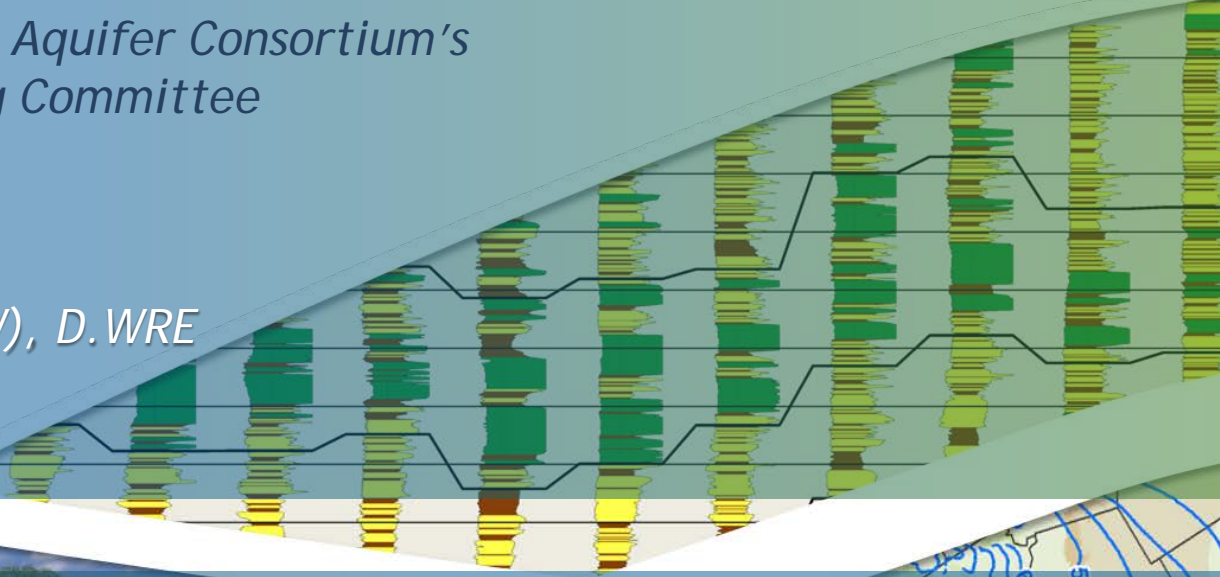
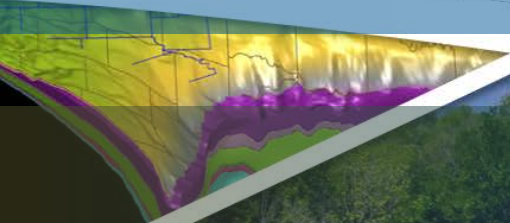


# Water Demand and Water Supply Update for East Central Illinois

*A Presentation to the Mahomet Aquifer Consortium's  
Regional Water Supply Planning Committee*

*February 27, 2015*

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Theresa Landewe*



# Water Demand Scenarios for the East Central Illinois Planning Region 2005 - 2050

*by Wittman Hydro Planning Associates (WHPA), 2008*

Special thanks to:

Pat Mills, U.S. Geological Survey, Urbana

Ken Hlinka and Conor Healy,  
Illinois Water Inventory Program, Illinois State Water Survey

# Major Water-Using Sectors

- Power Generation
- Self-Supplied Commercial & Industrial
- Agriculture & Irrigation
- Public Water Supply

