

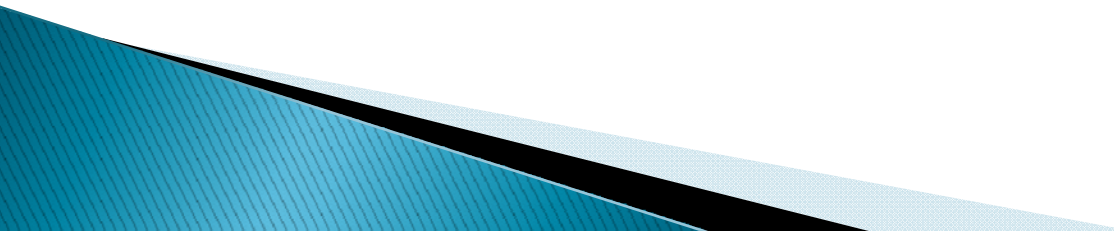
Progress or Devastation? The Effects of Ethanol Plant Location on Local Land Use

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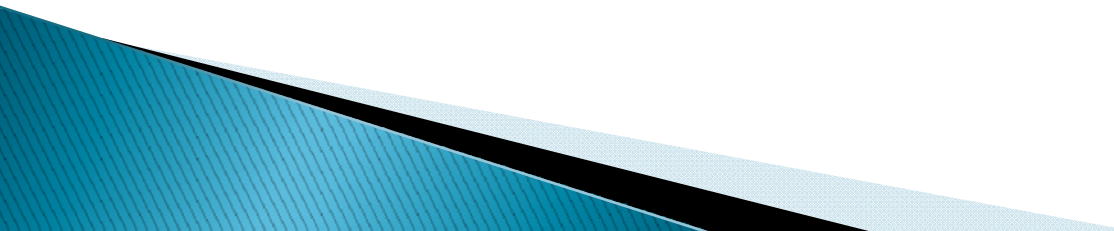
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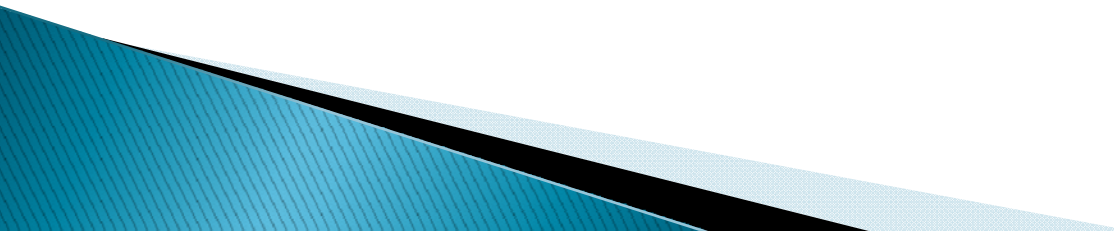
Background

- ▶ There is a considerable literature examining the impacts of siting ethanol plants. However, most of the analysis has been partial, and a missing component has been the measurement of impacts on land prices.
 - ▶ McNew and Griffith have documented local impacts on corn prices resulting from ethanol production, and more recently Fortenbery and Park have identified positive impacts on national average prices.
 - ▶ While one might expect price increases to be reflected in agricultural land prices, the actual impact has not been measured. Further, the impact on non-agricultural prices has not been studied.
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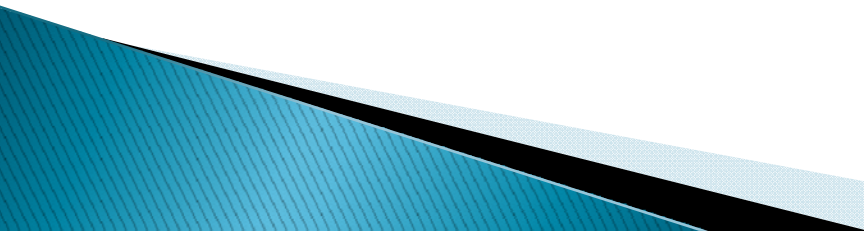
Perceptions

- ▶ Arguments have been made that suggest both positive and negative land price impacts associated with ethanol production.
 - ▶ In Wisconsin, potential negative impacts have been used to justify rejecting local plant sitings.
 - ▶ Conversely, other locations have argued local agricultural land prices would be enhanced, and net effects would be positive.
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Previous Experience

