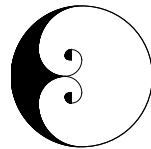
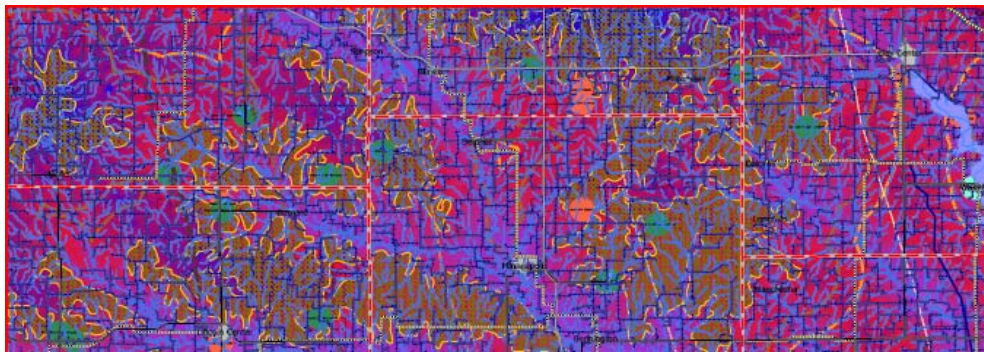


# North Central Kansas Renewable Energy Resource Analysis

**North Central Regional Planning Commission**  
Beloit, Kansas

Analysis of Land Area by Wind Class and  
Potential Reduction for Environmental Concerns  
for Clay, Cloud, Dickenson, Ellsworth,  
Jewell, Lincoln, Marshall, Mitchell, Ottawa,  
Republic, Saline, and Washington Counties

April 2009



**Coriolis**

**architecture • energy**

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Created by funding from the Rural Business Development Tax Credit program administered by the Kansas Department of Commerce and as invested by North Central Kansas Community Network, Inc. The Solar Map and 50 M Kansas Wind Resource Map layers were prepared by Coriolis and the 50, 70, and 100 M Wind Speed and Wind Power Map layers were prepared by AWS Truewind, LLC for the Kansas Corporation Commission. See original maps and associated reports for details. This material was prepared with the support of the U.S. Department of Energy (DOE) Grants No. DE-FG26-07NT43197 & DE-FG36-0747006. Whooping crane flyway data was acquired from the U.S. Fish and Wildlife Service. Untilled Land data was acquired from The Nature Conservancy. Prairie Chicken habitat data, flora and fauna data on threatened and endangered species, and species in need of conservation sitings, as well as protected areas, are from the Kansas Department of Wildlife and Parks. Data on archeological sites are from the Kansas State Historical Society. The latter two were accessed through The Kansas Geospatial Community Commons (KGCC). This multilayer pdf map is intended to facilitate the siting and development of renewable energy projects, particularly in early phases. All energy development projects should confirm resources with direct measurement in accordance with industry standards and development criteria with state and local officials. Neither the authors of this map or any data source used herein or any sponsoring agency assumes any responsibility for the completeness or accuracy of the information presented

Wind energy resources are described by wind classes as described in the table below. In the Great Plains areas of wind class 5 and better are generally considered potentially developable, although sites with better resources occur and will typically be more competitive.

<b>Wind Speeds At 10, 50, 70, and 100 Meters by Class</b>																
<b>Class</b>	<b>10 Meters</b>				<b>50 Meters</b>				<b>70 Meters</b>				<b>100 Meters</b>			
	<b>Min</b>	<b>Min</b>	<b>Max</b>	<b>Max</b>	<b>Min</b>	<b>Min</b>	<b>Max</b>	<b>Max</b>	<b>Min</b>	<b>Min</b>	<b>Max</b>	<b>Max</b>	<b>Min</b>	<b>Min</b>	<b>Max</b>	<b>Max</b>
	<b>M/sec</b>	<b>mph</b>	<b>M/sec</b>	<b>mph</b>	<b>M/sec</b>	<b>mph</b>	<b>M/sec</b>	<b>mph</b>	<b>M/sec</b>	<b>mph</b>	<b>M/sec</b>	<b>mph</b>	<b>M/sec</b>	<b>mph</b>	<b>M/sec</b>	<b>mph</b>
<b>1</b>	0.0	0.0	4.4	9.9	0.0	0.0	5.5	12.4	0.0	0.0	5.8	13.0	0.0	0.0	6.1	13.7
<b>2</b>	4.4	9.9	5.1	11.4	5.5	12.4	6.4	14.4	5.8	13.0	6.7	15.1	6.1	13.7	7.1	15.8
<b>3</b>	5.1	11.4	5.6	12.5	6.4	14.4	7.0	15.8	6.7	15.1	7.4	16.6	7.1	15.8	7.8	17.4
<b>4</b>	5.6	12.5	6.0	13.4	7.0	15.8	7.6	16.9	7.4	16.6	7.9	17.8	7.8	17.4	8.3	18.6
<b>5</b>	6.0	13.4	6.4	14.3	7.6	16.9	8.1	18.0	7.9	17.8	8.5	18.9	8.3	18.6	8.9	19.9
<b>6</b>	6.4	14.3	7.0	15.7	8.1	18.0	8.8	19.7	8.5	18.9	9.2	20.7	8.9	19.9	9.7	21.7
<b>7</b>	7.0	15.7	9.4	21.1	8.8	19.7	11.8	26.5	9.2	20.7	12.4	27.8	9.7	21.7	13.0	29.2

Turbine array density varies in response to terrain, resource, turbine selected, and other factors. Greater density is generally more economical to install but may also result in great production loss from turbine wakes within the array. Densities typically range from 8 – 12. A value of 10 was used in the table on the right. Note that this analysis is based on the aggregation of parcels and where islands too small for development are included the total shown may be optimistic.

The tables below provide a detailed breakdown of estimated wind resources by wind speed increment from different sources and elevations. The Coriolis source may have value in areas with greater surface roughness.

Later tables provide an indication of the reduction in land area that would occur if different categories of land with environmental concerns were excluded.

<b>Sum - TW70_Acreage</b>	<b>Wind Speed M/Sec</b>	<b>Potential Capacity MW @ 10 MW/SqMi</b>
<b>CountyName</b> <input type="button" value="v"/>	<b>=&gt; 8.0</b>	
⊕ <b>Clay</b>	7,658	120
⊕ <b>Cloud</b>	83,919	1,311
⊕ <b>Dickinson</b>	18,922	296
⊕ <b>Ellsworth</b>	187,842	2,935
⊕ <b>Jewell</b>	1,801	28
⊕ <b>Lincoln</b>	67,896	1,061
⊕ <b>Marshall</b>	8,935	140
⊕ <b>Mitchell</b>	19,244	301
⊕ <b>Ottawa</b>	12,458	195
⊕ <b>Republic</b>	101,938	1,593
⊕ <b>Saline</b>	2,016	31
⊕ <b>Washington</b>	55,063	860
<b>Grand Total</b>	<b>567,690</b>	<b>8,870</b>

Coriolis 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County

Sum - Cor50_Acreage		SpeedClass							Grand Total
CountyName	Subdivision Name	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	Grand Total
+ Clay			7,505	57,811	293,251	60,920	23		419,509
+ Cloud			326	18,313	200,074	232,955	7,633		459,300
+ Dickinson			5,956	85,011	363,318	90,857	11		545,153
+ Ellsworth			1,040	15,708	123,374	304,449	18,017		462,587
+ Jewell				24,916	247,357	303,313	9,207		584,792
+ Lincoln			658	29,569	217,868	199,391	13,294		460,780
+ Marshall		121	34,753	293,806	234,345	16,428			579,454
+ Mitchell			790	23,994	177,252	247,305	10,578	30	459,948
+ Ottawa			127	33,875	277,969	148,734	739		461,445
+ Republic				5,629	155,019	287,396	12,827		460,871
+ Saline			9,603	60,124	308,880	82,556	261		461,424
+ Washington			3,262	149,295	328,475	94,026	13		575,072
<b>Grand Total</b>		<b>121</b>	<b>64,019</b>	<b>798,050</b>	<b>2,927,183</b>	<b>2,068,330</b>	<b>72,603</b>	<b>30</b>	<b>5,930,335</b>

Coriolis 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township

Sum - Cor50_Acreage		SpeedClass							Grand Total
CountyName	Subdivision Name	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	Grand Total
Clay	Athelstane township			1,850	19,608	1,575			23,032
	Blaine township		183	4,494	21,217	1,111			27,006
	Bloom township			2,421	20,316	7,522			30,259
	Chapman township			3,514	15,724	3,701			22,939
	Clay Center city	894		756	100				1,749
	Clay Center township		1,485	6,594	15,984	335			24,397
	Exeter township			17	15,551	7,529			23,097
	Five Creeks township			1,699	15,000	6,345			23,044
	Garfield township			1,026	18,558	2,993			22,577
	Gill township			660	14,221	4,351			19,232
	Goshen township			3,547	18,293	696			22,537
	Grant township		2,413	9,291	9,590	311			21,605
	Hayes township			1,337	19,117	2,331			22,786
	Highland township			2,059	18,850	1,871			22,781
	Mulberry township	31		3,748	14,653	6,201			24,633
	Oakland township			829	14,840	7,252		23	22,944
	Republican township		1,438	6,567	11,854	874			20,732
	Sherman township			3,002	16,269	2,061			21,332
Union township			1,061	4,400	13,506	3,860		22,828	

Coriolis 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - Cor50_Acreage		SpeedClass							Grand Total
CountyName	Subdivision Name	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	Grand Total
Cloud	Arion township				5,676	17,019	490		23,185
	Aurora township			0	8,953	12,749	1,393		23,095
	Buffalo township			673	13,408	13,716			27,797
	Center township				8,806	23,682	2,166		34,655
	Colfax township			1,632	12,640	8,592	8		22,872
	Concordia city		326	1,300	1,136	0			2,761
	Elk township			2,216	12,251	3,598			18,066
	Grant township			1,037	12,032	9,955			23,024
	Lawrence township			1,978	15,686	5,657			23,320
	Lincoln township			2,445	8,383	3,865			14,694
	Lyon township			26	7,852	25,329	1,790		34,997
	Meredith township				7,542	15,171	409		23,122
	Nelson township			276	13,925	8,368			22,569
	Oakland township				5,722	17,232	110		23,064
	Shirley township			2,258	17,043	8,077			27,377
	Sibley township			2,090	11,920	8,884			22,894
	Solomon township			1,992	20,848	11,503	390		34,733
	Starr township			370	10,331	11,946	117		22,764
	Summit township			20	5,920	27,611	760		34,310

Coriolis 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - Cor50_Acreage		SpeedClass							Grand Total	
CountyName	Subdivision Name	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	Grand Total	
Dickinson	Abilene city		1,499	1,023	478				3,000	
	Banner township			847	17,326	4,657			22,830	
	Buckeye township			1,200	13,384	8,644			23,228	
	Center township		1,211	10,009	11,971	12			23,203	
	Cheever township			1,127	14,053	7,806			22,987	
	Flora township			1,575	14,262	7,172			23,009	
	Fragrant Hill township		615	3,043	12,978	2,517			19,153	
	Garfield township			1,159	21,710	307			23,175	
	Grant township		197	8,728	11,356	54			20,334	
	Hayes township			1,946	14,150	3,108			19,204	
	Herington city		443	663	240	6			1,352	
	Holland township				263	16,857	6,017	11		23,148
	Hope township				364	12,173	10,238			22,775
	Jefferson township				2,248	20,204	808			23,260
	Liberty township		113	6,830	17,219	3,966			28,128	
	Lincoln township		822	12,355	10,161	32			23,371	
	Logan township				744	19,304	3,118			23,166
	Lyon township		20	1,415	13,039	6,978			21,451	
	Newbern township				4,628	18,665	60			23,353
	Noble township		1,016	8,208	9,703	1,388			20,315	
	Ridge township				880	13,932	8,411			23,224
Rinehart township		19	3,093	15,314	4,674			23,100		
Sherman township				5,285	12,473	1,363			19,120	
Union township				4,547	15,079	3,492			23,118	
Wheatland township				177	19,985	2,915			23,077	
Willowdale township				2,654	17,304	3,114			23,072	

Coriolis 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - Cor50_Acreage		SpeedClass							Grand Total
CountyName	Subdivision Name	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	Grand Total
Ellsworth	Ash Creek township			708	8,858	12,165	1,312		23,044
	Black Wolf township			1,152	9,609	12,498	48		23,308
	Carneiro township			221	6,729	15,754	450		23,154
	Clear Creek township			152	5,552	17,513	54		23,270
	Columbia township			19	4,205	18,193	790		23,207
	Ellsworth city			800	427	120			1,346
	Ellsworth township			1,675	9,026	11,107	25		21,833
	Empire township		1,040	7,235	17,064	20,581	19		45,939
	Garfield township			49	4,552	14,840	3,469		22,911
	Green Garden township			416	2,465	20,445	4		23,330
	Langley township			732	10,098	12,276	1		23,107
	Lincoln township			2	2,497	19,837	1,189		23,524
	Mulberry township			50	6,915	14,968	1,131		23,064
	Noble township			971	11,110	10,675			22,757
	Palacky township				2,440	19,630	1,163		23,233
	Sherman township				1,683	15,590	6,022		23,295
	Thomas township			119	2,150	19,990	871		23,129
	Trivoli township			135	4,926	17,831	186		23,077
	Valley township			270	5,425	17,252	56		23,003
Wilson township			1,002	7,642	13,184	1,227		23,054	

Coriolis 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - Cor50_Acreage		SpeedClass							Grand Total
CountyName	Subdivision Name	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	Grand Total
Jewell	Allen township			5	7,041	15,239			22,284
	Athens township			2,547	12,027	10,864	10		25,248
	Browns Creek township				6,093	16,989			23,082
	Buffalo township			324	8,221	17,119	220		25,883
	Burr Oak township			3,707	14,652	6,776	69		25,204
	Calvin township			2	4,520	14,105	1,511		20,138
	Center township			382	5,583	15,067	1,879		22,911
	Erving township			1,267	13,501	8,161	45		22,974
	Esbon township			2,006	14,913	5,995			22,914
	Grant township				12,358	10,491			22,848
	Harrison township				4,046	18,392	433		22,871
	Highland township			818	6,500	15,653	5		22,975
	Holmwood township			1,592	11,416	9,452	370		22,829
	Ionia township			1,226	13,613	10,030	375		25,244
	Jackson township			805	8,013	13,669	389		22,875
	Limestone township			1,610	11,985	11,571			25,166
	Montana township			185	9,214	13,858	65		23,322
	Odessa township			2,594	12,583	7,774	11		22,962
	Prairie township			122	7,292	16,225			23,640
	Richland township			2,459	10,753	9,053	625		22,890
Sinclair township			315	10,647	10,369	1,284		22,615	
Vicksburg township			18	11,463	11,417			22,898	
Walnut township			591	11,570	13,096	7		25,265	
Washington township			86	6,841	14,037	1,908		22,872	
White Mound township			2,254	12,514	8,111			22,880	