# Power Generation

## Projected Water Withdrawals for Power Generation (WHPA, 2008) Baseline Scenario

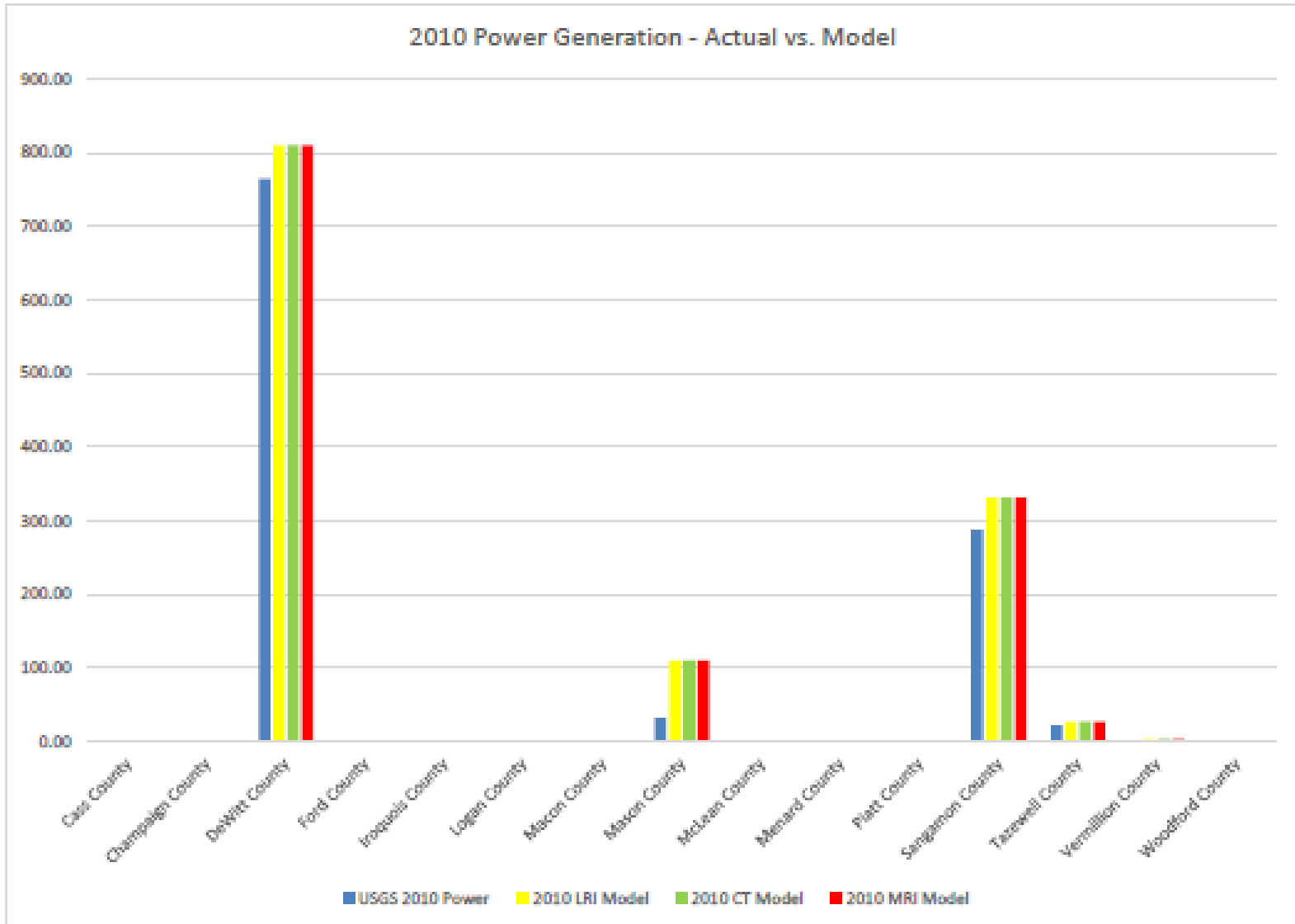
County	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
DeWitt	810.4	810.4	810.4	810.4	810.4	810.4	810.4	810.4	810.4	810.4
Mason	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0
Sangamon	371.3	331.5	331.5	331.5	331.5	331.5	331.5	331.5	331.5	331.5
Tazewell	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9
Vermilion	2.8	2.8	2.8	2.8*	2.8*	2.8*	2.8‡	2.8‡	2.8‡	2.8‡
Woodford	---	---	---	---	---	---†	---†	---†	---†	---†
Total	1,315	1,275	1,275	1,275	1,275	1,275	1,275	1,275	1,275	1,275

