2014 South Dakota Ag Economic Contribution Study

Prepared for: SOUTH DAKOTA DEPARTMENT OF AGRICULTURE

Prepared by: Decision Innovation Solutions™
Bridging Your Research Needs.

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Table 1, Acronyms

Acronym	Description
USDA	United States Department of Agriculture
USDA/NASS	United States Department of Agriculture, National Agricultural Statistics Service
USDA/ERS	United States Department of Agriculture, Economic Research Service
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
GDP	Gross Domestic Product
GSP	Gross State Product

Executive Summary

The results of this analysis show that agriculture is a critical component of South Dakota's overall economic well-being. South Dakota agriculture is connected to a large integrated set of industries – from the production of agricultural commodities to food and feed processing to agricultural input manufacturing and many other ag-support industries. The results of the analysis indicate that diminishment or removal of any one of them will likely cause significant negative impacts to the others.

This study is based on a combination of datasets from the 2012 Census of Agriculture, USDA/Risk Management Agency[1], and the IMPLAN modeling system. The analysis also shows that South Dakota has an agricultural resource base that continues to grow with and support the state's economy at large, primarily due to its integration across all sectors of the economy. Given the vitality of South Dakota's agricultural industries, it is reasonable to assume that South Dakota's agricultural base has room for continued growth and will remain a key part of the state's economic well-being.

Key Findings

- In 2012, total production agriculture and ag-related industries accounted for **$25.6 billion**, or more than **30 percent** of South Dakota's total output.
- Farming provides the base for a variety of agri-food industries, including food processing and the manufacture of farm machinery, chemicals and fertilizer. Taking those jobs into account means that in 2012, production agriculture and ag-related industries accounted for **115,651**, or **1 in every 5** jobs in South Dakota.
- Crop farming is a significant part of agriculture's economic contribution. Statewide output attributed to crop production and further processing is more than **$13.3 billion** and is responsible for **70,104 jobs**.
- Livestock farming is also a significant part of agriculture's economic contribution. Statewide output attributed to livestock production and further processing is just under **$8.6 billion** and is responsible for **30,303 jobs**.
- **37** of South Dakota's counties derive **at least one half** of their total output from ag and ag-related industries.
- **34** of South Dakota's counties derive **at least one third** of their total jobs from ag and ag-related industries.

[1] Due to the drought of 2012 in South Dakota, many South Dakota counties had significant crop insurance indemnities. To account for this, 2012 actual crop insurance indemnities by county were added to county crop sales as reported by the 2012 Census of Agriculture. Please visit this link for background on the implications of insurance indemnities on agricultural statistics: https://www.sdstate.edu/econ/commentator/upload/No549.pdf

- **26** of South Dakota's counties derive **at least one fourth** of their total jobs from the crop and crop processing industries.
- **26** of South Dakota's counties derive **at least one fifth** of their total output from the livestock and meat processing industries.

Background

The 2014 South Dakota Ag Economic Contribution Study is patterned after similar analyses done in Iowa in 2005, 2009 and 2014 (forthcoming). This analysis used the same methodology and estimating procedures as these studies in Iowa. The study relies heavily on data from the 2012 Census of Agriculture and the IMPLAN modeling system.

The IMPLAN system is a generalized social accounting system that tracks the purchases and sales of commodities between industries, businesses and consumers. Successive rounds of transactions stemming from an initial economic event, such as the production of agricultural commodities, are added together to provide an estimate of direct, indirect consumer-related and total effects of the activity

The intent of the study has been to develop an understanding of the current economic importance of South Dakota agriculture and the industry contributes to South Dakota's economy. The following subsections provide important context for the state of agriculture in South Dakota.

South Dakota Agriculture

South Dakota is currently ranked the #1 state in the nation for bison inventory, oat production, and sunflower production. Those, along with the following rankings, show South Dakota's ability to produce a diverse mix of various crops and livestock. These rankings demonstrate the importance of South Dakota to help feed, clothe, and fuel those beyond South Dakota's borders. According to 2013 data from the USDA/National Statistics Service, South Dakota is currently ranked in the top five states for[2]:

- Lamb crop inventory
- Proso millet production
- Flaxseed production
- Honey production
- Production of sorghum for grain
- Calf crop inventory
- Production of alfalfa hay
- Spring wheat production
- Beef cow inventory
- Land in farms
- Production of sorghum for silage

South Dakota Farm Demographics

According to the 2012 Census of Agriculture[3], there were 31,989 farms in South Dakota in 2012 (see Table 2). This was a net increase of 820 (2.6%) from 2007. These farms make up a total of 43,257,079 acres in South Dakota. The average size of a South Dakota farm in 2012 was 1,352 acres, which was 49 acres less than an average South Dakota farm in 2007.

[2] http://quickstats.nass.usda.gov/
[3] http://www.agcensus.usda.gov/

Table 2, Historical Census of Agriculture Data (USDA)

	2012	2007	2002	1997
Number of South Dakota Farms	31,989	31,169	31,736	33,191
Average South Dakota Farm Size (acres)	1,352	1,401	1,380	1,330
Market Value (per farm)				
Land and Buildings ($)	$ 2,281,026	$ 1,255,332	$ 618,651	$ 473,015
Machinery and Equipment ($)	$ 241,388	$ 155,652	$ 107,376	$ 89,285
Farm Products Sold ($)	$ 317,929	$ 210,801	$ 120,829	$ 110,395
Livestock Inventory				
Cattle and Calves	3,893,251	3,687,728	3,695,877	3,710,629
Beef Cows	1,610,559	1,649,492	1,694,091	1,662,162
Milk Cows	91,831	86,243	84,080	96,712
Hogs and Pigs	1,191,162	1,490,034	1,375,506	1,394,357
Laying Chickens	2,450,780	2,920,799	2,226,368	2,180,516
Broiler Chickens	144,015	272,986	321,260	291,387
Cattle and Calves Sold	2,567,027	2,745,227	2,707,872	2,449,587
Hogs and Pigs Sold	3,914,312	4,487,708	3,773,503	2,610,493
Production				
Corn for Grain	480,330,680	518,552,101	295,166,830	
Wheat for Grain	100,675,153	141,003,068	42,413,607	
Oats for Grain	4,525,084	8,758,284	5,717,330	
Soybeans	130,534,273	130,377,538	126,607,265	

The Census of Agriculture defines “farm” as any operation that produces for sale at least $1,000 worth of agricultural commodities, or would produce $1,000 worth of primary agricultural commodities for sale in a normal year. The definition is based on expected sales (or value attached thereto) rather than ownership or various operating characteristics. In the 2012 Census of Agriculture there was a new categorization of what types of farms are in operation throughout the nation. Specifically, the USDA has categorized farms according to the operation’s legal status for tax purposes:

Operation Type
Corporation (excluding family held)
Corporation, family held
Family & Individual
Institutional, Research, Reservation, and Other
Partnership

Using the typology structure above, Figure 1 and Figure 2 illustrate how these various farm types break out. As shown, at both the state and national levels the majority of farms are in the category Family & Individual. As shown, corporations are split into family held, and non-family held. The majority of farms classified as corporations are still family held operations.

Figure 1, South Dakota Farms, by Operation Type

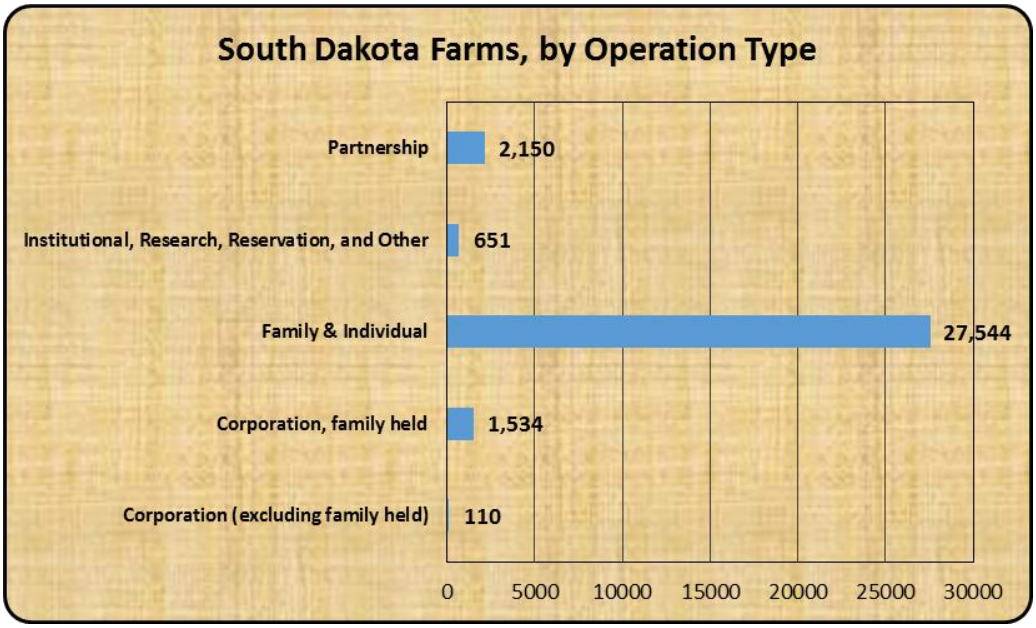
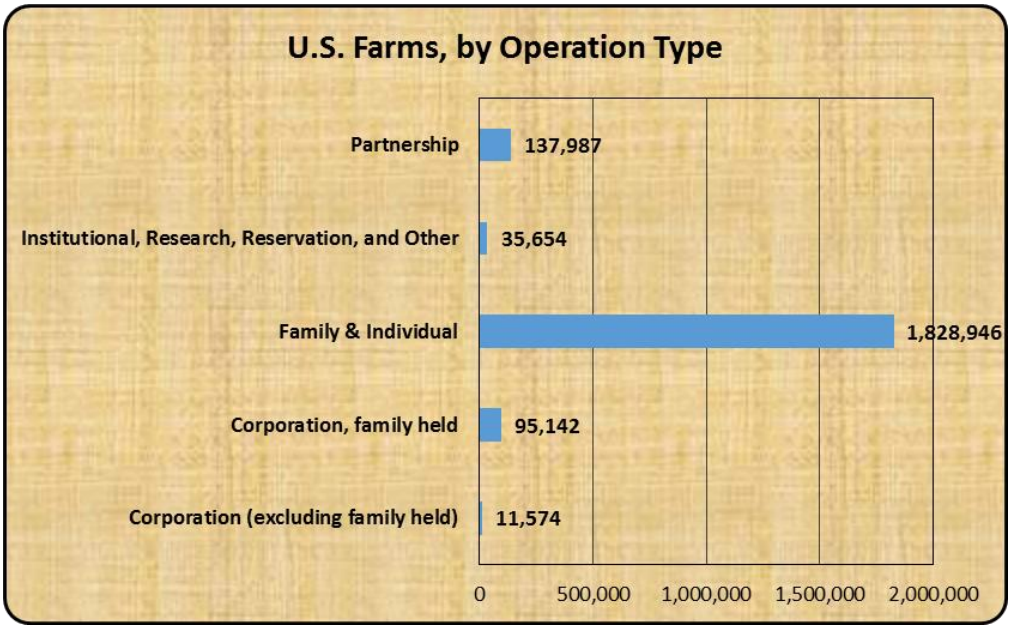


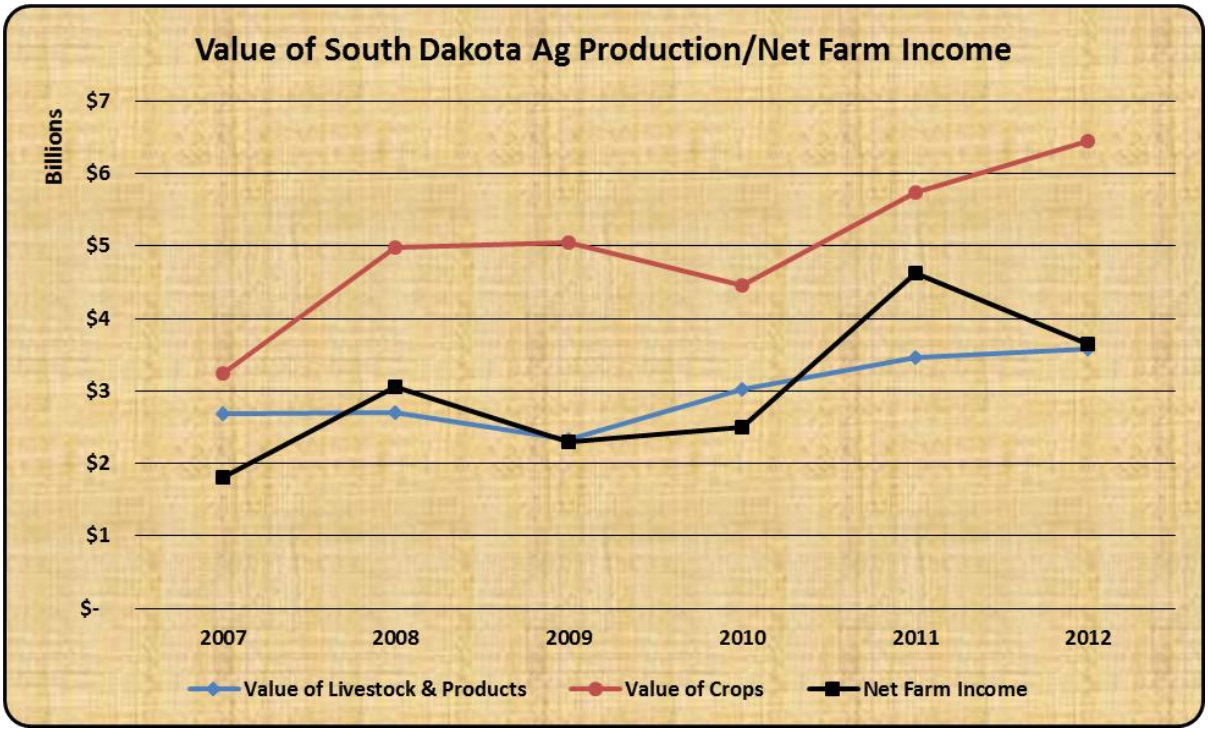
Figure 2, U.S. Farms, by Operation Type



Technology at both the farm and agribusiness levels have led to a steady decline in the share of employment devoted to the production and conversion of commodities grown in the state. However, while the share of employment directly related to agriculture has decreased over

time, the value of agriculture continues to increase, illustrating a long-standing continuous change in the structure of South Dakota agriculture. Figure 3 shows South Dakota data regarding the sales value of crops and livestock and what these sales have translated to in terms of direct value-added for the years 2007-2012. Using these data from the USDA, Economic Research Service[4], net farm income increased from about $1.8 billion in 2007 to $4.6 billion in 2011, but then fell to $3.6 billion in 2012. This overall five-year increase shows a very significant change in a short period of time.

Figure 3, Value of South Dakota Ag Production/Net Farm Income



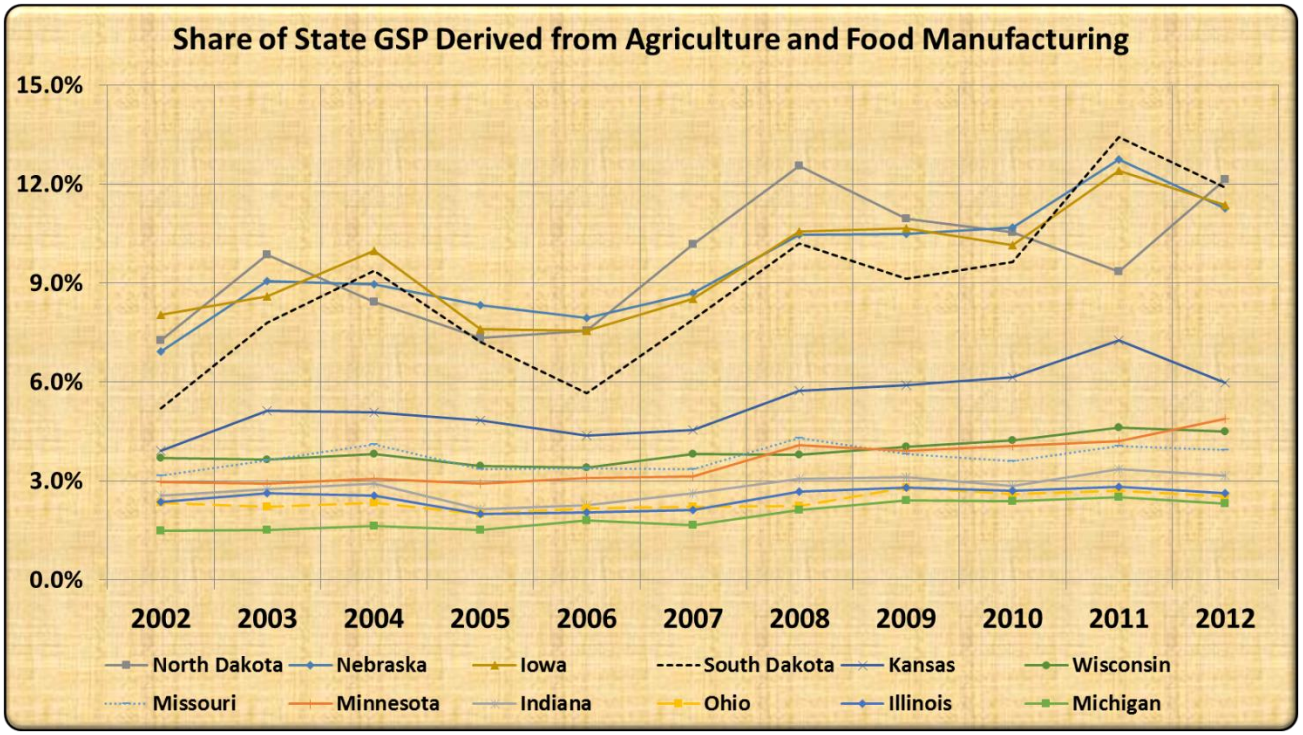
While net farm income can be high at times, farming in general reflects a substantial capital investment. The 2012 Census of Agriculture reports a per-farm average market value of land and buildings on South Dakota farms of $2.28 million. Per-farm market value of machinery and equipment in 2012 was $241,388. These state level per-farm averages compare to a national average of $1.08 million for land and buildings and $115,706 for machinery and equipment. These 2012 average figures at the state level represent a significant increase over 2002 levels. This increase in capital investment represents the potentially risky nature of farming.

