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# STAFF PAPER SERIES 

# Minnesota Farm Real Estate Sales: 1990-2002 

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# Minnesota Farm Real Estate Sales: 1990-2002 

## Steven J. Taff

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#### Abstract

This publication is a snapshot of the Minnesota Farm Real Estate Sales web site (http://www.apec.umn.edu/faculty/sjtaff/salesstudy) as of May 2, 2003. It will be formally "reissued" (the web site will be recaptured) each Spring, as new sales data become available. We no longer distribute a separate farm real estate report in the Minnesota Agricultural Economist (now the Minnesota Applied Economist).


The site consists largely of graphs and tables summarizing sales over the past decade. It provides averages at the multi-county region and at the statewide levels of aggregation. Individual transaction data are available for downloading and analysis at Minnesota Land Economics (MLE) web site, located at http://www.apec.umn.edu/landeconomics.

Electronic versions of this document are presented in fully navigable portable document format (pdf).

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## Overview

This site consists largely of graphs and tables summarizing Minnesota farm real estate sales over the past decade. The goal is to give you some pictures of the data without imposing too much interpretation on you. It's my job to present the numbers; it's your job to decide what they mean.

If you want to get right to work, jump to The Figures. Otherwise, read along to find out how the numbers that underlie the graphs and tables were derived.

This site provides averages at the multi-county region and at the statewide levels of aggregation. All of the transaction data summarized here are available for downloading and analysis at Minnesota Land Economics (MLE) web site. A key feature of the sales study site is its use of size- and location-adjusted mean prices; the MLE site, on the other hand, calculates only unadjusted means for user-selected aggregations.

Both sites are constantly changing as new data are made available, new analyses are completed, and errors are found and (hopefully) remedied. Please check back periodically to find out what's new.

A snapshot of the sales study site, taken annually, is available as a printable document ( 850 KB ). The most recent capture was May 2, 2003. We no longer distribute a separate farm real estate report in the Minnesota Agricultural Economist, (now the Minnesota Applied Economist). Some of the text here is drawn from the author's previous land market studies. Click here for some past issues.

Questions, comments, corrections, concerns should be directed to the author.

## Introduction

Economists commonly look to sales data to help understand land markets. In our language, we use observations of what some properties sold for (prices) to form expectations-to make a prediction-about how much other properties might sell for in the future (values).

Why might we care? I've heard three types of reasons. First, we're a score-keeping society. We want to know "how we're doing," and we've decided to accept the average price of farmland as one indicator of the general level of prosperity in rural America. If the price of land goes up, then people in the country must be doing better. It's the rustic counterpart of our infatuation with the Dow Jones Index-the Dow
goes up and we all celebrate, because "the economy" is somehow better. Both notions are largely unsupported by either economic science or common sense, but both are deeply embedded in the public psyche.

A second reason for tracking land price average is to decide if "Land" is a good investment strategy, compared to, say, utility stocks. I capitalize the word here to dramatize the difference between a piece of land, as in "the forty acres across the road," and Land as a class of assets. The average price of a set of land sales is felt by some analysts to be a useful indicator of how well investment in Land will perform.

A third use of average price data is to forecast a potential transaction price on an individual parcel. Two types of information might help here. If you know little or nothing about how much the parcel might fetch, you might decide to use the average price of parcels in the vicinity as the starting point of negotiation. Or, if you think you know what the parcel was worth last year, then you might use new knowledge about the movement of average prices to update your valuation. Either way, you use summary data for the entire market to help you with the valuation of an individual property.

Here is not the place for me to challenge any of these rationales. Nor will I provide my own estimates of what land will sell for or whether I think average prices will rise or fall. I can tell you with great confidence what did happen in the state's many land markets. It's up to you to figure out what will happen.

## The Data

Most of the data used in the graphs and tables on this site come from annual Minnesota Department of Revenue compilations of property transactions reported by county auditors. When a Minnesota property is sold, the transaction details must be recorded at the county courthouse on a form called a certificate of real estate value, or CRV. On it, the seller attests that such-and-such a property was sold to so-and-so on a certain date for a specific price. Other information about the property (its size, intended use, soil characteristics, prior year's estimated market value) is often entered on the CRV as well.

Sales prices here are analyzed on a per-acre basis; the price includes not just land but also associated improvements, including structures. (Most years, over half of the sales are for "bare land" only.) Sales with per-acre prices above $\$ 10,000$ are excluded. On many charts, the (few) higher priced sales are excluded for clarity. All properties in the study were previously classified as "agricultural" for tax purposes and were not intended, according to the buyer, to be converted from agriculture. The most recent sales year covers the period January 1 through September 30 only, because of the way the data is collected by the Department of Revenue. As a consequence, the remainder of the current sales year is not reported until the next sales study. So, for example, year 2002 sales that occurred in October, November, or December won't be available until the Spring 2004 study.

All these transactions can be analyzed or downloaded through the Minnesota Land Economics (MLE) web site.

