# Wisconsin Land Use MEGATRENDS

background, impacts, policy…information you need to know

Anna Haines

Director, Professor, Land Use Specialist

College of Natural Resources

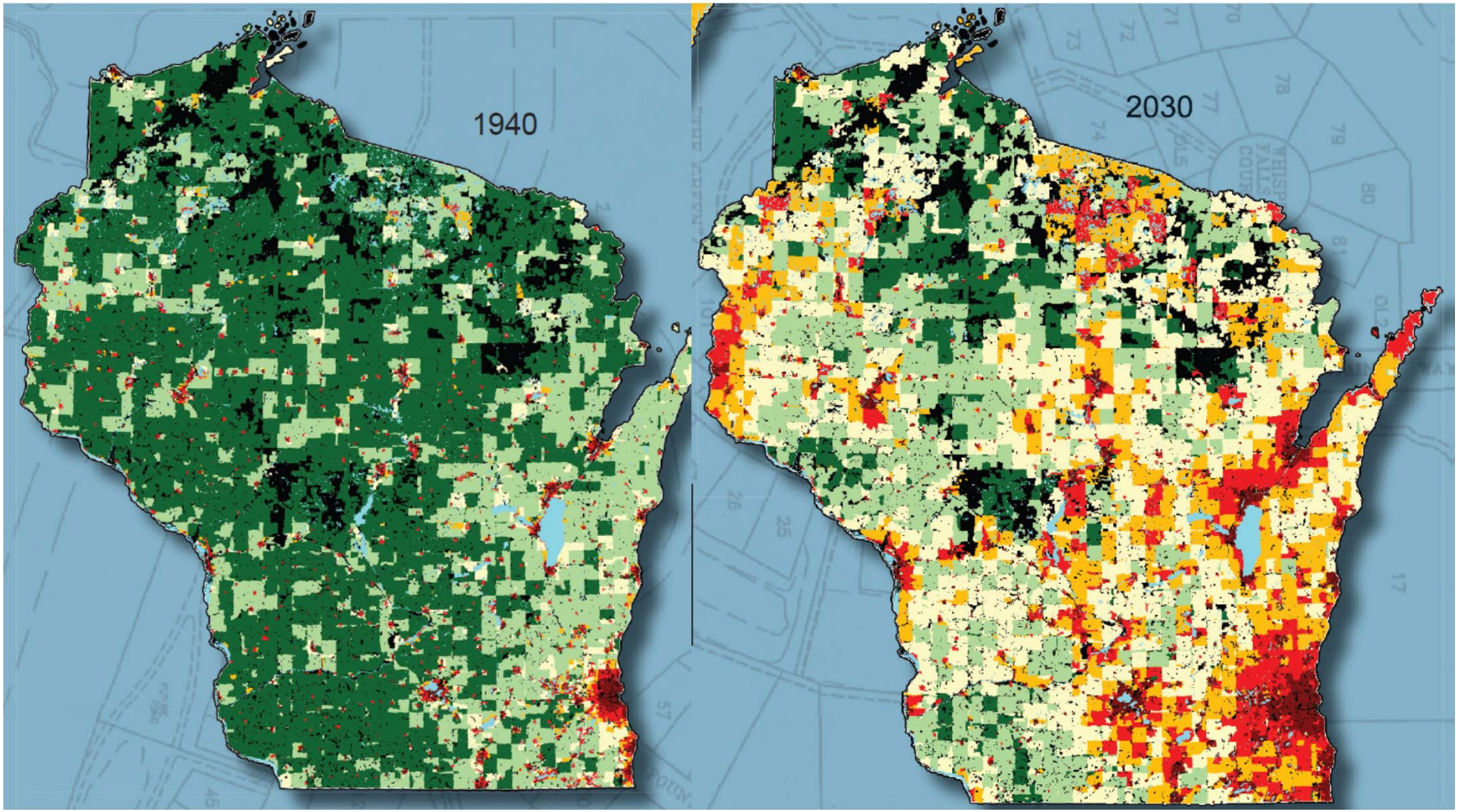
UW Extension Cooperative Extension

Center for Land Use Education

# Today's path

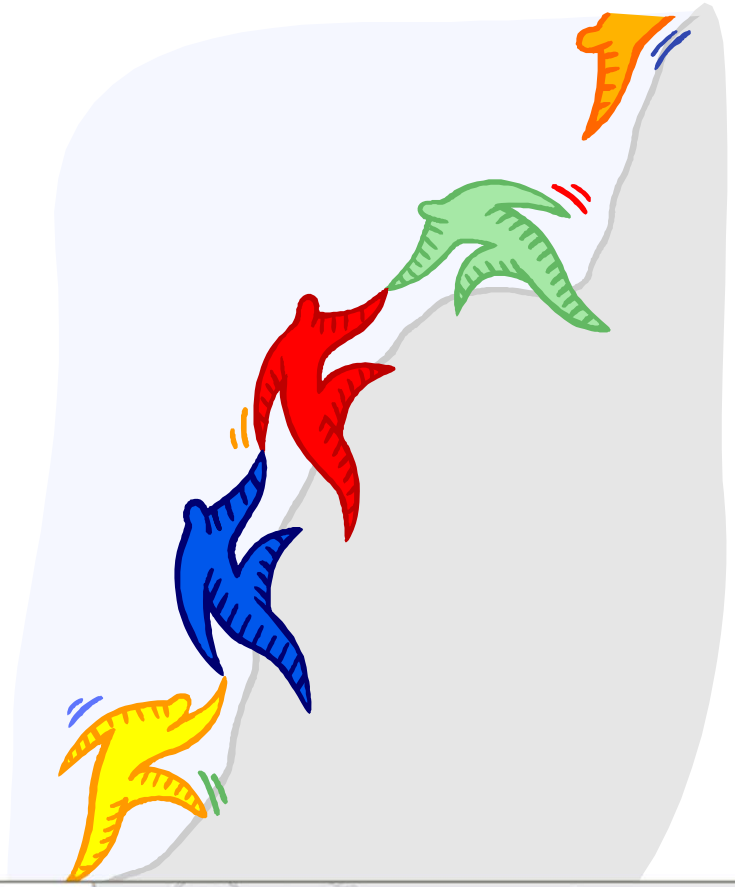
- Why megatrends?
- How created?
- What they look like?
- So what?

# Purpose

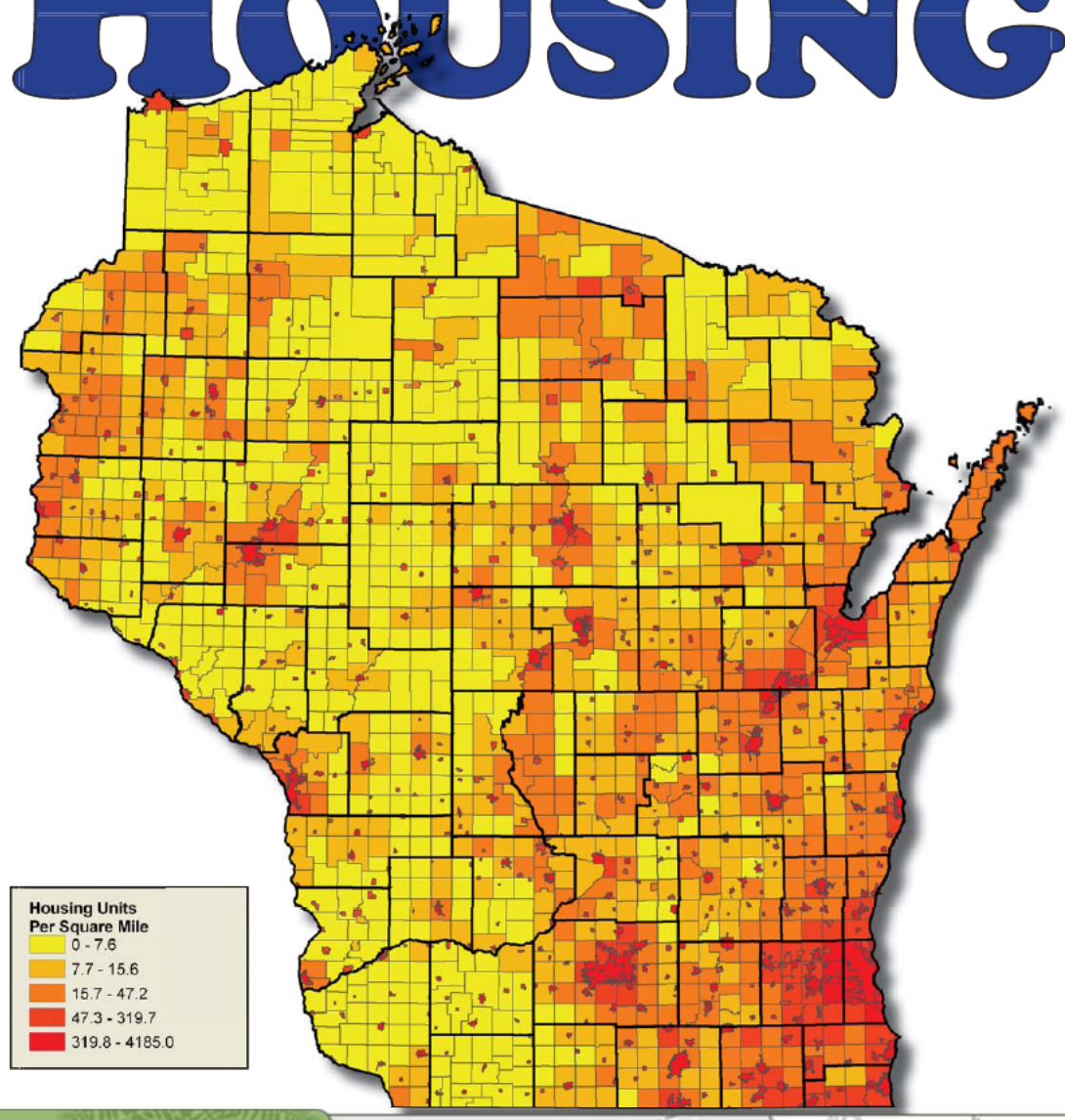


# Megatrends Creation

- Team effort!



# HOUSING




*The regions of the state with the highest population, southeast Wisconsin and the Fox River Valley, show the highest housing densities*

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- In WI, home ownership rates have always been fairly strong

- In 2005, 71% of WI householders owned their own home

**Figure 2: Home Ownership Through the Decades[9]**

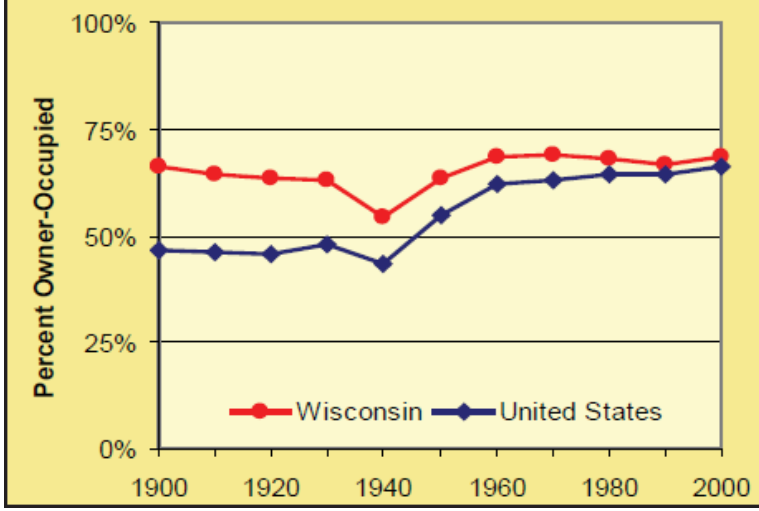
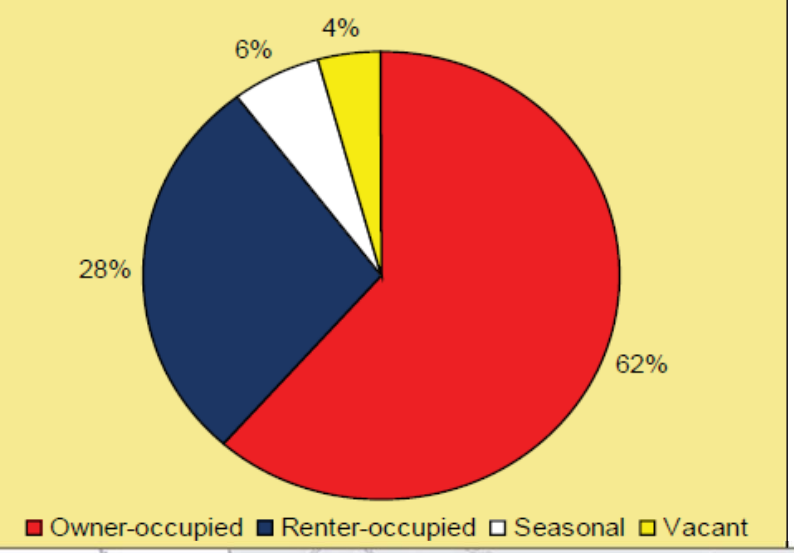
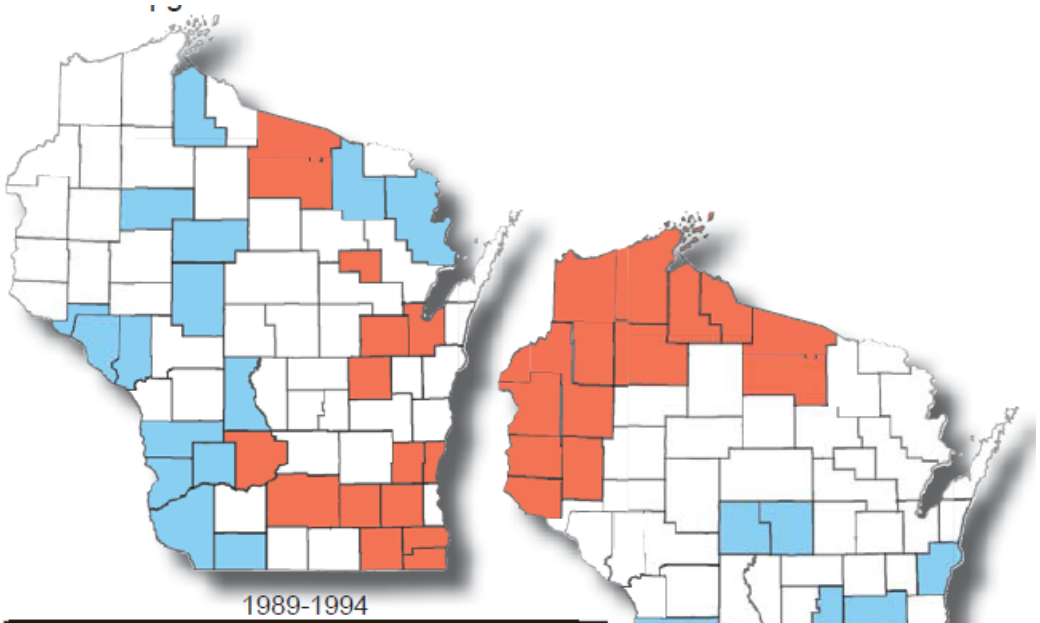