\*Reduced to 1.6 mgd for LRI Scenario

‡Reduced to 0.0 mgd for LRI Scenario

†Increased to 73.5 mgd for MRI Scenario

# Power Generation



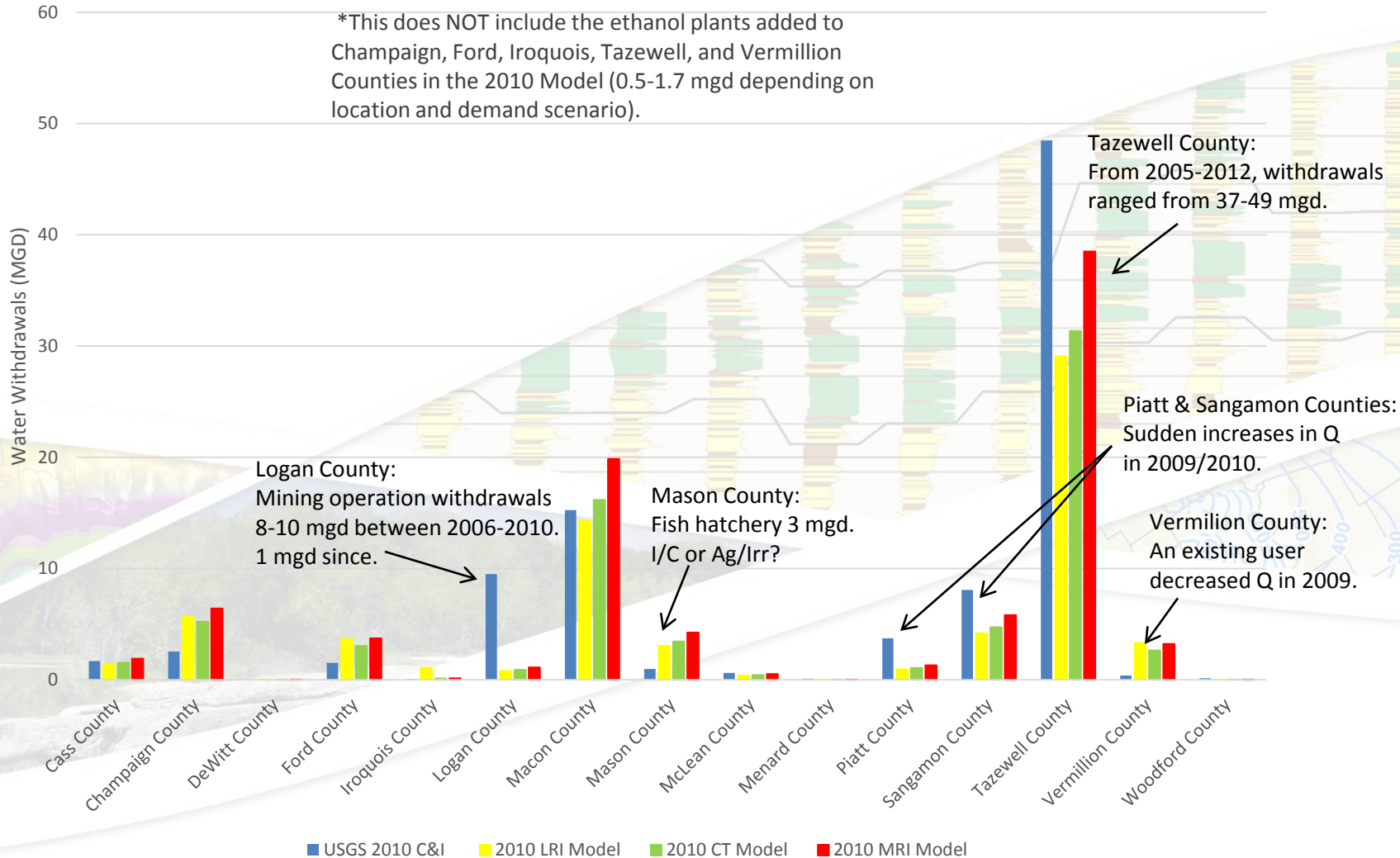
# Power Generation

*"It is reasonable to expect that the future demand for electricity within the 15-county study area will change because of population growth and the concomitant increase in economic activity. The current use of electricity within the study area is difficult to determine precisely. There is no accurate or predictable correlation between local demand for power and local generation, both now and in the future, due to the nature of the electric power market. **Increasing future electric demand may not be met by the six plants currently within the study area.**" WHPA, 2008*

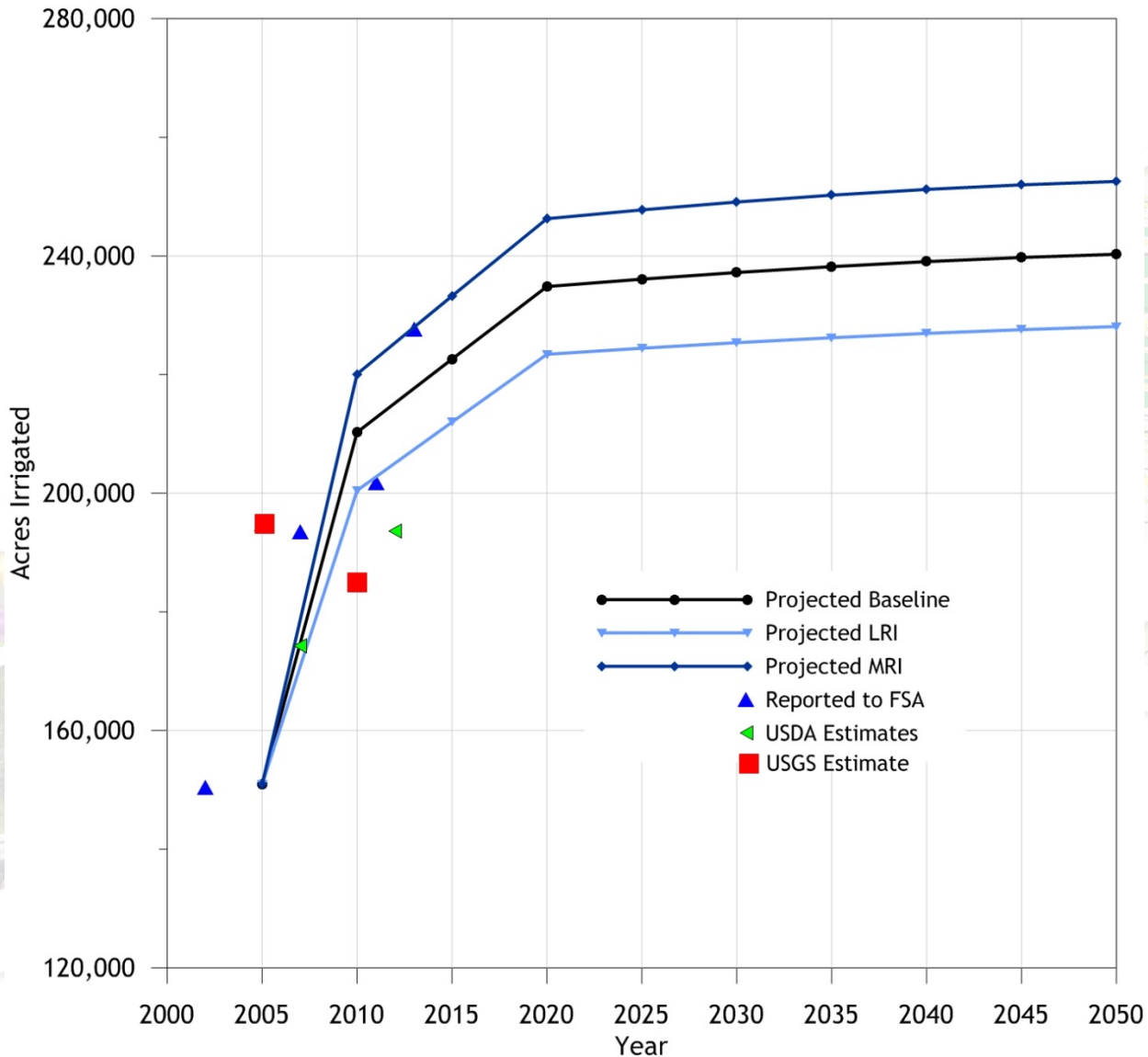
A corollary to this: it is not unlikely to think that electric power generated locally may only serve economic activity inside the 15-county region, further complicating predictions of water demand for power generation.