[4] http://www.ers.usda.gov/data-products/farm-income-and-wealth-statistics/value-added-years-by-state.aspx#Pd848aa3774e94058a95e3032f5cfba58_6_103iT0R0x41

Share of Gross State Product (GSP) Derived from Ag Production and Food Manufacturing

In addition to the knowledge that net farm income in South Dakota has shown strong increases recently, a comparison among other Midwestern states is also instructive. In an effort to standardize a comparison of net farm income across states, data from the Bureau of Economic Analysis (BEA) were used to show the relative share of GSP derived from Ag production and food manufacturing[5]. Figure 4 shows historical figures from 1997-2013 for twelve Midwestern states. As shown, South Dakota's share of GSP derived from Ag production and food manufacturing has fluctuated from a high of 13.4 percent in 2011 to a low of 5.2 percent in 2002.

Figure 4, Share of State GSP Derived from Agriculture and Food Manufacturing



In South Dakota, ag production generated 10.49 percent of GSP in 2012 for the second highest proportion in the nation. Food manufacturing generated 1.41 percent of South Dakota's 2012 GSP. Together, ag production and food manufacturing generated 11.91 percent of South Dakota's GSP, which was the second highest share nationwide. For comparison to other U.S. regions, Appendix A shows 2012 data for all states.

While these statistics indicate that South Dakota was not the second largest producer of raw ag commodities and processed food in the nation, they do show that South Dakota had the second

[5] Gross Domestic Product by State: http://www.bea.gov

largest proportion of any state's economic product directly generated through the production and manufacturing of food during 2012.

Grains, Oilseeds, Livestock and Poultry

The grains and oilseeds category along with cattle dominate South Dakota production of primary agricultural commodities.

Table 3 shows that these commodities consistently account for 89 percent of South Dakota farm marketing receipts.

Table 3, South Dakota Farm Sales by Source

	2012	% of 2012 Total	2007	% of 2007 Total	2002	% of 2002 Total	1997	% of 1997 Total
Total Sales ($1000)	10,170,227,000		6,570,450,000		3,834,625,000		3,664,129,000	
Average per farm	317,929		210,801		120,829		110,395	
Grains, Oilseeds, Dry Beans and Dry Peas ($1000)	6,072,922,000	60%	3,383,497,000	51%	1,575,910,000	41%	1,744,438,000	48%
Livestock, Poultry and their products ($1000)	4,097,304,000	40%	3,186,953,000	49%	2,258,715,000	59%	1,919,692,000	52%
Poultry and Eggs ($1000)	182,076,000	2%	140,798,000	2%	70,820,000	2%	73,683,000	2%
Cattle and Calves ($1000)	2,968,996,000	29%	2,307,618,000	35%	1,693,838,000	44%	1,333,193,000	36%
Milk and Other Dairy Products from cows ($1000)	374,490,000	4%	279,765,000	4%	156,498,000	4%	167,213,000	5%
Hogs and Pigs ($1000)	446,756,000	4%	381,360,000	6%			282,598,000	8%

Methodology

The 2014 South Dakota Ag Economic Contribution Study was completed with a combination of the 2012 Census of Agriculture, the IMPLAN modeling system (2012 data), SAS (Statistical Analysis System), and Microsoft Excel 2013. Results from this analysis are presented using common economic terms. The economic terms are:

- **Output**
  - The most broad measure of economic activity – sometimes referred to as "sales"
- **Employment (Jobs)**
  - A measure of job positions without regard to whether they are full-time equivalents
- **Value-Added**
  - A combination of Labor Income (defined below), Other Property Type Income, and Tax on Production and Imports
- **Household Income**
  - Income from all sources that accrues to individuals as payment for personal employment (earnings or labor income), payment for ownership interests or capital provision (dividends, interest, and rents), or as transfer payments (payments to individuals for which nothing is offered in return)
- **Labor Income**
  - The sum of Employee Compensation (work for hire) and Proprietor Income (self-employed) and is a *sub-component* of value-added.

Due to the large number of sectors available for analysis within the IMPLAN modeling system (440), a degree of aggregation was undertaken to better understand the contribution of agriculture to each of South Dakota's counties relative to other important South Dakota industries. In all, there are 58 sectors identified as being related to agriculture, some of which are not present in South Dakota (i.e., Tobacco Farming and Cotton Farming). In some cases (production agriculture sectors), the 2012 Census of Agriculture was used to calibrate the IMPLAN data for greater accuracy. The rest of South Dakota's industries were aggregated into fourteen key non-ag industries in South Dakota.

Upon identification of the 58 IMPLAN agricultural sectors, they were further aggregated into three broad agricultural classes: **Crops, Livestock, and Other Agriculture**. Examples of *some* sectors included in each of these broad classes are listed below. A summary of Non-Agricultural Sectors is also provided.

- **Crops**
  - Oilseed Farming, Grain Farming, Vegetable and Melon Farming, Greenhouse, Nursery, and Floriculture Production, Forest Nurseries, Forest Products, and Timber Tracts, Logging, Flour Milling and Malt Manufacturing, Wet Corn Milling, Soybean and Other Oilseed Processing, and Fruit and Vegetable Canning, Pickling, and Drying.
- **Livestock**
  - Cattle Ranching and Farming, Dairy Cattle and Milk Production, Poultry and Egg Production, Animal Production (Except Cattle and Poultry and Eggs (Hogs)), Fishing, Hunting and Trapping, Fluid Milk and Butter Manufacturing, Cheese Manufacturing, Animal (Except Poultry) Slaughtering, Rendering, and Processing, and Poultry Processing
- **Other Agriculture**
  - Support Activities for Agriculture and Forestry, Other Animal Food Manufacturing, Fats and Oils Refining and Blending, Breakfast Cereal Manufacturing, Frozen Food Manufacturing, Fertilizer Manufacturing, Pesticide and Other Ag Chemical Manufacturing, Farm Machinery and Equipment Manufacturing, and Veterinary Services
- **Non-Agricultural Sectors**
  - Construction, Entertainment, Financial, Government, Households, Information, Manufacturing, Mining, Remainder (all IMPLAN sectors not included elsewhere), Retail, Services, Transportation, Utilities, and Wholesale

In general, the methodology for this analysis is patterned after a similar analysis completed in Iowa in 2005[6]. Several data sources and software have been used to estimate what ag and ag-related industries contribute to each study area. This South Dakota reports data from 67 study areas: 66 counties and the State of South Dakota.

There can be considerable discussion (and often disagreement) regarding the blurred lines between production agriculture, processing, and retail, and how agriculture should be appropriately defined. Agriculture, or the agri-food system, is variously defined as including only farm-level production; as including farm-level production, input manufacturing, and food processing; or, from the farm-to-plate perspective, which would include distribution and retail. Because of the ability of commodities to easily be produced in one state and processed and/or manufactured in another, these distinctions can be complicated by questions of which values and activities should properly be credited to the subject-area economy.

[6] Much of the description of methodology in this section and justification for utilizing the same is borrowed from an Iowa report produced by Iowa State University in 2005. (http://www2.econ.iastate.edu/outreach/agriculture/agri-food/State_Report.pdf)

While there is room for discussion as to what rightly should and should not be included as parts of the agri-food sector, there are few arguments that its inclusion should be strictly limited to farming or primary commodity production. This is because in its most basic form, the agri-food system depends upon activities that produce primary agricultural commodities, which takes place at the farm level.

The "farm-to-plate" definition of the agri-food system opens the door to questions of both scope and identification. Discussions regarding the scope of the definition of the agri-food system break down into two basic questions:

1. To what point are activities driven by agriculture? In other words, at what point are the activities more appropriately tied to the consumers?
2. What portion of individual economic activities is actually agriculture-related?

With respect to the first of these issues, in general, basic food processing takes place close to production. Grain milling and livestock slaughter reduce the size of the commodity packages that must be shipped from producer to consumer. Where different components of the commodity are bound for different consumer populations, basic processing also allows those shipments to take place independently of each other. Both of these factors reduce cost and increase value to consumers.

Final food processing, however, is more likely to take place near the point of final consumption. Up until the last half of the 20th Century, most final food processing actually took place in the household kitchen. These activities take place close to the consumer for a number of reasons. First, final processing generally reduces portions and increases packaging in terms of both weight and volume, increasing shipping costs. Second, final processing often accelerates perishability, reducing shelf life and, again, increasing shipping costs. Finally, the final product of the process is often tailored to local or regional consumer preferences. All of these factors tend to move final processing from production centers to consumer centers. Any delineation of scope will have to address the logic of justifying where in this chain of events do activities change from being agriculture production-driven to being consumer-driven. The broader the delineation of scope, the more this discussion comes under scrutiny. There is no simple right or wrong answer to this question.

The closer to the consumer that we get with this first issue of scope, the more important it becomes to deal with the second issue. Among the food products in modern grocery stores are aisles of paper and plastic products, household cleaners, and personal care products. There are often photo finishing and shipping services, banking, and personal services. While the sale of food makes up the bulk of the total sales in these establishments, thereby assuring establishment classification as a grocer for statistical reporting purposes, a disproportionate

share of the margins or profits generated are actually non-food in nature. This is because food retailing is a low-margin business. The extent to which these activities are directly related to the production and processing of agricultural commodities is an open question. Whether the division of these activities should be by volume, by value, by margin, or by some other parameter is also unresolved.

Even if these issues could be reconciled, there is no clear way to separate these within-firm activities using official statistics on either the national or local levels. Resolving the scope issue, in this case, would only lead to another major obstacle to the analysis. As a result, this issue is generally dealt within an all-or-nothing manner if it is dealt with at all.

These are all questions of scope – how do we define the activities that are included under the umbrella of the agri-food system, in general, and in the context of specifically identified geographic areas and inquiries. Once scope is defined, a study must deal with the issue of identification, or how to identify relevant activities and estimate their value using the available statistics. While identifying and measuring activities would seem to be a simple task once scope is defined, the activities included in any definition of the agri-food system extending beyond basic agricultural production are intermingled with other industries in most state and federal statistics. Production agriculture, itself, has generally been reasonably separable in reported statistics (where such statistics exist), but much of production agriculture is exempt from reporting under employment security law (payroll tax), and much of agricultural production is marketed on a time-frame (i.e., crop year) that does not match standard reporting periods for other industries. This leaves large gray areas in the data stream, even where identification would not otherwise be a major problem.

In general, issues of scope get continually more contentious as we move into post-processing distribution and retail sales. In the discussion that follows, the IMPLAN input-output model will be used to look at a definition of the agri-food sector that runs from input manufacturing through food processing and how the definition of the agri-food sector explained contributes to a local economy.

Economic Impact Study versus Economic Contribution Study

The term “Economic Impact Study” implies a change has taken place within a local economy. The change in a local economy typically comes from one of the following sources:

- Entrance/departure of a new business or industry
- Expansion/contraction of an existing business or industry

While estimating a change (economic impact study) such as the entrance or departure of industry activity is a worthwhile endeavor in many instances, this is not how the contribution of

the agri-food sector in this analysis was estimated. This analysis is an effort to evaluate the structure of existing industries within an existing economy. As a result, shocking the economy to create or eliminate parts of the industry is not appropriate. For that reason, this study is called an "economic contribution analysis"; in other words, we are interested in understanding what South Dakota agriculture currently contributes to the overall economy. This is a key difference from what is traditionally termed an "economic impact study", which attempts to understand the economic impacts of a change within an economy (i.e., a business/industry entering or leaving a local area). With a contribution analysis, the sum of individual industry estimates will never differ from the total of what actually exists in a given study area.

Instead of conducting an economic impact study in the traditional sense, the data which underlie the IMPLAN modeling system[7] were used to create an agri-food focused aggregation of the economy of each study area. In other words, data within the IMPLAN modeling system were used to estimate the composition of industry output (sales) throughout the economy and to credit the production of that output to various industries, factors of production, regions, or populations. It is important to note that the actual IMPLAN software was not used to conduct this analysis. Instead, data were extracted for external analysis from the annually-purchased IMPLAN database. In so doing, re-aggregated data clearly link all agriculture and agri-food sector industries in South Dakota (and each county as appropriate) in a manner which maintained all of their original production relationships (production function).

While the details of a working Input-Output (I-O) model can be complex, conceptually, an I-O model is quite simple. An I-O model is basically a matrix of economic sectors. Sectors along one axis represent suppliers of inputs to the industries on the other axis, which represent industrial users or demanders. Suppliers and demanders are connected by an interconnected set of mathematical relationships specifying how much of each input is required to make a unit of any output. When an industry decides how much final output it will produce, the model specifies how much of all necessary inputs are required.

Conceptually, an I-O matrix starts out looking like the large system of mileage charts (similar to those that you find in the back of a road atlas). Unlike the numbers in a mileage chart, however, each of the cells in an I-O model contains part of a system of production functions that is mathematically-linked to all of the other cells in the model. The values of goods supplied or demanded can be changed for any of the industrial cells and the matrix system can be rebalanced, showing how that initial change affects all of the industries that supply inputs to or demand outputs from the industry altered.

[7] IMPLAN is a generalized social accounting system that quantifies the purchases and sales of commodities between industries, businesses and consumers. (www.implan.com)

Methods of Economic Contribution Analysis

There are two primary methods for utilizing the IMPLAN modeling system for conducting an analysis of this type: 1) Industry Only and 2) Production Process by Industry of Final Sale (Production Process). Both methods have merits, but as discussed below, the majority of analysis comprised in this report is conducted from a Production Process perspective.

Industry-Only

The industry only method relies upon data exported from the IMPLAN modeling system which is then summarized according to any number of aggregation schemes. The analysis is a straightforward process. Given that IMPLAN data are heavily reliant upon BEA labor statistics, using the Industry-Only method yields results quite similar to those from the BEA, which are also included in this report. Because the industry only analysis will likley yield results similar to BEA estimates, inclusion of an industry only analysis has not been performed.

Production Process by Industry of Final Sale

The production-process method allocates all local (dependent on study area) in-state production that enters any industry's input-stream to that industry's final output. In this accounting, the output of an industry is counted for that industry only if it is at its final stage of production within South Dakota or if the study area is a particular county, to that county. Perspective is gained by aggregating the Output and Value-added of South Dakota-produced-and-used intermediate inputs into the results of the industry of final export from or consumption within South Dakota. This gives a product valuation of output by industry where an industry's final values include all South Dakota-produced input values. By doing this we show the total value of South Dakota production that is driven by the final output of South Dakota industries. This will increase the values of industries that use proportionately more South Dakota inputs, because the values of those inputs are aggregated into these industries.

As additional context, any output that is subsequently used as an input in another industry within South Dakota is aggregated into the industry of final processing within the state. As an example, if the meat packing industry purchases all of its live cattle from South Dakota farmers, the output value, value-added, and personal income generated in the production of those cattle is aggregated up to the meat packing industry. Similarly, the value of farm machinery purchased for use on South Dakota farms is not included in the aggregation under farm machinery, but is included under agricultural production (and partially included, again, into food processing of the farm output that it was used to produce passes through South Dakota-based food processors on its journey to its final processed form within the state). In a nutshell, the employment, output, value-added, and income estimates in the production-process method estimate the total share of South Dakota economic activity utilized to generate final output from the agri-food sectors (or any of the other listed sectors).