- ▶ There is a rich literature on measuring the effects of industrial sites on neighboring property values. There are several potential negatives associated with industrial development, including noise, air, and water pollution that may have a negative impact on local residential property values.
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Examples

- ▶ Saphores and Aguilar–Benitez (2005) examined industrial development impacts in southern California and found that industrial odors can negatively affect local housing values by up to 3.4 percent.
 - ▶ Similarly, Anstine (2003), using hedonics, showed that noticeable pollution – such as sound or odor – negatively impacts housing values in rural locations. Anstine found that less noticeable disamenities associated with manufacturing or industrial facilities may not affect property values in the way that more obvious ones do.
 - ▶ Hedonic studies have shown that rail and highway development have a negative effect on neighboring property values (Cervero 2004).
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Objectives

- ▶ Investigate claims of localized land impacts on two fronts:
 - Impact a local ethanol plant has on the rate of agricultural land conversion to other uses – do ethanol plants result in reduced loss of farm land?
 - Impact a local ethanol plant has on local residential land values – are residential land values adversely affected by the siting of an ethanol plant?

Methodology

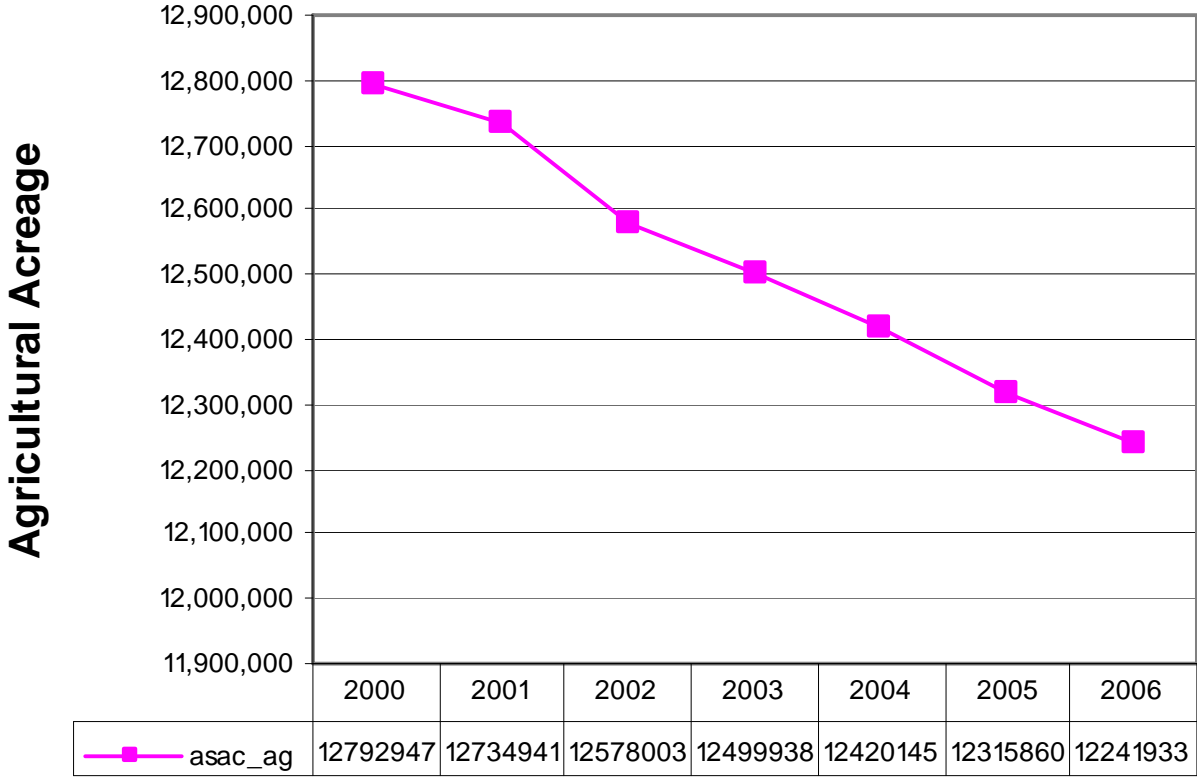
- ▶ We take two approaches to examining ethanol plant impacts on land use/value
 - First, we simply calculate descriptive statistics in an attempt to measure whether there are statistical differences in land changes based on distance from an ethanol plant.
 - Second, we estimate a series of double log models where the dependent variables are either change in agricultural land use to some other use, or change in residential real estate value. The independent variables represent distances from ethanol plants.

