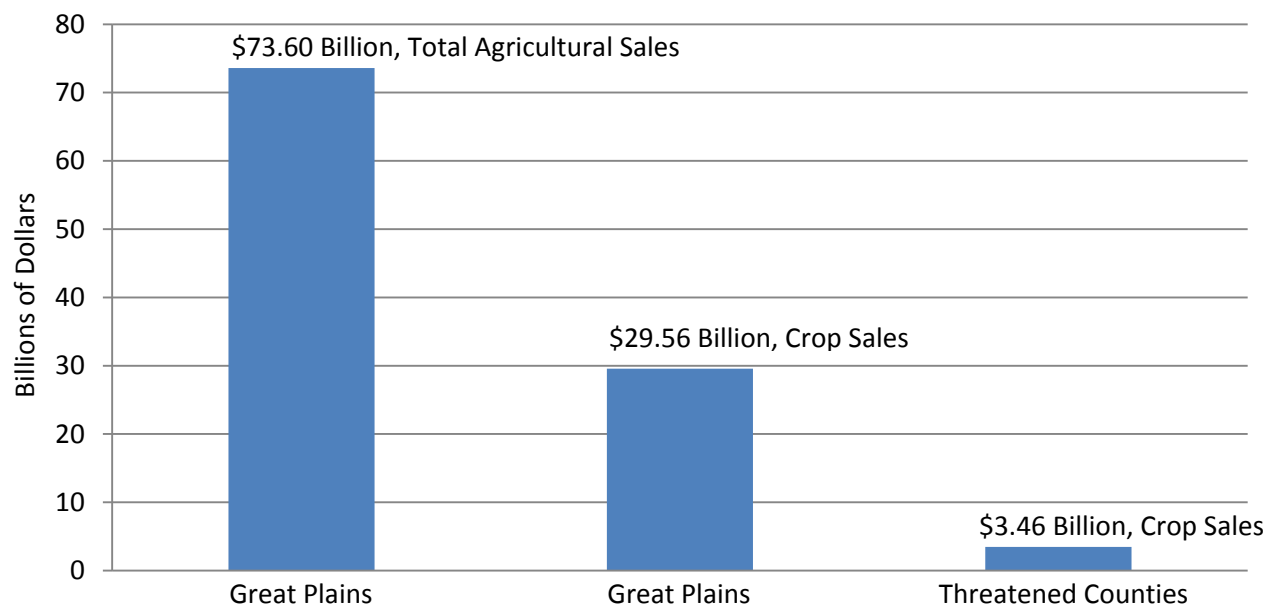
## Economic Impact of Groundwater Depletion

To assess the impact of aquifer depletion on the Great Plains, we compared the region's total agriculture sales with the region's total crop sales and the crop sales from threatened counties. For the entire Great Plains, total agricultural sales reached \$73.6 billion in 2007. Of this total, about \$29.56 billion or 40% of the sales were derived from cropland.

In the 36 threatened counties, there were about \$3.46 billion in crop sales — including both dryland and irrigated agriculture. On average, irrigated acres represented about 30% of the total cropland in these counties. As such, we estimate that about half or more of the \$3.46 billion in sales were derived from irrigated crops — about \$2.5 billion. Of this subtotal, not all of the irrigated cropland is threatened, but we will use \$2.5 billion as a conservative estimate of irrigated crop sales for the sake of argument.

If \$2.5 billion in sales are directly threatened by the depletion of the aquifer over the next 40 years, this amount represents a small fraction of the region's \$29.56 billion in crop sales — less than 10%. Moreover, if the aquifer becomes effectively depleted for irrigated agriculture, the land is not lost. Rather, it seems likely that most of this irrigated cropland will transition back to dryland farming. With the transition and crop sales from non-irrigated cropland, we estimate that the net loss is on the order of \$1 to 2 billion — about 5% of the region's total crop sales and less than 2% of total agricultural sales. In addition, we suspect that that the increased yield from improved dryland crop varieties will likely offset even this loss. In the end, we can only conclude that the continued depletion of the Ogallala Aquifer will have little economic impact on Great Plains agriculture over the next 40 years.

### AGRICULTURAL SALES, 2007



Source: U.S.D.A., National Agricultural Statistics Service, 2007 Census of Agriculture.

This analysis is not intended to say that we are unconcerned about the depletion of the Ogallala Aquifer. Obviously there are ecological impacts, and the local impact on the economy of

threatened rural counties can be very significant; but any notion that Great Plains agriculture is on the verge of collapse seems rather misguided.

**Plains Agriculture: The High-Tech Future**

The causes and effects of the demographic shifts in rural parts of the Plains are a matter of scholarly discussion, but one of the driving factors has been increased productivity. Farmers throughout the plains are now able to do much more with less. Modern agricultural technologies and equipment have reduced the need for bodies to work the land and provide other services to producers, and the apparent

result has been a steady decline in rural population.

Among 20 crops measured by the federal government since 1866, record national yields per acre have been set since 2007, particularly in 2009 and 2010. Signature crops grown on the plains, including corn and soybeans, set overall production records in the past three crop years.

**SELECTED PLAINS CROPS, BY YEAR OF RECORD-YIELD PER ACRE**

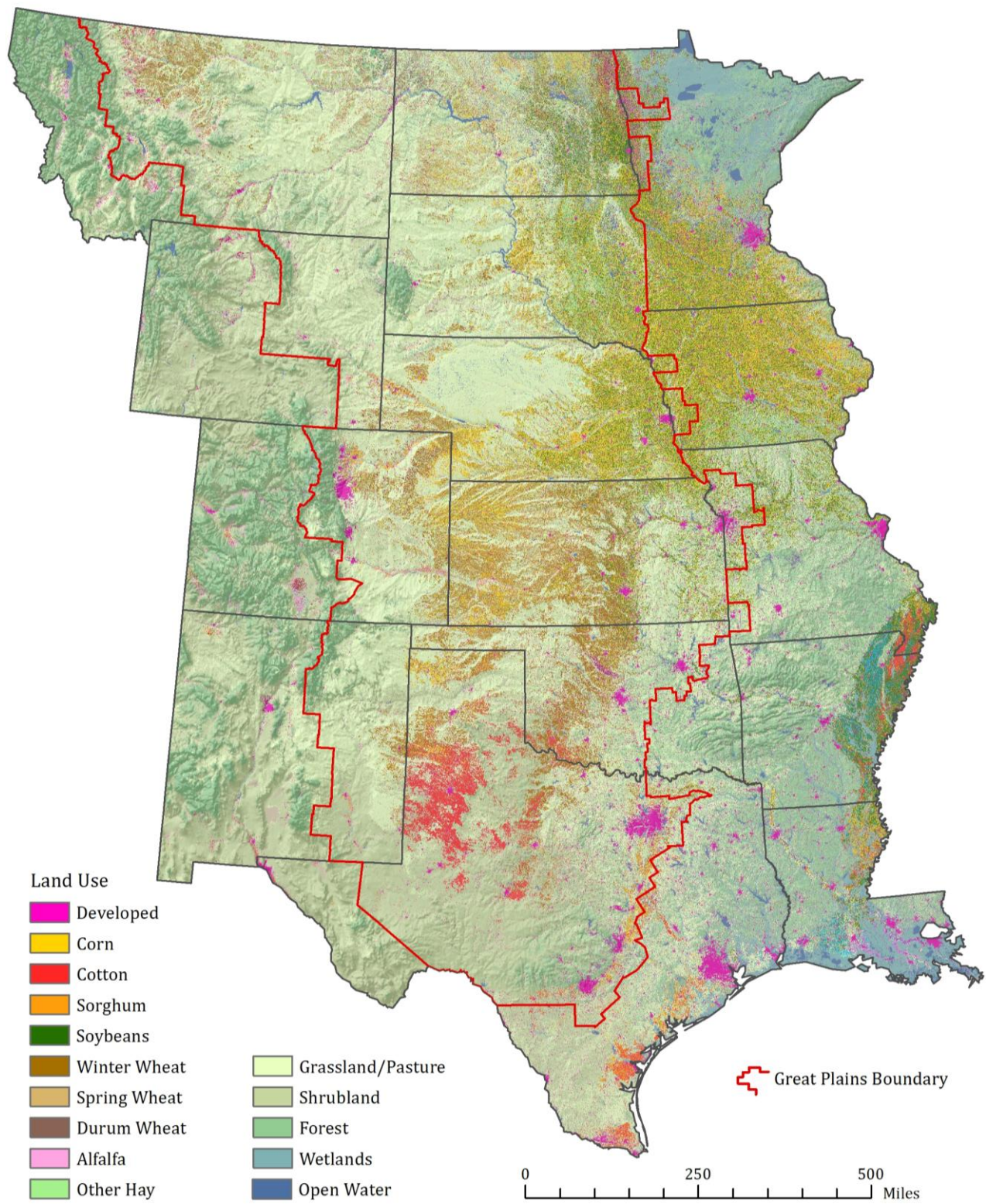
Crop	Year of Record-Yield/Acre
Barley	2010
Canola	2009
Corn for Grain	2009
Cotton	2007
Oats	2009
Sorghum for Grain	2007
Soybeans	2009
Sugar beets	2010
Sunflowers, All	2009
Wheat, All	2010

*Source: U.S.D.A. National Agricultural Statistics Service, April 2011.*

*Farmers throughout the plains are now able to do much more with less... and the apparent result has been a steady decline in rural population.*



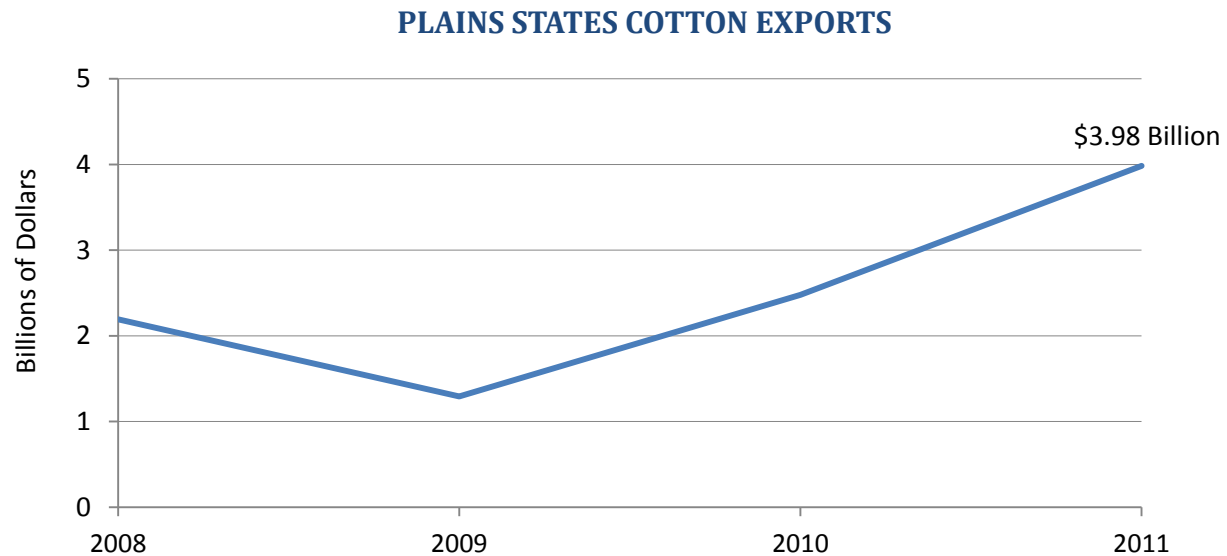
## GREAT PLAINS AGRICULTURE



Source: U.S.D.A., National Agriculture Statistics Service, National Cropland Data Layer, 2011.

Cotton represents another critical crop, particularly on the southern Plains. It was, as one historian noted, the “curtain raiser” for the initial British industrial revolution,<sup>57</sup> and later for the first industrial boom in the Northeastern United States. Many developing countries, notably China, import much of their fiber from the U.S. Overall,

plains cotton exports have been on the rise, rebounding after a downturn during the recent recession.<sup>58</sup> Chinese demand for cotton is likely to continue to increase,<sup>59</sup> providing outlets for U.S. production and offering expanded export opportunities for plains cotton farmers.



*Note: Exports of “cotton, not carded or combed”.*

*Source: U.S. Census, Foreign Trade Statistics.*



Cotton in Gaines County – Texas High Plains (Debi Cates)

*Chinese demand for cotton is likely to continue to increase, offering expanded export opportunities for plains cotton farmers.*



Population may still decline in many rural plains communities, but recent shifts in agriculture suggest that farming will remain a critical component in the prospects of the region, as well as the nation. Nearly one fifth of all jobs in plains non-metropolitan counties are in agribusiness sectors, and farm machinery equipment manufacturing is up 12 percent since 2003.<sup>60</sup> The current boom conditions may not persist without pause, particularly given weaknesses in the global economy.<sup>61</sup> But, over time, the large-scale global demand for food and fiber suggests a longer-term bull market in commodities.

Many critics object to the industrial scale of U.S. agriculture, and support an “alternative” of largely organic, small producers.<sup>62</sup> But technologically advanced large scale farming still accounts for the vast majority of U.S. agricultural exports. Technology, as Marcel Mauss put it, “is a traditional action made effective”.<sup>63</sup> No doubt, organic, specialized farming will increase; greatly enhancing our food quality and choices, but agriculture likely will remain a highly organized, technologically based industry with solid long-term growth prospects.



Stockyard in Fall River County - southwestern South Dakota (TTU)

*...over time, the large-scale global demand for food and fiber suggests a longer-term bull market in commodities.*





Woodford play near Calumet – central Oklahoma (Cooper Ross, IVM)

## Part Three

# The New Energy Boom

The cost and availability of energy have shaped economies since antiquity. Coal helped fire the rapid development of the British industrial revolution, a pattern repeated later in Germany and France. Due largely to coal, Braudel notes, “manufacturing industry was born,” and with it modern capitalism. Higher energy use drove the rapid rise of American economy in the 19<sup>th</sup> century; American energy usage multiplied by eight fold that century, four times the global average. Coal, oil, iron and other metals, notably copper, drove American manufacturing, which accounted for a mere 20% of U.S. exports in 1890; by 1913 that number had moved to nearly 50%.<sup>64</sup>

In the last half of the 20<sup>th</sup> century, America became a major importer of raw materials, especially oil. A persistent negative balance in energy developed, accounting at times for close to half of U.S. imports. Some more histrionic pundits, such as James Howard Kunstler, predict a coming catastrophe due to depleted resources, ushering in the end of the largely suburban “American way of life.”<sup>65</sup>

Such predictions seem particularly overwrought, given recent shifts in energy discoveries. Due in part to new technologies such as hydraulic fracking and horizontal drilling, estimates of North America’s energy resources have skyrocketed. By 2020 these new sources from shale will represent an estimated two-thirds of U.S. oil and gas production. By then, according to the consultancy PFC Energy, the United States will surpass Russia and Saudi Arabia as the world’s leading oil and gas producer.

A “westward shift” in energy development is on, with North America emerging as the lead player.<sup>66</sup> In 2011, the United States became a net exporter of petroleum products for the first time in 62 years. American imports of raw petroleum have fallen from a high of 60% of total to less than 46%.<sup>67</sup> Overall, according to Amy Myers Jaffe, Director of the Energy Forum at Rice University’s Baker Institute, U.S. oil reserves now stand at over 2 trillion barrels; Canada has slightly more. Together, this constitutes more than three times the total estimated reserves of the Middle East and North Africa.<sup>68</sup> Other observers, such as Michael Lind, believe that new discoveries, particularly of natural gas, mean that we might actually be living in an era of “peak renewables,” and at the onset of a “very long age of fossil fuels.”<sup>69</sup>

## *The Great Plains Gusher*

The Plains has been arguably the greatest beneficiary of the technological revolution in energy. North Dakota’s vast Bakken Field, where these new methods are being employed, may possess enough oil to double U.S. oil reserves.<sup>70</sup>

This new wave of exploration is being led not only by major oil companies, but also by independent “wildcat” operators who then frequently sell to the majors. Many are locally based in such small cities as Midland, Texas, Casper, Wyoming, and Williston, North Dakota.<sup>71</sup>

In 2010 total oil production in the Plains states amounted to 841.95 million barrels, about 2.307 million barrels per day. The region — taken together as a country — would rank 14<sup>th</sup> in worldwide daily oil production, slightly ahead of

### **OIL RESERVES PRODUCTION AND REFINING**

State	Share of U.S. Oil Reserves, 2009	Share of U.S. Crude Oil Production, 2010	Share of U.S. Oil Refinery Capacity, 2011
<b>Colorado</b>	1.3%	1.5%	0.6%
<b>Kansas</b>	1.3	2.0	1.9
<b>Montana</b>	1.7	1.3	1.1
<b>Nebraska</b>	0.0	0.1	0
<b>New Mexico</b>	3.4	3.3	0.8
<b>North Dakota</b>	5.1	5.7	0.3
<b>Oklahoma</b>	3.0	3.5	2.9
<b>South Dakota</b>	NA	0.1	NA
<b>Texas</b>	24.2	21.4	26.6
<b>Wyoming</b>	2.8	2.7	0.9
<b>Plains States</b>	<b>42.8</b>	<b>41.6</b>	<b>35.1</b>

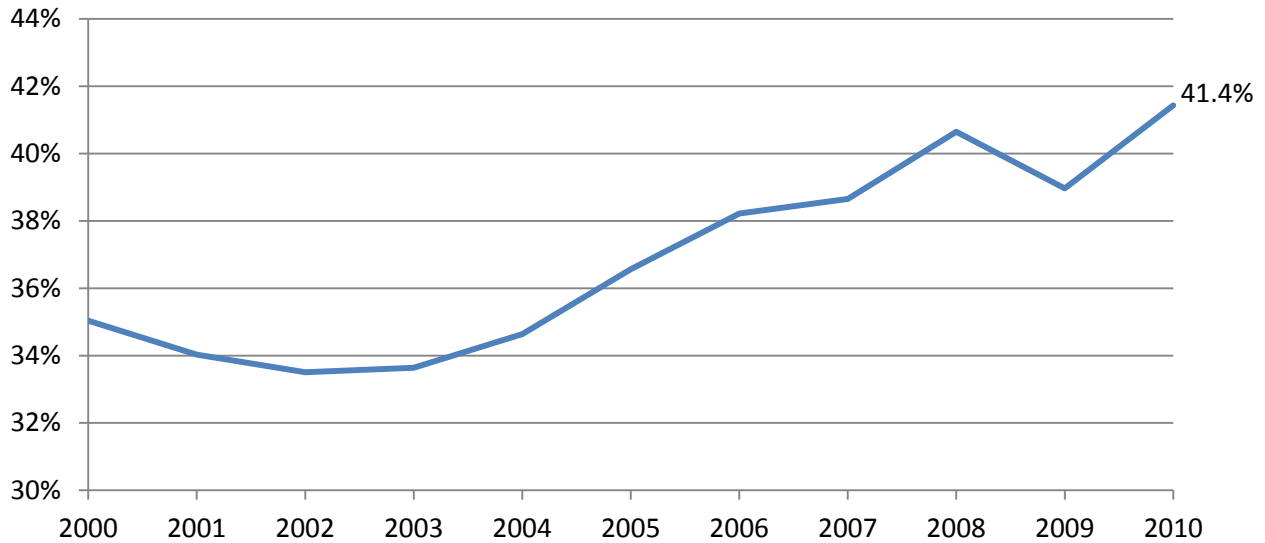
*Source: U.S. Energy Information Administration.*



Nigeria and just behind Norway. These numbers will most likely increase in coming years. North Dakota production alone is now set to surpass the production levels of OPEC member Ecuador.<sup>72</sup>

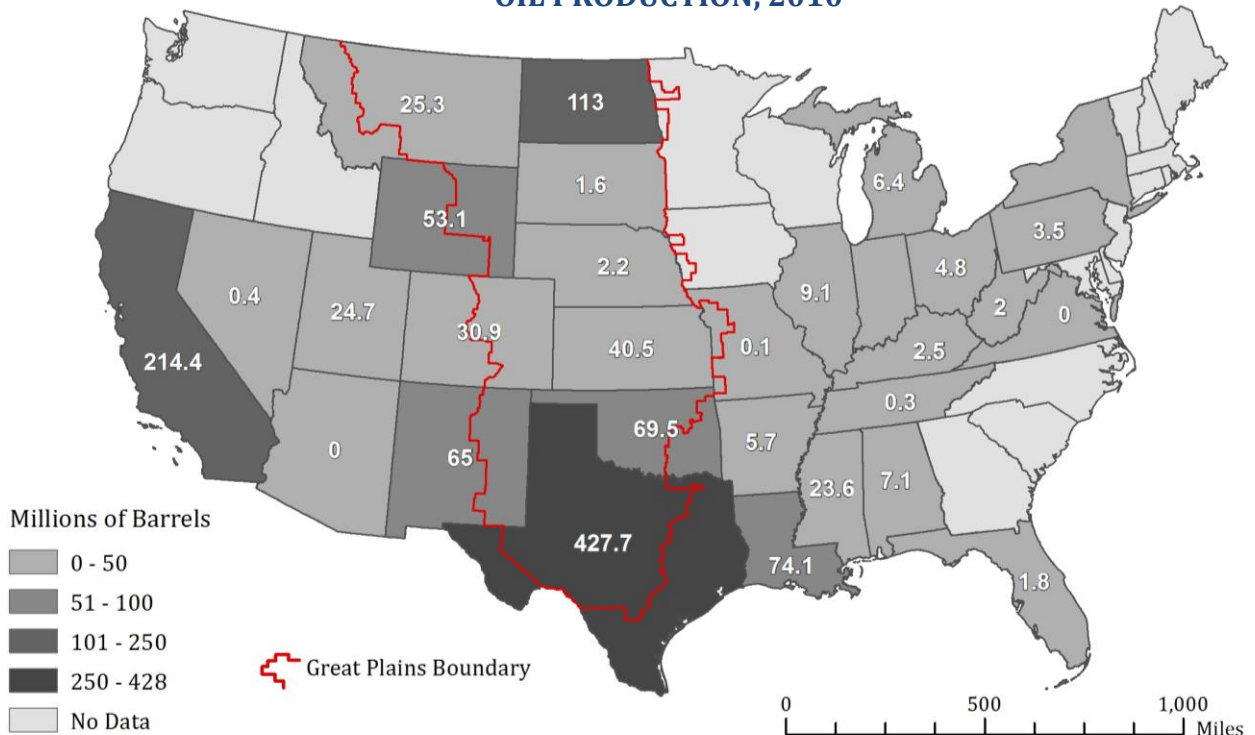
Texas' Eagle Ford shale oil is expected to *quintuple* its daily production by 2014 and reach a similar level.<sup>73</sup>

### PLAINS SHARE OF U.S. FIELD PRODUCTION OF CRUDE



Source: U.S. Energy Information Administration, Petroleum and Other Liquids dataset.

### OIL PRODUCTION, 2010



Source: U.S. Energy Information Administration.

*The Plains and the Natural Gas Revolution*

Perhaps no energy source possesses better prospects than natural gas. The massive new finds of gas, including in the Plains, could help this cleaner energy source replace dirtier options like coal. It could easily out-compete far more expensive, less reliable renewable sources as well.<sup>74</sup> In this, the Plains states are big winners.

Nearly 67% of U.S. gas reserves and production are located in the ten plains states.<sup>75</sup> Again, if it were a country, it would rank in the top ten worldwide for reserves of gas, ahead of Nigeria and behind the United Arab Emirates, both major OPEC members.<sup>76</sup>

**NATURAL GAS RESERVES AND PRODUCTION**

State	Share of U.S. Total Natural Gas Reserves	Share of U.S. Total Natural Gas Produced
Colorado	8.5%	6.9%
Kansas	1.2	1.6
Montana	0.4	0.5
Nebraska	NA	0
New Mexico	5.7	6.4
North Dakota	0.4	0.3
Oklahoma	8.4	8.6
South Dakota	NA	0
Texas	29.5	31.6
Wyoming	12.9	10.8
Plains States	<b>67.0</b>	<b>66.7</b>

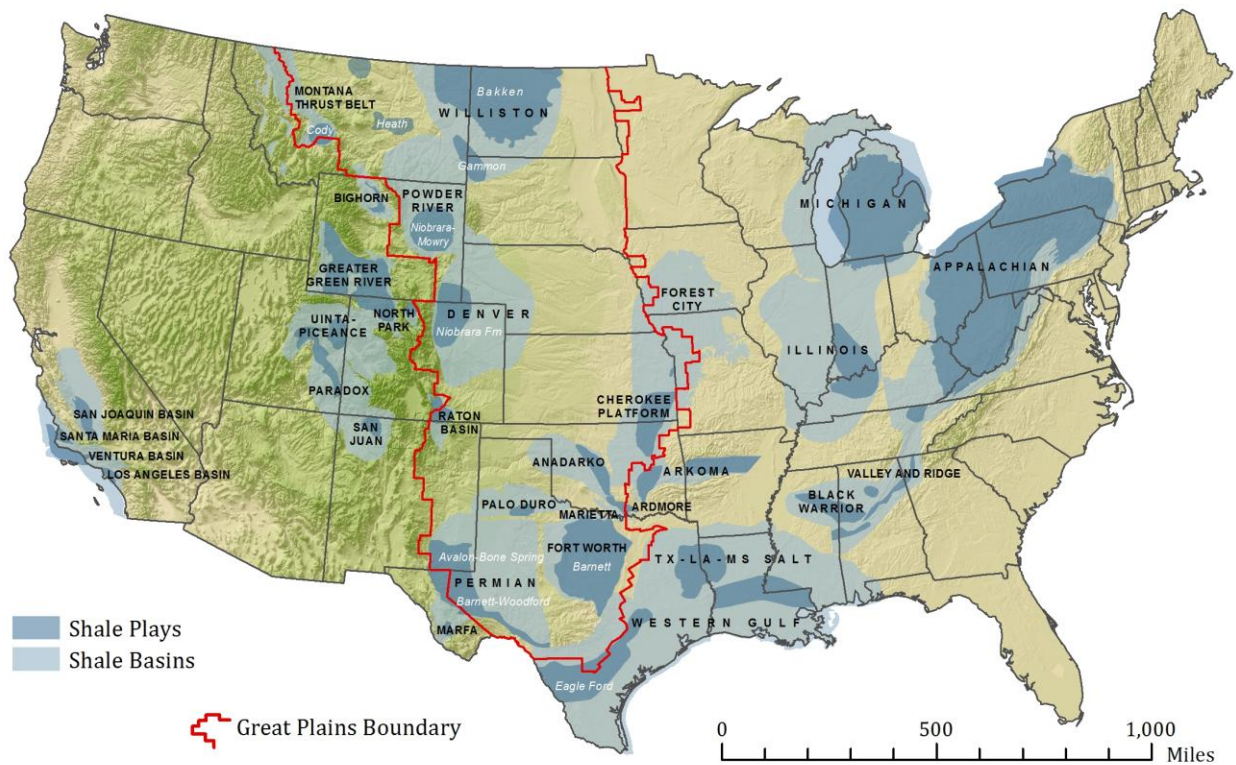
*Source: U.S. Energy Information Administration.*



Oil jacks near Williston - western North Dakota (TTU)

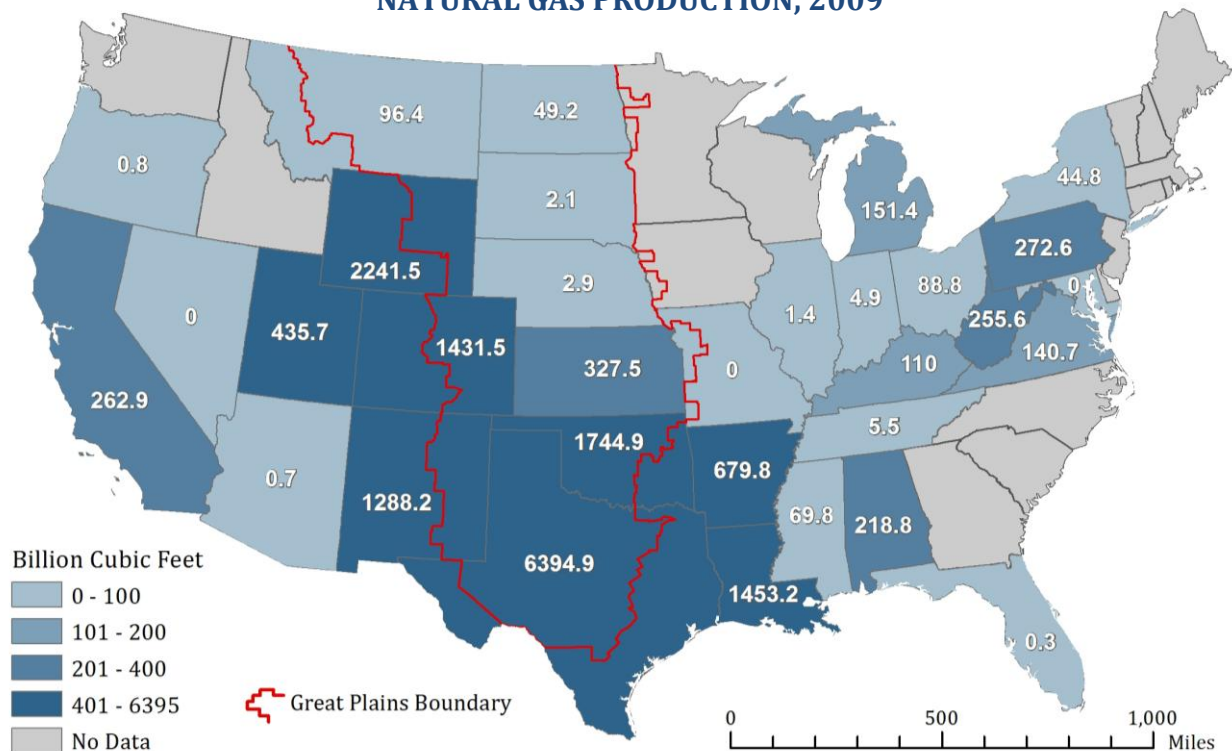
*Nearly 67% of U.S. gas reserves and production are located in the ten plains states.*

## SHALE GAS AND SHALE OIL BASINS AND PLAYS



Source: U.S. Energy Information Administration, *Shale Gas and Oil Plays, Lower 48 States*.

## NATURAL GAS PRODUCTION, 2009



Source: U.S. Energy Information Administration, *Natural Gas Annual Supply and Disposition by State, 2009*.