Coriolis 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - Cor50_Acreage		SpeedClass							Grand Total	
CountyName	Subdivision Name	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	Grand Total	
Lincoln	Battle Creek township			1,433	12,356	9,219	27		23,034	
	Beaver township		102	546	7,661	13,917	702		22,929	
	Cedron township			134	6,942	14,909	1,230		23,215	
	Colorado township		6	4,521	16,732	1,840	0		23,098	
	Elkhorn township		378	5,820	15,685	1,109	2		22,994	
	Franklin township			245	12,152	9,402	1,254		23,052	
	Golden Belt township				3,926	17,039	2,122		23,087	
	Grant township			596	10,720	10,641	1,254		23,211	
	Hanover township			11	6,011	16,731	268		23,021	
	Highland township			242	7,514	13,579	1,529		22,863	
	Indiana township		61	4,332	14,183	4,296	0		22,871	
	Logan township				394	11,405	10,932	181		22,912
	Madison township				55	13,563	9,259	149		23,026
	Marion township		15	523	9,831	12,335	3		22,707	
	Orange township				239	8,319	14,472	91		23,120
	Pleasant township		96	4,461	13,931	4,544				23,032
	Salt Creek township				2,440	15,974	4,621	23		23,057
	Scott township				1,859	13,671	7,530	21		23,081
	Valley township				91	5,592	13,509	3,838		23,030
Vesper township				1,627	11,703	9,506	601		23,437	

Coriolis 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - Cor50_Acreage		SpeedClass							Grand Total
CountyName	Subdivision Name	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	Grand Total
Marshall	Balderson township		152	8,524	15,363	85			24,124
	Bigelow township	54	4,197	11,569	7,545	821			24,185
	Blue Rapids City township		3,762	14,895	4,422	36			23,115
	Blue Rapids township		540	9,174	12,002	1,316			23,032
	Center township		1,466	13,424	9,458				24,348
	Clear Fork township		724	9,674	9,990	2,643			23,032
	Cleveland township		36	4,926	14,931	3,110			23,004
	Cottage Hill township		32	2,751	13,242	7,027			23,052
	Elm Creek township		2,767	13,754	6,371	42			22,934
	Franklin township		51	7,342	16,823	3			24,218
	Guittard township		400	11,838	10,725				22,963
	Herkimer township		616	17,376	4,827				22,818
	Lincoln township			8,250	14,478	124			22,852
	Logan township		810	16,377	5,830				23,017
	Marysville city		1,495	1,458	0				2,954
	Marysville township		1,718	13,676	4,466				19,860
	Murray township		1	4,170	18,365	292			22,827
	Noble township		596	9,577	12,237	507			22,917
	Oketo township		1,283	16,524	4,892				22,699
	Richland township			5,236	17,243	403			22,883
	Rock township		899	17,330	4,679				22,908
St. Bridget township		1,663	11,547	9,501				22,711	
Vermillion township	67	5,390	15,399	2,164				23,019	
Walnut township		917	16,664	5,410				22,990	
Waterville township		4,049	16,687	2,247				22,982	
Wells township		1,192	15,664	7,134	19			24,010	

Coriolis 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - Cor50_Acreage		SpeedClass								Grand Total
CountyName	Subdivision Name	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75		
Mitchell	Asherville township			933	13,210	9,057	17		23,217	
	Beloit city		127	1,843	614				2,584	
	Beloit township			1,626	13,231	5,725			20,582	
	Bloomfield township				6,517	16,636			23,153	
	Blue Hill township			76	7,160	13,851	2,025		23,112	
	Carr Creek township		21	4,313	10,014	8,641			22,989	
	Cawker township		642	6,334	12,013	3,708	119		22,816	
	Center township			262	5,728	16,953			22,943	
	Custer township			108	4,315	13,611	5,146	27	23,206	
	Eureka township			55	9,008	13,967	4		23,034	
	Glen Elder township			2,535	10,842	9,262	415		23,054	
	Hayes township			150	6,203	15,957	724		23,034	
	Logan township				1,009	9,167	12,953	27	23,155	
	Lulu township			2	3,123	19,593			22,719	
	Pittsburg township			143	6,655	14,451	1,840	3	23,093	
	Plum Creek township				93	8,428	14,269		22,790	
	Round Springs township				1,276	10,435	11,227		22,938	
	Salt Creek township				1,068	11,527	10,156	206	22,957	
	Solomon Rapids township				6	9,303	13,367		22,675	
Turkey Creek township				1,183	9,577	12,073		22,833		
Walnut Creek township				978	10,181	11,848	56	23,064		

Coriolis 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - Cor50_Acreage		SpeedClass							Grand Total
CountyName	Subdivision Name	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	Grand Total
Ottawa	Bennington township		35	4,173	18,069	4,620			26,897
	Blaine township			839	13,437	8,884			23,160
	Buckeye township		15	5,283	13,603	343			19,244
	Center township			888	15,272	6,588	52		22,800
	Chapman township			500	11,357	10,990			22,847
	Concord township			3,025	13,917	5,315			22,256
	Culver township			2,938	17,054	3,174			23,166
	Durham township			607	10,154	12,133			22,894
	Fountain township			301	17,530	5,293	19		23,143
	Garfield township			1,426	18,434	3,297			23,157
	Grant township			40	9,984	13,145			23,169
	Henry township			38	11,857	11,022	34		22,951
	Lincoln township				2,732	17,413	2,805		22,950
	Logan township				212	10,306	12,544		23,062
	Minneapolis city		77	759	188	94			1,119
	Morton township				4,809	16,445	1,701		22,955
	Ottawa township				1,325	13,663	7,973		22,961
	Richland township				1,380	13,153	8,381		22,913
	Sheridan township				1,888	15,805	5,520		23,213
	Sherman township				662	11,853	10,626		23,141
Stanton township				50	8,475	14,286	634	23,446	

Coriolis 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - Cor50_Acreage		SpeedClass							Grand Total
CountyName	Subdivision Name	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	Grand Total
Republic	Albion township			0	2,807	19,566	480		22,854
	Beaver township			510	9,869	12,661			23,040
	Belleville city			768	502	18			1,287
	Belleville township			279	10,396	10,987			21,662
	Big Bend township			218	8,891	13,918			23,027
	Courtland township			4	4,251	18,886			23,140
	Elk Creek township			144	17,459	5,520			23,124
	Fairview township				2,731	18,653	1,958		23,341
	Farmington township			896	11,879	10,133	29		22,937
	Freedom township			12	2,737	17,088	2,444		22,282
	Grant township			357	15,894	7,083	72		23,407
	Jefferson township			486	9,357	13,557	226		23,626
	Liberty township				2,109	17,310	3,734		23,154
	Lincoln township			170	11,584	11,020			22,773
	Norway township			584	8,230	14,190			23,004
	Richland township			837	10,612	11,331			22,780
	Rose Creek township			117	6,867	15,856	506		23,345
	Scandia township			238	7,091	15,677			23,007
	Union township				2,887	19,880	204		22,972
	Washington township			0	1,271	18,701	3,070		23,043
	White Rock township			9	7,593	15,362	103		23,066

Coriolis 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - Cor50_Acreage		SpeedClass							Grand Total
CountyName	Subdivision Name	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	Grand Total
Saline	Cambria township		9	6,206	16,073	603			22,892
	Dayton township		267	8,902	13,367	172			22,709
	Elm Creek township		46	4,999	16,535	1,139			22,720
	Eureka township		14	977	21,161	1,048			23,201
	Falun township			440	22,229	23,292	121		46,082
	Glendale township			1,719	16,697	4,683			23,099
	Greeley township		402	6,539	11,135	799			18,876
	Gypsum township			288	21,673	1,039			23,001
	Liberty township			264	17,432	5,348			23,044
	Ohio township			1,783	19,331	2,077			23,191
	Pleasant Valley township			2,347	16,629	4,153			23,129
	Salina city		8,665	4,691	2,589	147			16,092
	Smoky Hill township		198	2,985	11,119	187			14,489
	Smoky View township			701	15,818	6,466	64		23,049
	Smolan township			2,745	14,873	2,840			20,458
	Solomon township			3,887	18,736	518			23,141
	Spring Creek township			5,328	21,863	18,739	76		46,007
	Walnut township			3,125	17,167	2,834			23,126
Washington township			2,197	14,452	6,469			23,118	

Coriolis 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - Cor50_Acreage		SpeedClass							Grand Total	
CountyName	Subdivision Name	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	Grand Total	
Washington	Barnes township		421	9,930	12,494	148			22,993	
	Brantford township			826	14,789	7,377			22,992	
	Charleston township	52		13,619	9,237	5			22,914	
	Clifton township			3,883	15,496	3,733			23,112	
	Coleman township			591	15,488	7,120			23,199	
	Farmington township	11		8,312	14,761	95			23,179	
	Franklin township	103		14,639	8,108	35			22,884	
	Grant township			682	14,643	7,685			23,010	
	Greenleaf township	7		6,805	14,886	1,277			22,975	
	Haddam township			3,721	16,235	3,028			22,984	
	Hanover township		1,026	16,809	5,237	7			23,079	
	Highland township			4,078	14,491	4,304			22,873	
	Independence township		255		11,806	10,831			22,892	
	Kimeo township				1,637	15,137	6,273			23,046
	Lincoln township		350		5,821	13,855	3,006			23,032
	Linn township				537	13,791	8,710			23,038
	Little Blue township		423		16,905	5,657				22,985
	Logan township		153		9,091	13,360	174			22,778
	Lowe township				1,357	14,661	6,717			22,736
	Mill Creek township				8,457	14,413	313			23,183
	Sheridan township				1,249	14,545	7,234			23,028
	Sherman township				1,370	16,979	4,659			23,008
	Strawberry township				116	14,837	8,223			23,176
Union township				223	11,270	11,371	13		22,877	
Washington city		366		212					578	
Washington township		96		6,620	13,274	2,531			22,520	

**AWS TrueWind 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township**

Sum - TW50_Acreage		SpeedClass											Grand Total
CountyName	NAMELSAD	5.75 - 6.00	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	
Clay			1,546	7,584	38,414	106,919	147,635	105,562	11,556	177			419,392
Cloud			10,294	42,798	68,310	81,964	91,214	77,614	68,013	17,386	1,708	32	459,334
Dickinson			82	12,812	58,034	90,892	181,765	172,992	27,007	1,177	135		544,896
Ellsworth				4,510	27,186	57,428	85,592	100,812	110,788	60,329	15,676	272	462,591
Jewell		35	3,375	43,113	175,091	222,960	115,409	22,938		916			583,836
Lincoln				1,204	67,146	98,305	110,313	109,764	45,423	23,644	5,009	14	460,821
Marshall		0	2,950	35,389	95,811	152,604	174,146	106,730	10,226				577,855
Mitchell				6,016	70,248	88,977	137,477	132,473	20,421	4,021	426		460,059
Ottawa				2,026	67,843	139,836	154,980	80,058	16,382	274			461,399
Republic		0	2,596	32,927	70,291	88,851	84,740	87,941	91,648	872			459,866
Saline		501	5,407	10,841	53,151	161,238	169,430	56,898	3,668	197			461,332
Washington			326	11,267	56,346	118,096	180,901	154,149	51,867	896			573,848
<b>Grand Total</b>		<b>536</b>	<b>26,576</b>	<b>210,486</b>	<b>847,871</b>	<b>1,408,069</b>	<b>1,633,600</b>	<b>1,207,931</b>	<b>457,915</b>	<b>108,973</b>	<b>22,953</b>	<b>319</b>	<b>5,925,228</b>

Sum - TW50_Acreage		SpeedClass											Grand Total
CountyName	NAMELSAD	5.75 - 6.00	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	
Clay	Athelstane township				1,372	11,716	8,198	1,737	2				23,024
	Blaine township				1,367	10,537	11,899	3,194	2				26,999
	Bloom township			49	2,525	6,437	14,609	6,629	5				30,255
	Chapman township			156	2,850	6,426	8,999	4,243	259				22,933
	Clay Center city			123	1,125	501							1,749
	Clay Center township			41	6,207	12,609	4,826	707					24,390
	Exeter township					466	8,828	13,165	631				23,090
	Five Creeks township					3,876	12,310	6,746	107	0			23,040
	Garfield township					27	7,058	14,218	1,269				22,572
	Gill township				46	1,132	6,817	10,711	518				19,224
	Goshen township				101	2,128	10,734	8,766	801				22,531
	Grant township			222	2,980	7,444	6,807	3,896	246				21,595
	Hayes township					396	2,724	8,215	9,161	2,181	103		22,779
	Highland township					460	5,175	12,447	4,632	58			22,772
	Mulberry township			1,324	3,155	5,189	11,234	3,729					24,631
	Oakland township					1,490	6,949	8,679	4,923	882	16		22,939
	Republican township				401	3,627	7,746	7,416	1,532				20,722
Sherman township					3,170	9,666	7,500	907	85			21,328	
Union township				678	1,506	5,478	8,746	6,229	181			22,819	

**AWS TrueWind 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd**

Sum - TW50_Acreage		SpeedClass											Grand Total
CountyName	NAMELSAD	5.75 - 6.00	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	
Cloud	Arion township					1,118	4,089	6,072	10,377	1,531			23,188
	Aurora township					56	2,018	4,598	10,122	4,617	1,653	32	23,095
	Buffalo township		578	7,169	5,132	7,979	5,917	1,028					27,803
	Center township					1,891	3,770	7,456	12,171	9,315	55		34,657
	Colfax township				0	1,191	4,649	12,628	4,402	1			22,871
	Concordia city		24	1,447	793	456	42						2,762
	Elk township		1,203	5,034	9,667	2,162							18,067
	Grant township			3,976	9,426	7,752	1,671	206					23,030
	Lawrence township		857	10,671	9,557	2,238							23,323
	Lincoln township		1,976	2,818	2,749	4,015	2,528	610					14,696
	Lyon township				1,904	7,563	12,266	6,417	5,616	1,234			35,000
	Meredith township					2,999	12,113	6,036	1,805	170			23,122
	Nelson township				2,723	11,202	8,089	551	5				22,570
	Oakland township					346	5,198	11,189	5,930	401			23,063
	Shirley township		631	5,267	5,791	9,233	5,763	692					27,377
	Sibley township		5,026	5,776	7,618	4,226	252						22,898
	Solomon township			641	12,728	12,794	5,492	2,835	246				34,737
	Starr township					2,237	11,673	7,112	1,676	64			22,761
	Summit township				221	2,508	5,684	10,185	15,666	52			34,316