**Figure 3: Wisconsin Home Occupancy, 2000[11]**

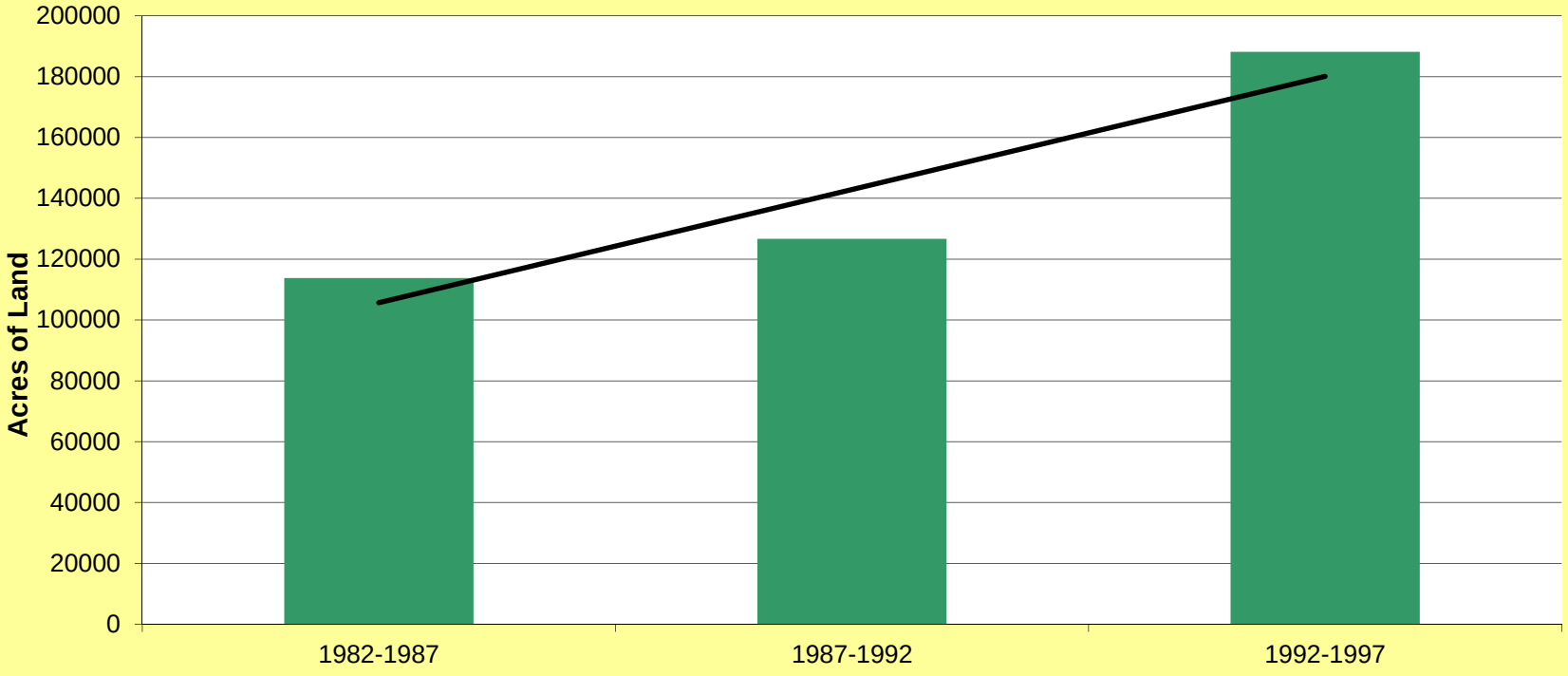


# Increases in housing values

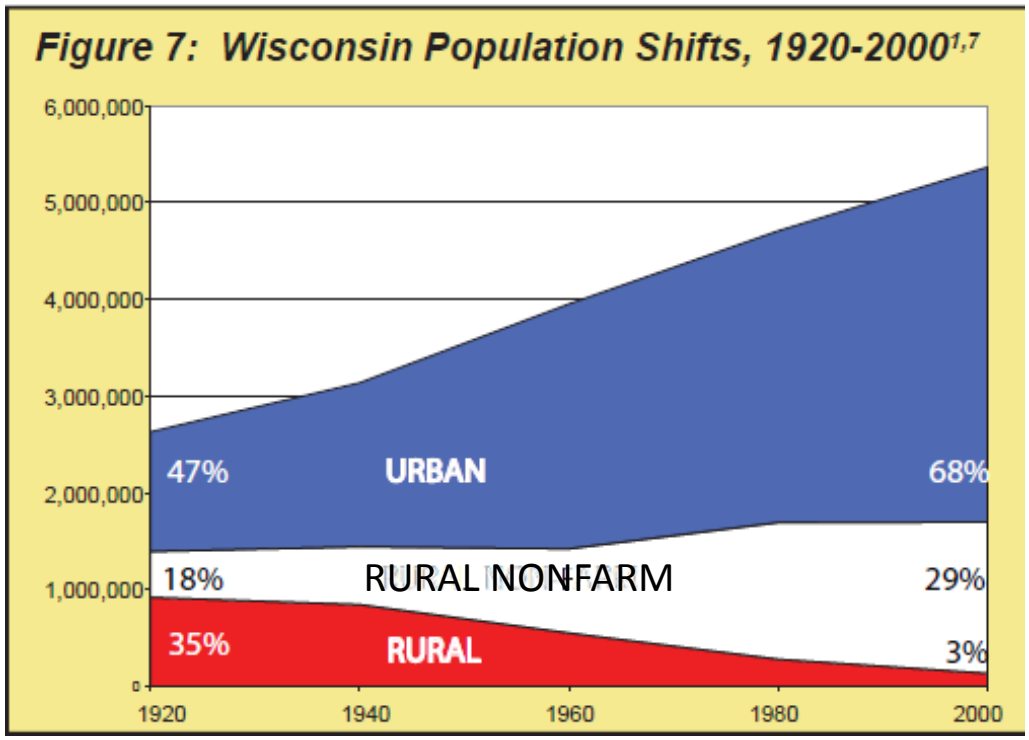



Maps reprinted courtesy Wisconsin Taxpayers Alliance

# Land Converted to Development

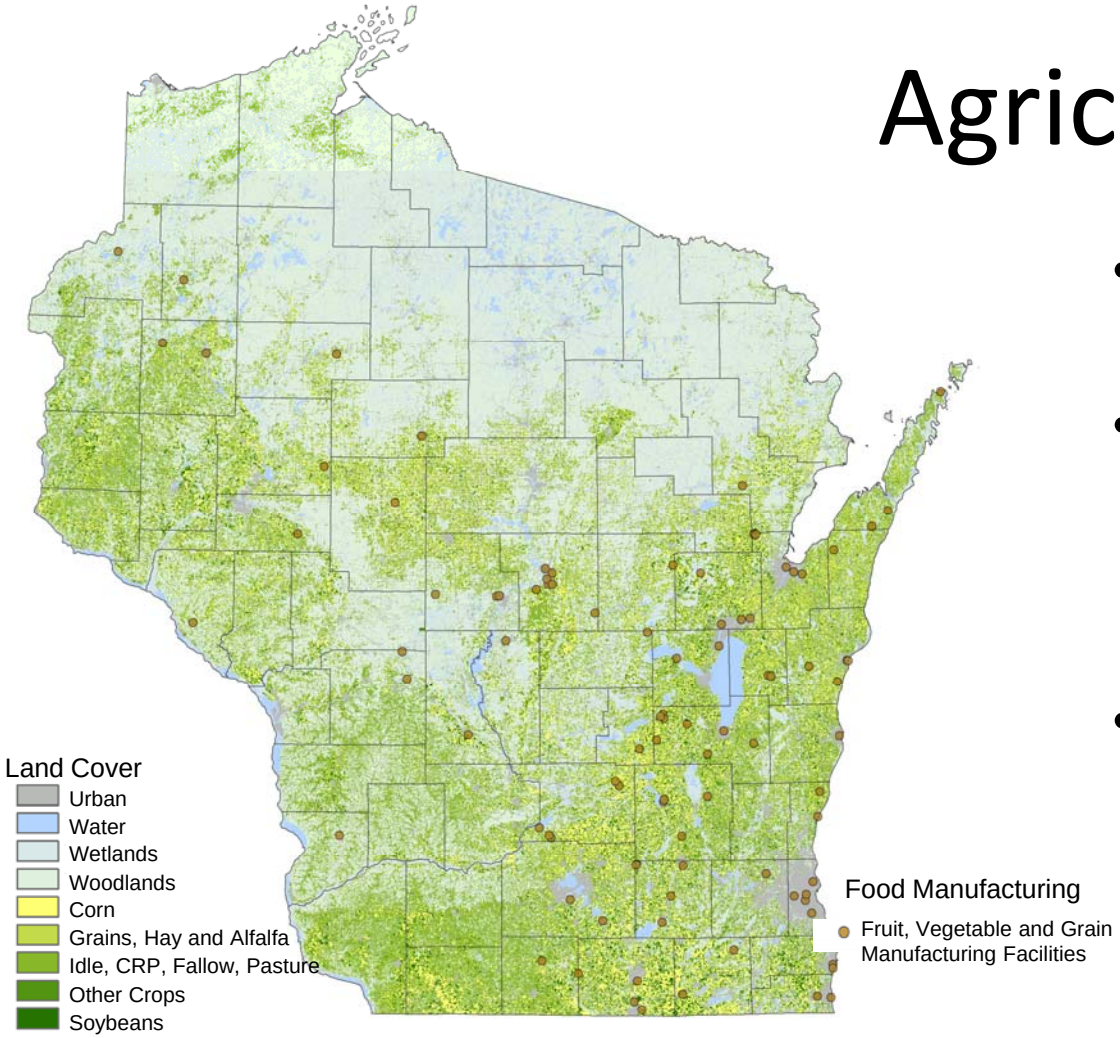


# Population shifts




- From 1900 to 2000:
  - 2.9 million new urban residents
  - 0.4 million new rural residents
- In 2000, only 3% of WI population resided on farms
- Expanding rural non farm population

# Agriculture




- Crops cover 10 million acres of land.
- Predominant uses are: corn for grain (32%), hay and forage (27%), and soybeans (13%).
- Wisconsin ranks first nationally in the production of corn for silage, second in oats, and third in forage.

# Wisconsin Agriculture is Changing

- Post-World War II
  - Increased mechanization and development of high-yield hybrids, fertilizers and pesticides
  - Pressure for farms to specialize and grow in size to meet demands of national and global markets

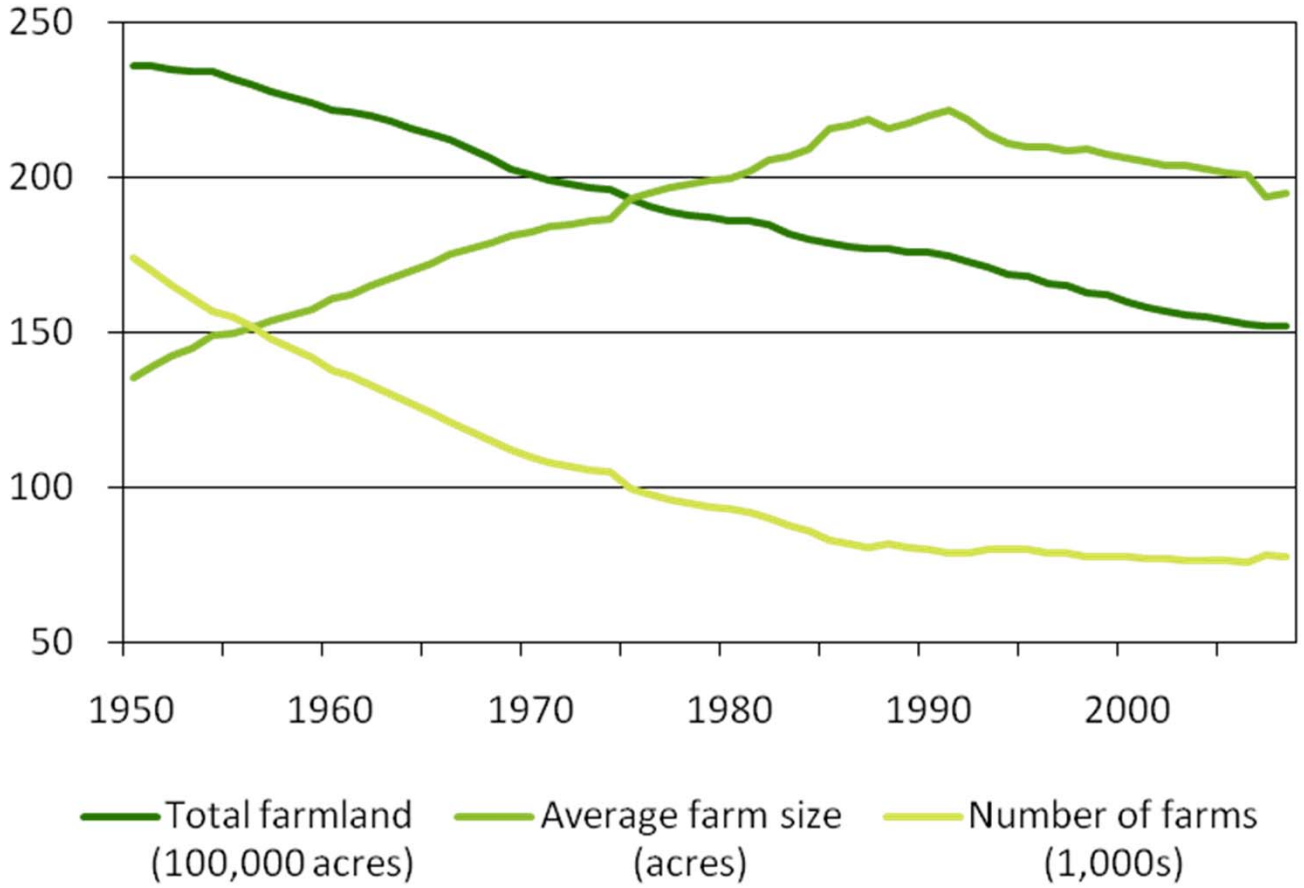

*Baling hay with Farmall tractor and McCormick baler*

# Wisconsin Agriculture is Changing

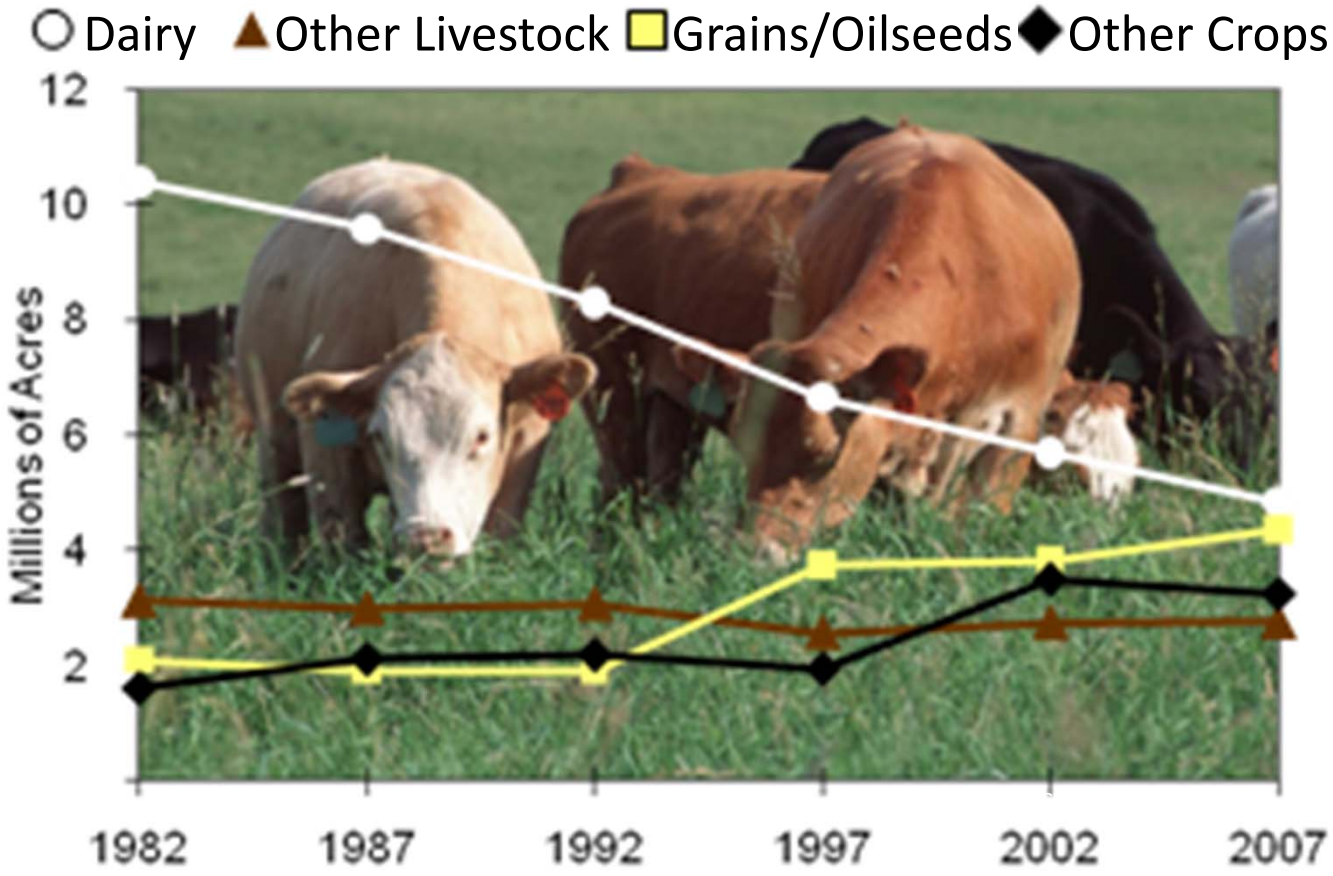
- Modern Agriculture
  - 78,000 farms on 15.2 million acres
  - $9 billion in sales
  - Less than 3% of residents live on a farm
  - Mid-sized farms are being replaced by large commercial operations and small, part-time residential farms