Before a price enters the MLE data base, it passes through an series of filters and adjustments designed to make comparison among transactions more meaningful and more reliable. A first step is to ensure that the numbers are correct. There is always the chance that simple recording errors are made. Next, local or state officials remove any sale not deemed "arms-length," because it was sold, for example, to a member of the seller's immediate family.

After this filtering, sales prices are adjusted to make comparison among sales more appropriate. First, to expunge the effects of inflation, sales prices are deflated by an officially reported rate to January 2 of the year in which they were recorded. This "adjustment for time," which has been relatively minor in years (like the past decade) where inflation has been low, is now done by the Department of Revenue.

A second price adjustment, "for terms," is also made by the Department of Revenue where appropriate. Not all farm real estate sales are for the full title by warranty deed. Some are made through a contract for deed, an arrangement that allows the buyer to pay a certain amount now and other amounts at stated intervals. Until the final payment is made, the property title remains in the possession of the seller-even though the land has been "sold." Because the agreed-upon payment schedule is entered on the CRV, the Department can calculate a present value of the initial and subsequent payments. This becomes the official recorded sales price for the transaction.

In previous years, I've reported the relative proportions of warranty deeds and contracts for deed. Following discussions with Department of Revenue officials, I've decided that the deed type is not a reliable variable in this data set. I've dropped the comparison, effective this year.

Adjustments don't end with a time- and terms-adjusted sales price. In most cases, users of the data are interested in per-acre prices, not per-parcel prices. That means some chosen total price must be divided by some total acreage. But which price? Which acres? Should we use the total price or should we first subtract out the value of buildings, personal property, ancillary property, or machinery to get closer to the "true" land price? Should we use all the land in the property, or just cropland?

On this site, I use the time- and terms-adjusted total sales price, minus the value of personal property, divided by the entire acreage of the parcel. That's why, when I'm being careful, I speak of the average price of farm real estate, not the price of "farmland" per se.

The graphs and tables included on this site (see The Figures) array the sales at the region or statewide levels only. The region boundaries used here are USDA agricultural statistics reporting districts. Here's a map of the district boundaries. The particular county groupings has problems, as would any such combination. For example, the Red River Valley, with its two worlds-apart farm real estate markets, is still lumped into a single reporting area. And the Twin Cities metropolitan area is split among three regions. You can create your own aggregations and do your own analysis by going to Minnesota Land Economics. If you need a clean copy of any of the charts for publication, please contact the author.

## How I calculated "average" prices

If there is any single story to be stressed from this analysis it is that use of a single number as "the" price of land for any area-county, region, state-can be misleading. There is a huge range in farm real estate prices throughout Minnesota. Reliance upon the movement of any single number like the mean may mislead more than it informs. All that we actually observe are the recorded prices of hundreds of individual parcels, of varying characteristics, scattered throughout the state.

For some markets, year to year price movements can be measured from repeated readings of the same property or the same asset. But in land sales studies, each observed transaction is for a different piece of land: we rarely see the same parcel sell more than once in a number of years. We opportunistically use observed sales as what statisticians sometimes call a "sample of convenience," a sample from which to estimate the average price of all land, sold and unsold combined, for that year.

If observed sales happen to be of properties that disproportionately represent one end of the (unknown) range of prices for all parcels, then the sample's average may mislead us. The wider the actual range and the fewer the number of observed sales, the more likely it is that such a disproportionate and hence misleading sample may be "drawn."

Do the observed sales analyzed here provide sufficient information for us to describe the distribution of-and to make predictions about-the value of all farmland parcels? There are two potential problems: not very many sales and not very representative sales. I attempt to deal with both problems by calculating a size- and location-adjusted mean price for each region and for the state as a whole.

For any level of aggregation, three different averages, single numbers that are intended to capture the flavor of the whole distribution, can be calculated:
(1) The transaction mean is obtained by dividing the sum of all per-acre sales prices by the number of properties sold. This might be thought of as "the average parcel price."
(2) The median, the price at which half of the transactions are higher and half are lower, can be thought of as the "middle price."
(3) The size-adjusted mean (which I called the "area mean" in previous publications) is the quotient of total dollar sales in an area divided by the total acreage sold in the same area. This final average can be thought of as the price of a "typical" acre.

We need a way to calculate an average from observed sales that best reflects the real but unobserved prices of all the other land in the area. We'd like to base our calculations on samples for which the range of (unknown) prices is small enough and for which the number of observations is large enough that we can feel comfortable that our observations are representative and that calculated statistics like the mean are useful.

For this, townships are probably too small a geographic area: there are many that have no land sales at all from year to year. The USDA districts are probably too large: there is such a wide range of land types within a typical region that we would have trouble meeting our narrow range criterion. A plausible compromise is to use counties, bigger than a township but smaller than a region, as the basic unit of aggregation. This, it is hoped, will ensure that there are a sufficient number of sales in each sample.