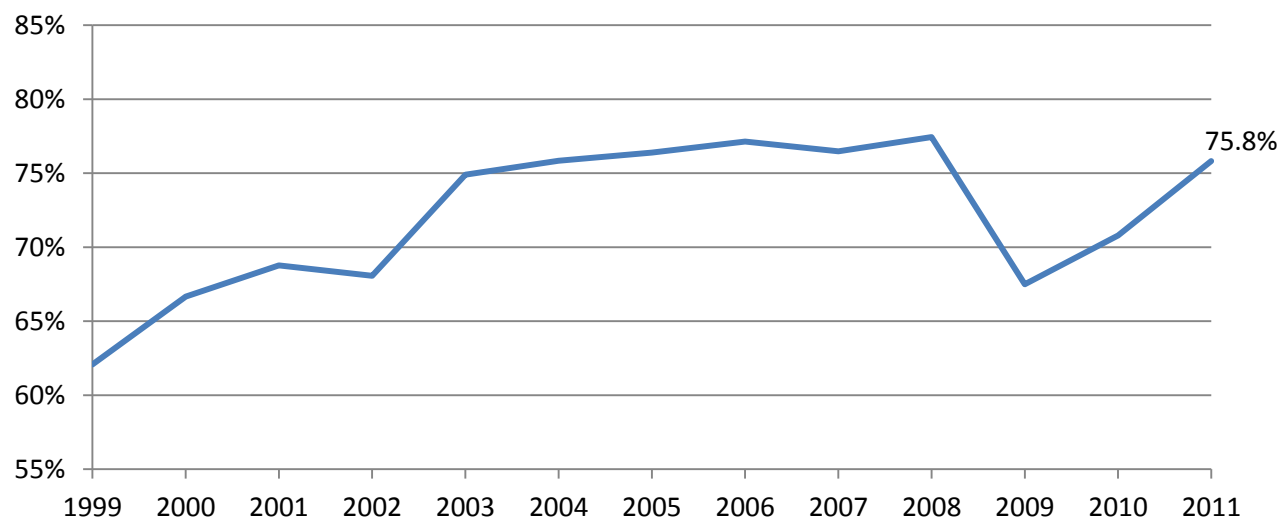


## Drilling Activity: An Ongoing Boom

In 1999, an average of 388 rigs operated in the ten plains states. Improved drilling techniques, including fracking and horizontal drilling, have unlocked oil and gas deposits that were previously economically unfeasible. By 2011 the average number of rigs working the plains states reached 1,414, an increase of 480% over the decade.<sup>77</sup>

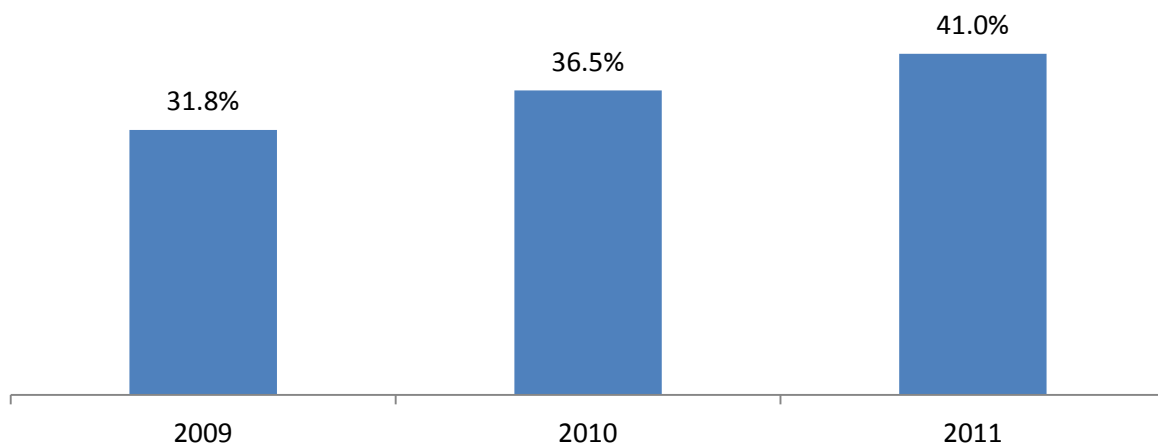
Of course, drilling activity has increased elsewhere in the U.S. during the past decade, but the plains states have gained an increased share of the overall national drilling activity: from 62.1% of the active rigs in 1999, to 75.8% by 2011. Share of worldwide rig activity has gone from 31.8% to 41%.

**PLAINS STATES SHARE OF U.S. ROTARY DRILLING RIGS**



Source: Baker Hughes North America Rotary Rig Counts.

**PLAINS STATES SHARE OF WORLDWIDE DRILLING RIGS IN OPERATION**



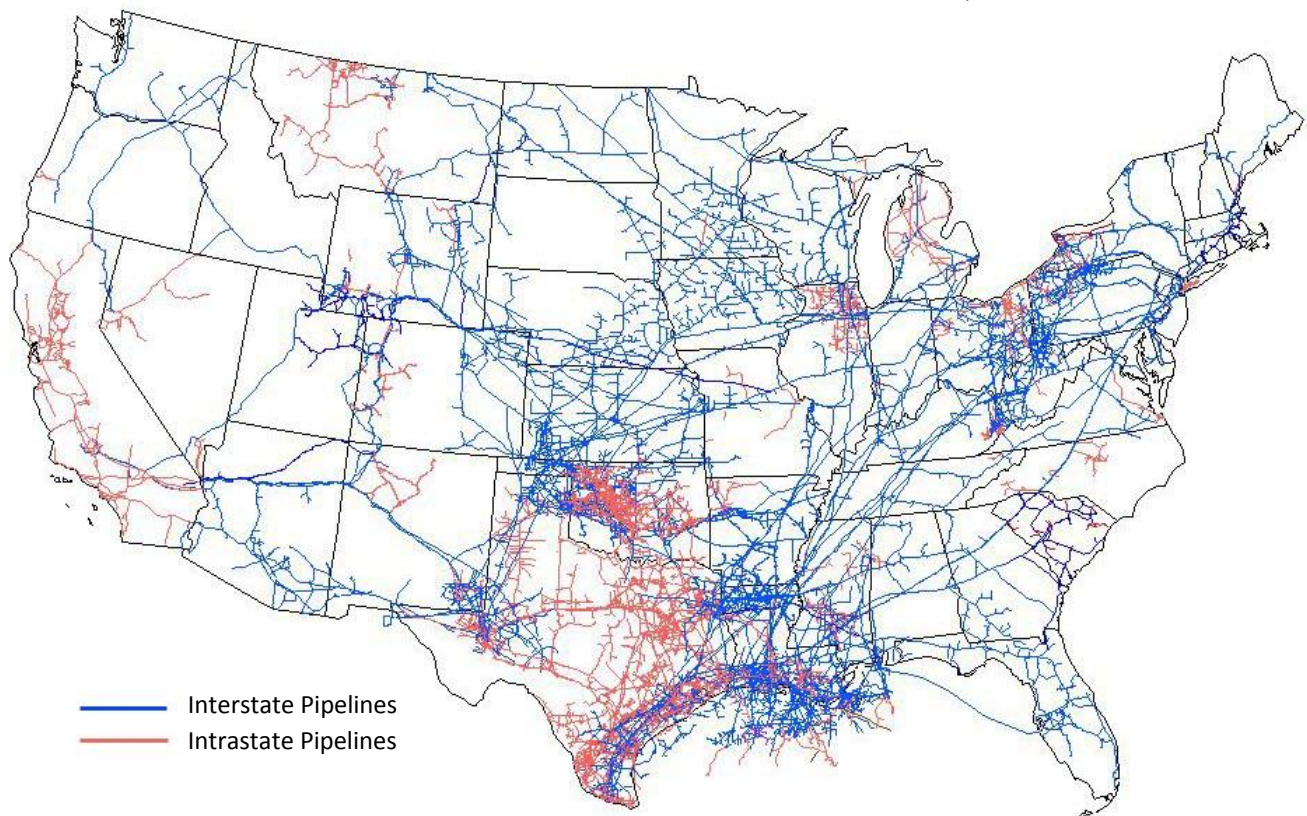
Source: Baker Hughes Rotary Rig Counts.

## Pipeline Infrastructure

Political wrangling between the administration and congress over the proposed Keystone XL pipeline's passage through the Plains has made headlines. But pipeline expansion has been taking place both in the plains and elsewhere over the past several years. Indeed, the first round of TransCanada's Keystone project was completed across the plains region and brought online in 2010.<sup>78</sup> Other pipeline companies, such as Enbridge, are currently implementing plans to expand regional pipeline capacity to accommodate increased oil production in the northern plains.<sup>79</sup>

Even though new pipelines are being planned and built, the overall pace of oilfield development has overwhelmed regional pipeline capacity in some areas, forcing oil to be shipped by alternative transport solutions, including rail.<sup>80</sup> As ever more oil production comes on line throughout the plains, challenges are also being posed by chokepoints in the regional pipeline infrastructure. Oil has piled up, lacking easily accessible outlets to east and west coast markets, and driving down prices for crude produced on the plains compared to oil produced elsewhere.<sup>81</sup>

### NATURAL GAS PIPELINE INFRASTRUCTURE, 2009

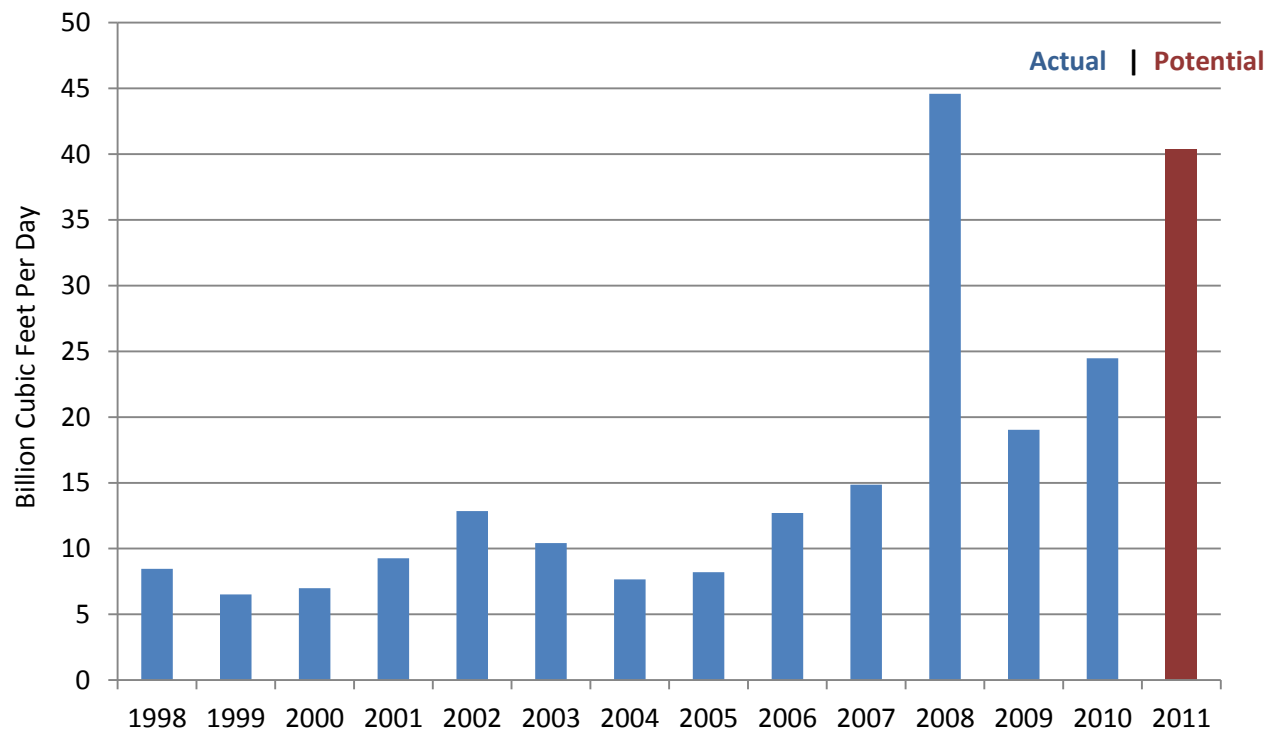


Source: U.S. Energy Information Administration, Office of Oil & Gas, Natural Gas Division, Gas Transportation Information System.

Nationally, the pace of natural gas pipeline installation has accelerated with the southern and central plains increasingly serving as a key nexus in the overall national gas transmission system. Recent pipeline projects — including the Midcontinent Express in Texas and Oklahoma, and the Rockies Express across Wyoming, Colorado, Kansas, and Nebraska — offer new routes for the region's shale gas.<sup>82</sup> Increased shale gas production coming online in

the northeastern U.S. is prompting plains gas producers and transport companies to explore options to provide gas to California and the west coast.<sup>83</sup> On the northern plains, existing infrastructure has been unable to keep up, leading companies to burn off gas produced at oil wells as a byproduct. Efforts to find ways to deliver this production to consumers may prove a continuing challenge as the Plains energy boom continues.<sup>84</sup>

### NATURAL GAS PIPELINE CAPACITY ADDITIONS



Note: Capacity includes transportation lines as well as gathering lines, interstate, and intrastate pipelines.

Source: U.S. Energy Information Administration, Natural Gas: Year-in-Review, December 2011.

*Even though new pipelines are being planned and built, the overall pace of oilfield development has overwhelmed regional pipeline capacity in some areas...*



## Coal in the Plains

Pennsylvania and West Virginia may be the states most commonly associated with coal production, but, as of 2010, the top ten coal mines in the nation were all located in Wyoming, Montana, or North Dakota.<sup>85</sup> Combined, the coal mines of the plains states were responsible for nearly 56% of the nation's reported productive capacity in coal in 2010.<sup>86</sup>

That same year, 18 of the nation's 25 most productive mines (by tons produced) were located in the plains states. Wyoming, the nation's leading coal producing state, was home to ten of the top 25 mines, including the eight most productive.

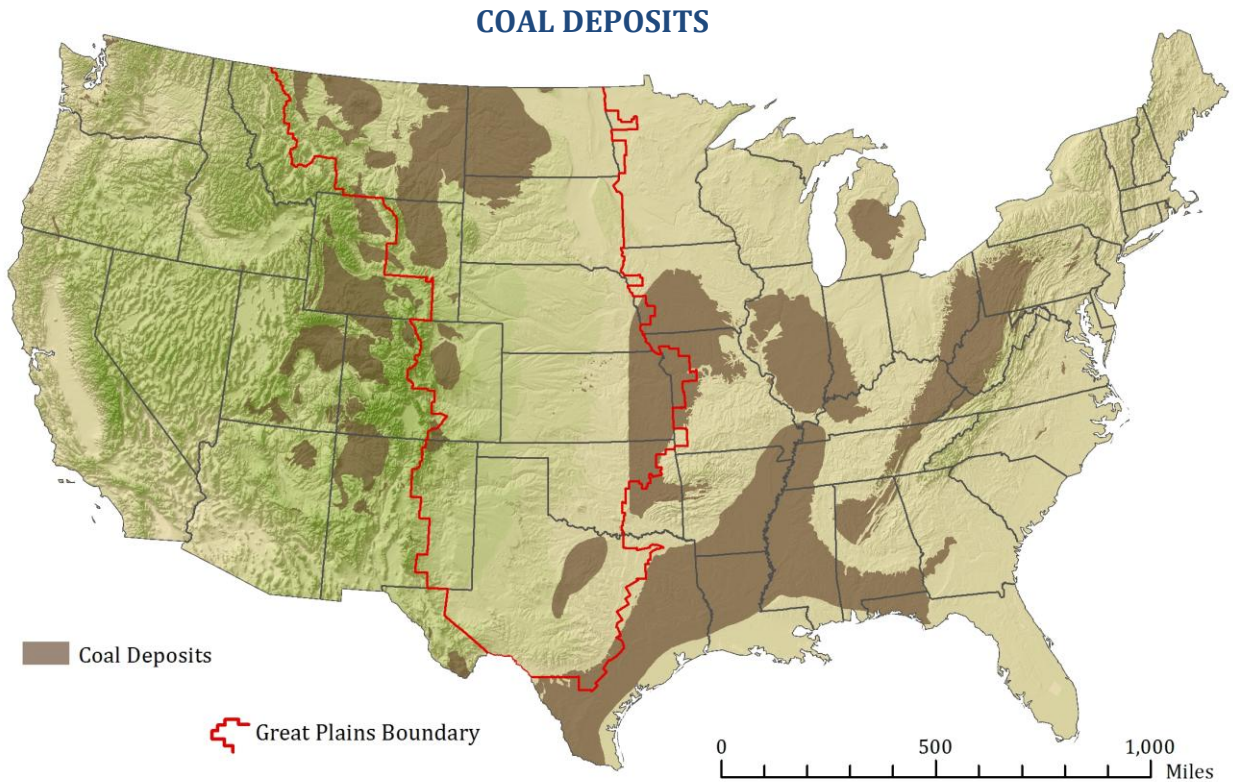
### COAL RESERVES AND PRODUCTION

State	Share of U.S. Coal Reserves	Percent of U.S. Production
<b>Colorado</b>	3.7%	2.3%
<b>Kansas</b>	0.3	0.0
<b>Montana</b>	28.7	4.1
<b>Nebraska</b>	NA	NA
<b>New Mexico</b>	2.6	1.9
<b>North Dakota</b>	2.6	2.7
<b>Oklahoma</b>	0.3	0.1
<b>South Dakota</b>	0.1	NA
<b>Texas</b>	3.6	3.8
<b>Wyoming</b>	14.9	40.8
<b>Total Plains States</b>	<b>56.8</b>	<b>55.8</b>

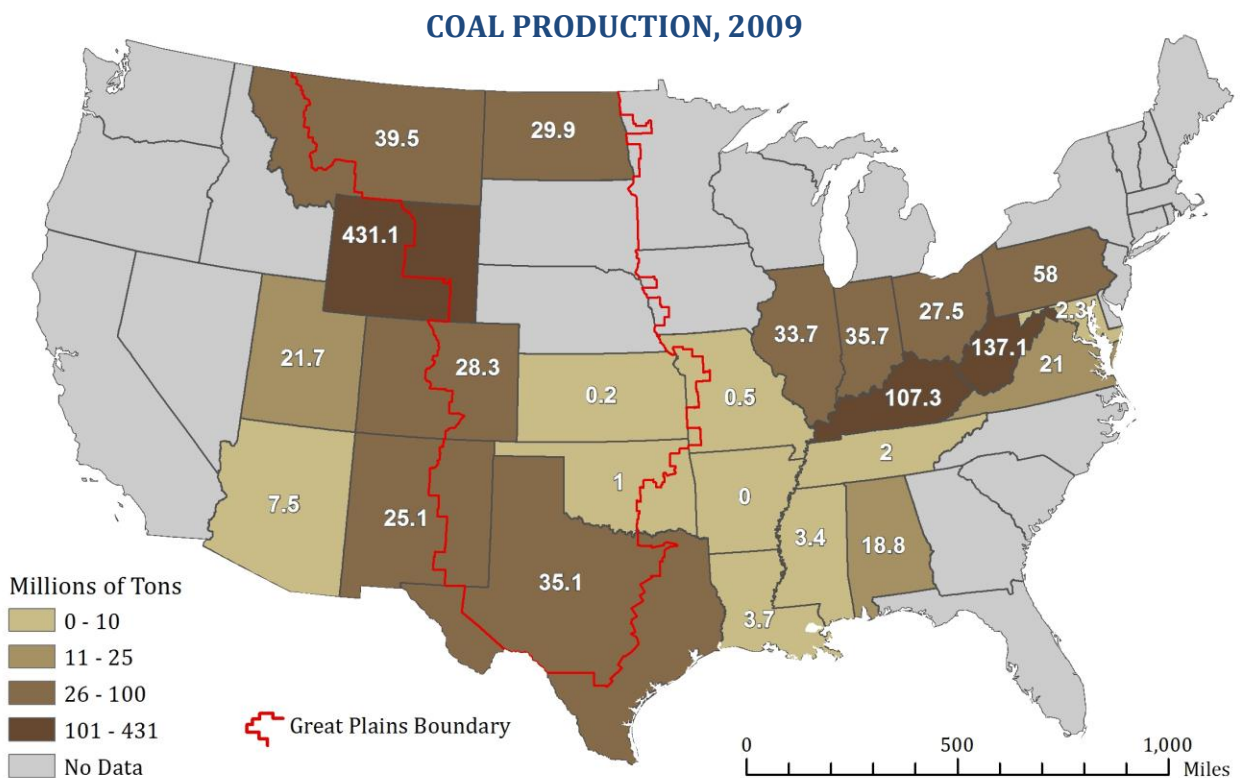
*Source: U.S. Energy Information Administration, and National Mining Association, 2009.*



Coal train near Kit Carson - eastern Colorado (TTU)



Source: U.S. Geological Survey, "Coal Fields of the Conterminous United States", Open-File Report OF 96-92.

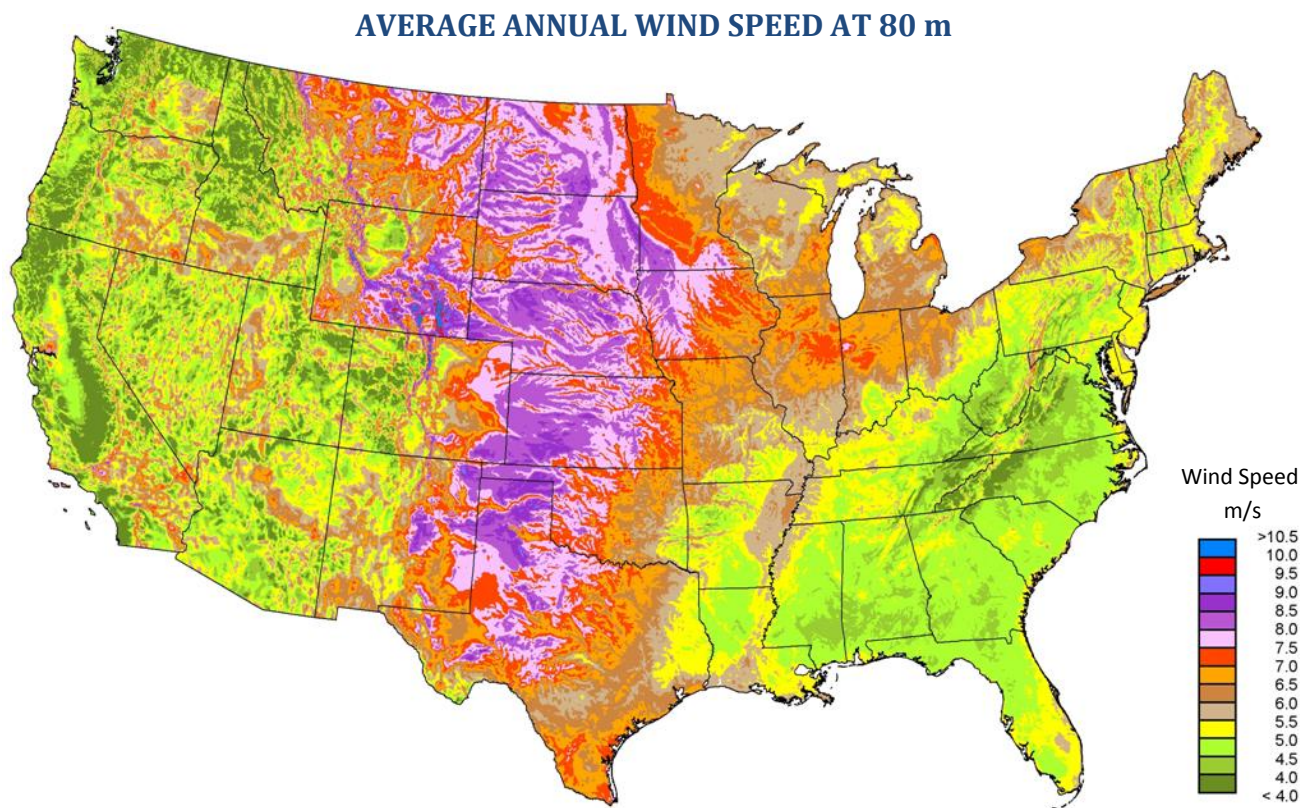


Source: U.S. Energy Information Administration, Annual Coal Report, 2009.

## Renewable Opportunities: Wind, Ethanol and Biofuels on the Plains

The past decade has seen a boom in installed wind generation capacity. Some consider the plains region from Texas northward as “the Saudi Arabia of wind”. North Dakota alone

possesses enough wind power potential, by some estimates, to supply 20 percent of the nation’s electrical needs.



*Note: Wind resource estimates developed by AWS Truepower.  
Source: U.S. Department of Energy, National Renewable Energy Laboratory.*



Gray County wind farm – southwestern Kansas (TTU)

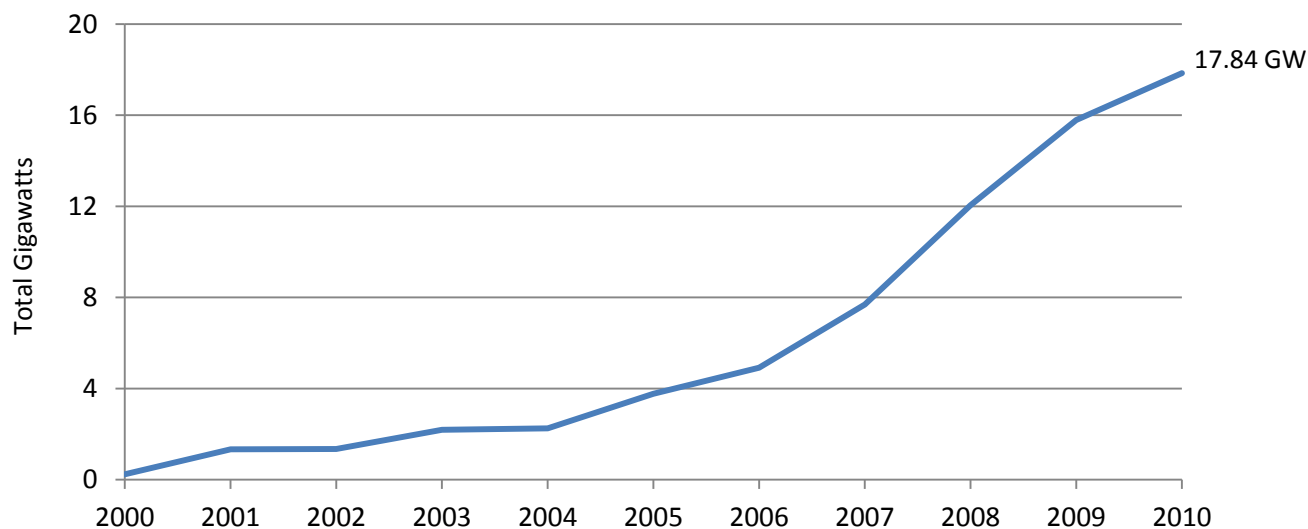
*Some consider the plains region from Texas northward as “the Saudi Arabia of wind”.*



In 2000, the plains states had a total of 234 MW of installed wind generation capacity. Over the past ten years this has grown rapidly, reaching 17,844 MW by the end of 2010, but has

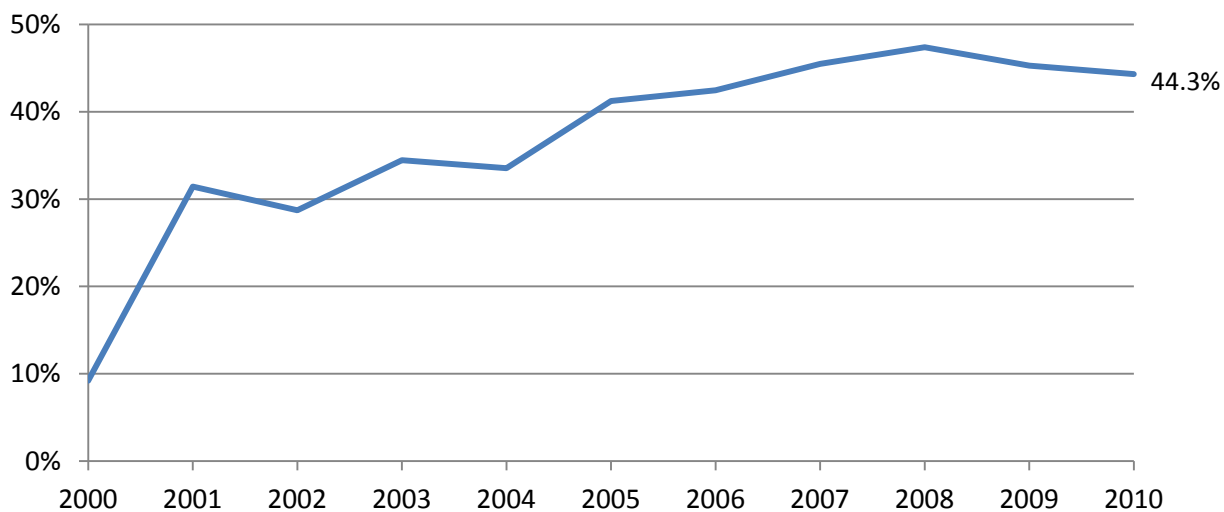
barely reached its full potential. As installation of wind turbines has boomed, the region's share of national capacity has also expanded massively, from 9% in 2000 to 44% in 2010.

### PLAINS STATES INSTALLED WIND POWER CAPACITY



Source: U.S. Department of Energy, Installed Wind-Capacity by State.

### PLAINS STATES SHARE OF INSTALLED U.S. WIND POWER CAPACITY



Source: U.S. Department of Energy, Installed Wind Power Capacity by State.

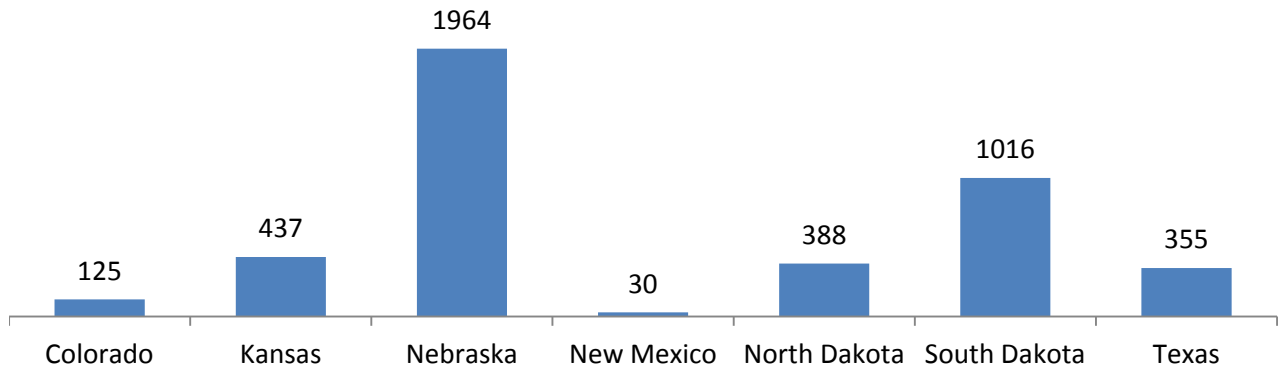
Biofuels have also grown throughout the region. Seven plains states were home to ethanol production facilities in 2011, providing 30.3% of national ethanol operation capacity. Nebraska is the region's chief ethanol producer, ranking second nationally behind Iowa.