*Contour stripcropping*

# Historic Farmland Trends



# Farmland by Agricultural Sector

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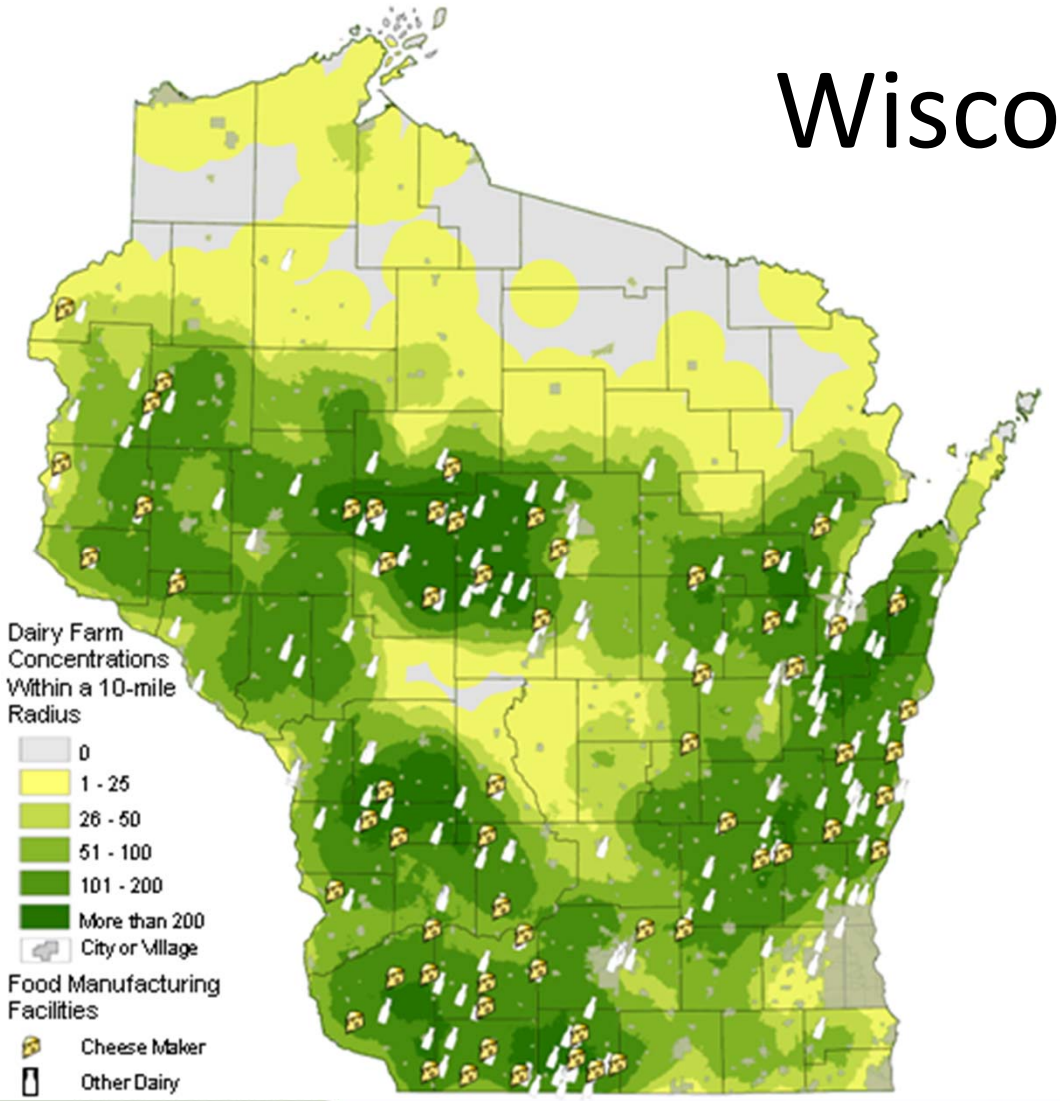
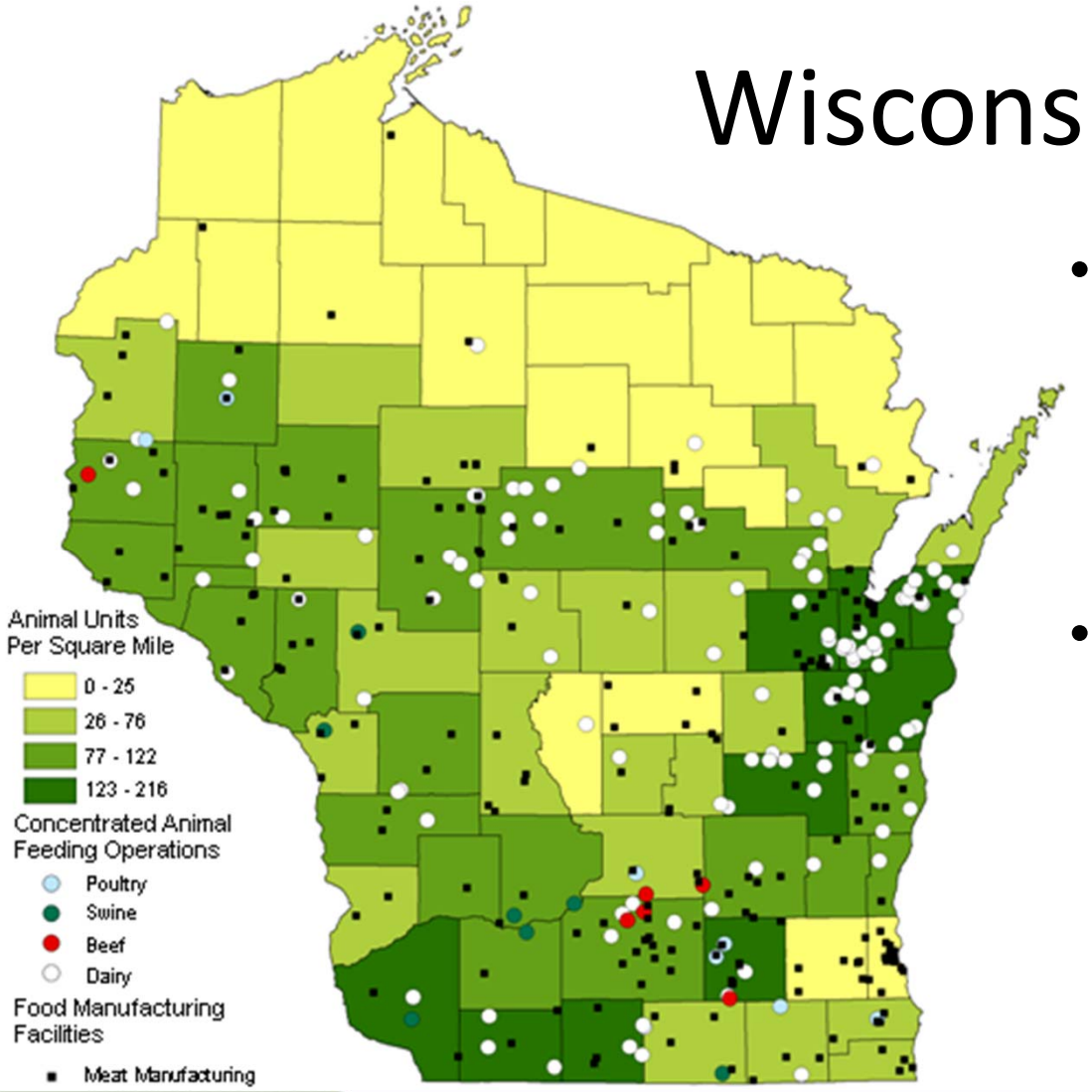
# Wisconsin Dairy




- Despite losing nearly two-thirds of all dairy farms over the last 25 years, dairy remains Wisconsin's largest agricultural sector.
- Dairy farms account for 4.8 million acres of land and $5.2 billion dollars in sales.
- Wisconsin ranks first nationally in the production of cheese and dry whey, and second in the production of milk and butter.

# Wisconsin Livestock




- Farms dedicated to raising livestock and poultry account for 2.8 million acres of land and $1.5 billion dollars in sales.
- Wisconsin ranks first nationally in the number of milk goats, second in milk cows, seventh in trout, and ninth in cattle and calves.

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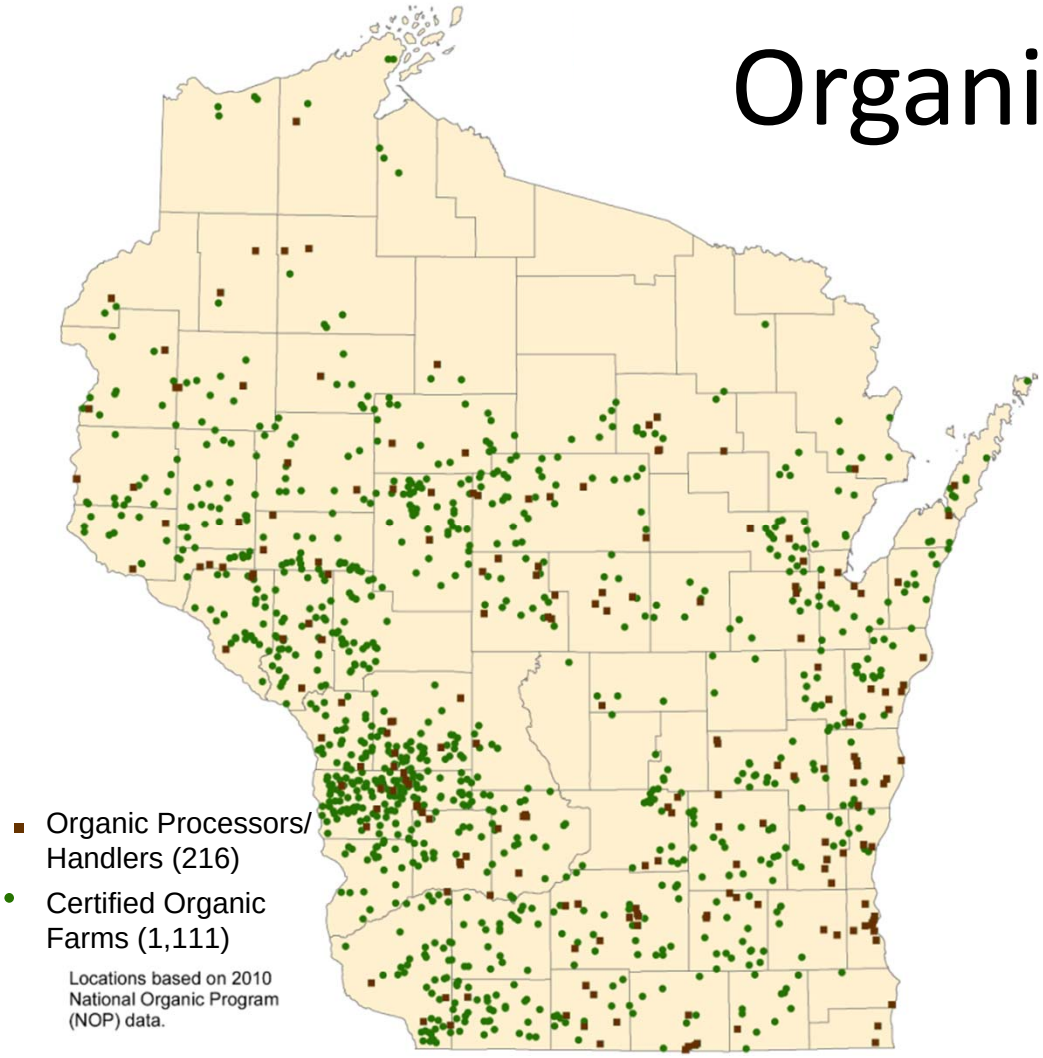
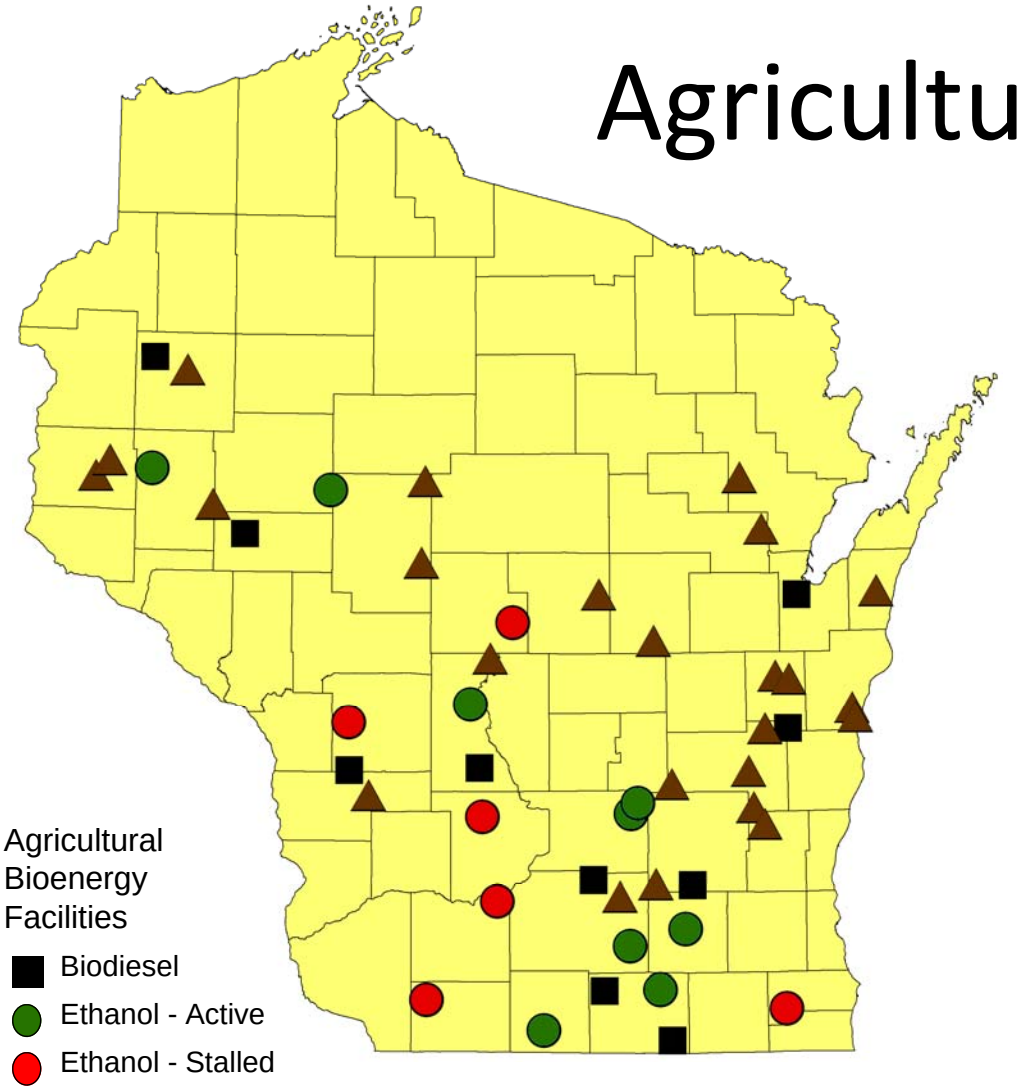
# Organic Agriculture