For the graphs and tables on this site, I first assigned a weight to each county based upon its relative proportion of the state's total farmland. Then I multiplied each county's weight by its average price so that sales from counties where there is more farmland are given more emphasis in the creation of a region or statewide average price. The size- and location-adjusted mean price for a region or the state is simply the sum of these weighted county prices.

This procedure reduces the chance that in any given year a dramatic increase in the number of sales from an area with, for example, relatively low land values, will unrealistically pull down the region average for that year.

For comparison, I provide all three kinds of average prices (in their location-adjusted form) in the price summary tables. But there is greater knowledge to be gained by examining the statewide price distributions and the region-level box plots that I've prepared for you. For these, I show only the size- and location-adjusted mean prices. The importance of location is illustrated by the not surprising finding that average land prices in different parts of the state move differently over time. I've also tested the argument that more productive land sells at a higher price, through graphs that compare selling price to agricultural productivity. There's more: check out The Figures.

## Land market dynamics

When owners are ready to sell farmland (or when buyers are ready to make an offer), how do they decide where to start the bidding? Both often start with the property's annual tax statement, which contains the assessor's estimate of what it is worth. Under Minnesota law, this estimate is for the full market value, the price the assessor expects the property to fetch if it went onto the market. How did the assessor come up with that estimate? By combining knowledge of local economic conditions with records of previous neighboring land sales, often obtained from University studies such as this one.

But buyers and sellers usually don't stop here. They frequently hire a professional appraiser to evaluate the property in much greater detail than can the assessor, who must assign a value to each of several thousand properties each year. Appraisers combine an examination of local market conditions and the characteristics of the property itself into a professional judgment of what the property might sell for. Many times appraisers will do an income analysis as well-something that assessors are not permitted to do. This method values the property using its long-term earning potential.

So assessors, appraisers, analysts, buyers, and sellers all rely, at least in part, upon previous sales in the
vicinity to decide on the value, the anticipated selling price, of a particular property. But these (few) nearby sales were themselves made at prices strongly influenced by the judgments of these same (few) assessors, appraisers, and analysts, based on the evidence of previous sales prices that they themselves were influential in determining in the first place.

The local farm real estate market is small, and it is circular. The market we think we observe from a distance is really one that we "make" ourselves, not a collection of independent decisions made by anonymous buyers and sellers.

The average price for a region that I report is just a compilation of the sales that originated in scores of small "markets." Anecdotal evidence suggests that almost all bidders for farmland in Minnesota are neighbors. Very rarely does a new farmer enter the community by buying a whole farm, and even more rarely do outside investors buy into a community for farming purposes. As a result, a typical farmland property up for sale probably sees at most two or three legitimate offers. This is not a market in the the usual sense: few of the usual features of markets beloved of economists can be expected to hold.

In particular, there is little reason to believe that the observed sales price represents a true compromise between buyer and seller based upon the income potential of the property. Instead, the price strongly reflects the professional judgment of of a single local assessor or a single real estate appraiser. Compilations can be used to infer economic conditions common to all local markets, but we should not fool ourselves into thinking that land is a commodity, that it has a single price, or that there are very many participants and local land markets.

## And in conclusion...

I hope you're not completely sated with the limited analysis I've put up on this site. I encourage you to try your own hand at land market analysis. If you need an unadjusted transaction mean or area mean, or if you need some other level of aggregation such as a county, or if you'd like to try some fancier market analysis, go directly to Minnesota Land Economics and roll your own.

## The Figures

a. USDA estimates of statewide farm real estate value, 1950-present
b. Three "independent" estimates of statewide farm real estate value, 1990-present
c. Farm real estate sales summaries, 1990-present, by region and statewide:

State North West North Central North East West Central Central East Central South West South Central South East
d. Histograms of statewide farm real estate sales prices, by year:
$\underline{1990} \underline{1991} \underline{1992} \underline{1993} \underline{1994} \underline{1995} \underline{1996} \underline{1997} \underline{1998} \underline{1999} \underline{2000} \quad \underline{2001} \quad \underline{2002} \quad \underline{1990}$ compared to 2002
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State North West West Central Central East Central South West South Central South East
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i. Relationship of statewide farm real estate sales prices to assessor estimated market value, by year: $\underline{1990} \underline{1991} \underline{1992} \underline{1993} \underline{1994} \underline{1995} \underline{1996} \underline{1997} \underline{1998} \underline{1999} \underline{2000} \underline{2001} \underline{2002}$

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Return to Minnesota Farm Real Estate Sales

These are archived copies (pdf format) of annual farm real estate sales studies published in the Minnesota Agricultural Economist.
$\underline{1996}$
$\underline{1997}$
$\underline{1998}$
$\underline{1999}$
$\underline{2000}$

