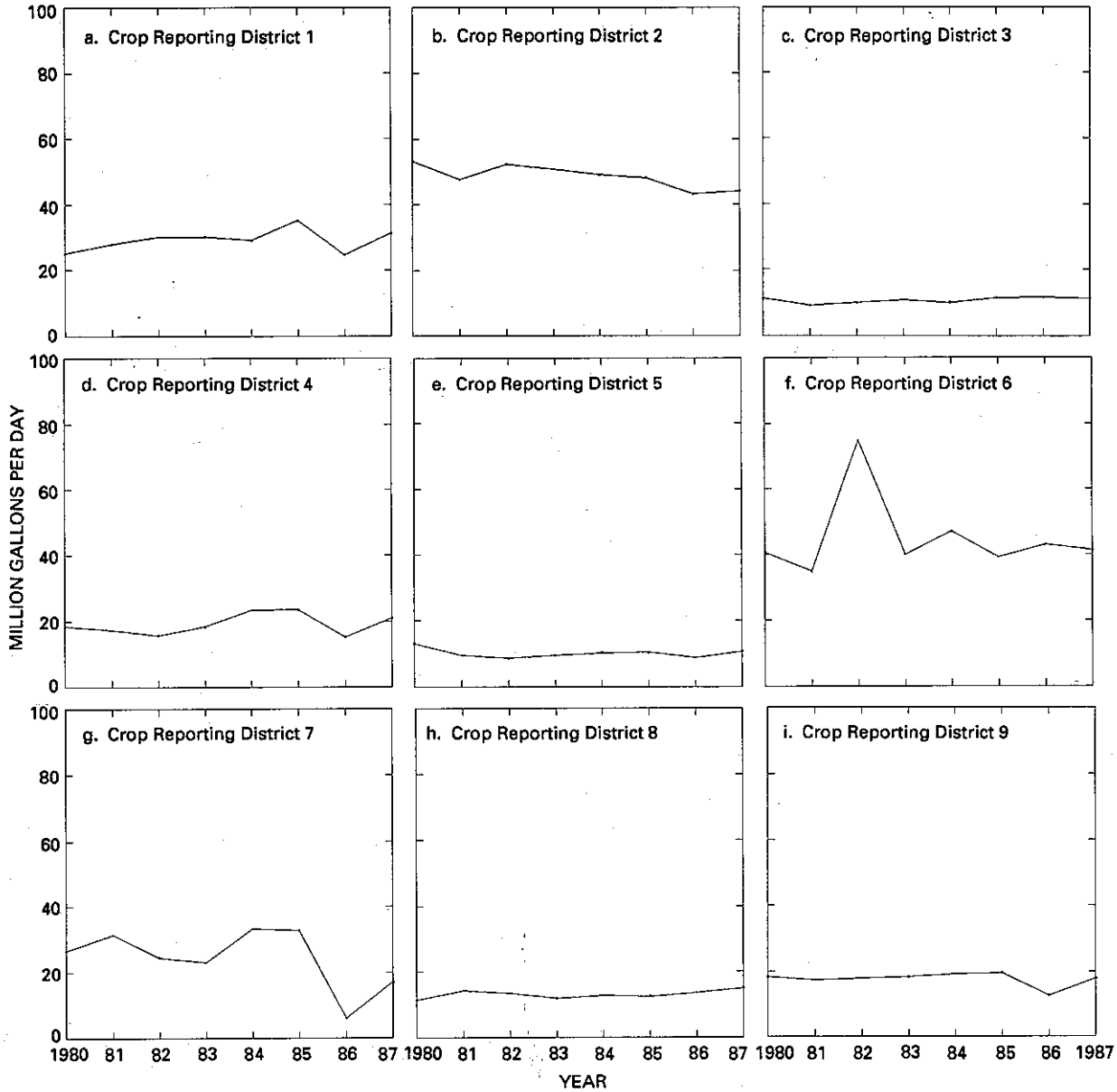

Figure 35. Total self-supplied industrial ground-water withdrawals from 1980 through1987 for each of the nine crop reporting districts

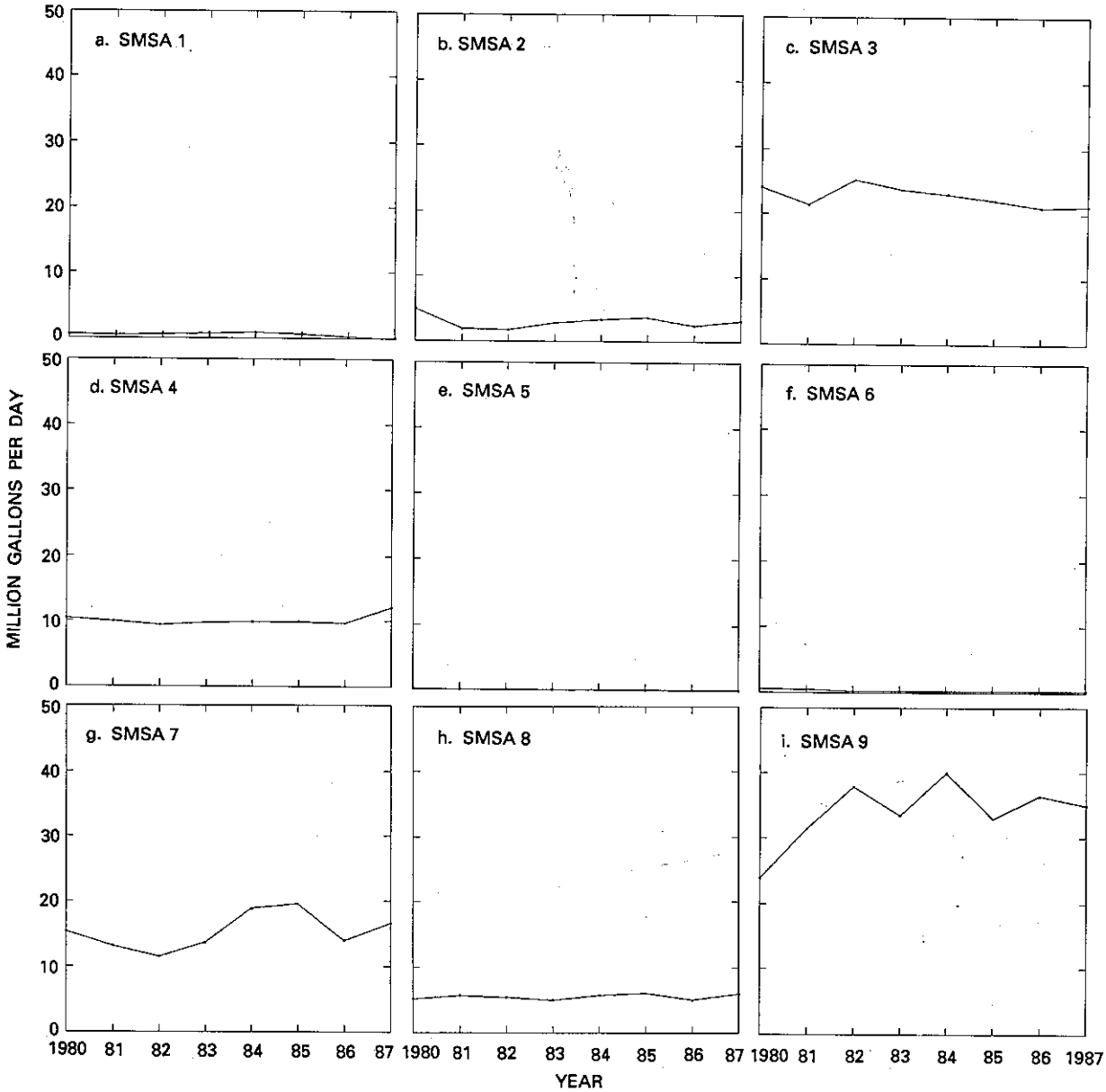

Figure 36. Total self-supplied industrial ground-water withdrawals from 1980 through 1987 for each of the nine Standard Metropolitan Statistical Areas (SMSAs)