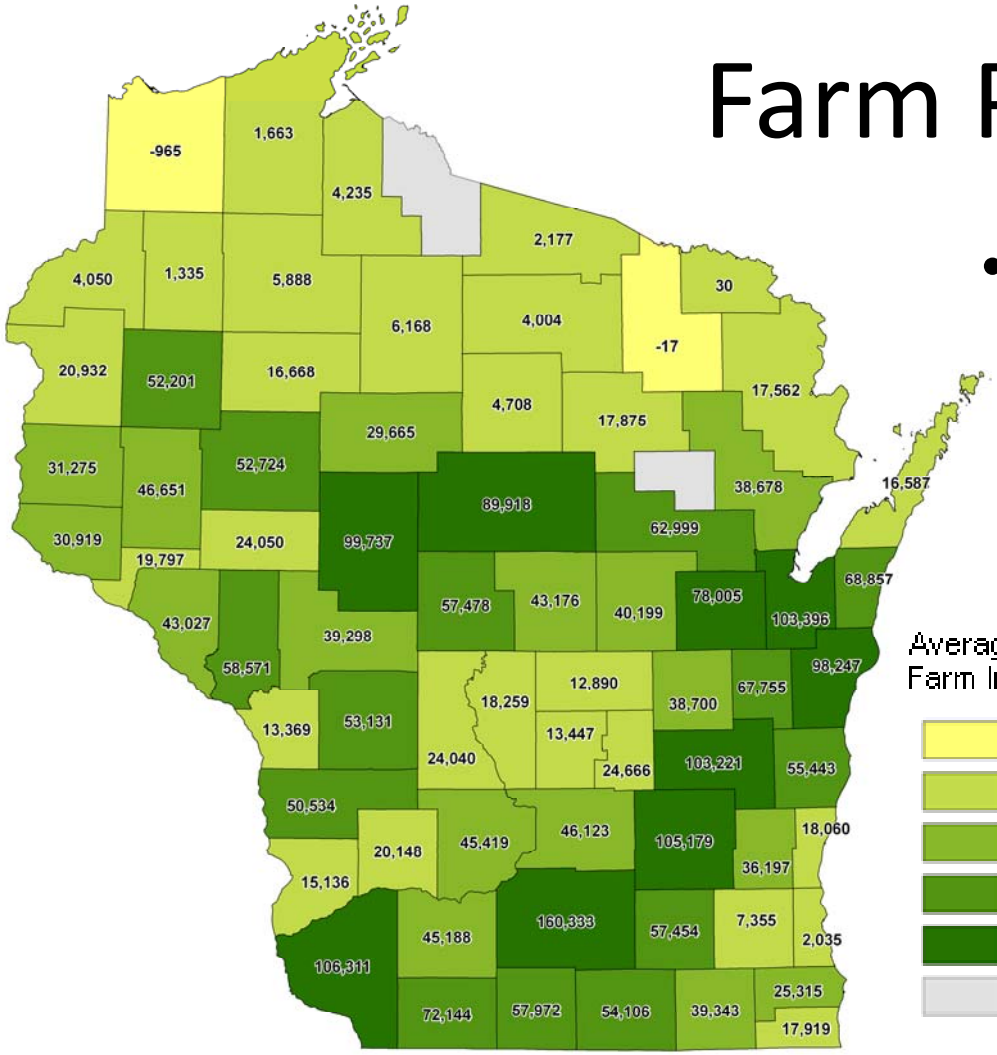

- Over the last decade, the number of organic farms and acres roughly doubled, while organic product sales increased five-fold.
- In 2007, organic agriculture constituted 1 percent of total farms and acres, and 1.5% of agricultural sales.

# Agricultural Bioenergy




- Corn ethanol and soy-based biodiesel supply 15% of Wisconsin's annual consumption of 3.2 billion gallons of gasoline and diesel.
- The state has 24 farm-based anaerobic digester systems.

# Farm Profitability




Average Net Farm Income

- Net loss
- $1 - $25,000
- $25,000 - $50,000
- $50,000 - $75,000
- $75,001 - $160,333
- Not disclosed

- Generally only farms with annual sales greater than $250,000 have positive rates of return.

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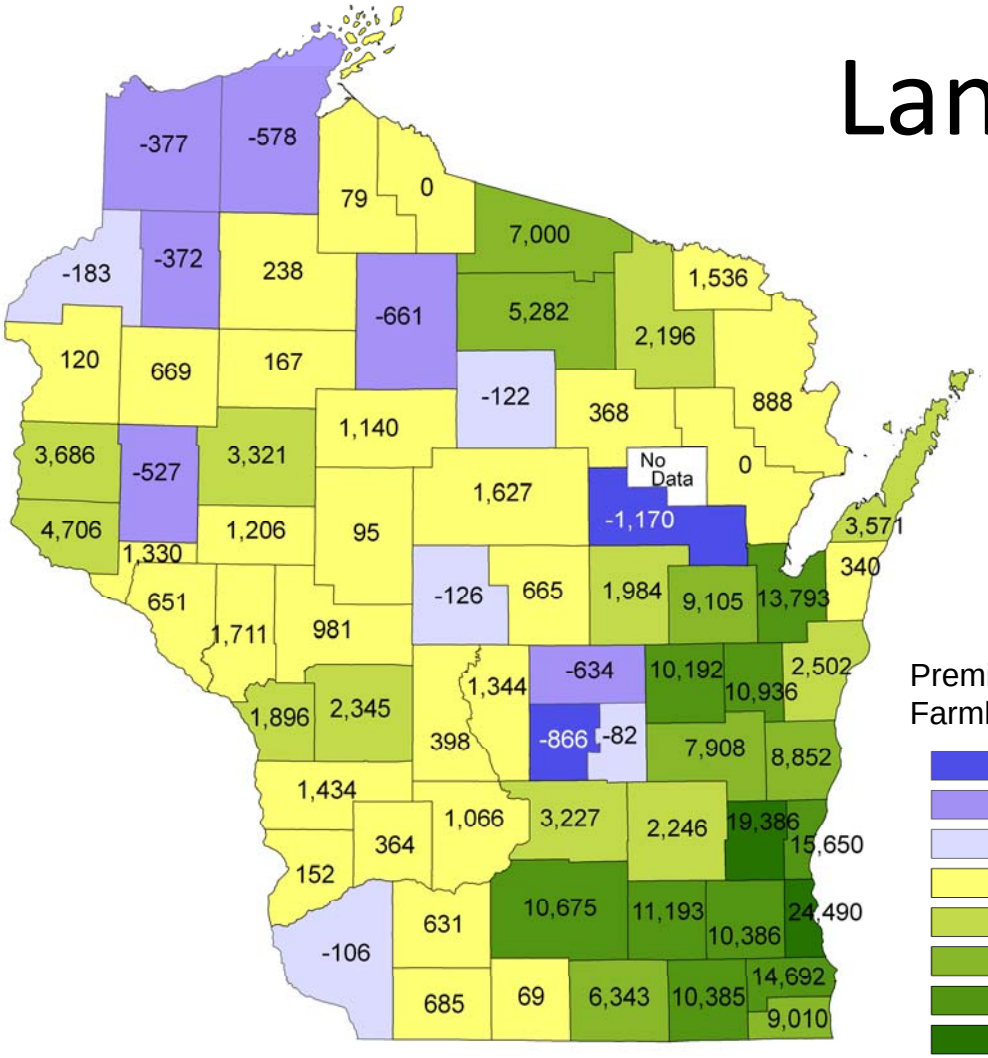
# Land Values




- High premiums are being paid for agricultural land conversion, particularly in southeast and northeast Wisconsin.

Premium Paid for Farmland ($/Acre)

- -$1,170 - -$750
- -$749 - -$300
- -$299 - $0
- $0 - $1,000
- $1,001 - $2,000
- $2,001 - $4,000
- $4.001 - $8.000
- $8,001 - $24,490

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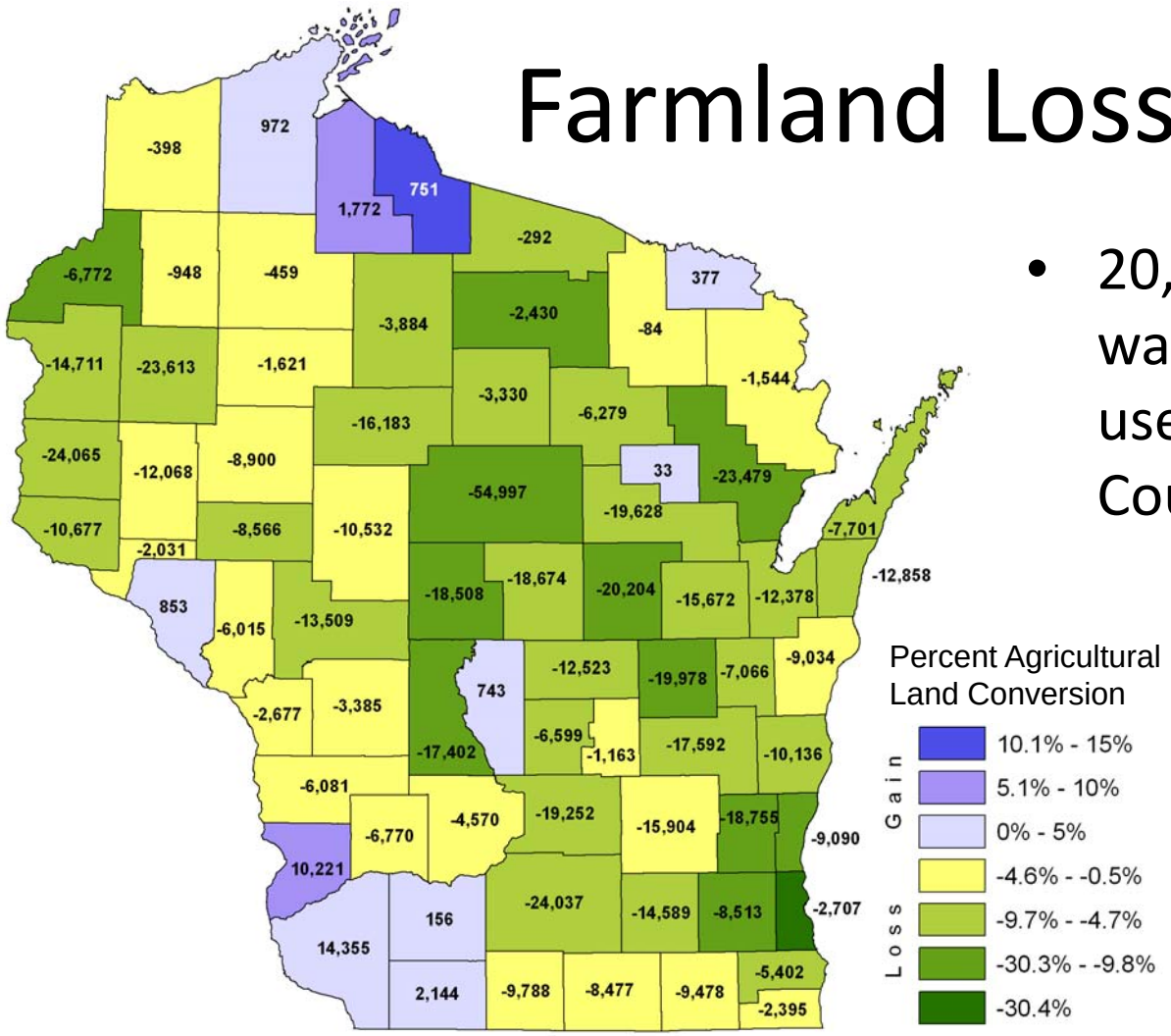
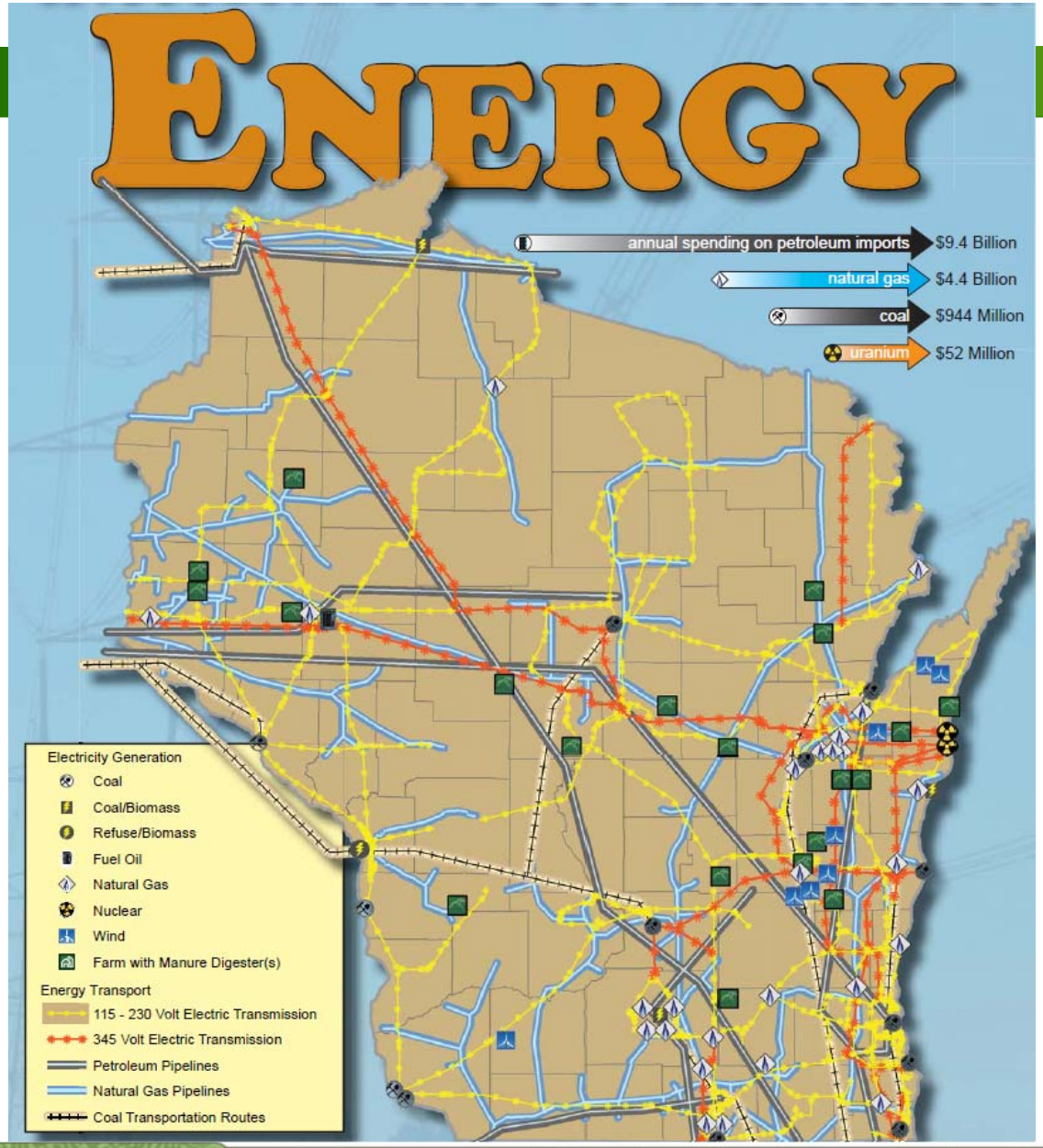
# Farmland Loss 2000-2009