## State North West North Central North East West Central Central East Central South West South Central South East

State

|  |  |  | Average Per-Acre Price (Location Weighted) |  |  |
| ---: | ---: | ---: | ---: | ---: | ---: |
|  | Number of <br> Sales | Acres Sold | Unweighted <br> Mean | Size Weighted <br> Mean | Median |
| 1990 | 3,154 | 380,555 | 737 | 704 | 697 |
| 1991 | 2,644 | 315,005 | 809 | 754 | 748 |
| 1992 | 2,775 | 316,725 | 852 | 792 | 776 |
| 1993 | 2,712 | 293,581 | 903 | 836 | 812 |
| 1994 | 2,975 | 319,058 | 948 | 870 | 846 |
| 1995 | 2,756 | 272,450 | 968 | 892 | 870 |
| 1996 | 2,971 | 310,432 | 1,074 | 966 | 962 |
| 1997 | 3,018 | 329,519 | 1,148 | 1,063 | 1,045 |
| 1998 | 2,761 | 289,055 | 1,243 | 1,147 | 1,124 |
| 1999 | 2,464 | 263,522 | 1,268 | 1,172 | 1,173 |
| 2000 | 2,473 | 273,686 | 1,397 | 1,265 | 1,245 |
| 2001 | 2,396 | 260,328 | 1,543 | 1,433 | 1,392 |
| 2002 | 1,788 | 186,434 | 1,638 | 1,545 | 1,490 |
|  | 34,887 | $3,810,350$ |  |  |  |

Original data from Department of Revenue compilations of Certificates of Real Estate Value, further adjusted by that agency and by the author, as described on the sales study site linked at the top.

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## State North West North Central North East West Central Central East Central South West South Central South East

North West

|  |  |  | Average Per-Acre Price (Location Weighted) |  |  |
| :---: | ---: | ---: | ---: | ---: | ---: |
|  | Number of <br> Sales | Acres Sold | Unweighted <br> Mean | Size Weighted <br> Mean | Median |
| 1990 | 356 | 54,641 | 482 | 464 | 461 |
| 1991 | 357 | 54,873 | 445 | 416 | 395 |
| 1992 | 355 | 50,909 | 523 | 497 | 490 |
| 1993 | 331 | 44,048 | 542 | 486 | 436 |
| 1994 | 347 | 50,409 | 548 | 482 | 464 |
| 1995 | 294 | 38,748 | 516 | 500 | 436 |
| 1996 | 333 | 51,083 | 574 | 490 | 494 |
| 1997 | 359 | 52,393 | 556 | 496 | 476 |
| 1998 | 332 | 51,519 | 552 | 487 | 449 |
| 1999 | 299 | 42,668 | 550 | 534 | 497 |
| 2000 | 313 | 50,568 | 656 | 519 | 506 |
| 2001 | 320 | 58,013 | 623 | 550 | 542 |
| 2002 | 283 | 45,950 | 658 | 616 | 599 |
|  | 4,279 | 645,822 |  |  |  |

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North Central

|  |  |  | Average Per-Acre Price (Location Weighted) |  |  |
| :---: | ---: | ---: | ---: | ---: | ---: |
|  | Number of <br> Sales | Acres Sold | Unweighted <br> Mean | Size Weighted <br> Mean | Median |
| 1990 | 133 | 18,073 | 281 | 225 | 202 |
| 1991 | 159 | 19,707 | 329 | 257 | 214 |
| 1992 | 122 | 15,232 | 369 | 295 | 232 |
| 1993 | 169 | 21,826 | 362 | 292 | 236 |
| 1994 | 174 | 21,050 | 382 | 308 | 269 |
| 1995 | 130 | 16,334 | 376 | 315 | 281 |
| 1996 | 105 | 12,672 | 482 | 415 | 366 |
| 1997 | 94 | 1,489 | 492 | 411 | 384 |
| 1998 | 76 | 10,293 | 551 | 417 | 406 |
| 1999 | 109 | 13,316 | 608 | 524 | 440 |
| 2000 | 133 | 15,353 | 736 | 700 | 564 |
| 2001 | 87 | 11,829 | 685 | 632 | 576 |
| 2002 | 55 | 6,351 | 948 | 894 | 843 |
|  | 1,546 | 194,525 |  |  |  |

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North East

|  |  |  | Average Per-Acre Price (Location Weighted) |  |  |
| :---: | ---: | ---: | ---: | ---: | ---: |
|  | Number of <br> Sales | Acres Sold | Unweighted <br> Mean | Size Weighted <br> Mean | Median |
| 1990 | 10 | 1,218 | 376 | 303 | 288 |
| 1991 | 15 | 1,616 | 311 | 272 | 188 |
| 1992 | 19 | 1,731 | 311 | 289 | 229 |
| 1993 | 17 | 1,451 | 280 | 278 | 252 |
| 1994 | 12 | 1,408 | 595 | 370 | 316 |
| 1995 | 7 | 770 | 336 | 272 | 217 |
| 1996 | 18 | 1,703 | 450 | 465 | 413 |
| 1997 | 13 | 1,183 | 711 | 719 | 569 |
| 1998 | 25 | 2,209 | 752 | 568 | 553 |
| 1999 | 24 | 2,048 | 561 | 544 | 400 |
| 2000 | 14 | 1,393 | 636 | 617 | 503 |
| 2001 | 12 | 806 | 1,449 | 1,142 | 1,199 |
| 2002 | 10 | 683 | 1,198 | 1,100 | 785 |
|  | 196 | 18,219 |  |  |  |