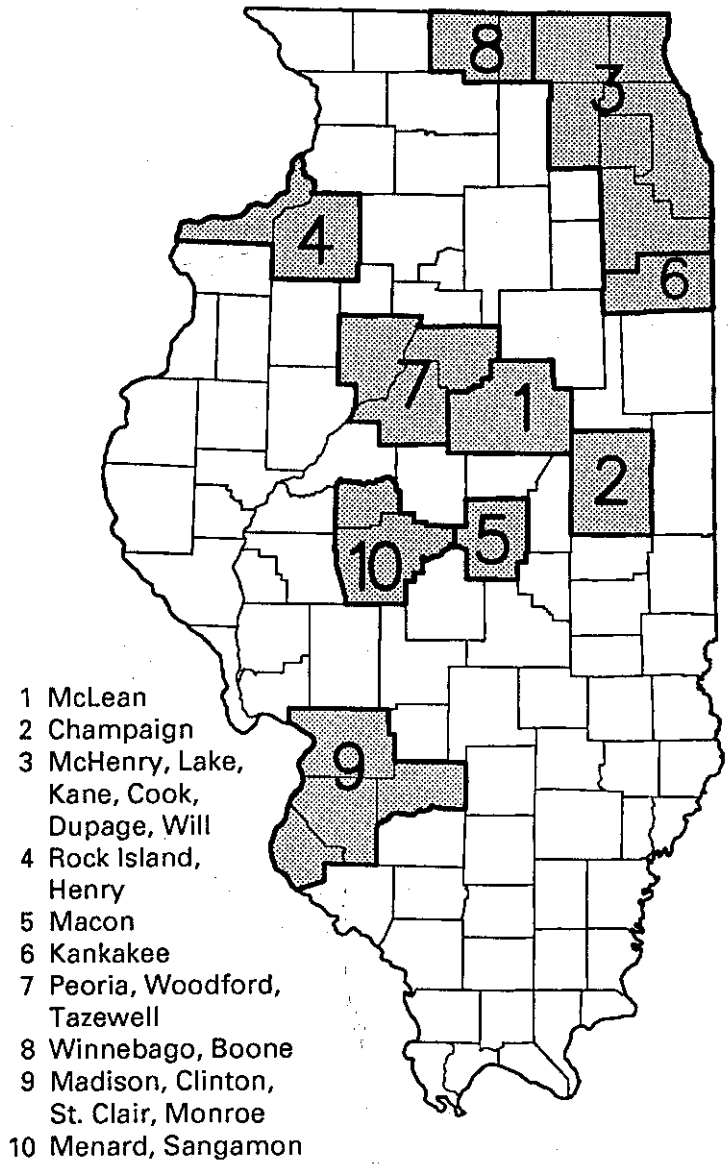

Figure 37. Locations of the Standard Metropolitan Statistical Areas

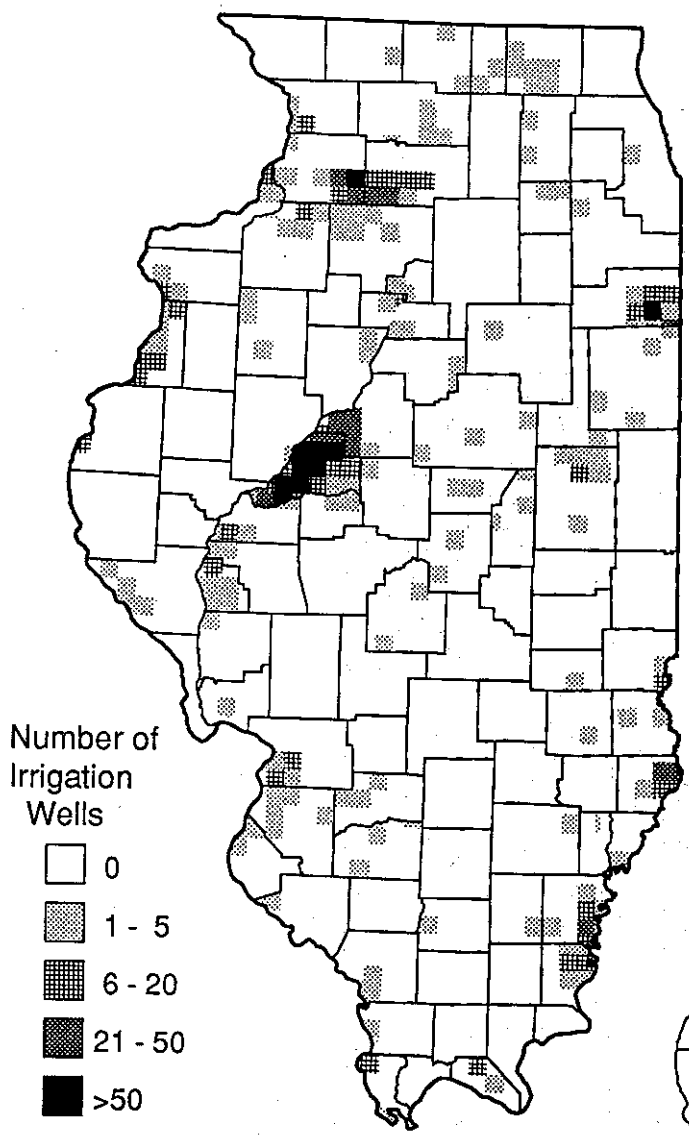

Figure 38. Density and distribution of irrigation wells

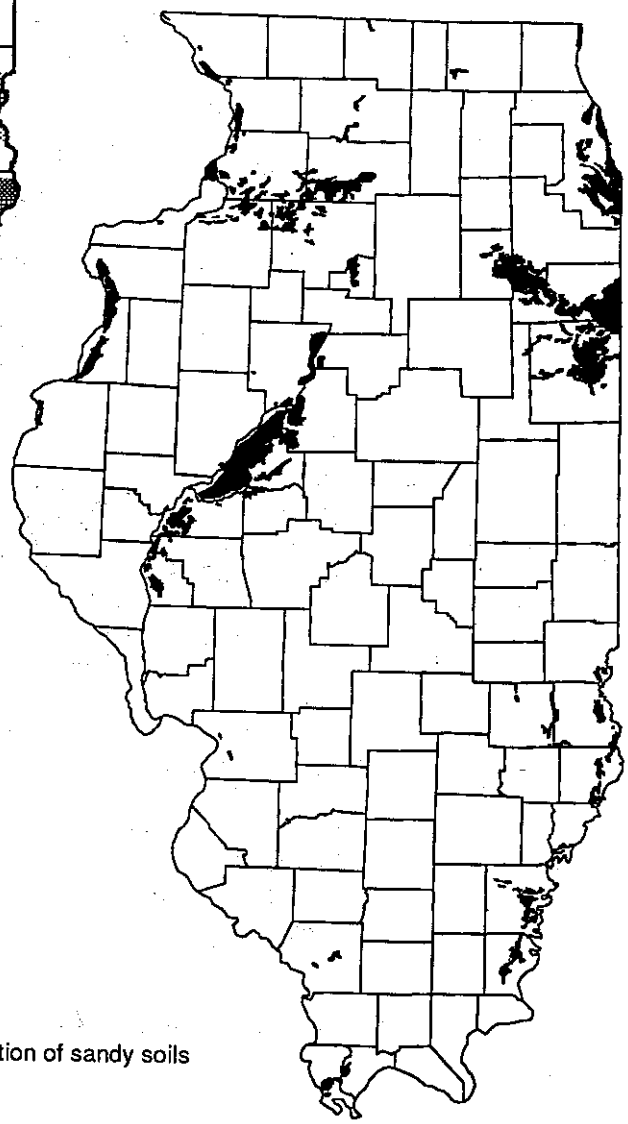

Figure 39. Distribution of sandy soils

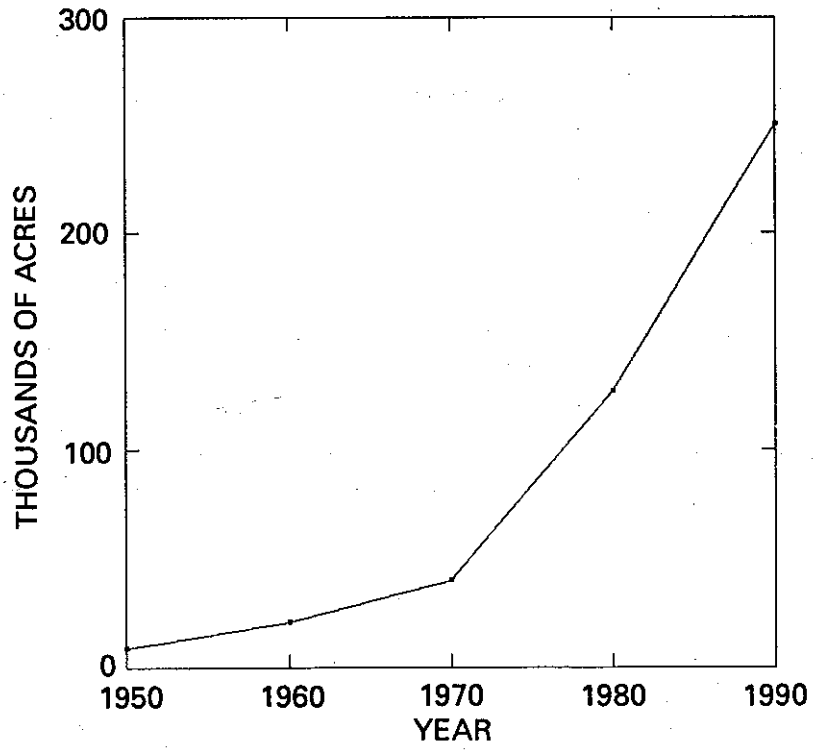

Figure 40. Changes in total irrigated acreage in Illinois, 1950–1990

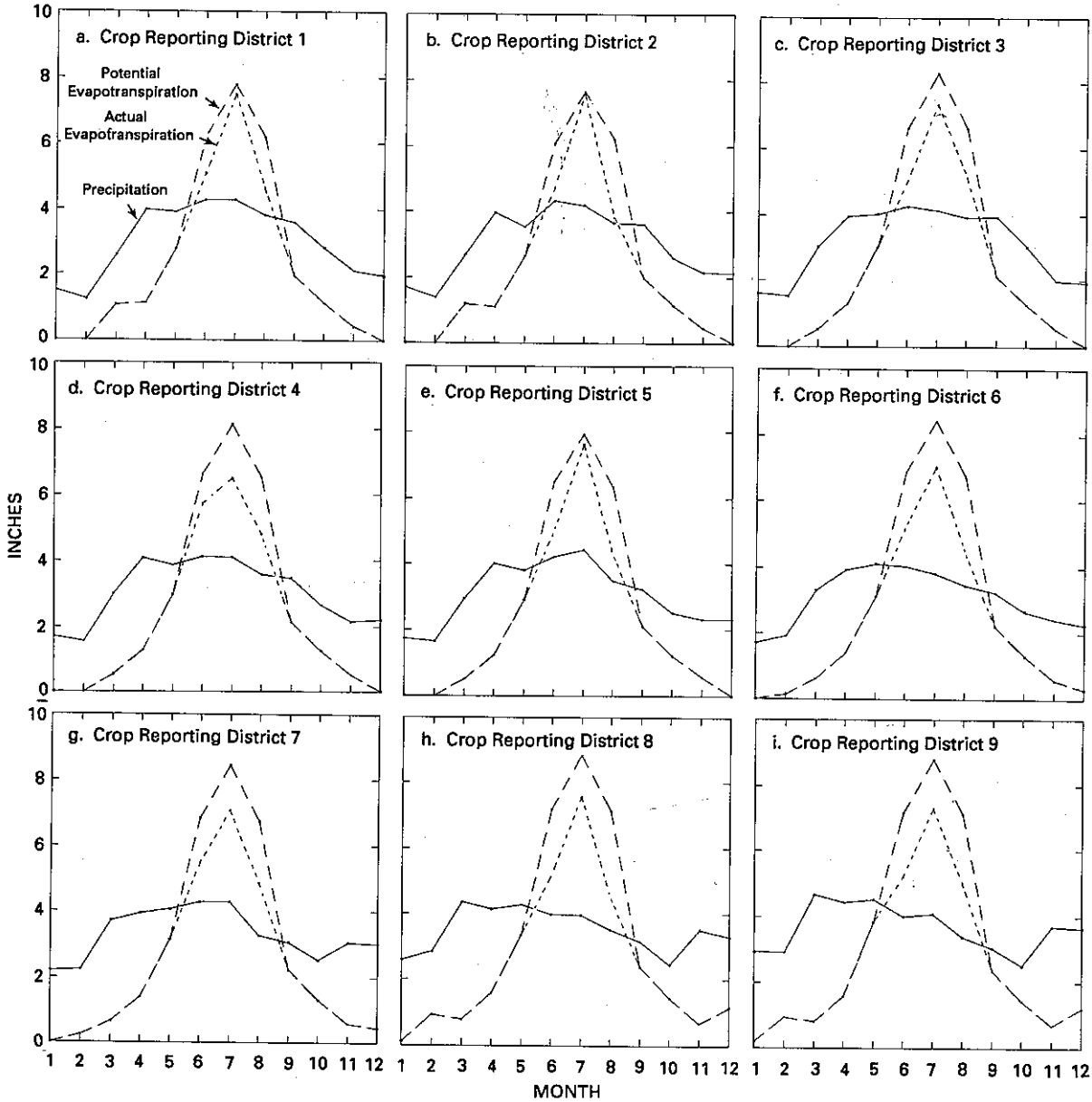

Figure 41. Average annual water budgets for the nine crop reporting districts

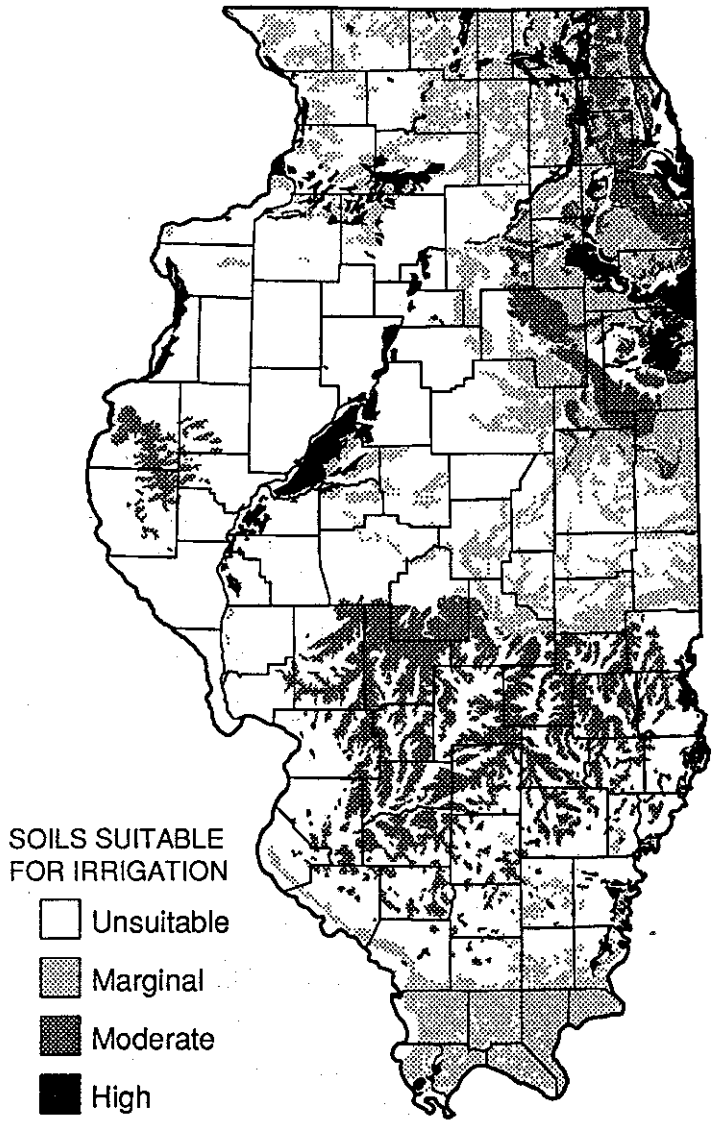

Figure 42. Soils considered unsuitable or marginally, moderately, or highly suitable for irrigation on the basis of average water available in the upper meter, subsoil drainage, and subsoil permeability