AWS TrueWind 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW50_Acreage		SpeedClass											Grand Total
CountyName	NAMELSAD	5.75 - 6.00	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	
Dickinson	Abilene city		12	1,850	1,086	51							2,999
	Banner township					1,474	7,902	10,133	3,199	112			22,819
	Buckeye township			1	1,842	6,108	8,879	5,949	440				23,218
	Center township		66	2,956	7,730	4,692	6,263	1,484					23,191
	Cheever township				1,002	1,898	7,705	12,005	368				22,978
	Flora township					1,888	10,580	9,476	1,058				23,002
	Fragrant Hill township			249	1,518	5,512	9,314	2,549					19,143
	Garfield township				2	3,953	13,215	5,946	51				23,167
	Grant township			1,750	12,038	4,426	2,037	75					20,326
	Hayes township			68	2,252	7,538	7,689	1,648					19,195
	Herington city					558	738	55					1,351
	Holland township						1,484	12,885	7,569	1,066	135		23,138
	Hope township					246	4,584	13,567	4,365				22,762
	Jefferson township					2,257	11,183	9,766	44				23,250
	Liberty township			21	1,711	6,824	13,708	5,847					28,111
	Lincoln township			1,653	11,873	9,060	777						23,362
	Logan township					2	3,655	17,316	2,181				23,153
	Lyon township					973	6,778	11,194	2,492				21,438
	Newbern township				4	4,014	13,421	5,903	1				23,343
	Noble township		3	2,878	8,755	6,104	2,320	244					20,303
	Ridge township					33	3,964	16,258	2,955				23,211
	Rinehart township			12	1,511	4,723	10,645	6,195	1				23,086
	Sherman township			1,375	5,467	7,327	4,408	535					19,112
	Union township				1	5,075	11,524	6,466	38				23,104
	Wheatland township					1	6,204	14,656	2,207	0			23,068
	Willowdale township				1,243	6,153	12,791	2,839	39				23,064

**AWS TrueWind 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd**

Sum - TW50_Acreage		SpeedClass											Grand Total
CountyName	NAMELSAD	5.75 - 6.00	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	
Ellsworth	Ash Creek township				1,858	3,941	6,773	7,517	2,660	281	14		23,044
	Black Wolf township				699	9,900	7,348	3,825	1,369	168			23,309
	Carneiro township		4	766	3,688	8,297	8,379	1,908	110				23,153
	Clear Creek township		318	3,392	5,335	7,792	6,014	419					23,270
	Columbia township				604	4,947	7,044	7,999	2,616				23,208
	Ellsworth city		87	1,103	156								1,346
	Ellsworth township		357	5,368	7,927	6,709	1,472						21,834
	Empire township		3,744	12,754	14,994	9,389	4,702	354					45,936
	Garfield township					338	4,074	8,157	6,649	3,370	323		22,911
	Green Garden township							1,614	13,783	7,787	148		23,331
	Langley township			1,244	4,521	6,379	7,224	3,722	15				23,105
	Lincoln township				201	1,009	3,172	5,952	9,954	3,220	17		23,525
	Mulberry township				1	1,074	6,573	9,419	4,937	968	92		23,063
	Noble township					1,807	4,682	6,633	6,261	3,023	353		22,759
	Palacky township							1,349	11,224	10,406	255		23,234
	Sherman township						482	5,765	8,174	8,063	812		23,296
	Thomas township						295	2,715	12,247	7,871	1		23,129
	Trivoli township					1,097	4,385	7,756	9,645	193			23,076
	Valley township							2,847	15,871	3,986	301		23,005
	Wilson township					1,846	6,459	6,557	7,489	701	5		23,056

**AWS TrueWind 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd**

Sum - TW50_Acreage		SpeedClass											Grand Total
CountyName	NAMELSAD	5.75 - 6.00	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	
☐ Jewell	Allen township			1,594	5,604	7,032	6,610	1,451					22,291
	Athens township		10	5,952	10,729	8,100	467						25,258
	Browns Creek township				4,071	15,990	3,030						23,091
	Buffalo township			59	10,051	15,474	300	10					25,894
	Burr Oak township			3,378	9,807	8,169	2,850	1,014					25,219
	Calvin township			168	6,096	10,330	3,489	64					20,147
	Center township			150	3,559	9,037	7,454	2,722					22,922
	Erving township		0	1,799	9,969	10,421	795						22,984
	Esbon township			3	2,740	11,453	8,133	598					22,927
	Grant township		2	3,893	15,836	3,128	0						22,858
	Harrison township			122	2,717	7,325	9,990	2,537					22,692
	Highland township				260	3,072	9,093	9,483	916				22,824
	Holmwood township		52	4,594	6,210	7,515	3,917	554					22,842
	Ionia township			2,965	14,005	6,654	1,598	34					25,256
	Jackson township	5	1,732	2,576	1,937	9,128	7,226						22,605
	Limestone township			92	3,454	11,570	9,512	552					25,180
	Montana township	30	1,270	1,418	6,417	8,452	5,164	351					23,103
	Odessa township		0	2,962	8,739	10,026	1,246						22,974
	Prairie township			1,205	5,386	10,369	6,520	169					23,648
	Richland township		152	3,940	6,777	7,942	3,992	100					22,902
	Sinclair township		122	3,280	11,531	6,146	1,515	33					22,626
	Vicksburg township		36	2,212	11,501	9,156	2						22,906
	Walnut township			77	2,748	8,785	11,586	1,713					24,909
	Washington township			370	9,277	9,523	3,402	313					22,883
	White Mound township			305	5,669	8,163	7,518	1,240					22,894

**AWS TrueWind 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd**

Sum - TW50_Acreage		SpeedClass											Grand Total
CountyName	NAMELSAD	5.75 - 6.00	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	
Lincoln	Battle Creek township				111	2,715	4,910	13,603	1,553	145			23,038
	Beaver township		75	756	3,081	4,409	7,205	6,620	785				22,930
	Cedron township			393	3,537	10,868	8,275	147					23,220
	Colorado township		8	9,579	10,746	2,743	23						23,098
	Elkhorn township		900	11,782	8,534	1,762	16						22,995
	Franklin township				988	8,950	8,598	2,459	1,491	552	14		23,053
	Golden Belt township					70	2,077	5,863	12,032	3,047	0		23,089
	Grant township		8	5,870	10,001	4,911	2,225	199					23,214
	Hanover township			151	2,954	6,688	12,916	317					23,025
	Highland township				84	2,081	7,289	9,562	3,764	86			22,865
	Indiana township		125	7,435	8,947	5,431	924	11					22,873
	Logan township			34	3,853	8,379	6,287	4,325	35				22,912
	Madison township				1,764	11,863	7,967	1,017	331	83			23,026
	Marion township		68	5,471	4,689	4,366	5,921	2,194	0				22,709
	Orange township			432	3,403	8,691	9,809	788					23,124
	Pleasant township		18	7,119	8,840	5,791	1,119	148					23,035
	Salt Creek township				9,937	9,395	2,682	947	98				23,059
	Scott township				2,812	8,096	6,651	4,160	1,301	64			23,083
	Valley township					13	3,050	6,546	7,753	4,439	1,231		23,031
	Vesper township				5,264	6,667	6,016	3,858	1,068	556	10		23,440

**AWS TrueWind 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd**

Sum - TW50_Acreage		SpeedClass											Grand Total
CountyName	NAMELSAD	5.75 - 6.00	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	
Marshall	Balderson township		2	240	1,649	3,613	10,245	8,131					23,880
	Bigelow township	0	580	7,998	4,410	3,471	4,509	2,881	320				24,170
	Blue Rapids City township		1,059	6,563	6,349	5,136	3,640	358					23,104
	Blue Rapids township		646	3,003	3,714	6,735	5,924	2,974	24				23,019
	Center township			12	2,723	7,038	12,135	2,425	3				24,336
	Clear Fork township			25	1,405	5,331	9,224	6,211	820				23,015
	Cleveland township			0	2,121	7,155	9,537	3,889	282				22,984
	Cottage Hill township				34	736	4,903	15,488	1,882				23,042
	Elm Creek township		136	2,747	4,177	6,353	8,912	600					22,925
	Franklin township				90	1,414	13,115	9,579	10				24,208
	Guittard township				252	3,375	11,321	7,487	516				22,951
	Herkimer township				4,834	12,072	4,620	1,023					22,548
	Lincoln township				4,759	10,513	6,550	1,014					22,836
	Logan township			35	713	3,846	11,053	6,436	929				23,012
	Marysville city			362	902	1,310	379						2,953
	Marysville township			486	5,448	8,522	4,927	470					19,854
	Murray township					262	5,893	13,528	3,130				22,813
	Noble township			1,604	6,550	8,314	4,682	1,738	12				22,899
	Oketo township		85	1,344	8,548	10,500	1,963	7					22,448
	Richland township				108	1,516	9,661	11,047	289				22,621
Rock township			23	5,583	9,962	6,481	846					22,895	
St. Bridget township		156	844	2,744	4,795	5,553	6,285	2,008				22,385	
Vermillion township		0	3,158	11,218	6,034	2,467	126					23,003	
Walnut township		8	433	3,249	10,251	7,701	1,341					22,983	
Waterville township	0	278	4,667	7,917	5,883	3,342	887					22,974	
Wells township			1,842	6,315	8,467	5,411	1,959	1				23,996	

**AWS TrueWind 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd**

Sum - TW50_Acreage		SpeedClass											Grand Total
CountyName	NAMELSAD	5.75 - 6.00	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	
▣ Mitchell	Ashville township			671	10,113	6,442	4,715	1,279	3				23,221
	Beloit city			1,195	1,360	30							2,585
	Beloit township			852	10,069	4,071	5,344	251					20,587
	Bloomfield township				68	521	8,232	14,336					23,158
	Blue Hill township					101	6,306	13,199	2,477	994	39		23,116
	Carr Creek township				2,585	8,145	9,115	3,144	7				22,996
	Cawker township			780	14,368	7,367	310						22,825
	Center township				28	1,914	9,173	11,388	445				22,948
	Custer township						4,285	13,583	3,679	1,498	167		23,212
	Eureka township				262	3,135	7,032	11,078	1,530				23,037
	Glen Elder township			2,358	11,305	8,127	1,272						23,062
	Hayes township					198	6,117	13,523	2,911	284	6		23,040
	Logan township			138	3,868	2,896	3,904	10,397	1,955				23,158
	Lulu township					820	7,371	11,576	2,958				22,724
	Pittsburg township					82	6,147	11,502	3,908	1,246	213		23,099
	Plum Creek township				1,312	8,284	12,634	567					22,796
	Round Springs township				757	5,796	14,240	2,149					22,942
	Salt Creek township				3,602	9,527	8,213	1,523	96				22,961
	Solomon Rapids township				4,774	12,623	5,285						22,682
	Turkey Creek township			23	4,531	3,527	8,500	6,041	217				22,839
	Walnut Creek township				1,246	5,373	9,282	6,935	235				23,071

AWS TrueWind 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW50_Acreage		SpeedClass											Grand Total
CountyName	NAMELSAD	5.75 - 6.00	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	
☒ Ottawa	Bennington township			327	6,448	9,021	10,494	596	6				26,893
	Blaine township			3	1,593	7,327	12,324	1,912					23,158
	Buckeye township			568	10,970	6,580	1,102	21					19,240
	Center township			145	3,585	6,924	8,767	3,161	207	8			22,798
	Chapman township				125	2,130	8,028	11,766	795				22,844
	Concord township			162	8,243	8,091	5,656	102					22,254
	Culver township			13	7,934	8,664	6,518	35					23,164
	Durham township				34	2,230	6,273	11,454	2,898				22,889
	Fountain township				4,172	12,151	5,859	790	171				23,143
	Garfield township			141	4,947	14,429	3,526	114					23,157
	Grant township					361	7,826	12,437	2,527	14			23,166
	Henry township				38	5,835	12,431	4,373	274				22,950
	Lincoln township				1,793	9,182	10,324	1,646					22,944
	Logan township				0	2,083	15,267	5,710					23,061
	Minneapolis city			190	725	204							1,119
	Morton township			477	10,363	8,818	3,239	57					22,954
	Ottawa township				1,042	7,548	7,995	5,401	970				22,956
	Richland township				1,171	11,690	8,949	1,099					22,910
	Sheridan township				4,661	10,938	7,099	515					23,213
	Sherman township					1,972	5,703	11,850	3,539	75			23,139
	Stanton township				0	3,657	7,599	7,020	4,995	177			23,447

**AWS TrueWind 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd**

Sum - TW50_Acreage		SpeedClass											Grand Total
CountyName	NAMELSAD	5.75 - 6.00	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	
Republic	Albion township							192	5,795	16,665	0		22,651
	Beaver township			2,976	7,243	11,789	1,040						23,047
	Belleville city					333	902	53					1,288
	Belleville township				13	3,735	13,518	4,402					21,668
	Big Bend township	0	2,153	6,211	8,044	4,662	1,717	33					22,819
	Courtland township			361	3,401	16,783	2,604						23,149
	Elk Creek township			473	9,761	6,352	4,301	1,514	661	64			23,126
	Fairview township						651	7,176	15,102	419			23,349
	Farmington township					1,391	6,737	10,555	4,260				22,942
	Freedom township					34	3,371	9,958	8,918	9			22,290
	Grant township		261	6,346	8,631	6,011	1,701	461					23,410
	Jefferson township				669	4,040	5,625	8,617	4,681				23,632
	Liberty township						623	8,152	14,128	0			22,903
	Lincoln township		1	2,839	6,589	6,961	6,157	231					22,778
	Norway township		4	4,269	10,436	5,887	2,415						23,011
	Richland township					317	3,905	8,073	10,303	186			22,784
	Rose Creek township				2	914	4,275	7,922	9,801	194			23,108
	Scandia township		2	4,346	4,535	5,527	5,898	2,707					23,015
	Union township			759	4,576	5,836	5,819	4,586	1,406				22,981
	Washington township				24	1,266	8,117	7,705	5,725				22,837
	White Rock township		175	4,348	6,369	7,014	5,171						23,076