In addition to drawing South Dakota-produced input values into the industry of final output, the production process method removes South Dakota-produced goods consumed by domestic households from the Output, Income, Value-added, and Employment totals by industry and presents them separately. This is a partial reflection of economic base theory, which holds that the impact or value of a regional economy is reflected by the ability of that economy to produce beyond its needs (export). Economic base theory holds that the means to strengthen and grow a local economy is to strengthen the industrial sectors that have the ability to sell locally produced goods into the non-local market.

Strict interpretations of economic base theory would omit local government demand and local investment (capital and inventory) as well as local household consumption from the valuation of an industry's contribution to the economy. The scenario used in this analysis is less strict, interpreting local government expenditures and investment as increases in the local economy's capacity to produce goods in the future, just as the income streams from exports increase the regional economy's capacity. The agri-food sector utilizes a substantial proportion of local inputs in its production processes. Because this aggregation pulls local inputs into the totals of the industry of final local production, this increases the totals in sectors like agri-food, which use a relatively high proportion of local inputs.

Industrial Aggregation within the IMPLAN Modeling System

The IMPLAN modeling system uses the nearly 21,000 industries identified and classified according to North American Industry Classification System (NAICS) and groups them into 440. To better understand the structure of the agri-food industry as well as how it compares to other South Dakota industries, these 440 industries were further aggregated.

Aggregated Agricultural and Other Sector Analysis

This method of aggregation allows for the comparison of South Dakota's agri-food industry to other industries such as Manufacturing, Transportation, and Financial Services, among others. Complete documentation regarding this method of aggregation can be found in the Appendix.

This method of aggregation was used for all study areas (county and state levels). Of note, this method of aggregation does not include the food distribution or retailing industries as a component of the agri-food industry for reasons described earlier. Further, the issue of IMPLAN grouping similar sectors (i.e., turkeys and egg-laying hens into a "Poultry" sector) is not an issue since all livestock sectors are grouped into an aggregated classification known as "livestock". The aggregated agricultural and other sector analysis method of aggregation includes the following industrial categories:

- Crops
- Livestock
- Other Ag
- Mining
- Utilities
- Construction

- Manufacturing
- Wholesale
- Retail
- Transportation
- Information
- Financial
- Services
- Entertainment
- Government
- Remainder

State Level Results

State Output

"Total output" refers to the total value of all of the output (production or sales) of a study area and/or industry within a study area. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The following figure illustrates the contribution of South Dakota's ag and ag-related industries to the state. This figure illustrates the contribution both in terms of actual amounts and the share of the economy. As shown in Figure 5, South Dakota's ag and ag-related industries significantly contribute to South Dakota's economy. A combination of Crops, Livestock, and Other Ag contribute nearly 30 percent of South Dakota's total output. Of this 30 percent, 16 percent came from crop industries, 10 percent from livestock industries, and 4 percent from other ag industries. In addition to the shares identified in these figures, actual numbers can be found in Table 4.

Figure 5, South Dakota Output by Industry

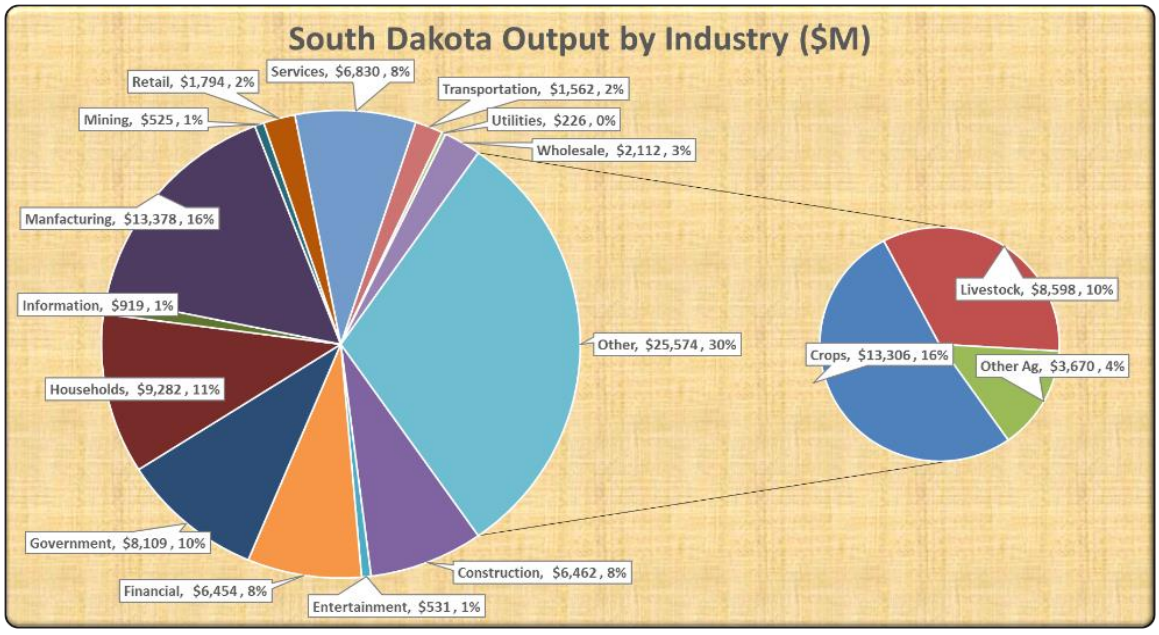


Figure 5 provides an illustration of the level of output derived from each of South Dakota's major industries. As shown, a combination of Crops, Livestock, and Other Ag comprise 30% of all economic activity in South Dakota. Other significant industries include Manufacturing (16%), Government (10%), Financial (8%), Construction (8%), and Services (8%).

State Jobs

"Jobs[8]" represents an estimate of the number of positions (jobs) currently filled in an area and/or industry. The estimates provided here originate with the databases of the IMPLAN input-output model. "Jobs" counts positions whether they are full-time or part time, so care must be used in making comparisons. "Jobs" does not count positions that are unfilled. All of the jobs in an area are generally referred to as "Total jobs." Where "Jobs" are preceded by an industry name (such as "Agricultural production" or "Agri-food sector") the number is an estimate of the number of jobs filled within that industry in the area specified.

This figure illustrates the contribution in terms of the share of the total jobs. As shown in Figure 6, South Dakota's ag and ag-related industries significantly contribute to South Dakota's total jobs. A combination of Crops, Livestock, and Other Ag support one in five (20 percent) of South Dakota's total jobs. Of this 20 percent, 12 percent came from crop industries, 5 percent from livestock industries, and 3 percent from other ag industries.

Figure 6, South Dakota Jobs by Industry

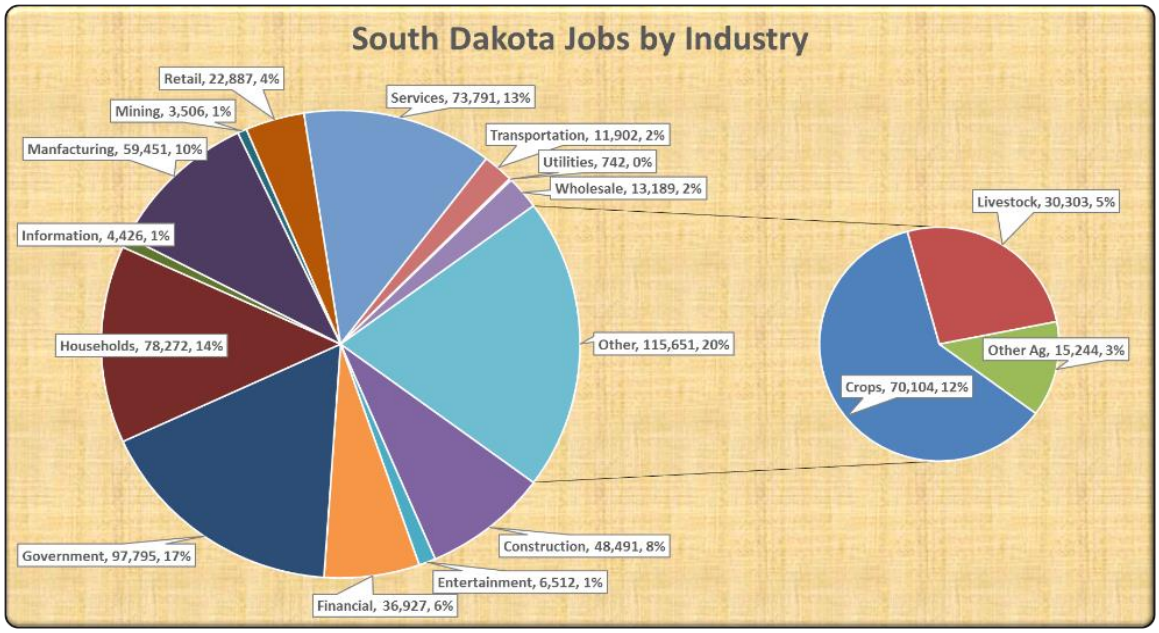


Figure 6 shows the number of jobs originating from South Dakota's major industries. As shown, Crops, Livestock, and Other Ag provide 20% of all jobs in South Dakota. Other significant industries include Government (17%), Services (13%), Manufacturing (10%), and Construction (8%).

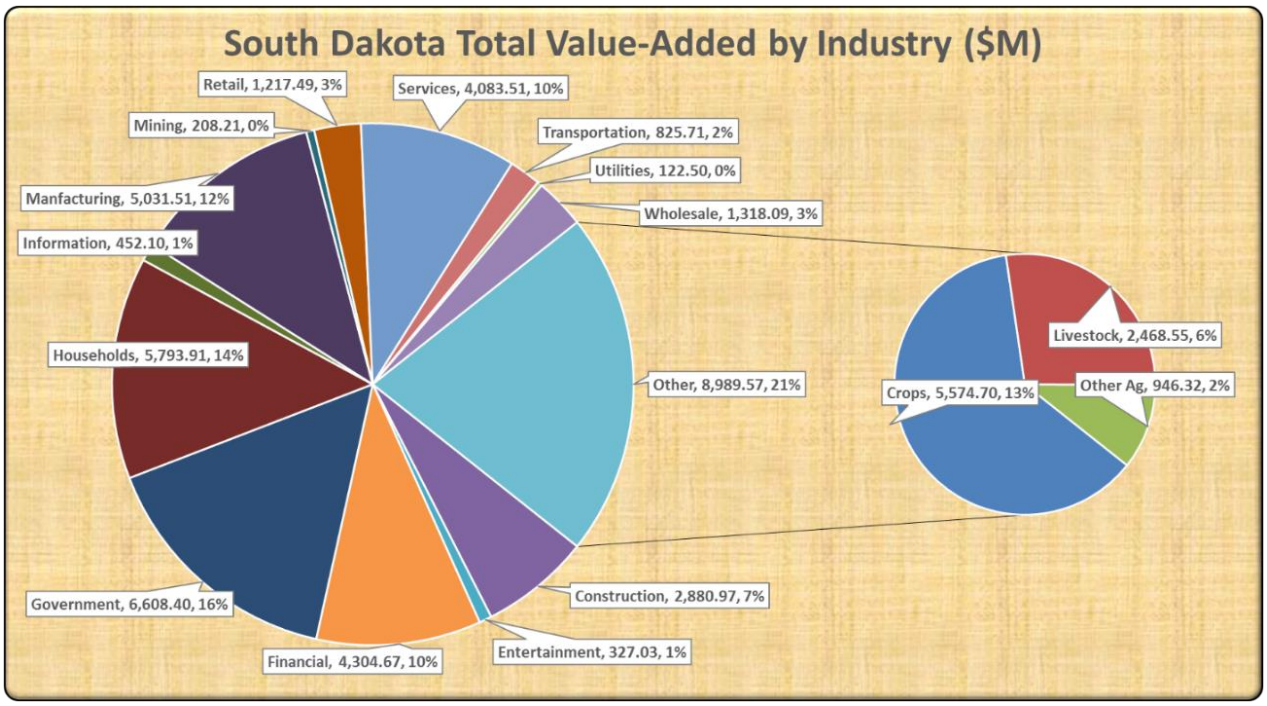
[8] Jobs do not refer to the number of people working or to full-time-equivalent employment. Jobs can be full or part time. A single individual can hold multiple jobs. In short, jobs cannot be looked upon as interchangeable or comparable across industries, businesses, or location. Comparisons of wages and compensation are more appropriate in an economic value context.

State Value-Added

"Total value-added" refers to that portion of the value of total output that was actually created by the economic activity in an area and/or industry. Total value-added for an area (industry) represents the value of the area's (industry's) total output minus the value of any inputs into the production process that were imported from other areas (industries). Key components of value-added are employee compensation (hired labor) and proprietor's income (self-employed), which collectively is called "labor income".

In terms of total value-added generated from various industries in South Dakota, the combination of the three agricultural sectors (crops, livestock, and other ag) is the largest contributor to the state's value-added. According to Figure 7, agriculture contributes 21 percent of the state's value-added. In this representation, household consumption is treated as its own industry, and all production feeding local household demand is aggregated to household demand.

Figure 7, South Dakota Total Value-Added by Industry ($M)



State Household Income

"Household income" refers to income from all sources that accrues to individuals as payment for personal employment (earnings or labor income), payment for ownership interests or capital provision (dividends, interest, and rents), or as transfer payments (payments to individuals for which nothing is offered in return). Figure 8 illustrates household income in terms of the share of the total household income derived from the ag and ag-related industries. As shown, South Dakota's ag and ag-related industries substantially contribute to South Dakota's total household income. A combination of Crops, Livestock, and Other Ag support 19 percent of total household income generated in the state. Of this 19 percent, 13 percent is from crop industries, 4 percent came from livestock industries, and 2 percent from other ag industries.

Figure 8, South Dakota Household Income by Industry

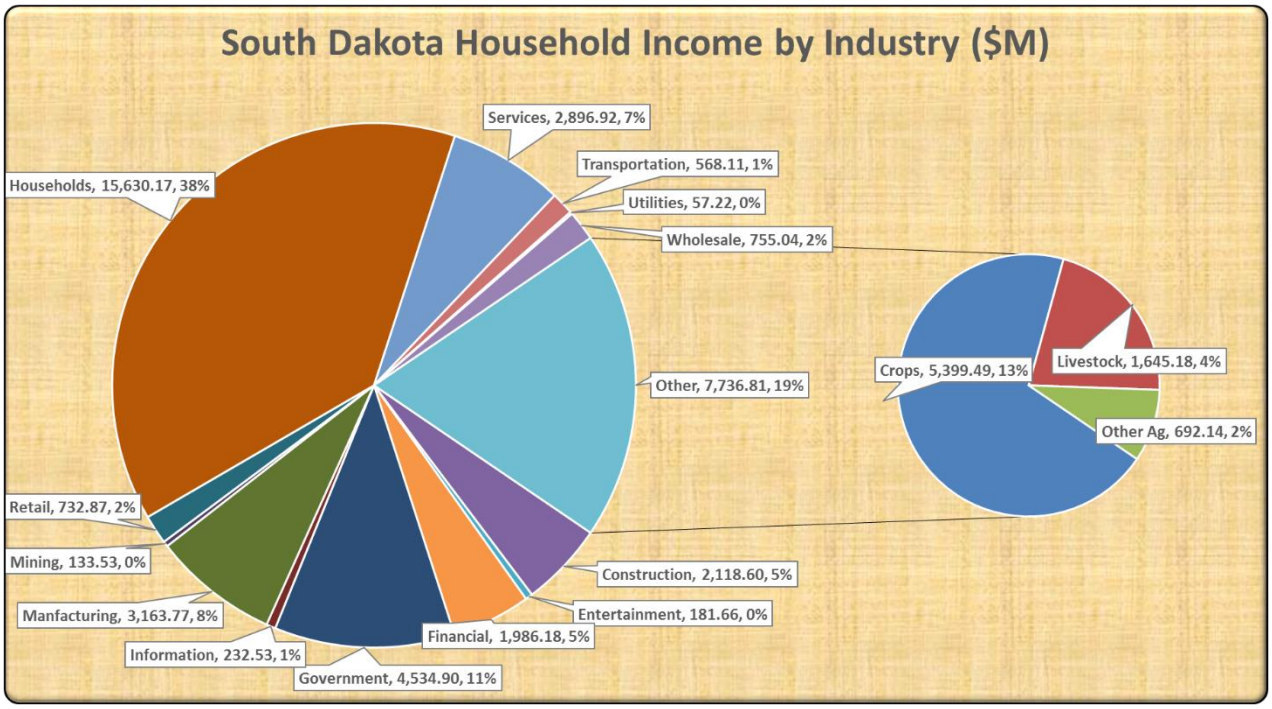


Table 4, IMPLAN results (Aggregated Ag Sector Analysis)

