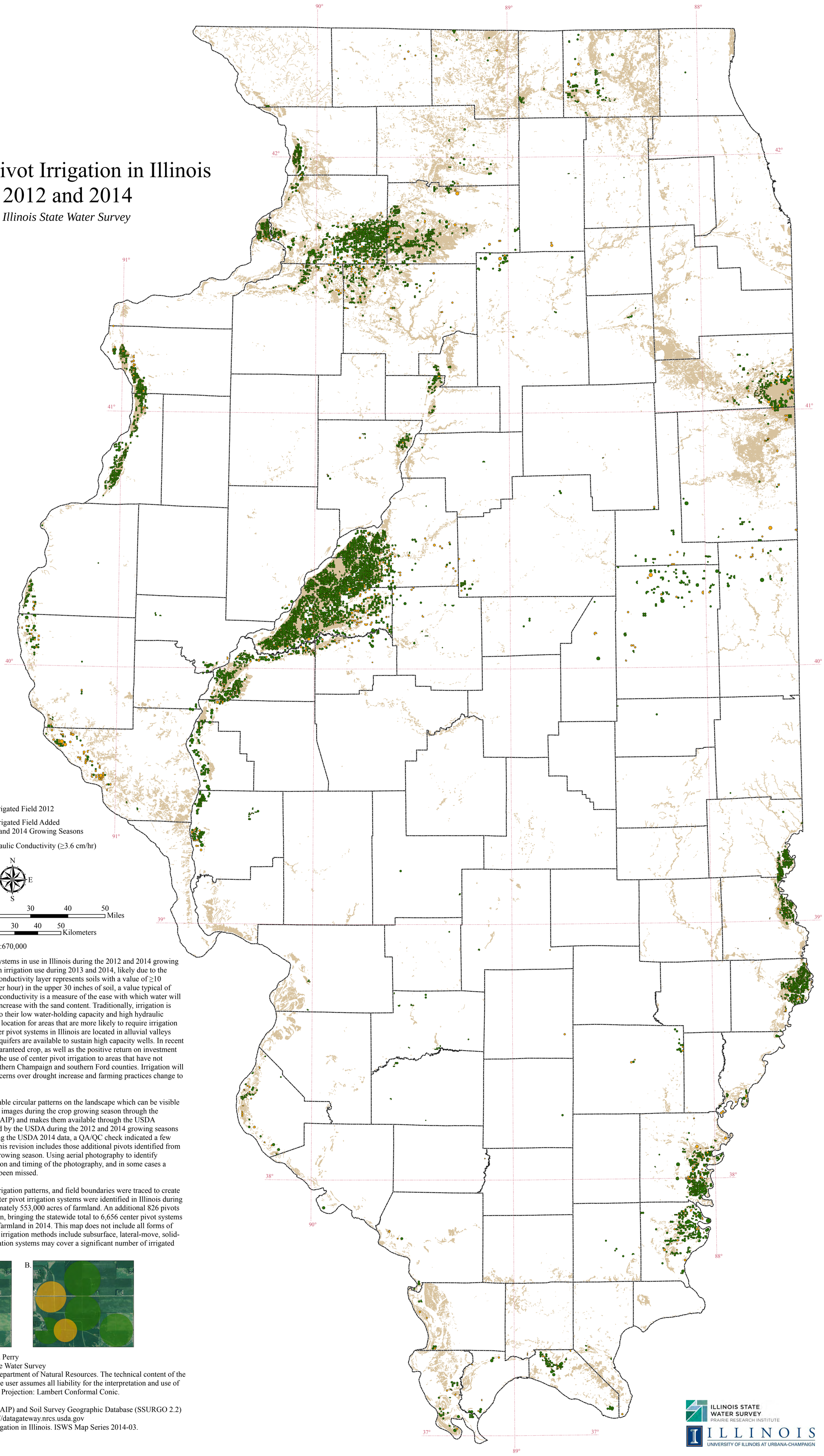
ISWS Map Series 2015-03
Published November 2015

Center Pivot Irrigation in Illinois 2012 and 2014

Illinois State Water Survey



This map displays center pivot irrigation systems in use in Illinois during the 2012 and 2014 growing seasons. There was a significant increase in irrigation use during 2013 and 2014, likely due to the drought in 2012. The saturated hydraulic conductivity layer represents soils with a value of ≥10 micrometers per second (3.6 centimeters per hour) in the upper 30 inches of soil, a value typical of sandy soils in Illinois. Saturated hydraulic conductivity is a measure of the ease with which water will move through a soil, and values typically increase with the sand content. Traditionally, irrigation is needed where sandy soils are present due to their low water-holding capacity and high hydraulic conductivity. This layer provides a general location for areas that are more likely to require irrigation for a successful crop. The majority of center pivot systems in Illinois are located in alluvial valleys where soils are sandy and where shallow aquifers are available to sustain high capacity wells. In recent years, seed corn contracts that require a guaranteed crop, as well as the positive return on investment for crops under irrigation, have expanded the use of center pivot irrigation to areas that have not historically required irrigation, such as northern Champaign and southern Ford counties. Irrigation will likely continue to expand in Illinois as concerns over drought increase and farming practices change to ensure crop yields meet expectations.

A. Center pivot irrigation imprints identifiable circular patterns on the landscape which can be visible in aerial images. The USDA collects aerial images during the crop growing season through the National Agricultural Imagery Program (NAIP) and makes them available through the USDA Geospatial Data Gateway. Images collected by the USDA during the 2012 and 2014 growing seasons were used to develop this map. In reviewing the USDA 2014 data, a QA/QC check indicated a few pivots were omitted from the 2012 map. This revision includes those additional pivots identified from USDA images collected during the 2014 growing season. Using aerial photography to identify irrigation systems is limited by the resolution and timing of the photography, and in some cases a system was not discernable and may have been missed.

B. The NAIP images were examined for irrigation patterns, and field boundaries were traced to create an ArcGIS map layer. A total of 5,829 center pivot irrigation systems were identified in Illinois during the summer of 2012, representing approximately 553,000 acres of farmland. An additional 826 pivots were in use during the 2014 growing season, bringing the statewide total to 6,656 center pivot systems irrigating approximately 625,000 acres of farmland in 2014. This map does not include all forms of irrigation employed in Illinois. Alternative irrigation methods include subsurface, lateral-move, solid-set, and traveling gun. These types of irrigation systems may cover a significant number of irrigated acres not reflected in this map.

A.

B.

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Funding was provided in part by Illinois Department of Natural Resources. The technical content of the map is the responsibility of the authors. The user assumes all liability for the interpretation and use of the map. Map compiled by Karen Bridges. Projection: Lambert Conformal Conic.
Sources:
National Agricultural Imagery Program (NAIP) and Soil Survey Geographic Database (SSURGO 2.2) from the USDA Geospatial Gateway, http://datagateway.nrcs.usda.gov
Bridges, et al. 2014. 2012 Center Pivot Irrigation in Illinois. ISWS Map Series 2014-03.
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