**AWS TrueWind 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd**

Sum - TW50_Acreage		SpeedClass											Grand Total
CountyName	NAMELSAD	5.75 - 6.00	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	
Saline	Cambria township			1,337	7,742	9,385	4,396	27					22,886
	Dayton township			1,151	15,341	5,854	357						22,703
	Elm Creek township			1,747	7,359	10,619	2,852	140					22,717
	Eureka township				48	9,453	9,955	3,601	137				23,193
	Falun township				155	4,384	25,231	14,987	1,224	94			46,075
	Glendale township				1,763	7,561	12,306	1,468					23,097
	Greeley township		61	699	4,567	6,421	5,955	1,109	58				18,871
	Gypsum township				2	5,427	12,307	5,074	183	0			22,993
	Liberty township					1,243	10,566	10,423	807				23,038
	Ohio township				1,912	13,997	6,746	523	9				23,188
	Pleasant Valley township			21	2,180	11,260	9,358	307					23,126
	Salina city	501	5,164	3,998	3,213	2,388	804	22					16,089
	Smoky Hill township		182	1,889	2,798	7,657	1,954	6					14,487
	Smoky View township					6,760	12,995	2,966	246	77			23,044
	Smolan township				776	15,120	4,153	405					20,454
	Solomon township				1,659	10,588	9,032	1,855					23,134
	Spring Creek township				3,403	14,264	19,771	7,573	965	26			46,002
Walnut township				169	7,646	10,929	4,336	39				23,120	
Washington township				64	11,212	9,762	2,076	0				23,115	

**AWS TrueWind 50 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd**

Sum - TW50_Acreage		SpeedClass											Grand Total
CountyName	NAMELSAD	5.75 - 6.00	6.00 - 6.25	6.25 - 6.50	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	
Washington	Barnes township			231	1,367	6,529	10,477	4,349	33				22,986
	Brantford township			192	4,215	7,830	6,986	2,365	1,328	77			22,993
	Charleston township			377	4,719	11,405	6,212	200					22,912
	Clifton township		22	4,688	14,950	3,451							23,111
	Coleman township					558	4,449	13,072	5,120				23,199
	Farmington township				840	11,033	11,052	254					23,180
	Franklin township		304	4,546	9,802	7,716	272						22,641
	Grant township					83	3,885	8,579	9,680	785			23,012
	Greenleaf township					1,558	11,822	8,562	1,028				22,971
	Haddam township				212	6,193	13,448	2,871	253	10			22,988
	Hanover township			12	5,198	6,119	6,481	4,785	481				23,076
	Highland township			0	1,588	8,505	9,248	3,167	107				22,615
	Independence township			182	1,115	6,489	12,737	2,100					22,623
	Kimeo township					2	2,490	12,469	8,054	24			23,040
	Lincoln township				288	2,067	4,451	10,858	5,360				23,024
	Linn township					206	4,472	13,998	4,360				23,036
	Little Blue township			1,038	7,697	8,588	5,263	394					22,980
	Logan township				193	5,288	12,204	5,084	8				22,776
	Lowe township					660	6,638	10,780	4,440				22,518
	Mill Creek township				2,377	11,130	9,244	435					23,186
	Sheridan township				163	2,990	11,097	8,623	153				23,026
	Sherman township					435	3,819	14,866	3,884				23,004
	Strawberry township				866	3,688	8,852	9,258	512				23,175
	Union township					1,192	5,667	9,514	6,305				22,678
	Washington city					39	539						578
	Washington township					718	3,843	9,631	7,564	762			22,519

**AWS TrueWind 70 Meter Wind Speeds, .25 M/Sec Increments, Acres by County**

Sum - TW70_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	Grand Total
⊕ Clay		137	8,083	41,137	113,569	155,171	93,636	7,606	52			<b>419,392</b>
⊕ Cloud		1,595	40,372	74,079	81,559	97,609	80,202	67,629	14,930	1,361		<b>459,334</b>
⊕ Dickinson		1	13,740	64,635	101,813	200,657	145,127	17,948	922	52		<b>544,896</b>
⊕ Ellsworth			1,579	25,883	57,277	87,628	102,381	111,780	59,802	16,086	174	<b>462,591</b>
⊕ Jewell		697	26,228	165,757	230,971	128,747	29,635	1,801				<b>583,836</b>
⊕ Lincoln			1,790	76,827	96,678	113,119	104,511	40,550	23,681	3,665		<b>460,821</b>
⊕ Marshall		1,258	27,974	91,397	158,168	179,698	110,425	8,935				<b>577,855</b>
⊕ Mitchell			5,680	82,487	89,498	143,897	119,252	15,431	3,586	226		<b>460,059</b>
⊕ Ottawa			1,267	79,489	149,275	147,748	71,163	12,383	74			<b>461,399</b>
⊕ Republic		476	21,378	73,624	94,343	82,128	85,979	100,583	1,355			<b>459,866</b>
⊕ Saline		4,495	13,199	64,455	171,620	160,853	44,694	1,950	66			<b>461,332</b>
⊕ Washington		19	7,815	50,726	116,243	183,108	160,874	54,242	821			<b>573,848</b>
<b>Grand Total</b>		<b>8,677</b>	<b>169,107</b>	<b>890,496</b>	<b>1,461,015</b>	<b>1,680,363</b>	<b>1,147,880</b>	<b>440,838</b>	<b>105,289</b>	<b>21,390</b>	<b>174</b>	<b>5,925,228</b>

**AWS TrueWind 70 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township**

Sum - TW70_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	Grand Total
⊖ Clay	Athelstane township			1,609	12,767	7,653	996					<b>23,024</b>
	Blaine township			1,189	11,635	11,986	2,189					<b>26,999</b>
	Bloom township			2,115	7,058	15,418	5,664					<b>30,255</b>
	Chapman township			2,927	6,887	9,085	3,908	126				<b>22,933</b>
	Clay Center city			1,117	632							<b>1,749</b>
	Clay Center township		21	6,523	12,994	4,505	347					<b>24,390</b>
	Exeter township				719	10,776	11,141	454				<b>23,090</b>
	Five Creeks township				3,559	13,150	6,268	62				<b>23,040</b>
	Garfield township				14	7,920	14,109	529				<b>22,572</b>
	Gill township			82	1,522	8,853	8,733	35				<b>19,224</b>
	Goshen township			37	2,056	11,877	8,302	258				<b>22,531</b>
	Grant township	137	3,036	8,589	6,621	3,115	97					<b>21,595</b>
	Hayes township			375	3,094	9,076	8,327	1,856	51			<b>22,779</b>
	Highland township				477	6,018	12,614	3,664	0			<b>22,772</b>
	Mulberry township	0	4,000	5,335	11,644	3,652						<b>24,631</b>
	Oakland township			1,385	7,423	8,501	5,036	593	1			<b>22,939</b>
	Republican township			436	4,932	8,178	6,553	624				<b>20,722</b>
Sherman township				3,191	10,065	7,394	657	21			<b>21,328</b>	
Union township			591	1,730	6,226	9,638	4,624	10			<b>22,819</b>	

AWS TrueWind 70 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW70_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	
<input checked="" type="checkbox"/> Cloud	Arion township				552	3,888	6,837	11,315	595			23,188
	Aurora township				3	1,593	4,873	10,527	4,748	1,351		23,095
	Buffalo township	76	5,287	6,562	8,151	6,589	1,137					27,803
	Center township				1,039	3,748	7,912	13,272	8,676	10		34,657
	Colfax township				693	4,968	13,369	3,841				22,871
	Concordia city		1,164	838	694	66						2,762
	Elk township	163	5,111	10,985	1,807							18,067
	Grant township		1,116	10,486	9,093	2,087	249					23,030
	Lawrence township		9,122	12,128	2,072							23,323
	Lincoln township	259	4,087	2,150	4,521	2,957	722					14,696
	Lyon township			2,311	8,405	12,057	5,970	5,661	596			35,000
	Meredith township				2,322	13,684	5,467	1,538	111			23,122
	Nelson township			1,211	11,257	9,478	620	4				22,570
	Oakland township				126	5,481	11,655	5,599	202			23,063
	Shirley township	162	4,830	5,484	9,900	6,481	520					27,377
	Sibley township	935	9,441	7,873	4,455	194						22,898
	Solomon township		215	14,051	12,616	5,414	2,425	16				34,737
	Starr township				1,706	12,671	6,782	1,602	0			22,761
	Summit township				2,149	6,251	11,663	14,254				34,316

**AWS TrueWind 70 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd**

Sum - TW70_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	
<input checked="" type="checkbox"/> Dickinson	Abilene city		1,868	1,112	19							2,999
	Banner township				1,305	9,083	9,743	2,632	56			22,819
	Buckeye township		1	2,461	7,913	8,426	4,398	20				23,218
	Center township	1	3,339	7,953	4,958	6,410	528					23,191
	Cheever township			1,057	2,416	10,087	9,417					22,978
	Flora township				2,496	12,272	7,614	619				23,002
	Fragrant Hill township		186	1,678	6,987	9,231	1,061					19,143
	Garfield township			6	5,676	14,560	2,924					23,167
	Grant township		2,067	12,941	3,663	1,655	0					20,326
	Hayes township		82	3,306	8,976	6,051	781					19,195
	Herington city				259	1,012	81					1,351
	Holland township					1,834	14,149	6,238	866	52		23,138
	Hope township				190	4,943	14,881	2,748				22,762
	Jefferson township				2,732	14,049	6,468					23,250
	Liberty township			1,640	7,784	15,159	3,527					28,111
	Lincoln township		1,879	13,649	7,605	229						23,362
	Logan township				1	5,629	16,614	910				23,153
	Lyon township				671	7,237	11,411	2,119				21,438
	Newbern township			0	5,104	15,748	2,491					23,343
	Noble township		3,134	9,476	5,791	1,892	11					20,303
	Ridge township				44	5,108	16,584	1,475				23,211
	Rinehart township		1	1,626	5,849	12,226	3,384					23,086
	Sherman township		1,185	6,135	8,059	3,495	238					19,112
	Union township				4,985	12,918	5,201					23,104
	Wheatland township				10	9,467	12,402	1,188				23,068
	Willowdale township			1,595	8,319	11,934	1,216					23,064

AWS TrueWind 70 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW70_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	
Ellsworth	Ash Creek township			1,177	4,031	6,712	7,973	2,864	284	4		23,044
	Black Wolf township			346	9,687	7,574	3,990	1,539	172			23,309
	Carreiro township			452	3,689	8,979	8,450	1,524	60			23,153
	Clear Creek township		118	3,237	5,933	8,050	5,694	238				23,270
	Columbia township				407	5,404	7,053	7,929	2,416			23,208
	Ellsworth city			950	397							1,346
	Ellsworth township		40	4,720	8,934	6,862	1,277					21,834
	Empire township		1,421	14,007	15,921	9,836	4,502	250				45,936
	Garfield township				6	3,811	9,072	6,584	3,329	109		22,911
	Green Garden township						1,560	13,737	7,909	125		23,331
	Langley township		994	4,427	6,299	7,791	3,591	3				23,105
	Lincoln township				53	801	2,973	5,889	10,440	3,368		23,525
	Mulberry township				556	6,748	10,265	4,651	814	29		23,063
	Noble township				1,396	4,471	6,217	6,891	3,377	406		22,759
	Palacky township							1,027	10,695	11,338	174	23,234
	Sherman township					589	5,992	8,298	8,023	393		23,296
	Thomas township					121	2,437	13,025	7,546			23,129
	Trivoli township				618	4,268	8,188	9,895	108			23,076
	Valley township						2,060	16,594	4,037	314		23,005
	Wilson township				1,223	7,102	6,886	7,254	590	1		23,056

AWS TrueWind 70 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW70_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	
Jewell	Allen township		3	6,353	7,200	7,329	1,405					22,291
	Athens township		5,789	12,303	6,913	254						25,258
	Browns Creek township			3,770	16,588	2,733						23,091
	Buffalo township			9,896	15,823	174	1					25,894
	Burr Oak township		892	8,890	10,830	3,308	1,300					25,219
	Calvin township			5,341	10,413	4,359	33					20,147
	Center township		0	2,108	8,905	8,222	3,688					22,922
	Erving township		1,277	11,319	10,240	148						22,984
	Esbon township			1,827	11,154	9,243	703					22,927
	Grant township		1,949	17,665	3,243							22,858
	Harrison township		0	1,633	6,948	10,323	3,788					22,692
	Highland township			16	2,015	8,746	10,246	1,801				22,824
	Holmwood township		2,648	5,824	7,683	5,573	1,115					22,842
	Ionia township		2,069	14,419	6,943	1,823	2					25,256
	Jackson township		327	3,558	1,623	8,939	8,159	0				22,605
	Limestone township			0	1,994	11,185	10,996	1,006				25,180
	Montana township		370	1,570	4,576	10,027	6,085	475				23,103
	Odessa township			1,720	8,789	11,430	1,035					22,974
	Prairie township			92	5,926	11,093	6,473	64				23,648
	Richland township			1,930	6,478	8,033	6,104	357				22,902
Sinclair township			1,269	11,396	8,135	1,757	69				22,626	
Vicksburg township			1,459	12,145	9,302	1					22,906	
Walnut township				1,219	7,896	12,862	2,931				24,909	
Washington township			3	7,465	10,506	4,408	501				22,883	
White Mound township				2,782	9,528	8,633	1,951				22,894	