Over time, biofuels will create new jobs,

increase farm income, improve the country's balance of trade, and reduce our dependence on imported fuel and chemicals. The renewable sector will likely expand well beyond corn-based ethanol and towards other, perhaps more sustainable non-food fuels, based on wood, agricultural waste, and switchgrass.<sup>87</sup>

### ETHANOL OPERATING PRODUCTION

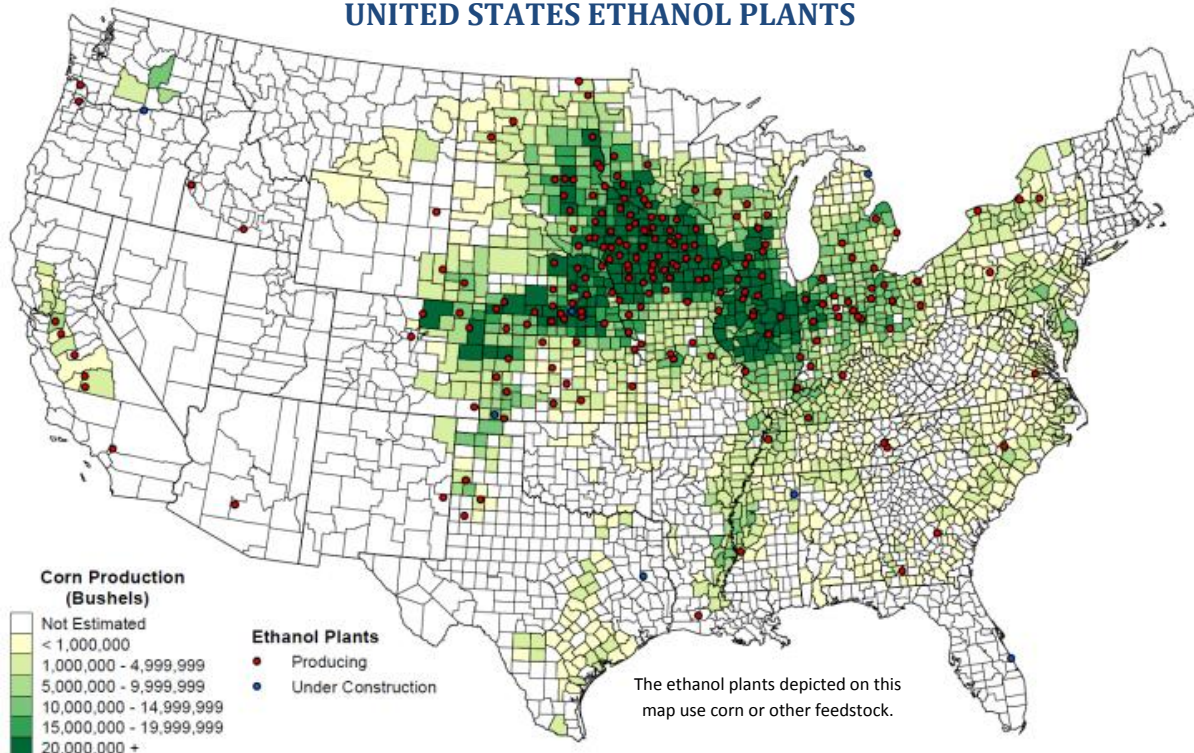
Millions of Gallons Per Year



*Note: Ethanol production data as of October, 2011.*

*Source: Renewable Fuels Association.*

### UNITED STATES ETHANOL PLANTS



*Note: Ethanol plants as of March, 2012. Corn for grain, 2011.*

*Source: U.S.D.A., National Agricultural Statistics Service, and Ethanol Producer Magazine, March 2012.*

## The Future of Plains Energy

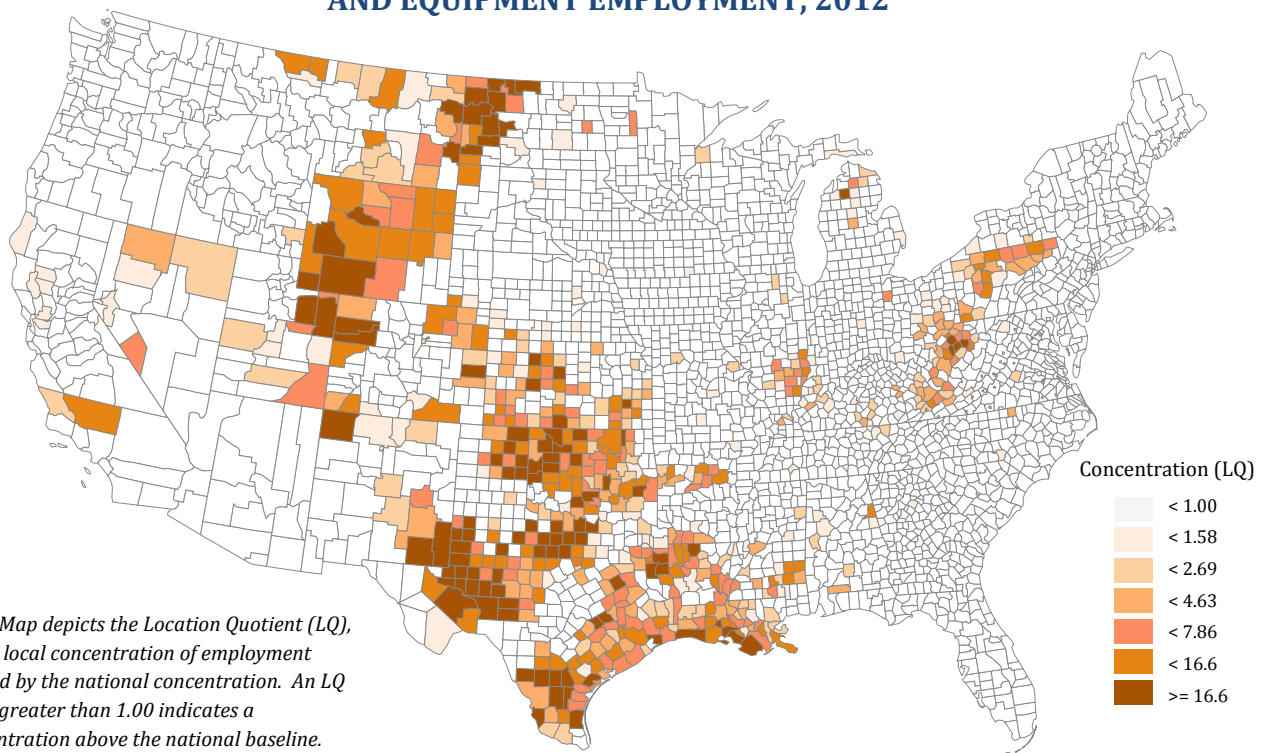
Continued development of energy resources in the Great Plains — for economic and technological reasons — will remain predominately focused on fossil fuels. To date, most renewable energy remains too expensive and unreliable to supply the needs of the country, as evidenced by the industry’s continuing extreme dependence on subsidies, grants and loans from the government.<sup>88</sup>

Even before the Obama Administration’s green energy drive, renewables, outside of hydro-electric power, enjoyed a global average subsidy of more than five times per kilowatt hour as fossil fuels. This dependence also makes such projects highly susceptible to changes in the political climate.

Even under current policies, by 2035, according to the U.S. Energy Information Agency, fossil fuels will still account for nearly four-fifths of the nation’s energy use. “Unless we shut down the economy,” notes columnist Robert Samuelson, “we need fossil fuels.”<sup>89</sup>

Over the next decade, many responsible environmental groups, such as the WorldWatch Institute, see natural gas as the best way to reduce pollution and greenhouse gas emissions. The fuel has enormous potential for transportation, underscored by the large scale development of natural gas vehicles on the Indian subcontinent.<sup>90</sup>

### CONCENTRATION OF OIL AND GAS EXTRACTION, DISTRIBUTION, AND EQUIPMENT EMPLOYMENT, 2012



*Note: Map depicts the Location Quotient (LQ), or the local concentration of employment divided by the national concentration. An LQ value greater than 1.00 indicates a concentration above the national baseline.*

*Source: QCEW Workers, Non-QCEW Workers, and Self-employed, EMSI Class of Worker dataset, March 2012.*

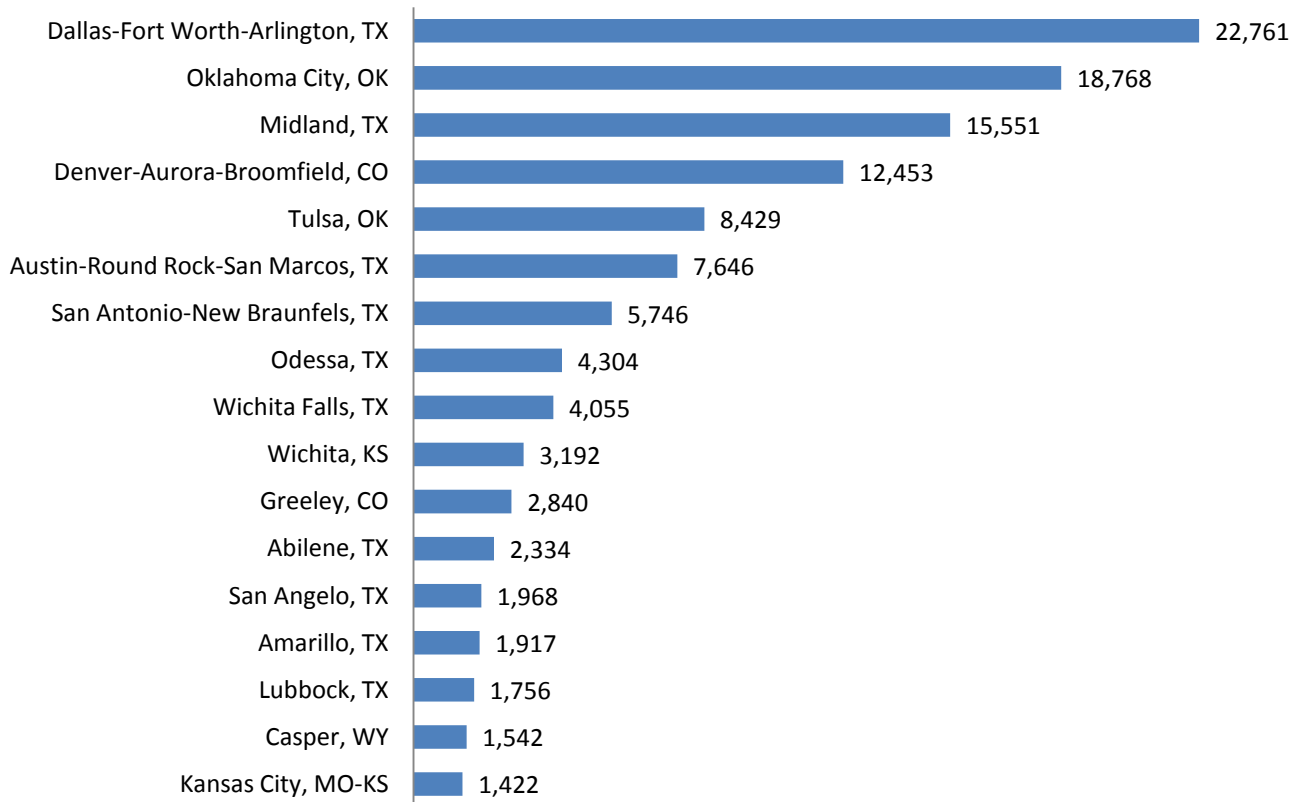


Overall, fossil fuel energy could serve as a means to finance further development of green alternatives in the future, notes Jaffe: “...You can’t force a technology that’s not commercial. Rather than subsidize things that are not going to be competitive, we need to actually use that money to create technologies.”<sup>91</sup>

Energy development provides jobs in many places, but the Great Plains has gained a

lion’s share, garnering roughly 45% percent of all new energy jobs. Energy has also keyed strong regional growth in cities throughout the region, notably in western North Dakota, in Oklahoma City and Tulsa, and, in Texas, in Midland, Odessa, Wichita Falls, and Abilene. Texas’ Barnett shale gas field alone has produced 100,000 jobs over the past fifteen years, and the more recently discovered Eagle Ford find another 60,000.

### OIL AND GAS EXTRACTION JOB GROWTH IN PLAINS METROPOLITAN AREAS, 2001-2011



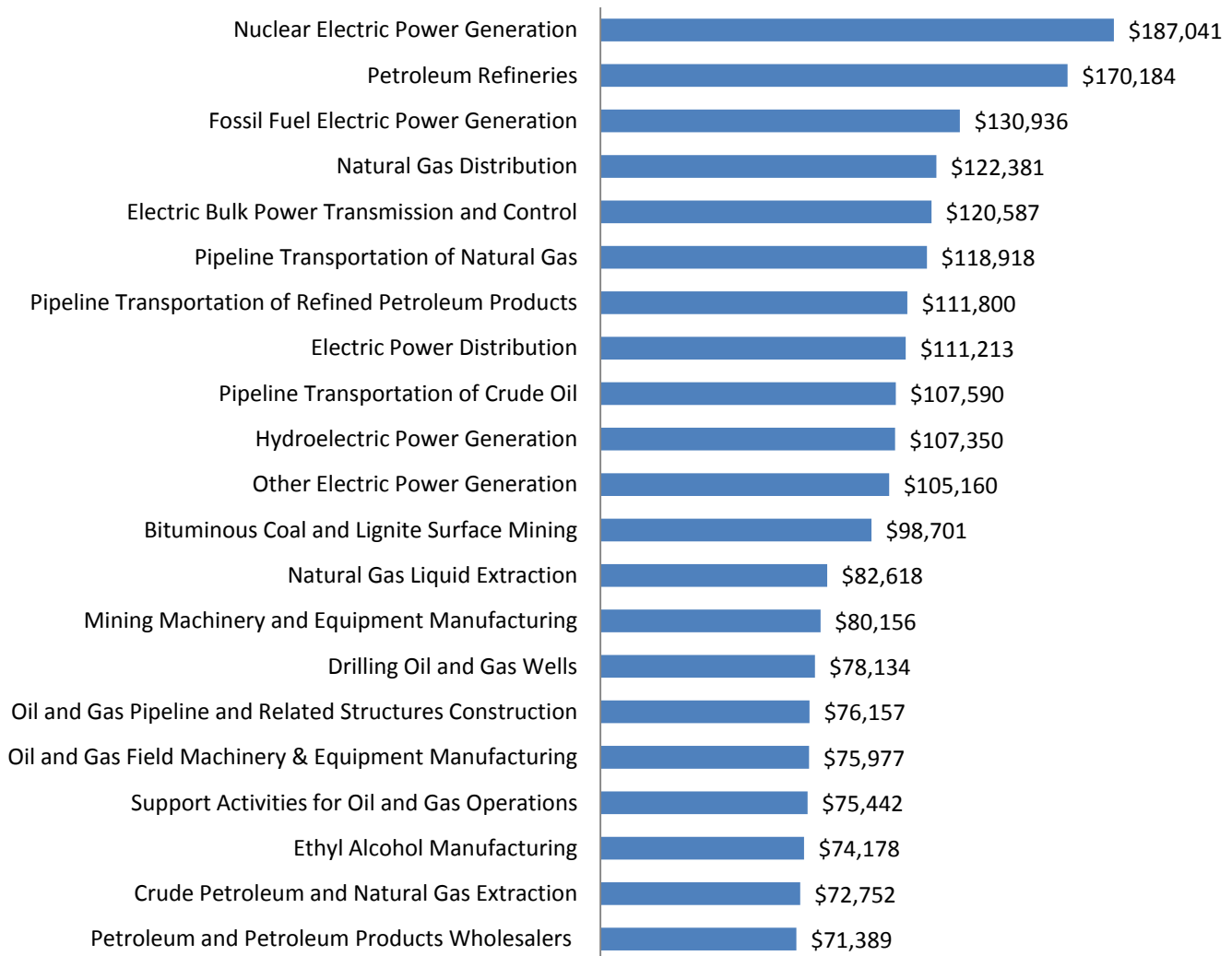
Source: EMSI Complete Employment dataset, April 2011.

*Energy development provides jobs in many places, but the Great Plains has gained a lion’s share, garnering roughly 45% percent of all new energy jobs.*

Overall, jobs in the energy industry also pay among the highest wages of any sector. IHS Global Insight suggests, over two million jobs are sustained indirectly by the industry.<sup>92</sup> Critically,

these jobs have created opportunities in a region that for many decades suffered low rates of income growth and a lack of well paying jobs.

### AVERAGE ANNUAL WAGE IN KEY GREAT PLAINS ENERGY SECTORS, 2011



Source: EMSI Complete Employment dataset, April 2011.

*Even under current policies, by 2035, fossil fuels will still account for nearly four-fifths of the nation's energy use.*





Devon Tower, Oklahoma City, Oklahoma (Cooper Ross, IVM)



## Part Four

# The Industrial Resurgence

For the plains and for the nation, the energy revolution also promises the prospect of a third aspect of the tangible economy: manufacturing. It is no coincidence that some of the biggest backers of shale gas exploration are prominent CEOs of industrial firms.<sup>93</sup> A recent study by PwC suggests shale gas could lead to the development of one million industrial jobs.<sup>94</sup>

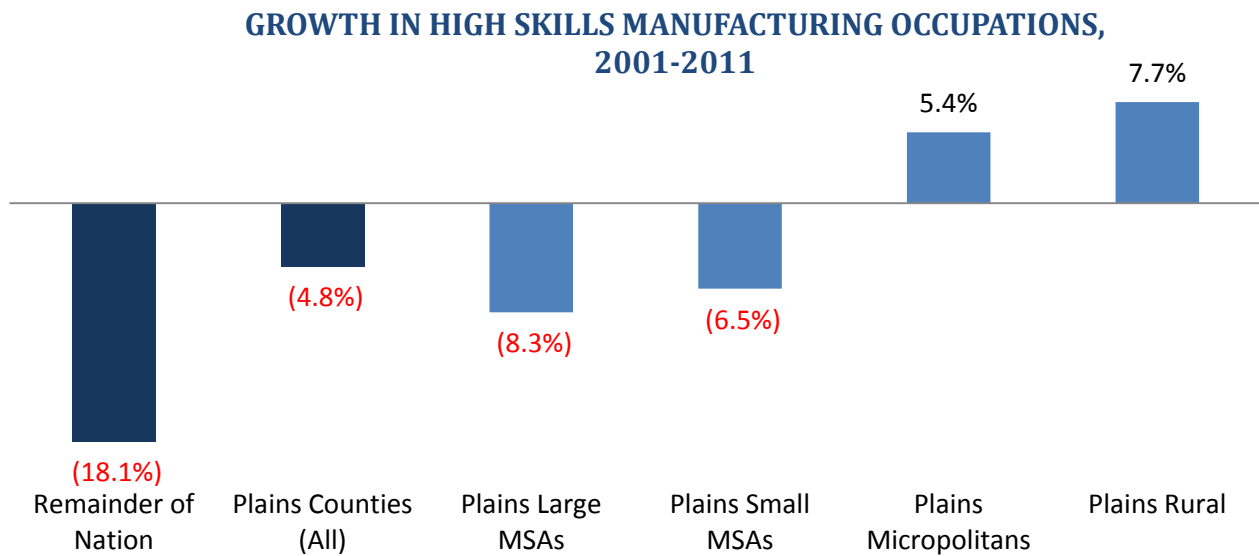
### ***Industry Drives Income and Job Growth***

Manufacturing's role in promoting job and income growth is often understated. Although manufacturing employment overall has dropped, the percentage of higher-wage, skilled industrial jobs has been climbing over the last two decades.

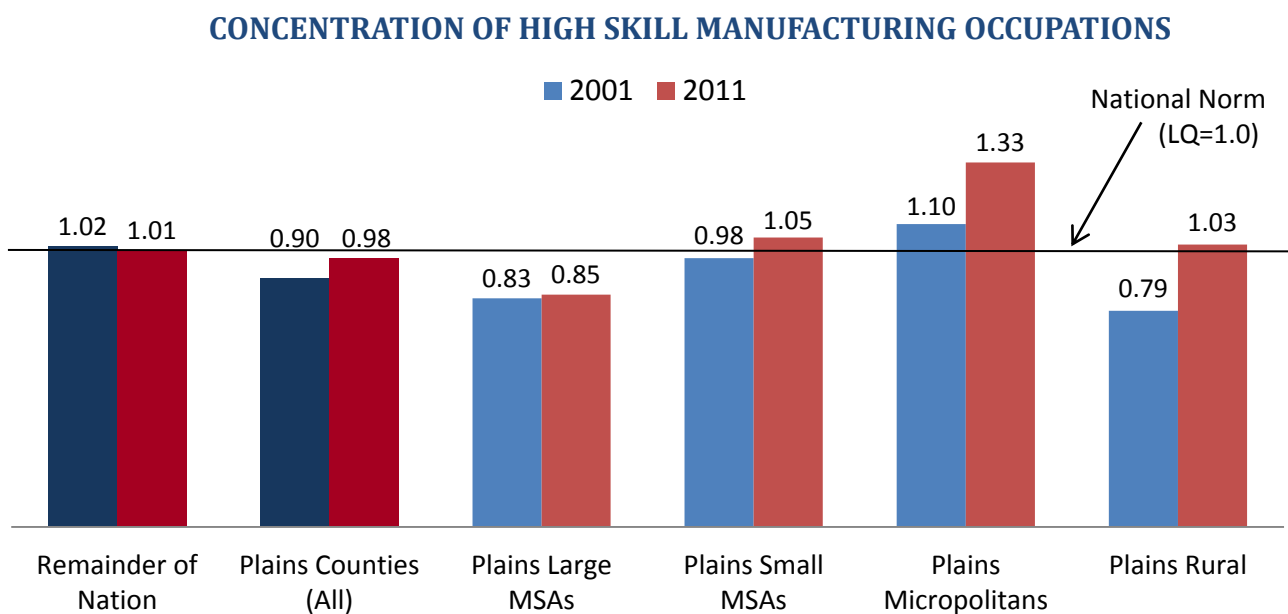
This growth has been concentrated in formerly rural regions in the West and South, as well as small towns.<sup>95</sup> Since 2001, the plains region has significantly outperformed the rest of the nation in the types of manufacturing jobs that pay more than median wage. Though it amounts to just a few thousand jobs, the region's small cities (micropolitans) and rural counties actually added high skill production jobs during a time when overall national production occupations fell 21%.

The growth of these high-skill jobs in the region's mid- and small-sized cities and its rural regions has outpaced that of the nation. These

places can now legitimately claim to be centers for growth in high-skilled manufacturing jobs.



Source: EMSI Complete Employment dataset, April 2011.

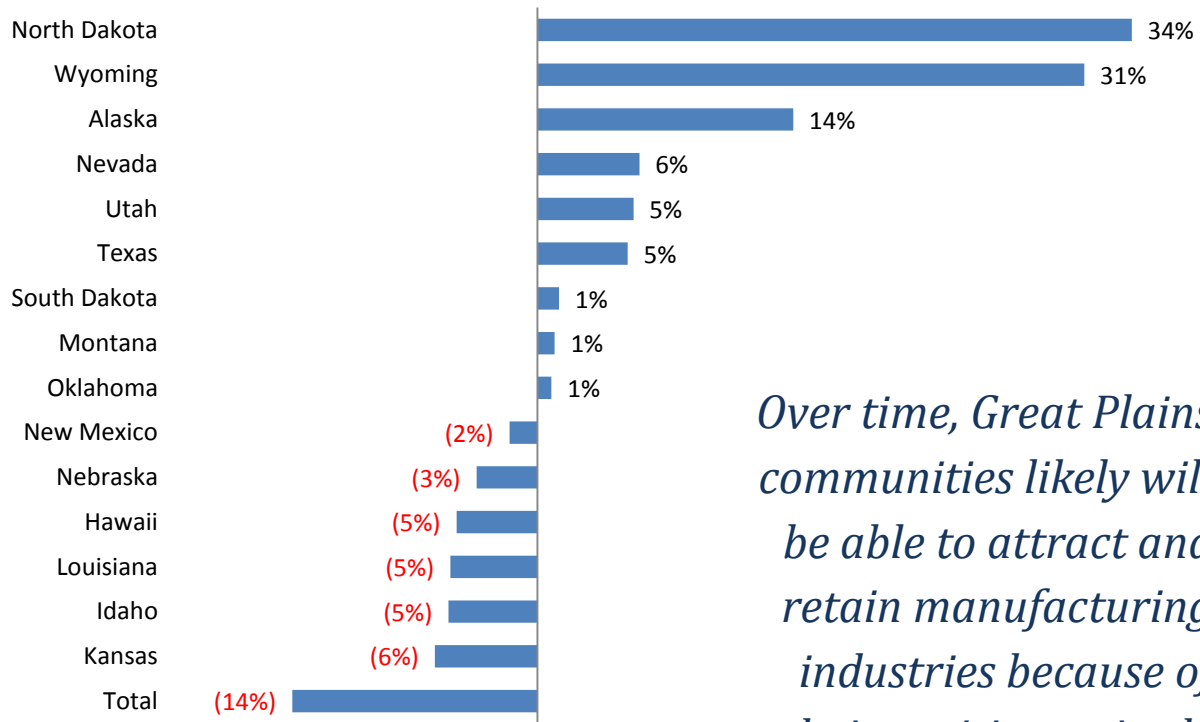


Source: EMSI Complete Employment dataset, April 2011.

This trend continued a decade-long pattern; 13 of the top 15 best performing states for goods and materials industries were in the plains and the intermountain west. Over time,

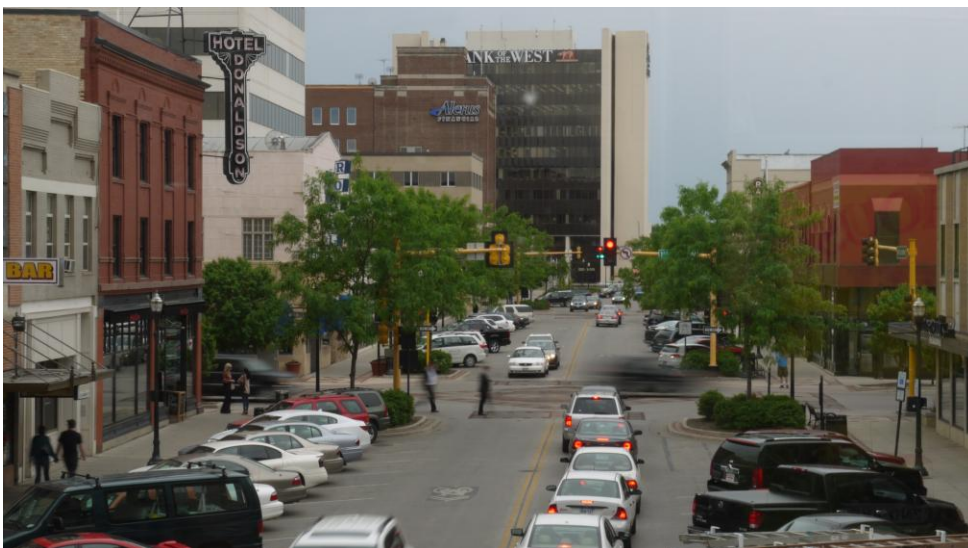
Great Plains communities likely will be able to attract and retain manufacturing industries because of their positive attitude toward industry and growth.

### FASTEST GROWING STATES IN GOODS AND MATERIALS INDUSTRIES, EMPLOYMENT GROWTH, 2001-2011



Source: EMSI Complete Employment dataset, April 2011.

*Over time, Great Plains communities likely will be able to attract and retain manufacturing industries because of their positive attitude toward industry and growth.*

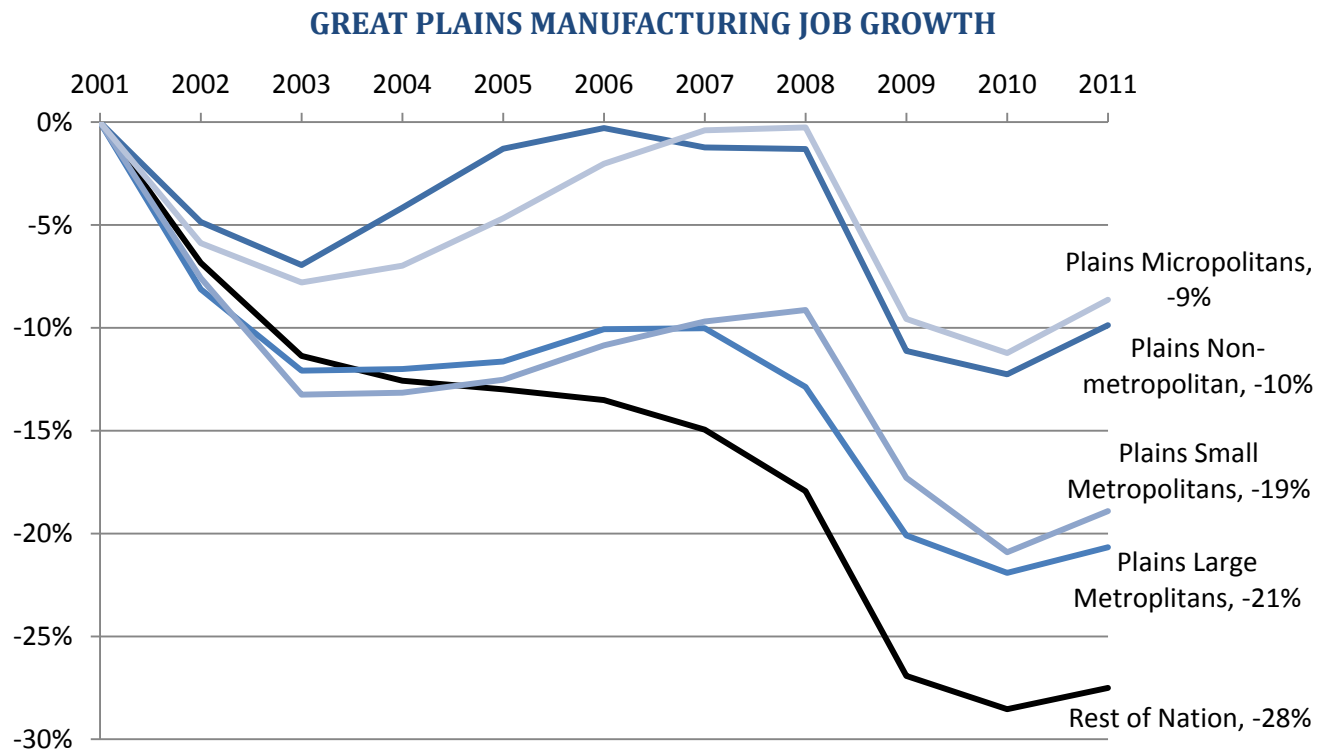


Fargo, North Dakota (TTU)



Of course, the region's manufacturing sector was not immune to the recent recession. Employment in the 472 specific industries that make up the manufacturing sector was down 11.4% between 2008 and 2010. This was; however, better than the 12.9% drop experienced

in the rest of the nation. In the face of economic headwinds and pressure from foreign competitors, the manufacturing sector shed nearly 130,000 jobs in the ten state plains region over the past five years.



Source: EMSI Complete Employment dataset, April 2011.



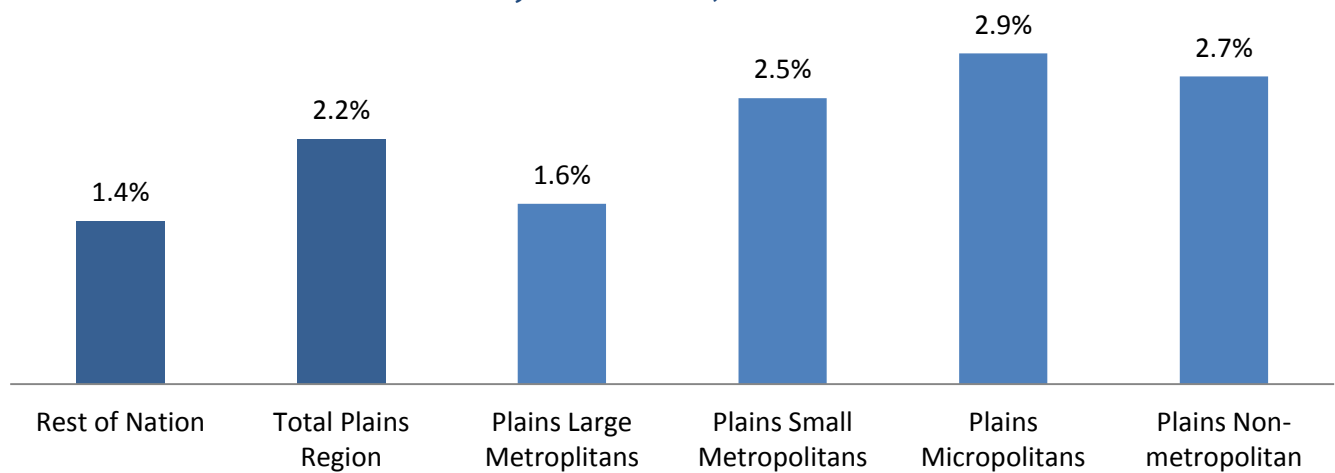
Wichita, Kansas (TTU)

*Of course, the region's manufacturing sector was not immune to the recent recession.*

Yet it is now evident that the region's manufacturing employment is on the rebound, especially outside of its five largest metropolitan areas. This growth has been stronger than that seen in the remainder of the nation. During 2010-2011, manufacturing employment grew by 2.2% in the plains region, well ahead of the 1.4% growth seen nationwide. Despite its relative

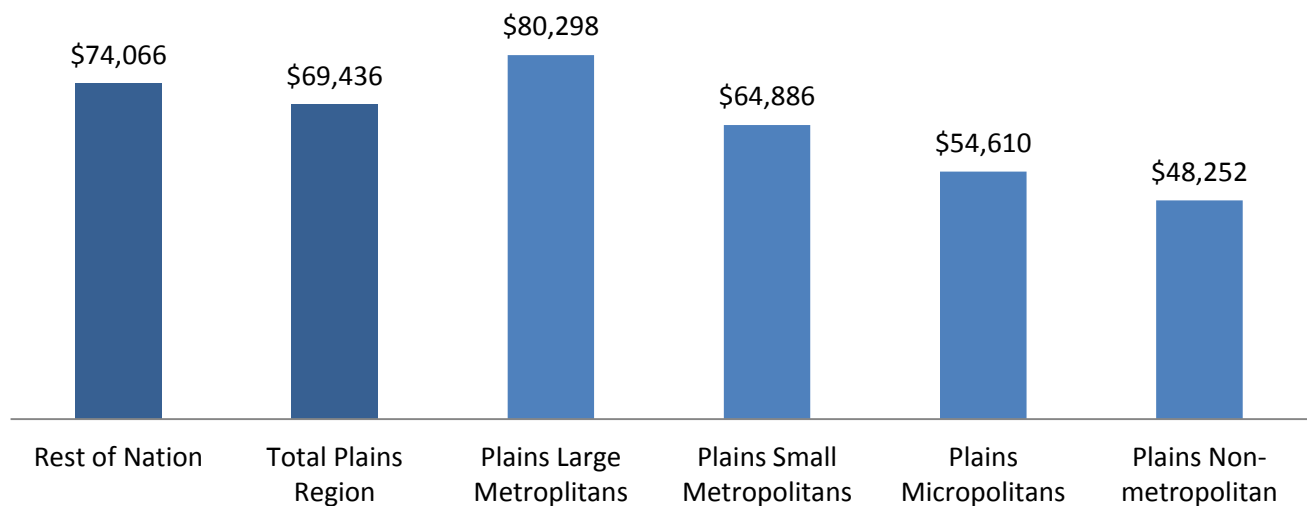
strength, the overall concentration of manufacturing employment remains below the national average. Average earnings per manufacturing job on the plains, particularly in the small cities and non-metropolitan areas, trail those of workers nationally, although this is somewhat off-set by lower costs, particularly for housing.