Industry	Household Income	HH Income (% of Total)	Total Jobs	Total Jobs (% of Total)	Total Output ($M)	Total Output (% of Total)	Total Value-Added ($M)	Total VA (% of Total less HH)	Total VA (% of Total)
Crops	$ 5,399	13.3%	70,104	12.2%	$ 13,306	15.9%	$ 5,575	15.3%	13.2%
Livestock	$ 1,645	4.0%	30,303	5.3%	$ 8,598	10.3%	$ 2,469	6.8%	5.9%
Other Ag	$ 692	1.7%	15,244	2.7%	$ 3,670	4.4%	$ 946	2.6%	2.2%
Total Ag	$ 7,737	19.0%	115,651	20.2%	$ 25,574	30.5%	$ 8,990	24.7%	21.3%
Construction	$ 2,119	5.2%	48,491	8.5%	$ 6,462	7.7%	$ 2,881	7.9%	6.8%
Entertainment	$ 182	0.5%	6,512	1.1%	$ 531	0.6%	$ 327	0.9%	0.8%
Financial	$ 1,986	4.9%	36,927	6.4%	$ 6,454	7.7%	$ 4,305	11.8%	10.2%
Government	$ 4,535	11.1%	97,795	17.1%	$ 8,109	9.7%	$ 6,608	18.2%	15.7%
Households	$ 15,630	38.4%	78,272	13.7%	$ 9,282	11.1%	$ 5,794		13.7%
Information	$ 233	0.6%	4,426	0.8%	$ 919	1.1%	$ 452	1.2%	1.1%
Manfacturing	$ 3,164	7.8%	59,451	10.4%	$ 13,378	16.0%	$ 5,032	13.8%	11.9%
Mining	$ 134	0.3%	3,506	0.6%	$ 525	0.6%	$ 208	0.6%	0.5%
Retail	$ 733	1.8%	22,887	4.0%	$ 1,794	2.1%	$ 1,217	3.4%	2.9%
Services	$ 2,897	7.1%	73,791	12.9%	$ 6,830	8.2%	$ 4,084	11.2%	9.7%
Transportation	$ 568	1.4%	11,902	2.1%	$ 1,562	1.9%	$ 826	2.3%	2.0%
Utilities	$ 57	0.1%	742	0.1%	$ 226	0.3%	$ 123	0.3%	0.3%
Wholesale	$ 755	1.9%	13,189	2.3%	$ 2,112	2.5%	$ 1,318	3.6%	3.1%
Total	**$ 40,728**	**100.0%**	**573,541**	**100.0%**	**$ 83,758**	**100.0%**	**$ 42,164**	**100.0%**	**100.0%**

County Level Results

The main focus to this point of this report has been to provide background, discuss methodology, and present results at the state level. However, similar analyses have been performed for all of South Dakota's 66 counties. As one would expect, the contribution of agriculture varies widely, not just in terms of total contribution, but the degree to which some counties are more or less reliant upon agriculture in terms of the four primary measures of economic contribution (output, jobs, value-added, and household income) presented in this document. While there is significant variation across counties, there are some consistencies as well. A county that is very reliant upon agriculture in terms of output is more likely to be reliant upon agriculture in terms of jobs, value-added, and household income.

County Output

Figure 9 shows the level of output derived from ag and ag-related industries at the county level. As shown, there are 43 counties (sum of right two columns in Figure 9 which derive greater than 45 percent of their output from the ag and ag-related industries. The top five counties which derive the largest share of their output from ag and ag-related industries are Jerauld, Faulk, Sully, Spink, and Clark Counties.

Figure 9, Percent of Output Derived from Ag and Ag-Related Industries

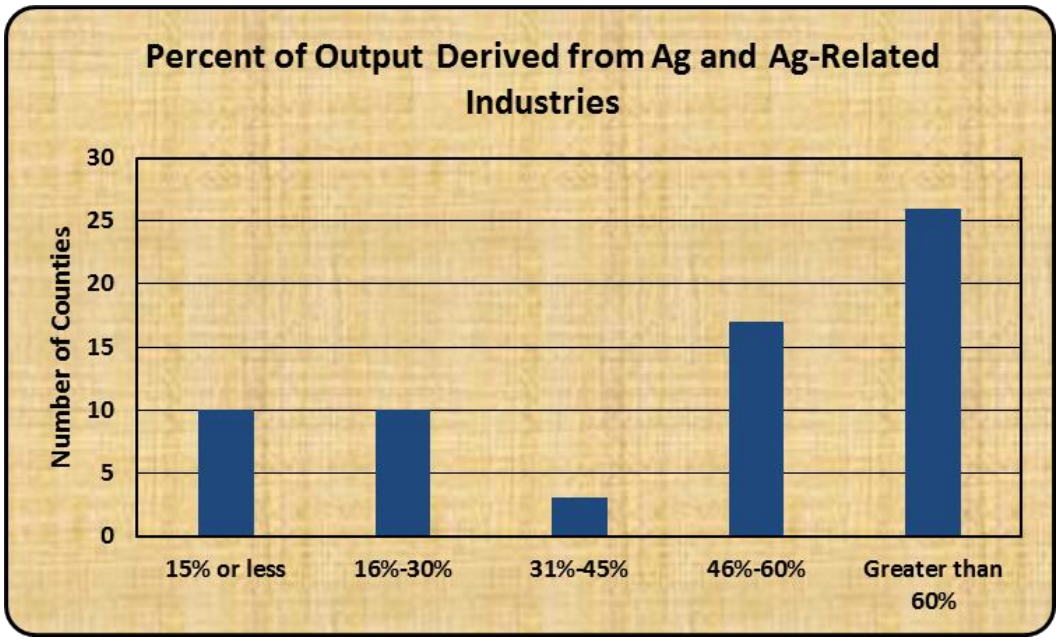


Figure 10 and Figure 11 illustrate the amounts and degree to which each South Dakota county derives its output from all of South Dakota agriculture (Crops, Livestock, Other Ag). As shown, as one moves from west to east, counties derive an increasing level of economic activity from agriculture. However, the percent of output derived from agriculture tends to make up a higher share of output the more rural a county is. The share of output derived from all of agriculture ranges from 4.1% to 87.8%.

Figure 10, Output Derived from Total Ag ($M)

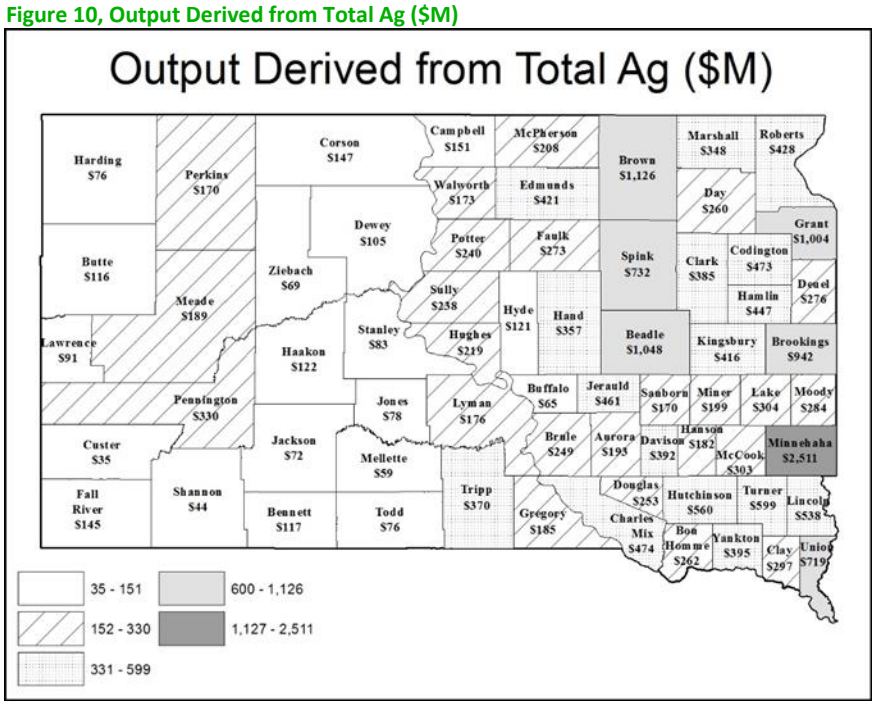


Figure 11, Percent of Output Derived from Total Ag ($M)

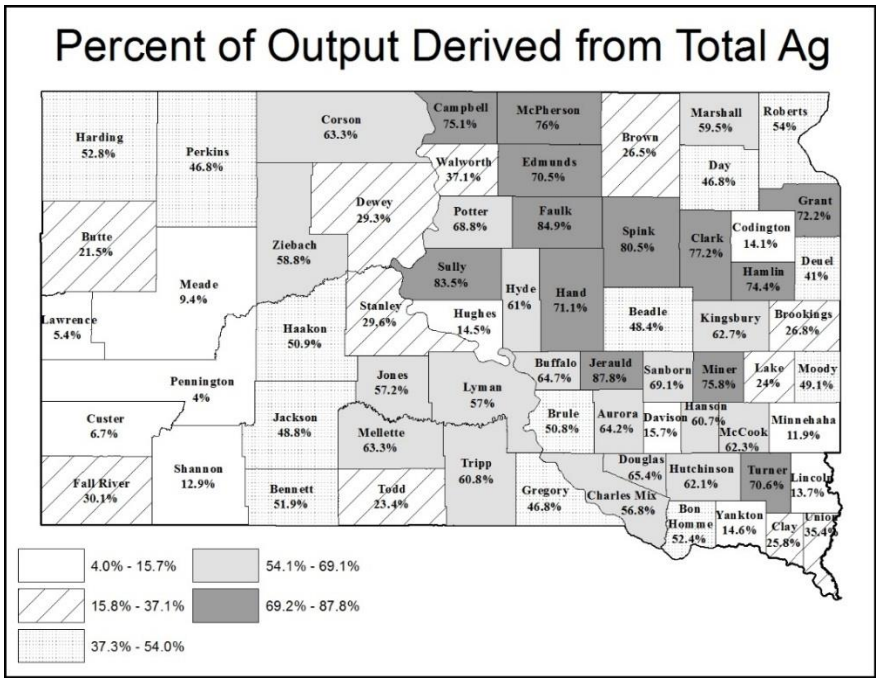


Figure 12 and Figure 13 illustrate the degree to which each South Dakota county derives its output from production and processing of crops. As shown, as one moves from west to east, counties derive an increasing level of economic activity from the production and processing of crops. When the share of output derived from the production and processing of crops is mapped, we see a higher share in counties in the central part of the state. The share of output derived from the production and processing of crops ranges from 0.6% to 72.1%.

Figure 12, Output Derived from Crops

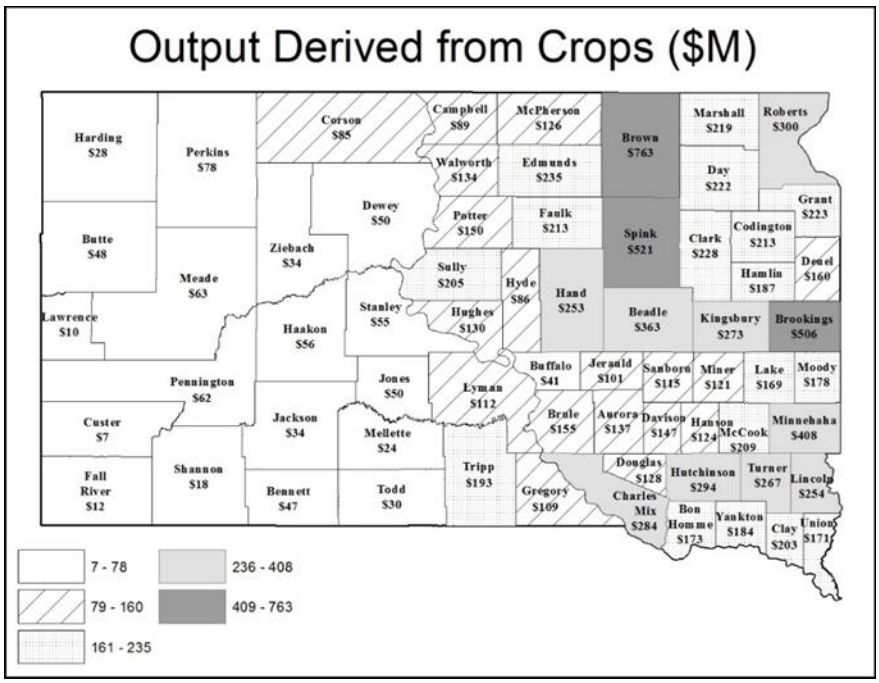


Figure 13, Percent of Output Derived from Crops

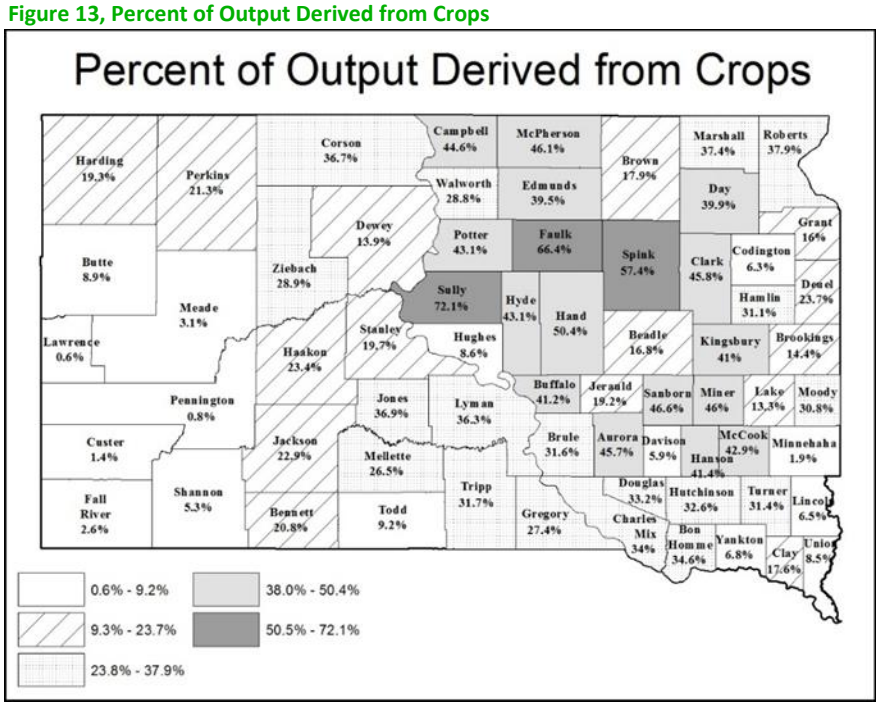


Figure 14 and Figure 15 illustrates the degree to which each South Dakota county derives its output from production and processing of livestock. With the exception of a few eastern counties, there is no clear pattern with regard to the level of economic activity from the production and processing of livestock. When the *share* of output derived from the production and processing of livestock is mapped, we see fairly even distribution across the state. The share of output derived from the production and processing of livestock ranges from 1.0% to 67.6%.

Figure 14, Output Derived from Livestock

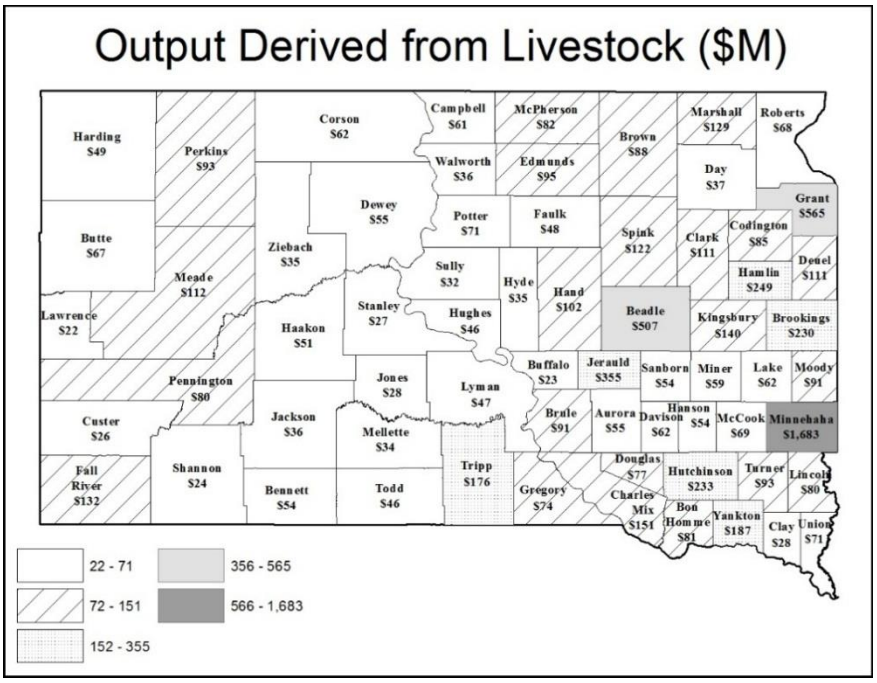
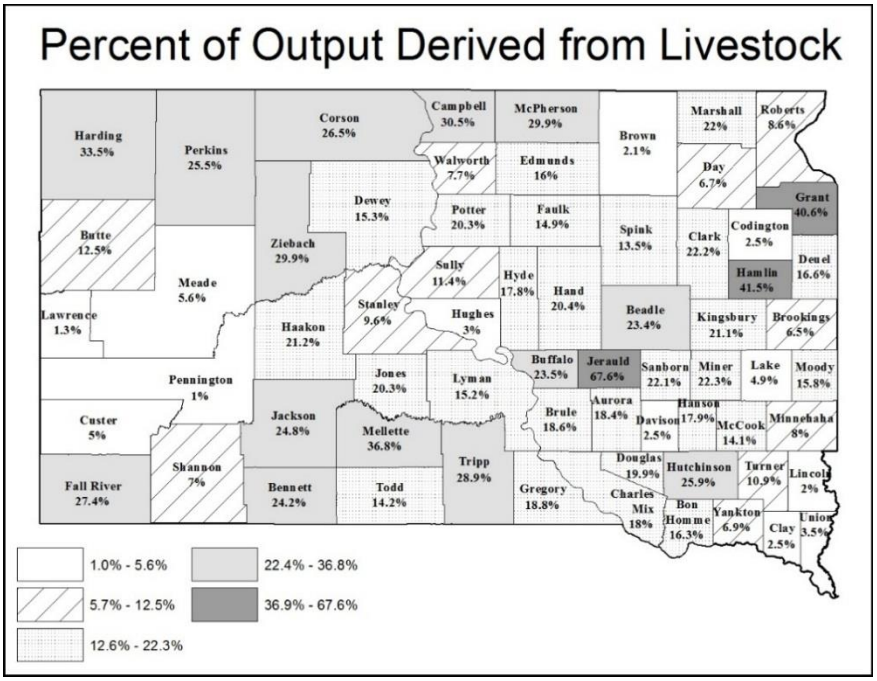


Figure 15, Percent of Output Derived from Livestock



County Jobs

Figure 16 shows the level of jobs derived from ag and ag-related industries at the county level. As shown, there are 40 counties (sum of right three data columns) which derive greater than 30 percent of their jobs from the ag and ag-related industries. The top five counties which derive the largest share of their jobs from ag and ag-related industries are Jerauld, Faulk, Campbell, Sully and McPherson.