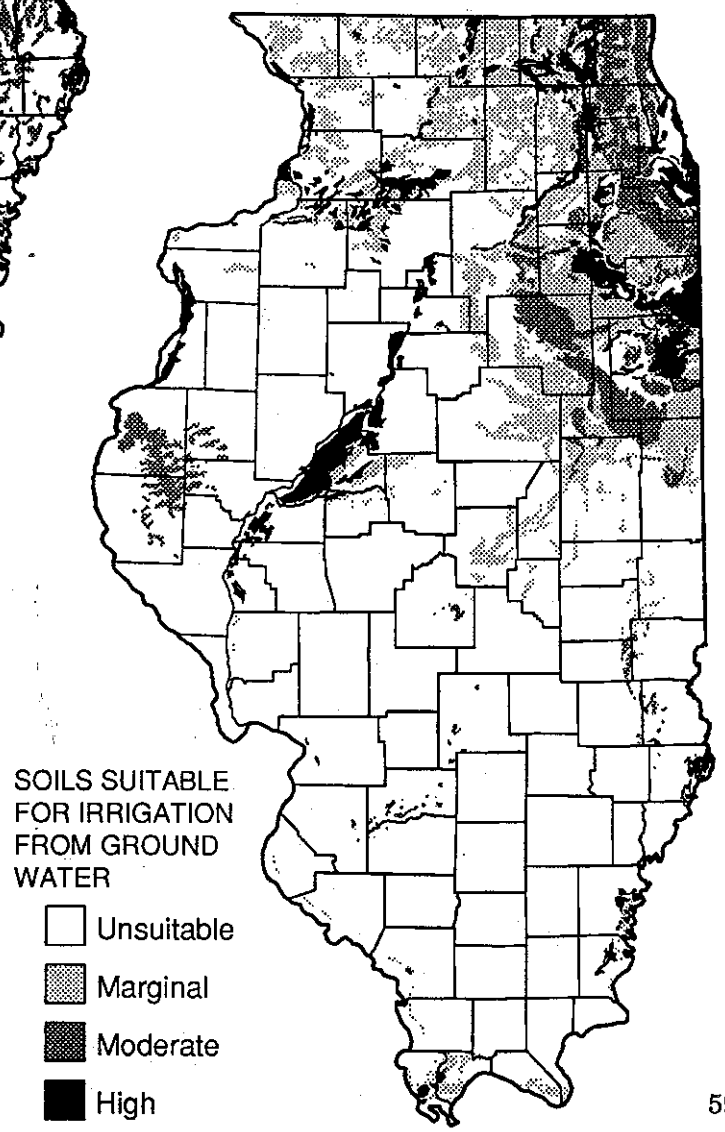

Figure 43. Soils considered unsuitable or marginally, moderately, or highly suitable for irrigation from ground-water resources, on the basis of availability of adequate ground-water resources (defined as 150,000 gallons per day per square mile)

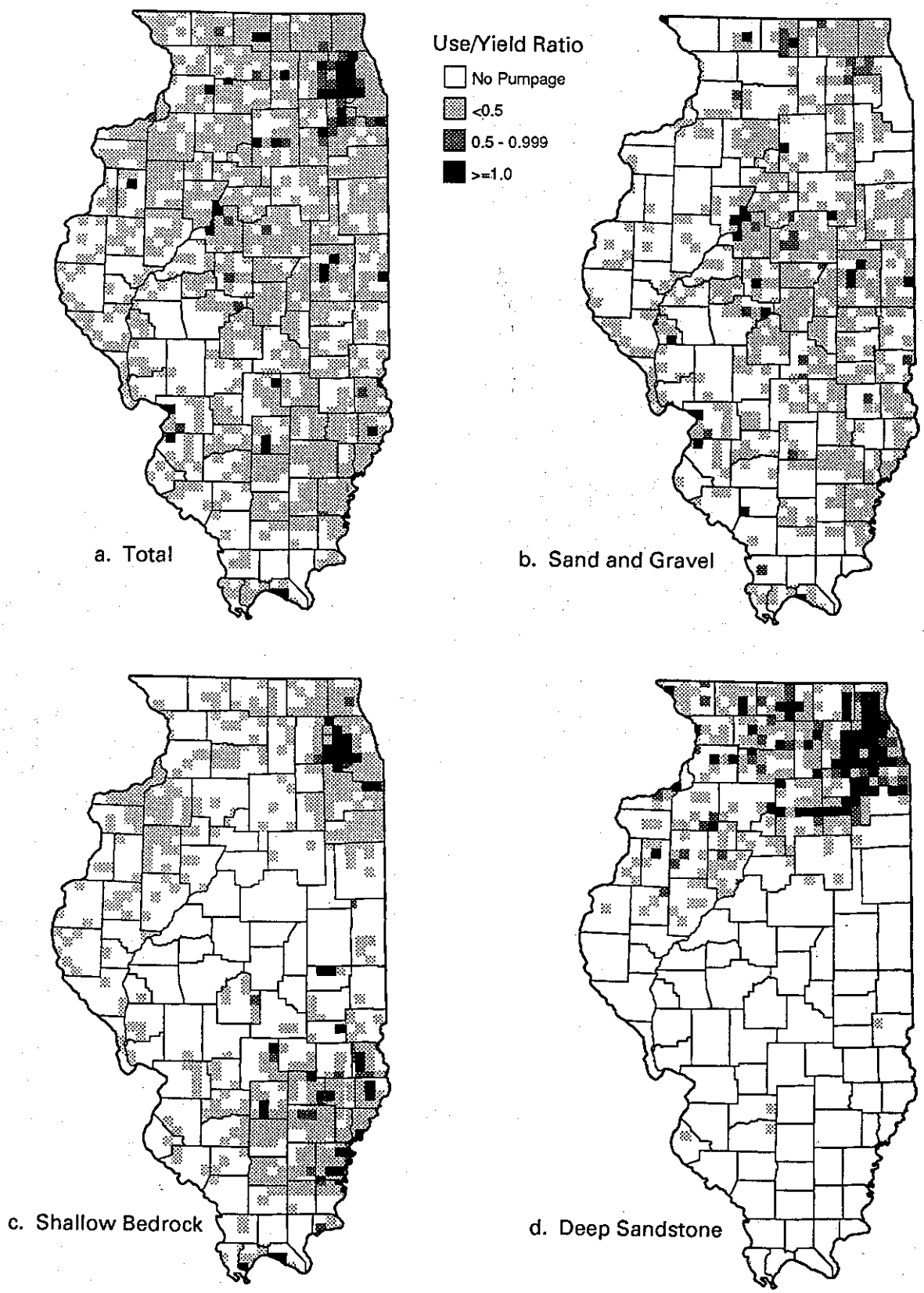

Figure 44. Use/yield ratio distribution for potential aquifer yields and 1980–1987 average of ground-water uses except irrigation

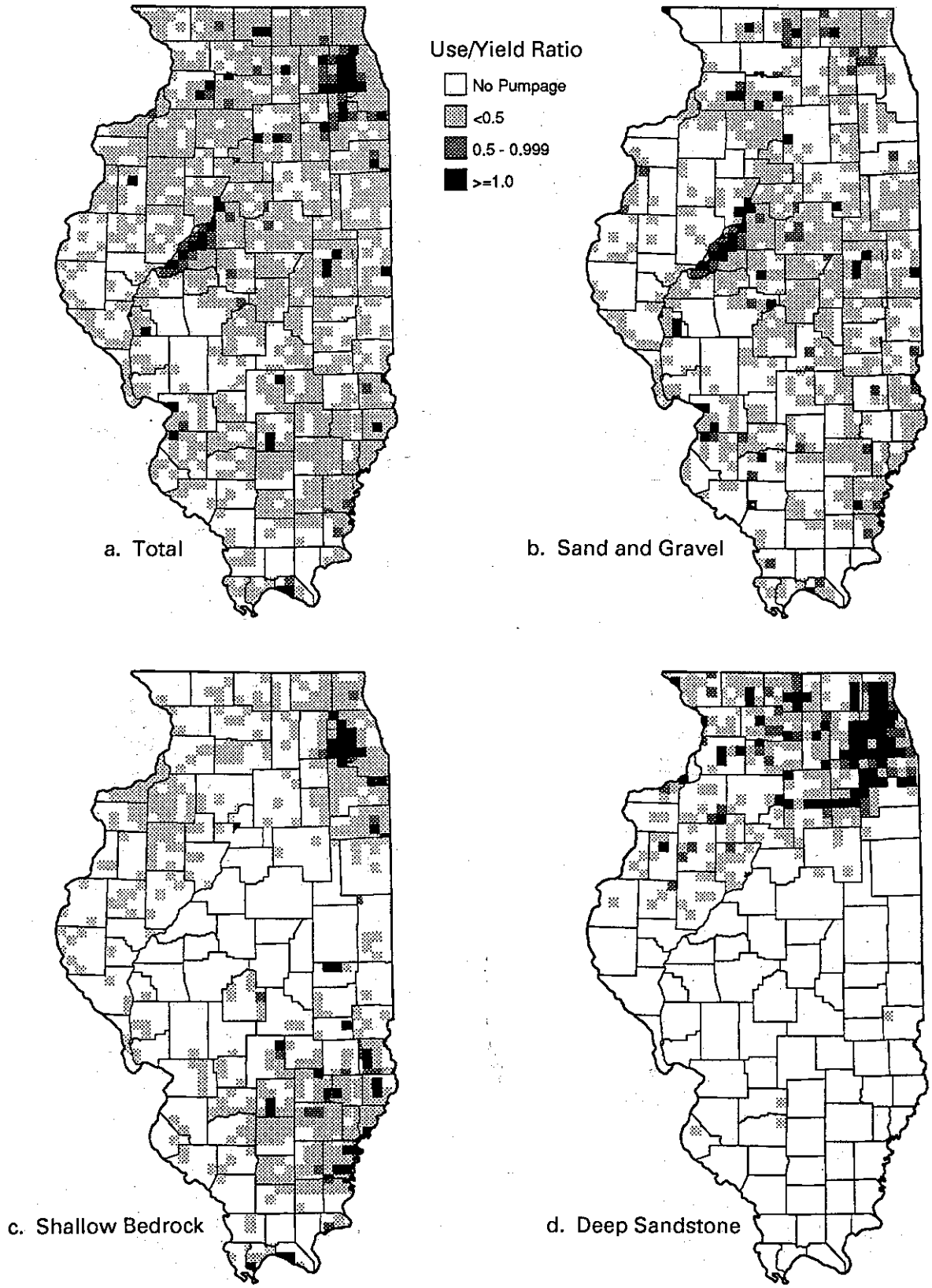

Figure 45. Use/yield ratio distribution for potential aquifer yields and 1980–1987 average of ground-water uses, including estimated irrigation pumpage for 30-year average weather conditions (seasonal impact)