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West Central

|  |  |  | Average Per-Acre Price (Location Weighted) |  |  |
| ---: | ---: | ---: | ---: | ---: | ---: |
|  | Number of <br> Sales | Acres Sold | Unweighted <br> Mean | Size Weighted <br> Mean | Median |
| 1990 | 406 | 57,068 | 601 | 587 | 573 |
| 1991 | 375 | 54,244 | 635 | 616 | 617 |
| 1992 | 409 | 53,360 | 701 | 670 | 655 |
| 1993 | 328 | 43,045 | 701 | 663 | 686 |
| 1994 | 341 | 43,755 | 768 | 733 | 729 |
| 1995 | 309 | 37,501 | 731 | 714 | 668 |
| 1996 | 396 | 46,489 | 822 | 769 | 753 |
| 1997 | 463 | 57,440 | 881 | 839 | 816 |
| 1998 | 452 | 52,197 | 923 | 879 | 835 |
| 1999 | 381 | 43,996 | 978 | 976 | 916 |
| 2000 | 387 | 47,229 | 1,057 | 986 | 976 |
| 2001 | 377 | 44,923 | 1,144 | 1,039 | 1,040 |
| 2002 | 254 | 29,198 | 1,143 | 1,082 | 1,056 |
|  | 4,878 | 610,445 |  |  |  |

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Central

|  |  |  | Average Per-Acre Price (Location Weighted) |  |  |
| ---: | ---: | ---: | ---: | ---: | ---: |
|  | Number of <br> Sales | Acres Sold | Unweighted <br> Mean | Size Weighted <br> Mean | Median |
| 1990 | 701 | 71,126 | 834 | 794 | 745 |
| 1991 | 478 | 50,115 | 927 | 851 | 857 |
| 1992 | 577 | 55,514 | 933 | 871 | 822 |
| 1993 | 618 | 55,726 | 1,053 | 977 | 886 |
| 1994 | 671 | 59,631 | 1,079 | 979 | 937 |
| 1995 | 622 | 50,802 | 1,186 | 1,087 | 1,116 |
| 1996 | 654 | 60,041 | 1,248 | 1,139 | 1,108 |
| 1997 | 603 | 59,724 | 1,421 | 1,335 | 1,274 |
| 1998 | 571 | 51,976 | 1,489 | 1,366 | 1,328 |
| 1999 | 553 | 53,476 | 1,579 | 1,415 | 1,384 |
| 2000 | 536 | 57,955 | 1,796 | 1,599 | 1,568 |
| 2001 | 541 | 43,429 | 2,016 | 1,801 | 1,717 |
| 2002 | 413 | 33,862 | 2,308 | 2,206 | 2,045 |
|  | 7,538 | 703,377 |  |  |  |

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## Back to Minnesota Farm Real Estate Sales

## State North West North Central North East West Central Central East Central South West South Central South East

| East Central $\quad$ Average Per-Acre Price (Location Weighted) |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Number of Sales | Acres Sold | Unweighted Mean | Size Weighted Mean | Median |
| 1990 | 300 | 28,493 | 579 | 520 | 489 |
| 1991 | 293 | 24,865 | 820 | 674 | 575 |
| 1992 | 335 | 28,477 | 838 | 697 | 591 |
| 1993 | 399 | 33,539 | 875 | 710 | 585 |
| 1994 | 496 | 40,690 | 922 | 789 | 742 |
| 1995 | 452 | 36,515 | 1,015 | 828 | 833 |
| 1996 | 426 | 37,385 | 1,323 | 1,055 | 1,084 |
| 1997 | 370 | 31,883 | 1,386 | 1,199 | 1,159 |
| 1998 | 327 | 22,730 | 1,774 | 1,533 | 1,669 |
| 1999 | 300 | 20,195 | 1,710 | 1,542 | 1,612 |
| 2000 | 236 | 14,978 | 1,985 | 1,824 | 1,686 |
| 2001 | 213 | 14,051 | 2,519 | 2,301 | 2,233 |
| 2002 | 135 | 8,605 | 2,317 | 2,149 | 2,031 |
|  | 4,282 | 342,406 |  |  |  |

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## State North West North Central North East West Central Central East Central South West South Central South East