### PLAINS MANUFACTURING RESURGENCE, JOB GROWTH, 2010-2011



Source: EMSI Complete Employment dataset, April 2011.

### MANUFACTURING AVERAGE ANNUAL WAGE, 2011



Source: EMSI Complete Employment dataset, April 2011.

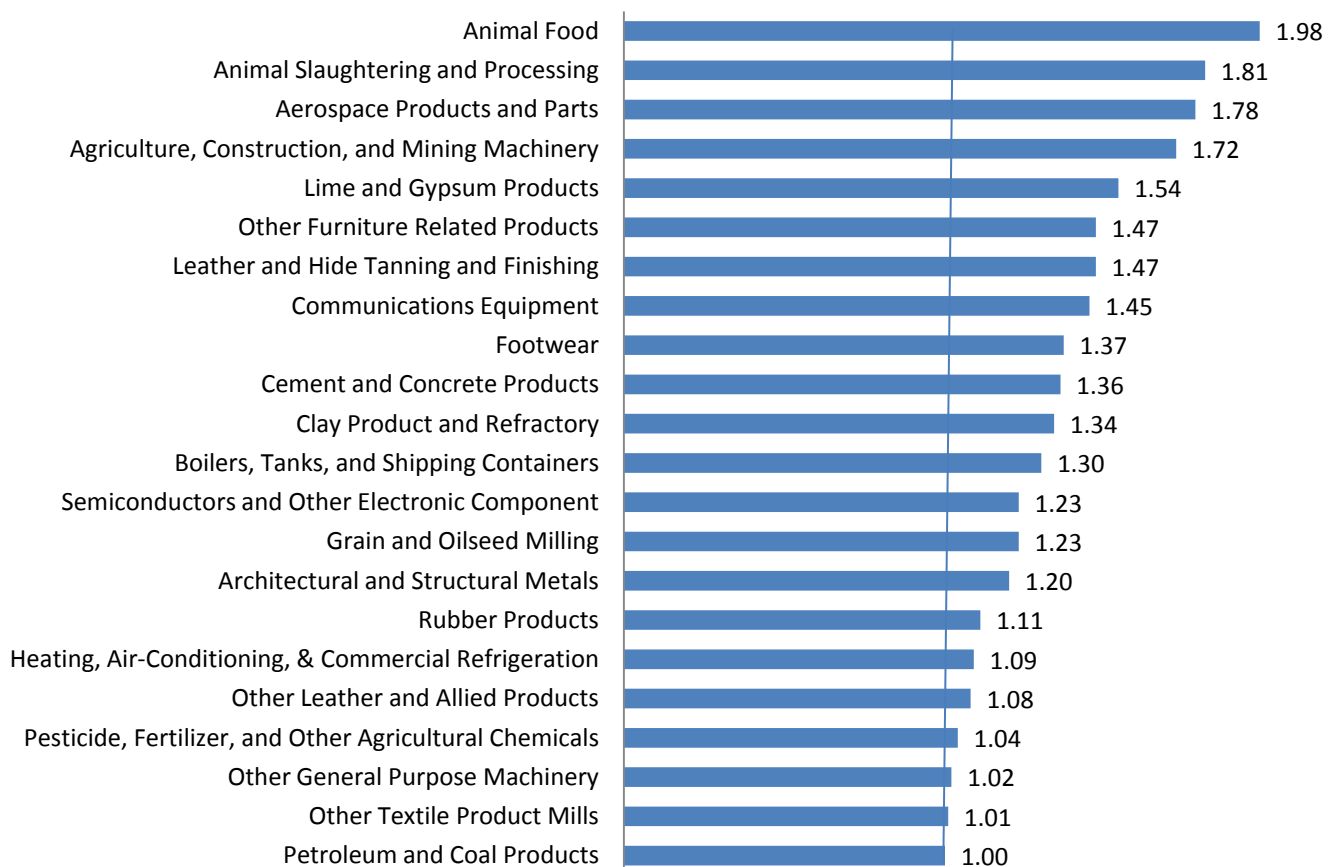
## Plains Manufacturing: Areas of Strength

Several industries stand out in the region. Meat processing, taking advantage of easy access to the region's abundant farms and ranches, is one area of strength. Others are beet sugar manufacturing, largely centered in the Red River Valley of North Dakota, and the production of ethyl alcohol (including the ethanol industry). Aircraft manufacturing is usually associated with Seattle, but Wichita, Kansas has emerged as a major center for the industry, with over 20,000 employed by companies that include Cessna. Many of these jobs are located in just a handful

of counties, including Sedgwick County, Kansas (Wichita), Tarrant County, Texas (Fort Worth) and Dallas County, Texas.

Farm machinery manufacturing represents another regional strength, with jobs scattered throughout the plains, servicing the region's agricultural sector and demand from abroad.<sup>96</sup> Slightly over one in four jobs nationally in this sector are located on the plains. Oil and gas field machinery manufacturing jobs also enjoy a strong presence.

### MOST CONCENTRATED PLAINS MANUFACTURING INDUSTRIES, LOCATION QUOTIENT BY EMPLOYMENT, 2011

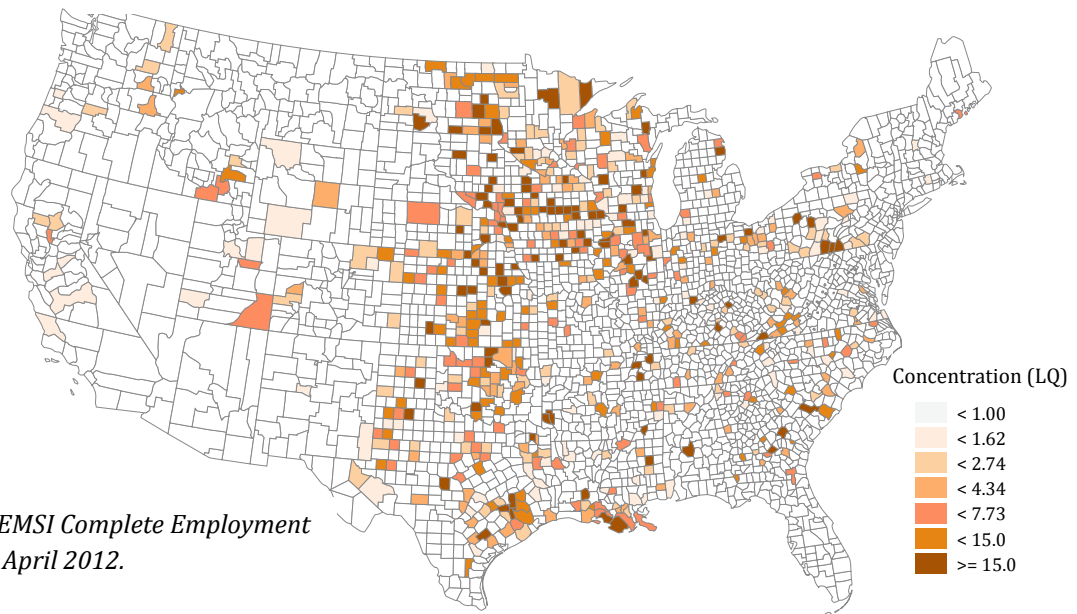


*Note: The Location Quotient (LQ) compares the regional share of economic activity in a particular industry to the national share. An LQ value greater than 1.00 indicates a regional concentration.*

*Source: EMSI Complete Employment dataset, April 2011.*



### CONCENTRATION OF MACHINERY MANUFACTURING FOR AGRICULTURE, CONSTRUCTION AND MINING, 2012



Source: EMSI Complete Employment dataset, April 2012.

### LARGEST PLAINS MANUFACTURING INDUSTRIES, EMPLOYMENT, 2011



Source: EMSI Complete Employment dataset, April 2011.

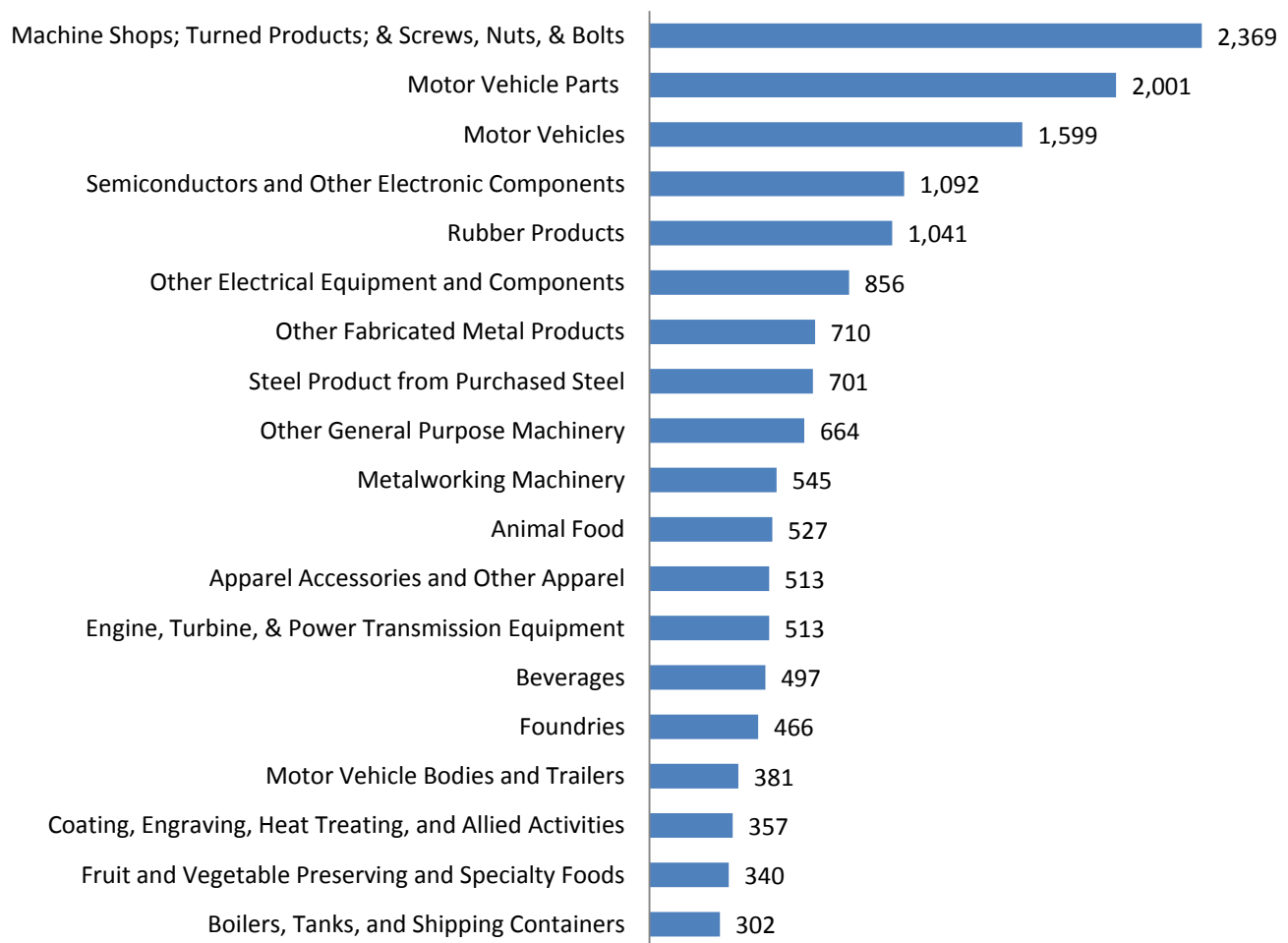
Most notable has been the growth of various vehicle, heavy equipment, machinery, and industrial metal manufacturing sectors. The turbine and turbine generator manufacturing industry also are expanding. Machine shops lead the way in overall job growth.

Auto manufacturing has not yet emerged as a major plains industry, but the recovering fortunes of the domestic auto industry has spurred notable job growth in automotive assembly, parts, and components manufacturing

sectors. Growth in vehicle assembly is helping to stimulate connected industries such as interior parts, power trains, and engines.

The apparel industry added more than 500 jobs the past two years, and appears near the top of the growth rankings, but it is a relatively small industrial sector on the plains. However, as is the case with automobiles, growth in finished apparel products appears to be stimulating growth in smaller fabric and thread mills.

### FASTEST GROWING PLAINS MANUFACTURING INDUSTRIES, EMPLOYMENT GROWTH, 2009-2011



Source: EMSI Complete Employment dataset, April 2011.

## The Geography of Regional Manufacturing Centers

A review of the top ten manufacturing counties by concentration (LQ) reveals the predominance of meat packing, food production and agricultural equipment manufacturing. Located in isolated, low population counties, these

large operations dominate the local employment environment, leading to high location quotients. The region may be diversifying, but its agricultural roots still influence the overall industry mix.

### TOP PLAINS COUNTIES BY MANUFACTURING CONCENTRATION, 2011

County Name	Jobs	LQ	Notable Manufacturing Employers/Industries
Carson, TX	3,402	7.48	Home to only nuclear assembly plant in U.S. (Pantex)
Sargent, ND	1,358	5.81	Bobcat-Doosan manufacturing plant
Jerauld, SD	789	5.18	Jack Links beef jerky/products plant w/ 600 employees
Dakota, NE	4,946	4.92	Major Tyson meat packing plant in Dakota City
Parmer, TX	2,110	4.46	Cargill Meat packing plant
Saline, NE	2,751	4.42	Meat packing/animal slaughter
Moore, TX	3,908	4.31	Meat packing/animal slaughter (Swift)
Colfax, NE	2,019	4.25	Meat packing/animal slaughter (Cargill)
Ford, KS	6,286	4.20	Meat packing/animal slaughter (Cargill), Ag equipment
Dawson, NE	3,838	3.55	Meat packing (Tyson), Automotive parts manufacture

Source: Analysis of EMSI Complete Employment dataset and local county Web resources.

## Growth Ahead?

Manufacturing on the plains displayed considerable resiliency during the recession, but still has lost overall employment during the past five years. There are signs, however, that the region's manufacturers may be looking to ramp up hiring. The Mid-America Business Conditions Index, which measures economic activity, has

found a strong upward trend in the plains states of North Dakota, South Dakota, Nebraska, Kansas, and Oklahoma.<sup>97</sup> Manufacturers in most of the states experienced a positive to strong 2011, and there are signs of continued growth in 2012.<sup>98</sup>



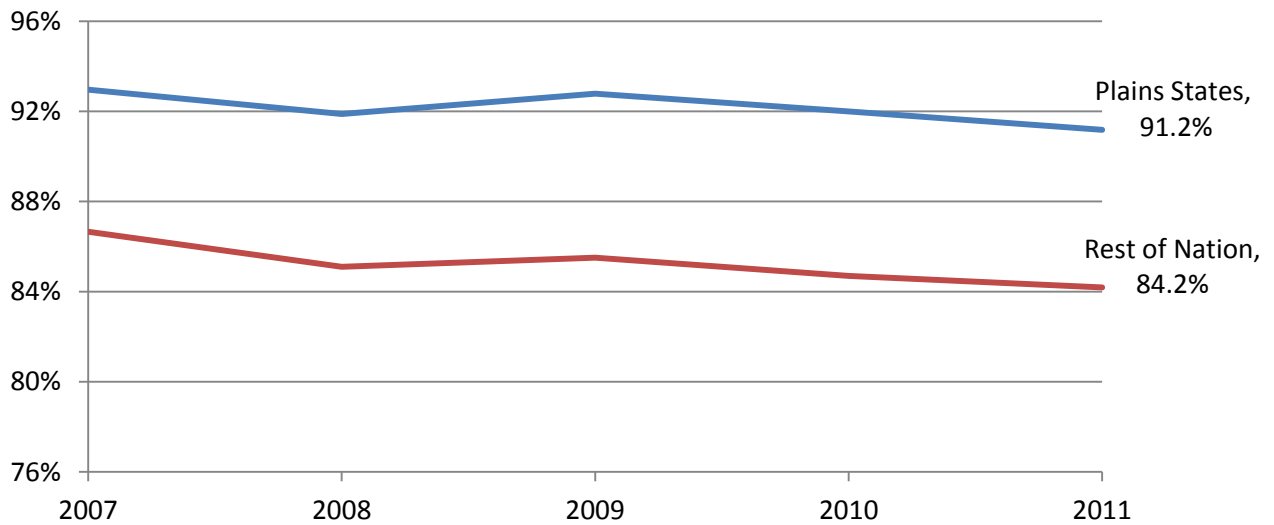
## The Plains: An Industrial Export Superstar

Surprisingly, given its wealth in minerals, energy, food and fiber, manufactured goods make up a large share of exports from the ten plains states<sup>99</sup> — about 92% over the past five years. This places the plains about 7% ahead of non-

plains states.

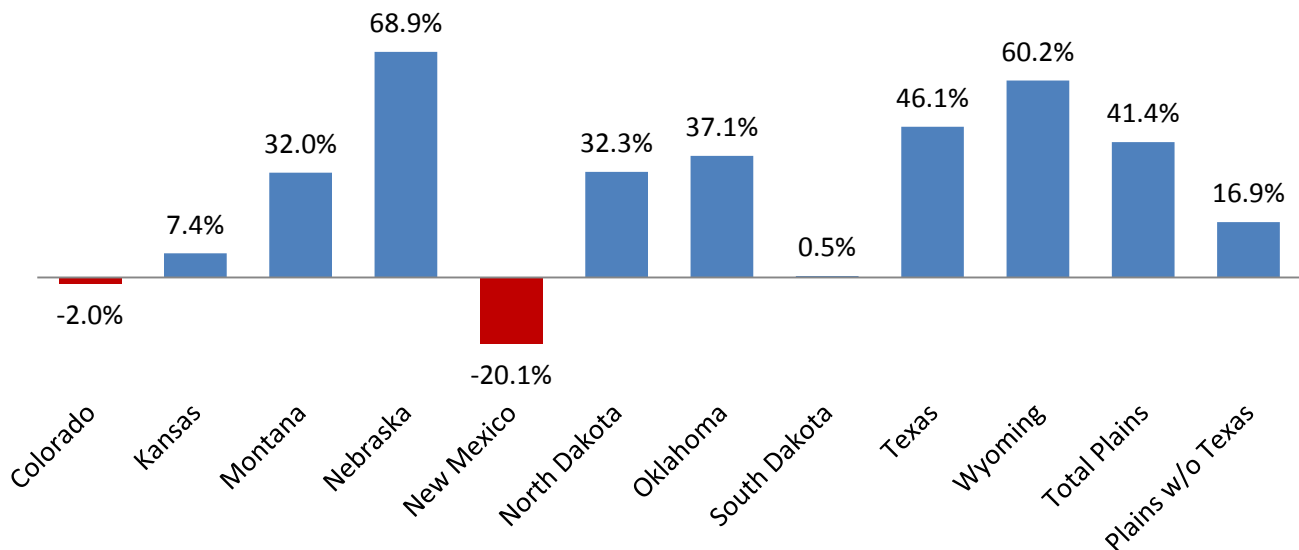
Most plains states have seen increases since 2007, although Colorado and New Mexico have yet to recover their losses in exports seen during 2008-2009.

### MANUFACTURED GOODS SHARE OF TOTAL EXPORTS, 2007-2011



Source: U.S. Census Bureau, Foreign Trade Division.

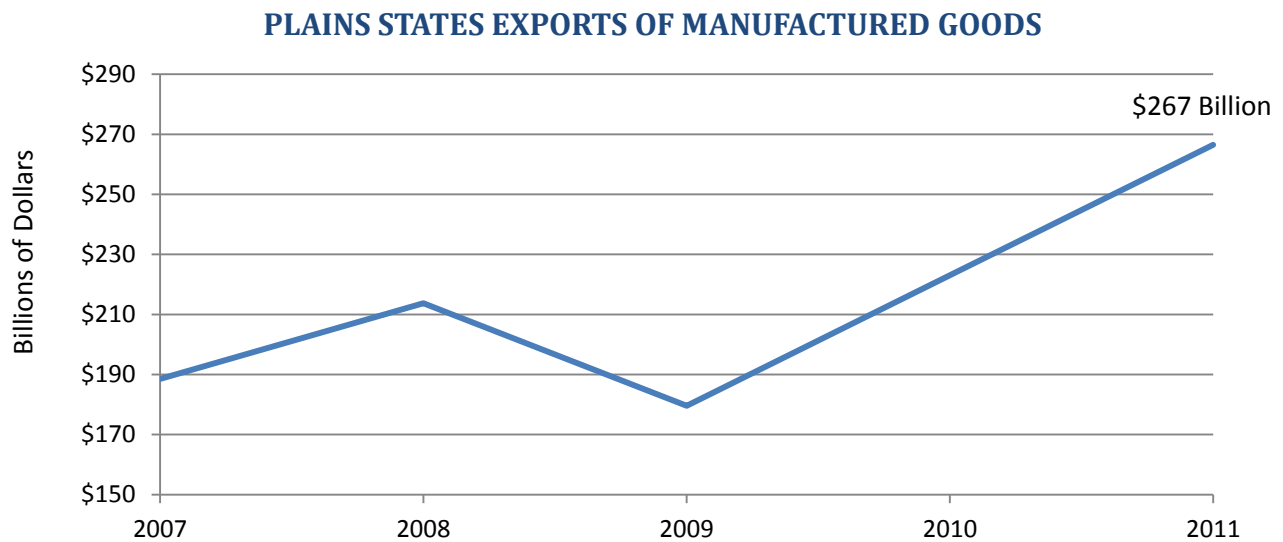
### CHANGE IN MANUFACTURED EXPORTS, 2007-2011



Source: U.S. Census Bureau, Foreign Trade Division.

Overall, Plains' manufactured exports expanded to reach nearly \$270 Billion in 2011, more than the

total industrial exports of Australia.<sup>100</sup>



Source: U.S. Census Bureau, Foreign Trade Division.



Sioux Falls, South Dakota (TTU)

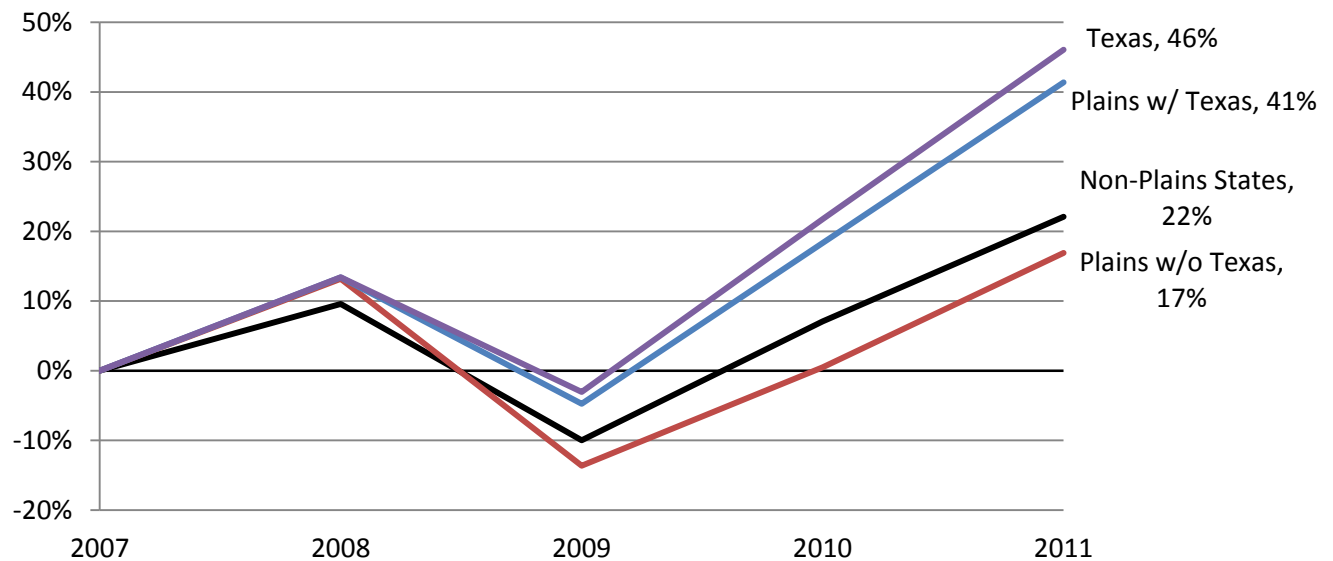
*Surprisingly, given its wealth in minerals, energy, food and fiber, manufactured goods make up a large share of exports from the ten plains states.*

Texas has been the engine of much of this growth and strength. It accounts for a disproportionate amount of the region's manufactured exports. Home to roughly 58% of the ten-state region's population, it nonetheless produced roughly 85% of the region's annual manufactured export value over the past five years. After a dip

in 2009, its manufactured exports are relatively booming, outperforming the nation by a good margin.

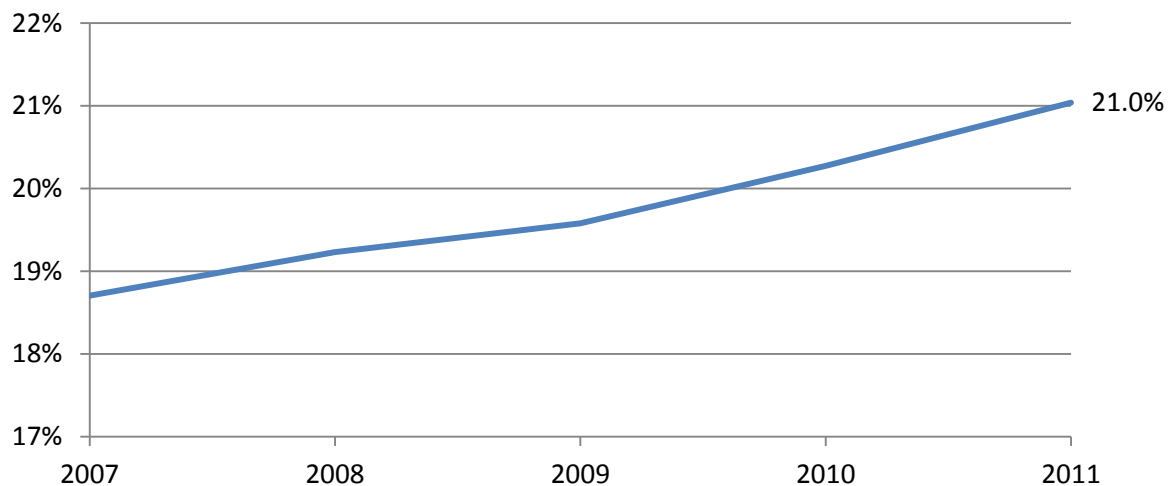
In 2007, 18.7% of U.S. manufactured exports were sourced from the region. By 2011, this had increased to 21%.

### GROWTH OF MANUFACTURED EXPORTS, PLAINS STATES vs THE NATION



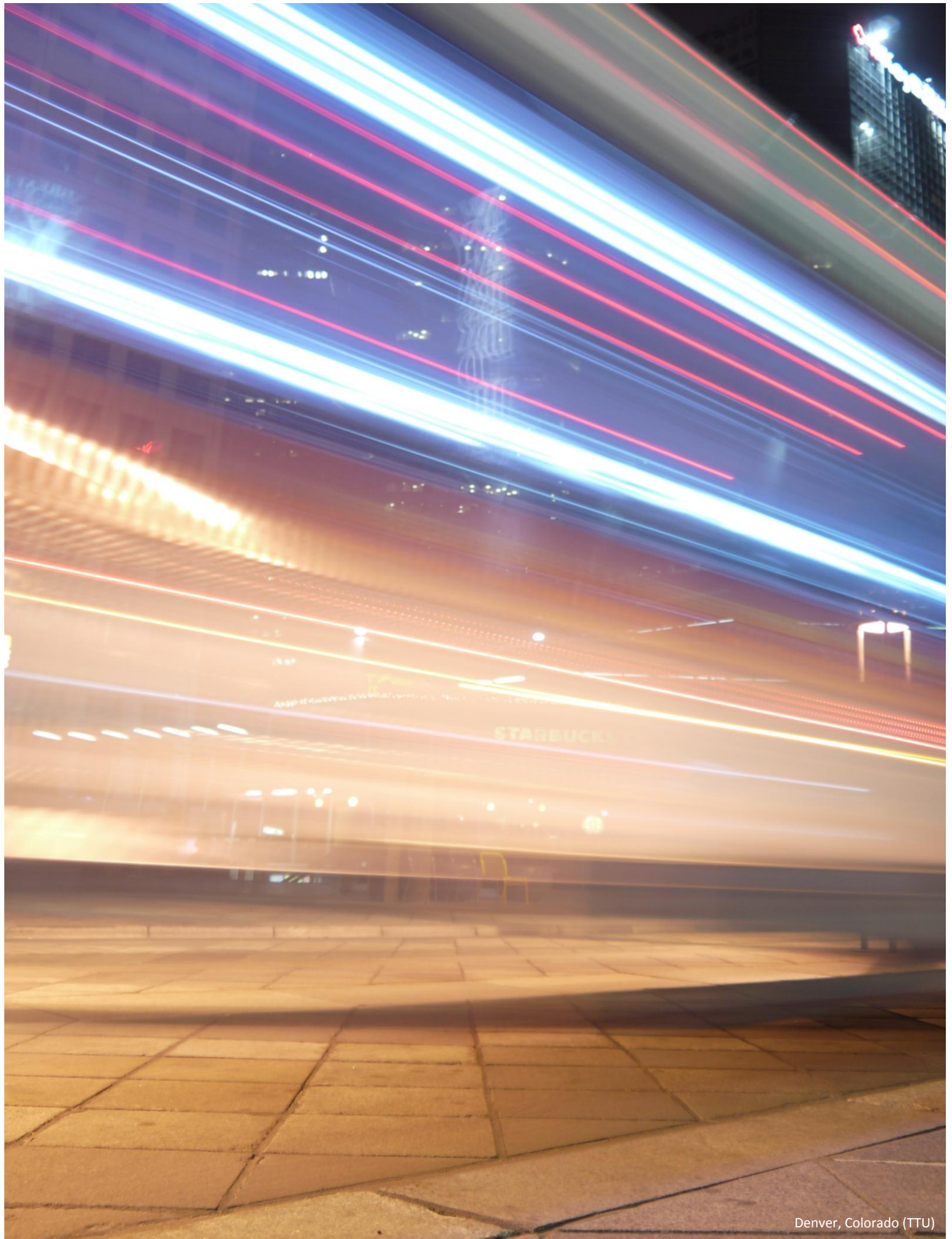
Source: U.S. Census Bureau, Foreign Trade Division.

### PLAINS STATES SHARE OF U.S. MANUFACTURED EXPORTS



Source: U.S. Census Bureau, Foreign Trade Division.