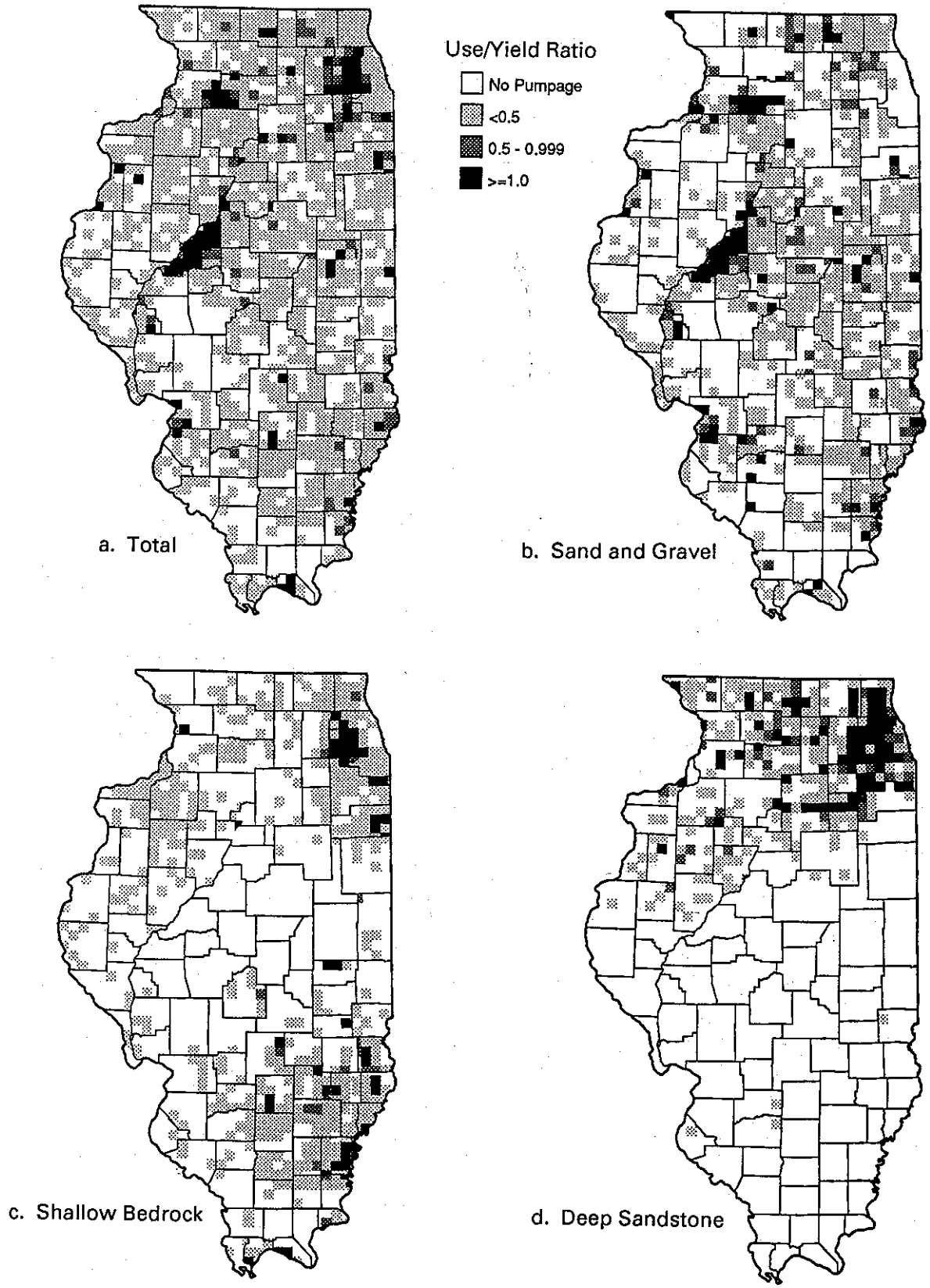

Figure 46. Use/yield ratio distribution for potential aquifer yields and 1980–1987 average of all ground-water uses, including estimated irrigation pumpage for drought (1988) weather conditions (seasonal impact)

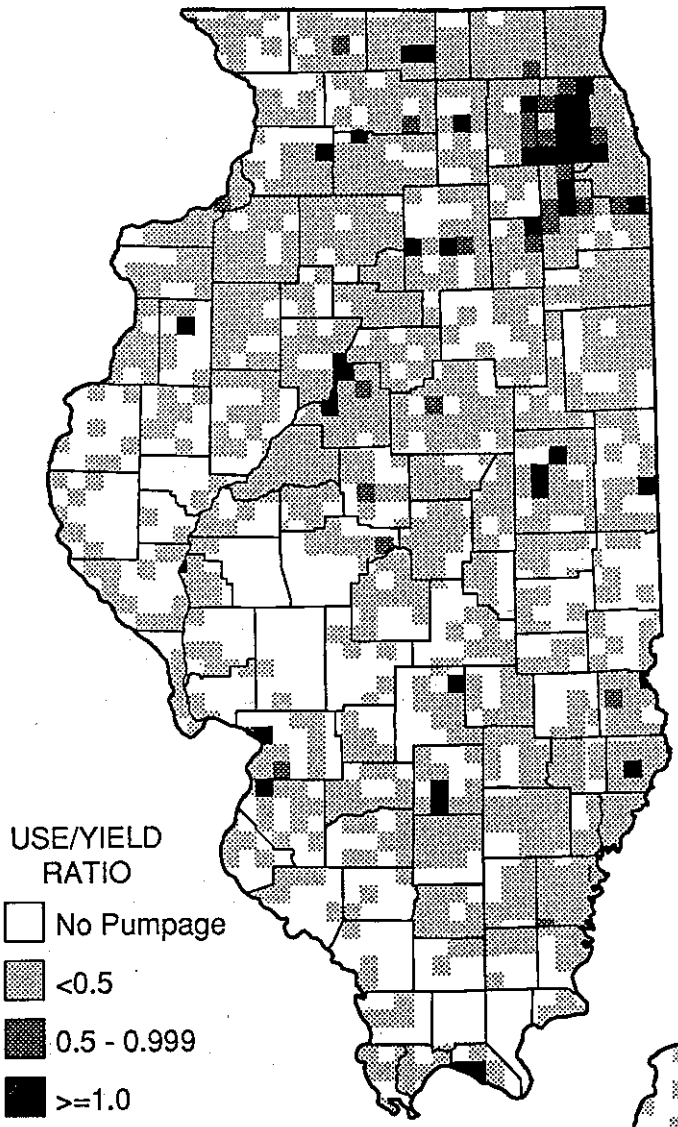

Figure 47. Use/yield ratio distribution for all aquifer potential yields and 1980–1987 average of all ground-water uses, including estimated irrigation pumpage for 30-year average weather conditions (annual impact)

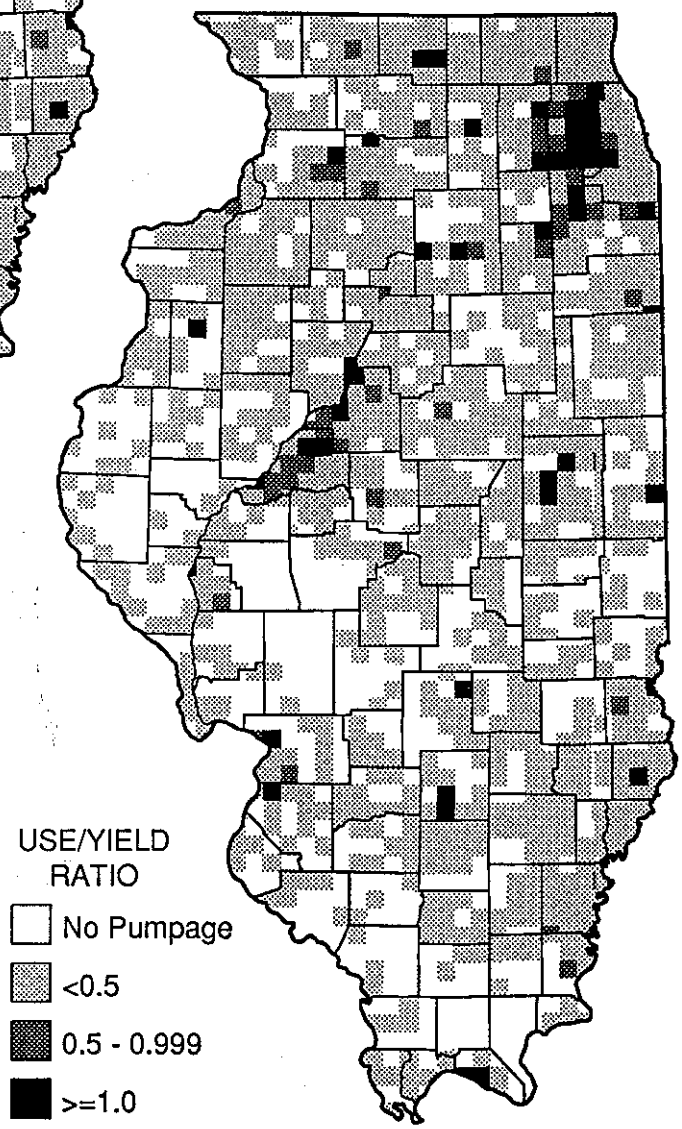

Figure 48. Use/yield ratio distribution for all aquifer potential yields and 1980-1987 average of all ground-water uses, including estimated irrigation pumpage for drought (1988) weather conditions (annual impact)

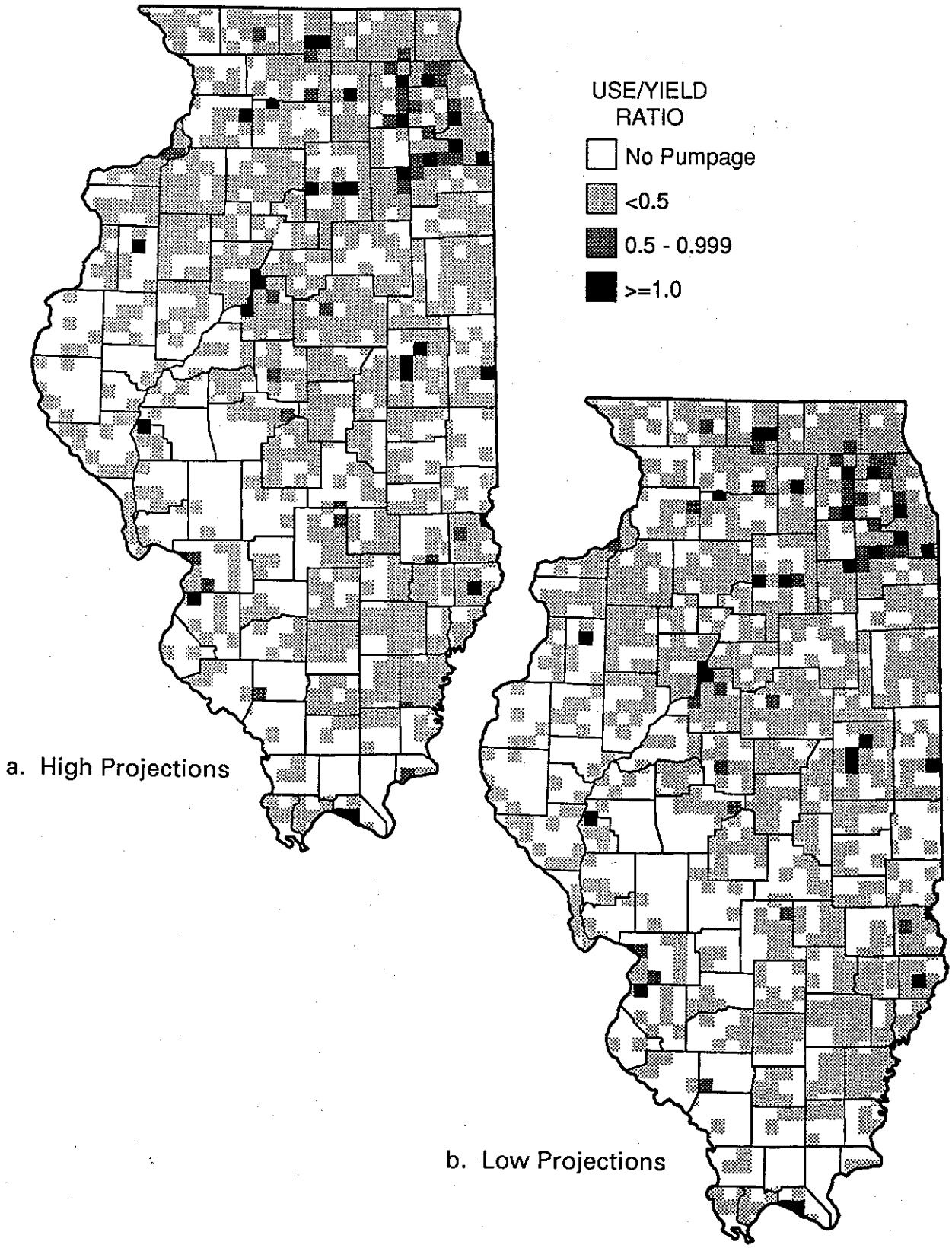

Figure 49. Use/yield ratio distribution for all aquifer potential yields and all projected ground-water uses, except irrigation, based on projections for self-supplied industrial uses