South West

|  |  |  | Average Per-Acre Price (Location Weighted) |  |  |
| ---: | ---: | ---: | ---: | ---: | ---: |
|  | Number of <br> Sales | Acres Sold | Unweighted <br> Mean | Size Weighted <br> Mean | Median |
| 1990 | 407 | 50,644 | 929 | 921 | 965 |
| 1991 | 341 | 39,986 | 1,039 | 1,003 | 1,037 |
| 1992 | 271 | 31,962 | 1,106 | 1,073 | 1,086 |
| 1993 | 253 | 29,075 | 1,143 | 1,085 | 1,147 |
| 1994 | 283 | 36,584 | 1,089 | 1,085 | 1,100 |
| 1995 | 249 | 30,845 | 1,202 | 1,125 | 1,136 |
| 1996 | 352 | 39,148 | 1,170 | 1,110 | 1,161 |
| 1997 | 377 | 47,586 | 1,216 | 1,181 | 1,235 |
| 1998 | 303 | 36,994 | 1,366 | 1,344 | 1,354 |
| 1999 | 242 | 32,284 | 1,356 | 1,277 | 1,335 |
| 2000 | 295 | 34,246 | 1,448 | 1,359 | 1,398 |
| 2001 | 286 | 32,224 | 1,509 | 1,502 | 1,496 |
| 2002 | 197 | 23,505 | 1,654 | 1,583 | 1,611 |
|  | 3,856 | 465,083 |  |  |  |

Original data from Department of Revenue compilations of Certificates of Real Estate Value, further adjusted by that agency and by the author, as described on the sales study site linked at the top.

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State North West North Central North East West Central Central East Central South West South Central South East

South Central

|  |  |  | Average Per-Acre Price (Location Weighted) |  |  |
| ---: | ---: | ---: | ---: | ---: | ---: |
|  | Number of <br> Sales | Acres Sold | Unweighted <br> Mean | Size Weighted <br> Mean | Median |
| 1990 | 412 | 43,123 | 1,176 | 1,112 | 1,151 |
| 1991 | 307 | 30,458 | 1,252 | 1,238 | 1,268 |
| 1992 | 346 | 33,911 | 1,271 | 1,228 | 1,234 |
| 1993 | 291 | 26,580 | 1,388 | 1,340 | 1,367 |
| 1994 | 340 | 32,031 | 1,484 | 1,383 | 1,374 |
| 1995 | 359 | 28,054 | 1,482 | 1,357 | 1,352 |
| 1996 | 400 | 32,404 | 1,709 | 1,571 | 1,587 |
| 1997 | 435 | 37,320 | 1,724 | 1,675 | 1,689 |
| 1998 | 375 | 30,335 | 1,971 | 1,849 | 1,823 |
| 1999 | 311 | 32,630 | 1,931 | 1,705 | 1,849 |
| 2000 | 298 | 25,329 | 1,967 | 1,813 | 1,839 |
| 2001 | 323 | 31,121 | 2,150 | 2,073 | 2,058 |
| 2002 | 268 | 21,302 | 2,348 | 2,204 | 2,197 |
|  | 4,465 | 404,598 |  |  |  |

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## State North West North Central North East West Central Central East Central South West South Central South East

South East

|  |  |  | Average Per-Acre Price (Location Weighted) |  |  |
| ---: | ---: | ---: | ---: | ---: | ---: |
|  | Number of <br> Sales | Acres Sold | Unweighted <br> Mean | Size Weighted <br> Mean | Median |
| 1990 | 429 | 56,169 | 858 | 805 | 785 |
| 1991 | 319 | 39,141 | 1,033 | 901 | 878 |
| 1992 | 341 | 45,629 | 1,057 | 881 | 913 |
| 1993 | 306 | 38,291 | 1,110 | 1,016 | 996 |
| 1994 | 311 | 33,500 | 1,273 | 1,124 | 1,039 |
| 1995 | 334 | 32,881 | 1,254 | 1,119 | 1,063 |
| 1996 | 287 | 29,507 | 1,441 | 1,247 | 1,202 |
| 1997 | 304 | 29,501 | 1,677 | 1,432 | 1,397 |
| 1998 | 300 | 30,802 | 1,694 | 1,547 | 1,485 |
| 1999 | 245 | 22,909 | 1,789 | 1,658 | 1,652 |
| 2000 | 261 | 26,635 | 1,967 | 1,809 | 1,773 |
| 2001 | 237 | 23,932 | 2,296 | 2,174 | 2,016 |
| 2002 | 173 | 16,978 | 2,310 | 2,148 | 2,039 |
|  | 3,847 | 425,875 |  |  |  |

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1990 Minnesota farm real estate sales


These are histograms of statewide sales prices over the years. They show the number of transactions in each price range. The higher the bar, the more sales were observed in that range. A few over- $\$ 3,500$ sales were dropped for consistency.

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1991 Minnesota farm real estate sales


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1992 Minnesota farm real estate sales


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1993 Minnesota farm real estate sales


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1994 Minnesota farm real estate sales


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1995 Minnesota farm real estate sales


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1996 Minnesota farm real estate sales


These are histograms of statewide sales prices over the years. They show the number of transactions in each price range. The higher the bar, the more sales were observed in that range. A few over- $\$ 3,500$ sales were dropped for consistency.

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1997 Minnesota farm real estate sales


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1998 Minnesota farm real estate sales


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1999 Minnesota farm real estate sales


These are histograms of statewide sales prices over the years. They show the number of transactions in each price range. The higher the bar, the more sales were observed in that range. A few over- $\$ 3,500$ sales were dropped for consistency.