Figure 16, Percent of Jobs Derived from Ag and Ag-Related Industries

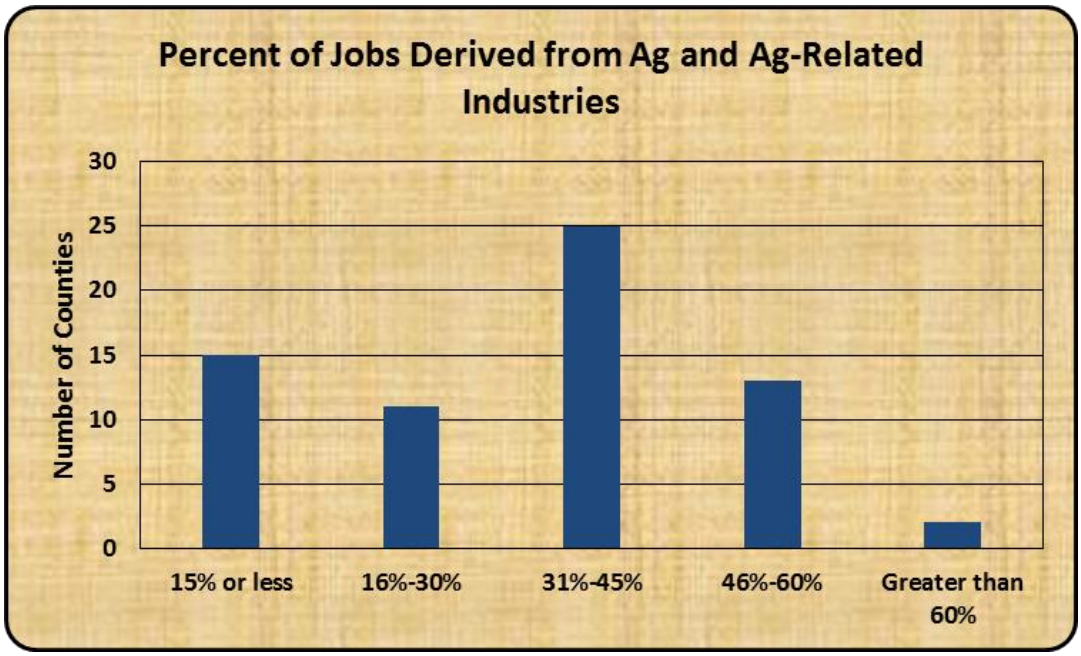


Figure 17 and Figure 18 illustrate the number of jobs by county that find their origins from all of South Dakota agriculture (Crops, Livestock, and Other Ag). As shown, eastern South Dakota counties tend to have a higher number of jobs with origins in South Dakota agriculture. However, the share of jobs derived from agriculture tends to make up a higher share of output the more rural a county is. The share of jobs derived from all of agriculture ranges from 2.9% to 73.2%.

Figure 17, Jobs Derived from Total Ag

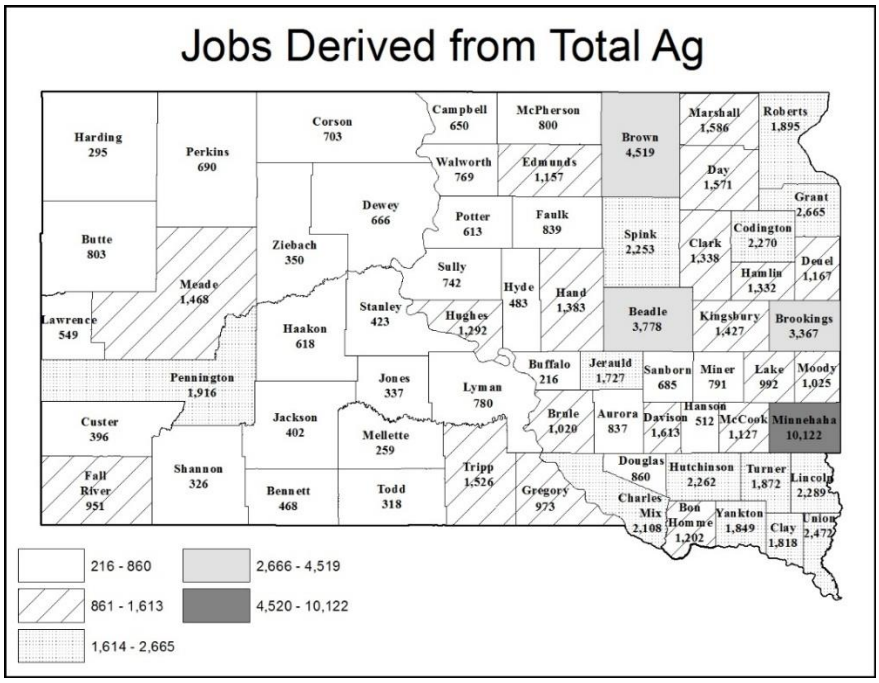


Figure 18, Percent of Jobs Derived from Total Ag

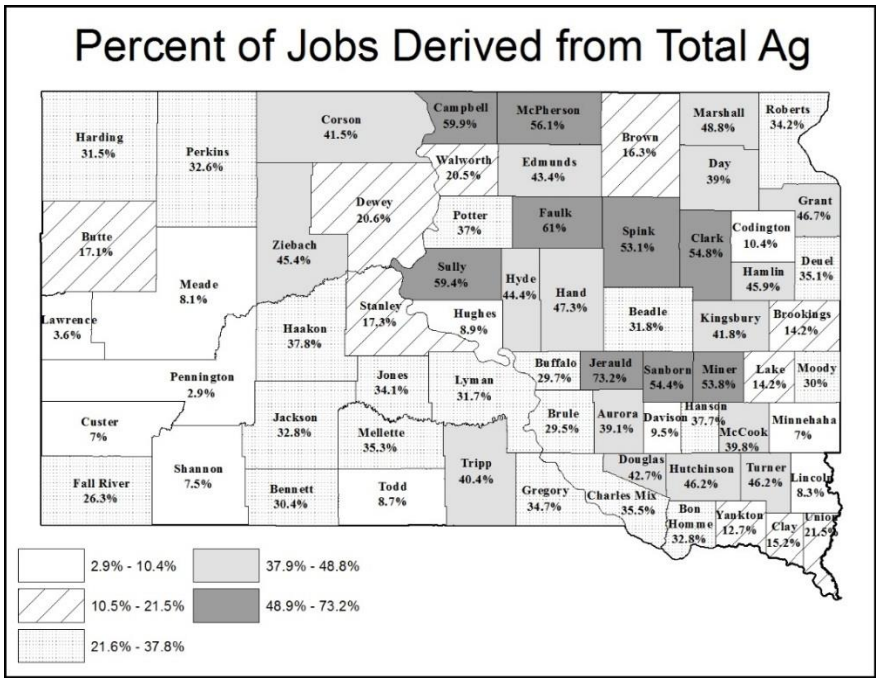


Figure 19 and Figure 20 illustrate the number of jobs that find their origins in the production and processing of crops. As shown, eastern South Dakota counties tend to have a higher number of jobs with origins in the production and processing of South Dakota crops. When the *share* of jobs derived from the production and processing of crops is mapped, we see a higher share in counties in the central part of the state. The share of output derived from the production and processing of crops ranges from 0.6% to 55.4%.

Figure 19, Jobs Derived from Crops

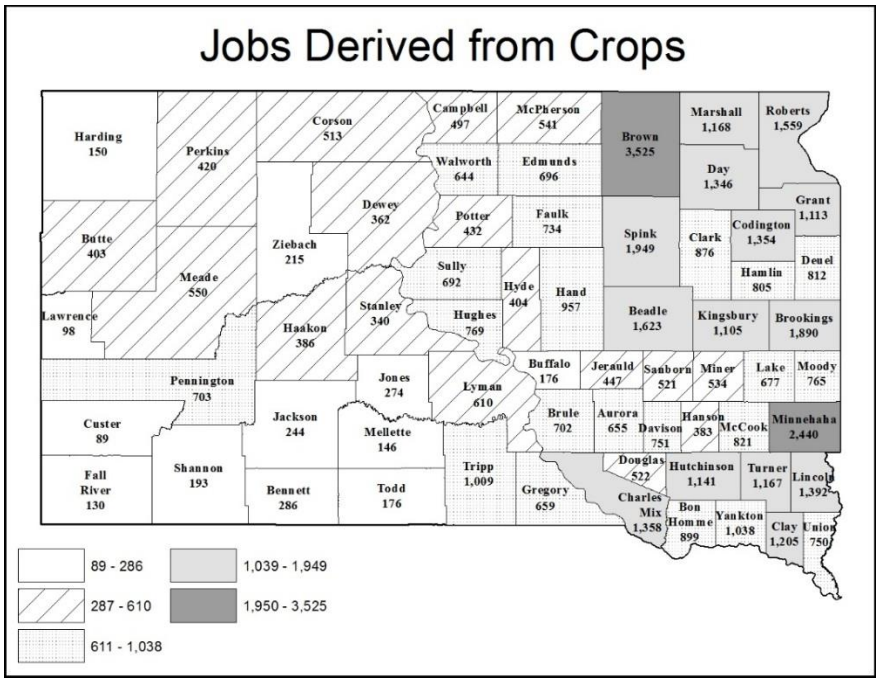


Figure 20, Percent of Jobs Derived from Crops

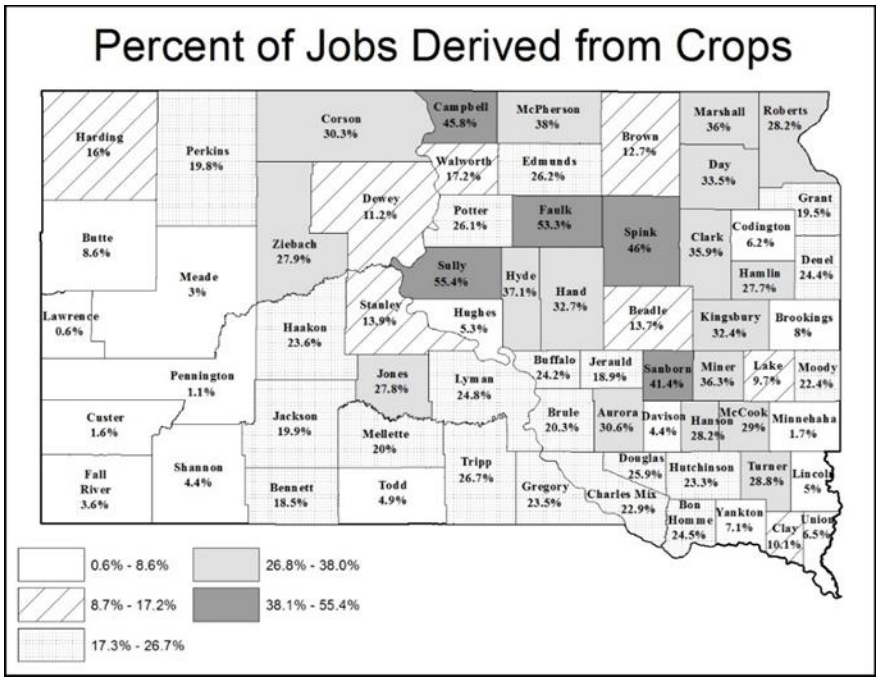


Figure 21 and Figure 22 illustrates the number of jobs that find their origins in the production and processing of livestock. As shown, eastern South Dakota counties tend to have a higher number of jobs with origins in the production and processing of South Dakota livestock. When the *share* of jobs derived from the production and processing of livestock is mapped, we see no distinct pattern across the state. The share of jobs derived from the production and processing of livestock ranges from 0.6% to 51.6%.

Figure 21, Jobs Derived from Livestock

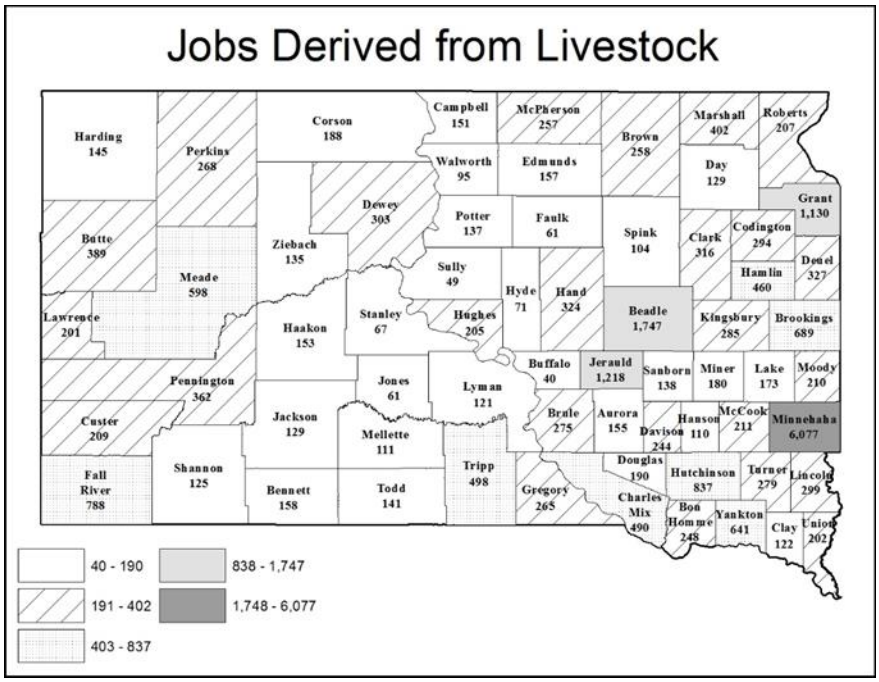
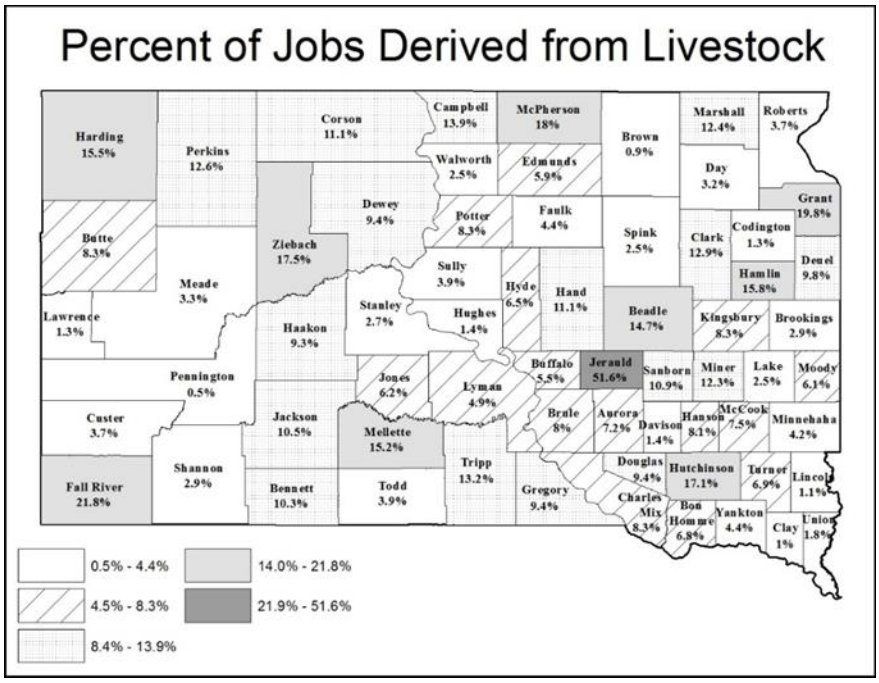