## Part Five

# The Great Plains in the Information Age

Remoteness long has been a curse of the countryside, distancing it from innovative ideas and people. One European historian blames the difficulty of transport for the “partial suffocation” rural areas.<sup>101</sup> Karl Marx, going further, dismissed the countryside for what he dubbed “the idiocy of rural life”.<sup>102</sup>

Not surprisingly, most economic historians have focused on the role of dense agglomerations as drivers of innovation; urbanites often have taken advantage of what one historian labeled “the backwardness and inferiority of others.” Yet in many cases the “frontier” — whether in eastern Europe in the 15<sup>th</sup> century, Russia in the 18<sup>th</sup> or the American Great Plains in late 19<sup>th</sup> — helped drive the growth of the metropolis, providing natural resources and new markets.<sup>103</sup>

### *Can the Periphery Be Innovative?*

With its wide expanses and relatively open class structure, early America offered a welcome refuge for Europeans seeking freedom from the shackles of a still-entrenched feudal culture. For much of the 19<sup>th</sup> century American farming was primarily small scale and family run.<sup>104</sup> But the rural population never constituted a traditional peasantry, as found in Europe. They were more restless; they tended to be far more oriented towards innovation and the pursuit of profit. “Almost all the farmers of the United States,” de Tocqueville observed, “combine some trade with agriculture; most of them make agriculture itself a trade.”<sup>105</sup>

The Great Plains presented unique problems for these enterprising farmers. Unlike the land east of the Mississippi, the scarcity of water and timber rendered the Great Plains a “treeless wasteland,” considered virtually unfit for habitation.

Not surprisingly, those willing to brave the harsh conditions tended to be entrepreneurial risk-takers by nature. Many were new not only to the land, but to the country itself. In 1890 some 43 percent of all North Dakotans were foreigners.<sup>106</sup> These new residents were highly innovative, constantly on the lookout for new methods of animal husbandry, planting, and marketing.

In his classic work, *The Great Plains* (1931), Walter Prescott Webb argued that technological advancements were fundamental to the region’s settlement. The utilization of steel in products such as the plow, the six-gun, the windmill, and barbed wire allowed farmers and ranchers to master a harsh, often unforgiving environment.<sup>107</sup>

This pattern persisted into the 20<sup>th</sup> century, with advancements in the technology of farming — machines, crops, pesticides and irrigation — creating greater efficiency and ever-increasing productivity. With the development of railroads, electrification, the telephone and an extensive highway system, a constellation of regional hubs and small farming communities spread throughout the region.

The region’s machinery and equipment industry emerged as a direct result of demand for

specialized mechanical products from increasingly sophisticated farmers. The machinery and equipment industry spawned related and supporting industries, competitive in their own right; the local electronics industry is the most prominent example.

Today, advances in plant science are feeding the evolution of new products in nutrition, pharmaceuticals, fuel, and advanced materials. The oil boom on the western edge of the Great Plains also has been spawned by new horizontal drilling and extraction technologies. Precision agriculture now combines advanced technologies in machinery, equipment, agronomy, information technology and electronics.

Advances in information and communications technology (ICT) will constitute arguably the most significant technology driving the Great Plains in the future. ICT is critical infrastructure for development, a crosscutting technology that impacts all facets of the economy and society including manufacturing, retailing, health care, education, civic engagement and science. Faster broadband and wireless technologies let people use a variety of digital tools to enhance productivity, and enables connections to networks of complementary and/or similar people and organizations for collaboration and innovation.<sup>108</sup> Most important of all, the growing efficiency of telecommunications technology provides the plains a unique opportunity to break the pattern of isolation, and connect to the rest of the world instantaneously.



## The Post-Industrial Plains

Historically, Plains businesses tended to be concentrated in fields leveraging low costs, cheap electricity and land. Products were produced in the plains, but marketing, processing, research and development frequently took place elsewhere. Now, the Internet allows firms to take these initial advantages and create new value.

Today, a Plains farmer, securities dealer, machine shop worker, or software writer enjoys virtually the same access to the latest market and technical information as someone in midtown Manhattan or Silicon Valley. This not only helps traditional Great Plains producers, but also generates a whole new breed of software and research-based companies rooted in the plains.

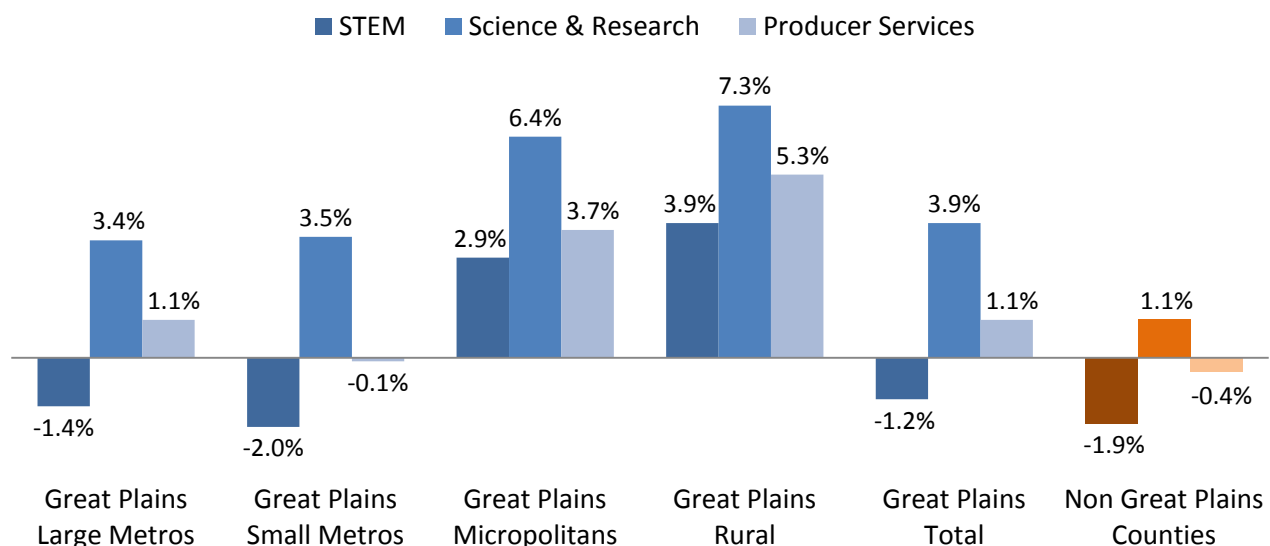
Indeed over the past decade, the Great Plains has outperformed the national norms in a host of research and information based fields, including in STEM (science, technology, engineering and math) occupations. This

contrasts with the common view in the media that holds the region to be something of a technological desert.<sup>109</sup>

Of course, these gains have to be looked at in relative terms. Even today the Location Quotient for science and research occupations remains 0.93 of the nation, revealing a relative shortfall in these kinds of jobs compared to the rest of the U.S.<sup>110</sup>

Indeed some of the Plains' relative gains rest on the smaller base of STEM employment across much of the region. Computer specialists showed the largest increase from 2008 to 2011 (559 jobs), but only muster a Location Quotient of 0.33 when compared to the rest of the nation. Life science technicians, and technicians in the physical and social sciences also continue to increase (405 jobs) but are considerably more concentrated — with a LQ of 1.37 — in Great Plains micropolitans than in the rest of the nation.

### EMPLOYMENT GROWTH IN STEM, SCIENCE, AND PRODUCER SERVICES

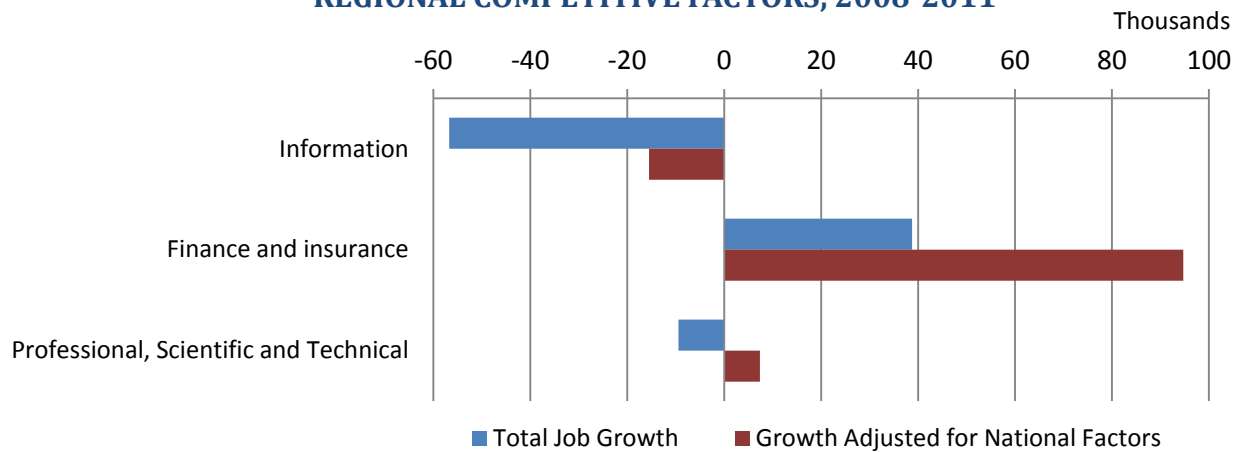


Source: EMSI Complete Employment dataset, April 2011.

Producer services on the Great Plains are growing in contrast with what is happening elsewhere in the U.S. This was accounted for entirely by employment growth in the finance and insurance sectors. As shown in the figure below, total employment in producer services has grown significantly since 2008. The red bar represents

jobs credited to regional competitiveness; national trends and industry change rates have been factored out. Finance and insurance firms on the Great Plains have created almost 40,000 more jobs than might have been expected. Likewise, the other two segments of the producer services category also outperform national norms.

### PRODUCER SERVICES: TOTAL JOB GROWTH AND GROWTH DUE TO REGIONAL COMPETITIVE FACTORS, 2008-2011



Source: EMSI Complete Employment dataset, April 2011.



Omaha, Nebraska (TTU)

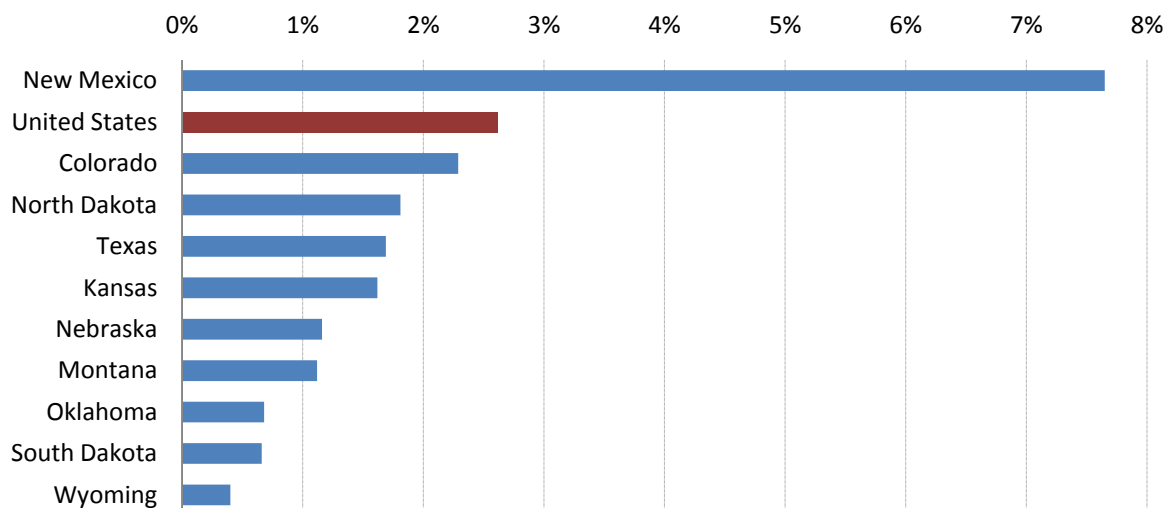
*Today, a Plains farmer, securities dealer, machine shop worker, or software writer enjoys virtually the same access to the latest market and technical information as someone in midtown Manhattan or Silicon Valley.*

## Research and Development on the Great Plains

The competition for intellectual property and knowledge, as well as for skilled workers, represents a major factor in spurring economic growth. So far the Plains still lag the rest of the nation in total R&D performed by federal and

state agencies, businesses, universities, and other nonprofit organizations. New Mexico is the region's exception, with its multiple, large, national research laboratories.

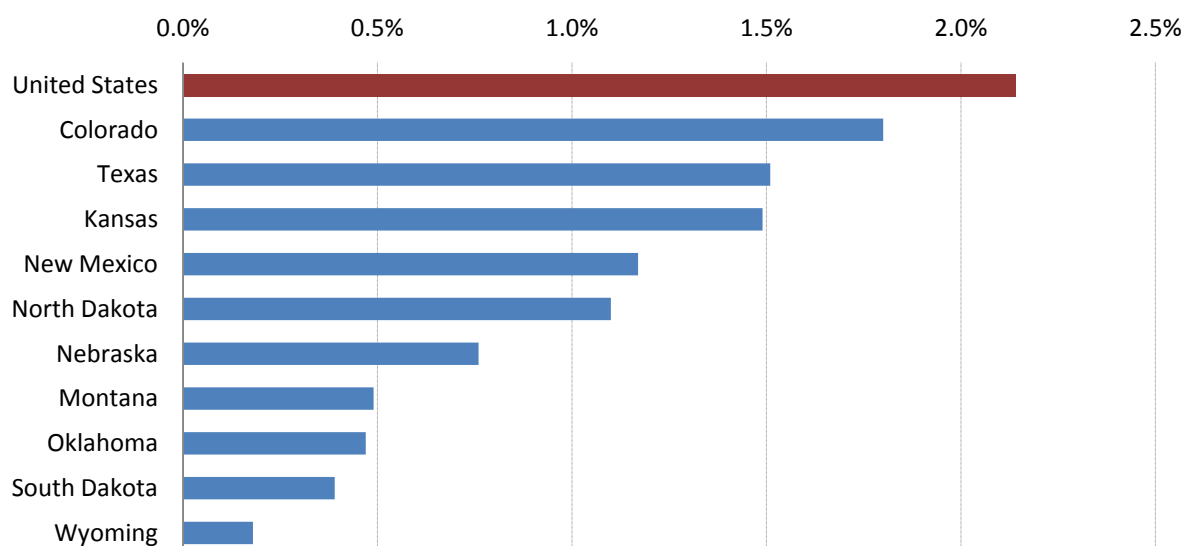
### TOTAL R&D AS A SHARE OF GROSS STATE PRODUCT



*Note: Total R&D as a percentage of gross state product, 2008.*

*Source: National Science Foundation, Science and Engineering Indicators, 2012.*

### BUSINESS R&D AS A SHARE OF TOTAL PRIVATE OUTPUT



*Note: Business R&D as a percentage of private industry output, 2008.*

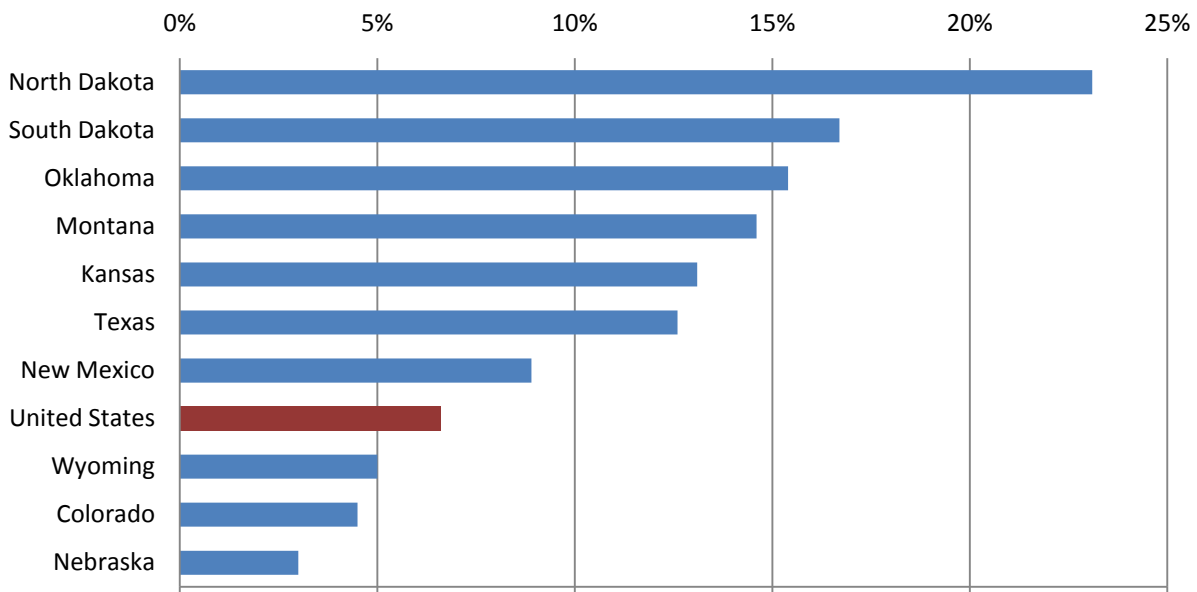
*Source: National Science Foundation, Science and Engineering Indicators, 2012.*



Yet economic conditions could change this picture. Due to generally healthy local economies, most Great Plains states now can invest a higher percentage of state and local funds into R&D at academic institutions, compared to the rest of the country. North Dakota ranks

number one nationally in state and local funding of R&D at universities and colleges, and five other Great Plains states stand in the top ten, including South Dakota (5), Oklahoma (6), Montana (7), Kansas (8) and Texas (9).

### STATE AND LOCAL GOVERNMENT-SOURCED EXPENDITURES AT UNIVERSITIES AND COLLEGES, 2009



Source: National Science Foundation, Academic and Science Research Expenditures, Fiscal Year, 2009.



North Dakota State University, Fargo, North Dakota (TTU)

*North Dakota ranks number one nationally in state and local funding of R&D at universities and colleges...*

## ***Building the Brain Belt***

In the informational economy,<sup>111</sup> a skilled workforce is the lifeblood of any successful company, city, state, or region. The productivity of well-trained people is critical for economic growth and prosperity.<sup>112</sup> Consequently, the Great Plains' history of educating its best and brightest only to see them leaving to fulfill their ambitions in some distant big city has remained a long-term source of consternation.

This has been a long-standing problem. Following the drought of 1956-1957, President Dwight Eisenhower established the Great Plains Drought Committee. The Committee concluded there was a pressing need to address the lack of opportunities for young people.

In the mid-1990s, renewed fears about regional depopulation and the ability to compete in a world with a “new set of challenges” prompted Congress to establish the Northern

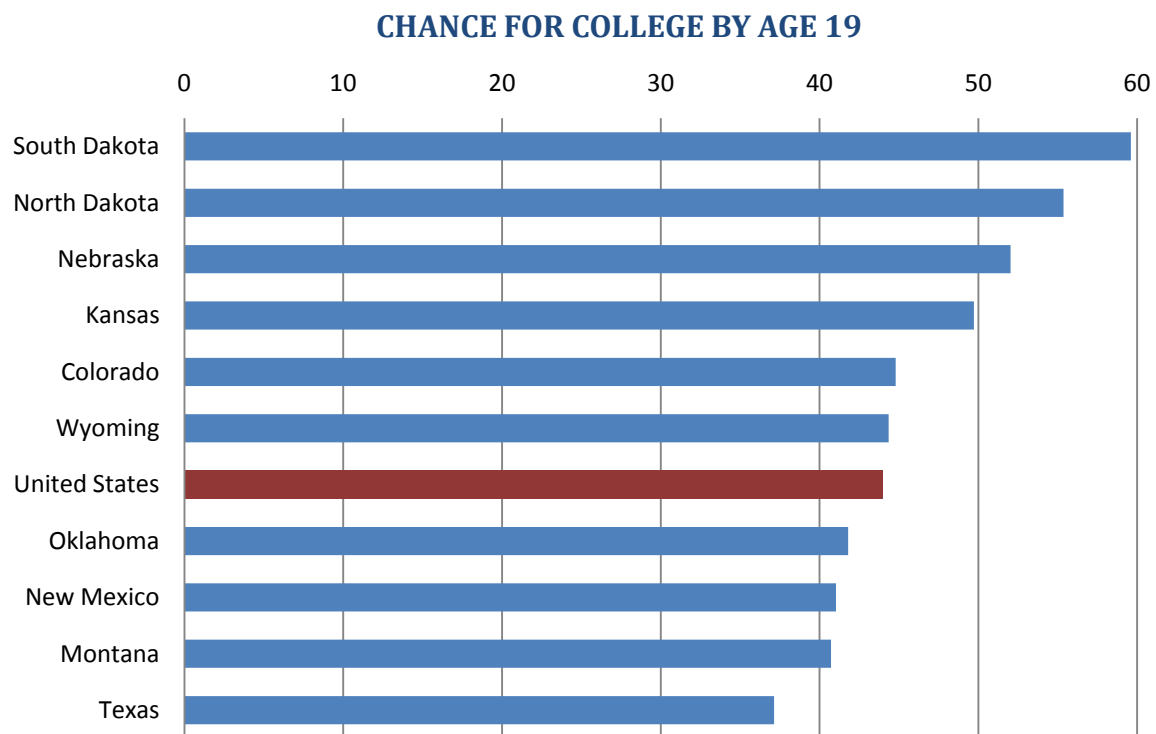
Great Plains Rural Development Commission. Rather than view nature as the principal threat — a legacy of the Dust Bowl — the Commission concluded that the new challenges were those posed by an increasingly integrated, technology-driven global economy.

There remain significant questions about the ability of the Great Plains to thrive in the informational economy. Fortunately, the region maintains a core competitive advantage: its surplus of highly educated young people. Students in Nebraska, Kansas and the Dakotas, for example, tend to perform better in school as measured by graduation rates, college attendance, or enrollment in upper-level science and education programs than those in more urbanized areas. In this sense many parts of the Plains could serve as a veritable “brain belt” for the 21<sup>st</sup> century.

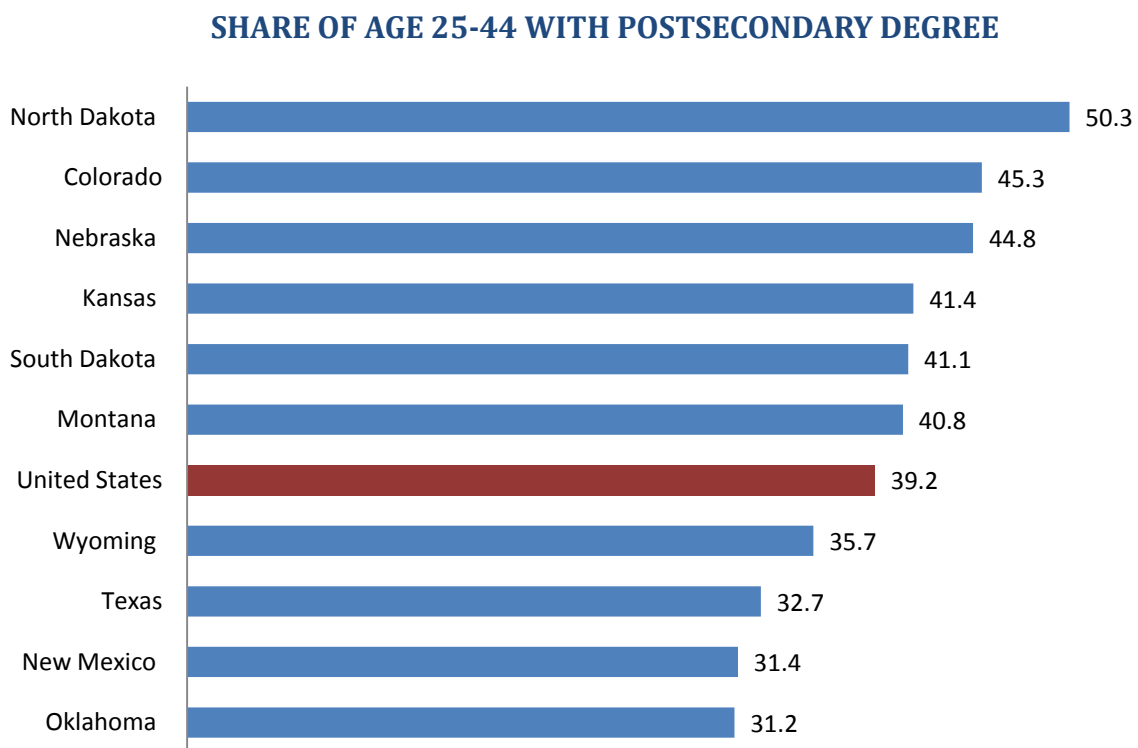


Texas Tech University, Lubbock, Texas (TTU)

*Fortunately, the region  
maintains a core  
competitive advantage:  
its surplus of highly  
educated young people.*



Source: National Center for Higher Education Management Systems.



Source: U.S. Census Bureau, 2010 Decennial Census.



Historically, many of these young people, once they gain skills, leave, or are inadequately employed if they choose to stay.<sup>113</sup> But, in large part due to advances in communications, many of these workers are now being absorbed. Between 1990 and 2000 the percentage of counties with a “skills surplus,” according to researcher Sean Moore, actually dropped more dramatically in rural areas than in metropolitan locations, probably because information, business services, and other technology-related business have shifted location to the far periphery.<sup>114</sup>

One of the first companies to capitalize on this brain belt was Great Plains Software in Fargo, ND. Doug Burgum, a local boy originally from nearby Arthur, moved back home from Chicago to join the fledgling local start-up. He saw great potential in the area’s considerable engineering expertise from North Dakota State University and from the state’s large and expanding specialty farm equipment industry. “My business strategy

is to be close to the source of supply; it’s like being near fertile land or a raw material,” Burgum explains. “North Dakota gave us access to the raw material of college students.”

By leveraging some farmland, and with help from family members, he bought the company. In the next fifteen years Great Plains Software became a force in the information business. In 2001 it was acquired by Microsoft. By 2007 the company employed roughly one thousand people in its sprawling, wooded complex on the outskirts of Fargo, and it plays a critical role in the overall strategy of the world’s dominant software company.

The success of Great Plains Software sparked other start-ups, in fields that range from biotechnology to wireless networking to radio frequency identification systems. Today, North Dakota has one of the highest rates of high-tech start-ups in the nation, and the Fargo area is an undisputed epicenter.



Microsoft campus, Fargo, North Dakota (TTU)





Denver, Colorado (TTU)



## Part Six

# The New Demography of the Plains

The demographic profile of the Plains is changing in two significant ways. First, the region is now growing faster than the national average, something that has not been the case for decades. Second, this growth is concentrated heavily in the region's urban areas.

These separate but related phenomena often confuse observers. Population in many rural areas has decreased as the concentration of growth in urban centers has occurred, yet this has occurred even as the overall demographic trends for the entire region have turned distinctly positive.

### ***Population Growth is Back***

The restoration of population growth constitutes the most auspicious trend for the region. From the 1990s and onward, the Plains states – even excluding Texas – have consistently beaten the rest of the nation in population growth.

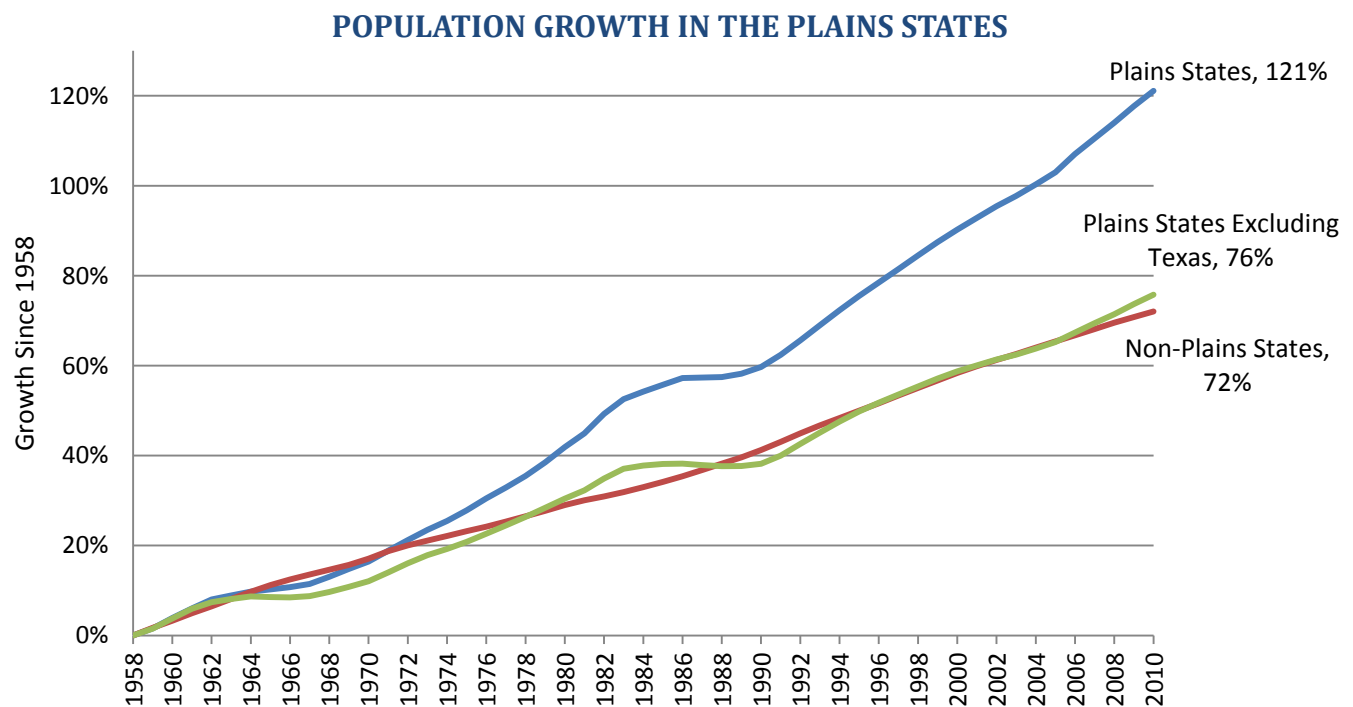
## Urbanization and the Shifting Demographics of the Great Plains

This growth is not evenly distributed within the region. Our demographic analysis breaks the plains into settlement types: large and small metropolitans, micropolitans and non-metropolitan/micropolitan counties. This county-based definition mirrors the one used by the Center for Great Plains Studies at the University of Nebraska-Lincoln and David Wishart's regional definition<sup>115</sup>, modified to account for immediately adjacent metropolitan counties.

According to this regional definition, the plains are home to 30.2 million residents, 9.7% of

the nation's total population. Population has grown 7.4% over the past five years, compared to 4.5% nationally.

Virtually all this growth has taken place in the region's larger towns and cities. Early settlers peppered the region with small towns and smaller hamlets, as they built an economy based upon growing crops and raising animals. Now the region has become increasingly metropolitan. By 2010, 82% of the region's population lived in metropolitan counties, 10% in micropolitan counties and 8% in non-metropolitan counties.