- 20,000 acres of farmland was converted to other uses in Winnebago County

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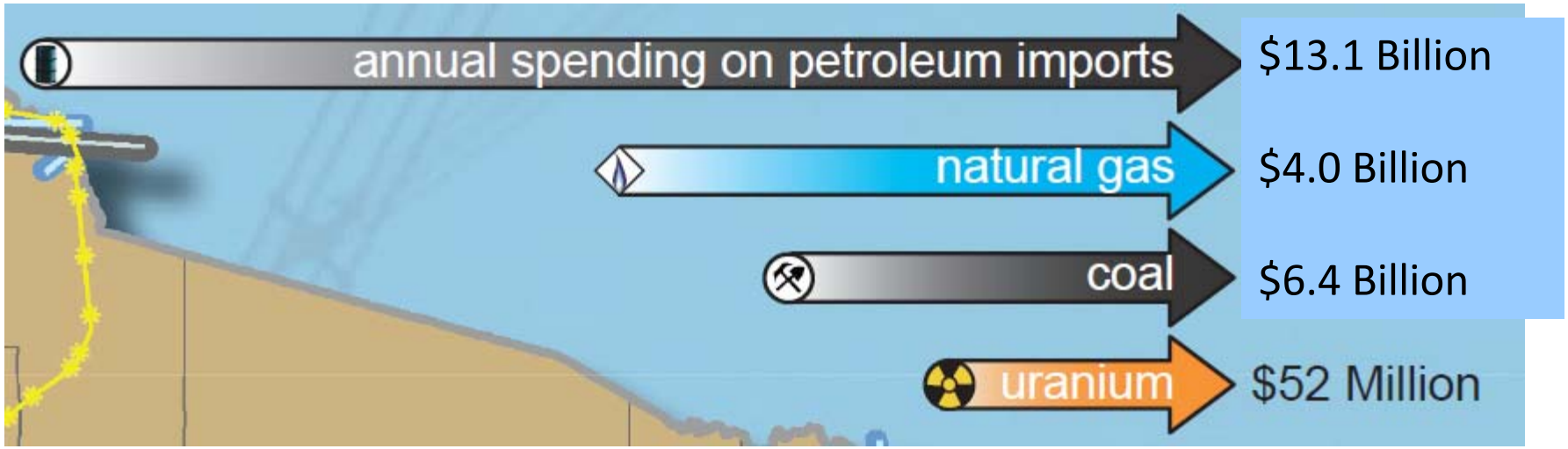
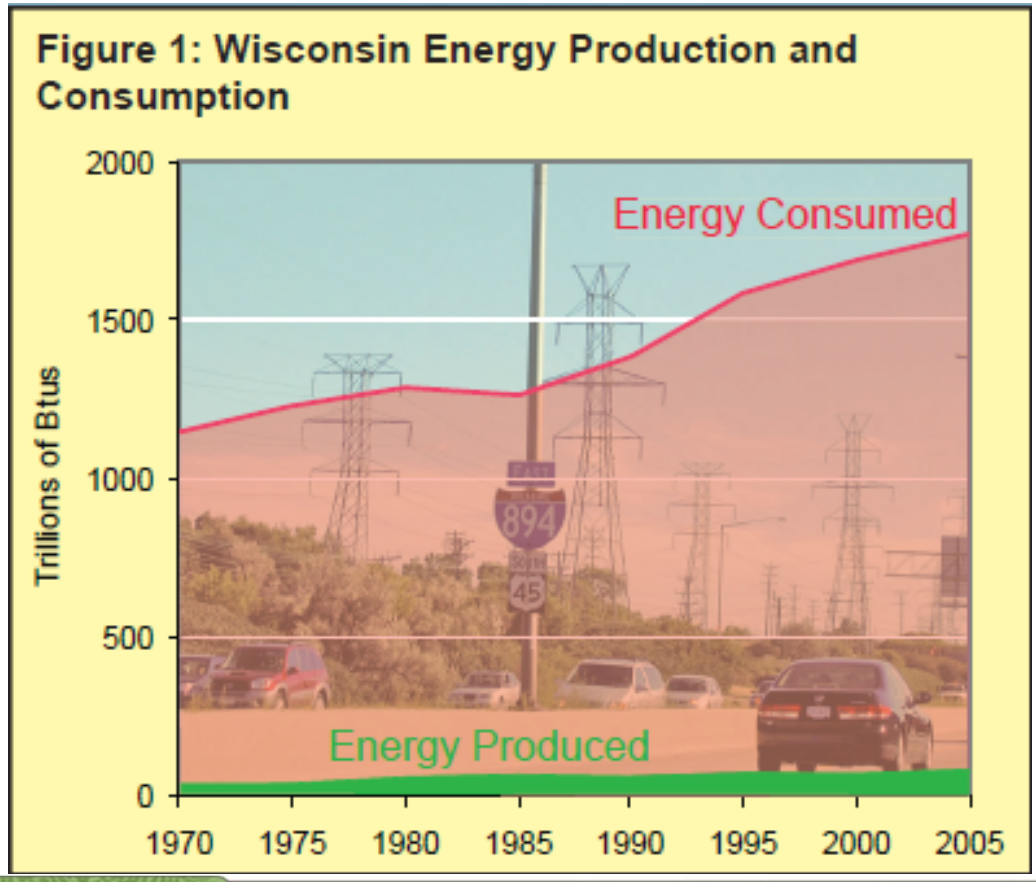
# Why think about energy?

- $23.5 billion left WI in 2008 for energy, over $4000 per person
- Energy efficiency and renewable energy create local jobs
- Move toward energy independence
- Reduce air pollution



# Energy use in WI is increasing




Since 1970 overall energy consumption in WI increased by 55%, more than double the rate of population growth

Almost no increase in energy use from 1970-1985 while the GNP increased 20%

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# Current WI energy sources

- WI has no sources of petroleum, coal or natural gas
- Renewable energy is ~5% of total energy use and comes mainly from wood, other biomass, and hydro

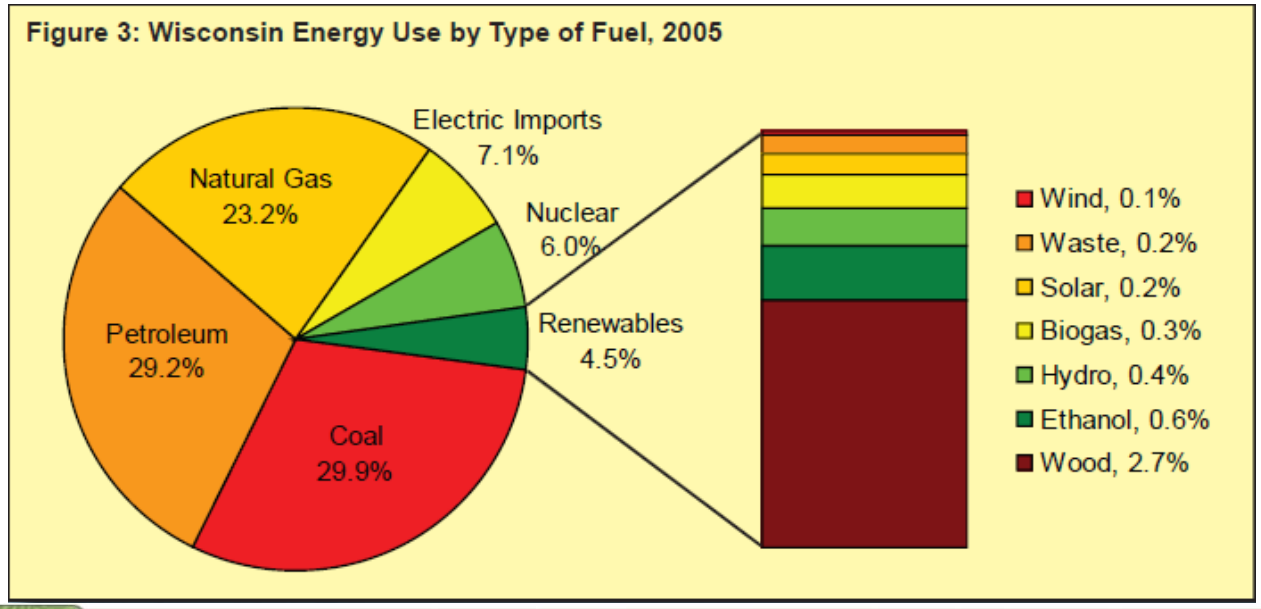
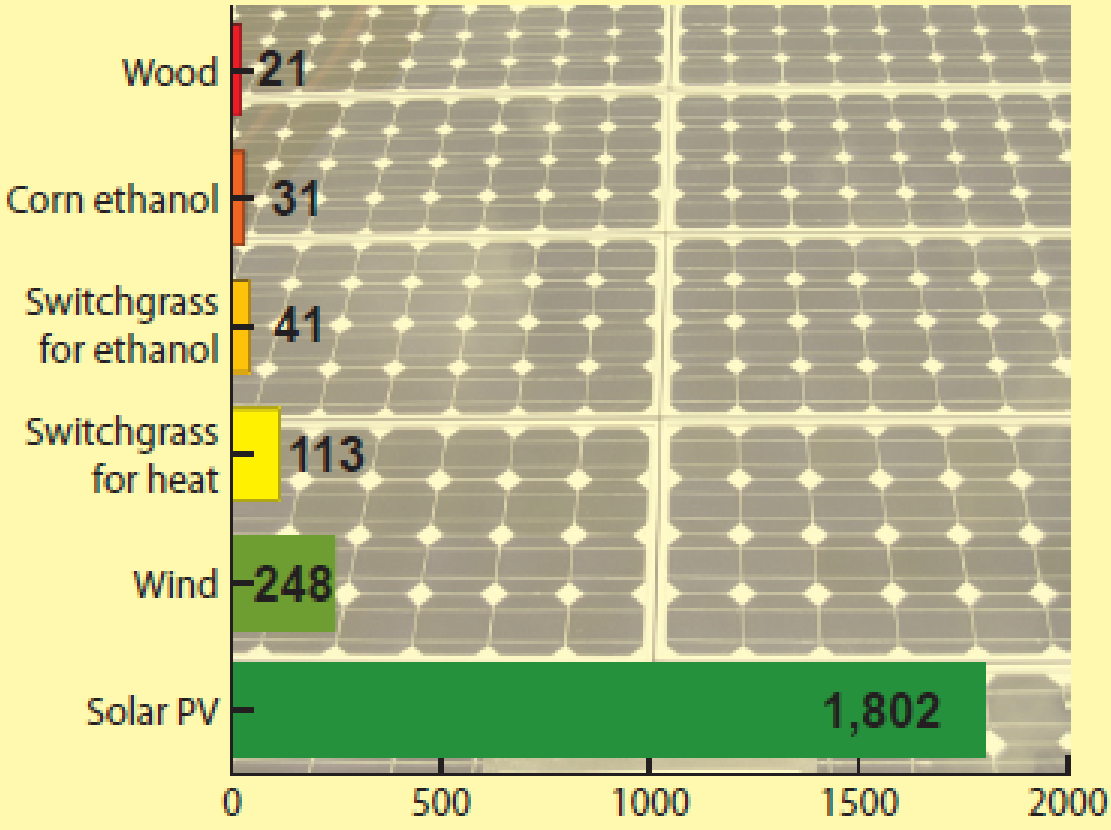
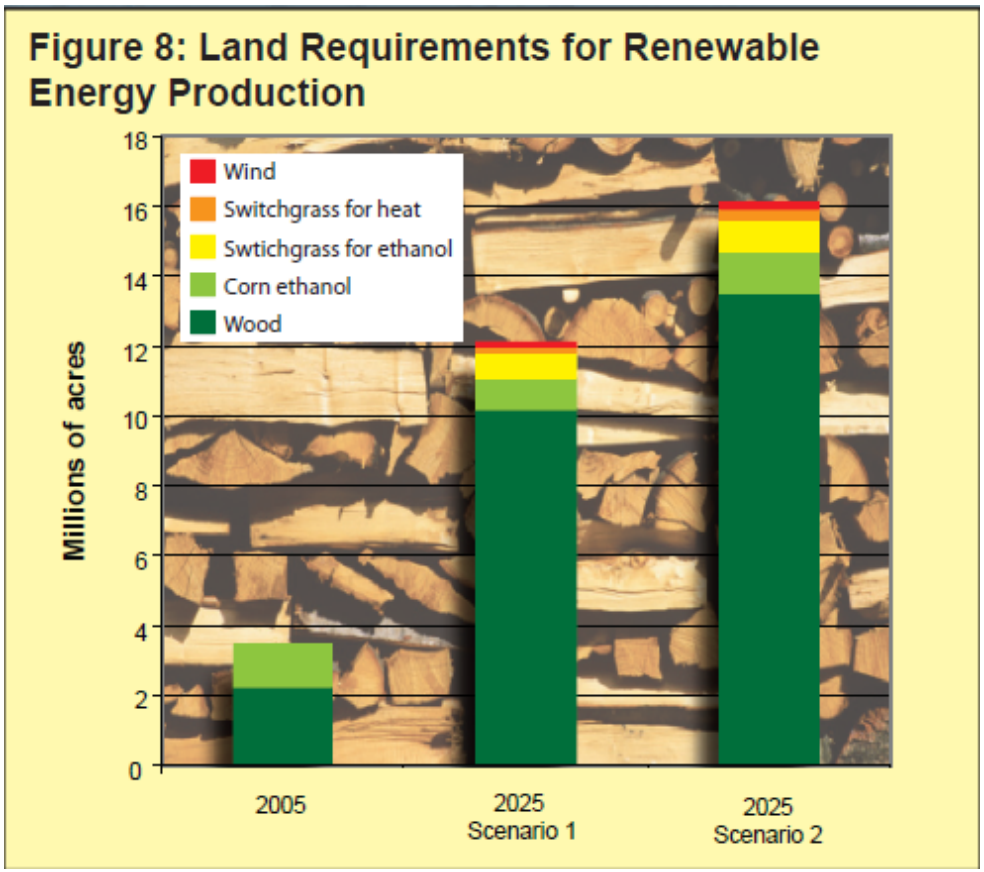


**Figure 7: Wisconsin Renewable Energy Production (per acre)**



# 25% renewable energy by 2025




- Producing 25% of WI's energy from renewable sources is estimated to take 35-46% of Wisconsin's land
- Energy efficiency takes no land

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## Scenario – 25 x 25

land use scenarios for achieving
ducing 25% of its energy with
y 2025. These scenarios are not
. Rather, they are a means to
ut the role of renewable energy
within communities, businesses
er to achieve a more energy

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land use acreage
for those uses.
ate's current
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f Energy Independence.
ume continued growth
significant expansion
a factor of about 10),
oelectric power, and
ses in solar. Growth
development
cellulosic and
d other alternative
ume a significant
arily wood, wind,
s of biofuels – were
acreages based on
Wisconsin Office of Energy
nsin Focus on Energy, Midwest
sociation, and Wilinski Associates,

n scenarios one and two, illustrated in part
this map, is the amount of land saved through
oretically, land that would have been used for energy
is or is put to a non-energy use – this is known as
watts). To put this into perspective, from 1973 to 1985 the
of the United States grew by 20%, but during the same
ear zero growth in energy use. Thus, we had economic gains

**Map 2: Land Use Scenario - 25 x 25**

- Urban area
- Hypothetical wind farm (1 square = 16 turbines)
- Current wind farm
- Current ethanol facility
- Wood energy
- Ethanol/switchgrass
- Ethanol exports
- Additonal lands for ethanol
- Additonal lands for wood
- Remaining land

with no growth in energy use largely because of increases in energy efficiency.[11] To achieve energy efficiency at this scale means changing individual, household, institutional and business behavior in our use of energy for heating and cooling, electricity and transportation.

