Association of American State Geologists

Illinois State Geological Survey

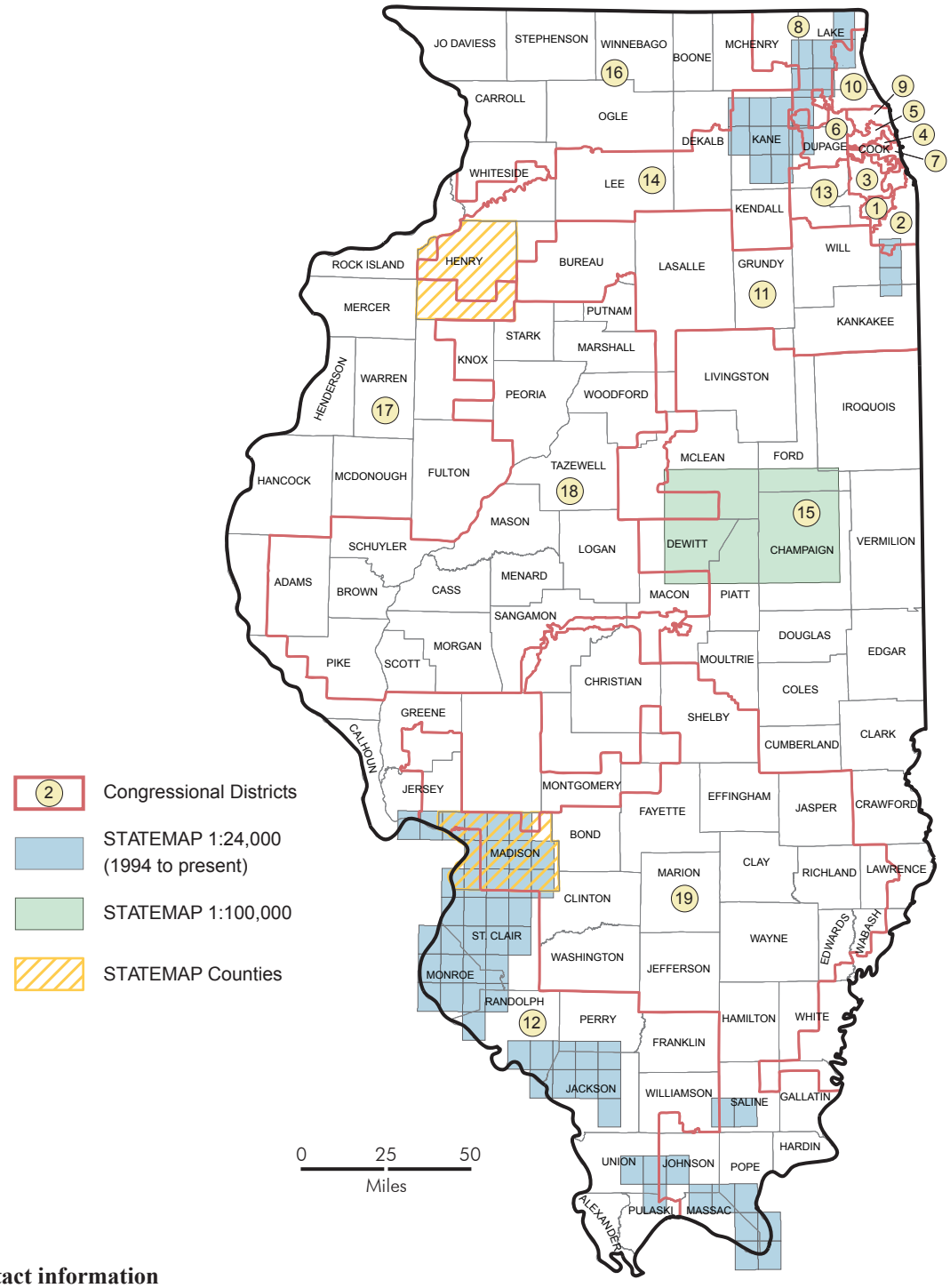
United States Geological Survey

science for a changing world

National Cooperative Geologic Mapping Program

STATEMAP Component: States compete for federal matching funds for geologic mapping