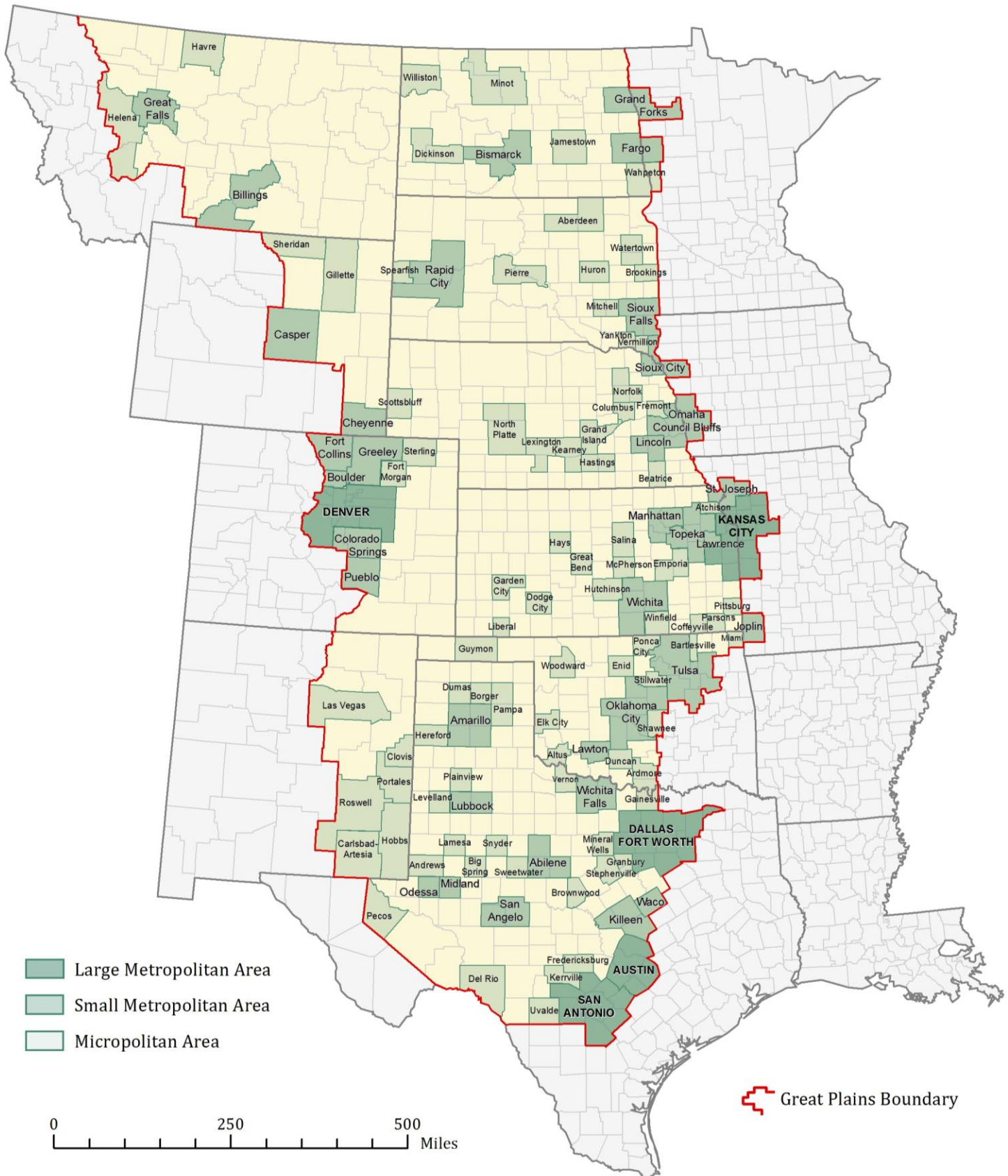


Source: U.S. Census Bureau, 1958-2010 Population Estimates.

*From the 1990s and onward, the Plains states – even excluding Texas – have consistently beaten the rest of the nation in population growth.*

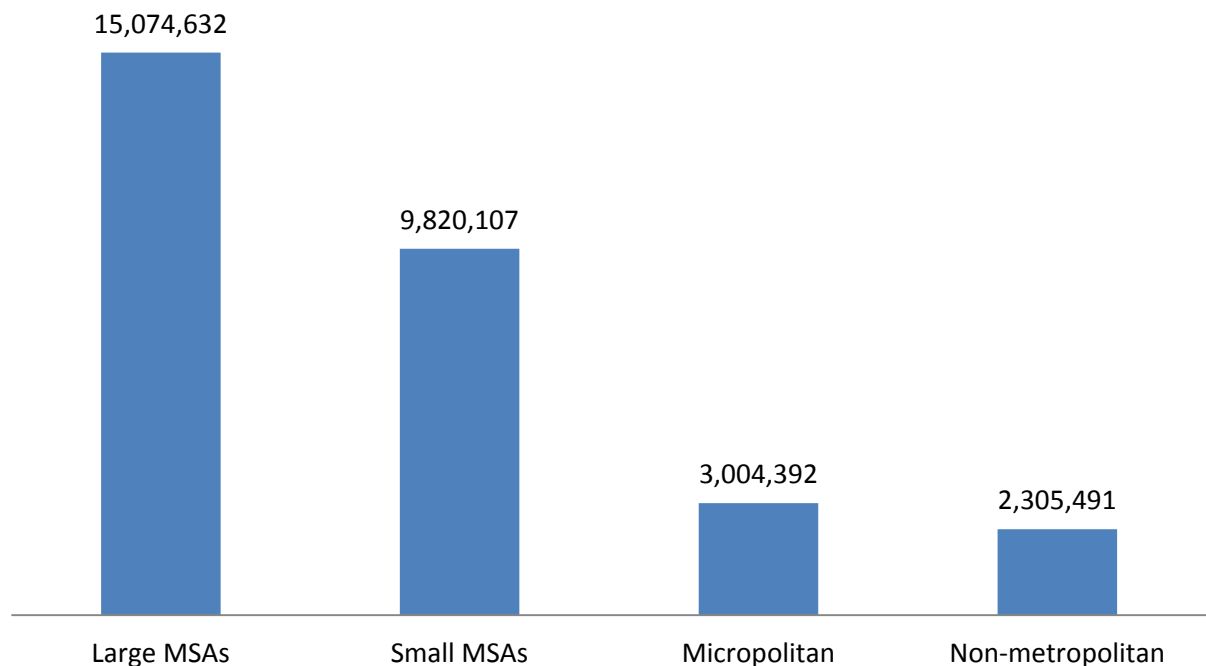


## GREAT PLAINS METROPOLITAN AND MICROPOLITAN AREAS



- **Large metropolitans** — The five largest metropolitan areas on the plains. Each sits on the borders of the region: Dallas-Fort Worth, Denver, San Antonio, Kansas City and Austin. 49.9% of the region's population.
- **Small metropolitans** — The other 35 plains metropolitan areas, ranging in population size from Oklahoma City to Casper. 32.5% of the region's population.
- **Micropolitans** — The region's 86 single or multi-county areas with an urbanized principal city of 10,000-50,000 in population. 9.9% of the region's population.
- **Non-metropolitans** — The remaining counties, predominately rural, not a part of a metropolitan or micropolitan area. 7.6% of the region's population.

#### TOTAL POPULATION OF THE FOUR PLAINS COUNTY TYPES, 2011



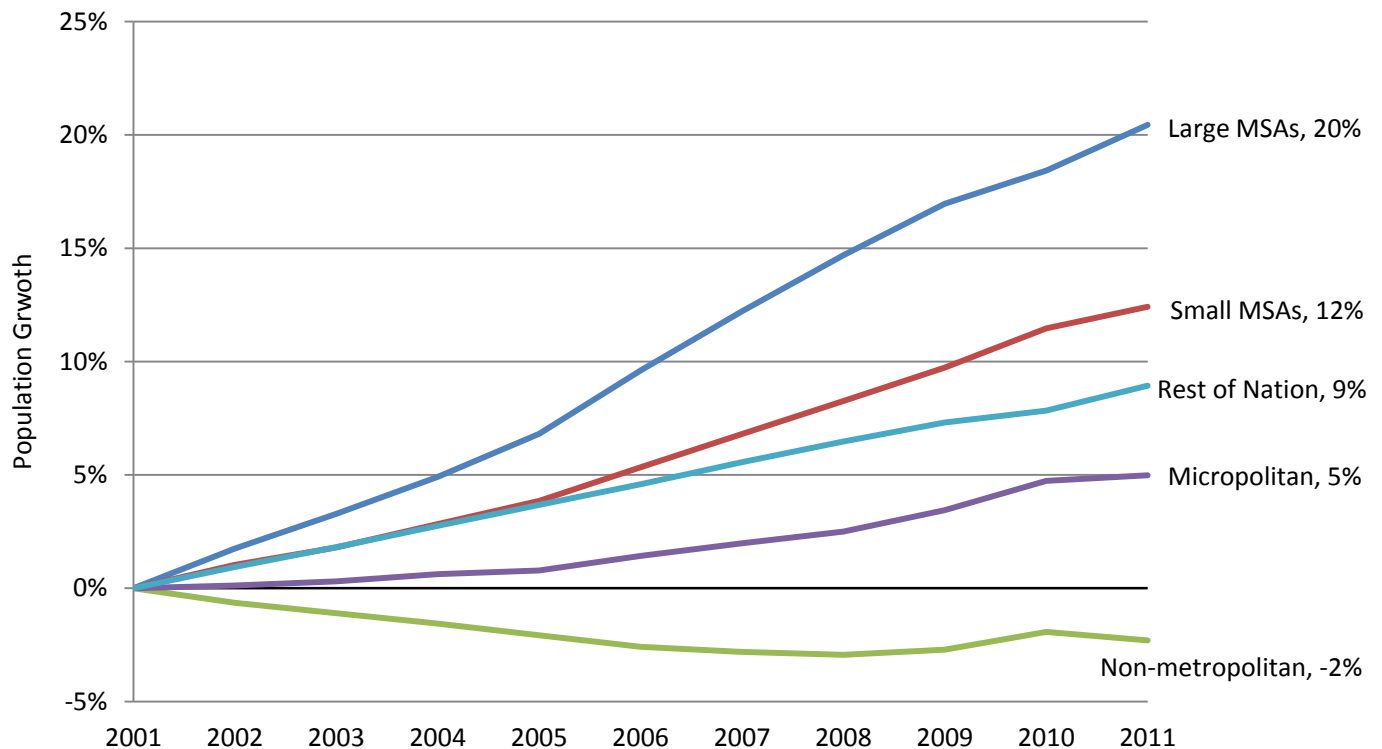
Source: U. S Census Bureau, 2011 Population Estimate.

*...the region has become increasingly metropolitan. By 2010, 82% of the region's population lived in metropolitan counties...*

From 2001-2011 the region's population grew more than 14%, fueled by 20% growth in its large MSAs and 12% growth in the small MSAs. It's notable that even the Plains' small

metropolitan areas exceeded the national growth rate. The micropolitan counties grew 5% while the non-metropolitan counties lost 2.3% of their population.

### POPULATION GROWTH IN THE PLAINS BY COUNTY TYPE



Source: U.S. Census Bureau, 2001-2011 Population Estimates.



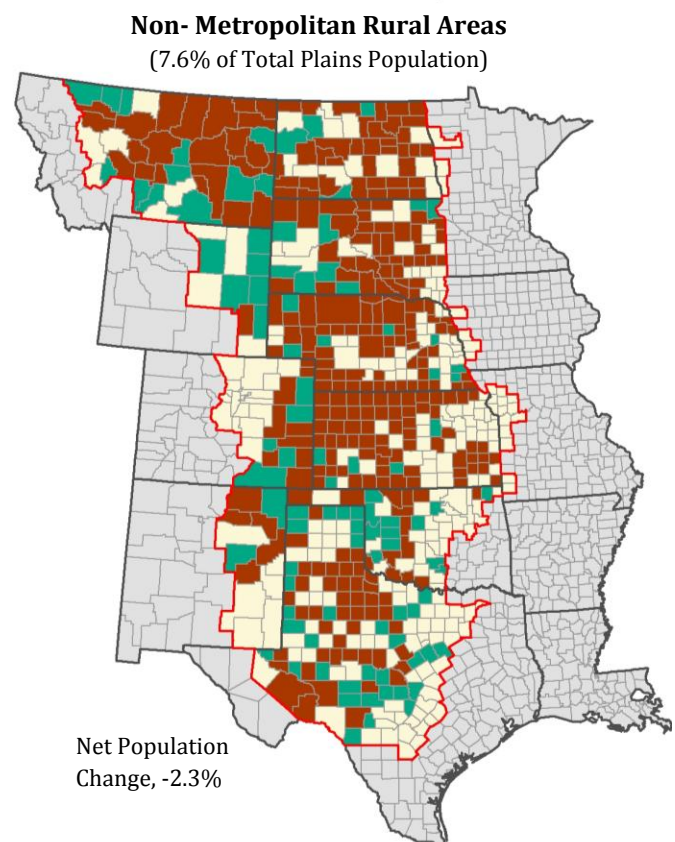
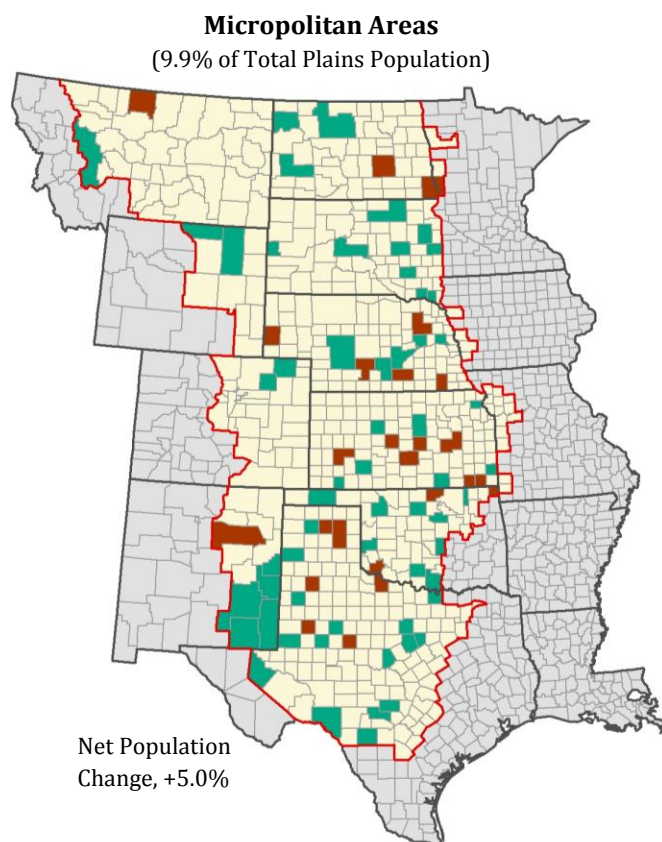
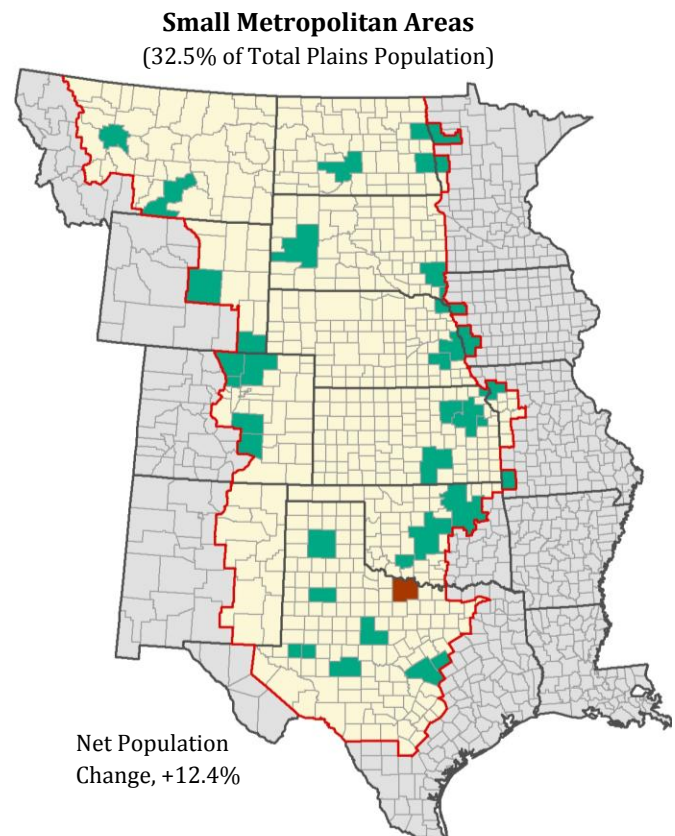
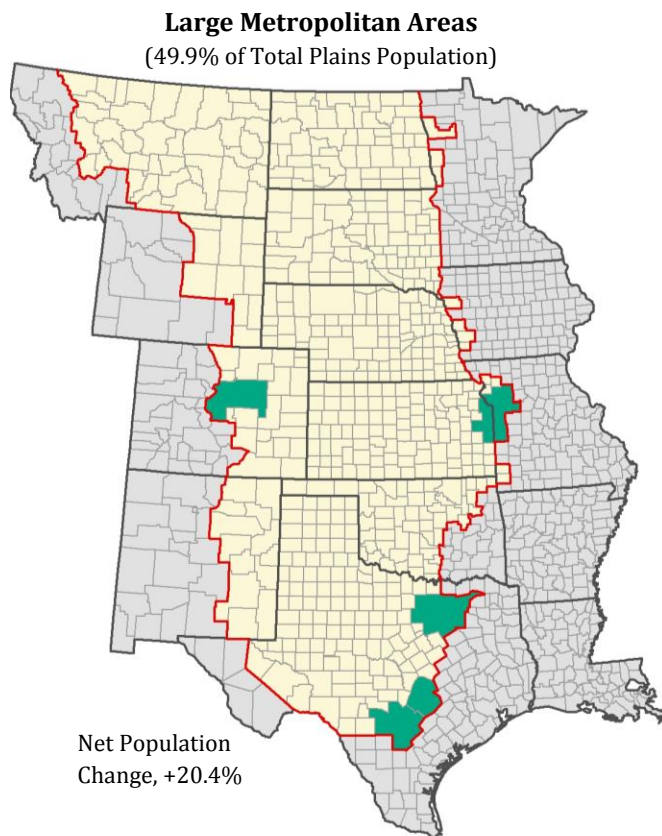
Omaha, Nebraska (TTU)

*It's notable that even the Plains' small metropolitan areas exceeded the national growth rate.*



**GREAT PLAINS POPULATION CHANGE BY COUNTY TYPE, 2001-2011**

Increase Decrease

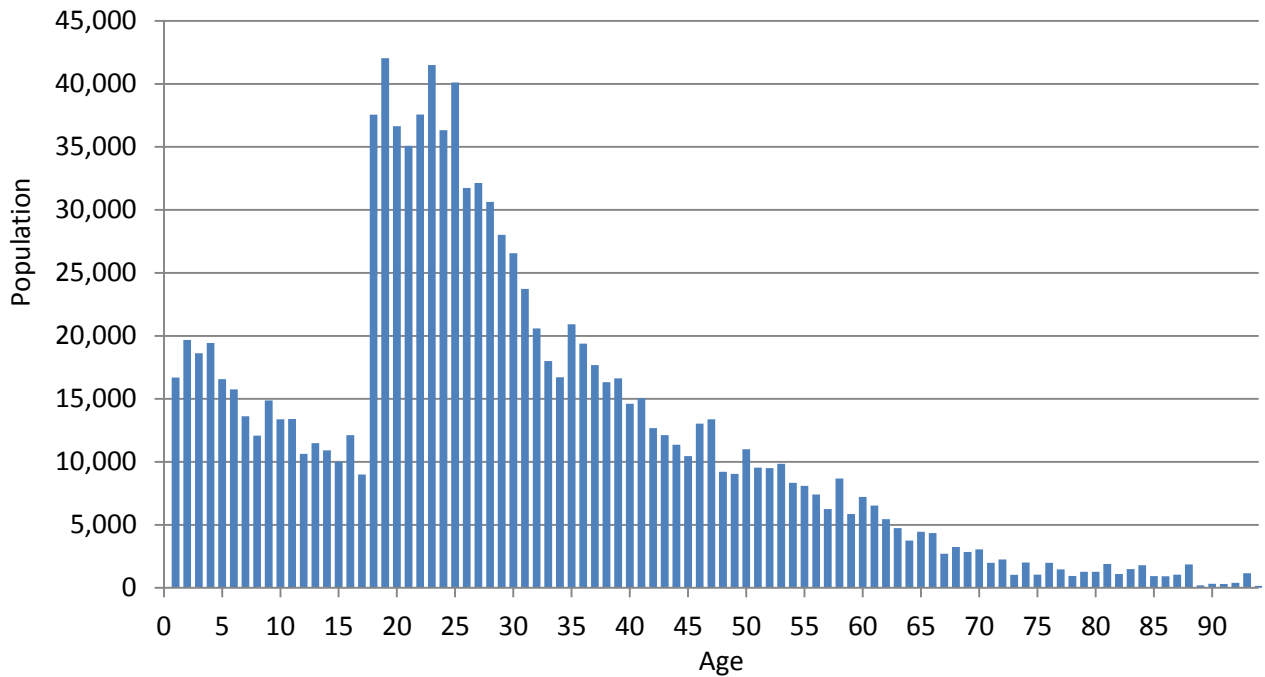
*Source: U.S. Census Bureau, 2001-2011 Population Estimates.*

## Not Just a Bunch of Old People.

Reporting about the demography of the plains usually focuses on the concentration of seniors, particularly in small towns. But, as a whole, the region contains proportionately many

more children and fewer older residents than the rest of the nation. This is particularly true of newcomers, largely younger adults seeking economic opportunity or about to raise a family.

### AGE STRUCTURE OF MIGRANTS MOVING TO THE GREAT PLAINS FROM OTHER STATES



Source: U.S. Census Bureau, American Community Survey, Public Use Microdata Area (PUMA) data 2010.

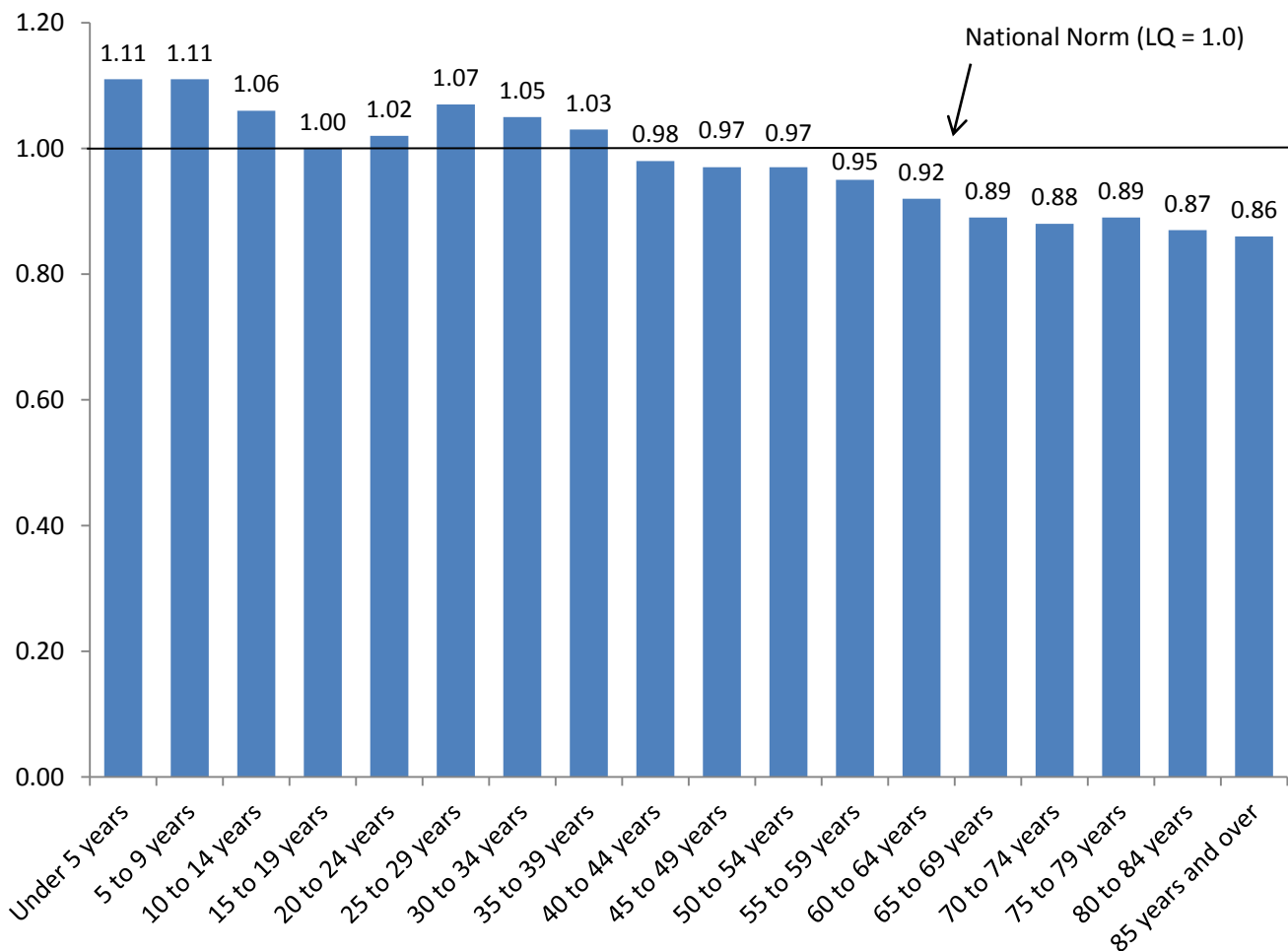


Fort Collins, Colorado (TTU)

The following chart shows the region's Location Quotient for each age group (a region with age groups in the same distribution as the nation as a whole would show an LQ of 1.0 for every age group). The population balance in the plains leans towards age 40 and under.

This age profile for the region primarily reflects the demographics in the largest metropolitan areas, which are doing a better than average job of holding on to 25-45 year-olds, and showing high numbers of the somewhat correlated children's age groups.

### AGE GROUP CONCENTRATIONS IN THE PLAINS REGIONS, 2011



Source: U.S. Census Bureau, 2011 Population Estimate.

*...as a whole, the region contains proportionately many more children and fewer older residents than the rest of the nation.*



The chart below breaks down the age profile by county type. Compared to the larger urban areas, the non-metropolitans and micropolitans show a much different age profile. Non-metropolitans (purple bars) are much heavier on older residents, while lacking those aged 20-40; these counties show conspicuously low levels of college age residents, ages 20-24. However, even the non-metropolitan counties are holding onto young and school-age children at average national rates. Non-metropolitan county demographics are dominated by the oldest age groups.

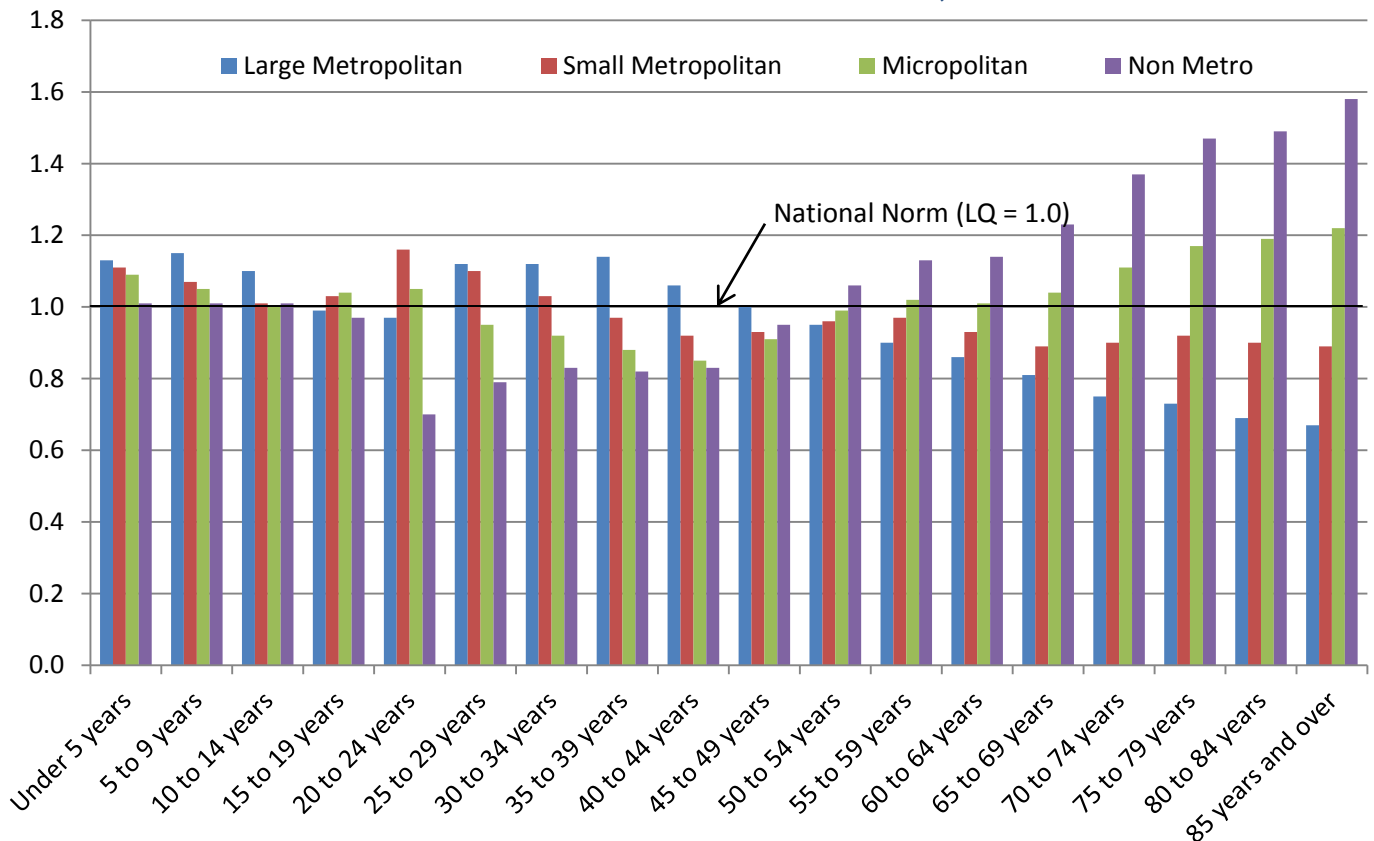
The small metropolitans (red bars) show high levels of 20-30 year olds, presumably due to the presence of universities in places like Lincoln, Fort Collins, Boulder, Lubbock, Greeley, Waco,

Fargo, Abilene, Manhattan, and Grand Forks.

These areas show their greatest age deficiency in the 40-44 age group, but still display strong numbers of children, especially those under age 5 and below, as well as an average portion of the elderly.

Micropolitan areas show a somewhat similar age profile to the small MSAs, but with much higher concentrations of the elderly, especially those over 70. These regions also contain some universities, most particularly in Stillwater, Oklahoma, but also Weatherford, Oklahoma; Emporia, Hays, and Pittsburg, Kansas; Kearney, Nebraska; Brookings and Vermillion, South Dakota; Minot, North Dakota; and Las Vegas and Las Cruces, New Mexico.

**PLAINS AGE PROFILE BY COUNTY TYPE, 2011**



Source: U.S. Census Bureau, 2011 Population Estimates.

## The Immigrants Return

Over the past few decades, the Great Plains generally have been less ethnically diverse than the rest of the nation, yet the area has accelerated in growth of its non-white population. The region now has about as many non-Hispanic white residents as other regions.

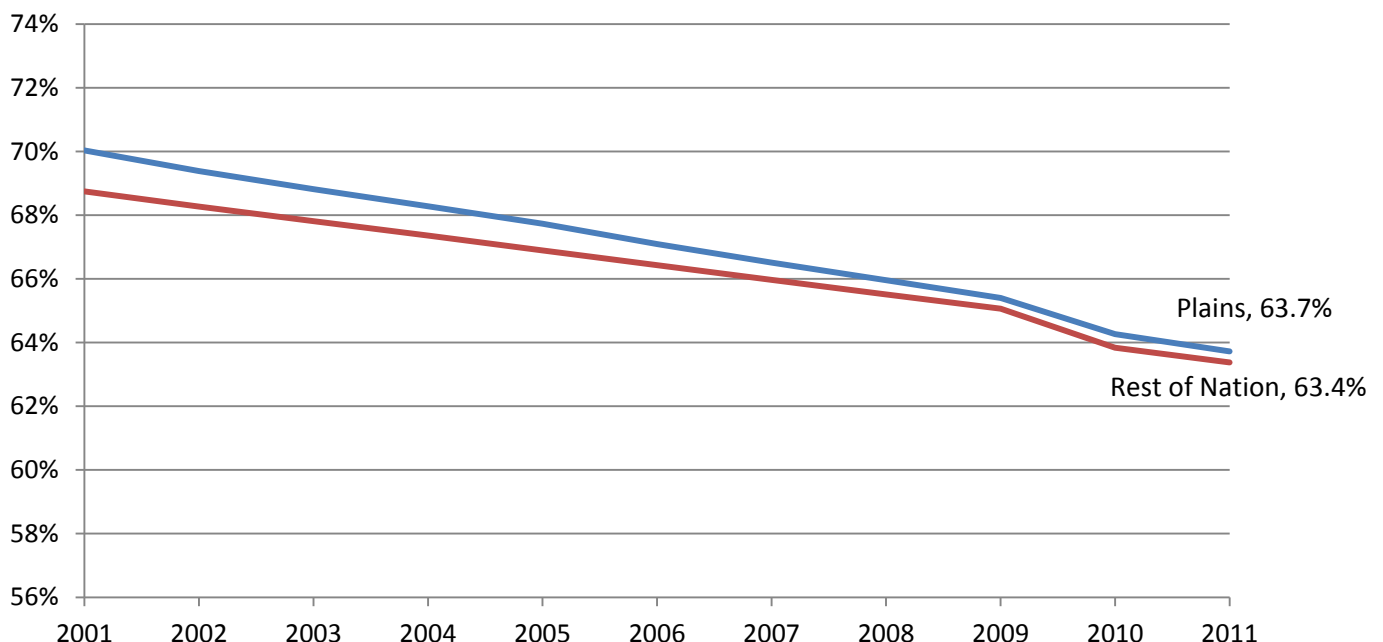
Over the past decade, all ethnicities grew much faster than non-Hispanic white. Much of the growth has taken place in Colorado and Texas. While whites still make up a large share of the regional population, Hispanic growth was nearly double the volume of white growth.