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## 2000 Minnesota farm real estate sales



These are histograms of statewide sales prices over the years. They show the number of transactions in each price range. The higher the bar, the more sales were observed in that range. A few over- $\$ 3,500$ sales were dropped for consistency.

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## 2001 Minnesota farm real estate sales



These are histograms of statewide sales prices over the years. They show the number of transactions in each price range. The higher the bar, the more sales were observed in that range. A few over- $\$ 3,500$ sales were dropped for consistency.

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## 2002 Minnesota farm real estate sales



These are histograms of statewide sales prices over the years. They show the number of transactions in each price range. The higher the bar, the more sales were observed in that range. A few over- $\$ 3,500$ sales were dropped for consistency.

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# State North West West Central Central East Central South West South Central South East 

## Minnesota Farm Real Estate Sales, 1990-present: North West

These are called box-and-whisker plots. They show far more information about the price distribution than can a single number like the average price. The median price (not adjusted here for size or location), the price at which half the sales were higher and half were lower, is shown by the horizontal bar within each box. Movement of the median is shown by the connecting line. The box shows the interquartile range, within which half of the sales prices fell. The upper and lower dotted whiskers span essentially the entire price distribution, except for a few extreme observations. The pattern of rising medians and broadening interquartile ranges for many of the regions suggest some of the statistical reasons for the observed increases in average prices. While many lower price sales still are seen, there has been a rise in the size of the higher price sales and a general upward shifting of the mass of the price distribution. (There were too few farmland sales in the North East and North Central districts for meaningful analysis.)

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# State North West West Central Central East Central South West South Central South East 

## Minnesota Farm Real Estate Sales, 1990-present: West Central



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## Minnesota Farm Real Estate Sales, 1990-present:

Central

These are called box-and-whisker plots. They show far more information about the price distribution than can a single number like the average price. The median price (not adjusted here for size or location), the price at which half the sales were higher and half were lower, is shown by the horizontal bar within each box. Movement of the median is shown by the connecting line. The box shows the interquartile range, within which half of the sales prices fell. The upper and lower dotted whiskers span essentially the entire price distribution, except for a few extreme observations. The pattern of rising medians and broadening interquartile ranges for many of the regions suggest some of the statistical reasons for the observed increases in average prices. While many lower price sales still are seen, there has been a rise in the size of the higher price sales and a general upward shifting of the mass of the price distribution. (There were too few farmland sales in the North East and North Central districts for meaningful analysis.)

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State North West West Central Central East Central South West South Central South East

## Minnesota Farm Real Estate Sales, 1990-present: East Central



These are called box-and-whisker plots. They show far more information about the price distribution than can a single number like the average price. The median price (not adjusted here for size or location), the price at which half the sales were higher and half were lower, is shown by the horizontal bar within each box. Movement of the median is shown by the connecting line. The box shows the interquartile range, within which half of the sales prices fell. The upper and lower dotted whiskers span essentially the entire price distribution, except for a few extreme observations. The pattern of rising medians and broadening interquartile ranges for many of the regions suggest some of the statistical reasons for the observed increases in average prices. While many lower price sales still are seen, there has been a rise in the size of the higher price sales and a general upward shifting of the mass of the price distribution. (There were too few farmland sales in the North East and North Central districts for meaningful analysis.)

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## Minnesota Farm Real Estate Sales, 1990-present: South West

These are called box-and-whisker plots. They show far more information about the price distribution than can a single number like the average price. The median price (not adjusted here for size or location), the price at which half the sales were higher and half were lower, is shown by the horizontal bar within each box. Movement of the median is shown by the connecting line. The box shows the interquartile range, within which half of the sales prices fell. The upper and lower dotted whiskers span essentially the entire price distribution, except for a few extreme observations. The pattern of rising medians and broadening interquartile ranges for many of the regions suggest some of the statistical reasons for the observed increases in average prices. While many lower price sales still are seen, there has been a rise in the size of the higher price sales and a general upward shifting of the mass of the price distribution. (There were too few farmland sales in the North East and North Central districts for meaningful analysis.)

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## Minnesota Farm Real Estate Sales, 1990-present: South Central



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## Minnesota Farm Real Estate Sales, 1990-present: South East

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## Movements in Minnesota farm real estate prices (adjusted for size and location)



This chart shows each region's annual price divided by its 1990 price. This permits us to examine relative price movements without being distracted by differing price levels. So, for example, the South East average price increased to 2.8 times its 1990 level by 2001 ; the North West average price remained essentially unchanged over the same time span.