AWS TrueWind 70 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW70_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	Grand Total
Lincoln	Battle Creek township			41	2,784	5,673	13,521	958	60			23,038
	Beaver township		30	1,199	3,363	4,597	8,227	5,275	240			22,930
	Cedron township			135	3,825	12,005	7,205	50				23,220
	Colorado township		50	11,986	9,549	1,500	13					23,098
	Elkhorn township		1,364	13,044	7,568	1,010	9					22,995
	Franklin township				1,228	9,181	8,280	2,405	1,542	417		23,053
	Golden Belt township					4	1,752	6,038	12,848	2,446		23,089
	Grant township		0	6,772	9,989	4,762	1,596	94				23,214
	Hanover township			122	3,129	8,041	11,620	113				23,025
	Highland township					1,850	7,318	10,211	3,454	33		22,865
	Indiana township		292	8,142	8,477	5,203	748	11				22,873
	Logan township			19	4,719	8,715	6,927	2,533				22,912
	Madison township				2,338	12,519	6,934	868	351	17		23,026
	Marion township		54	6,626	4,309	4,606	6,058	1,057				22,709
	Orange township			321	4,029	9,857	8,505	412				23,124
	Pleasant township			7,521	8,601	5,728	1,071	114				23,035
	Salt Creek township			11,487	8,494	2,371	687	20				23,059
	Scott township			3,468	8,063	6,827	3,944	771	10			23,083
	Valley township					2,765	6,364	8,423	4,726	753		23,031
	Vesper township			5,942	6,215	5,905	3,732	1,197	449			23,440

**AWS TrueWind 70 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd**

Sum - TW70_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	
Marshall	Balderson township		101	1,401	3,387	9,701	9,290					23,880
	Bigelow township	300	7,557	4,894	3,756	4,635	2,800		228			24,170
	Blue Rapids City township	373	6,489	6,888	5,474	3,678	202					23,104
	Blue Rapids township	422	2,768	3,859	7,273	6,327	2,371					23,019
	Center township			2,203	6,919	13,020	2,194					24,336
	Clear Fork township		8	1,061	5,514	9,898	5,931	602				23,015
	Cleveland township			1,526	7,611	10,090	3,538	219				22,984
	Cottage Hill township				645	5,329	15,726	1,342				23,042
	Elm Creek township	19	1,756	4,554	6,684	9,555	357					22,925
	Franklin township			55	988	12,715	10,447	3				24,208
	Guittard township			170	2,356	11,716	8,212	497				22,951
	Herkimer township			3,458	12,638	5,467	985					22,548
	Lincoln township			3,792	11,149	7,048	847					22,836
	Logan township			643	3,563	11,131	6,819	857				23,012
	Marysville city		35	1,033	1,446	439						2,953
	Marysville township		8	5,430	8,705	5,325	386					19,854
	Murray township				145	5,674	14,286	2,707				22,813
	Noble township		760	6,279	8,930	5,376	1,554					22,899
	Oketo township		963	7,152	11,976	2,353	5					22,448
	Richland township			17	1,011	8,306	12,841	447				22,621
	Rock township			4,802	10,584	6,628	880					22,895
	St. Bridget township		563	2,246	4,933	5,646	6,963	2,033				22,385
	Vermillion township		1,610	12,096	6,777	2,488	32					23,003
	Walnut township		255	2,820	10,872	7,892	1,144					22,983
	Waterville township	143	3,611	8,624	6,159	3,690	746					22,974
	Wells township		1,490	6,392	8,674	5,571	1,869					23,996

**AWS TrueWind 70 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd**

Sum - TW70_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	
▣ Mitchell	Asherville township		337	11,185	7,091	3,911	697					23,221
	Beloit city		1,013	1,572	0							2,585
	Beloit township		648	10,725	4,275	4,898	41					20,587
	Bloomfield township			33	621	11,961	10,543					23,158
	Blue Hill township				103	7,673	12,016	2,562	749	13		23,116
	Carr Creek township			3,179	8,320	9,016	2,481					22,996
	Cawker township		1,275	17,299	4,219	32						22,825
	Center township			9	2,413	11,723	8,713	90				22,948
	Custer township					3,926	14,082	3,757	1,367	79		23,212
	Eureka township			308	3,525	8,544	10,025	636				23,037
	Glen Elder township		2,363	14,398	5,694	608						23,062
	Hayes township				264	7,053	13,513	2,011	200			23,040
	Logan township		39	3,868	3,039	4,428	11,160	623				23,158
	Lulu township				1,125	7,718	11,832	2,049				22,724
	Pittsburg township				3	5,944	12,126	3,622	1,270	135		23,099
	Plum Creek township			1,711	9,514	11,292	280					22,796
	Round Springs township			924	6,569	14,387	1,062					22,942
	Salt Creek township			4,798	9,560	7,795	795	13				22,961
	Solomon Rapids township			6,003	13,316	3,363						22,682
	Turkey Creek township		5	5,057	3,750	9,714	4,274	40				22,839
	Walnut Creek township			1,420	6,100	9,910	5,613	28				23,071

AWS TrueWind 70 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW70_Acreage		SpeedClass											Grand Total
CountyName	NAMELSAD	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00		
☐ Ottawa	Bennington township		53	7,189	11,624	7,902	125						26,893
	Blaine township			1,592	8,011	12,647	909						23,158
	Buckeye township		306	13,674	4,550	709							19,240
	Center township		117	3,962	7,400	8,952	2,226	141					22,798
	Chapman township			1	2,024	8,912	11,342	564					22,844
	Concord township		153	10,209	8,212	3,680							22,254
	Culver township		2	9,259	9,641	4,262							23,164
	Durham township			1	2,193	6,872	11,801	2,022					22,889
	Fountain township			5,054	12,508	4,975	543	62					23,143
	Garfield township		81	5,724	14,812	2,536	4						23,157
	Grant township				391	8,619	12,187	1,967	1				23,166
	Henry township			31	7,280	12,247	3,265	127					22,950
	Lincoln township			2,783	11,418	8,352	390						22,944
	Logan township				2,117	17,855	3,089						23,061
	Minneapolis city		116	823	179								1,119
	Morton township		440	12,015	8,401	2,099							22,954
	Ottawa township			1,577	7,792	8,444	4,599	545					22,956
	Richland township			1,529	13,092	7,702	586						22,910
	Sheridan township			4,065	12,184	6,845	120						23,213
	Sherman township				1,634	6,175	12,282	3,023	24				23,139
	Stanton township				3,812	7,963	7,693	3,931	49				23,447

**AWS TrueWind 70 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd**

Sum - TW70_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	
Republic	Albion township					61	4,303	18,256	31			22,651
	Beaver township		1,222	7,840	13,125	861						23,047
	Belleville city				14	1,219	55					1,288
	Belleville township			4	3,181	14,213	4,270					21,668
	Big Bend township	476	5,347	9,456	5,435	2,000	106					22,819
	Courtland township		84	2,960	18,027	2,078						23,149
	Elk Creek township		0	9,101	7,441	4,473	1,448	660	3			23,126
	Fairview township					394	6,026	16,275	653			23,349
	Farmington township				539	6,201	11,219	4,983				22,942
	Freedom township					2,558	10,027	9,620	86			22,290
	Grant township		5,004	9,212	6,896	1,874	423					23,410
	Jefferson township			255	3,915	6,150	8,726	4,586				23,632
	Liberty township					83	6,387	16,427	7			22,903
	Lincoln township		1,983	6,758	7,496	6,429	111					22,778
	Norway township		2,501	11,019	6,787	2,704						23,011
	Richland township				189	3,250	8,165	10,971	208			22,784
	Rose Creek township				298	3,284	8,501	10,662	363			23,108
	Scandia township		1,979	5,992	5,940	6,191	2,913					23,015
	Union township		391	3,958	6,115	6,092	4,885	1,540				22,981
	Washington township				1,013	6,803	8,414	6,602	5			22,837
	White Rock township		2,866	7,070	7,930	5,210						23,076

**AWS TrueWind 70 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd**

Sum - TW70_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	
Saline	Cambria township		1,540	9,569	9,199	2,579						22,886
	Dayton township		2,109	17,706	2,800	88						22,703
	Elm Creek township		2,140	10,037	8,665	1,869	5					22,717
	Eureka township			0	10,956	9,704	2,525	8				23,193
	Falun township			137	4,566	27,317	13,454	568	33			46,075
	Glendale township			1,494	8,950	12,407	246					23,097
	Greeley township	9	811	5,482	6,207	5,622	710	30				18,871
	Gypsum township				6,615	12,908	3,399	70				22,993
	Liberty township				2,135	10,599	9,894	410				23,038
	Ohio township			2,439	14,861	5,670	218					23,188
	Pleasant Valley township			2,922	13,143	6,998	64					23,126
	Salina city	4,442	4,542	4,111	2,430	559	5					16,089
	Smoky Hill township	44	2,057	3,600	7,665	1,121						14,487
	Smoky View township				8,554	12,301	1,943	213	33			23,044
	Smolan township			1,124	16,959	2,049	322					20,454
	Solomon township			2,795	11,534	8,001	805					23,134
	Spring Creek township			2,663	15,359	20,484	6,844	652	0			46,002
	Walnut township			333	8,413	11,380	2,994	0				23,120
	Washington township			44	12,610	9,196	1,264					23,115

**AWS TrueWind 70 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd**

Sum - TW70_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	6.50 - 6.75	6.75 - 7.00	7.00 - 7.25	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	
Washington	Barnes township		150	1,290	6,171	11,072	4,300	4				22,986
	Brantford township		2	3,207	8,486	7,569	2,358	1,334	37			22,993
	Charleston township		271	3,799	12,573	6,144	126					22,912
	Clifton township		3,154	15,872	4,085							23,111
	Coleman township				142	3,533	13,368	6,156				23,199
	Farmington township			492	10,821	11,659	207					23,180
	Franklin township	19	3,597	10,285	8,398	342						22,641
	Grant township				9	2,755	8,740	10,726	783			23,012
	Greenleaf township				782	11,353	9,779	1,056				22,971
	Haddam township			16	4,615	14,579	3,478	298	1			22,988
	Hanover township			4,696	6,541	6,567	4,901	372				23,076
	Highland township			957	7,880	10,091	3,530	156				22,615
	Independence township		51	888	5,811	13,905	1,968					22,623
	Kimeo township					2,241	13,273	7,526				23,040
	Lincoln township			35	1,956	4,571	11,650	4,813				23,024
	Linn township				88	3,546	15,012	4,389				23,036
	Little Blue township		590	7,773	9,048	5,288	281					22,980
	Logan township			93	4,982	12,748	4,952					22,776
	Lowe township				407	6,132	10,914	5,065	0			22,518
	Mill Creek township			954	11,151	10,418	663					23,186
	Sheridan township			42	3,153	11,432	8,374	26				23,026
	Sherman township				216	3,842	15,494	3,452				23,004
	Strawberry township			265	3,876	8,713	9,927	394				23,175
	Union township				696	5,489	8,824	7,669				22,678
	Washington city				578							578
	Washington township			63	3,778	9,119	8,754	805				22,519

AWS TrueWind 100 Meter Wind Speeds, .25 M/Sec Increments, Acres by County

Sum - TW100_Acra		SpeedClass									Grand Total
CountyName	NAMELSAD	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	9.00 - 9.25	9.25 - 9.50	
Clay		384	19,714	98,049	157,616	128,188	15,327	114			419,392
Cloud		2,596	72,126	82,558	103,431	96,070	79,224	21,556	1,773		459,334
Dickinson		1,250	54,167	91,603	194,331	170,766	31,537	1,199	41		544,896
Ellsworth			6,676	44,744	79,009	107,763	119,451	79,801	24,010	1,136	462,591
Jewell		895	76,232	243,547	184,670	71,912	6,579				583,836
Lincoln			47,443	102,578	109,969	122,197	44,440	28,251	5,943		460,821
Marshall		2,850	49,449	138,959	192,187	165,748	28,661				577,855
Mitchell		31	65,732	93,753	139,457	135,498	20,648	4,692	248		460,059
Ottawa			50,446	149,835	157,440	84,877	18,754	47			461,399
Republic		965	43,001	102,997	89,083	87,176	122,132	14,511			459,866
Saline		7,106	46,718	148,901	188,733	66,460	3,386	29			461,332
Washington		200	18,128	83,768	165,302	200,959	99,767	5,723			573,848
<b>Grand Total</b>		<b>16,277</b>	<b>549,832</b>	<b>1,381,294</b>	<b>1,761,229</b>	<b>1,437,613</b>	<b>589,908</b>	<b>155,924</b>	<b>32,015</b>	<b>1,136</b>	<b>5,925,228</b>

AWS TrueWind 100 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township

Sum - TW100_Acreage		SpeedClass									Grand Total
CountyName	NAMELSAD	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	9.00 - 9.25	9.25 - 9.50	
Clay	Athelstane township		26	11,148	10,337	1,514					23,024
	Blaine township		8	8,705	14,153	4,133					26,999
	Bloom township		89	4,038	15,496	10,621	11				30,255
	Chapman township		811	6,071	9,641	6,139	272				22,933
	Clay Center city			1,609	140						1,749
	Clay Center township		753	16,057	6,725	856					24,390
	Exeter township			169	6,931	15,306	684				23,090
	Five Creeks township			590	11,431	10,753	265				23,040
	Garfield township				3,523	16,293	2,756				22,572
	Gill township		14	838	7,576	10,726	69				19,224
	Goshen township			517	7,613	12,899	1,501				22,531
	Grant township	384	8,006	7,990	5,006	210					21,595
	Hayes township			1,596	8,154	10,161	2,772	96			22,779
	Highland township			3	3,958	13,145	5,649	18			22,772
	Mulberry township	0	5,178	10,835	8,512	106					24,631
	Oakland township		204	5,464	9,380	6,662	1,229	0			22,939
	Republican township		3,253	8,351	8,212	906					20,722
Sherman township		26	9,118	10,511	1,585	89				21,328	
Union township		1,346	4,951	10,319	6,173	29				22,819	

AWS TrueWind 100 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW100_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	9.00 - 9.25	9.25 - 9.50		
Cloud	Arion township				1,835	7,035	12,968	1,350				23,188
	Aurora township				342	4,173	10,333	6,525	1,723			23,095
	Buffalo township	17	7,704	6,395	11,250	2,379	58					27,803
	Center township				2,162	7,039	13,404	12,003	49			34,657
	Colfax township			1	2,651	12,623	7,597					22,871
	Concordia city		1,301	946	493	22						2,762
	Elk township	253	8,856	8,958								18,067
	Grant township		4,923	11,835	5,588	684						23,030
	Lawrence township	55	15,949	7,184	135							23,323
	Lincoln township	258	4,279	3,489	4,748	1,875	47					14,696
	Lyon township		511	7,466	13,183	7,060	5,990	790				35,000
	Meredith township			0	12,025	8,986	1,963	148				23,122
	Nelson township			5,328	14,257	2,841	144					22,570
	Oakland township				2,597	11,880	7,884	702				23,063
	Shirley township	257	6,754	8,125	10,035	2,207						27,377
	Sibley township	1,756	11,801	7,770	1,571							22,898
	Solomon township		10,049	14,686	7,016	2,964	22					34,737
	Starr township			22	8,251	12,208	2,241	39				22,761
	Summit township			353	5,295	12,094	16,575					34,316