The Hispanic presence on the plains is concentrated in the southern edge of the region but this population is spreading across broad parts of the region. In plains towns like Grand Island, Nebraska you encounter a plethora of Mexican or Honduran restaurants. Over the past

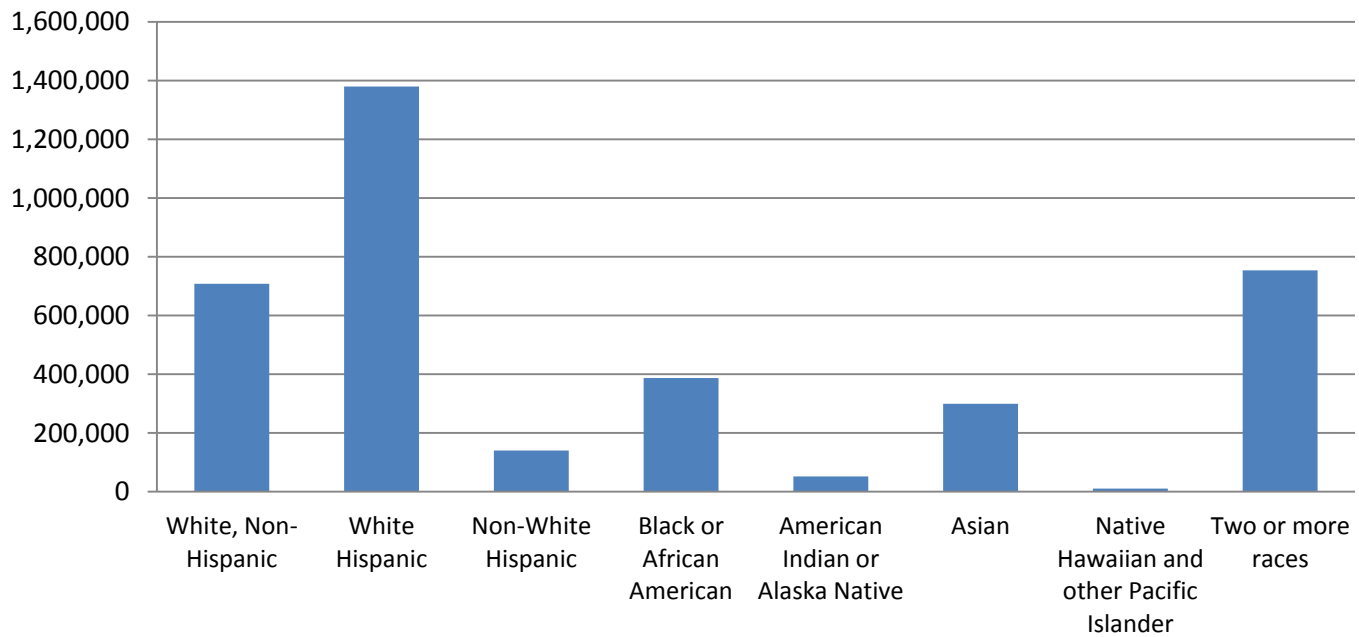
twenty years the percentage of foreign-born residents in Nebraska has more than tripled.<sup>116</sup>

In many places Hispanics are the major counter-force to wholesale depopulation, filling schools and opening businesses. Every county except one in the western half of Kansas has been undergoing depopulation of non-Hispanic whites. "Hispanic residents have pushed from hubs like nearby Dodge City, Garden City and Liberal into ever smaller communities," wrote A.G. Sulzberger in *The New York Times* last winter, "buying property on the cheap, enticed, many say, by the opportunity to live quiet lives in communities more similar to those in which they were raised."<sup>117</sup> These patterns challenge the common stereotype of the region as ethnically homogeneous. In reality the plains are now no more "white" than the rest of the country.

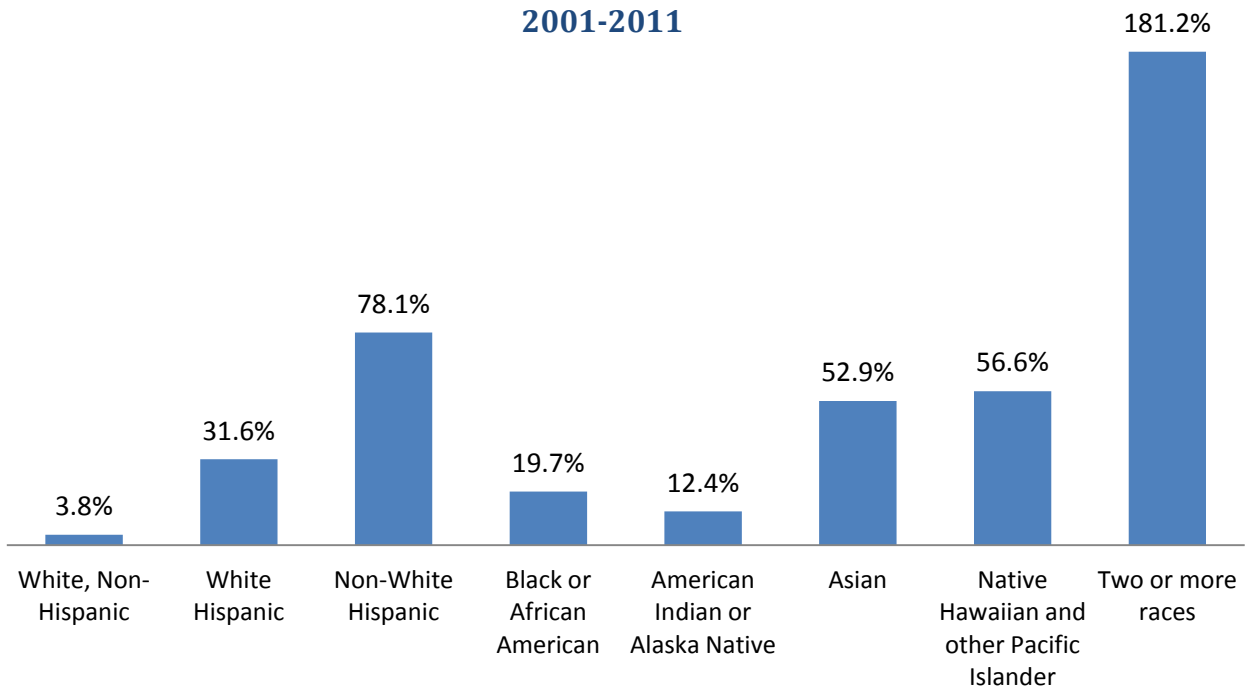
### SHARE OF TOTAL POPULATION AS NON-HISPANIC WHITE



Source: U.S. Census Bureau, 2001-2011 Population Estimates.

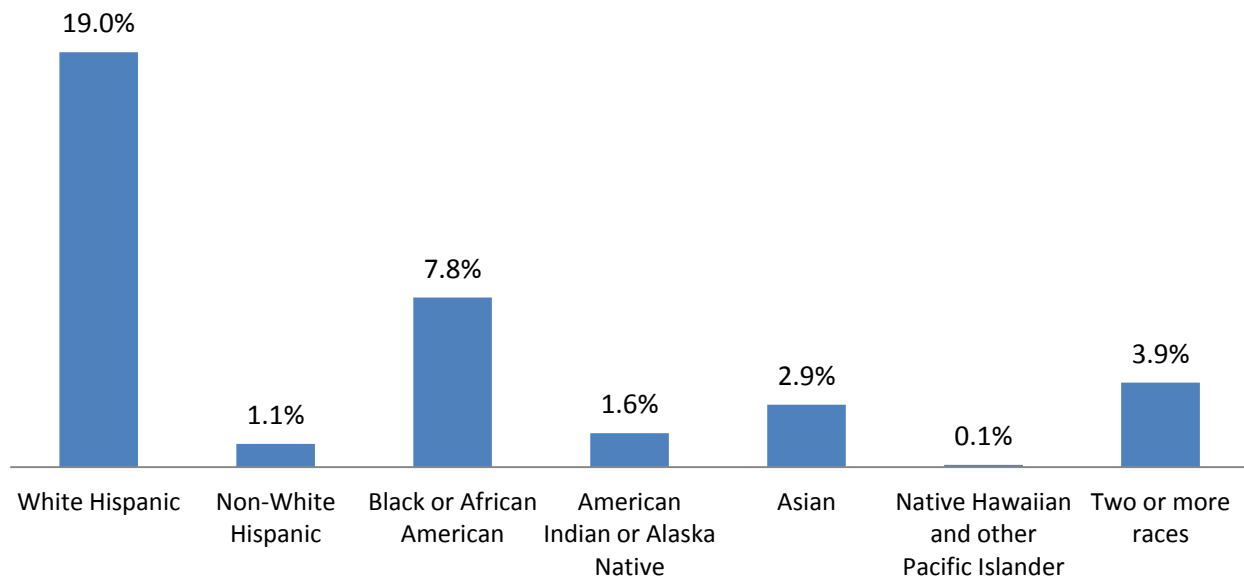
**GREAT PLAINS POPULATION GROWTH BY ETHNICITY,  
2001-2011**

Source: U.S. Census Bureau, 2001-2011 Population Estimates.

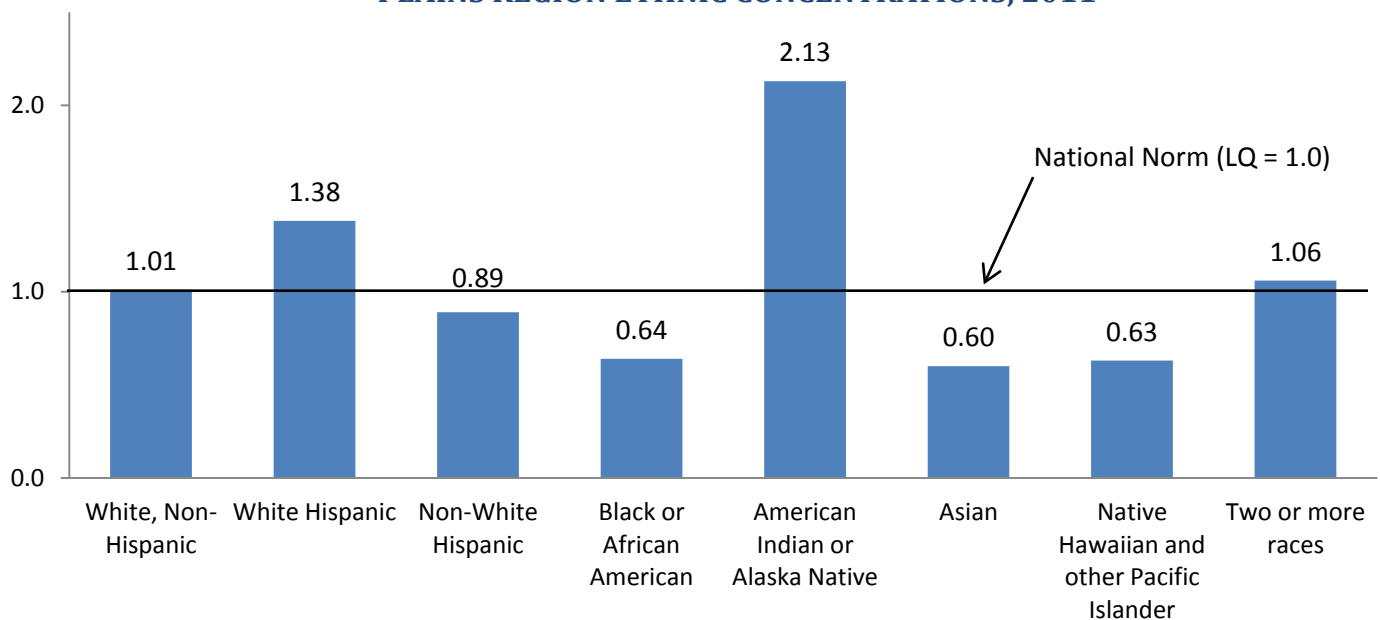
**GREAT PLAINS PERCENT POPULATION GROWTH BY ETHNICITY,  
2001-2011**

Source: U.S. Census Bureau, 2001-2011 Population Estimates.



**GREAT PLAINS MINORITY GROUPS AS A SHARE OF TOTAL POPULATION, 2011**

Source: U.S. Census Bureau, 2011 Population Estimate.

**PLAINS REGION ETHNIC CONCENTRATIONS, 2011**

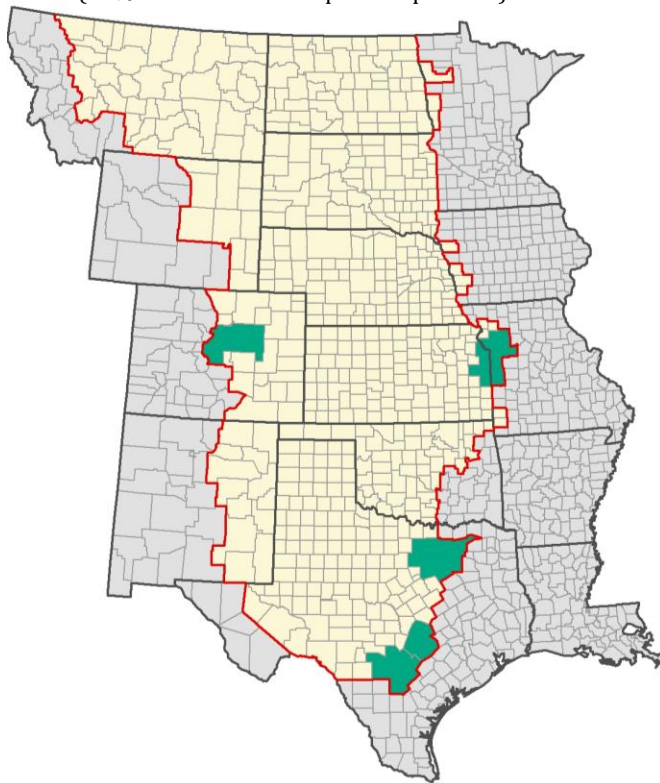
Source: Location Quotient (LQ) based on U.S. Census Bureau, 2011 Population Estimate.

*These patterns challenge the common stereotype... In reality the plains are now no more “white” than the rest of the country.*

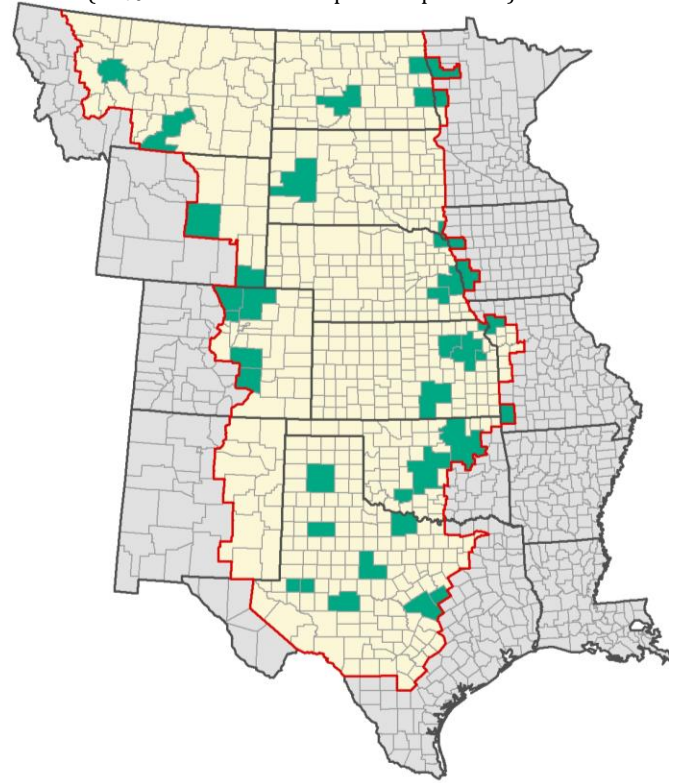
## GREAT PLAINS HISPANIC POPULATION CHANGE, 2001-2011

■ Increase ■ Decrease

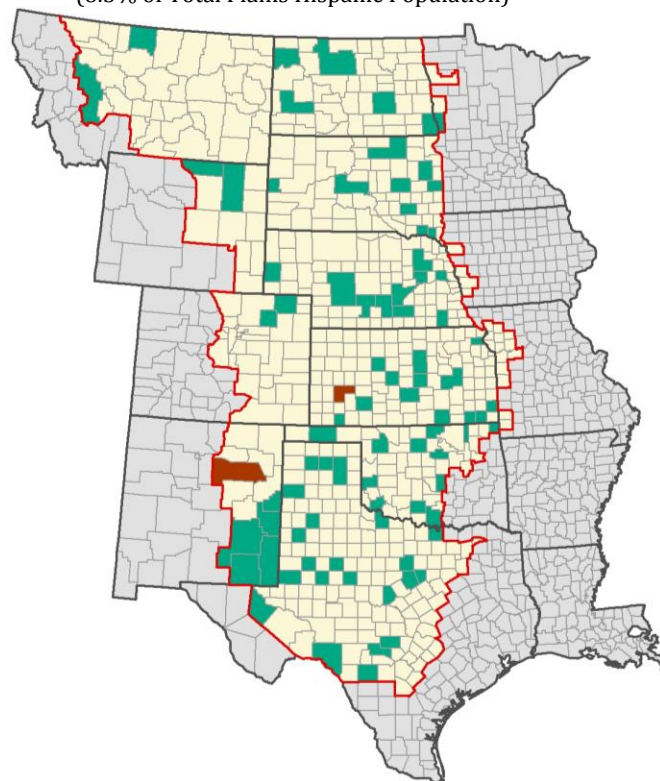
**Large Metropolitan Areas**  
(63% of Total Plains Hispanic Population)



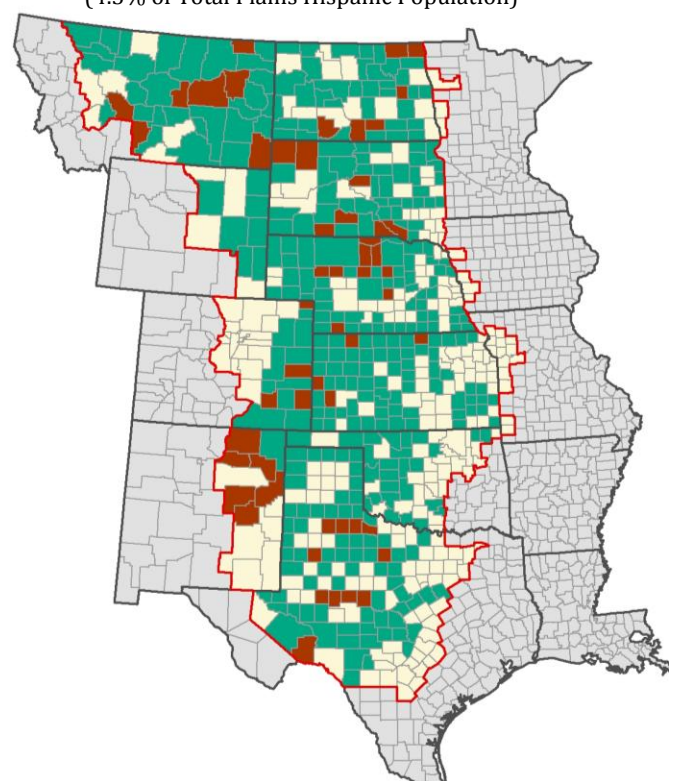
**Small Metropolitan Areas**  
(24% of Total Plains Hispanic Population)



**Micropolitan Areas**  
(8.5% of Total Plains Hispanic Population)



**Non- Metropolitan Rural Areas**  
(4.5% of Total Plains Hispanic Population)



Source: U.S. Census Bureau, 2001 2011 Population Estimates.

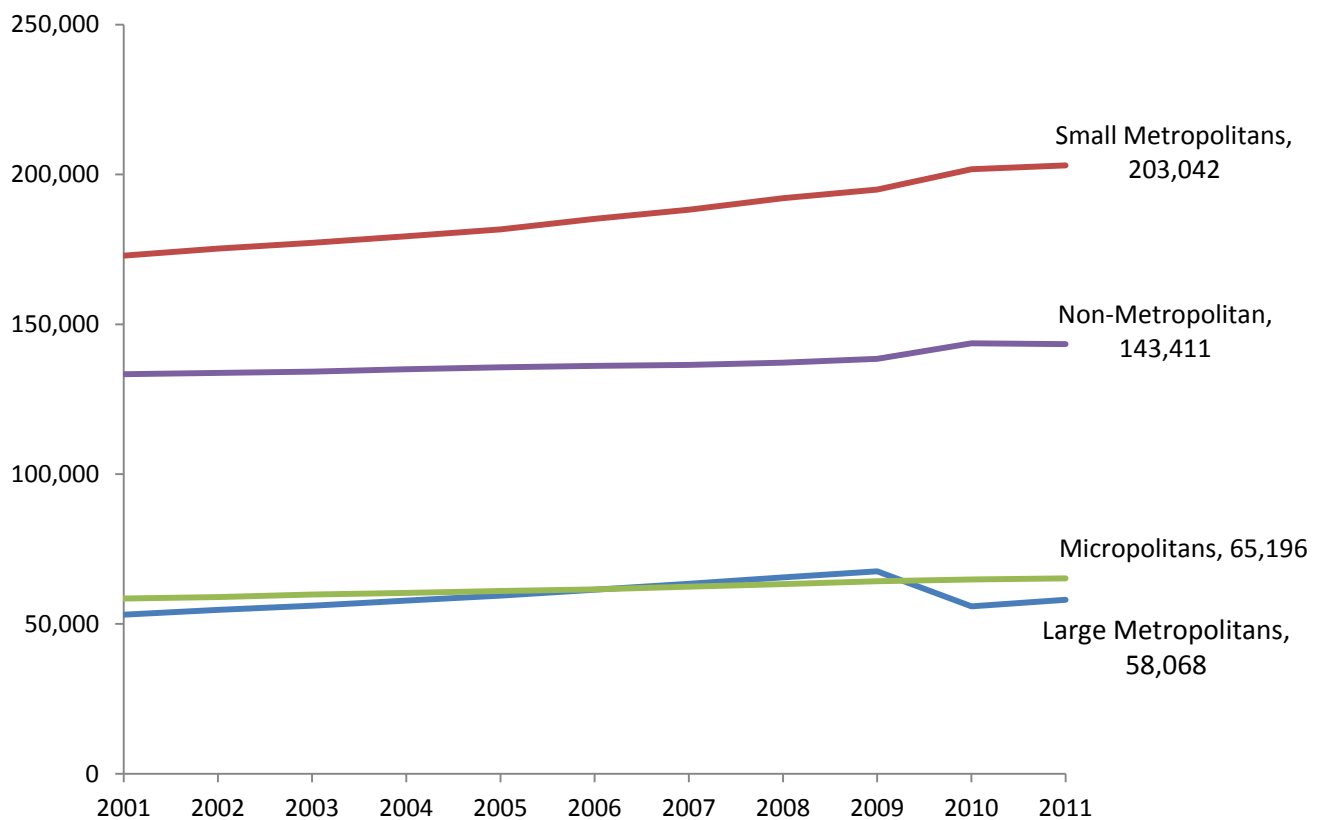
## Native Americans

Native Americans number roughly 470,000 in the Great Plains, making the region home to one fifth of the nation's Native American population. Nevertheless they constitute just 1.6% of the total population.

The Plains, as might be expected, also have a concentration of Native Americans about

twice the national average. The Native American population clusters largely in the region's non-metropolitan rural counties although their population grew fastest in the small metropolitan and micropolitan areas.

### NATIVE AMERICAN POPULATION ON THE GREAT PLAINS

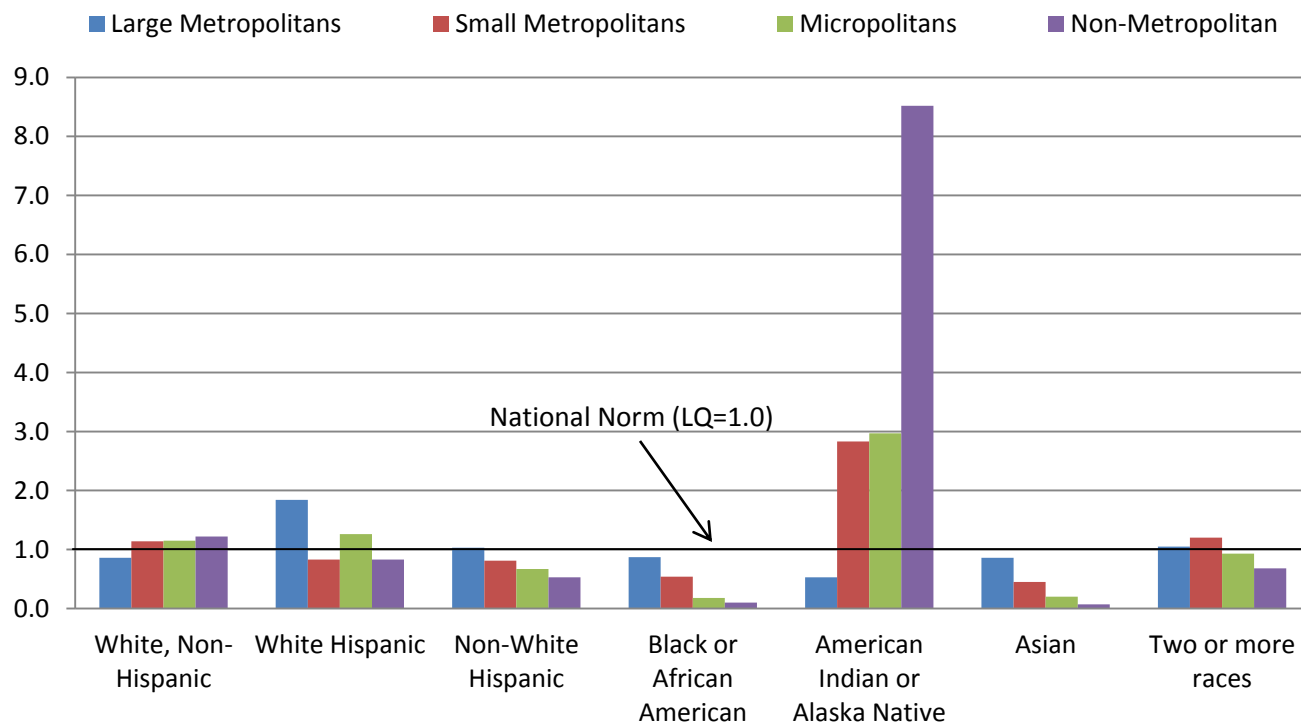


Source: U.S. Census Bureau, 2001-2011 Population Estimates.

*Native Americans number roughly 470,000 in the Great Plains, making the region home to one fifth of the nation's Native American population.*

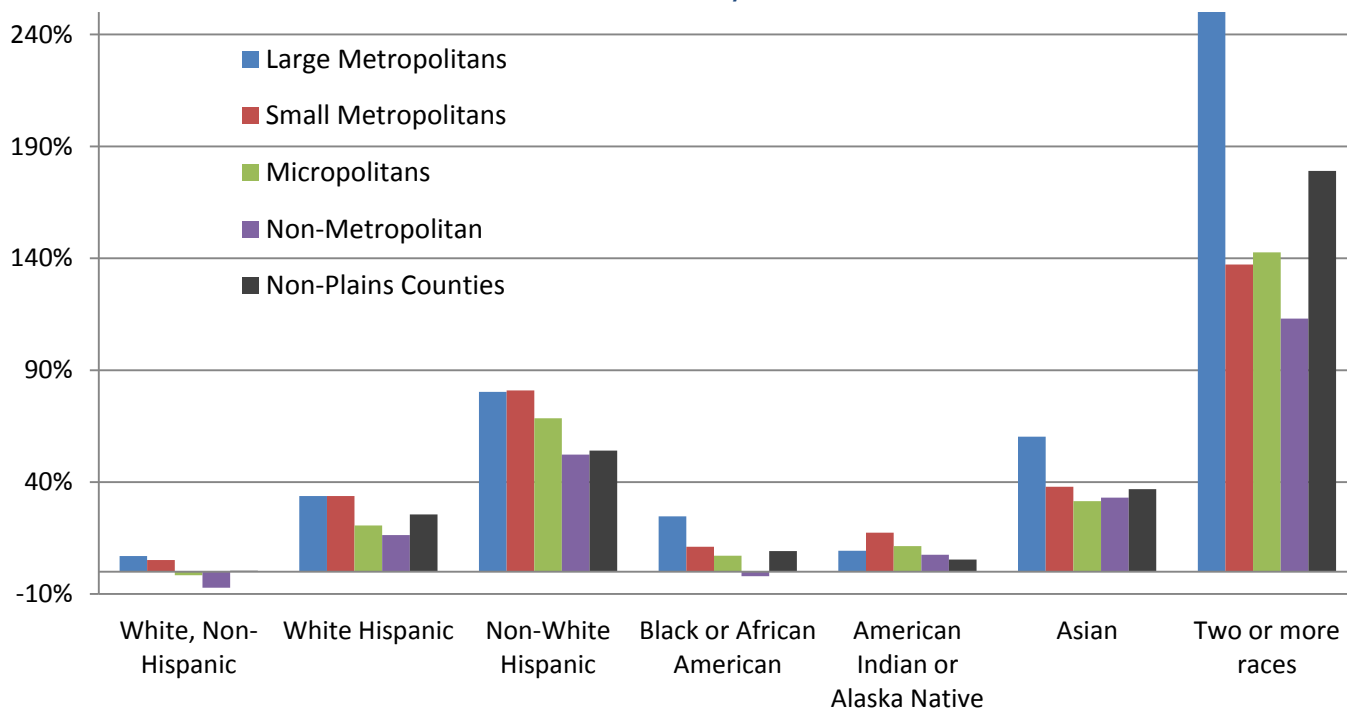


### RACE/ETHNICITY CONCENTRATION BY COUNTY TYPE, 2011



Source: Location Quotient (LQ) based on U.S. Census Bureau, 2011 Population Estimate.

### GROWTH RATE BY RACE/ETHNICITY, 2001-2011



Source: Analysis based on U.S. Census Bureau, 2001-2011 Population Estimates.