The tradeoffs evident in these growth scenarios underscore the need to consider land use prioritization as it pertains to energy use. What is an appropriate mix and arrangement of land uses in local communities? To what purpose should Wisconsin use its public and private forest lands? How can Wisconsin ensure that its forested land is sustainably harvested?

**Forests**
(Projected to provide 53% of renewable energy in 2025.)
A total of 10.2 million acres or roughly the size of Wisconsin's Northwoods of forestland would need to be sustainably harvested to meet the 2025 goal.

**Corn and cellulosic ethanol and non-wood biomass fuel**
(Projected to produce 20% of renewable energy in 2025.)
Nearly 2 million acres of land would be dedicated to corn and switchgrass for energy use in Wisconsin. We selected areas surrounding current ethanol facilities and assumed the land dedicated to corn would have corn grown there 4 out of every 5 years.

**Wind**
(Projected to provide 7% of renewable energy in 2025.)
A total of 114,000 acres of land is needed to achieve the 2025 goal for wind energy. Each box is 640 acres in size and represents 16 turbines, assuming that each tower requires 40 acres of land. Random locations were selected throughout the high winds region of Wisconsin.

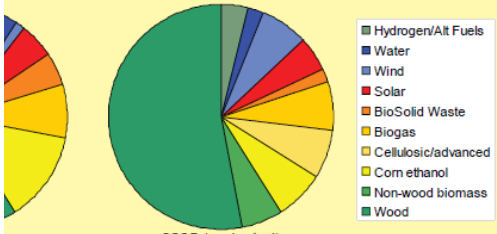
**Solar**
(Projected to provide 5% of renewable energy in 2025.)
Urban surfaces cover about 600,000 acres in Wisconsin. Less than 2%, or 11,000 acres, of that area could produce enough solar energy to meet our goal.

**Ethanol exports**
Wisconsin currently exports 2/3 of its annual ethanol production. If that same proportion is exported in 2025, an additional 3.5 million acres of farmland will be devoted to corn or switchgrass.

**Land not used for energy production**
If we continue to export ethanol at today's rate, then the total amount of remaining land is roughly 14 million acres. Of that, about 3.6 million is unavailable, representing water, wetlands, and currently developed lands. The remaining 10.4 million acres (30% of the land in Wisconsin) must provide sufficient space for food and fiber production, homes, parks, recreation, and habitat.

**Additional land needed assuming no energy efficiency**
If we continue to increase our energy consumption at the current pace of 18 trillion Btus per year, with no energy efficiency, an additional 3.3 million acres of forests and 650,000 acres of farmland will be needed for renewable energy production.

**in Renewable Energy Portfolio**




2025 (projected)

# Land use approaches to reduce energy use

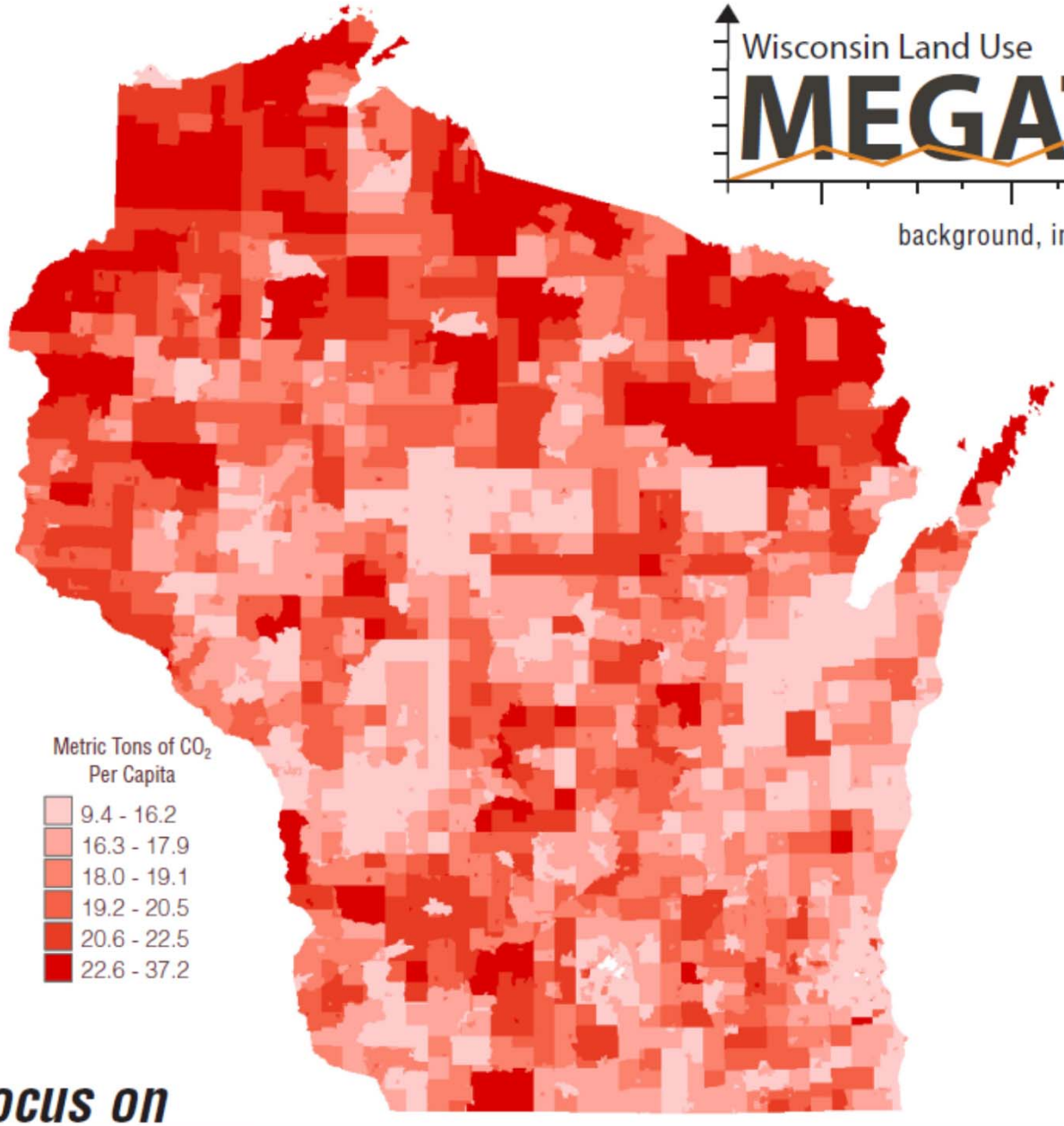
- Building design
  - From 2001-2006, Wisconsin's Focus on Energy programs helped 38,400 businesses and 547,224 households save over $129 million in energy costs
  - The largest energy savings came from converting to more efficient lighting and heating systems and adding insulation

Summer 2009

Wisconsin Land Use

# MEGATRENDS

background, impacts, policy ... information you need to know



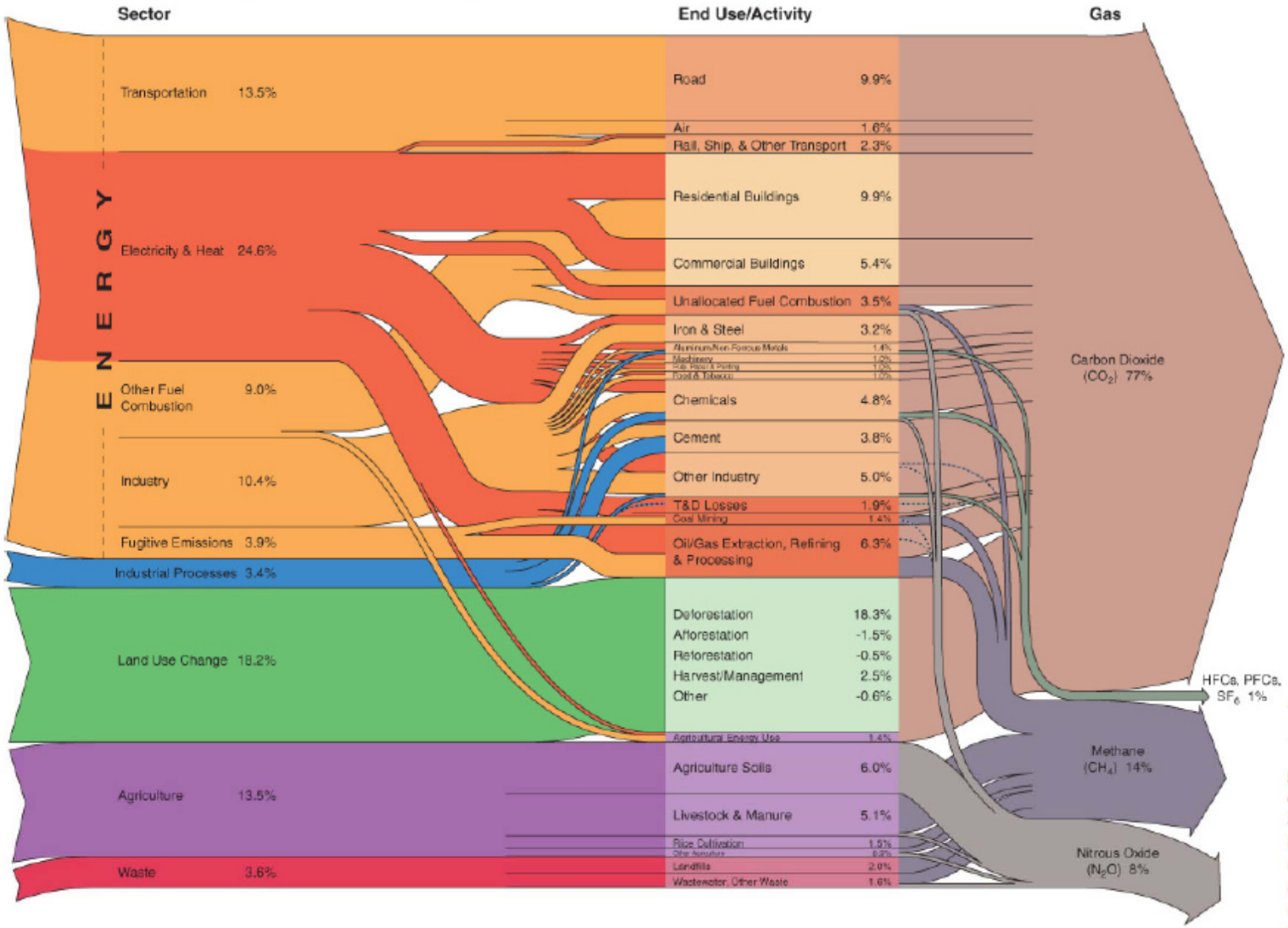

## Find Your Community

*How many tons of $CO_2$ are you and your neighbors emitting to the atmosphere?*

***Focus on***

# CLIMATE CHANGE

# World Greehouse Gas Emissions Flow



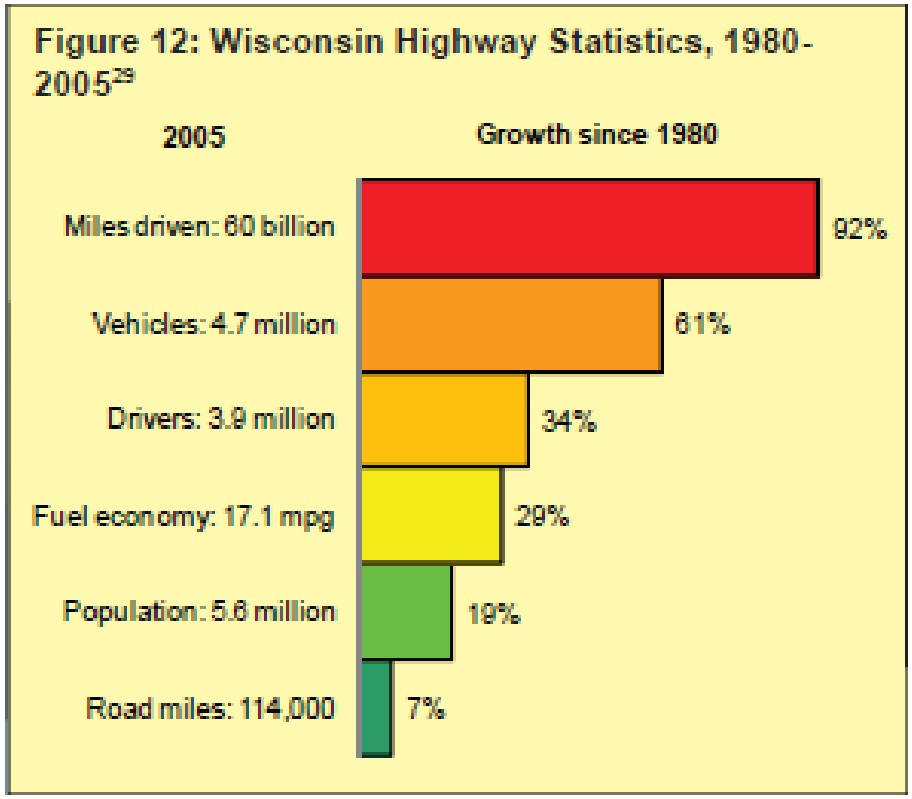

World Resources Institute

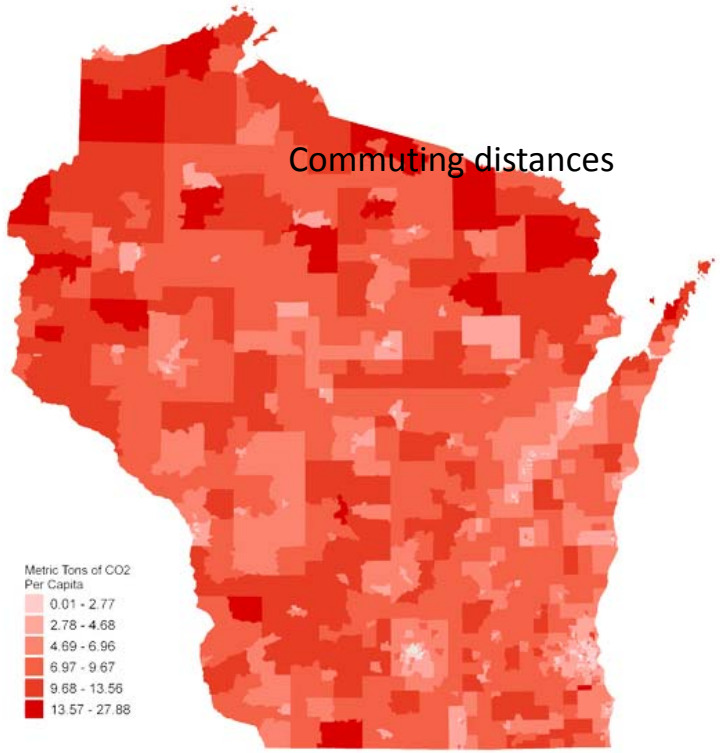
*Figure 3*

***Greenhouse Gas Flow***[10]

*This diagram traces global greenhouse gas emissions from specific sectors and end-use activities through to emissions. Electricity and heat generation, transportation, buildings, industry, land use change, and agriculture are major contributors to global GHG emissions. Carbon dioxide is the most prevalent form of GHG, but methane, nitrous oxide and other gases have greater potential to contribute to global warming.*