ILLINOIS



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SUMMARY OF STATEMAP
GEOLOGIC MAPPING PROGRAM IN ILLINOIS

FFY	7.5' Quadrangles Mapped	Federal Dollars	State Dollars	Total Project Dollars
1993	Champaign (30' x 60') & Mermet Surficial Geology Mermet & Reevesville Geology	$72,395	$126,768	$199,163
1994	Elburn & Geneva Surficial Geology Anna & Mt. Pleasant Bedrock Geology	80,000	128,270	208,270
1995	Brownfield, Smithland, Paducah E., & Little Cypress Surficial Geology Brownfield, Paducah NE, & Smithland Bedrock Geology	34,999	69,581	104,580
1996	Henry (County), Sugar Grove, Aurora N, Alton, & Grafton Surficial Geology Alton & Grafton Bedrock Geology	108,921	109,409	218,330
1997	Pingree Grove, Elgin, Elsah, & O'Fallon Surficial Geology Elsah & O'Fallon Bedrock Geology	100,000	100,000	200,000
1998	Hampshire, Maple Park, Cahokia, French Village, & Millstadt Surficial Geology Cahokia, French Village, & Millstadt Bedrock Geology	153,827	263,853	417,680
1999	Beecher W, Steger, Columbia, Waterloo, & Renault Surficial Geology Columbia, Waterloo, & Renault Bedrock Geology	119,856	196,036	315,892
2000	Wadsworth, Wood River, Monks Mound, Granite City, & Collinsville Surficial Geology Wood River, Monks Mound, & Collinsville Bedrock Geology	138,935	139,176	278,111
2001	Wauconda Surficial Geology Valmeyer, Selma, Paderborn, & Ames Bedrock Geology	184,036	184,512	368,548
2002	Bethalto &Prairietown; Edwardsville, & Oakville Surficial Geology Bethalto, Prairietown, Edwardsville, Oakville, & Granite City Bedrock Geology	150,000	150,249	300,249
2003	Grayslake, Marine, St. Jacob, Worden Surficial Geology New Athens West & Red Bud Geology; Prairie du Rocher & Vienna Bedrock Geology	201,980	203,037	405,017
2004	Highland, Grantfork, Libertyville, & New Douglas Surficial Geology Freeburg, Ava, Oraville, Raddle, Rockwood, & Willisville Bedrock Geology	217,273	217,273	434,546
2005	Lake Zurich, Lebanon, Mascoutah, & Madison (County) Surficial Geology Carrier Mills, Chester, Harrisburg, Vergennes, & Welge Bedrock Geology	249,196	249,196	498,392
2006	Ames, Barrington, Freeburg, Streamwood, & West Chicago Surficial Geology Cypress, Murphysboro, & Pomona Bedrock Geology	227,531	228,999	456,530
2007	New Athens East, New Athens West, & Wheeling Surficial Geology Brussels, Herod, Nutwood, & Winfield Bedrock Geology	242,230	243,550	485,780
	TOTALS Total number of maps: 108	**$2,281,179**	**$2,609,909**	**$4,891,088**

May 2007

Geologic Mapping in Illinois

The Illinois State Geological Survey has a continuing project to map the geology of the entire state, in three dimensions, from land surface down to and into the bedrock, at the detailed scale of 1:24,000 (1 inch = 2000 feet). The STATEMAP part of the National Cooperative Geologic Mapping Program has contributed significantly to advancing this project. From its inception in 1993, STATEMAP-supported projects have been focused in three areas: 1) mapping the bedrock and surficial deposits exposed in southernmost Illinois, primarily to seek evidence of relatively recent faulting in this earthquake-prone area astride the New Madrid and Wabash Valley seismic zones; 2) mapping the glacial deposits and bedrock in the rapidly urbanizing area on the Illinois side of the Mississippi River opposite St. Louis; 3) mapping the glacial deposits in rapidly urbanizing areas of the western Chicago suburbs; and 4) mapping the glacial deposits at a proposed site for a third airport in the Chicago region. The STATEMAP program also contributed to an important pilot project to create a three-dimensional model at the 1:100,000-scale (1 inch = about 1.6 miles) of the complex glacial geology that underlies the Champaign area.