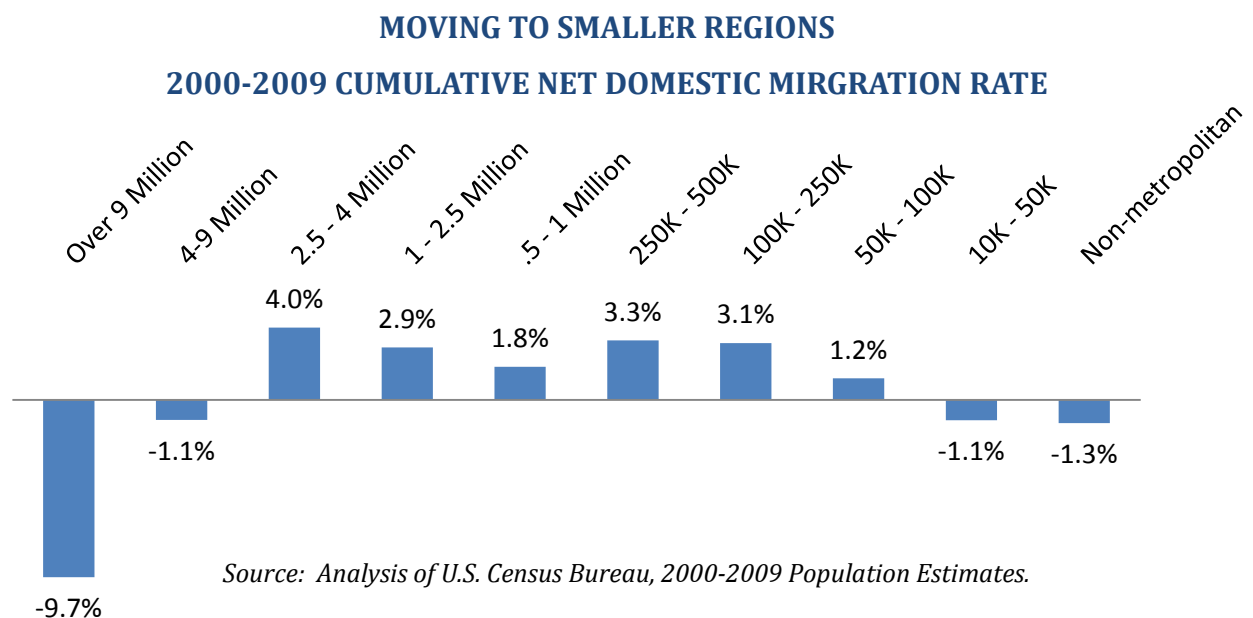
## Will the Plains Demographic Rebound Continue?

Many pundits predict that America's population growth will take place overwhelmingly in the densest urban centers, particularly concentrated along the coasts. Yet our study of demographic trends suggests that, nationwide, people are actually moving to less dense — although not usually remote — areas. This is not a move to small towns as much as to the larger towns and cities across the country, including in the Plains.

This rebound reflects the pattern first seen in the national outward movement to suburbs and exurbs. Over the past three decades the most rapid growth in rural America has taken place in the peripheries of major metropolitan areas. The desire for a more rural lifestyle has, ironically, transformed many once rustic areas into extensions of the suburbs. Between the 1970s and 2004, some four hundred former rural areas grew by 50 percent and are now home to over 70 million people.<sup>118</sup>

In his prescient 1978 book *The New Heartland*, author John Herbers recognized that the movement first to suburbs, then to the exurbs on the suburban fringes, represented something other than a “return to the land.” Traditional “boundaries” between rural and urban, small town and city, were breaking down into something new, “mostly a movement of a prosperous, adventurous middle class superimposed over small towns and countryside.”<sup>119</sup>

This trend appears to have accelerated during subsequent decades. Since 2000, according to the most recent census information, more than 2.7 million Americans have moved out of the largest cities. Much of the migration went to small (although not the very smallest) and midsize locations; a significant portion went to places with between 50,000 and 500,000 residents.<sup>120</sup>

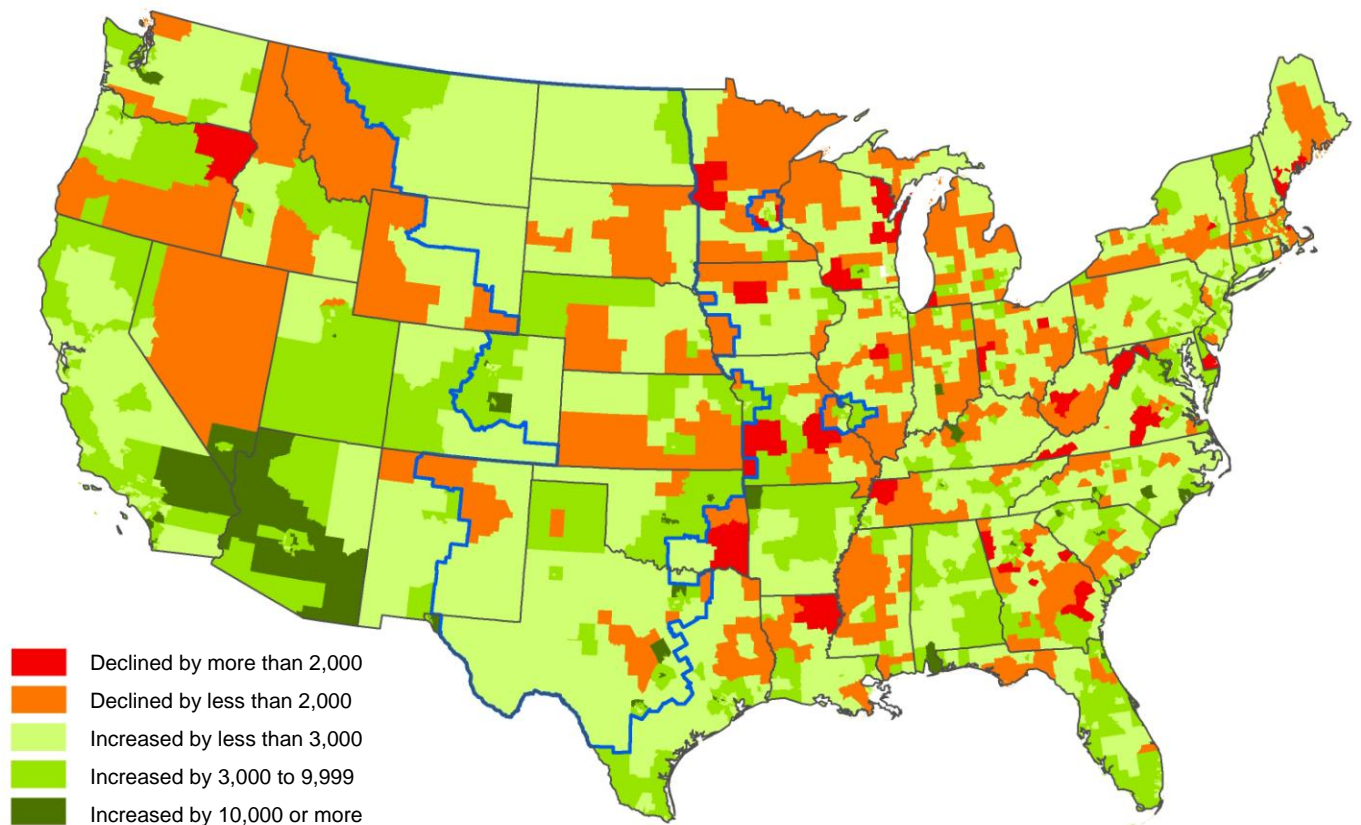


Migration patterns, notes demographer Ali Modarres, show that net migration has become more positive in large swaths of the heartland regions, including large parts of the Great Plains.

These changes mark a significant reversal in the relentless migration of large populations

into the very largest urban centers. Demographer Wendell Cox has described this process as “sprawl beyond sprawl.”

### NET MIGRATION BY PUBLIC USE MICRODATA AREA (PUMA)



*Note: Analysis includes only individuals who moved from one state to another within the past 12 months.*

*Source: U.S. Census Bureau, American Community Survey, 2010.*

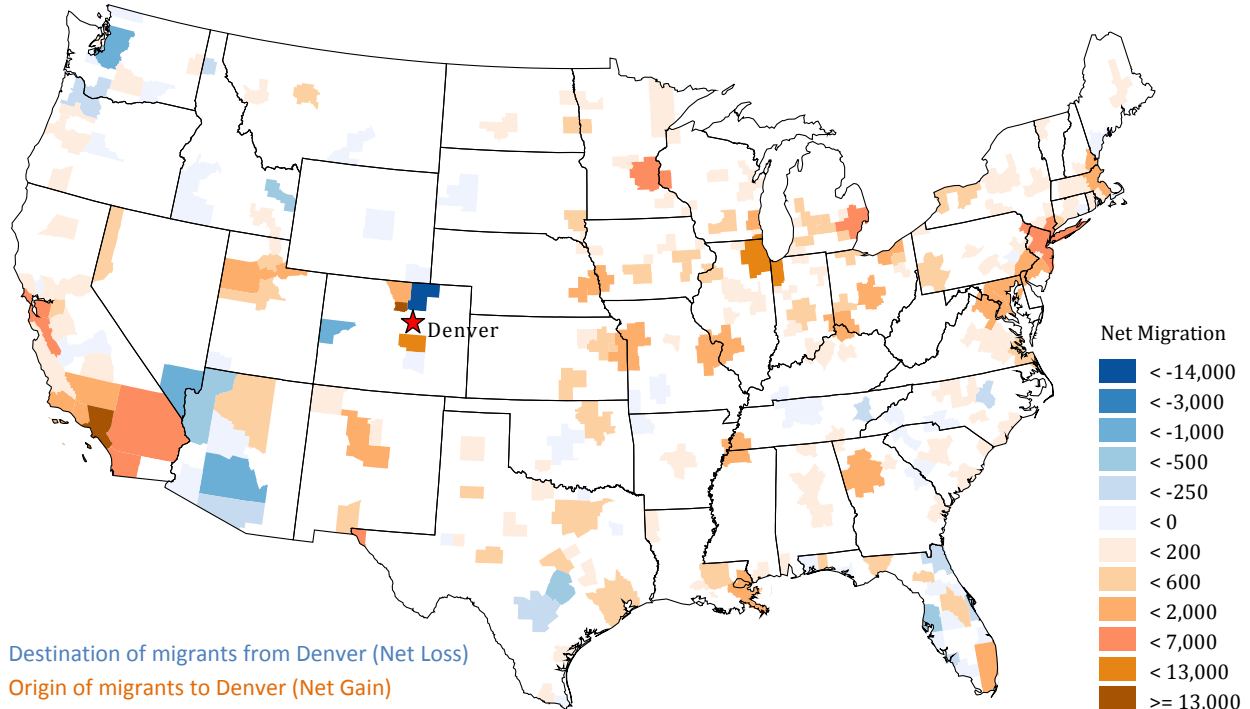
*...net migration has become more positive in large swaths of the heartland regions, including large parts of the Great Plains.*



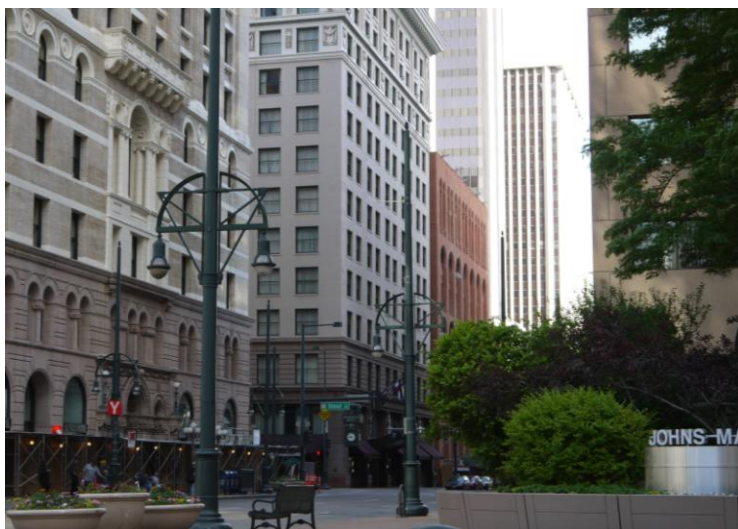
Such patterns are even more marked in the largest Great Plains metropolitan areas, particularly in those cities on the eastern and western fringe. Texas cities like Dallas and Austin do particularly well in net migration, drawing heavily from both coasts.

This same pattern can be seen in the greater Denver area. All of these emerging metros have enjoyed particularly strong gains from the coasts, particularly from the New York area, the San Francisco Bay Area, and greater Los Angeles.

### DENVER MSA NET MIGRATION SHED, 2000-2010



Source: Analysis of U.S. Internal Revenue Service data.



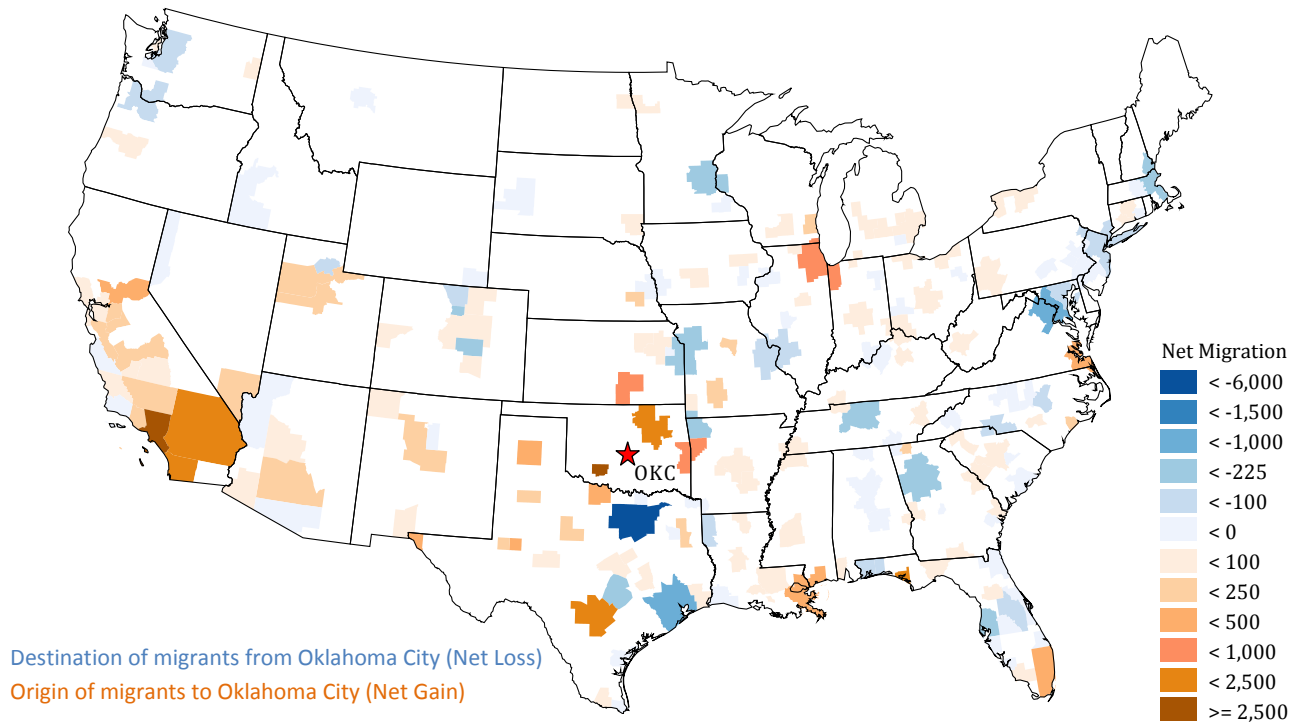
Denver, Colorado (TTU)

*...these emerging  
metros have enjoyed  
particularly strong  
gains from the  
coasts...*

Perhaps more revealing, these same patterns — albeit not quite as pronounced — can be seen in such major Great Plains metros as Oklahoma City, which has gained migrants both from the more rural hinterland and from

California. The former destination of Okies has now emerged as a major source of newcomers to this quintessential southern plains metropolis.

### OKLAHOMA CITY MSA NET MIGRATION SHED, 2000-2010



Source: Analysis of U.S. Internal Revenue Service data.



Oklahoma City, Oklahoma (TTU)

*The former destination  
of Okies has now  
emerged as a major  
source of newcomers...*

## *The Future of Plains Migration*

The movement to smaller cities is expected to grow in future decades. The urban ideal historically has not necessarily been the megacity, but rather what author Kirkpatrick Sale defined as “the optimum city” — an idea advanced in the past by such figures as Leonardo Da Vinci to Montesquieu and Rousseau — cities with 100,000 people or even less.<sup>121</sup>

Rather than an ever more crowded and concentrated America, we may well witness the revival of something akin to the network of vital smaller communities that characterized America in the 19th century. “The intelligence and the power are dispersed abroad,” de Tocqueville observed, “and instead of radiating from a point, they cross each other in every direction.”<sup>122</sup>

This growth will not likely take place in the most remote areas, but be concentrated in specific places, as it has always been. This was particularly true in the more arid southern plains, where the need to bring in water supplies forced the development of relatively small areas amid wide open spaces.<sup>123</sup>

In the 21<sup>st</sup> century, patterns of future demographic growth in the Plains will be driven by the need to concentrate critical infrastructure such as high-speed telecommunications and airports, cultural and, for an aging population, health care facilities. As cities such as Oklahoma City, Fargo, Sioux Falls, Midland, Lubbock and Omaha grow, smaller communities close to these

hubs will also expand, while those further away from roads, airports, and natural attractions will continue to diminish.

Even as more isolated smaller towns shrink and some marginal farmland is returned to nature’s domain, small cities are attracting returning residents and newcomers. College towns such as Lawrence and Manhattan in Kansas, Norman and Stillwater in Oklahoma, Lubbock in Texas and Grand Forks in North Dakota, for example, are attractive to those who seek intellectually stimulating work but in a lower key, small town atmosphere. Opportunities exist in such communities to both build a business and enjoy a more bucolic, low-key lifestyle.<sup>124</sup>

This new demographic paradigm will be spurred by technology. “Both individuals and corporations are beginning to define the meaning of space as opposed to being defined by that space,” suggests Ryan Mathews, a futurist who runs Black Monk Consulting in Eastpointe, Michigan. “You used to build cars in Detroit because that’s where the rail lines met, where you had access to massive supplies of coal and steel. So people would go to the city for that job. Now we’re not so dependent on infrastructure or we’re redefining what it means — now it’s high-speed lines and satellite links — so we’re moving beyond the industrial model, with economic activity diffusing from great population centers.”<sup>125</sup>

*The movement to smaller cities is expected to grow in future decades.*

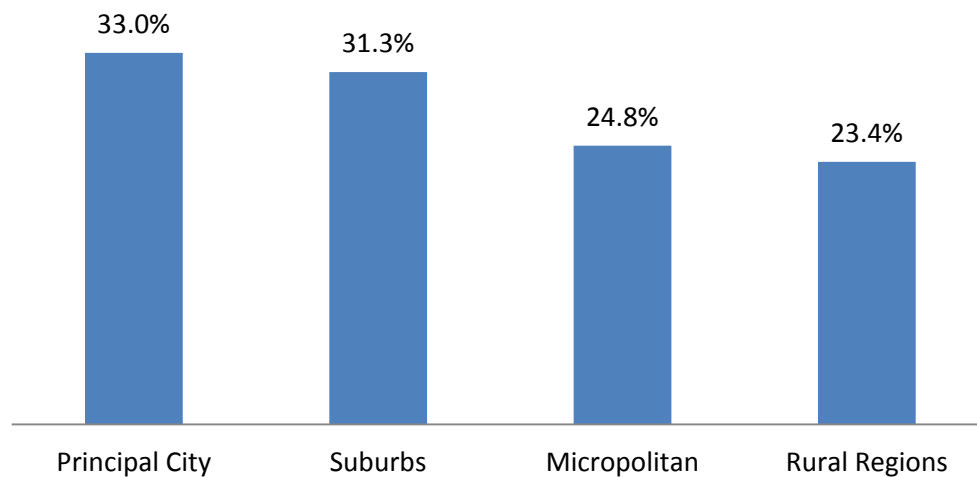
In the coming decades the impact on costs and congestion in big cities and along the coasts will drive more and more people into the Great Plains. Compared to most metropolitan areas, the cities and towns of the region boast remarkably reasonable housing costs.<sup>126</sup>

Quality-of-life considerations could play a decisive role in attracting newcomers to the Great Plains. Even young families, a demographic that has hitherto been leaving the region, could find the advantages compelling. Another pivotal group, baby boomers, may now be considering an “equity migration” from the coasts. Both kinds of households could enjoy significant capital gains and reduce debts, while still engaging in economic activities made possible by the Internet. An analysis of boomer migration shows that they are

a demographic that is opting for more rural alternatives as opposed to cities or even suburbs.

Beginning as far back as the Jeffersonian era, Americans have continued to express a desire for a low-key, small-town lifestyle. This remains the case today. Recent surveys reveal that as many as one out of three U.S. adults would prefer to live in a rural area, compared to some 20 percent who actually do live there. Another poll, conducted in 2008 by the Pew Research Center, found that a majority of Americans would actually prefer to live in rural areas or small towns, more than twice as many as opted for urban or suburban areas. More Americans, it appears, yearn to live in the countryside than in the city even though most will likely never get the chance.<sup>127</sup>

#### SHARE OF HOMEOWNERS PAYING MORE THAN 30% OF INCOME TOWARDS HOUSING, 2010



Source: U.S. Census Bureau, 2010 Decennial Census.

*... as far back as the Jeffersonian era, Americans have continued to express a desire for a low-key, small-town lifestyle. This remains the case today.*



Most Americans believe that rural areas epitomize traditional values of family, religion, and self-sufficiency and that they are more attractive, friendlier, and safer, particularly for children. These perceptions, interestingly enough, are also held by the majority of suburbanites and an only slightly larger proportion of rural residents. However exaggerated this image might be, it suggests that there is a large, mostly untapped population that would consider a move to a smaller community in the Plains.<sup>128</sup>

One large segment of rural newcomers may be returnees: people who left the plains or other rural areas as they entered adulthood, but would be inclined to return if opportunities were sufficient. Many natives of the Dakotas, for example, see themselves as enjoying a good quality of life, which is not just a reason to stay but also a reason to return.<sup>129</sup>



Wichita, Kansas (TTU)

*Most Americans believe that rural areas epitomize traditional values of family, religion, and self-sufficiency and that they are more attractive, friendlier, and safer, particularly for children.*







## Part Seven

# The Way Ahead

During the coming decades, the notion of the Buffalo Commons may seem as anachronistic as the pre-Columbian past it seeks to evoke. Restoring the natural environment where possible is no doubt a worthy idea, but many places in the Great Plains have not outlived their usefulness for human habitation.

These locations have been — and are likely to continue to be — rebounding in jobs, population, and income. Yet the fate of the region is not sealed. There are numerous positive steps the region should take to keep these trends going well into the future.

### ***Foster Economic Diversification in the “Brain Belt”***

Our analysis suggests that Plains communities need to diversify their economies, helping to move away from reliance on resource extraction. A resource boom is a good reason to invest in physical infrastructure to sustain growth, but investments to build ecosystems for innovation and entrepreneurship are equally as important.

Economic development agencies, educators, and the business community need to continue to actively collaborate to create partnerships across state lines. Economic development efforts should include an interrelated array of policies, programs and investments, falling into three major categories.<sup>130</sup>

- An entrepreneurial approach focusing on new business and technology-based development.
- Recruitment, expansion, or investments and other programs, directed towards international trade and export promotion.
- “Fertile soil” policies that encourage growth amongst almost any type of business by improving business climate, investing in infrastructure, or by providing a highly skilled work.

There already have been efforts in this direction. The Kansas Technology Enterprise Corporation, founded in 1987 and dismantled in 2011, was one early and most comprehensive science and technology initiative on the Plains. Several of KTEC’s programs, including university Centers of Excellence, Mid-America Manufacturing Technology Center, and the Angel tax credit programs continue, and will now be administered by the Kansas Department of Commerce.

North Dakota’s Centers of Excellence Program funds partnerships between North

Dakota campuses and businesses, invests in the infrastructure and research capacity at colleges and universities, and commercializes new ideas into products, skills and services that can create and attract new businesses and career-path jobs. The Red River Valley Research Corridor, spanning the border between North Dakota and Minnesota, coordinates science and engineering initiatives to help build private-public research networks. It serves as an innovation broker to bring researchers together with technology innovators from inside and outside the region.

Nebraska’s Business Innovation Act of 2011 includes grants to small businesses for prototyping new products, and support for commercialization of a product or process, including market assessments and strategic planning. The act also provides funding for businesses to establish partnerships with universities for applied R&D of new products, or to use intellectual property generated at a public college or university.

The history of Texas as a global leader in science and technology began in 1958, when Jack Kilby of Texas Instruments invented the first integrated circuit and laid the foundation for a \$200 billion industry. Today, the Texas Emerging Technology Fund promotes and finances commercial projects that promise to produce medical or scientific breakthroughs or are likely to lead to high-quality new jobs.

*Economic development efforts should include an interrelated array of policies, programs and investments...*



The Great Plains is a relatively “undiscovered” hotspot for science and technology-based development. The region has long boasted better education scores than most coastal states. Recently the growth of technology corridors, including around Winnipeg, the Red River Valley, Sioux Falls and in parts of the Texas prairie are putting the spotlight on America’s new heartland of innovation.

The challenge for the future will be to build on the region’s existing and emerging opportunities while ensuring that the benefits accrue as broadly as possible. This will require investments in education, training and infrastructure and the creation of networks around new technologies in the traditional plains strengths in agriculture, manufacturing and energy.



Denver, Colorado (TTU)

*The challenge for the future will be to build on the region’s existing and emerging opportunities while ensuring that the benefits accrue as broadly as possible.*

## *Communities for Immigrants, Returnees and Educated Migrants*

New migration to the Plains is critical to the area's future. For a generation, the plains narrative about migration has been about trying to keep people from leaving. Now that many parts of the region are becoming destinations for new residents, increasing employment opportunities has become the most important factor for attracting and retaining new migrants. Local leaders need to maintain housing affordability by monitoring local supply and by ensuring that local policies do not artificially increase housing costs. Social infrastructure, such as schools, must also be maintained, along with systems to help integrate new immigrants, and childcare.

Easy access to open spaces, natural amenities, and efficient communities with reasonable commutes are critical lifestyle advantages for the Great Plains. Communities need to preserve these pastoral advantages as towns and cities expand.

In recent decades many Plains towns and cities allowed their central cores to deteriorate. These centers also must be maintained if the area is to be appealing, particularly to those coming from larger metropolitan areas.



Liberal, Kansas (TTU)

*Social infrastructure must also be maintained along with systems to help integrate new immigrants...*



## ***Upgrade Basic Infrastructure***

Due to its relatively low density, the Plains region needs quicker and more efficient access to markets. A robust natural resources and manufacturing economy will only put further stress on road, rail, and pipeline infrastructure systems.

Energy suppliers, for example, need greater investment in pipelines and rail cars. The state of Wyoming, for example, already initiates nearly one quarter of all rail tonnage transported

in the U.S. New pipeline infrastructure is coming in line, yet the system remains strained, particularly in the northern plains. A lack of other transport options is putting additional pressure on road and rail systems.

Agricultural producers also need easier conveyance to key markets, both to the coasts and to overseas markets, particularly to Asia. The pending expansion of the Panama Canal offers new potential for worldwide exporting.



Amarillo, Texas (TTU)

*Due to its relatively low density, the Plains region needs quicker and more efficient access to markets.*

## ***Maintain Skills Training and Workforce Education***

The Great Plains faces a somewhat different economic situation than the rest of the nation. As the nation generally struggles with unemployment and underemployment, robust growth and strong income gains have placed considerable strain on the region's workforce. Employers are often faced with extreme difficulties in finding the workers they need.

Education, skills training and workforce development have become the epicenter of economic development. Growth now depends on the decisions that individual entrepreneurs and skilled workers make about where to live and work. A 21<sup>st</sup> century talent pool is an essential ingredient of innovation-driven business ecosystems, and is linked to efforts mentioned above about diversifying the economy.

One example of how personalized, anytime/anywhere education and training can be delivered is the Great Plains Interactive Distance Education Alliance (IDEA). Founded in 1994, IDEA capitalizes on the institutional resources of 11 major research universities to sponsor graduate education programs using distributed learning technologies.

IDEA's University partners include Colorado State University, Iowa State University, Kansas State University, Michigan State University, University of Missouri, Montana State University, University of Nebraska, North Dakota

State University, Oklahoma State University, South Dakota State University, and Texas Tech University. The Alliance offers fully online graduate coursework and program options in high-demand professional fields in the Human Sciences.

AG\*IDEA, an affiliate of the Great Plains IDEA, expands this concept to a national level through a consortium of 20 universities offering programs and courses in agriculture disciplines. AG\*IDEA, like IDEA, allows institutions to work together in graduate programs. This efficient sharing of resources — critical in less densely settled regions like the Plains — enhances the teaching experience for faculty and, most importantly, enriches the learning experience for students.

Workforce and economic development agencies, educators and trainers, and the business community need to continue to actively collaborate to share information and create partnerships across state lines. Private businesses must be open to working with training and placement agencies to communicate their needs, and regional governments must be open to creating more flexible funding sources for specialized training. Educational institutions are beginning to use the ample labor market data available to tailor programs to fit the need of the region's economy.

*...robust growth and strong income gains have placed considerable strain on the region's workforce.*



## ***Continue to Foster Regional Collaboration***

Many of the innovations leading to successful business ventures or government initiatives will be the product of assembled resources. Collaboration among private and public organizations is necessary to provide the infrastructure and coordinated action needed to compete, including the finance tools involving public-private partnerships.

Two collaborative regional initiatives that span the entirety of the Great Plains are now underway: The Ports-to-Plains Alliance on the western edge, and the International Mid-Continent Trade Corridor on the eastern edge. These initiatives are focused on transportation and trade, but also inherently include both advocacy and networking functions.

### **Ports-To-Plains Alliance**

The Ports-to-Plains Alliance includes three congressionally designated High Priority Corridors on the National Highway System. Ports-to-Plains, Heartland Expressway and Theodore Roosevelt Expressway form the backbone, with direct connections to five additional corridors. The Alliance, based in Lubbock, Texas, represents a nine-state, 2300-plus mile economic development corridor between Texas, and Alberta, Canada.

The Ports-to-Plains Trade Corridor represents more than just a road. It aims to establish a network of people who share an interest in the robust growth of jobs and investment throughout North America's heartland in the new century. The coalition helps

communities market themselves as part of a major economic region driven not only by legacy industries, but by advanced manufacturing, biotechnology, biofuels, wind power, and clean energy technologies.

### **International Mid-Continent Trade Corridor**

The International Mid-Continent Trade Corridor links highways in Mexico, the United States, and Canada. This super-corridor uses existing highways, such as the Interstate 35 from the Mexican border at Laredo, Texas, to the Canadian border north of Duluth, Minnesota.

The North America Corridor Coalition (NASCO) is a public/private alliance that works to advance economic development and security through the North American heartland in transportation innovation and security, energy efficiency and logistics, and workforce development. Spanning almost 2,500 hundred miles through the central United States, Canada, and Mexico, the NASCO trade corridor connects 71 million people and supports a large part of \$1 trillion in total commerce between the three nations. NASCO has also established the North American Inland Port Network to advance the operations of inland ports along the corridor.

Critics of these and other regional alliances claim that the initiatives circumvent the national sovereignty of the three North American countries. Yet the alliances offer a compelling vision of how best to maximize continental realities through creating shared economic

opportunity throughout the region by lowering transportation costs, and by connecting business and public leaders. Such efforts are critical to make the Great Plains a force in the global economy.

Collaboration comes in many forms, but the common thread is the mobilization and

empowerment of many to accomplish shared goals and objectives. Regional leadership based on networks rather than hierarchy can drive an ongoing conversation about regional issues and then help catalyze those initiatives by bringing the right people together.<sup>131</sup>

### REGIONAL TRADE CORRIDORS



## ***Conclusion: The Plains and the Expansive Character of American Life***

Despite significant challenges, the Great Plains states and communities remain well positioned to grow and prosper over the coming decades.

The resource boom on the Great Plains is likely to continue (with perhaps an occasional slowdown) as developing countries demand more food, fiber, energy and manufactured goods. Yet the region's appeal and future prosperity rests on far more than such assets as open land, ample resources, and lower costs. The area's appeal lies deep in that part of the American character that

seeks access to open spaces, and looks for opportunities where until recently there were few. As Frederick Jackson Turner noted over a century ago, "He would be a rash prophet who should assert the expansive character of American life has now entirely ceased."<sup>132</sup>

The Great Plains region has already proved to be anything but "the great American desert." As we move into the 21<sup>st</sup> century, it destined to once again take its role at the center stage of American aspiration, innovation and progress.



Alliance, Nebraska (TTU)

*The area's appeal lies deep in that part of the American character that seeks access to open spaces, and looks for opportunities...*



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