# Self-Supplied Commercial & Industrial

2010 Commercial and Industrial - Reported vs. Modeled



# Irrigated Acreage

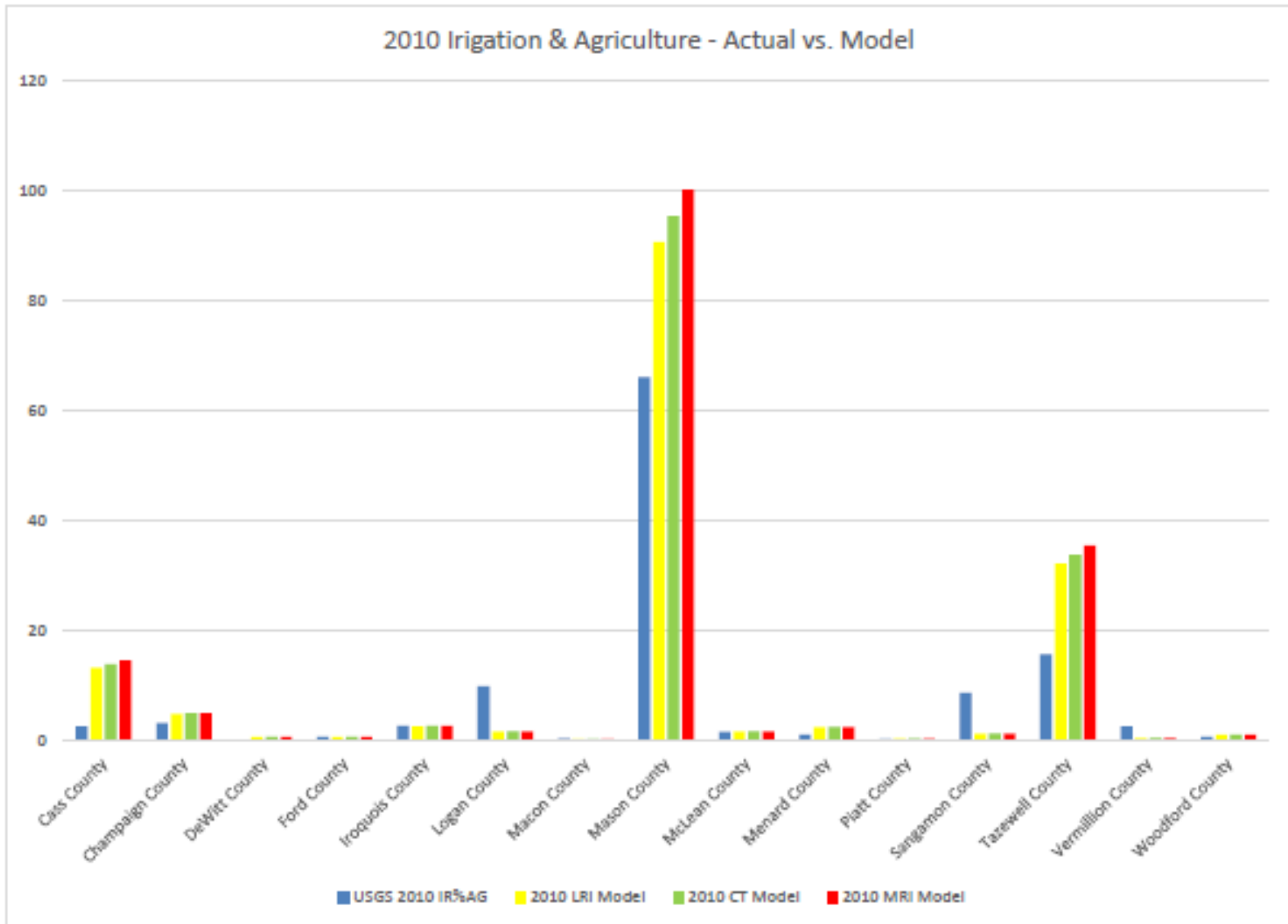




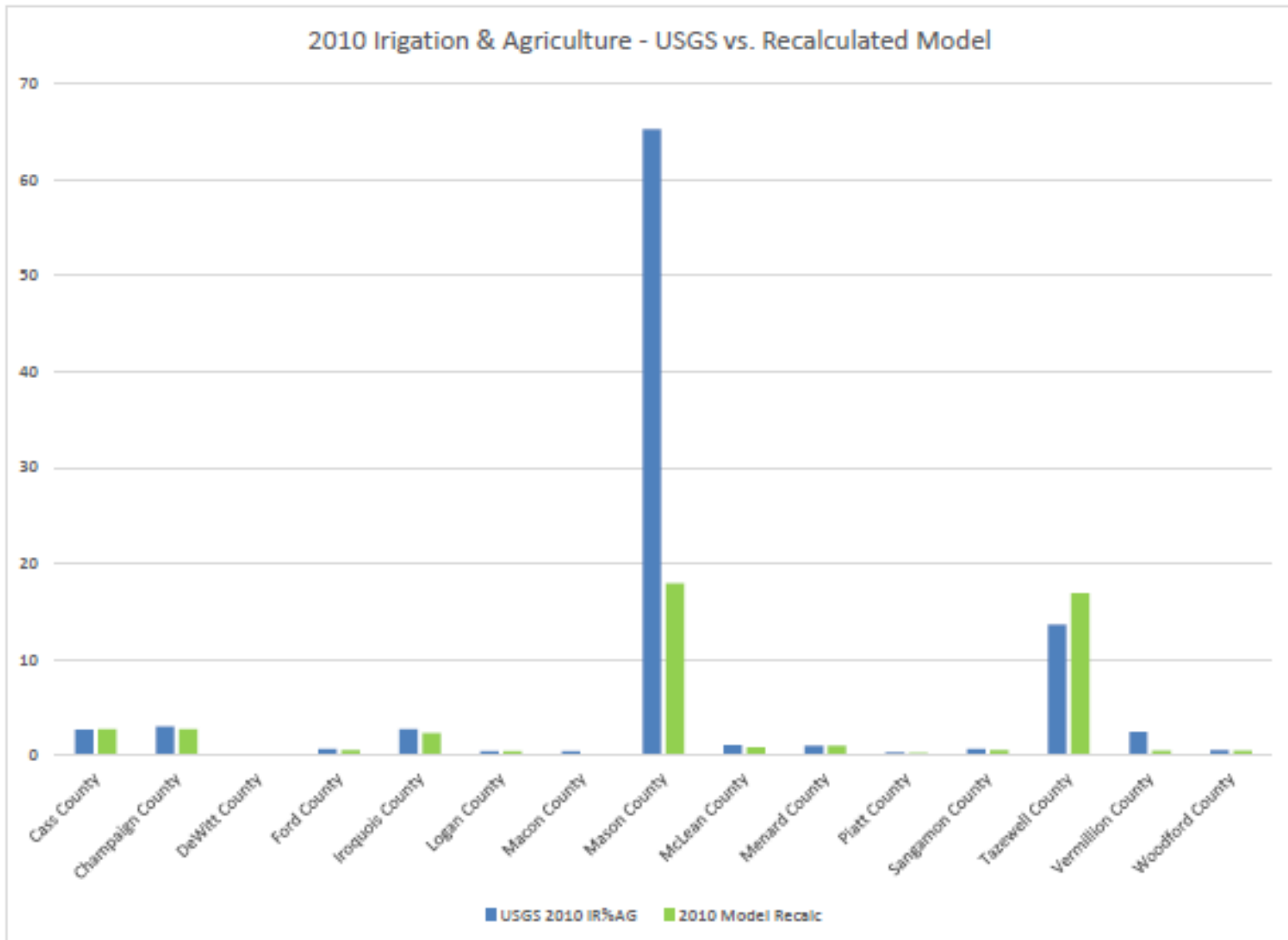
# Irrigation

County	"Normal" Summer Precipitation Deficit (in)	2010 Summer Precipitation Deficit (in)	USGS 2010 Ag/Irr Estimated Q (mgd)	WHPA 2010 Baseline Ag/Irr Projected Q (mgd)	Recalculated 2010 Ag/Irr Q (mgd)
Cass	9.86	1.85	2.66	14.0	2.73
Champaign	9.17	5.60	3.05	5.0	2.74
DeWitt	9.21	5.38	0.17	0.8	0.17
Ford	9.45	6.54	0.66	0.8	0.54
Iroquois	10.55	6.23	2.7	2.7	2.34