AWS TrueWind 100 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW100_Acreage		SpeedClass									Grand Total
CountyName	NAMELSAD	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	9.00 - 9.25	9.25 - 9.50	
Dickinson	Abilene city	109	2,790	100							2,999
	Banner township			94	6,628	12,248	3,752	98			22,819
	Buckeye township		1,562	7,408	9,373	4,864	12				23,218
	Center township	750	8,952	5,294	7,355	840					23,191
	Cheever township		67	2,457	9,196	11,257					22,978
	Flora township			1,295	11,109	9,612	985				23,002
	Fragrant Hill township		726	5,863	10,890	1,664					19,143
	Garfield township			3,815	15,891	3,460					23,167
	Grant township	99	11,284	6,869	2,072	2					20,326
	Hayes township	34	1,793	9,472	7,038	858					19,195
	Herington city				753	599					1,351
	Holland township				304	12,130	9,561	1,102	41		23,138
	Hope township				2,767	13,073	6,923				22,762
	Jefferson township			139	13,589	9,520	1				23,250
	Liberty township		158	5,404	15,897	6,652					28,111
	Lincoln township	1	10,925	11,676	761						23,362
	Logan township				3,468	18,438	1,248				23,153
	Lyon township				3,623	13,682	4,133				21,438
	Newbern township			2,490	17,398	3,454					23,343
	Noble township	258	9,870	7,657	2,503	16					20,303
	Ridge township				2,206	17,678	3,327				23,211
	Rinehart township		1,000	4,388	12,887	4,811					23,086
	Sherman township	1	4,657	9,135	4,985	334					19,112
	Union township			769	13,029	9,284	21				23,104
	Wheatland township				6,730	14,763	1,575				23,068
	Willowdale township		384	7,279	13,876	1,525					23,064

AWS TrueWind 100 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW100_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	9.00 - 9.25	9.25 - 9.50		
Ellsworth	Ash Creek township			2,970	4,713	9,175	5,559	617	9			23,044
	Black Wolf township			1,626	13,406	4,812	3,075	391				23,309
	Carneiro township			1,843	7,690	11,101	2,430	89				23,153
	Clear Creek township		673	5,613	8,318	7,919	747					23,270
	Columbia township				2,376	8,112	8,306	4,415				23,208
	Ellsworth city			1,346								1,346
	Ellsworth township		389	9,098	9,350	2,989	8					21,834
	Empire township		5,574	18,781	14,011	6,962	607					45,936
	Garfield township				975	8,724	8,835	4,213	164			22,911
	Green Garden township					250	10,084	12,562	435			23,331
	Langley township		40	3,389	5,170	8,383	6,097	27				23,105
	Lincoln township				200	1,807	4,903	10,579	6,019	17		23,525
	Mulberry township			0	3,732	11,067	7,191	1,051	22			23,063
	Noble township				3,107	5,384	7,611	5,543	1,113			22,759
	Palacky township						101	7,382	14,632	1,119		23,234
	Sherman township				91	4,084	8,591	9,721	809			23,296
	Thomas township					834	9,311	12,985	0			23,129
	Trivoli township			77	1,890	8,144	12,281	684				23,076
	Valley township					54	13,734	8,414	803			23,005
	Wilson township				3,981	7,963	9,981	1,128	3			23,056

AWS TrueWind 100 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW100_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	9.00 - 9.25	9.25 - 9.50		
☐ Jewell	Allen township		1,581	8,323	9,011	3,376					22,291	
	Athens township	188	13,873	10,830	367						25,258	
	Browns Creek township		111	18,481	4,499						23,091	
	Buffalo township		664	23,635	1,584	12					25,894	
	Burr Oak township		2,067	12,359	8,089	2,663	41				25,219	
	Calvin township		456	10,366	9,018	307					20,147	
	Center township		44	4,305	10,966	7,450	157				22,922	
	Erving township	1	8,259	13,928	796						22,984	
	Esbon township		36	6,937	12,432	3,517	4				22,927	
	Grant township		10,568	12,215	75						22,858	
	Harrison township		108	3,867	9,886	8,829					22,692	
	Highland township			156	4,472	12,255	5,940				22,824	
	Holmwood township		3,986	6,224	8,179	4,267	187				22,842	
	Ionia township		10,316	10,909	3,959	72					25,256	
	Jackson township	349	4,105	4,001	13,553	597					22,605	
	Limestone township		134	5,385	15,422	4,240					25,180	
	Montana township	357	1,918	8,122	10,775	1,930					23,103	
	Odessa township		5,130	13,823	4,021						22,974	
	Prairie township		1,698	10,023	11,563	363					23,648	
	Richland township		2,914	7,054	9,736	3,198					22,902	
	Sinclair township		2,867	15,913	3,188	658					22,626	
	Vicksburg township		4,700	17,699	507						22,906	
	Walnut township		9	2,904	11,661	10,089	245				24,909	
	Washington township		687	10,874	9,100	2,222					22,883	
	White Mound township			5,212	11,811	5,866	5				22,894	

AWS TrueWind 100 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW100_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	9.00 - 9.25	9.25 - 9.50		
Lincoln	Battle Creek township			1,890	5,162	14,846	1,094	46			23,038	
	Beaver township		737	3,284	4,545	8,890	5,366	108			22,930	
	Cedron township			2,215	9,721	11,151	133				23,220	
	Colorado township		9,317	11,188	2,581	12					23,098	
	Elkhorn township		11,716	8,984	2,285	10					22,995	
	Franklin township			374	6,965	9,842	3,510	1,896	465		23,053	
	Golden Belt township					397	4,870	13,442	4,379		23,089	
	Grant township		2,482	12,151	6,344	2,140	97				23,214	
	Hanover township			1,829	6,195	14,695	306				23,025	
	Highland township				428	5,111	11,524	5,734	69		22,865	
	Indiana township		6,388	7,986	6,692	1,782	25				22,873	
	Logan township			3,263	9,585	7,913	2,151				22,912	
	Madison township			499	11,682	9,014	1,407	413	11		23,026	
	Marion township		5,286	4,870	4,855	6,505	1,193				22,709	
	Orange township			2,366	9,431	10,643	685				23,124	
	Pleasant township		696	13,206	6,067	2,772	294				23,035	
	Salt Creek township		7,959	11,197	3,107	796	0				23,059	
	Scott township		1,672	8,270	7,822	4,538	782				23,083	
	Valley township				666	6,188	9,226	5,933	1,018		23,031	
	Vesper township		1,190	9,006	5,836	4,953	1,776	678		1	23,440	

AWS TrueWind 100 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW100_Acreage		SpeedClass									Grand Total
CountyName	NAMELSAD	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	9.00 - 9.25	9.25 - 9.50	Grand Total
Marshall	Balderson township		374	2,528	6,777	13,522	678				23,880
	Bigelow township	756	9,411	4,470	4,686	4,282	565				24,170
	Blue Rapids City township	930	8,749	6,927	5,572	927					23,104
	Blue Rapids township	830	3,517	6,250	7,916	4,490	15				23,019
	Center township		24	4,615	11,670	7,966	61				24,336
	Clear Fork township		133	3,259	9,670	8,551	1,402				23,015
	Cleveland township		13	4,328	11,846	6,275	522				22,984
	Cottage Hill township			123	2,397	16,556	3,966				23,042
	Elm Creek township	31	3,179	5,345	11,141	3,228					22,925
	Franklin township			172	5,036	17,705	1,294				24,208
	Guittard township			478	7,075	13,315	2,083				22,951
	Herkimer township			9,841	10,585	2,076	45				22,548
	Lincoln township		60	8,185	11,658	2,933					22,836
	Logan township		37	1,619	8,717	10,606	2,032				23,012
	Marysville city		313	1,112	1,528						2,953
	Marysville township		880	8,133	9,082	1,759					19,854
	Murray township				1,990	13,190	7,632				22,813
	Noble township		2,364	8,594	9,217	2,699	25				22,899
	Oketo township		1,896	13,665	6,749	138					22,448
	Richland township			305	3,121	15,383	3,812				22,621
	Rock township		283	9,199	10,230	3,182					22,895
	St. Bridget township	17	932	3,830	5,913	7,201	4,492				22,385
	Vermillion township		6,834	11,384	4,506	279					23,003
	Walnut township		746	6,690	12,202	3,345					22,983
	Waterville township	285	6,290	9,187	5,099	2,113					22,974
	Wells township		3,412	8,720	7,802	4,026	37				23,996

AWS TrueWind 100 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW100_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	9.00 - 9.25	9.25 - 9.50		
<input checked="" type="checkbox"/> Mitchell	Asherville township		9,266	7,866	5,221	869					23,221	
	Beloit city	19	2,399	167							2,585	
	Beloit township		9,970	4,685	5,876	56					20,587	
	Bloomfield township			401	11,081	11,675					23,158	
	Blue Hill township				4,819	14,201	3,174	922	0		23,116	
	Carr Creek township		527	8,836	10,224	3,409					22,996	
	Cawker township		15,786	6,961	78						22,825	
	Center township			1,352	11,795	9,764	36				22,948	
	Custer township				868	15,578	4,702	1,962	100		23,212	
	Eureka township		0	2,676	8,652	10,974	734				23,037	
	Glen Elder township	12	14,259	7,888	903						23,062	
	Hayes township			33	4,416	15,547	2,833	211			23,040	
	Logan township		2,422	3,334	4,614	11,877	912				23,158	
	Lulu township			501	6,524	12,486	3,213				22,724	
	Pittsburg township				2,149	14,213	4,994	1,597	147		23,099	
	Plum Creek township		730	9,084	12,439	543					22,796	
	Round Springs township		27	5,185	15,951	1,779					22,942	
	Salt Creek township		1,863	11,217	9,036	844	0				22,961	
	Solomon Rapids township		4,140	14,417	4,126						22,682	
	Turkey Creek township		3,689	4,312	9,981	4,833	26				22,839	
	Walnut Creek township		654	4,839	10,704	6,851	23				23,071	

AWS TrueWind 100 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW100_Acreage		SpeedClass									Grand Total
CountyName	NAMELSAD	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	9.00 - 9.25	9.25 - 9.50	
<input checked="" type="checkbox"/> Ottawa	Bennington township		5,687	11,453	9,667	86					26,893
	Blaine township		647	6,712	14,360	1,440					23,158
	Buckeye township		10,688	7,705	846						19,240
	Center township		2,506	7,439	10,075	2,645	133				22,798
	Chapman township			483	6,473	14,816	1,071				22,844
	Concord township		7,594	10,036	4,624						22,254
	Culver township		7,113	10,753	5,297						23,164
	Durham township			696	5,886	12,478	3,829				22,889
	Fountain township		1,956	14,411	6,107	650	19				23,143
	Garfield township		2,166	17,430	3,559	3					23,157
	Grant township			127	5,941	13,653	3,439	5			23,166
	Henry township			4,598	14,145	4,103	104				22,950
	Lincoln township		1,712	11,118	9,624	490					22,944
	Logan township			380	16,314	6,367					23,061
	Minneapolis city		624	495							1,119
	Morton township		9,444	10,475	3,035						22,954
	Ottawa township		2	7,327	9,288	5,532	807				22,956
	Richland township		293	11,632	9,966	1,018					22,910
	Sheridan township		13	14,210	8,595	396					23,213
	Sherman township				5,486	12,570	5,056	28			23,139
	Stanton township			2,356	8,152	8,629	4,296	14			23,447

AWS TrueWind 100 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW100_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	9.00 - 9.25	9.25 - 9.50		
Republic	Albion township					1,087	18,068	3,497			22,651	
	Beaver township		3,661	12,894	6,493						23,047	
	Belleville city				469	819					1,288	
	Belleville township			886	9,233	11,532	18				21,668	
	Big Bend township	884	8,809	9,483	3,134	510					22,819	
	Courtland township		344	14,937	7,868						23,149	
	Elk Creek township		1,103	12,343	6,069	2,681	809	121			23,126	
	Fairview township				34	2,923	17,233	3,159			23,349	
	Farmington township				2,366	11,183	9,389	4			22,942	
	Freedom township				320	8,115	13,267	588			22,290	
	Grant township	81	7,702	10,857	3,923	849					23,410	
	Jefferson township			1,649	6,189	8,377	7,336	80			23,632	
	Liberty township					1,711	19,365	1,827			22,903	
	Lincoln township		4,629	7,692	9,658	799					22,778	
	Norway township		5,959	11,399	5,587	65					23,011	
	Richland township				996	6,505	14,134	1,149			22,784	
	Rose Creek township				1,033	7,440	10,722	3,912			23,108	
	Scandia township		4,647	6,171	6,312	5,885					23,015	
	Union township		1,657	4,994	7,078	6,136	3,116				22,981	
	Washington township			247	3,184	10,556	8,676	174			22,837	
	White Rock township		4,491	9,446	9,138	2					23,076	

AWS TrueWind 100 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW100_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	9.00 - 9.25	9.25 - 9.50		
Saline	Cambria township	92	8,912	10,015	3,867						22,886	
	Dayton township		16,575	5,966	162						22,703	
	Elm Creek township	156	7,824	12,208	2,524	4					22,717	
	Eureka township			7,623	12,075	3,488	7				23,193	
	Falun township			1,372	22,944	20,585	1,160	14			46,075	
	Glendale township			6,636	15,615	846					23,097	
	Greeley township	171	3,397	7,081	7,188	1,008	26				18,871	
	Gypsum township			1,683	15,278	5,920	112				22,993	
	Liberty township			40	9,781	12,444	773				23,038	
	Ohio township		96	14,744	7,922	426					23,188	
	Pleasant Valley township		689	12,565	9,804	68					23,126	
	Salina city	5,953	5,298	3,930	904	4					16,089	
	Smoky Hill township	732	3,233	8,853	1,668						14,487	
	Smoky View township			2,626	17,251	2,909	243	15			23,044	
	Smolan township		245	16,227	3,642	340					20,454	
	Solomon township		431	12,207	9,517	980					23,134	
	Spring Creek township		19	10,910	23,828	10,179	1,066				46,002	
	Walnut township			5,650	12,491	4,979					23,120	
	Washington township			8,564	12,271	2,279					23,115	

AWS TrueWind 100 Meter Wind Speeds, .25 M/Sec Increments, Acres by County and Township, Cont'd

Sum - TW100_Acreage		SpeedClass										Grand Total
CountyName	NAMELSAD	7.25 - 7.50	7.50 - 7.75	7.75 - 8.00	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	9.00 - 9.25	9.25 - 9.50		
Washington	Barnes township		384	2,738	10,615	9,021	228					22,986
	Brantford township		64	6,663	9,638	4,656	1,814	157				22,993
	Charleston township		766	9,413	11,992	741						22,912
	Clifton township	4	6,167	16,498	442							23,111
	Coleman township				1,090	8,890	13,219	0				23,199
	Farmington township		2	2,458	17,490	3,230						23,180
	Franklin township	196	7,460	12,523	2,462							22,641
	Grant township				569	6,621	11,100	4,722				23,012
	Greenleaf township				3,631	16,694	2,646					22,971
	Haddam township			464	10,964	10,745	797	17				22,988
	Hanover township		162	7,929	6,869	6,654	1,462					23,076
	Highland township		7	3,381	11,297	7,478	452					22,615
	Independence township		298	2,104	14,100	6,122	0					22,623
	Kimeo township				324	8,556	14,018	143				23,040
	Lincoln township			614	3,050	10,495	8,844	20				23,024
	Linn township				1,024	10,808	11,203	0				23,036
	Little Blue township		2,816	10,454	7,830	1,880						22,980
	Logan township			1,363	9,963	11,414	36					22,776
	Lowe township				2,269	11,656	8,051	542				22,518
	Mill Creek township			3,524	15,571	4,043	48					23,186
	Sheridan township			957	8,213	13,058	799					23,026
	Sherman township				1,305	13,218	8,424	57				23,004
	Strawberry township			1,385	5,930	13,655	2,206					23,175
	Union township				2,411	8,832	11,370	65				22,678
	Washington city			146	432							578
	Washington township			1,155	5,822	12,494	3,048					22,519

Environmental concerns can reduce the amount of land area available for development. The following series of tables provide summary data on several categories of land that may be of concern.