Data

The data come from the Wisconsin Department of Revenue's tax data. We have annual observations from 2000 to 2006 for each town, village, and city for the state of Wisconsin. The data consist of the amount of land in agricultural production, and the value of non-agricultural real estate in each community.

The value of agricultural land is problematic because Wisconsin property taxes are based on use value, not market value, and we do not have annual transactions prices for agricultural land sales.

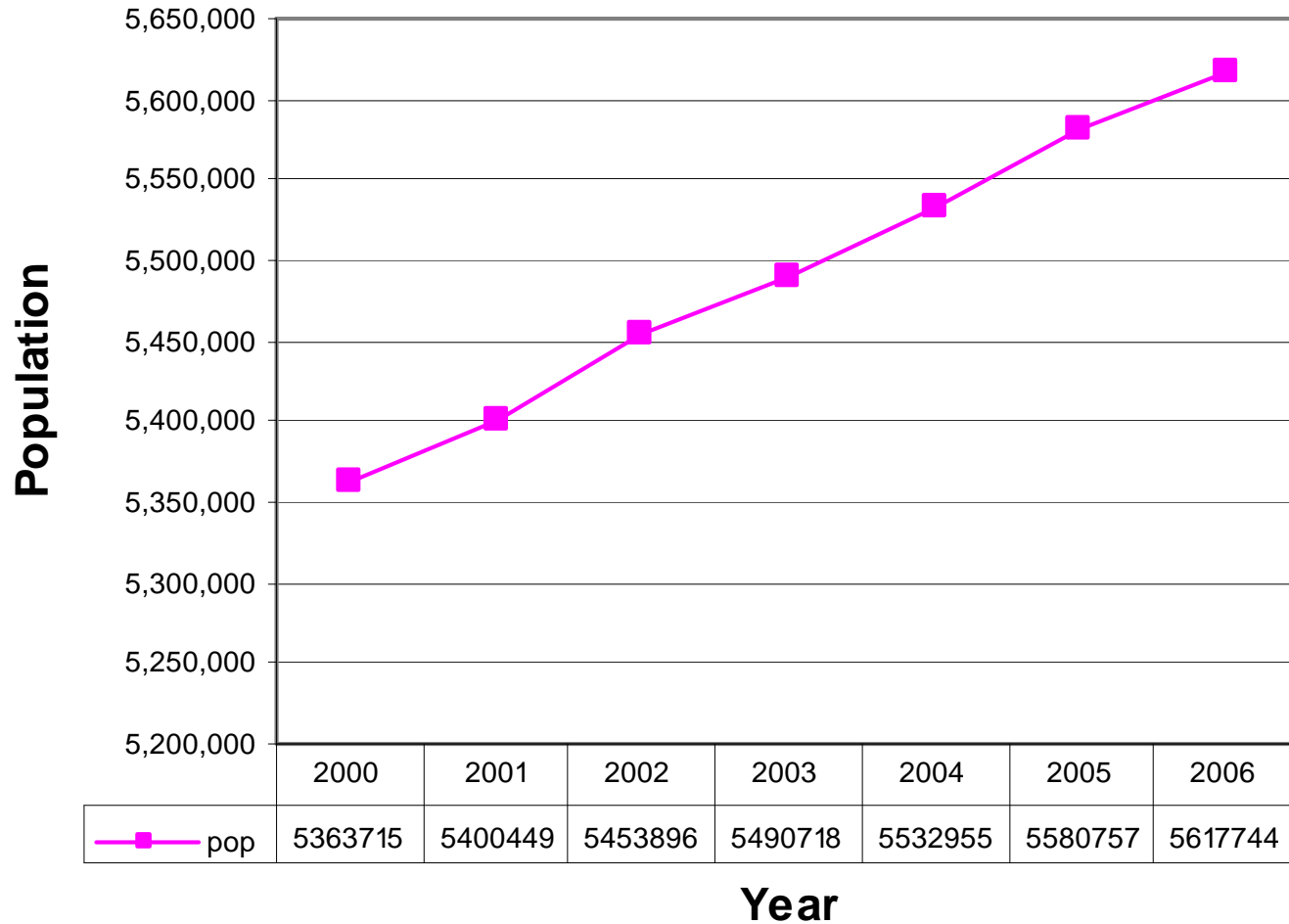
State Agricultural Acreage



Year

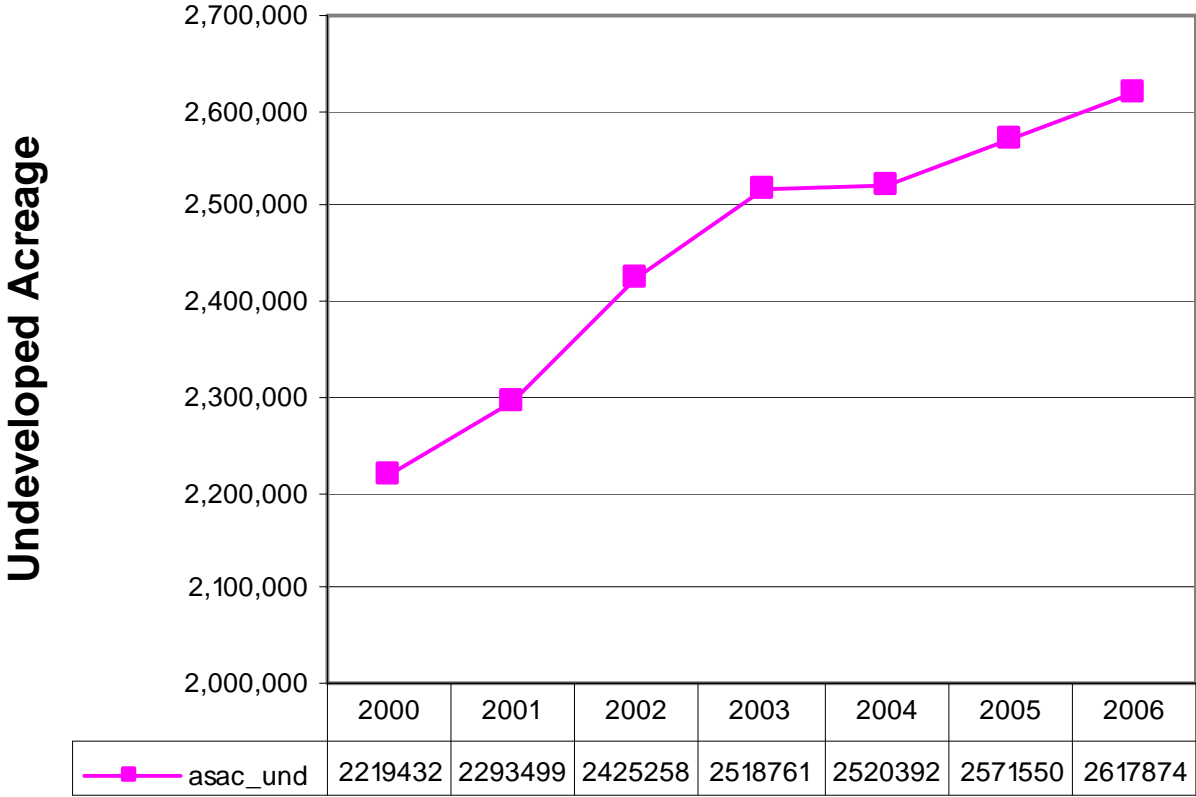
% Change 00-06: -4.3%

(Estimated) State Population



% Change 00-06: 4.7%

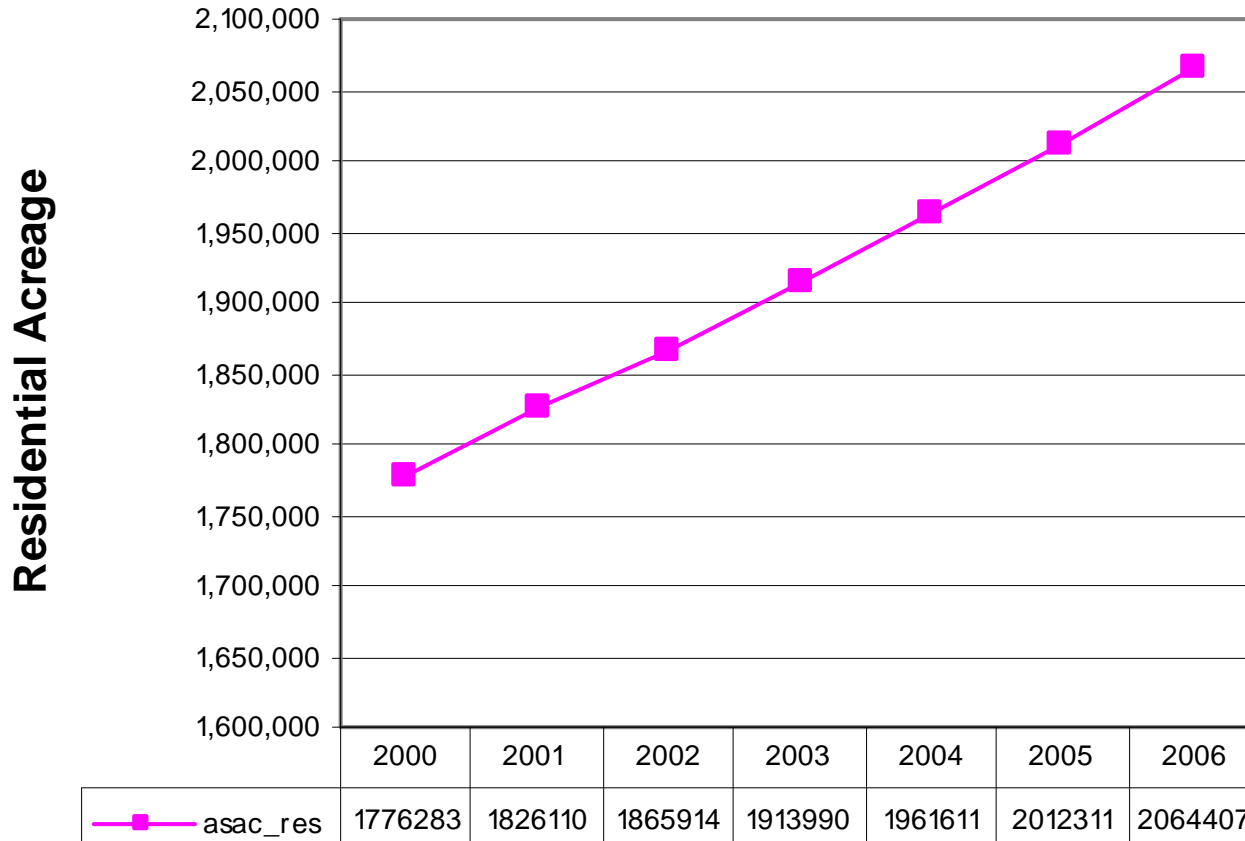