Logan	9.92	6.40	0.44	1.7	0.45
Macon	10.34	4.01	0.43	0.3	0.17
Mason	9.81	2.15	65.24	95.4	17.91
McLean	10.34	7.30	1.08	1.7	0.85
Menard	10.15	3.42	1.01	2.5	1.03
Piatt	9.10	4.25	0.31	0.4	0.23
Sangamon	10.15	4.31	0.69	1.3	0.54
Tazewell	10.63	5.42	13.65	33.9	16.88
Vermilion	9.17	4.44	2.45	0.6	0.49
Woodford	10.20	6.26	0.57	1.2	0.51

# Irrigation



# Irrigation



# Population

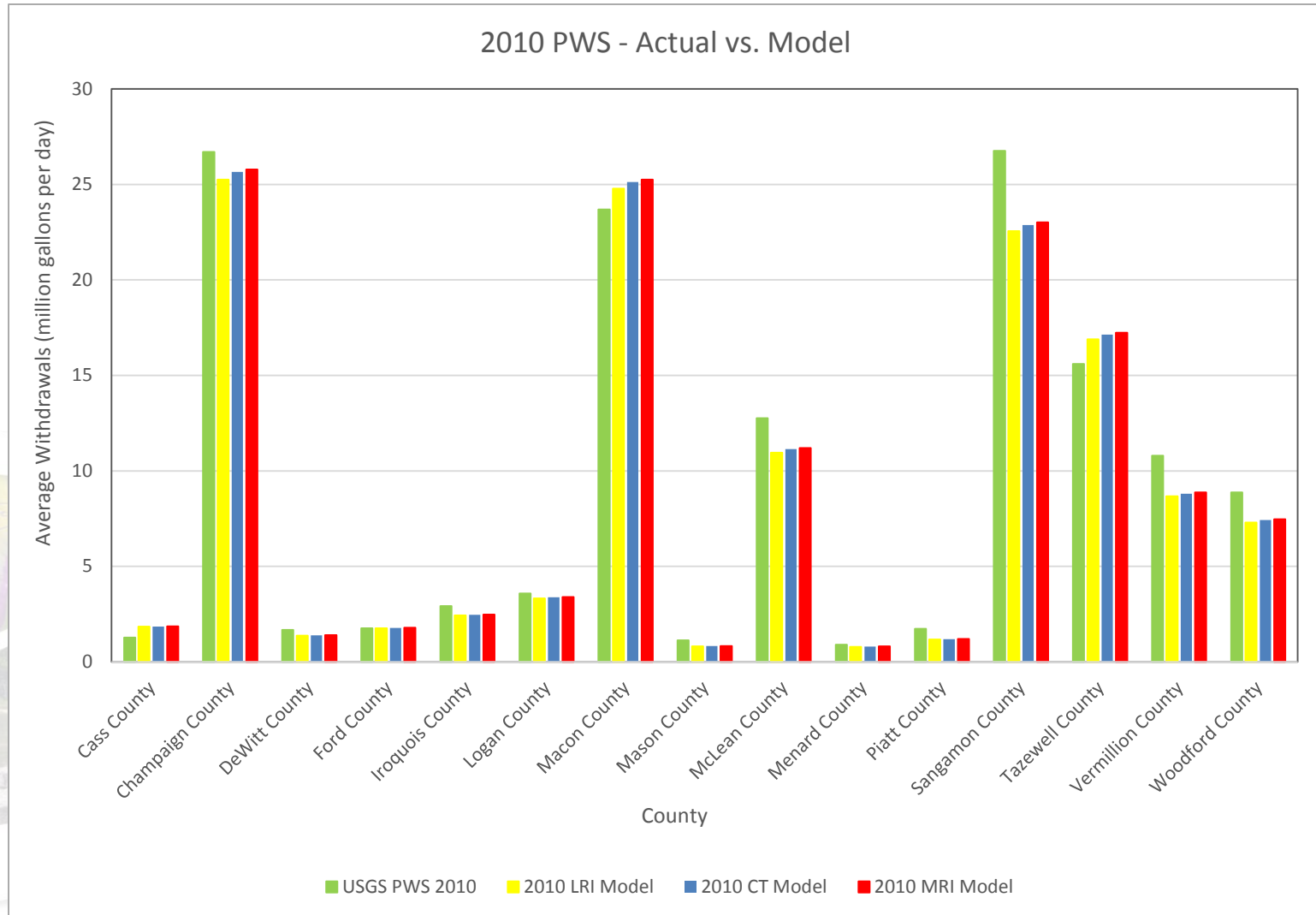
County	2005 Census	2010 Census	Percent Change	2010 DCEO	Predicted Change (%)
Cass	13,898	13,642	-1.84	14,722	5.93
Champaign	184,905	201,081	8.75	194,234	5.05
DeWitt	16,617	16,561	-0.34	17,885	7.63
Ford	14,157	14,081	-0.54	14,706	3.88
Iroquois	30,677	29,718	-3.13	32,524	6.02
Logan	30,603	30,305	-0.97	31,353	2.45
Macon	110,167	110,768	0.55	111,957	1.62
Mason	15,741	14,666	-6.83	16,615	5.55
McLean	159,013	169,572	6.64	168,611	6.04
Menard	12,738	12,705	-0.26	13,598	6.75
Piatt	16,680	16,729	0.29	17,023	2.06
Sangamon	192,789	197,465	2.43	195,115	1.21
Tazewell	129,999	135,394	4.15	139,616	7.40
Vermilion	82,344	81,625	-0.87	78,181	-5.05
Woodford	37,448	38,664	3.25	39,362	5.11
<b>TOTAL</b>	<b>1,047,776</b>	<b>1,082,976</b>	<b>3.36</b>	<b>1,085,502</b>	<b>3.60</b>