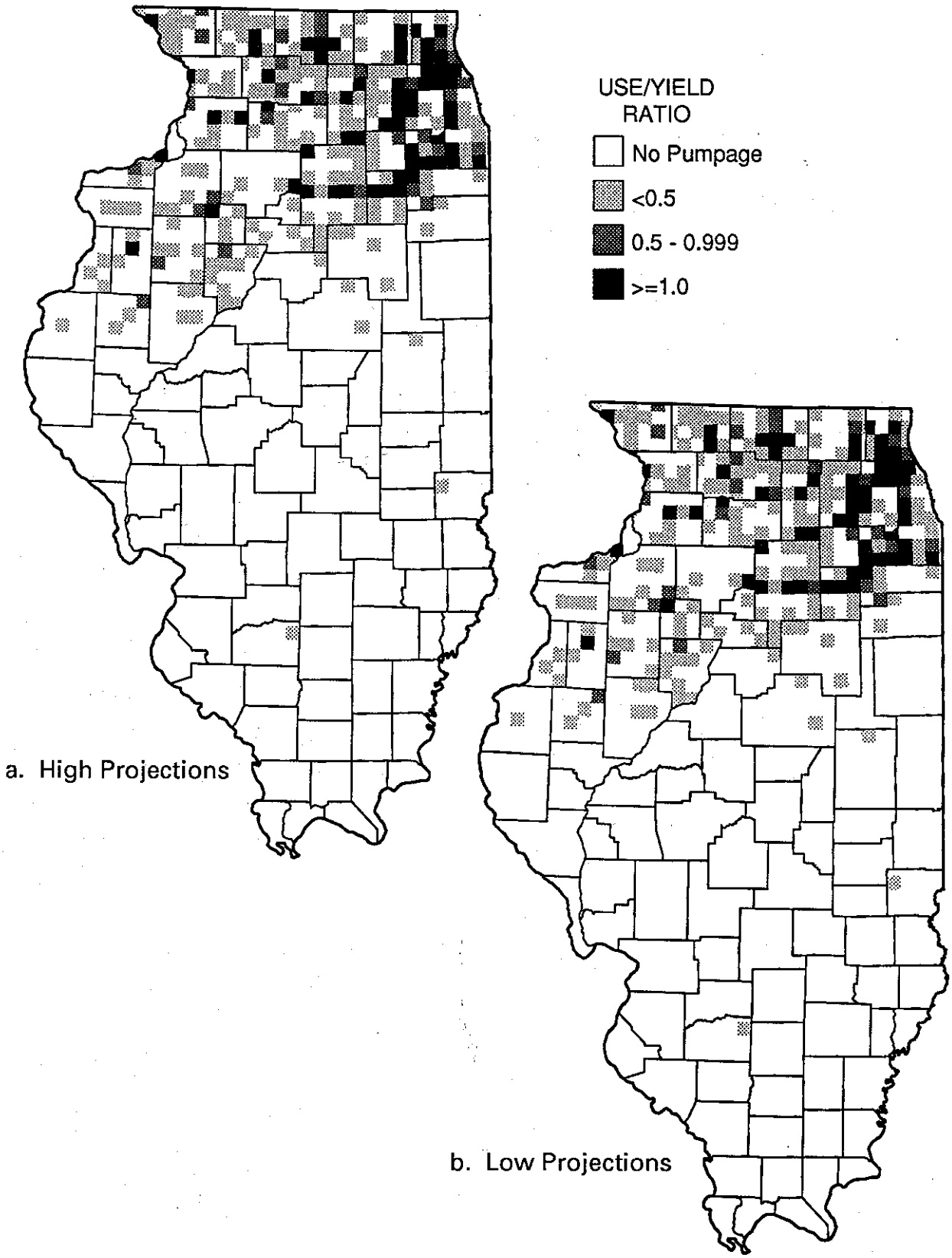

Figure 50. Use/yield ratio distribution for deep sandstone potential yields and all projected deep sandstone ground-water uses except irrigation, based on projections for self-supplied industrial uses

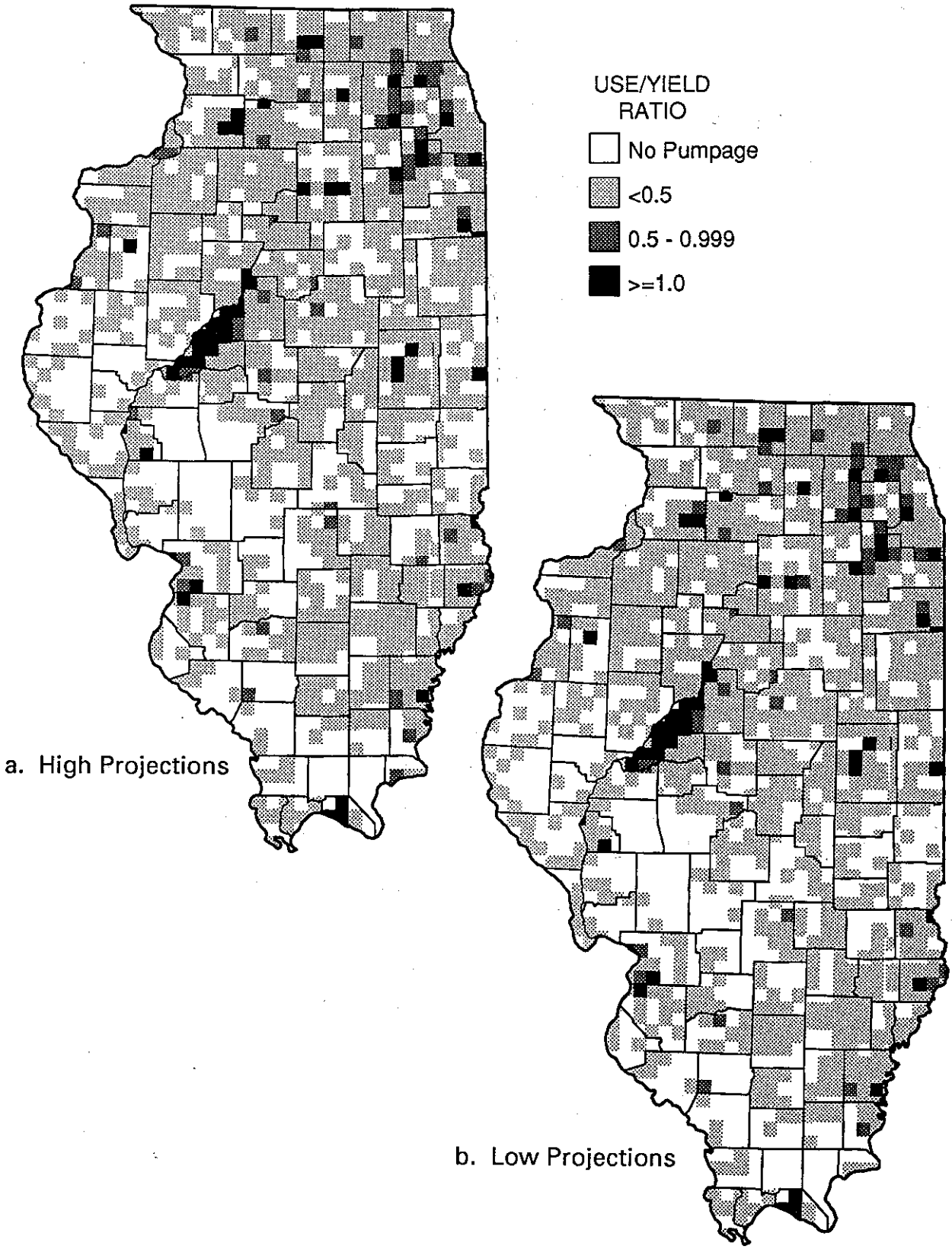

Figure 51. Use/yield ratio distribution for all aquifer potential yields and all projected ground-water uses, including expanded irrigation during average weather conditions, based on projections for self-supplied industrial uses (seasonal impacts)

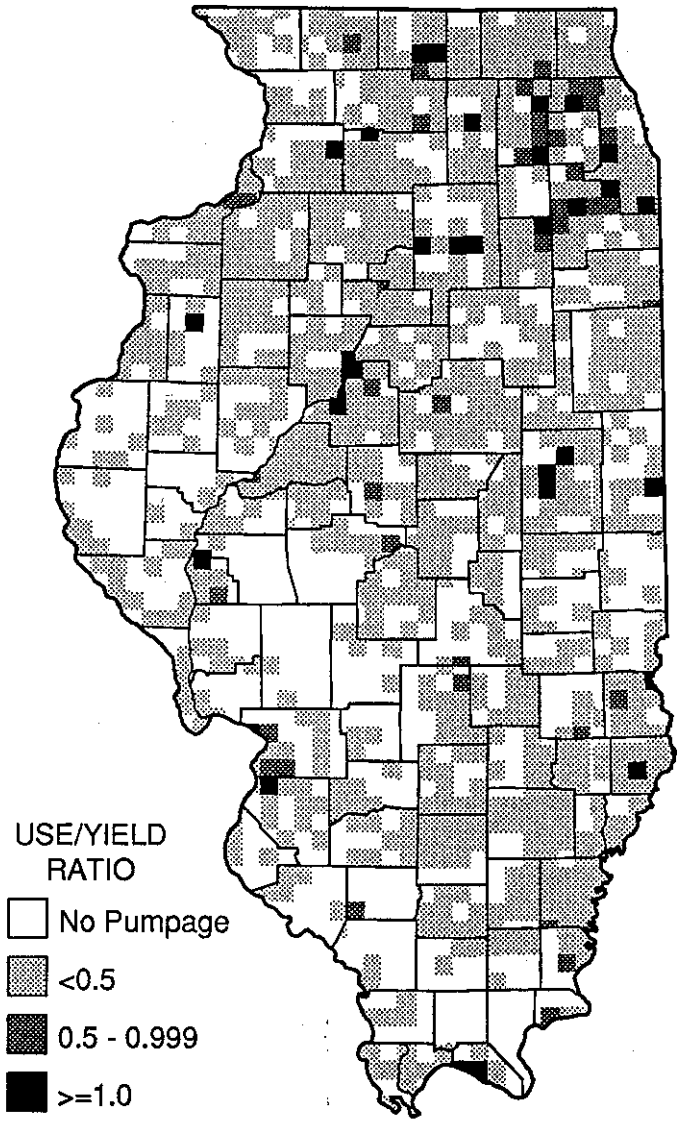

Figure 52. Use/yield ratio distribution for all aquifer potential yields and all projected ground-water uses including expanded irrigation during average weather conditions, based on the high projections for self-supplied industrial uses (annual impacts)

Table 1. Construction Features of Network Wells

Network well name	*I.D. number*	*Date started*	*Depth (ft)*	*Diameter (in.)*	*Type of well construction*	*Aquifier type**
Northwest						
Cambridge	00011	10/61	42	78	Dug	Unconsolidated
Galena	00021	9/63	25	36	Dug	Sandstone
Mt. Morris	00031	11/60	55	8	Drilled	Unconsolidated
Northeast						
Crystal Lake	00041	9/50	18	6	Drilled	Unconsolidated
Fermi Lab	00052	4/84	19.5	5	Drilled	Unconsolidated
West						
Good Hope	00072	6/80	30	36	Dug	Unconsolidated
Central						
Middletown	00081	11/57	38	36	Bored	Unconsolidated
Snicarte	00091	3/58	41	36	Dug	Sand
East						
Bondville	01120	4/82	21	6	Drilled	Unconsolidated
Swartz	00111	6/54	35	48	Dug	Unconsolidated
Watseka	00122	10/62	19.5	42	Dug	Unconsolidated
West-southwest						
Coffman	00061	3/56	28	36	Dug	Unconsolidated
Greenfield	00132	5/65	22	36	Dug	Unconsolidated
East-southeast						
Janesville	00143	4/69	15	60	Dug	Unconsolidated
St. Peter	00153	5/65	15	60	Dug	Unconsolidated
Southwest						
Elco	00163	3/84	23	36	Dug	Unconsolidated
Sparta	00171	11/60	27	36	Dug	Unconsolidated
SWS No. 2	00181	1/52	81	8	Drilled	Sand
Southeast						
Boyleston	00221	3/84	23	36	Dug	Unconsolidated
Dixon Springs	00191	1/55	9	36	Dug	Unconsolidated
S.E. IL College	00202	8/84	11	10	Drilled	Unconsolidated

**Most dug or bored wells receive water from thin sand lenses with fine-grained unconsolidated glacial materials. Unless specifically known from a driller's log or from units correlated from other wells in the area of similar depth, all network wells are completed in such materials. The principal exceptions are at Galena (the only bedrock well in the shallow network) and at Snicarte and SWS No. 2, which are known to be finished in major sand aquifers.*

Table 2. Ambient Ground-Water Quality in Illinois*

Parameter	*Drift deposits*	*Bedrock aquifers*
Total dissolved solids	400-600 mg/l	350-3,000 mg/l
Hardness	300-500 mg/l	150-1,000 mg/l
Sulfates	50-200 mg/l	25-600 mg/l
Nitrates	0-20 mg/l	0-5 mg/l
Chlorides	0-20 mg/l	0-1,000 mg/l
Iron	0.3-10 mg/l	0.3-5.0 mg/l