State Undeveloped Acreage



Year

% Change 00-06: 18%

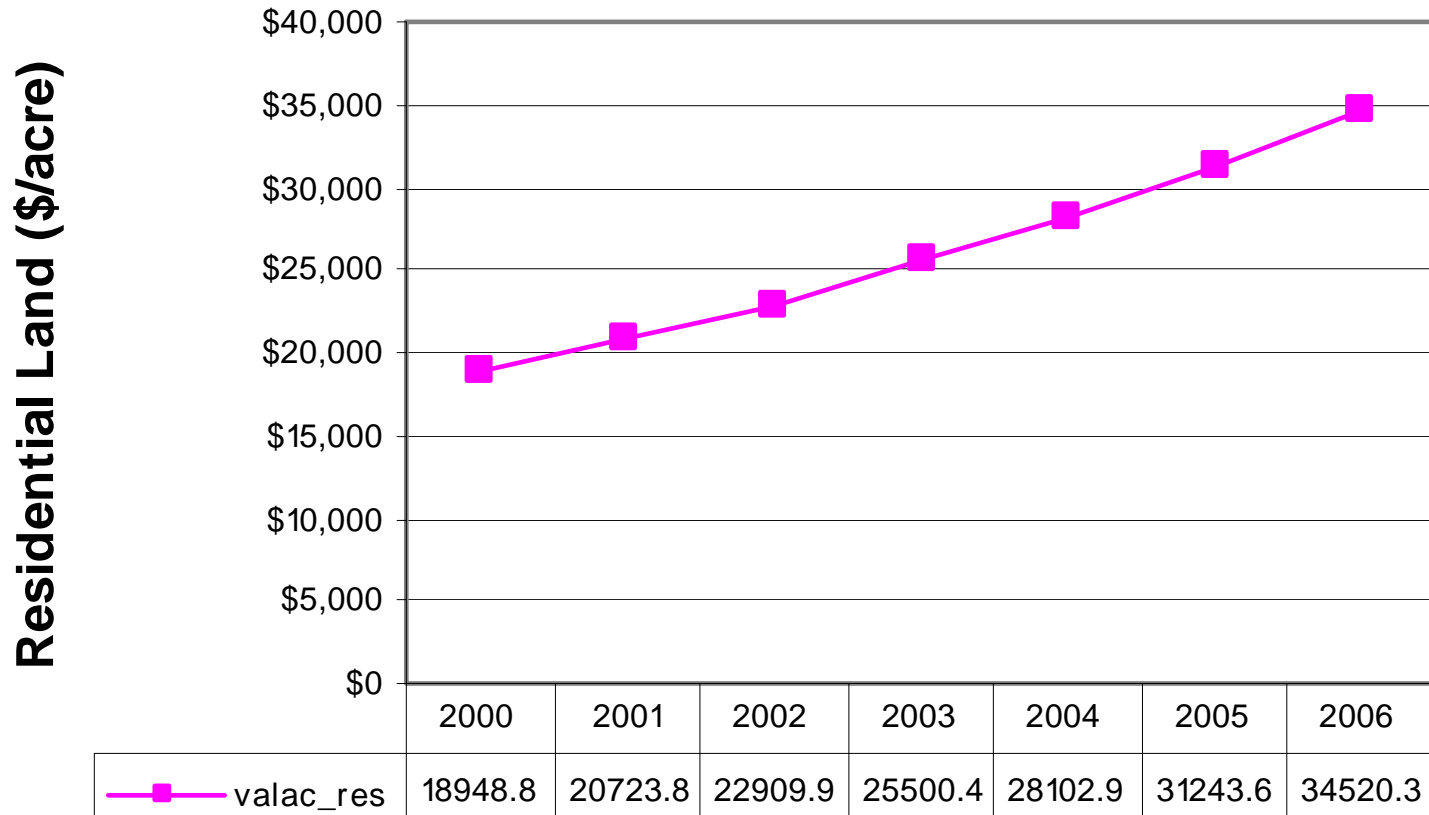
State Residential Acreage



Year

% Change 00-06: 16.2%

State Average Residential Land Value



Year

Change 00-06: 15,572 (82.2%)

Table 1: Wisconsin Ethanol Plants (Operating)

Plant	Location	Date Production Began	Gallons/year (millions)	Bushels/year (millions)
ACE Ethanol	Stanley	Jun-02	42	15.00
Badger State Ethanol	Monroe	Oct-02	55	19.64
Utica Energy	Oshkosh	Apr-03	52	18.57
United Wisconsin Grain Producers	Friesland	Apr-05	51	18.21
Western Wisconsin Energy	Boyceville	Sep-06	52	18.57
United Ethanol	Milton	Mar-07	40	14.29
Central Wisconsin Alcohol	Plover	?	4	1.43
Renew Energy	Jefferson	Nov-07	130	46.43
Castle Rock Renewable Fuels	Necedah	Feb-08	50	17.86