Illinois' geology is dominated by complexly layered deposits of clay, sand and gravel, and boulders laid down by continental glaciers that repeatedly flowed across the land and melted away during the last 1.6 million years. With few outcrops to study, geologists must rely on drilling to map these deposits in the subsurface, an inherently expensive process. Our state's rich farmland, some of the most productive in the world, owes its fertility to the abundant mineral nutrients in the finely ground rock materials that are the parent materials of the state's soils. The glacial deposits also are the primary source of drinking water for 37% of the state's total population, and more than 90% of the rural population, and contain abundant supplies of sand and gravel for use as construction materials. The people of Illinois, who live on and use the state's earth materials, need more information about the state's geology to successfully maintain natural areas and restore unique habitats, locate new drinking-water sources and keep existing ones free of contamination, and to properly site land-fills and other potentially harmful but essential industries.

Careful economic analysis of the costs and benefits of having and using geologic maps, based on the use of geologic maps in Kentucky, (the only state fully mapped at the 1:24,000-scale) showed that every dollar invested in geologic mapping will return at least 25 to 39 dollars.

Maps delivered annually to the USGS are now made immediately available to the public as digital graphics through the ISGS website, and are published soon after in the Illinois Preliminary Geologic Map (IPGM) series. ISGS geologic maps (both surficial and bedrock) are being increasingly used by consultants, engineers, government agencies, educators, businesses, and scientists for a variety of purposes. For example, an engineering company in the St. Louis Metro East region recently used our maps to aid their investigation of a landslide in the Grafton, Illinois area. The landslide was controlled by the near-surface occurrence of a shale layer that is particularly susceptible to failure. The near-surface occurrence of bedrock (as indicated in the surficial map) and the distribution type of bedrock (as indicated in the bedrock map) were useful information for the client and can help to highlight areas at risk for future landslides.

Outcome Statement for 2006-2007 STATEMAP Project

The Murphysboro, Pomona and Cypress 7.5' Quadrangles were a part of the 06-07 bedrock maps of the Illinois STATEMAP program.

Significant outcome in the Pomona Quadrangle was a 4 foot thick coal that occurs 71 feet below the surface and another 2.5 foot seam at 91 feet below the surface. This is the Murphysboro Coal which can be low in sulfur. It was drilled in Sec. 9, T9S, R2W, in the northern part of the Pomona Quadrangle.

The southwestern corner of the Pomona Quadrangle yields three different structural styles and fabric orientation: 1) north-south gravity or slump faults confined to the upper Elviran Stage of the Chesterian Series, 2) an en echlon, northwest trending, strike-slip (oblique-slip) faults of the Pomona Fault Zone (PFZ), 3) a northeast-striking growth fault in the Tradewater Formation. The southwest corner of the Pomona Quadrangle is complexly faulted because it occurs at the nexus of an ancient valley slump system that trends north and the northern reaches of the Ste. Genevieve Fault Zone called the PFZ that trend northwest and the southeastern reaches of the Bodenschatz-Lick Fault Zone which is oriented northeast.

Significant outcome in the Cypress 7.5' Quadrangle is the use of the map to help delineate viticultural areas. It is important to better define lands suitable for viticulture as Illinois increasingly develops its demands for vineyard sites. The report with the map shows orientation, slope, elevation, and bedrock geology and soil type with other factors to generate potential areas for vineyard site selection.