**From Gibb and O'Hearn (1980).*

Table 3. Total Ground-Water Withdrawals by Crop Reporting District
(Million gallons per day)

Crop reporting district	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
1	144.45	144.06	140.23	156.88	130.32	152.92	153.99	169.84
2	377.74	351.91	380.15	388.52	354.52	380.20	355.99	354.51
3	48.41	47.07	39.59	45.64	29.66	42.58	39.48	44.23
4	129.79	126.98	130.93	145.61	133.83	122.64	145.46	158.36
5	62.40	56.94	58.10	56.91	47.61	53.96	54.87	59.50
6	91.53	94.50	114.39	79.28	78.24	80.45	87.47	88.48
7	54.62	61.15	54.46	47.70	49.60	58.47	45.92	45.53
8	36.61	42.45	34.00	36.88	19.71	43.44	40.41	41.72
9	35.99	36.74	33.45	31.01	28.16	37.44	35.26	33.97

Table 4. Public Water Supply Ground-Water Withdrawals by Crop Reporting District
(Million gallons per day)

Crop reporting district	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
1	74.72	70.52	66.90	68.73	68.25	66.49	68.74	72.59
2	270.19	264.60	270.50	275.64	275.04	264.67	227.01	234.35
3	14.86	14.31	14.66	14.80	14.93	15.28	12.54	13.80
4	48.36	46.96	44.62	43.17	43.74	45.07	44.00	48.39
5	27.11	25.25	27.24	28.94	30.43	29.84	30.22	30.91
6	22.99	22.07	20.43	21.66	24.70	23.90	25.95	26.87
7	8.85	8.91	9.01	8.57	9.13	9.00	9.42	8.85
8	3.75	4.64	3.66	3.79	4.03	4.07	4.06	4.99
9	3.84	8.00	8.11	4.46	4.31	6.35	5.87	6.19

Table 5. Public Water Pumpage by County
(Million gallons per day)

County	*1980-1987 average*	*1995 adjusted pumpage*
Adams	1.301	1.263
Alexander	0.327	0.318
Bond	0.063	0.062
Boone	3.474	3.521
Brown	0.062	0.061
Bureau	3.485	3.402
Calhoun	0.517	0.507
Carroll	1.481	1.449
Cass	1.555	1.501
Champaign	19.023	18.819
Christian	1.393	1.369
Clark	1.283	1.269
Clay	0.219	0.223
Clinton	0.325	0.325
Cook*	72.096	50.518
Crawford	1.893	1.874
Cumberland	0.253	0.247
DeKalb	6.923	6.881
DeWitt	1.568	1.545
Douglas	1.084	1.058
DuPage*	76.020	6.808
Edgar	0.357	0.351
Edwards	0.025	0.026
Effingham	0.296	0.295
Fayette	0.132	0.131
Ford	1.412	1.393
Fulton	0.977	0.911
Gallatin	1.338	1.344
Greene	0.377	0.364
Grundy	2.264	2.288
Hamilton	0.020	0.020
Hancock	0.233	0.231
Hardin	0.125	0.123

Table 5. Continued

County	*1980-1987 average*	*1995 adjusted pumpage*
Henderson	6.564	6.553
Henry	4.054	3.911
Iroquois	2.037	2.009
Jackson	0.103	0.100
Jasper	0.375	0.372
Jersey	0.892	0.888
JoDaviess	2.224	2.217
Johnson	0.022	0.023
Kane	29.978	31.908
Kankakee	1.905	1.863
Kendall	1.771	1.774
Knox	1.316	1.265
Lake*	15.003	9.591
LaSalle	10.502	10.248
Lawrence	1.205	1.218
Lee	3.645	3.491
Livingston	1.640	1.621
Logan	3.593	3.536
McDonough	0.690	0.674
McHenry	11.602	12.229
McLean	4.933	4.934
Macon	1.128	1.115
Macoupin	0.018	0.018
Madison	11.026	11.029
Marion	0.025	0.025
Marshall	1.212	1.170
Mason	1.030	0.984
Massac	2.283	2.303
Menard	0.737	0.733
Mercer	0.936	0.932
Monroe	0.107	0.110
Montgomery	0.530	0.529
Morgan	0.079	0.078
Moultrie	0.438	0.438

Table 5. Concluded

County	*1980-1987 average*	*1995 adjusted pumpage*
Ogle	5.363	5.345
Peoria	16.439	15.879
Perry	0.047	0.048
Piatt	1.358	1.342
Pike	0.781	0.760
Pulaski	0.665	0.655
Putnam	0.426	0.418
Randolph	0.833	0.829
Richland	0.109	0.110
Rock Island	2.730	2.710
St. Clair	0.192	0.163
Saline	0.006	0.006
Sangamon	2.189	2.196
Schuyler	0.577	0.550
Scott	4.161	4.047
Shelby	1.192	1.175
Stark	0.472	0.440
Stephenson	5.503	5.500
Tazewell	13.503	13.131
Union	1.398	1.403
Vermilion	1.372	1.337
Wabash	0.804	0.812
Warren	2.678	2.603
Washington	0.105	0.104
Wayne	0.130	0.131
White	1.224	1.230
Whiteside	4.714	4.597
Will*	30.627	31.605
Winnebago	35.072	34.910
Woodford	1.533	1.521
TOTALS	461.707	365.941

* *Adjusted for planned Lake Michigan water allocations.*

Table 6. Average Daily Ground-Water Uses for Largest Water-Using Industries, 1980-1987

Industry	*SIC**	*Average (mgd)*	*Minimum (mgd)*	*Maximum (mgd)*	*Standard deviation*
Food	20	27.836	22.478	33.653	4.091
Paper	26	9.378	8.125	11.644	0.962
Chemical	28	32.717	29.163	36.952	2.798
Petroleum	29	18.303	10.691	21.657	3.633
Rubber	30	8.887	8.229	10.241	0.625
Stone	32	4.595	1.252	6.168	2.014
Primary metal	33	17.665	14.283	20.884	2.250
Fabricated metal	34	4.533	2.932	7.733	1.939
Machinery	35	5.101	4.481	5.797	0.455
Electronic	36	3.315	2.948	3.630	0.231
Instrument	38	7.203	6.421	8.835	0.737

**Standard Industrial Classification*

Table 7. Self-Supplied Industrial Ground-Water Withdrawals by Crop Reporting District
(Million gallons per day)

Crop reporting district	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*
1	24.95	27.71	29.93	29.98	28.87	35.02	24.46	31.09
2	53.02	47.45	52.14	50.60	48.85	48.00	43.01	43.94
3	11.02	8.88	9.69	10.60	9.83	11.23	11.38	11.10
4	18.47	17.22	15.65	18.35	23.38	23.52	15.09	20.96
5	13.00	9.47	8.53	9.38	10.14	10.37	8.79	10.55
6	40.59	34.85	74.77	40.00	46.85	39.06	42.94	41.23
7	26.45	31.30	24.32	22.96	33.12	32.52	6.09	17.01
8	11.28	14.11	13.30	11.84	12.55	12.32	13.45	14.82
9	18.28	17.24	17.75	18.19	19.05	19.48	12.48	17.73

Table 8. Industrial Ground-Water Use Adjustments with Method A

Industry	*SIC**	*1980-1987 average ground-water use (mgd)*	*Percent change for ground water*	*Ground-water use*	
				Plus 1 std deviation (mgd)	*Minus 1 std deviation (mgd)*
Food	20	27.836	15	31.93	23.75
Paper	26	9.378	10	10.34	8.42
Chemical	28	32.717	9	35.52	29.92
Petroleum	29	18.303	18	21.94	14.67
Stone	32	4.595	44	6.61	2.58
Primary metal	33	17.665	13	19.92	15.42
Fabricated metal	34	4.533	43	6.47	2.59
Machinery	35	5.101	9	5.56	4.65
Electronic	36	3.315	7	3.55	3.08
Instrument	38	7.203	10	7.94	6.47

*Standard Industrial Classification

Table 9. Industrial Ground-Water Use Adjustments with Method B

Industry	*SIC**	*1980-1987 average ground-water use (mgd)*	*Percent change for ground water*	*Ground-water use*	
				Plus 1 std deviation (mgd)	*Minus 1 std deviation (mgd)*
Food	20	62.469	16	32.35	23.33
Paper	26	18.235	6	9.90	8.86
Chemical	28	74.307	10	36.03	29.41
Petroleum	29	43.303	21	22.13	14.47
Stone	32	20.031	18	5.42	3.77
Primary metal	33	209.826	30	22.97	12.37
Fabricated metal	34	10.706	19	5.41	3.65
Machinery	35	21.763	28	6.54	3.66
Electronic	36	4.064	1	3.35	3.29

*Standard Industrial Classification

Table 10. Values of R^2 from Bivariate Correlations between Industrial Ground-Water Use and Indices of Industrial Productivity

Industry	*SIC**	*Time*	*Employment*	*Output*	*Productivity*
Food	20	.099	.124	.051	.069
Textile	22	.322	.120	.185	.269
Apparel	23	.196	.136	.229	.090
Lumber	24	.190	.002	.328	.085
Furniture	25	.745	.526	.380	.510
Paper	26	.058	.124	.044	.122
Printing	27	.170	.058	.153	.195
Chemical	28	.441	.122	.518	.441
Petroleum	29	.069	.733	.781	.032
Rubber	30	.383	.320	.247	.166
Stone	32	.650	.831	.270	.417
Primary metal	33	.147	.162	.159	.019
Fabricated metal	34	.607	.360	.110	.680
Machinery	35	.344	.769	.041	.288
Electronic	36	.247	.244	.091	.207
Transportation	37	.880	.542	.282	.655
Instrument	38	.374	.330	.129	.420

**Standard Industrial Classification*

Table 11. Results from Multivariate Correlations between Industrial Ground-Water Use and Indices of Industrial Productivity for Largest Water-Using Industries

Industry	*SIC*	R^2	*Probability**	*Standard error*
Food	20	.210	.789	4.808
Paper	26	.912	.014	0.377
Chemical	28	.536	.335	2.522
Petroleum	29	.921	.011	1.348
Rubber	30	.358	.579	0.662
Stone	32	.901	.018	0.837
Primary metal	33	.169	.844	2.713
Fabricated metal	34	.711	.140	1.378
Machinery	35	.943	.006	0.143
Electronic	36	.667	.183	0.177
Instrument	38	.667	.183	0.563

**Probability of obtaining the given value of R^2 with a completely random set of data*

Table 12. Results from Multivariate Correlations between Total Industrial Water Use and Indices of Industrial Productivity for Largest Water-Using Industries

Industry	*SIC*	R^2	*Probability**	*Standard error*
Food	20	.929	.004	3.563
Paper	26	.925	.010	0.364
Chemical	28	.639	.213	5.980
Petroleum	29	.972	.001	2.002
Stone	32	.901	.018	1.476
Primary metal	33	.420	.492	63.420
Fabricated metal	34	.815	.060	1.183
Machinery	35	.718	.134	4.324
Instrument	36	.701	.148	0.291

**Probability of obtaining the given value of R^2 with a completely random set of data*

Table 13. Industrial Ground-Water Use Adjustments with Method C

Industry	*SIC*	*1980-1987 average water use (mgd)*	*1995 adjusted water use (mgd)*	*1995 adjusted ground-water use (mgd)*
Food	20	62.469	236.01	106.00
Paper	26	18.235	36.11	18.00
Chemical	28	74.307	-36.87	-16.22
Petroleum	29	43.303	-16.67	-7.00
Stone	32	20.031	-1.50	-0.35
Primary metal	33	209.826	139.92	11.19
Fabricated metal	34	10.706	9.24	3.88
Machinery	35	21.763	18.05	4.15
Electronic	36	4.064	-1.12	-0.92
Instrument	38	7.203	18.49	18.49

Table 14. 1986 Illinois Manufacturing and Total Self-Supplied Industrial Pumpage, with Adjustments
(Million gallons per day)

	Manufacturing	*Total SSI*
1986	138.5	192.910
Adjusted (+)	151.9	221.408
Adjusted (-)	112.3	172.992

Table 15. Present and Projected Self-Supplied Industrial Ground-Water Withdrawals
(Million gallons per day)