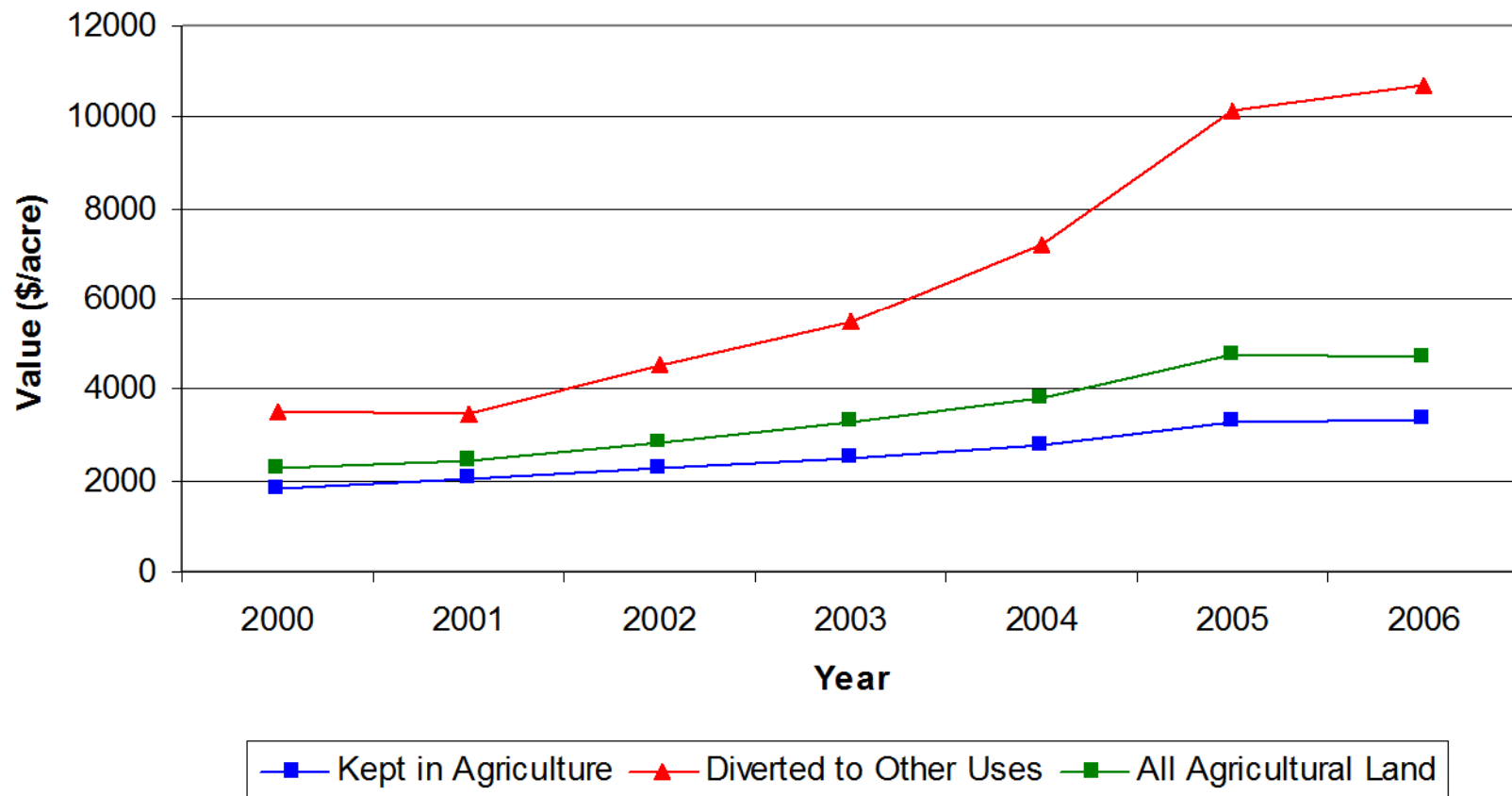
Table 2: Distribution of Municipalities Across Zones

Zone	Frequency (percent of municipalities)
2-Mile	7 (0.4%)
10-Mile	49 (2.6%)
25-Mile	258 (13.6%)
50-Mile	894 (47.0%)
Rest of State	1009 (53.0%)