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$\underline{1990} \underline{1991} \underline{1992} \underline{1993} \underline{1994} \underline{1995} \underline{1996} \underline{1997} \underline{1998} \underline{1999} \underline{2000} \underline{2001} \underline{2002}$

## Minnesota farm real estate sales productivity 1990

\$6,000


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## Minnesota farm real estate sales productivity 1991

$\$ 6,000$


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## Minnesota farm real estate sales productivity 1992

\$6,000


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## Minnesota farm real estate sales productivity 1994

\$6,000


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\$6,000


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## Minnesota farm real estate sales productivity 1997

\$6,000


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## Minnesota farm real estate sales productivity 1998

\$6,000


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## Minnesota farm real estate sales productivity 1999

$\$ 6,000$


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# State North West West Central Central East Central South West South Central South East 

## Minnesota Farm Real Estate Sales, 1990-present: State



These are called box-and-whisker plots. They show far more information about the price distribution than can a single number like the average price. The median price (not adjusted here for size or location), the price at which half the sales were higher and half were lower, is shown by the horizontal bar within each box. Movement of the median is shown by the connecting line. The box shows the interquartile range, within which half of the sales prices fell. The upper and lower dotted whiskers span essentially the entire price distribution, except for a few extreme observations. The pattern of rising medians and broadening interquartile ranges for many of the regions suggest some of the statistical reasons for the observed increases in average prices. While many lower price sales still are seen, there has been a rise in the size of the higher price sales and a general upward shifting of the mass of the price distribution. (There were too few farmland sales in the North East and North Central districts for meaningful analysis.)

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## Back to Minnesota Farm Real Estate Sales

## Minnesota farmland values

These charts are based on a series maintained by the Minnesota Agricultural Statistics Service office. Each summer the USDA reports an estimated average price of farmland plus buildings for each state, as of January 1 of that year. The data come from a sample of land parcels throughout the country, conducted earlier in the year. Owners of land within each sampled parcel are asked what they think their land is worth (its expected sales price, or value in our terms). Their responses are aggregated to give a statistically valid average for the entire state. The USDA approach can ensure that the state average is a valid summary of the individual owners' valuations, but it cannot, of course, ensure that individual owners really know what their land is worth in the first place.

## Average USDA estimated Minnesota farm real estate values



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## Back to Minnesota Farm Real Estate Sales

Here are three estimates of average farm real estate value, drawn from three different sources of data. One line shows price according to an annual USDA survey of property owners; another is the locationand size-adjusted average of local property tax assessors' assignment of property values for tax purposes; the third is the location- and size-adjusted mean described on the sales study site.

The underlying parcel-level value estimates are calculated by the assessors for January 2 of the indicated year, based on data collected the previous fall. From these county reports, I compile total agricultural values and total deeded (tillable and nontillable farmland) acres for each township for which I have data for the three immediately preceding years. These township per-acre averages (agricultural value divided by deeded acres) are then averaged (weighted by total township agricultural land extent) for each year and reported as a single statewide estimated land value.

On average, the assessors' EMV is a pretty good predictor of price, even though the value estimates preceded the actual sale by as many as two years. Preliminary EMVs are available at Minnesota Land Economics in July of the noted year, USDA state-level estimates in August, and the final sales report in April of the next year.

## Estimates of average Minnesota farm real estate values: 1990 - present


$\$ 600$
$\begin{array}{lllllllllllll}1990 & 1991 & 1992 & 1993 & 1994 & 1995 & 1996 & 1997 & 1998 & 1999 & 2000 & 2001 & 2002\end{array}$

Original data from Department of Revenue compilations of Certificates of Real Estate Value, further adjusted by that agency and by the author, as described on the sales study site linked at the top.

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## Minnesota farm real estate sales 1990 (gray) and 2002 (black)



These are histograms of statewide sales prices over the years. They show the number of transactions in each price range. The higher the bar, the more sales were observed in that range. A few over- $\$ 3,500$ sales were dropped for consistency.

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## Back to Minnesota Farm Real Estate Sales

$\underline{1990} \underline{1991} \underline{1992} \underline{1993} \underline{1994} \underline{1995} \underline{1996} \underline{1997} \underline{1998} \underline{1999} \underline{2000} \underline{2001} \underline{2002}$


These histograms show the number of transactions in each size class. The higher the bar the more sales were observed of that size. Over the years, most Minnesota farm real estate transactions have for 160 acres or fewer, wtih the bulk at 40, 80, and 120 acres. This pattern reflects both the Survey origins of Midwestern farmland boundaries and the fact that practically nobody buys whole farms anymore.

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## Back to Minnesota Farm Real Estate Sales

$\underline{1990} \underline{1991} \underline{1992} \underline{1993} \underline{1994} \underline{1995} \underline{1996} \underline{1997} \underline{1998} \underline{1999} \underline{2000} \underline{2001} \underline{2002}$


These histograms show the number of transactions in each size class. The higher the bar the more sales were observed of that size. Over the years, most Minnesota farm real estate transactions have for 160 acres or fewer, wtih the bulk at 40, 80, and 120 acres. This pattern reflects both the Survey origins of Midwestern farmland boundaries and the fact that practically nobody buys whole farms anymore.

Original data from Department of Revenue compilations of Certificates of Real Estate Value, further adjusted by that agency and by the author, as described on the sales study site linked at the top.

## Prepared by Steven J. Taff

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