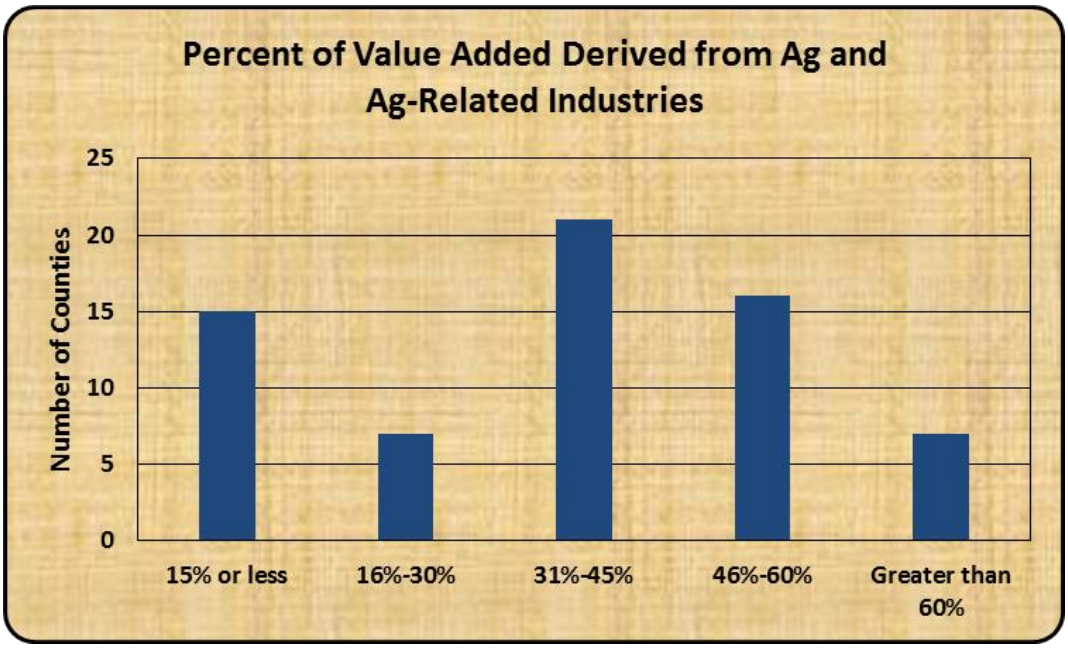
Figure 22, Percent of Jobs Derived from Livestock



County Value-Added

Figure 23 shows the level of value-added derived from ag and ag-related industries at the county level. As shown, there are 23 counties (sum of right two columns in Figure 23 which derive greater than 45 percent of their of value-added from the ag and ag-related industries. The top five counties which derive the largest share of their of value-added from ag and ag-related industries are Faulk, Sully, Jerauld, Spink and Clark.

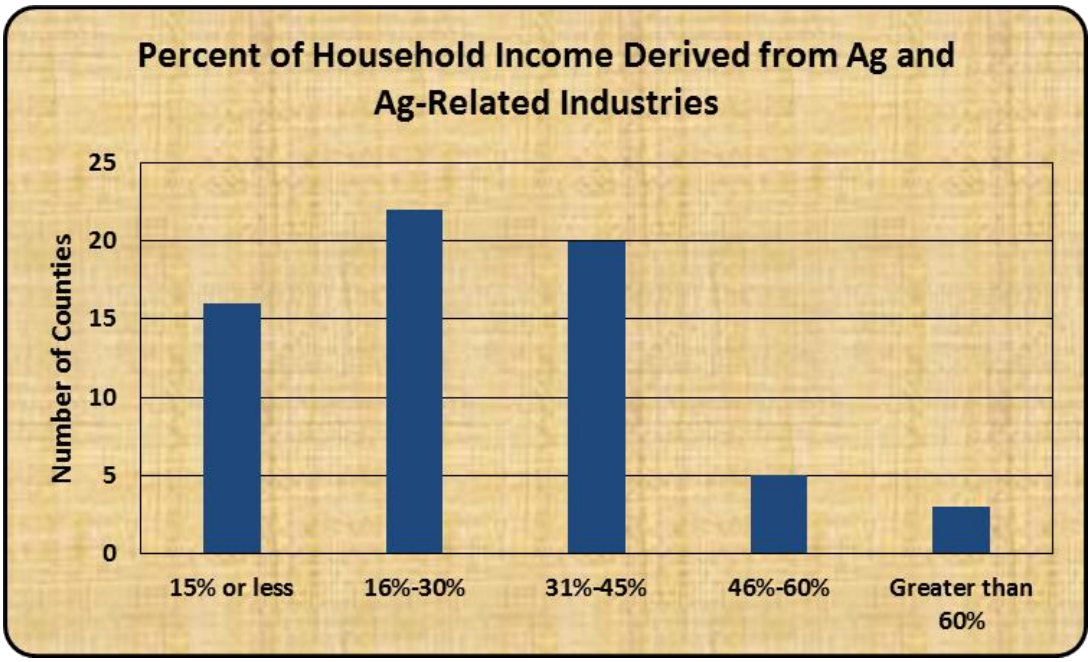
Figure 23, Percent of Value Added Derived from Ag and Ag-Related Industries



County Household Income

Figure 24 shows the level of household income derived from ag and ag-related industries at the county level. As shown, there are 28 counties (sum of right three columns in Figure 24 which derive greater than 30 percent of their household income from the ag and ag-related industries. The top five counties which derive the largest share of their household income from ag and ag-related industries are Spink, Sully, Faulk, Jerauld, and Clark.

Figure 24, Percent of Household Income Derived from Ag and Ag-Related Industries



County Reliance upon Agriculture

Table 5 illustrates the top ten counties that are most and least reliant upon ag and ag-related industries based on the total ag output as a percent of total output. Not surprisingly, the counties most reliant upon ag and ag-related industries tend to be rural while those least reliant upon ag and ag-related industries tend to be more urban. As discussed at the state level, the degree to which further processing is present in a county has large implications regarding how a county ranks – the more value added to locally-sourced inputs, the higher share of its economy will be attributed to a county.

Table 5, Ten Counties Most and Least Reliant Upon Ag and Ag-Related Industries

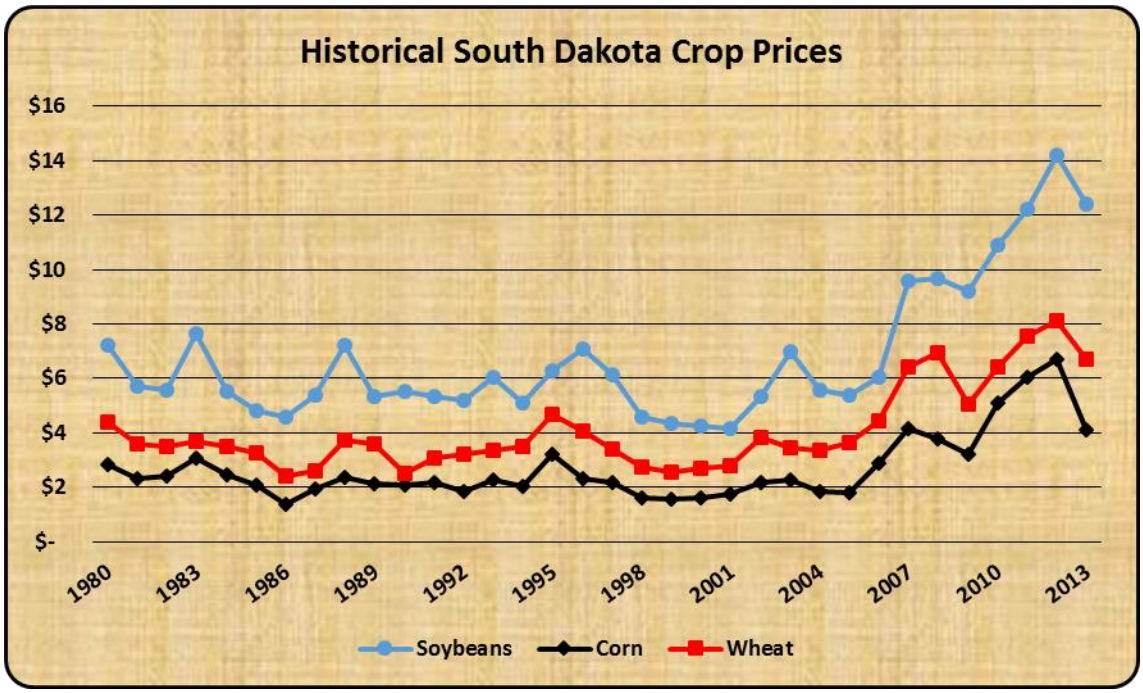
Ten South Dakota Counties Most Reliant on Agriculture		Ten South Dakota Counties Least Reliant on Agriculture	
1	Jerauld	1	Pennington
2	Faulk	2	Lawrence
3	Sully	3	Custer
4	Spink	4	Meade
5	Clark	5	Minnehaha
6	McPherson	6	Shannon
7	Miner	7	Lincoln
8	Campbell	8	Codington
9	Hamlin	9	Hughes
10	Grant	10	Yankton

South Dakota Agriculture: Looking Ahead

Commodity Prices

While crop farmers have seen record prices for corn, soybeans, and wheat the past several years (see Figure 25), prices have dropped significantly recently. Absent a large increase in demand, a large crop anticipated in 2014 is expected to continue to put pressure on prices for the next few years. Some would like to compare the potential of the 2014 crop with what U.S. farmers produced in 2009. At that time, it was a record breaking corn crop. The September 2014 Crop Production Report by the USDA put the national average corn yield estimate at 171.7 bushels per acre. In 2009, the average national corn yield was just over 165 bushels per acre.

Figure 25, Historical South Dakota Cash Crop Prices



We do see some similarities in 2014 to 2009. In both years, we had a relatively cool summer, which indicates the potential for good crop production, at least for corn. Even though it's early to see the outcome for 2014, farmers will have to wait and see what happens during the rest of September and October 2014. USDA crop condition reports continue to rate high percentages of crops as good to excellent. Seasonally, the U.S. corn condition rating tends to go down as we approach the end of August and September. The degree to which the rating goes down, if any, will have implications for commodity prices.

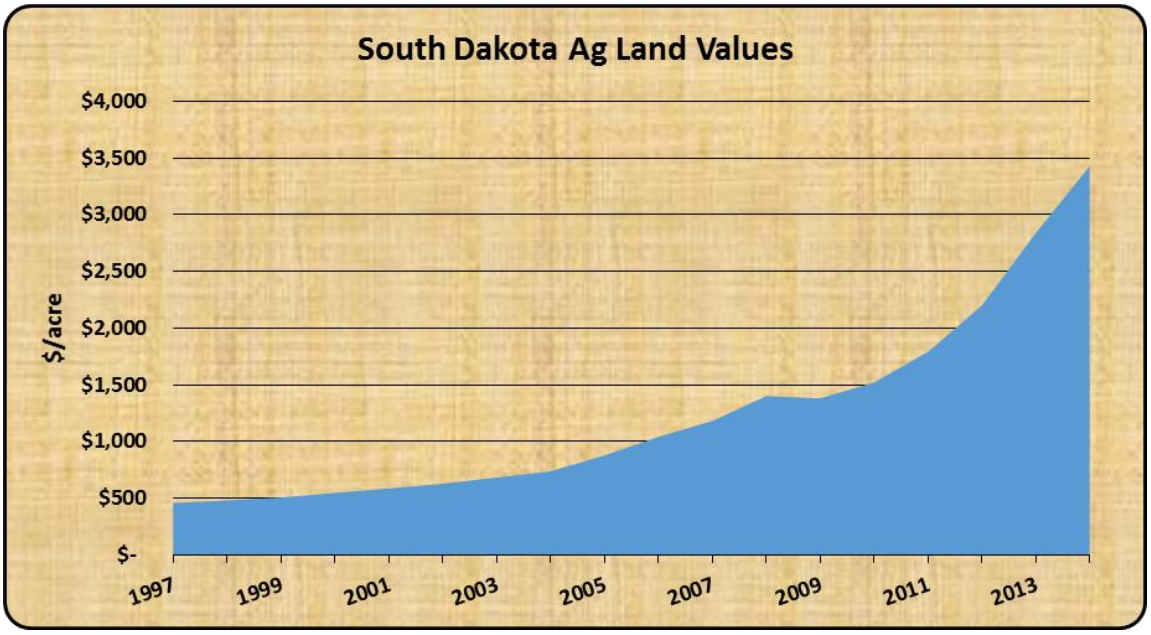
With a good crop in the making, corn production for 2014/15 is forecast to be at a record 14.4 billion bushels, which exceeds 2013's 13.9 billion bushel record production. This expected abundant harvest has driven prices lower, prompting farmers to take more control of their

grain marketing by building more on-farm storage, holding onto the crop and timing the sale to maximize profit. Projected corn use for 2014/15 is also forecasted to be higher with use for ethanol, exports and feed, and residual disappearance with the larger crop. The degree to which additional demand sources are able to absorb added supplies of corn and other commodities will add a degree of support in prices of not only corn, but other crops grown in South Dakota.

Land Values

It has been very apparent that agricultural land values have posted double digit percentage increases since the mid-2000's. As shown in Figure 26, the average price per acre has increased from $736 in 2004, to $3,430 in 2012 according to USDA/NASS[9]. As commodity prices have begun to come down in recent years, the ability of prospective land owners to bid up the price of land is slowing. As this continues to occur, the pace at which land values increase will slow. However, cow/calf producers in a profitable operating environment are able to pay higher pasture rental rates; this will provide some support to land values.

Figure 26, South Dakota Ag Land Values



Land Use

Tumbling futures prices for corn since late Spring 2014 caused the cash market to go down as low as $2.50/bu in some parts of the Midwest. Basis also weighs down cash corn bids. The spread between futures and local cash prices has widened to more than $1/bu in some cases. These have been the widest average basis ranges in this part of Corn Belt since 2008. While

[9] http://quickstats.nass.usda.gov/

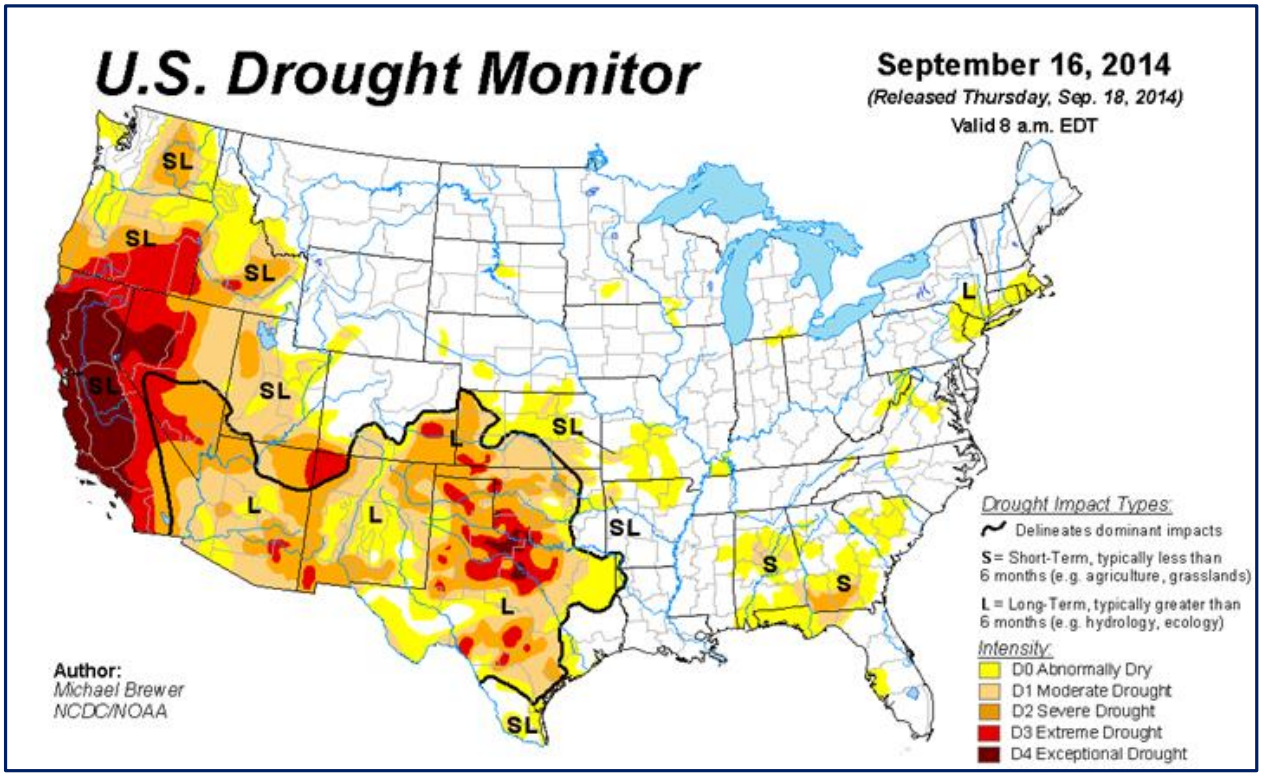
basis has widened considerably for new-crop corn regardless of location, the spread from region to region is very large.