# Public Water Supply

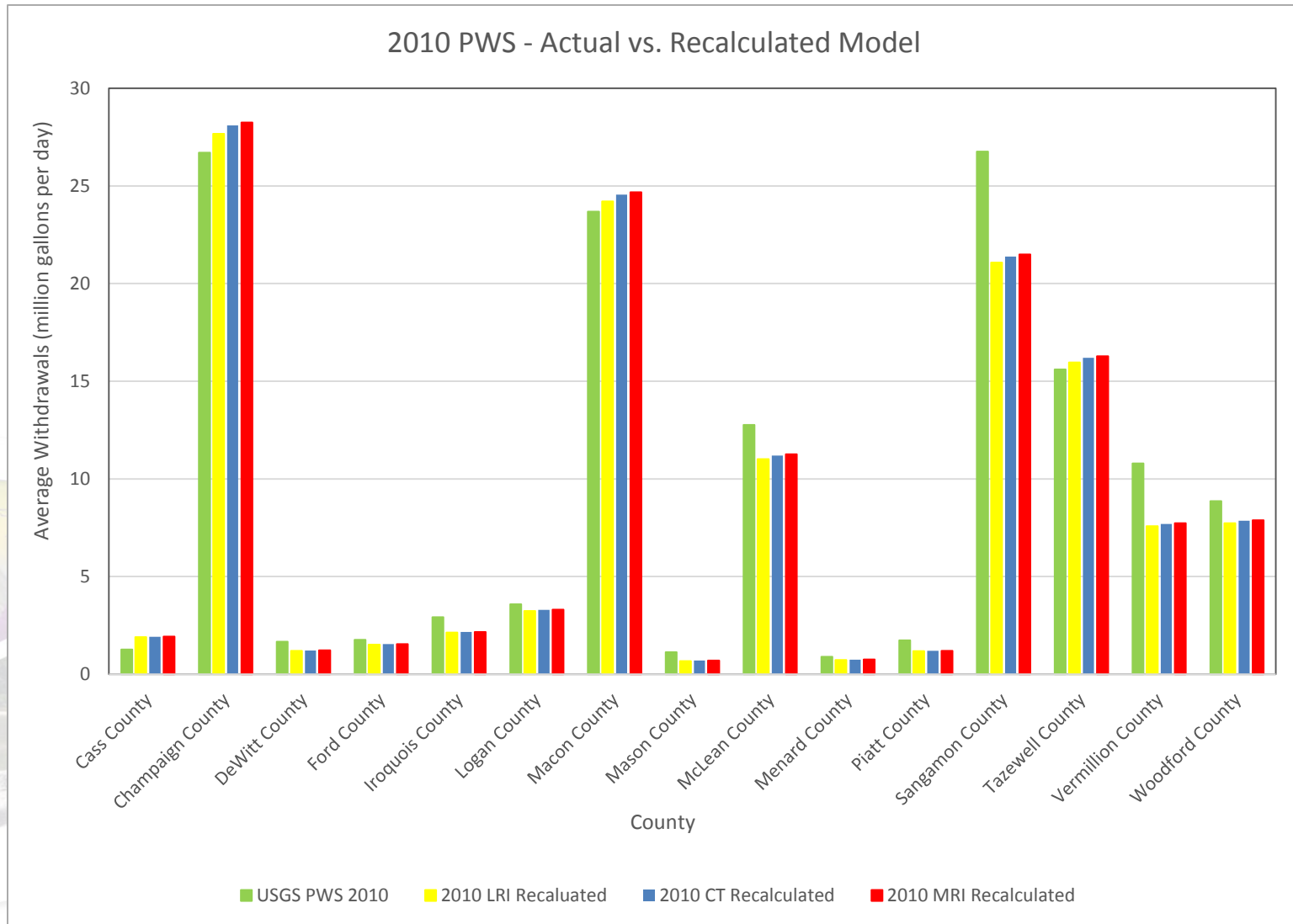
Comparison of Estimated 2010 Public Water Supply Withdrawals, Predicted Scenario Withdrawals, and Recalculated Scenario Withdrawals