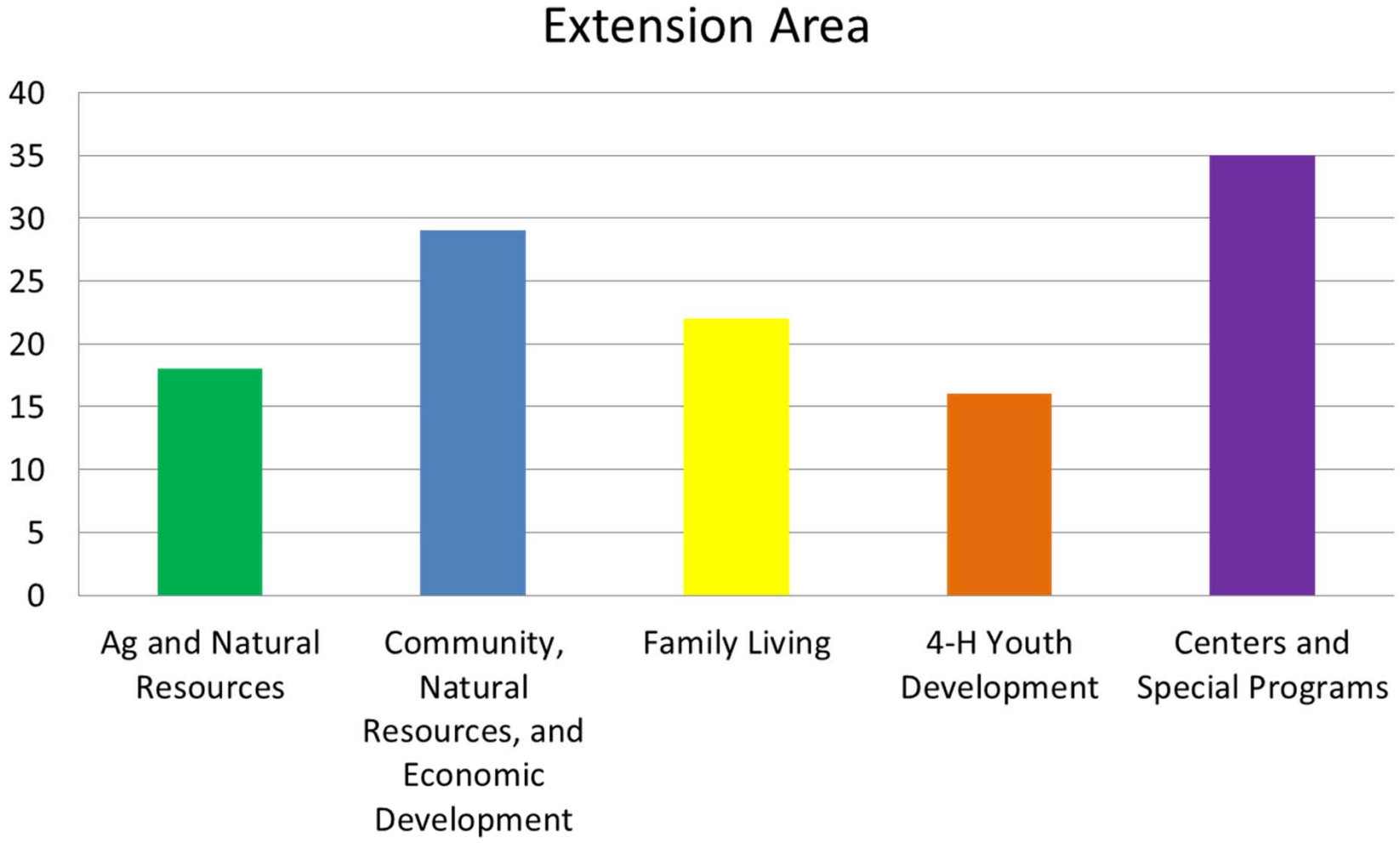
# Energy & transportation

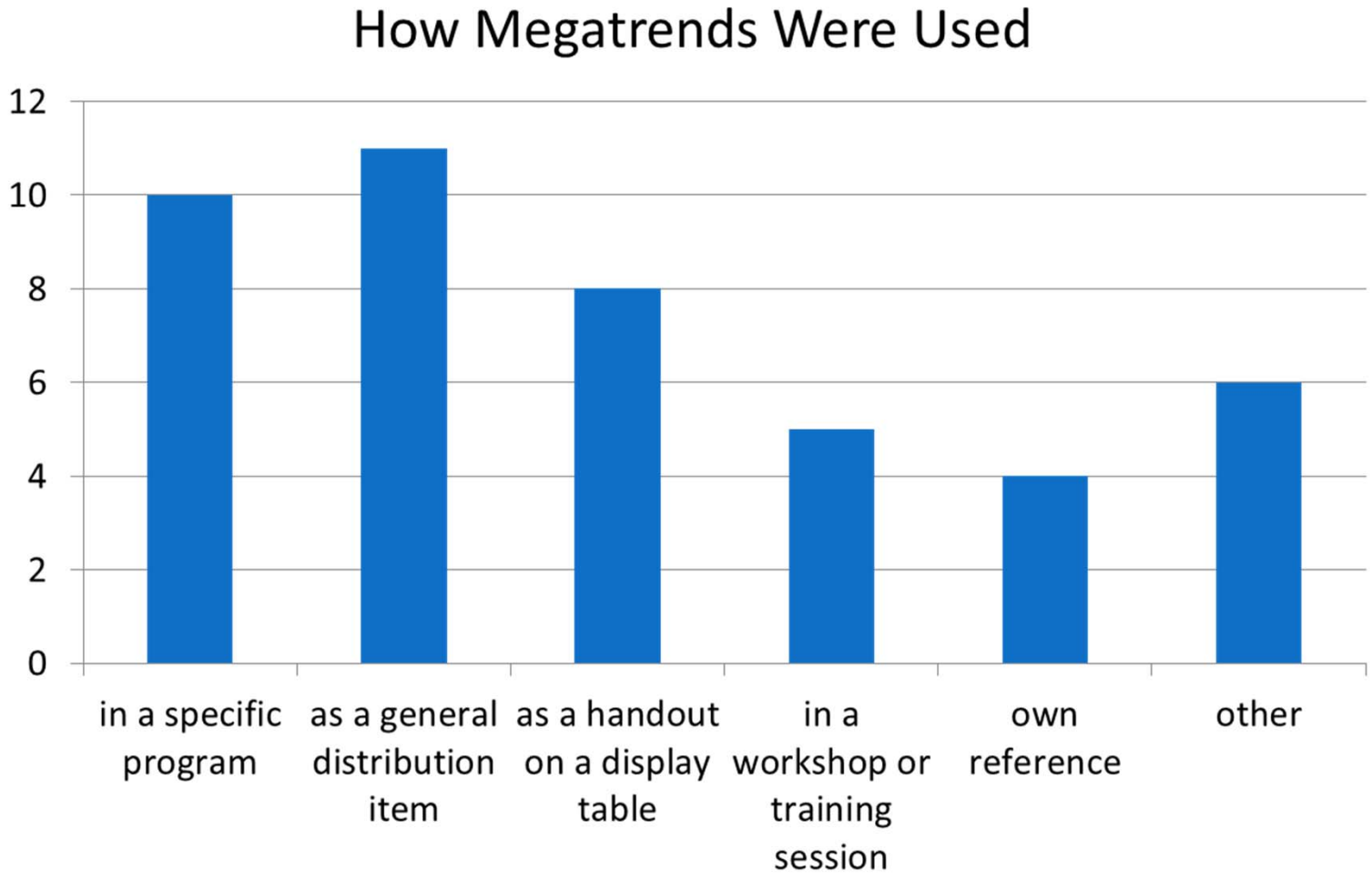


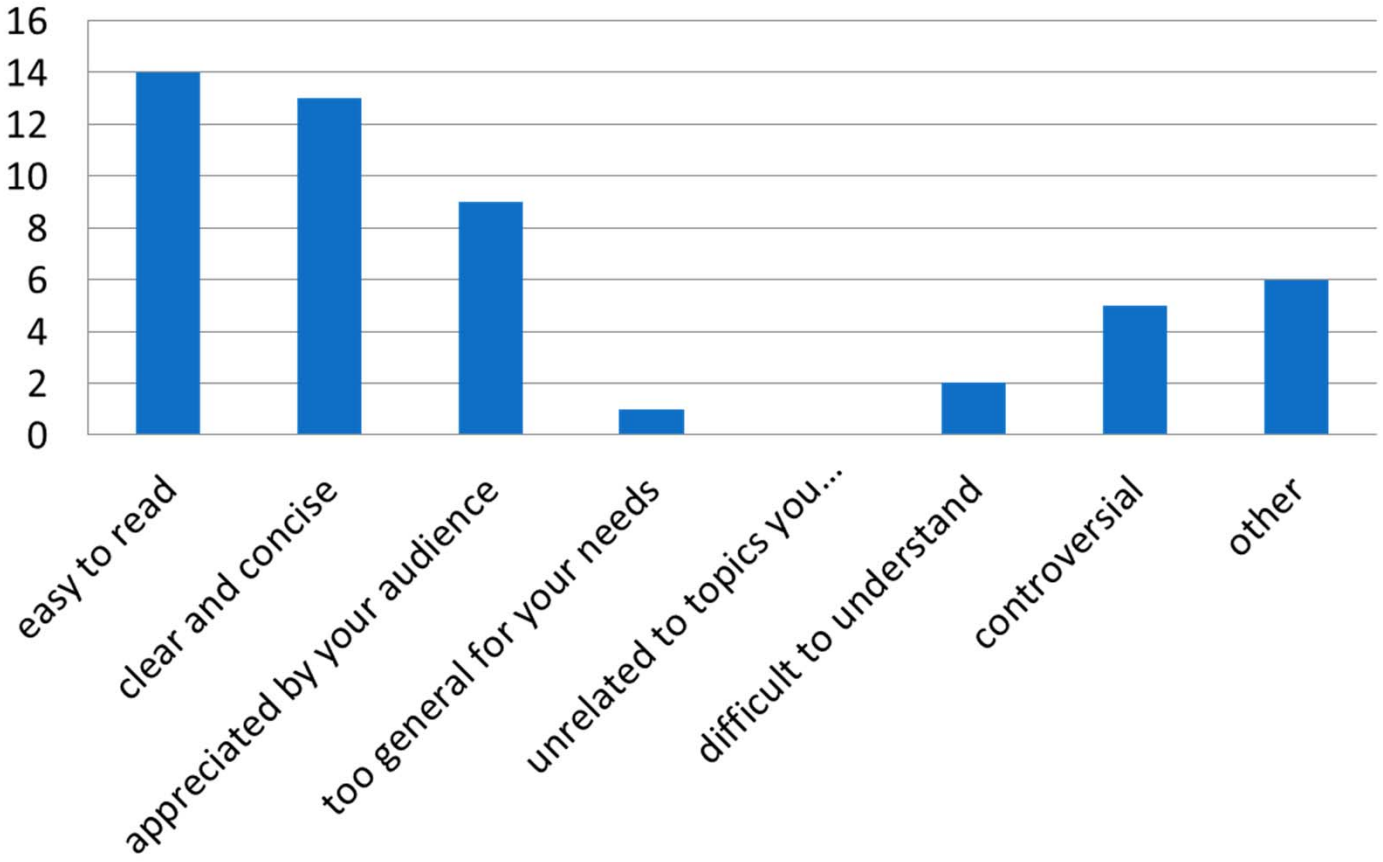
# Impact?

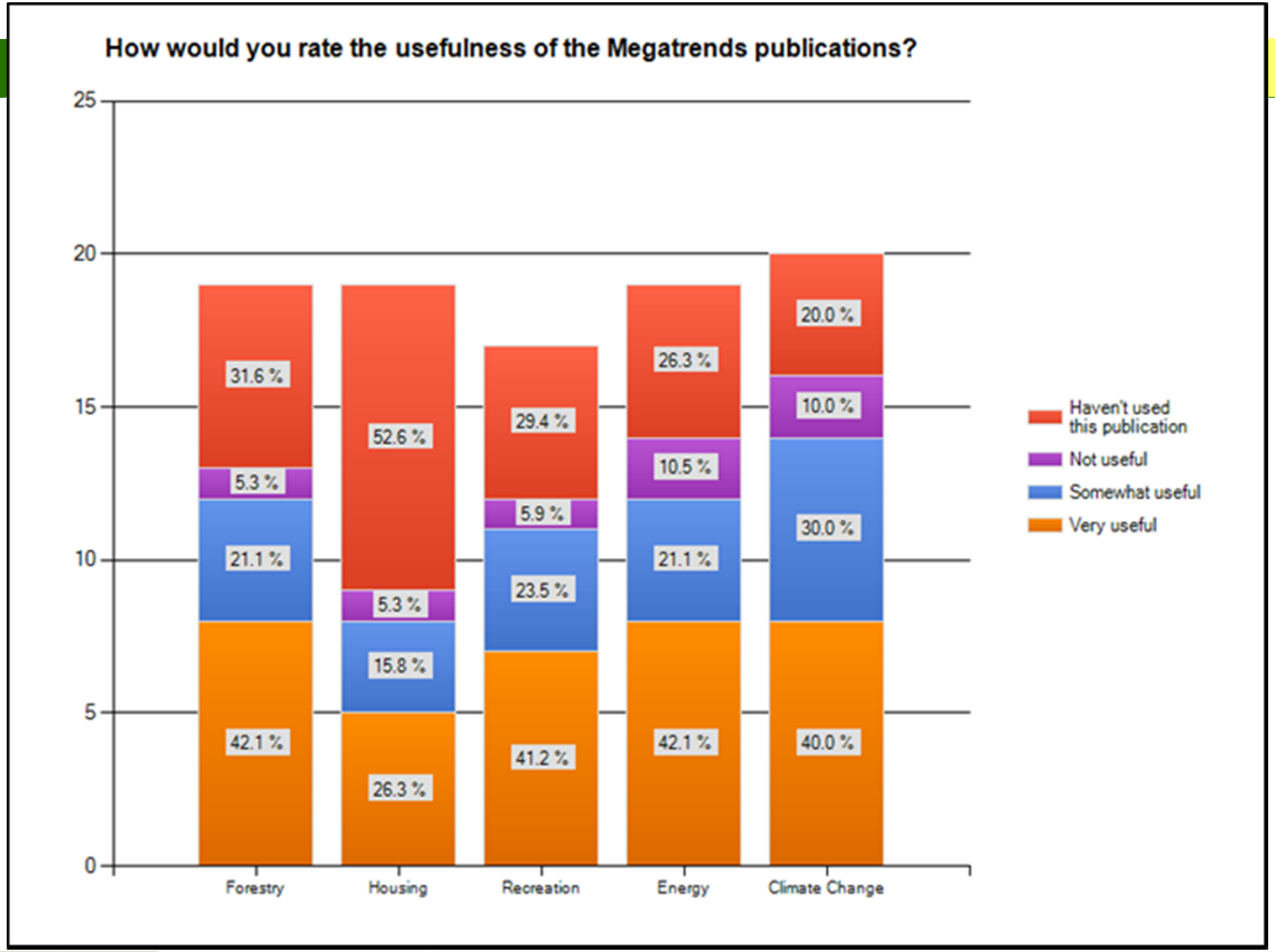
- Outputs and outcomes
- Orders
  - 10 copies to every county office
- Survey of extension staff


Extension Area
40
35
30
25
20
15
10
5
0
Ag and Natural Resources
Community, Natural Resources, and Economic Development
Family Living
4-H Youth Development
Centers and Special Programs


How Megatrends Were Used
12
10
8
6
4
2
0
in a specific program
as a general distribution item
as a handout on a display table
in a workshop or training session
own reference
other