**Untilled Land Area, Acres by County**

Sum - Acreage	SpeedClass				
CountyAbbrev	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	Total Result
CD	37,141	10,377	1,361		48,878
CY	1,050	1			1,052
DK	5,893	573	45		6,511
EW	50,242	26,346	8,499	91	85,179
JW	29				29
LC	29,138	15,476	2,935		47,548
MC	8,337	3,467	226		12,031
MS	480				480
OT	8,020	49			8,069
SA	1,815	66			1,881
WS	1,246				1,246
<b>Total Result</b>	<b>143,391</b>	<b>56,356</b>	<b>13,066</b>	<b>91</b>	<b>212,903</b>

Untilled Land Area, Acres by County and Township

Sum - Acreage		SpeedClass	UntilledLand				Total
CountyAbbrev	NAMELSAD	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	Result	
		TRUE	TRUE	TRUE	TRUE		
CD	Arion township	6,019	163			6,182	
	Aurora township	5,884	4,669	1,351		11,904	
	Center township	10,263	4,826	10		15,098	
	Colfax township	2,132				2,132	
	Lyon township	4,236	405			4,641	
	Meredith township	1,538	111			1,649	
	Nelson township	4				4	
	Oakland township	5,443	202			5,645	
	Solomon township	16				16	
	Starr township	1,160	0			1,160	
	Summit township	448				448	
CY	Chapman township	126				126	
	Exeter township	295				295	
	Five Creeks township	36				36	
	Oakland township	593	1			594	
DK	Banner township	2,238	56			2,294	
	Flora township	611				611	
	Holland township	3,044	517	45		3,607	
EW	Ash Creek township	2,864	284	4		3,152	
	Black Wolf township	1,539	172			1,711	
	Carneiro township	1,524	60			1,583	
	Clear Creek township	238				238	
	Columbia township	164				164	
	Empire township	250				250	
	Garfield township	6,216	2,730	94		9,040	
	Green Garden township	71	897			967	
	Langley township	2,892	3			2,894	
	Lincoln township	5,711	6,972	2,084		14,767	
	Mulberry township	4,619	806	29		5,454	
	Noble township	5,252	3,135	406		8,793	
	Palacky township	298	4,153	5,602	91	10,144	
	Sherman township	3,917	4,615	281		8,813	
	Thomas township	7,497	1,994			9,491	
	Trivoli township	4,738	108			4,846	
	Wilson township	2,454	418	1		2,872	

Untilled Land, Cont'd

Sum - Acreage		SpeedClass	UntilledLand				Total
CountyAbbrev	NAMELSAD	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	Result	
JW	Highland township	29				29	
LC	Battle Creek township	507	60			567	
	Beaver township	4,979	240			5,219	
	Franklin township	1,731	1,452	417		3,601	
	Golden Belt township	4,024	6,130	1,733		11,887	
	Grant township	94				94	
	Hanover township	6				6	
	Highland township	7,495	2,667	33		10,194	
	Indiana township	11				11	
	Logan township	2,516				2,516	
	Madison township	579	268	17		864	
	Marion township	193				193	
	Pleasant township	76				76	
	Salt Creek township	20				20	
	Scott township	723	10			734	
	Valley township	5,163	4,208	735		10,105	
	Vesper township	1,021	440			1,461	
MC	Blue Hill township	2,345	737	13		3,095	
	Custer township	3,228	1,354	79		4,661	
	Eureka township	154				154	
	Hayes township	373	121			493	
	Logan township	7				7	
	Pittsburg township	2,217	1,256	135		3,607	
	Salt Creek township	13				13	
MS	Bigelow township	157				157	
	Clear Fork township	323				323	
OT	Center township	141				141	
	Chapman township	274				274	
	Durham township	1,459				1,459	
	Fountain township	62				62	
	Grant township	1,070				1,070	
	Henry township	127				127	
	Ottawa township	545				545	
	Sherman township	1,567				1,567	
	Stanton township	2,775	49			2,824	
SA	Falun township	555	33			588	
	Liberty township	403				403	
	Smoky View township	205	33			238	
	Spring Creek township	652	0			652	
WS	Highland township	156				156	
	Lowe township	988				988	
	Union township	102				102	
<b>Total Result</b>		<b>143,391</b>	<b>56,356</b>	<b>13,066</b>	<b>91</b>	<b>212,903</b>	

Prairie Chicken (greater) Habitat, Acres by County

Sum - Acreage	SpeedClass		PrairieChickenHabitat		Grand Total
	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	
CountyAbbrev	1	1	1	1	
+ CD	67,625	14,930	1,361		83,915
+ CY	7,508	52			7,560
+ DK	14,222	922	52		15,195
+ EW	77,449	42,916	14,161	174	134,701
+ JW	1,801				1,801
+ LC	40,550	23,681	3,665		67,896
+ MC	14,811	3,586	226		18,623
+ MS	2,391				2,391
+ OT	12,383	74			12,458
+ RP	17,471	211			17,682
+ SA	1,840	52			1,892
+ WS	52,848	821			53,668
<b>Grand Total</b>	<b>310,898</b>	<b>87,245</b>	<b>19,465</b>	<b>174</b>	<b>417,783</b>

Prairie Chicken (greater) Habitat, Acres by County and Township

Sum - Acreage		SpeedClass	PrairieChickenHabitat			
CountyAbbrev	NAMELSAD	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	Total Result
		TRUE	TRUE	TRUE	TRUE	
CD	Arion township	11,315	595			11,911
	Aurora township	10,524	4,748	1,351		16,623
	Center township	13,272	8,676	10		21,958
	Colfax township	3,841				3,841
	Lyon township	5,661	596			6,257
	Meredith township	1,538	111			1,649
	Nelson township	4				4
	Oakland township	5,599	202			5,801
	Solomon township	16				16
	Starr township	1,602	0			1,602
	Summit township	14,254				14,254
CY	Chapman township	126				126
	Exeter township	454				454
	Five Creeks township	62				62
	Garfield township	528				528
	Gill township	35				35
	Goshen township	258				258
	Hayes township	1,758	51			1,809
	Highland township	3,664	0			3,664
	Oakland township	593	1			594
	Sherman township	21				21
	Union township	10				10
DK	Banner township	2,554	56			2,610
	Flora township	619				619
	Holland township	6,142	866	52		7,060
	Hope township	1,611				1,611
	Lyon township	2,119				2,119
	Ridge township	1				1
	Wheatland township	1,177				1,177
EW	Ash Creek township	2,864	284	4		3,152
	Black Wolf township	1,539	172			1,711
	Cameiro township	1,524	60			1,583
	Clear Creek township	238				238
	Columbia township	7,929	2,416			10,345
	Empire township	250				250
	Garfield township	6,584	3,329	109		10,023
	Green Garden township	71	3,227	125		3,423
	Langley township	3,591	3			3,594
	Lincoln township	5,863	9,659	3,368		18,890
	Mulberry township	4,651	814	29		5,494
	Noble township	6,891	3,377	406		10,674
	Palacky township	298	4,829	9,727	174	15,028
	Sherman township	8,298	8,023	393		16,714
	Thomas township	9,711	6,026			15,736
	Trivoli township	9,893	108			10,001
	Wilson township	7,254	590	1		7,845

Prairie Chicken(greater) Habitat, Acres by County and Township

Sum - Acreage		SpeedClass	PrairieChickenHabitat				Total
CountyAbbrev	NAME	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	Result	
JW	Highland township	1,801				1,801	
LC	Battle Creek township	958	60			1,018	
	Beaver township	5,275	240			5,515	
	Cedron township	50				50	
	Franklin township	2,405	1,542	417		4,364	
	Golden Belt township	6,038	12,848	2,446		21,333	
	Grant township	94				94	
	Hanover township	113				113	
	Highland township	10,211	3,454	33		13,698	
	Indiana township	11				11	
	Logan township	2,533				2,533	
	Madison township	868	351	17		1,235	
	Marion township	1,057				1,057	
	Orange township	412				412	
	Pleasant township	114				114	
	Salt Creek township	20				20	
	Scott township	771	10			782	
	Valley township	8,423	4,726	753		13,902	
	Vesper township	1,197	449			1,646	
MC	Blue Hill township	2,562	749	13		3,324	
	Custer township	3,757	1,367	79		5,204	
	Eureka township	634				634	
	Hayes township	1,944	200			2,144	
	Logan township	491				491	
	Lulu township	1,789				1,789	
	Pittsburg township	3,620	1,270	135		5,025	
	Salt Creek township	13				13	
MS	Bigelow township	228				228	
	Clear Fork township	602				602	
	Cleveland township	219				219	
	Cottage Hill township	1,342				1,342	
OT	Center township	141				141	
	Chapman township	564				564	
	Durham township	2,022				2,022	
	Fountain township	62				62	
	Grant township	1,967	1			1,969	
	Henry township	127				127	
	Ottawa township	545				545	
	Sherman township	3,023	24			3,047	
	Stanton township	3,931	49			3,979	
RP	Albion township	1,570				1,570	
	Elk Creek township	660	3			663	
	Fairview township	18				18	
	Farmington township	1,959				1,959	
	Jefferson township	2,294				2,294	
	Richland township	10,971	208			11,179	
SA	Eureka township	8				8	
	Falun township	542	32			574	
	Gypsum township	70				70	
	Liberty township	410				410	
	Smoky View township	158	20			178	
	Spring Creek township	652	0			652	

**Prairie Chicken(greater) Habitat, Acres by County and Township**

Sum - Acreage		SpeedClass	PrairieChickenHabitat			
CountyAbbrev	NAMELSAD	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	Total Result
WS	Brantford township	1,334	37			1,371
	Coleman township	6,156				6,156
	Grant township	10,726	783			11,509
	Greenleaf township	1,056				1,056
	Haddam township	298	1			299
	Highland township	156				156
	Kimeo township	7,526				7,526
	Lincoln township	4,813				4,813
	Linn township	4,389				4,389
	Lowe township	5,065	0			5,065
	Sheridan township	26				26
	Sherman township	3,452				3,452
	Strawberry township	394				394
	Union township	6,651				6,651
	Washington township	805				805
<b>Total Result</b>		<b>310,898</b>	<b>87,245</b>	<b>19,465</b>	<b>174</b>	<b>417,783</b>

Whooping Crane 75.08% Flyway Occurrence, Acres by County

Sum - Acreage	SpeedClass	WhoopingCranePct			Grand Total
	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	
CountyAbbrev	TRUE	TRUE	TRUE	TRUE	
EW	96,206	56,043	15,952	174	168,374
LC	27,783	22,272	3,341		53,395
MC	11,950	3,586	226		15,763
<b>Grand Total</b>	<b>135,938</b>	<b>81,900</b>	<b>19,519</b>	<b>174</b>	<b>237,532</b>

Whooping Crane 75.08% Flyway Occurrence, Acres by County and Township

Sum - Acreage	NAMELSAD	SpeedClass	WhoopingCranePct			Total Result
		8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	8.75 - 9.00	
CountyAbbrev	NAMELSAD	TRUE	TRUE	TRUE	TRUE	
EW	Ash Creek township	2,864	284	4		3,152
	Black Wolf township	1,539	172			1,711
	Clear Creek township	4				4
	Columbia township	7,929	2,416			10,345
	Empire township	193				193
	Garfield township	1,750	446	3		2,199
	Green Garden township	13,737	7,909	125		21,771
	Lincoln township	5,889	10,440	3,368		19,697
	Noble township	6,891	3,377	406		10,674
	Palacky township	1,027	10,695	11,338	174	23,234
	Sherman township	8,298	8,023	393		16,714
	Thomas township	13,025	7,546			20,571
	Trivoli township	9,212	108			9,320
	Valley township	16,594	4,037	314		20,944
	Wilson township	7,254	590	1		7,845
LC	Battle Creek township	72				72
	Cedron township	50				50
	Franklin township	969	795	109		1,873
	Golden Belt township	6,038	12,848	2,446		21,333
	Grant township	94				94
	Hanover township	113				113
	Highland township	10,211	3,454	33		13,698
	Indiana township	11				11
	Marion township	78				78
	Orange township	412				412
	Pleasant township	114				114
	Valley township	8,423	4,726	753		13,902
	Vesper township	1,197	449			1,646
MC	Blue Hill township	2,562	749	13		3,324
	Custer township	3,757	1,367	79		5,204
	Hayes township	2,005	200			2,204
	Pittsburg township	3,622	1,270	135		5,026
	Walnut Creek township	4				4
<b>Total Result</b>		<b>135,938</b>	<b>81,900</b>	<b>19,519</b>	<b>174</b>	<b>237,532</b>