A combination of lower prices and shifts in basis may lead to a shift in crop acreage in the outer reaches of the Corn Belt beginning in Spring 2015. As these two market dynamics continue to work, marginal lands in western and northern South Dakota will have pressure to revert back to its use prior to the large increases in prices and returns in the mid-2000's. While decreases in land values may not be sudden nor severe, there will be pressure on marginal land values. A prolonged period of lower prices could have negative implications for both land owners and land renters.

Livestock

While lower crop prices have the potential to negatively affect crop producers, livestock producers in South Dakota are experiencing a bit of relief. The 2012 drought is still an issue as many cattle producers work to rebuild their herds. As shown in Figure 27, states such as California, Texas and Oklahoma are still suffering from the prolonged effects of the drought. Given the favorable weather conditions in the Midwest during 2014, cattle will likely continue to have a more pronounced presence in South Dakota and other Midwestern states.

Figure 27, U.S. Drought Monitor



The drought is affecting the distribution of cattle inventory across the U.S. as cattle are shifting away from those states still suffering from drought conditions to areas that are not as dry. Low supplies of beef and other meat products and continued demand has sent retail beef prices climbing higher and higher to record prices. The question is whether or not consumers will continue to pay these record high prices while the industry works to build up the cattle inventory, or if consumers will turn to a lower-cost alternatives.

A unique challenge facing South Dakota cattle producers are the lingering effects of the Atlas Blizzard which hit the area in late fall 2013. Estimates of cattle lost are in the tens of thousands. Generations of genetic improvements were lost to the storm. While live cattle and/or funds donated to the ranchers affected by the storm have undoubtedly been helpful, the effects of the losses from the storm will be felt for many years to come.

Appendix A, Shares of Gross State Product Derived from Ag Production and Food Processing (2012)

		Ag Production/Food Manufacturing			Ag Production			Food Manufacturing		
State	Total GSP ($1,000)	GSP ($1,000)	Percent of GSP	Rank	GSP ($1,000)	Percent of GSP	Rank	GSP ($1,000)	Percent of GSP	Rank
United States	$ 16,141,152	$ 400,276	2.48%		$ 166,937	1.03%		$ 233,339	1.45%	
North Dakota	$ 49,509	$ 6,004	12.13%	1	$ 5,253	10.61%	1	$ 751	1.52%	19
South Dakota	**$ 43,758**	**$ 5,210**	**11.91%**	**2**	**$ 4,591**	**10.49%**	**2**	**$ 619**	**1.41%**	**22**
Iowa	$ 156,606	$ 17,804	11.37%	3	$ 11,164	7.13%	4	$ 6,640	4.24%	2
Nebraska	$ 103,062	$ 11,621	11.28%	4	$ 8,152	7.91%	3	$ 3,469	3.37%	5
Idaho	$ 58,231	$ 5,221	8.97%	5	$ 3,538	6.08%	5	$ 1,683	2.89%	7
Kansas	$ 138,958	$ 8,288	5.96%	6	$ 4,753	3.42%	7	$ 3,535	2.54%	12
North Carolina	$ 452,358	$ 24,315	5.38%	7	$ 4,874	1.08%	21	$ 19,441	4.30%	1
Arkansas	$ 118,993	$ 6,084	5.11%	8	$ 2,898	2.44%	9	$ 3,186	2.68%	9
Kentucky	$ 177,967	$ 8,971	5.04%	9	$ 2,324	1.31%	17	$ 6,647	3.73%	3
Montana	$ 42,140	$ 2,102	4.99%	10	$ 1,847	4.38%	6	$ 255	0.61%	42
Minnesota	$ 298,272	$ 14,596	4.89%	11	$ 9,819	3.29%	8	$ 4,777	1.60%	17
Wisconsin	$ 272,086	$ 12,224	4.49%	12	$ 5,018	1.84%	12	$ 7,206	2.65%	10
Virginia	$ 445,090	$ 18,019	4.05%	13	$ 1,544	0.35%	40	$ 16,475	3.70%	4
Georgia	$ 438,324	$ 17,481	3.99%	14	$ 4,703	1.07%	23	$ 12,778	2.92%	6
Missouri	$ 269,356	$ 10,599	3.93%	15	$ 3,084	1.14%	19	$ 7,515	2.79%	8
Mississippi	$ 101,549	$ 3,771	3.71%	16	$ 2,466	2.43%	10	$ 1,305	1.29%	23
Indiana	$ 306,838	$ 9,700	3.16%	17	$ 4,493	1.46%	15	$ 5,207	1.70%	16
Tennessee	$ 280,485	$ 8,625	3.08%	18	$ 1,439	0.51%	37	$ 7,186	2.56%	11
Vermont	$ 28,422	$ 857	3.02%	19	$ 306	1.08%	22	$ 551	1.94%	13
Illinois	$ 704,138	$ 18,520	2.63%	20	$ 6,434	0.91%	26	$ 12,086	1.72%	15
Oklahoma	$ 171,432	$ 4,442	2.59%	21	$ 2,731	1.59%	13	$ 1,711	1.00%	31
Ohio	$ 548,526	$ 13,885	2.53%	22	$ 3,949	0.72%	29	$ 9,936	1.81%	14
New Mexico	$ 89,188	$ 2,142	2.40%	23	$ 1,672	1.87%	11	$ 470	0.53%	46
Washington	$ 390,918	$ 9,054	2.32%	24	$ 5,144	1.32%	16	$ 3,910	1.00%	30
Michigan	$ 416,769	$ 9,651	2.32%	25	$ 3,672	0.88%	27	$ 5,979	1.43%	21
California	$ 2,125,717	$ 49,193	2.31%	26	$ 25,564	1.20%	18	$ 23,629	1.11%	27
Oregon	$ 210,242	$ 4,788	2.28%	27	$ 2,376	1.13%	20	$ 2,412	1.15%	26
Maine	$ 53,235	$ 1,203	2.26%	28	$ 351	0.66%	30	$ 852	1.60%	18
Colorado	$ 278,551	$ 6,037	2.17%	29	$ 2,697	0.97%	24	$ 3,340	1.20%	24
Alabama	$ 189,542	$ 3,756	1.98%	30	$ 1,809	0.95%	25	$ 1,947	1.03%	29
Pennsylvania	$ 629,851	$ 12,168	1.93%	31	$ 3,119	0.50%	38	$ 9,049	1.44%	20
Louisiana	$ 251,369	$ 4,395	1.75%	32	$ 2,108	0.84%	28	$ 2,287	0.91%	34
Delaware	$ 60,650	$ 1,055	1.74%	33	$ 335	0.55%	36	$ 720	1.19%	25
Wyoming	$ 41,839	$ 709	1.69%	34	$ 620	1.48%	14	$ 89	0.21%	50
South Carolina	$ 177,985	$ 2,793	1.57%	35	$ 1,054	0.59%	33	$ 1,739	0.98%	32
Utah	$ 134,483	$ 2,022	1.50%	36	$ 608	0.45%	39	$ 1,414	1.05%	28
Texas	$ 1,463,021	$ 20,198	1.38%	37	$ 8,514	0.58%	34	$ 11,684	0.80%	37
Florida	$ 769,007	$ 10,594	1.38%	38	$ 4,584	0.60%	32	$ 6,010	0.78%	38
Hawaii	$ 72,512	$ 888	1.22%	39	$ 472	0.65%	31	$ 416	0.57%	43
Arizona	$ 271,503	$ 3,231	1.19%	40	$ 1,546	0.57%	35	$ 1,685	0.62%	41
Maryland	$ 336,481	$ 3,733	1.11%	41	$ 977	0.29%	41	$ 2,756	0.82%	35
New York	$ 1,280,737	$ 12,733	0.99%	42	$ 2,417	0.19%	44	$ 10,316	0.81%	36
Alaska	$ 59,643	$ 583	0.98%	43	$ 11	0.02%	50	$ 572	0.96%	33
New Hampshire	$ 66,111	$ 577	0.87%	44	$ 70	0.11%	47	$ 507	0.77%	39
New Jersey	$ 528,788	$ 4,597	0.87%	45	$ 740	0.14%	45	$ 3,857	0.73%	40
Nevada	$ 128,896	$ 864	0.67%	46	$ 312	0.24%	43	$ 552	0.43%	48
Connecticut	$ 242,930	$ 1,566	0.64%	47	$ 285	0.12%	46	$ 1,281	0.53%	45
Massachusetts	$ 431,937	$ 2,755	0.64%	48	$ 298	0.07%	48	$ 2,457	0.57%	44
Rhode Island	$ 51,566	$ 272	0.53%	49	$ 30	0.06%	49	$ 242	0.47%	47
West Virginia	$ 69,711	$ 358	0.51%	50	$ 173	0.25%	42	$ 185	0.27%	49

Appendix B, IMPLAN Aggregated Agriculture Aggregation Template

IMPLAN Code	IMPLAN Description	Aggregrated Description
1	Oilseed farming	Crops
2	Grain farming	Crops
3	Vegetable and melon farming	Crops
4	Fruit farming	Crops
5	Tree nut farming	Crops
6	Greenhouse, nursery, and floriculture production	Crops
7	Tobacco farming	Crops
8	Cotton farming	Crops
9	Sugarcane and sugar beet farming	Crops
10	All other crop farming	Crops
15	Forest nurseries, forest products, and timber tracts	Crops
16	Logging	Crops
43	Flour milling and malt manufacturing	Crops
44	Wet corn milling	Crops
45	Soybean and other oilseed processing	Crops
48	Sugar cane mills and refining	Crops
49	Beet sugar manufacturing	Crops
54	Fruit and vegetable canning, pickling, and drying	Crops
11	Cattle ranching and farming	Livestock
12	Dairy cattle and milk production	Livestock
13	Poultry and egg production	Livestock
14	Animal production, except cattle and poultry and eggs	Livestock
17	Fishing	Livestock
18	Hunting and trapping	Livestock
55	Fluid milk and butter manufacturing	Livestock
56	Cheese manufacturing	Livestock
57	Dry, condensed, and evaporated dairy product manufacturing	Livestock
58	Ice cream and frozen dessert manufacturing	Livestock
59	Animal (except poultry) slaughtering, rendering, and processing	Livestock
60	Poultry processing	Livestock
61	Seafood product preparation and packaging	Livestock
19	Support activities for agriculture and forestry	Other Ag
41	Dog and cat food manufacturing	Other Ag
42	Other animal food manufacturing	Other Ag
46	Fats and oils refining and blending	Other Ag
47	Breakfast cereal manufacturing	Other Ag
50	Chocolate and confectionery manufacturing from cacao beans	Other Ag
51	Confectionery manufacturing from purchased chocolate	Other Ag
52	Nonchocolate confectionery manufacturing	Other Ag
53	Frozen food manufacturing	Other Ag
62	Bread and bakery product manufacturing	Other Ag
63	Cookie, cracker, and pasta manufacturing	Other Ag
64	Tortilla manufacturing	Other Ag
65	Snack food manufacturing	Other Ag
66	Coffee and tea manufacturing	Other Ag
67	Flavoring syrup and concentrate manufacturing	Other Ag
68	Seasoning and dressing manufacturing	Other Ag
69	All other food manufacturing	Other Ag
70	Soft drink and ice manufacturing	Other Ag
71	Breweries	Other Ag
72	Wineries	Other Ag
73	Distilleries	Other Ag

IMPLAN Code	IMPLAN Description	Aggregrated Description
74	Tobacco product manufacturing	Other Ag
126	Other basic organic chemical manufacturing	Other Ag
130	Fertilizer manufacturing	Other Ag
131	Pesticide and other agricultural chemical manufacturing	Other Ag
203	Farm machinery and equipment manufacturing	Other Ag
379	Veterinary services	Other Ag
20	Oil and gas extraction	Mining
21	Coal mining	Mining
22	Iron ore mining	Mining
23	Copper, nickel, lead, and zinc mining	Mining
24	Gold, silver, and other metal ore mining	Mining
25	Stone mining and quarrying	Mining
26	Sand, gravel, clay, and ceramic and refractory minerals mining and (	Mining
27	Other nonmetallic mineral mining and quarrying	Mining
28	Drilling oil and gas wells	Mining
29	Support activities for oil and gas operations	Mining
30	Support activities for other mining	Mining
31	Electric power generation, transmission, and distribution	Utilities
32	Natural gas distribution	Utilities
33	Water, sewage and other systems	Utilities
34	Construction of new nonresidential commercial and health care struc	Construction
35	Construction of new nonresidential manufacturing structures	Construction
36	Construction of other new nonresidential structures	Construction
37	Construction of new residential permanent site single- and multi-fami	Construction
38	Construction of other new residential structures	Construction
39	Maintenance and repair construction of nonresidential maintenance	Construction
40	Maintenance and repair construction of residential structures	Construction
75	Fiber, yarn, and thread mills	Manfacturing
76	Broadwoven fabric mills	Manfacturing
77	Narrow fabric mills and schiffli machine embroidery	Manfacturing
78	Nonwoven fabric mills	Manfacturing
79	Knit fabric mills	Manfacturing
80	Textile and fabric finishing mills	Manfacturing
81	Fabric coating mills	Manfacturing
82	Carpet and rug mills	Manfacturing
83	Curtain and linen mills	Manfacturing
84	Textile bag and canvas mills	Manfacturing
85	All other textile product mills	Manfacturing
86	Apparel knitting mills	Manfacturing
87	Cut and sew apparel contractors	Manfacturing
88	Men's and boys' cut and sew apparel manufacturing	Manfacturing
89	Women's and girls' cut and sew apparel manufacturing	Manfacturing
90	Other cut and sew apparel manufacturing	Manfacturing
91	Apparel accessories and other apparel manufacturing	Manfacturing
92	Leather and hide tanning and finishing	Manfacturing
93	Footwear manufacturing	Manfacturing
94	Other leather and allied product manufacturing	Manfacturing
95	Sawmills and wood preservation	Manfacturing
96	Veneer and plywood manufacturing	Manfacturing
97	Engineered wood member and truss manufacturing	Manfacturing
98	Reconstituted wood product manufacturing	Manfacturing
99	Wood windows and doors and millwork	Manfacturing

IMPLAN Code	IMPLAN Description	Aggregrated Description
100	Wood container and pallet manufacturing	Manfacturing
101	Manufactured home (mobile home) manufacturing	Manfacturing
102	Prefabricated wood building manufacturing	Manfacturing
103	All other miscellaneous wood product manufacturing	Manfacturing
104	Pulp mills	Manfacturing
105	Paper mills	Manfacturing
106	Paperboard Mills	Manfacturing
107	Paperboard container manufacturing	Manfacturing
108	Coated and laminated paper, packaging paper and plastics film ma	Manfacturing
109	All other paper bag and coated and treated paper manufacturing	Manfacturing
110	Stationery product manufacturing	Manfacturing
111	Sanitary paper product manufacturing	Manfacturing
112	All other converted paper product manufacturing	Manfacturing
115	Petroleum refineries	Manfacturing
116	Asphalt paving mixture and block manufacturing	Manfacturing
117	Asphalt shingle and coating materials manufacturing	Manfacturing
118	Petroleum lubricating oil and grease manufacturing	Manfacturing
119	All other petroleum and coal products manufacturing	Manfacturing
120	Petrochemical manufacturing	Manfacturing
121	Industrial gas manufacturing	Manfacturing
122	Synthetic dye and pigment manufacturing	Manfacturing
123	Alkalies and chlorine manufacturing	Manfacturing
124	Carbon black manufacturing	Manfacturing
125	All other basic inorganic chemical manufacturing	Manfacturing
127	Plastics material and resin manufacturing	Manfacturing
128	Synthetic rubber manufacturing	Manfacturing
129	Artificial and synthetic fibers and filaments manufacturing	Manfacturing
132	Medicinal and botanical manufacturing	Manfacturing
133	Pharmaceutical preparation manufacturing	Manfacturing
134	In-vitro diagnostic substance manufacturing	Manfacturing
135	Biological product (except diagnostic) manufacturing	Manfacturing
136	Paint and coating manufacturing	Manfacturing
137	Adhesive manufacturing	Manfacturing
138	Soap and cleaning compound manufacturing	Manfacturing
139	Toilet preparation manufacturing	Manfacturing
140	Printing ink manufacturing	Manfacturing
141	All other chemical product and preparation manufacturing	Manfacturing
142	Plastics packaging materials and unlaminated film and sheet manuf	Manfacturing
143	Unlaminated plastics profile shape manufacturing	Manfacturing
144	Plastics pipe and pipe fitting manufacturing	Manfacturing
145	Laminated plastics plate, sheet (except packaging), and shape mar	Manfacturing
146	Polystyrene foam product manufacturing	Manfacturing
147	Urethane and other foam product (except polystyrene) manufacturin	Manfacturing
148	Plastics bottle manufacturing	Manfacturing
149	Other plastics product manufacturing	Manfacturing
150	Tire manufacturing	Manfacturing
151	Rubber and plastics hoses and belting manufacturing	Manfacturing
152	Other rubber product manufacturing	Manfacturing
153	Pottery, ceramics, and plumbing fixture manufacturing	Manfacturing
154	Brick, tile, and other structural clay product manufacturing	Manfacturing
155	Clay and nonclay refractory manufacturing	Manfacturing
156	Flat glass manufacturing	Manfacturing