County	*1980-1987 average*	*1986*	*Adjusted high*	*Adjusted low*
Adams	10.212	11.284	12.750	9.813
Alexander	0.018	0.027	0.039	0.015
Bond	0.031	0.003	0.003	0.002
Boone	0.652	0.145	0.169	0.118
Bureau	2.018	0.121	0.128	0.104
Calhoun	0.043	0.000	0.000	0.000
Carroll	2.453	2.317	2.526	2.108
Cass	0.914	0.817	0.939	0.694
Champaign	5.191	4.235	4.695	3.750
Christian	0.707	0.509	0.564	0.454
Clark	0.175	0.231	0.255	0.207
Clay	0.982	0.824	0.912	0.736
Clinton	0.566	0.392	0.432	0.353
Coles	0.181	0.119	0.133	0.105
Cook	14.552	12.432	13.737	11.204
Crawford	4.201	4.501	4.870	4.139
Cumberland	0.230	0.196	0.217	0.175
DeKalb	0.500	0.427	0.431	0.321
Douglas	0.063	0.056	0.062	0.051
DuPage	2.058	1.742	1.593	1.298
Edgar	0.047	0.001	0.002	0.000
Edwards	0.530	0.485	0.639	0.431
Effingham	0.284	0.227	0.250	0.000
Fayette	4.150	1.282	1.413	1.151
Ford	0.016	0.000	0.000	0.000
Franklin	0.410	0.278	0.409	0.244
Fulton	0.233	0.082	0.100	0.070
Gallatin	1.255	1.076	1.184	0.968
Grundy	8.444	8.462	8.736	7.260
Hamilton	0.671	1.088	1.198	0.987
Hardin	1.180	1.089	1.198	0.980
Henry	0.031	0.021	0.029	0.012
Iroquois	0.102	0.085	0.096	0.075

Table 15. Continued

County	1980-1987 average	1986	Adjusted high	Adjusted low
Jackson	0.060	0.058	0.075	0.045
Jasper	0.660	1.103	1.214	0.992
Jefferson	0.500	0.858	0.953	0.775
Jersey	0.006	0.000	0.000	0.000
JoDaviess	1.757	1.510	1.592	1.303
Kane	2.060	1.856	1.970	1.611
Kankakee	0.461	0.873	1.021	0.832
Kendall	0.662	0.684	0.721	0.616
Knox	0.002	0.000	0.000	0.000
Lake	2.449	1.974	2.730	2.208
LaSalle	5.911	5.397	5.968	4.815
Lawrence	6.209	7.715	8.487	6.944
Lee	0.272	0.072	0.090	0.049
Livingston	0.062	0.053	0.061	0.046
Logan	0.040	0.008	0.010	0.006
McDonough	0.016	0.015	0.021	0.008
McHenry	2.645	2.285	2.496	1.965
McLean	0.518	0.228	0.263	0.193
Macon	0.005	0.001	0.001	0.000
Macoupin	0.001	0.000	0.000	0.000
Madison	38.155	35.846	40.933	30.760
Marion	7.959	0.654	0.729	0.585
Marshall	1.082	1.033	1.126	0.940
Mason	0.796	1.081	1.199	0.979
Massac	5.725	5.672	10.328	6.001
Monroe	0.003	0.001	0.002	0.000
Montgomery	0.027	0.000	0.000	0.000
Morgan	5.117	5.676	6.143	5.128
Ogle	1.579	1.312	1.351	1.075
Peoria	10.257	7.275	9.393	7.308
Perry	0.335	1.276	1.404	1.148
Piatt	1.345	1.267	1.383	1.152
Pike	0.041	0.057	0.063	0.051
Pulaski	0.021	0.000	0.000	0.000

Table 15. Concluded

County	*1980-1987 average*	*1986*	*Adjusted high*	*Adjusted low*
Putnam	0.178	0.187	0.094	0.079
Randolph	0.004	0.001	0.002	0.000
Richland	0.971	0.906	1.000	0.813
Rock Island	10.220	9.817	10.681	8.501
St. Clair	11.532	11.270	12.397	10.143
Saline	0.346	0.351	0.387	0.315
Shelby	0.313	0.288	0.340	0.236
Stephenson	2.030	2.032	2.247	1.688
Tazewell	6.370	5.441	6.407	4.870
Union	0.006	0.003	0.003	0.002
Vermilion	2.849	2.273	3.395	2.510
Wabash	1.439	0.382	0.420	0.344
Washington	0.387	0.345	0.390	0.318
Wayne	2.226	1.733	1.921	1.553
White	3.666	2.784	3.083	2.495
Whiteside	2.323	2.335	2.807	1.864
Will	8.555	7.601	8.242	7.055
Williamson	0.035	0.029	0.035	0.023
Winnebago	6.147	4.732	6.290	4.737
Woodford	0.004	0.004	0.006	0.003
TOTAL	219.439	192.910	221.408	172.992

Table 16. Irrigation Characteristics by County

County	*No. of irrigation systems*	*No. of irrigation wells*	*No. of irrigated acres*	*No. of acres irrigated from ground water*
Adams	1	1	140	140
Alexander	10	10	704	704
Boone	2	2	256	256
Bureau	18	18	2,267	2,267
Carroll	23	18	2,804	2,294
Cass	27	23	3,222	2,822
Champaign	15	15	2,659	2,659
Christian	2	2	192	192
Clark	40	40	5,387	5,387
Clinton	4	4	544	544
Cook	1	1	136	136
Crawford	3	3	322	322
Cumberland	2	1	15	10
DeWitt	5	5	588	588
Edwards	1	1	120	120
Effingham	3	0	200	0
Fayette	3	0	248	0
Ford	2	2	300	300
Franklin	8	1	625	3
Fulton	5	5	680	680
Gallatin	32	32	5,761	5,761
Greene	7	7	1,206	1,206
Hamilton	1	1	136	136
Hancock	10	10	1,162	1,162
Henderson	46	46	5,155	5,155
Henry	22	22	1,844	1,844
Iroquois	6	4	627	355
Jackson	7	2	775	460
Jasper	2	1	30	15
Jersey	1	1	3	3
Kane	4	3	530	360
Kankakee	152	149	12,380	12,210
Kendall	4	4	430	430
Knox	3	3	30	30

Table 16. Continued

County	No. of irrigation systems	No. of irrigation wells	No. of irrigated acres	No. of acres irrigated from ground water
Lawrence	74	74	7,154	7,154
Lee	96	96	11,382	11,382
Livingston	4	1	343	15
Logan	2	2	272	272
McHenry	23	13	2,716	1,801
McLean	4	4	247	247
Macon	5	2	74	44
Madison	19	19	2,148	2,148
Marshall	16	15	1,607	1,577
Mason	857	857	90,831	90,831
Massac	12	11	1,533	1,509
Menard	4	4	502	502
Mercer	26	26	2,881	2,881
Monroe	16	11	1,522	1,035
Morgan	3	3	635	635
Ogle	10	10	1,218	1,218
Peoria	10	4	1,005	505
Perry	8	0	1,380	0
Piatt	4	4	421	421
Pike	10	10	1,385	1,385
Putnam	7	7	642	642
Randolph	1	1	136	136
Richland	3	0	15	0
Rock Island	15	15	2,176	2,176
St. Clair	21	9	1,351	598
Sangamon	5	0	183	0
Schuyler	4	0	161	0
Scott	13	13	2,644	2,644
Shelby	1	0	100	0
Stephenson	1	1	10	10
Tazewell	183	183	25,989	25,989
Union	6	2	290	160
Wabash	2	2	390	390
Warren	1	0	2	0

Table 16. Concluded

County	No. of irrigation systems	No. of irrigation wells	No. of irrigated acres	No. of acres irrigated from ground water
Washington	11	3	1,196	401
Wayne	3	3	390	390
White	57	56	8,419	8,259
Whiteside	172	172	22,154	22,154
Will	3	3	408	408
Winnebago	9	7	1,015	648
Woodford	3	2	467	307
TOTALS	2,196	2,082	248,872	239,425

Table 17. Reported Irrigated Crops and Acreages

Irrigated crop	Acreage	Irrigated crop	Acreage	Irrigated crop	Acreage
Corn	55,306	Cabbage	280	Other melons	43
Soybeans	29,589	Tomatoes	269	Cut flowers	40
Seed corn	9,016	Gladiolis	250	Indian corn	40
Popcorn	7,558	Peppers	197	Oats	32
Green beans	2,338	Watermelon	190	Cauliflower	25
Sod	2,510	Apples	159	Blackberries	22
Sweet corn	2,027	Peaches	143	Shallots	20
Peas	1,175	Onions	140	Raspberries	15
Wheat	1,165	Chives	140	Spinach	15
Alfalfa/hay	1,044	Strawberries	121	Sweet potatoes	5
Potatoes	904	Muskmelon	101	Chrysanthemums	3
Pumpkins	581	Herbs	90	Christmas trees	2
Ornamental nursery crops	535	Seed soybeans	80	Nut trees	2
Cucumbers/pickles	453	Blueberries	65	China cabbage	1
Vegetables (misc.)	371	Turnip greens	50	Asparagus	1
Horseradish	360				

Table 18. 30-Year Mean Precipitation (Inches) and Temperature (°F) and 1988 Precipitation and Temperature, by Crop Reporting District

	J	*F*	*M*	*A*	*M*	*J*	*J*	*A*	*S*	*O*	*N*	*D*
CRD 1												
Mean precip.	1.49	1.22	2.58	3.97	3.91	4.28	4.28	3.82	3.59	2.82	2.10	1.95
Mean temp.	19.42	24.71	35.29	49.78	60.87	70.07	73.96	71.85	64.27	53.08	38.70	26.00
1988 precip.	1.90	0.76	2.05	2.22	1.97	0.74	1.20	3.48	1.82	2.59	3.81	1.43
1988 temp.	17.06	20.48	37.22	48.92	62.96	72.14	76.64	76.46	65.30	46.04	39.20	26.96
CRD 2												
Mean precip.	1.72	1.39	2.69	3.95	3.52	4.32	4.18	3.65	3.61	2.59	2.16	2.14
Mean temp.	21.22	26.01	35.89	49.78	59.86	69.57	73.56	72.07	64.98	53.78	39.69	27.50
1988 precip.	1.99	1.33	2.28	2.69	1.64	1.14	2.49	3.75	2.10	3.04	5.16	2.05
1988 temp.	17.78	21.74	37.22	48.02	61.52	72.14	76.28	76.82	65.66	46.22	40.82	27.50
CRD 3												
Mean precip.	1.58	1.50	3.03	3.95	4.03	4.27	4.14	3.93	3.94	3.04	1.98	1.92
Mean temp.	23.22	28.71	38.70	52.77	63.07	72.16	76.15	73.96	66.56	55.47	41.29	29.50
1988 precip.	1.85	0.74	1.91	1.52	2.15	2.02	0.70	3.10	1.74	1.42	3.63	1.56
1988 temp.	22.64	23.90	40.10	51.80	65.30	73.94	77.90	78.62	67.82	48.74	41.18	30.20
CRD 4												
Mean precip.	1.69	1.54	3.01	4.08	3.86	4.12	4.10	3.58	3.46	2.66	2.15	2.22
Mean temp.	23.41	28.51	38.79	52.48	62.87	72.07	84.45	73.45	66.76	55.27	41.20	29.50
1988 precip.	1.89	1.02	2.82	1.84	1.51	0.73	0.78	2.69	1.96	1.86	4.53	2.51
1988 temp.	22.64	23.90	39.74	51.44	64.76	73.22	77.54	77.90	67.10	48.02	41.36	29.12
CRD 5												
Mean precip.	1.73	1.64	2.94	4.00	3.80	4.21	4.42	3.48	3.21	2.51	2.32	2.31
Mean temp.	23.81	28.31	38.50	51.78	62.17	71.46	74.66	72.66	66.36	54.77	41.00	29.61
1988 precip.	1.69	1.17	2.96	2.01	1.44	0.39	1.69	2.08	2.73	3.46	5.05	2.94
1988 temp.	21.92	23.90	39.20	50.00	64.40	73.40	77.54	77.72	66.74	47.30	41.54	29.30
CRD 6												
Mean precip.	1.69	1.91	3.32	3.93	4.12	4.04	3.83	3.48	3.26	2.68	2.43	2.26
Mean temp.	26.51	31.41	41.20	54.48	64.17	73.26	76.75	74.66	67.96	56.57	43.09	32.20
1988 precip.	2.22	2.48	4.16	1.24	1.64	1.44	2.96	2.11	1.73	2.02	6.02	3.36
1988 temp.	25.34	26.42	41.54	54.14	65.84	74.48	78.26	79.34	69.26	50.72	43.34	32.79
CRD 7												
Mean precip.	2.20	2.22	3.70	3.92	4.05	4.27	4.28	3.25	3.05	2.53	3.05	3.01
Mean temp.	27.41	32.00	41.79	54.48	64.08	73.17	76.66	74.66	68.16	56.48	43.29	32.90
1988 precip.	2.72	3.35	4.52	1.54	1.54	0.84	4.23	1.56	1.82	2.80	6.41	2.70
1988 temp.	25.88	28.22	42.62	54.14	66.02	74.30	78.62	79.16	68.72	49.82	44.06	33.10