All Other "Areas of Concern", Acres by County

Sum - Acreage	SpeedClass	OtherExclusionMask		Grand Total
	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	
CountyAbbrev	1	1	1	
+ CD	568	4		571
+ CY	248			248
+ DK	2,105			2,105
+ EW	10,454	4,221	237	14,912
+ LC	6,365	2,394	311	9,070
+ MC	170	22		191
+ MS	153			153
+ OT	1,222	9		1,230
+ RP	3,214			3,214
+ SA	304	1		306
+ WS	193			193
<b>Grand Total</b>	<b>24,996</b>	<b>6,650</b>	<b>548</b>	<b>32,194</b>

All Other "Areas of Concern", Acres by County and Township

Sum - Acreage		SpeedClass	OtherExclusionMask		
CountyAbbrev	NAMELSAD	8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	Total Result
CD	Arion township	270	4		274
	Center township	12			12
	Meredith township	285			285
CY	Oakland township	248			248
DK	Hope township	1,152			1,152
	Lyon township	558			558
	Ridge township	363			363
	Wheatland township	32			32
EW	Ash Creek township	510	83	4	597
	Black Wolf township	2			2
	Carneiro township	864	29		894
	Clear Creek township	22			22
	Empire township	56			56
	Garfield township	1,098	0		1,098
	Green Garden township	0	1,256	17	1,273
	Langley township	26			26
	Lincoln township	1,570	917	167	2,654
	Mulberry township	1,694	153		1,848
	Noble township	1,267	300	49	1,616
	Palacky township			0	0
	Sherman township	970	1,031		2,001
	Thomas township	1,281	420		1,701
	Trivoli township	1,038			1,038
	Wilson township	54	31		85
LC	Battle Creek township	8			8
	Beaver township	549	76		624
	Franklin township	218	31		249
	Golden Belt township	1,655	1,324	278	3,257
	Highland township	2,188	868	33	3,089
	Indiana township	1			1
	Logan township	1,005			1,005
	Madison township	1			1
	Pleasant township	84			84
	Salt Creek township	12			12
	Scott township	1			1
	Valley township	594	86	0	680
	Vesper township	51	10		61
MC	Blue Hill township	0	0		0
	Hayes township	169	22		191
MS	Logan township	61			61
	Richland township	92			92
	St. Bridget township	0			0

All Other "Areas of Concern" Cont'd

Sum - Acreage		SpeedClass	OtherExclusionMask		
		8.00 - 8.25	8.25 - 8.50	8.50 - 8.75	Total Result
CountyAbbrev	NAMELSAD	TRUE	TRUE	TRUE	
OT	Center township	80			80
	Durham township	186			186
	Grant township	0			0
	Henry township	0			0
	Sherman township	409	9		418
	Stanton township	545			545
RP	Albion township	738			738
	Fairview township	168			168
	Freedom township	445			445
	Liberty township	227			227
	Richland township	379			379
	Rose Creek township	619			619
	Washington township	638			638
SA	Eureka township	8			8
	Falun township	162	1		163
	Smoky View township	1			1
	Spring Creek township	134			134
WS	Grant township	26			26
	Greenleaf township	47			47
	Haddam township	15			15
	Kimeo township	104			104
<b>Total Result</b>		<b>24,996</b>	<b>6,650</b>	<b>548</b>	<b>32,194</b>

**Net Land Area (acres) with TrueWind Wind Speed => 8.0 M/Sec at 70 M, Less Untilled Land, Prairie Chicken (greater) Habitat, Whooping Crane Flyway (75.08 % Occurance), and All other "Areas of Concern"  
Acres by County and Township**

Sum - Acreage	TargetedLandFlag		County
CountyName	NAMELSAD	1	Total
			Total Result
<input type="checkbox"/> Clay	Garfield township	0	0
<input type="checkbox"/>	Hayes township	98	98
<input type="checkbox"/> Cloud	Aurora township	3	3
<input type="checkbox"/> Dickinson	Banner township	78	78
<input type="checkbox"/>	Buckeye township	20	20
<input type="checkbox"/>	Holland township	96	96
<input type="checkbox"/>	Hope township	513	513
<input type="checkbox"/>	Logan township	910	910
<input type="checkbox"/>	Ridge township	1,111	1,111
<input type="checkbox"/>	Wheatland township	12	12
			<b>2,739</b>
<input type="checkbox"/> Marshall	Franklin township	3	3
<input type="checkbox"/>	Guittard township	497	497
<input type="checkbox"/>	Logan township	796	796
<input type="checkbox"/>	Murray township	2,707	2,707
<input type="checkbox"/>	Richland township	355	355
<input type="checkbox"/>	St. Bridget township	2,033	2,033
			<b>6,391</b>
<input type="checkbox"/> Mitchell	Center township	90	90
<input type="checkbox"/>	Eureka township	2	2
<input type="checkbox"/>	Hayes township	6	6
<input type="checkbox"/>	Logan township	132	132
<input type="checkbox"/>	Lulu township	260	260
<input type="checkbox"/>	Turkey Creek township	40	40
<input type="checkbox"/>	Walnut Creek township	24	24
			<b>554</b>
<input type="checkbox"/> Republic	Albion township	15,979	15,979
<input type="checkbox"/>	Fairview township	16,742	16,742
<input type="checkbox"/>	Farmington township	3,024	3,024
<input type="checkbox"/>	Freedom township	9,261	9,261
<input type="checkbox"/>	Jefferson township	2,292	2,292
<input type="checkbox"/>	Liberty township	16,206	16,206
<input type="checkbox"/>	Rose Creek township	10,406	10,406
<input type="checkbox"/>	Union township	1,540	1,540
<input type="checkbox"/>	Washington township	5,969	5,969
			<b>81,420</b>
<input type="checkbox"/> Saline	Greeley township	30	30
<input type="checkbox"/>	Smoky View township	8	8
<input type="checkbox"/>	Walnut township	0	0
			<b>38</b>
<input type="checkbox"/> Washington	Barnes township	4	4
<input type="checkbox"/>	Hanover township	372	372
<input type="checkbox"/>	Union township	1,018	1,018
			<b>1,394</b>
<input type="checkbox"/> <b>Total Result</b>		<b>92,637</b>	<b>92,637</b>

## North Central Kansas Renewable Energy Resource Map(s)

### Sources of Data for Key Individual Layers

#### Solar Map

##### Solar Radiation

Annual Solar Insolation (energy), Watt-hour/M<sup>2</sup>

Taken from the Kansas Solar Resource Map prepared for the Kansas Corporation Commission by Coriolis in 2008. Based on 15 years (1991-2005) of hourly solar insolation contained in the National Solar Radiation Data Base (NSRB) acquired from the National Renewable Energy Laboratory. A copy of the Kansas Solar Resource Map and associated information can be downloaded from <http://www.kcc.state.ks.us/energy/solar.htm> .

Solar: 1 January Avg thru Solar: 12 December Avg show month specific values taken from the data described above.

#### Wind Map

##### Truewind Power Density, 100 m

Taken AWS Truewind prepared a series of wind speed and power maps for the Kansas Corporation Commission in 2008 using their MesoMap method. Copies of the Wind Resource Map of Kansas are available at <http://www.kcc.state.ks.us/energy/wind.htm> .

Truewind Power Density, 70 m, Truewind Power Density, 50 m, Truewind Wind Speed, 100 m, Truewind Wind Speed, 70 m, Truewind WindSpeed, 50 m, are all part of the map set described above.

##### Coriolis Wind Speed Raster, 50 m

Taken from the Kansas Wind Resource Map prepared for the Kansas Corporation Commission by Coriolis in 2003 using the WindMap software. Copies of the individual county maps are available at [http://www.kcc.state.ks.us/energy/comm\\_wind/cw\\_toolkit.htm](http://www.kcc.state.ks.us/energy/comm_wind/cw_toolkit.htm) .

#### Environmental Map

##### TNC: Lesser Prairie Chicken Range Drawing

Provided by Brian Obermeyer <[bobermeyer@TNC.ORG](mailto:bobermeyer@TNC.ORG)> of The Nature Conservancy.

##### TNC: Greater Prairie Chicken Range Drawing

Provided by Brian Obermeyer <[bobermeyer@TNC.ORG](mailto:bobermeyer@TNC.ORG)> of The Nature Conservancy.

##### State: Natural Communities by Section Drawing 2

Originator: Kansas Natural Heritage Inventory

Publication\_Date: 20080718

Title: natural\_communities

##### State: Protected Areas Drawing

Originator: Kansas Natural Heritage Inventory  
Publication\_Date: 20080718  
Title: protected\_areas

State: Archaeological Sites by Section

Wind and Prairie Task Force

TNC: Untilled Lands

Provided by Brian Obermeyer <[bobermeyer@TNC.ORG](mailto:bobermeyer@TNC.ORG)> of The Nature Conservancy.

State: Rare Plants and Animals 1 mi buffer Drawing

Originator: Kansas Natural Heritage Inventory  
Publication\_Date: 20080718  
Title: rare\_species

TNC: Whooping Cranes Migration 90avg\_buffers\_75-95 Drawing

The Whooping Crane Migration data was provide by Brian Obermeyer <[bobermeyer@TNC.ORG](mailto:bobermeyer@TNC.ORG)> and Chris Hise [cmhise@TNC.ORG](mailto:cmhise@TNC.ORG) and the following information must accompany the data.

#### **Required Reading for Users of the Whooping Crane Tracking Project Database**

**WCTP-GIS data or derivatives thereof (e.g., shape files, jpegs) may not be distributed or posted on the Internet without this explanatory document.**

The Cooperative Whooping Crane Tracking Project (WCTP) was initiated in 1975 to collect a variety of information on whooping crane migration through the U.S. portion of the Central Flyway. Since its inception in 1975, a network of Federal and State cooperating agencies has collected information on whooping crane stopovers and funneled it to the U.S. Fish and Wildlife Service (Service) Nebraska Field Office where a database of sighting information is maintained. The WCTP database includes a hardcopy file of whooping crane sighting reports and a digital database in various formats based on those sighting reports. A subset of the database along with sight evaluation (habitat) information collected between 1975 and 1999 was summarized by Austin and Richert (2001).\*

In the Fall of 2007, the WCTP database was converted to a GIS format (ArcGIS 9.2) to facilitate input, updates, and provide output options in a spatial context. During this process, inconsistencies between the digital database and sighting report forms were identified and corrected. Location information in various formats was derived from data in the corrected database, and new fields were added to the corrected database (e.g., latitude and longitude in decimal degrees, an accuracy field, and location comment field). The attached file contains observation data through the 2007 Fall migration and is referred to as the WCTP-GIS (2007b).

The appropriate use of the WCTP-GIS is constrained by limitations inherent in both the GIS technology and observer bias inherent in any database comprised of incidental observations. Without an understanding of the assumptions and limitations of the data, analyses and output from the spatial database can result in faulty conclusions. The following assumptions and characteristics of the database are crucial to interpreting output correctly.

- First and foremost, the database is comprised of incidental sightings of whooping cranes during migration. Whooping cranes are largely opportunistic in their use of stopover sites along the Central Flyway, and will use sites with available habitat when weather or diurnal conditions require a break in migration. Because much of the Central Flyway is sparsely populated, only a small percent of stopovers are observed, those observed may not be identified, those identified may not be reported, and those reported may not be confirmed (only confirmed sightings are included in the database). Based on the crane population and average flight distances, as little as 4 percent of crane stopovers are reported. *Therefore, absence of documented whooping crane use of a given area in the Central Flyway does NOT mean that whooping cranes do not use that area or that various projects in the vicinity will not potentially adversely affect the species.*
- In the database, the location of each sighting is based on the first observation of the crane group even though, in many cases, the group was observed at multiple locations in a local area. For this and other reasons described below, only large scale analyses of whooping crane occurrences are appropriate. GIS **cannot** be legitimately used with this database for measurements of distance of whooping crane groups from various habitat or geographic entities (i.e., using various available GIS data layers). In addition, point locations of whooping crane groups known to roost in various wetlands or rivers may not coincide with those wetlands. The user needs to refer to the attribute table or contact the Nebraska Field office for more specific information on individual observations.
- Precision of the data: When a “Cadastral” location (Township, Range, Section, ¼-Section) was provided on the original sighting form, the geographic point representing that sighting was placed in the center of the indicated Section or ¼-Section and the latitude and longitude of that point was recorded in DMS. These records are indicated by “Cadastral” in the accuracy field. When Cadastral information was lacking, Degrees-Minutes-Seconds (DMS) latitude and DMS longitude was derived by adding seconds (00) to the Degrees and Minutes of latitude and longitude originally estimated and recorded on the observation form. These observations are identified by “Historic” in the accuracy field. GPS latitude and longitude was used when available, but when none of the above was reported, the point was placed on text description of location (e.g. 3 miles N of Denton), and identified in the accuracy field with “Landmark”. DMS latitude and longitude were converted to decimal degrees which were used to populate the GIS data layer.
- Observer bias: Observer bias is an inherent characteristic of any data obtained through incidental sightings. That is, for the subset of crane use that is recorded, relatively more sightings are recorded in areas such as National Wildlife Refuges where knowledgeable observers are available to look for cranes and report their presence. However, relative use of such areas is also determined to some extent by habitat management on the areas and availability of alternative habitat in the region. For these reasons, representations of the crane migration corridor based on percent of confirmed sightings should be interpreted conservatively, particularly in Oklahoma and Kansas where a high percent of sightings occur on a few National Wildlife Refuges.

The WCTP-GIS (2007) will be updated annually following the Fall migration and distributed to State cooperators and Fish and Wildlife Service Ecological Services Field Offices in the Central Flyway. Contact information for these offices can be found at <http://www.fws.gov>. Federal regulatory agencies and project proponents should contact the appropriate Fish and Wildlife Service for help in evaluating potential project impacts to the endangered whooping crane.

\* Austin, E.A. and A.L. Richert. 2001. A comprehensive review of observational and site evaluation data of migrant whooping cranes in the United States, 1943-99. U.S. Geological Survey. Northern Prairie Wildlife Research Center, Jamestown, North Dakota, and State Museum, University of Nebraska, Lincoln, Nebraska. 157 pp.