# Characterize Megatrends?



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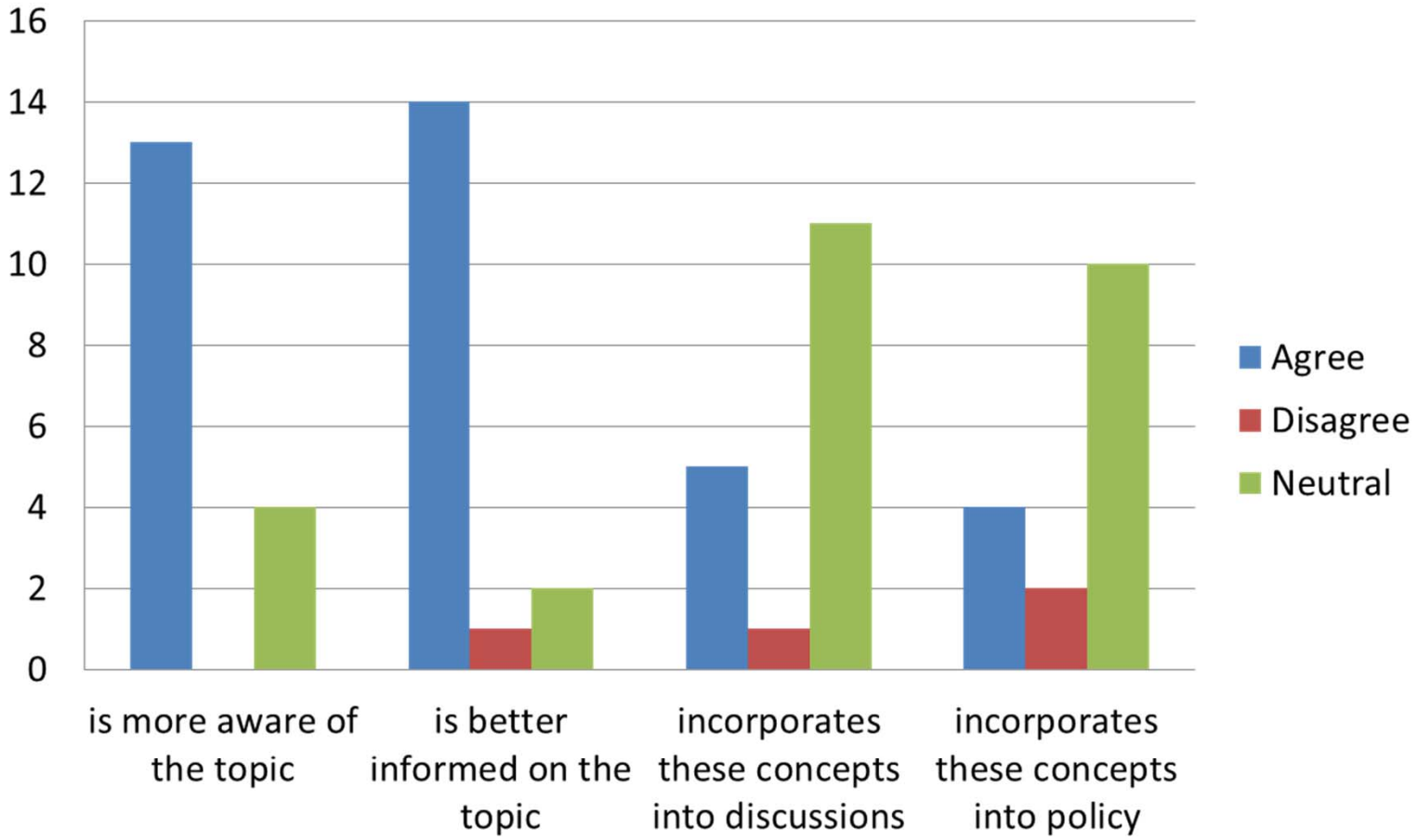
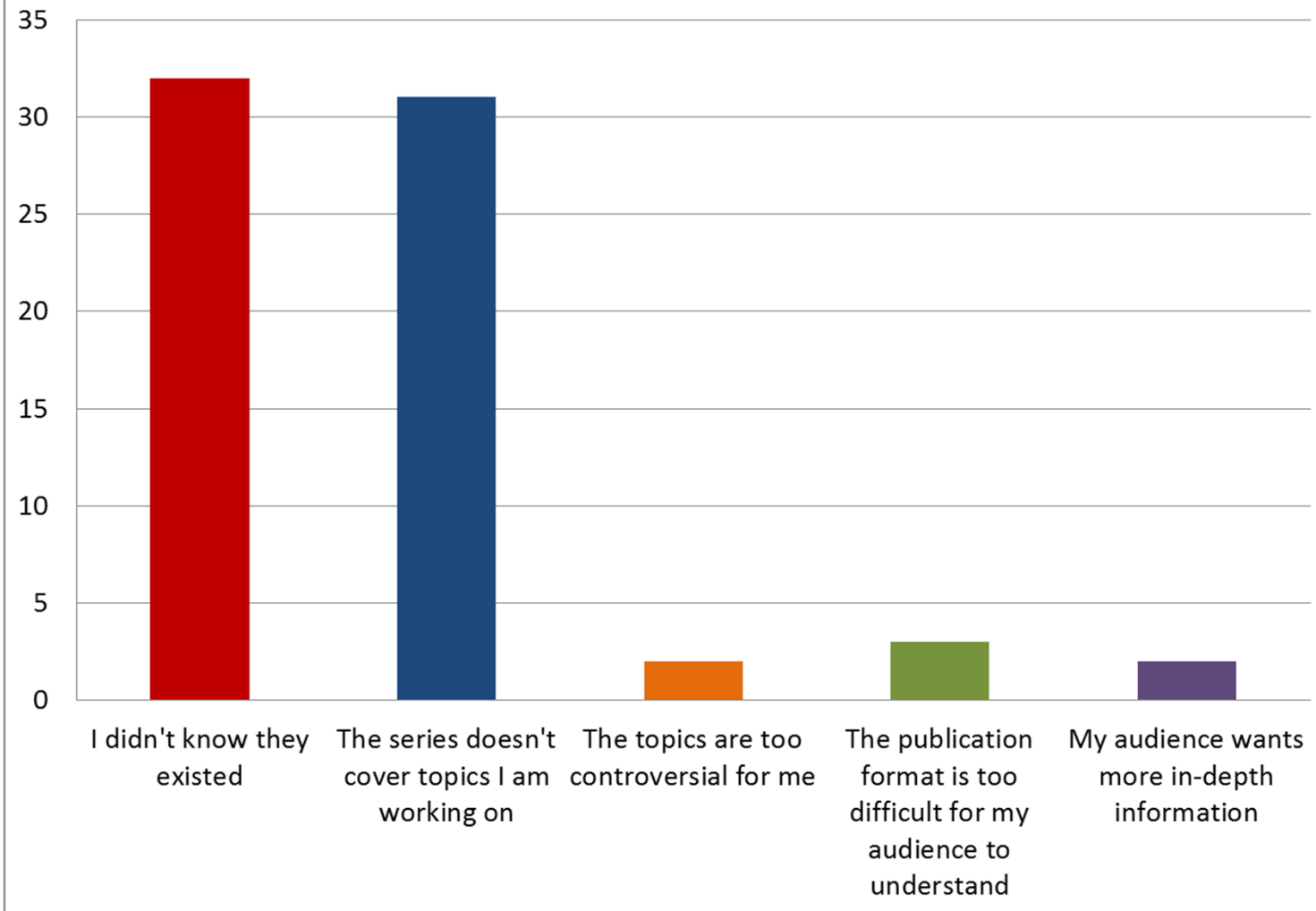
## As a result of Megatrends, my audience



# Why haven't you used any of the Megatrend series? (check all that apply)



# Comments

- Supportive, although one person super angry
  1. They take some studying to fully appreciate, but they have terrific information in a nice format. It is not something for a short attention span, so I take bits and pieces and use it in talks (graphics too) rather than give it to most audiences
  2. Seem to lean strongly
  3. They cover controversial topics, which is good!
  4. a good quick reference for the state

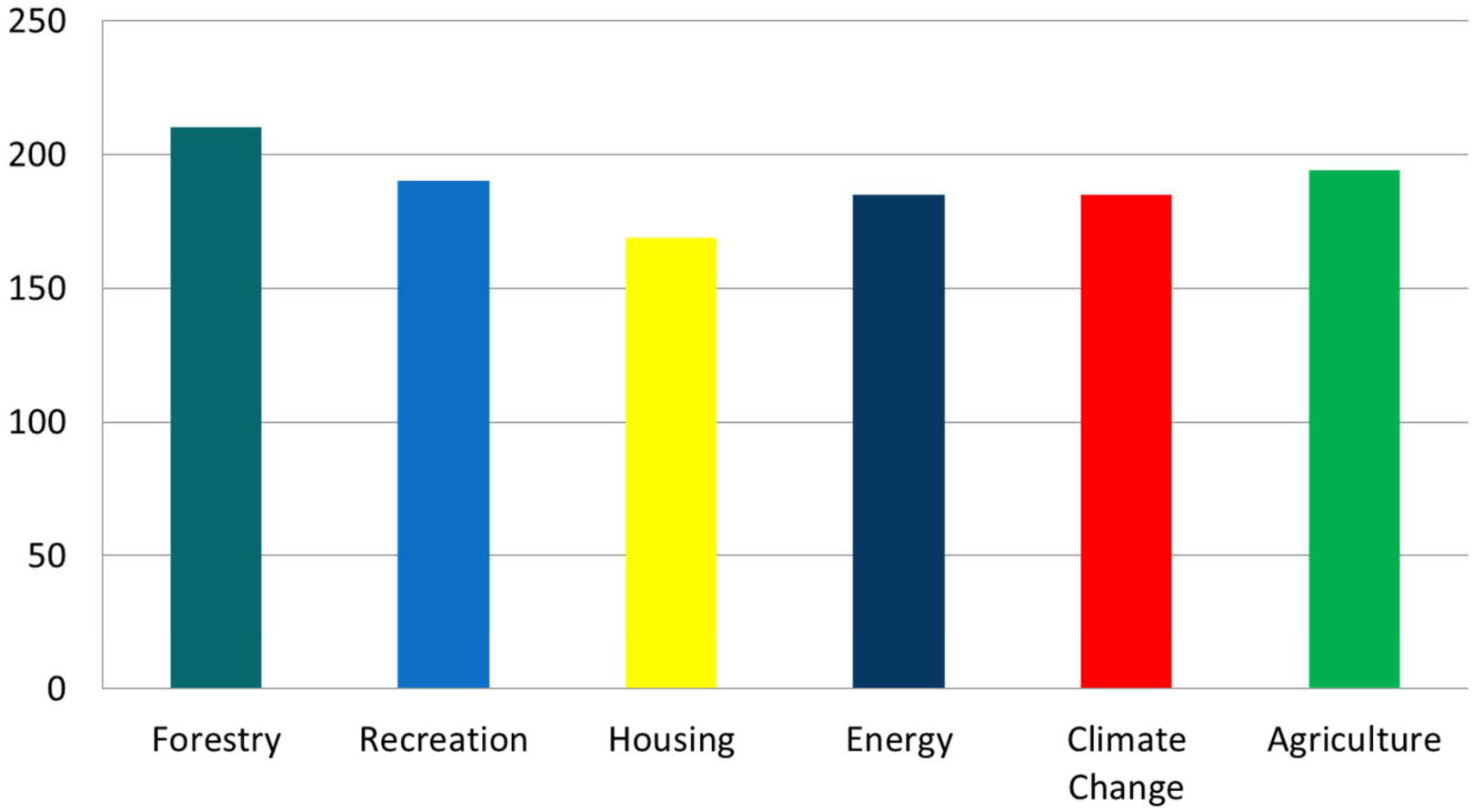
# Comments: How to make more useful?

1. BE OBJECTIVE, SCIENTIFIC AND SCHOLARLY!! Most of the writing appears to be cut and paste from other sources, with sometimes little relevance to WI. Very poor use of data and statistics...often misleading and steers readers to a particular perspective, usually not locally relevant. Not scholarly or scientific, very low quality information with limited usage for most educators and citizens. I am extremely discouraged with these publications because they are not objective, with a particular emphasis towards misrepresenting data and UW-Extension and UW-Systems basic goals. This is not research as much as it is canned propaganda. I am embarrassed to use it, and don't, because it is an excellent example of what is WRONG with research and higher learning. Data manipulation through a limited perspective and mindset, get rid of it, and the existing copies already printed.
2. Have more of them printed!

# New Megatrend

- Energy II – Renewables linked to climate change
  - Conservation and efficiency
  - Wind
  - Solar
  - Biomass
  - Biogas
  - Nuclear
  - New Technology
  - Jobs
  - Community Policies
  - Other States

# Megatrends Hard Copy Order 2012

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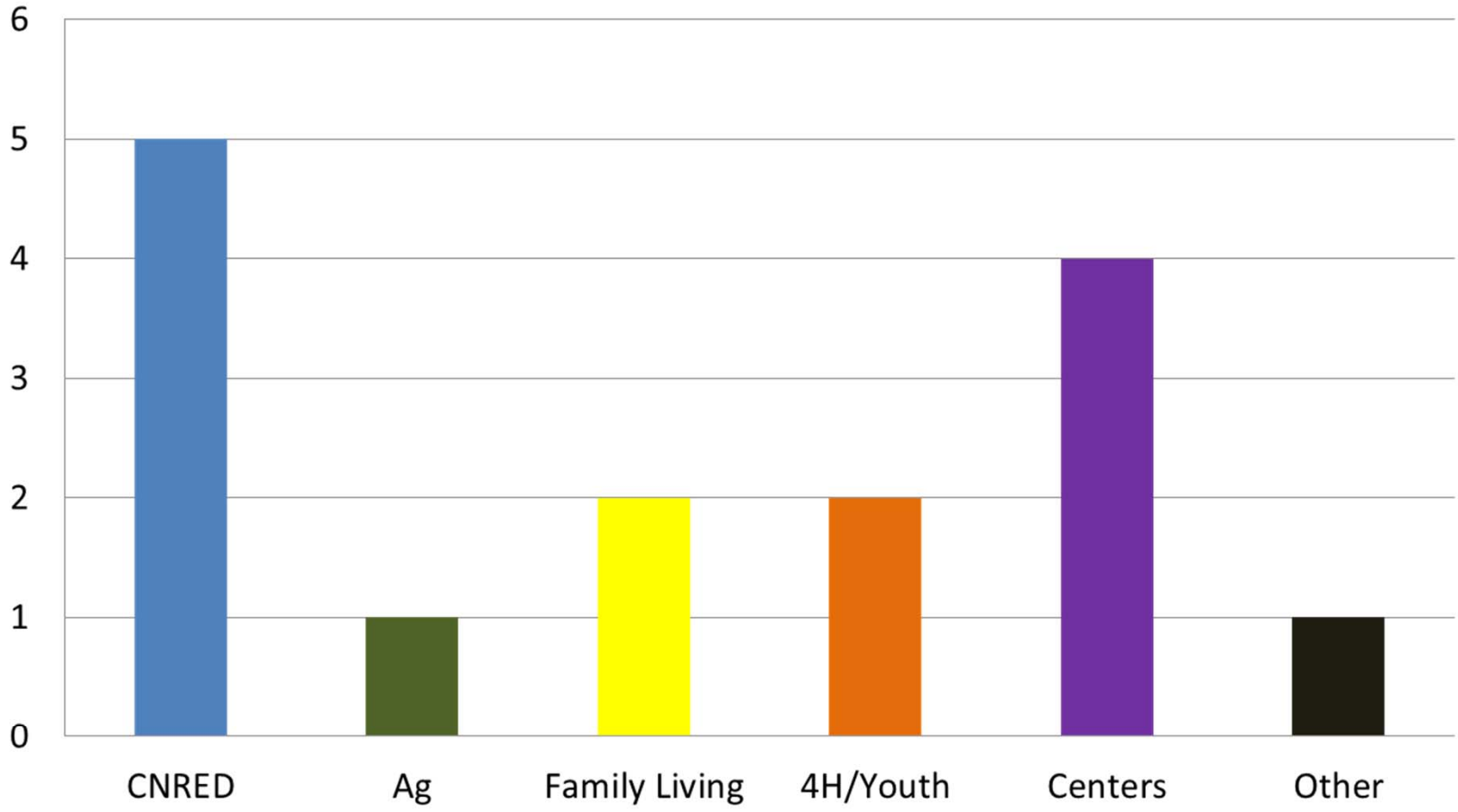
## Which programs ordered copies?




College of Natural Resources
UW Extension Cooperative Extension
Center for Land Use Education

# We want to know:

- Degrees of separation
- Influence, no matter how subtle, on decision-making

# Questions?
# Comments?

Anna Haines

ahaines@uwsp.edu