Table 18. Concluded

	J	F	M	A	M	J	J	A	S	O	N	D
CRD 8												
Mean precip.	2.57	2.84	4.36	4.14	4.28	3.98	3.95	3.52	3.14	2.45	3.28	3.29
Mean temp.	31.21	35.69	45.00	57.27	66.07	74.66	78.26	76.46	69.85	58.46	45.88	36.10
1988 precip.	2.38	3.05	4.87	1.72	2.29	1.15	4.68	2.26	5.16	3.35	6.34	2.65
1988 temp.	29.12	32.11	45.14	56.12	66.20	75.20	78.62	79.70	69.26	51.80	46.04	36.32
CRD 9												
Mean precip.	2.94	2.93	4.65	4.43	4.51	4.00	4.08	3.38	3.06	2.52	3.71	3.66
Mean temp.	31.60	35.69	45.09	57.18	69.96	74.55	78.06	76.35	69.85	58.28	45.99	36.30
1988 precip.	2.78	4.18	4.80	2.30	2.18	1.19	5.47	1.76	3.61	3.72	7.28	2.33
1988 temp.	29.12	32.70	45.68	55.40	65.84	74.48	78.44	79.34	68.90	51.44	45.86	35.96

Table 19. Computed Seasonal Soil Moisture Deficits by Crop Reporting District
(Inches)

	1	2	3	4	5	6	7	8	9
30-Year Mean									
Fine sand	12.73	12.75	16.05	16.61	14.76	7.81	7.32	9.13	8.66
Sandy loam/clay	3.77	3.62	4.40	5.26	4.25	5.93	5.84	6.61	6.78
Silt/clay loam	2.97	3.82	4.00	4.26	3.85	5.33	4.64	5.89	5.58
1988									
Fine sand	14.98*	12.99	16.13	17.80*	17.52*	16.70	16.78	13.28	13.62
Sandy loam/clay	12.47	11.12	13.37	14.81	14.72	14.94	13.98	11.71	11.48
Silt/clay loam	11.76	9.02	11.73	14.30	13.40	14.50	12.42	10.75	9.82

**Average irrigation water use in 1988 (estimated from field study measurements)*
Crop Reporting District 1 = 11.18 - 14.22 mgd
Crop Reporting District 4 = 18.29 mgd
Crop Reporting District 5 = 10.66 mgd (Cravens et al., 1990)

Table 20. Seasonal Irrigation Ground-Water Use* by County
(Million gallons per day)

County	*Average*	*1988*
Adams	0.180	0.548
Alexander	1.369	2.424
Boone	0.281	0.755
Bureau	2.355	8.153
Carroll	2.096	8.006
Cass	4.467	12.026
Champaign	3.007	10.470
Christian	0.301	0.818
Clark	8.707	21.562
Clinton	0.939	1.714
Cook	0.152	0.360
Crawford	0.439	1.174
Cumberland	0.013	0.034
DeWitt	0.814	2.503
Edwards	0.197	0.346
Ford	0.338	1.178
Franklin	0.004	0.006
Fulton	0.886	2.690
Gallatin	10.274	17.763
Greene	2.055	5.326
Hamilton	0.222	0.391
Hancock	1.499	4.555
Henderson	6.418	19.233
Henry	1.961	6.682
Iroquois	0.399	1.388
Jackson	0.796	1.453
Jasper	0.021	0.055
Jersey	0.004	0.010
Kane	0.406	0.958
Kankakee	16.335	54.624
Kendall	0.457	1.403
Knox	0.033	0.096
Lawrence	10.748	27.405
Lee	10.024	39.373

Table 20. Concluded

County	*Average*	*1988*
Livingston	0.016	0.056
Logan	0.339	1.140
McHenry	1.951	5.458
McLean	0.310	1.040
Macon	0.057	0.190
Madison	3.538	9.276
Marshall	2.396	6.834
Mason	125.606	386.724
Massac	2.465	4.336
Menard	0.723	2.285
Mercer	3.036	10.436
Monroe	1.759	3.114
Morgan	1.084	2.767
Ogle	1.189	4.315
Peoria	0.738	2.178
Piatt	0.475	1.653
Pike	2.240	5.946
Putnam	0.630	2.281
Randolph	0.264	0.468
Rock Island	2.348	7.902
St. Clair	1.030	1.880
Scott	4.280	11.367
Stephenson	0.008	0.032
Tazewell	34.468	109.998
Union	0.311	0.551
Wabash	0.640	1.125
Washington	0.690	1.260
Wayne	0.642	1.129
White	13.546	23.828
Whiteside	22.830	79.533
Will	0.434	1.333
Winnebago	0.717	2.371
Woodford	0.382	1.283
TOTAL	319.336	949.576

* Based on a 92-day irrigation season

Table 21. Projected 1995 Ground-Water Pumpage for Public Water Supplies and Self-Supplied Industries Combined and for Expanded Agricultural Irrigation, Totaled by County
(Million gallons per day)

	PWS and SSI** Totals*		
County	*Adjusted up*	*Adjusted down*	*Expanded agricultural irrigation*
Adams	14.013	11.076	0.068
Alexander	0.357	0.333	0.516
Bond	0.065	0.064	--
Boone	3.690	3.639	0.107
Brown	0.061	0.061	--
Bureau	3.531	3.507	0.885
Calhoun	0.507	0.507	--
Carroll	3.976	3.558	0.788
Cass	2.439	2.194	1.675
Champaign	23.517	22.572	1.123
Christian	1.935	1.825	0.115
Clark	1.524	1.476	3.261
Clay	0.912	0.736	--
Clinton	0.656	0.577	0.355
Coles	0.458	0.430	--
Cook	64.255	61.722	0.059
Crawford	6.744	6.013	0.161
Cumberland	0.465	0.423	0.008
DeKalb	7.312	7.202	--
DeWitt	1.546	1.546	0.305
Douglas	1.121	1.110	--
DuPage	8.401	8.106	--
Edgar	0.354	0.352	--
Edwards	0.665	0.457	0.074
Effingham	0.546	0.500	--
Fayette	1.544	1.282	--
Ford	1.394	1.394	0.126
Franklin	0.409	0.244	0.005
Fulton	0.911	0.911	0.331
Gallatin	2.528	2.312	3.850

Table 21. Continued

PWS and SSI** Totals*

County	*Adjusted up*	*Adjusted down*	*Expanded agricultural irrigation*
Greene	0.365	0.363	0.770
Grundy	11.023	9.547	--
Hamilton	1.218	1.107	0.085
Hancock	0.235	0.233	0.562
Hardin	1.320	1.102	--
Henderson	6.554	6.554	2.412
Henry	3.940	3.923	0.739
Iroquois	2.107	2.086	0.151
Jackson	0.101	0.101	0.295
Jasper	1.587	1.365	0.007
Jefferson	0.953	0.775	--
Jersey	0.889	0.889	0.005
JoDaviess	3.810	3.521	--
Johnson	0.023	0.023	--
Kane	33.878	33.519	0.154
Kankakee	2.884	2.695	6.125
Kendall	2.496	2.391	0.175
Knox	1.265	1.265	0.014
Lake	12.328	11.800	--
LaSalle	16.218	15.065	--
Lawrence	9.705	8.162	4.029
Lee	3.581	3.540	3.755
Livingston	1.682	1.667	0.007
Logan	3.537	3.537	0.127
McDonough	0.696	0.683	--
McHenry	14.726	14.195	0.733
McLean	5.197	5.127	0.124
Macon	1.117	1.116	0.022
Macoupin	0.018	0.018	--
Madison	51.962	41.789	1.324
Marion	0.754	0.610	--
Marshall	2.297	2.111	0.895
Mason	2.185	1.965	47.105

Table 21. Continued

PWS and SSI** Totals*

County	*Adjusted up*	*Adjusted down*	*Expanded agricultural irrigation*
Massac	12.631	8.304	0.928
Menard	0.735	0.735	0.269
Mercer	0.934	0.934	1.136
Monroe	0.112	0.110	0.655
Montgomery	0.529	0.529	--
Morgan	6.221	5.206	0.403
Moultrie	0.438	0.438	--
Ogle	6.698	6.422	0.445
Peoria	25.271	23.186	0.280
Perry	1.452	1.196	--
Piatt	2.728	2.497	0.175
Pike	0.824	0.812	0.843
Pulaski	0.654	0.654	--
Putnam	0.511	0.496	0.238
Randolph	0.832	0.830	0.098
Richland	1.110	0.923	--
Rock Island	13.391	11.211	0.882
St. Clair	12.561	10.307	0.391
Saline	0.393	0.321	--
Sangamon	2.196	2.196	--
Schuyler	0.550	0.550	--
Scott	4.047	4.047	1.609
Shelby	1.515	1.411	--
Stark	0.441	0.441	--
Stephenson	7.748	7.189	0.005
Tazewell	19.538	18.001	12.926
Union	1.407	1.406	0.115
Vermilion	4.733	3.848	--
Wabash	1.232	1.156	0.243
Warren	2.604	2.604	--
Washington	0.494	0.442	0.260
Wayne	2.052	1.684	0.237
White	4.313	3.725	5.085

Table 21. Concluded

PWS and SSI** Totals*

County	*Adjusted up*	*Adjusted down*	*Expanded agricultural irrigation*
Whiteside	7.404	6.461	8.571
Will	39.847	38.660	0.160
Williamson	0.035	0.023	--
Winnebago	41.200	39.647	0.267
Woodford	1.529	1.526	0.145
TOTAL	587.397	539.101	119.793

* Public Water Supply
** Self-Supplied Industrial

Table 22. Use/Yield Ratios for Municipal and Industrial Pumpage

Category	*Percent area overpumped*	*# Townships with r > 1**	*Total townships with pumpage*
Total	45	994	4.5
Sand and gravel	28	634	4.4
Shallow bedrock	41	518	7.9
Deep sandstone	72	289	24.9

*r = ground-water use / yield ratio

Table 23. Use/Yield Ratios for Municipal and Industrial Pumpage* under Average Weather Conditions

Category	*Percent area overpumped*	*# Townships with r > 1***	*Total townships with pumpage*
Total	60	1089	5.5
Sand and gravel	50	756	6.6
Shallow bedrock	44	522	8.4
Deep sandstone	73	290	25.2

* *Seasonal pumpage rates*
** *r = ground-water use / yield ratio*

Table 24. Use/Yield Ratios for Municipal, Industrial, and Irrigation Pumpage* under Drought (1988) Conditions

Category	*Percent area overpumped*	*# Townships with r > 1***	*Total townships with pumpage*
Total	87	1089	8.0
Sand and gravel	89	756	11.8
Shallow bedrock	48	522	9.2
Deep sandstone	75	290	25.9

**Seasonal pumpage rates*
*** r = ground-water use / yield ratio*

Table 25. Annual Impacts of Average and 1988 Irrigation

Irrigation water use		*Ratios*	*# Townships with r* > 1*
Average	80 mgd	0.001 - 7.55	46
1988	240 mgd	0.001 - 7.55	51

* r = ground-water use / yield ratio

Table 26. Projected Municipal, Industrial, and Average Seasonal Irrigation Pumpage

	Projected		*Projected with irrigation*	
	High	*Low*	*High*	*Low*
# Townships with r > 1*	34	31	61	59
Ratios	0.001 - 6.79	0.001 - 5.94	0.001 - 13.39	0.001 - 13.39

*r = ground-water use / yield ratio