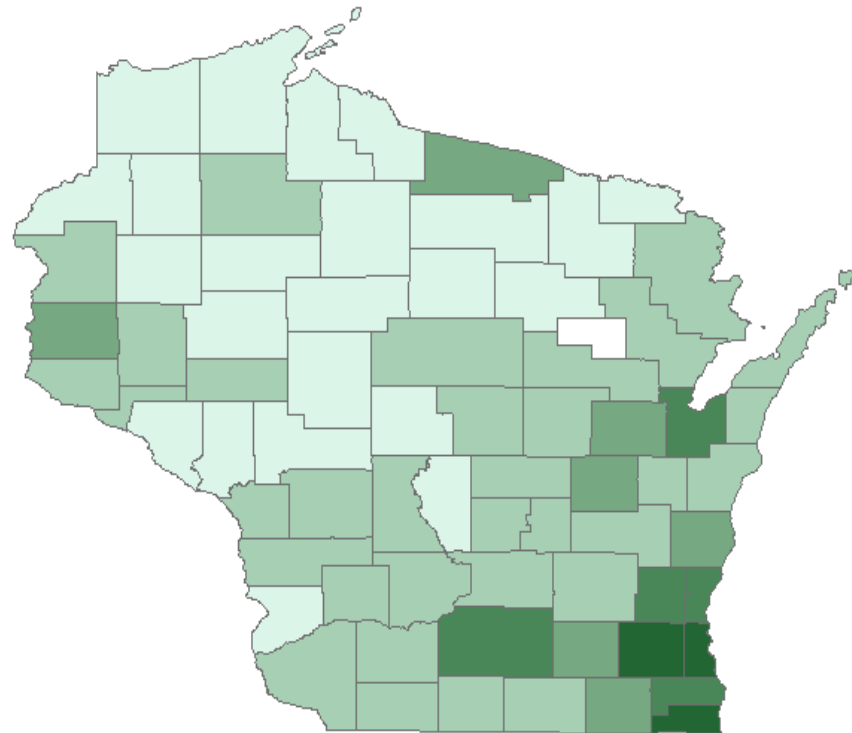
Summary Information for Zones Surrounding Ethanol Facilities: Changes from 2000 - 2006

Zone	% Change Population	%Change Agricultural Acreage	% Change Undeveloped Acreage	% Change Residential Acreage	Change Residential Land Value (\$/acre)	% Change Residential Land Value
2-Mile	10.7	-3.3	-4.1	24.1	3795.85	49.7
10-Mile	6.0	-4.1	17.1	31.1	5587.1	37.5
25-Mile	5.1	-4.2	16.7	17.5	12095.47	70.5
50-Mile	6.5	-4.4	19.4	19.6	16892.21	85
Rest of State	3.6	-4.2	16.6	14.4	14773.11	80.2
Entire State	4.7	-4.3	18.0	16.2	15571.5	82.2

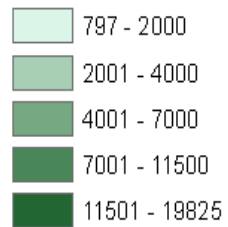
Average Value of Agricultural Land Sold in Wisconsin by Year



Average Value of Agricultural Land Sold by County, 2000-2006



Value(\$/acre)



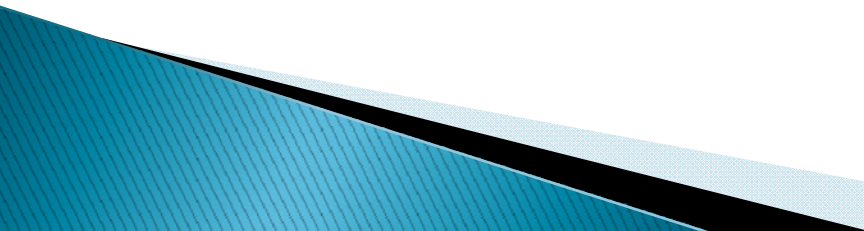
Percent Change in Agricultural Land Use

Variable	Coefficient	T-Statistic
Two Miles	-0.01	-0.41
Ten Miles	0.008	0.80
Twenty-five Miles	-0.006	-1.2
Fifty Miles	0.003	1.11
Constant	-0.010	-7.9

Percent Change in Residential Land Value

Variable	Coefficient	T-Statistic
Two Miles	-0.008	-0.55
Ten Miles	0.011	1.58
Twenty-five Miles	-0.006	-2.05
Fifty Miles	-0.012	-7.47
Constant	0.110	131.51

Conclusions

- ▶ Results suggest no significant difference in land transfers out of agriculture based on proximity to an ethanol plant. Thus, the existence of an ethanol plant does not appear to reduce loss of agricultural land.
 - ▶ Conversely, ethanol plants do not appear to have an adverse impact on local residential property values. This is in contrast with results for some other type manufacturing facilities.
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Further Research

- ▶ We are attempting to acquire specific transactions prices by tract for agricultural land, and would like to evaluate the impact on agricultural land prices directly as a result of ethanol plant location.
 - ▶ This would likely be done using an hedonic pricing model that attempts to explain land prices based on an entire series of characteristics.
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