IMPLAN Code	IMPLAN Description	Aggregrated Description
157	Other pressed and blown glass and glassware manufacturing	Manfacturing
158	Glass container manufacturing	Manfacturing
159	Glass product manufacturing made of purchased glass	Manfacturing
160	Cement manufacturing	Manfacturing
161	Ready-mix concrete manufacturing	Manfacturing
162	Concrete pipe, brick, and block manufacturing	Manfacturing
163	Other concrete product manufacturing	Manfacturing
164	Lime and gypsum product manufacturing	Manfacturing
165	Abrasive product manufacturing	Manfacturing
166	Cut stone and stone product manufacturing	Manfacturing
167	Ground or treated mineral and earth manufacturing	Manfacturing
168	Mineral wool manufacturing	Manfacturing
169	Miscellaneous nonmetallic mineral products	Manfacturing
170	Iron and steel mills and ferroalloy manufacturing	Manfacturing
171	Steel product manufacturing from purchased steel	Manfacturing
172	Alumina refining and primary aluminum production	Manfacturing
173	Secondary smelting and alloying of aluminum	Manfacturing
174	Aluminum product manufacturing from purchased aluminum	Manfacturing
175	Primary smelting and refining of copper	Manfacturing
176	Primary smelting and refining of nonferrous metal (except copper an	Manfacturing
177	Copper rolling, drawing, extruding and alloying	Manfacturing
178	Nonferrous metal (except copper and aluminum) rolling, drawing, ext	Manfacturing
179	Ferrous metal foundries	Manfacturing
180	Nonferrous metal foundries	Manfacturing
181	All other forging, stamping, and sintering	Manfacturing
182	Custom roll forming	Manfacturing
183	Crown and closure manufacturing and metal stamping	Manfacturing
184	Cutlery, utensil, pot, and pan manufacturing	Manfacturing
185	Handtool manufacturing	Manfacturing
186	Plate work and fabricated structural product manufacturing	Manfacturing
187	Ornamental and architectural metal products manufacturing	Manfacturing
188	Power boiler and heat exchanger manufacturing	Manfacturing
189	Metal tank (heavy gauge) manufacturing	Manfacturing
190	Metal can, box, and other metal container (light gauge) manufacturin	Manfacturing
191	Ammunition manufacturing	Manfacturing
192	Arms, ordnance, and accessories manufacturing	Manfacturing
193	Hardware manufacturing	Manfacturing
194	Spring and wire product manufacturing	Manfacturing
195	Machine shops	Manfacturing
196	Turned product and screw, nut, and bolt manufacturing	Manfacturing
197	Coating, engraving, heat treating and allied activities	Manfacturing
198	Valve and fittings other than plumbing	Manfacturing
199	Plumbing fixture fitting and trim manufacturing	Manfacturing
200	Ball and roller bearing manufacturing	Manfacturing
201	Fabricated pipe and pipe fitting manufacturing	Manfacturing
202	Other fabricated metal manufacturing	Manfacturing
204	Lawn and garden equipment manufacturing	Manfacturing
205	Construction machinery manufacturing	Manfacturing
206	Mining and oil and gas field machinery manufacturing	Manfacturing
207	Other industrial machinery manufacturing	Manfacturing
208	Plastics and rubber industry machinery manufacturing	Manfacturing
209	Semiconductor machinery manufacturing	Manfacturing

IMPLAN Code	IMPLAN Description	Aggregrated Description
210	Vending, commercial, industrial, and office machinery manufacturing	Manfacturing
211	Optical instrument and lens manufacturing	Manfacturing
212	Photographic and photocopying equipment manufacturing	Manfacturing
213	Other commercial and service industry machinery manufacturing	Manfacturing
214	Air purification and ventilation equipment manufacturing	Manfacturing
215	Heating equipment (except warm air furnaces) manufacturing	Manfacturing
216	Air conditioning, refrigeration, and warm air heating equipment manu	Manfacturing
217	Industrial mold manufacturing	Manfacturing
218	Metal cutting and forming machine tool manufacturing	Manfacturing
219	Special tool, die, jig, and fixture manufacturing	Manfacturing
220	Cutting tool and machine tool accessory manufacturing	Manfacturing
221	Rolling mill and other metalworking machinery manufacturing	Manfacturing
222	Turbine and turbine generator set units manufacturing	Manfacturing
223	Speed changer, industrial high-speed drive, and gear manufacturing	Manfacturing
224	Mechanical power transmission equipment manufacturing	Manfacturing
225	Other engine equipment manufacturing	Manfacturing
226	Pump and pumping equipment manufacturing	Manfacturing
227	Air and gas compressor manufacturing	Manfacturing
228	Material handling equipment manufacturing	Manfacturing
229	Power-driven handtool manufacturing	Manfacturing
230	Other general purpose machinery manufacturing	Manfacturing
231	Packaging machinery manufacturing	Manfacturing
232	Industrial process furnace and oven manufacturing	Manfacturing
233	Fluid power process machinery	Manfacturing
234	Electronic computer manufacturing	Manfacturing
235	Computer storage device manufacturing	Manfacturing
236	Computer terminals and other computer peripheral equipment manu	Manfacturing
237	Telephone apparatus manufacturing	Manfacturing
238	Broadcast and wireless communications equipment	Manfacturing
239	Other communications equipment manufacturing	Manfacturing
240	Audio and video equipment manufacturing	Manfacturing
241	Electron tube manufacturing	Manfacturing
242	Bare printed circuit board manufacturing	Manfacturing
243	Semiconductor and related device manufacturing	Manfacturing
244	Electronic capacitor, resistor, coil, transformer, and other inductor ma	Manfacturing
245	Electronic connector manufacturing	Manfacturing
246	Printed circuit assembly (electronic assembly) manufacturing	Manfacturing
247	Other electronic component manufacturing	Manfacturing
248	Electromedical and electrotherapeutic apparatus manufacturing	Manfacturing
249	Search, detection, and navigation instruments manufacturing	Manfacturing
250	Automatic environmental control manufacturing	Manfacturing
251	Industrial process variable instruments manufacturing	Manfacturing
252	Totalizing fluid meters and counting devices manufacturing	Manfacturing
253	Electricity and signal testing instruments manufacturing	Manfacturing
254	Analytical laboratory instrument manufacturing	Manfacturing
255	Irradiation apparatus manufacturing	Manfacturing
256	Watch, clock, and other measuring and controlling device manufactu	Manfacturing
257	Software, audio, and video media reproducing	Manfacturing
258	Magnetic and optical recording media manufacturing	Manfacturing
259	Electric lamp bulb and part manufacturing	Manfacturing
260	Lighting fixture manufacturing	Manfacturing
261	Small electrical appliance manufacturing	Manfacturing

IMPLAN Code	IMPLAN Description	Aggregrated Description
262	Household cooking appliance manufacturing	Manfacturing
263	Household refrigerator and home freezer manufacturing	Manfacturing
264	Household laundry equipment manufacturing	Manfacturing
265	Other major household appliance manufacturing	Manfacturing
266	Power, distribution, and specialty transformer manufacturing	Manfacturing
267	Motor and generator manufacturing	Manfacturing
268	Switchgear and switchboard apparatus manufacturing	Manfacturing
269	Relay and industrial control manufacturing	Manfacturing
270	Storage battery manufacturing	Manfacturing
271	Primary battery manufacturing	Manfacturing
272	Communication and energy wire and cable manufacturing	Manfacturing
273	Wiring device manufacturing	Manfacturing
274	Carbon and graphite product manufacturing	Manfacturing
275	All other miscellaneous electrical equipment and component manufa	Manfacturing
276	Automobile manufacturing	Manfacturing
277	Light truck and utility vehicle manufacturing	Manfacturing
278	Heavy duty truck manufacturing	Manfacturing
279	Motor vehicle body manufacturing	Manfacturing
280	Truck trailer manufacturing	Manfacturing
281	Motor home manufacturing	Manfacturing
282	Travel trailer and camper manufacturing	Manfacturing
283	Motor vehicle parts manufacturing	Manfacturing
284	Aircraft manufacturing	Manfacturing
285	Aircraft engine and engine parts manufacturing	Manfacturing
286	Other aircraft parts and auxiliary equipment manufacturing	Manfacturing
287	Guided missile and space vehicle manufacturing	Manfacturing
288	Propulsion units and parts for space vehicles and guided missiles	Manfacturing
289	Railroad rolling stock manufacturing	Manfacturing
290	Ship building and repairing	Manfacturing
291	Boat building	Manfacturing
292	Motorcycle, bicycle, and parts manufacturing	Manfacturing
293	Military armored vehicle, tank, and tank component manufacturing	Manfacturing
294	All other transportation equipment manufacturing	Manfacturing
295	Wood kitchen cabinet and countertop manufacturing	Manfacturing
296	Upholstered household furniture manufacturing	Manfacturing
297	Nonupholstered wood household furniture manufacturing	Manfacturing
298	Metal and other household furniture (except wood) manufacturing1	Manfacturing
299	Institutional furniture manufacturing	Manfacturing
300	Wood television, radio, and sewing machine cabinet manufacturing1	Manfacturing
301	Office furniture and custom architectural woodwork and millwork man	Manfacturing
302	Showcase, partition, shelving, and locker manufacturing	Manfacturing
303	Mattress manufacturing	Manfacturing
304	Blind and shade manufacturing	Manfacturing
305	Surgical and medical instrument manufacturing	Manfacturing
306	Surgical appliance and supplies manufacturing	Manfacturing
307	Dental equipment and supplies manufacturing	Manfacturing
308	Ophthalmic goods manufacturing	Manfacturing
309	Dental laboratories	Manfacturing
310	Jewelry and silverware manufacturing	Manfacturing
311	Sporting and athletic goods manufacturing	Manfacturing
312	Doll, toy, and game manufacturing	Manfacturing
313	Office supplies (except paper) manufacturing	Manfacturing

IMPLAN Code	IMPLAN Description	Aggregrated Description
314	Sign manufacturing	Manfacturing
315	Gasket, packing, and sealing device manufacturing	Manfacturing
316	Musical instrument manufacturing	Manfacturing
317	All other miscellaneous manufacturing	Manfacturing
318	Broom, brush, and mop manufacturing	Manfacturing
319	Wholesale trade	Wholesale
320	Retail - Motor vehicle and parts	Retail
321	Retail - Furniture and home furnishings	Retail
322	Retail - Electronics and appliances	Retail
323	Retail - Building material and garden supply	Retail
324	Retail - Food and beverage	Retail
325	Retail - Health and personal care	Retail
326	Retail - Gasoline stations	Retail
327	Retail - Clothing and clothing accessories	Retail
328	Retail - Sporting goods, hobby, book and music	Retail
329	Retail - General merchandise	Retail
330	Retail - Miscellaneous	Retail
331	Retail - Nonstore	Retail
332	Air transportation	Transportation
333	Rail transportation	Transportation
334	Water transportation	Transportation
335	Truck transportation	Transportation
336	Transit and ground passenger transportation	Transportation
337	Pipeline transportation	Transportation
338	Scenic and sightseeing transportation and support activities for trans	Transportation
339	Couriers and messengers	Transportation
341	Newspaper publishers	Information
342	Periodical publishers	Information
343	Book publishers	Information
344	Directory, mailing list, and other publishers	Information
345	Software publishers	Information
346	Motion picture and video industries	Information
347	Sound recording industries	Information
348	Radio and television broadcasting	Information
349	Cable and other subscription programming	Information
350	Internet publishing and broadcasting	Information
351	Telecommunications	Information
352	Data processing, hosting, and related services	Information
353	Other information services	Information
354	Monetary authorities and depository credit intermediation	Financial
355	Nondepository credit intermediation and related activities	Financial
356	Securities, commodity contracts, investments, and related activities	Financial
357	Insurance carriers	Financial
358	Insurance agencies, brokerages, and related activities	Financial
359	Funds, trusts, and other financial vehicles	Financial
360	Real estate	Financial
113	Printing	Services
114	Support activities for printing	Services
340	Warehousing and storage	Services
362	Automotive equipment rental and leasing	Services
363	General and consumer goods rental except video tapes and discs	Services
364	Video tape and disc rental	Services

IMPLAN Code	IMPLAN Description	Aggregrated Description
365	Commercial and industrial machinery and equipment rental and leas	Services
366	Lessors of nonfinancial intangible assets	Services
367	Legal services	Services
368	Accounting, tax preparation, bookkeeping, and payroll services	Services
369	Architectural, engineering, and related services	Services
370	Specialized design services	Services
371	Custom computer programming services	Services
372	Computer systems design services	Services
373	Other computer related services, including facilities management	Services
374	Management, scientific, and technical consulting services	Services
375	Environmental and other technical consulting services	Services
376	Scientific research and development services	Services
377	Advertising and related services	Services
378	Photographic services	Services
380	All other miscellaneous professional, scientific, and technical service	Services
381	Management of companies and enterprises	Services
382	Employment services	Services
383	Travel arrangement and reservation services	Services
384	Office administrative services	Services
385	Facilities support services	Services
386	Business support services	Services
387	Investigation and security services	Services
388	Services to buildings and dwellings	Services
389	Other support services	Services
390	Waste management and remediation services	Services
391	Elementary and secondary schools	Services
392	Junior colleges, colleges, universities, and professional schools	Services
393	Other educational services	Services
394	Offices of physicians, dentists, and other health practitioners	Services
395	Home health care services	Services
396	Medical and diagnostic labs and outpatient and other ambulatory ca	Services
397	Hospitals	Services
398	Nursing and residential care facilities	Services
399	Child day care services	Services
400	Individual and family services	Services
401	Community food, housing, and other relief services, including rehabil	Services
411	Hotels and motels, including casino hotels	Services
412	Other accommodations	Services
413	Food services and drinking places	Services
414	Automotive repair and maintenance, except car washes	Services
415	Car washes	Services
416	Electronic and precision equipment repair and maintenance	Services
417	Commercial and industrial machinery and equipment repair and mai	Services
418	Personal and household goods repair and maintenance	Services
419	Personal care services	Services
420	Death care services	Services
421	Dry-cleaning and laundry services	Services
422	Other personal services	Services
423	Religious organizations	Services
424	Grantmaking, giving, and social advocacy organizations	Services
425	Civic, social, professional, and similar organizations	Services
426	Private households	Services

IMPLAN Code	IMPLAN Description	Aggregrated Description
402	Performing arts companies	Entertainment
403	Spectator sports	Entertainment
404	Promoters of performing arts and sports and agents for public figures	Entertainment
405	Independent artists, writers, and performers	Entertainment
406	Museums, historical sites, zoos, and parks	Entertainment
407	Fitness and recreational sports centers	Entertainment
408	Bowling centers	Entertainment
409	Amusement parks, arcades, and gambling industries	Entertainment
410	Other amusement and recreation industries	Entertainment
427	Postal service	Government
428	Federal electric utilities	Government
429	Other Federal Government enterprises	Government
430	State and local government passenger transit	Government
431	State and local government electric utilities	Government
432	Other state and local government enterprises	Government
437	Employment and payroll for SL Government Non-Education	Government
438	Employment and payroll for SL Government Education	Government
439	Employment and payroll for Federal Non-Military	Government
440	Employment and payroll for Federal Military	Government
361	Imputed rental value for owner-occupied dwellings	Remainder
433	*Not an industry (Used and secondhand goods)	Remainder
434	*Not an industry (Scrap)	Remainder
435	*Not an industry (Rest of the world adjustment)	Remainder
436	*Not an industry (Noncomparable imports)	Remainder