County	USGS 2010 Estimated PWS Withdrawals (mgd)	2010 PWS Scenario Predictions (mgd)			2010 PWS Scenario Recalculations (mgd)		
		LRI	CT	MRI	LRI	CT	MRI
Cass	1.04	1.84	1.85	1.86	1.90	1.92	1.93
Champaign	25.20	25.26	25.65	25.79	27.67	28.10	28.25
DeWitt	1.25	1.37	1.39	1.40	1.20	1.21	1.22
Ford	1.48	1.76	1.78	1.79	1.52	1.54	1.54
Iroquois	2.16	2.43	2.46	2.48	2.13	2.16	2.17
Logan	2.92	3.33	3.38	3.40	3.24	3.29	3.31
Macon	23.01	24.78	25.13	25.26	24.21	24.55	24.68
Mason	0.64	0.81	0.83	0.83	0.68	0.70	0.70
McLean	11.65	10.96	11.14	11.20	11.02	11.20	11.27
Menard	0.84	0.79	0.80	0.81	0.73	0.74	0.75
Piatt	1.31	1.17	1.19	1.20	1.18	1.20	1.20
Sangamon	24.10	22.56	22.88	23.01	21.08	21.38	21.50
Tazewell	15.17	16.89	17.14	17.24	15.96	16.20	16.28
Vermilion	9.24	8.68	8.81	8.87	7.58	7.69	7.74
Woodford	7.76	7.30	7.43	7.47	7.73	7.86	7.89
<b>TOTAL</b>	<b>127.77</b>	<b>129.94</b>	<b>131.88</b>	<b>132.60</b>	<b>127.82</b>	<b>129.74</b>	<b>130.44</b>

# Public Water Supply



# Public Water Supply Recalculated



# Public Water Supply

## Differences from the USGS Estimated 2010 PWS Withdrawal (%)

County	USGS 2010 Estimated PWS Withdrawals (mgd)	2010 PWS Scenario Prediction Differences from USGS Estimated* (%)			2010 PWS Scenario Recalculation Differences from USGS Estimated* (%)		
		LRI	CT	MRI	LRI	CT	MRI
Cass	1.04	77	78	79	83	85	86
Champaign	25.20	0	2	2	10	12	12
DeWitt	1.25	10	11	12	-4	-3	-2
Ford	1.48	19	20	21	3	4	4
Iroquois	2.16	13	14	15	-1	0	0
Logan	2.92	14	16	16	11	13	13
Macon	23.01	8	9	10	5	7	7
Mason	0.64	27	30	30	6	9	9
McLean	11.65	-6	-4	-4	-5	-4	-3
Menard	0.84	-6	-5	-4	-13	-12	-11
Piatt	1.31	-11	-9	-8	-10	-8	-8
Sangamon	24.10	-6	-5	-5	-13	-11	-11
Tazewell	15.17	11	13	14	5	7	7
Vermilion	9.24	-6	-5	-4	-18	-17	-16
Woodford	7.76	-6	-4	-4	0	1	2
<b>TOTAL</b>	<b>127.77</b>						



# Data Issues

- All water demand sectors should report water withdrawals
- Reporting should be mandatory
- All water withdrawals should be made public (including I/C)
- Withdrawals should be accurately reported as withdrawals, not total water produced or used (consistency in reporting)
- Monthly withdrawals should be reported
- Population served should be accurately reported annually
- Public water suppliers should report price annually
- Significant changes in water withdrawals should be explained

*From WHPA, 2008*

# Summary

- Generally good agreement between estimated 2010 withdrawals and projected withdrawals across all sectors. Only 2010 data point.
- Power generation sector “projections” were not really forecasts but assumptions of recurring withdrawals based on continuing power plant operations.
- Industrial/commercial differences can generally be ascribed to unpredictable operational changes by a company or companies.
- Irrigation withdrawals are highly dependent upon summer rainfall and, like the weather, are currently not predictable.
- Irrigated acreage estimates highly uncertain.
- Irrigation model currently uses the May thru August precip deficit.  
It may need to add September and October precip deficits.
- Poor agreement for Mason and Tazewell Counties.
- Public water supply withdrawals are largely dependent upon Population and DCEO projections did not project declines.
- “Population served” not consistently reported.
- Still have some county differences that need further exploration.

# Upcoming Deadlines

- ❑ April 15: Submit draft report to RWSPC and MAC Board for review
- ❑ May 15: RWSPC/MAC Board comments due
- ❑ May 30: Revise draft and submit final report