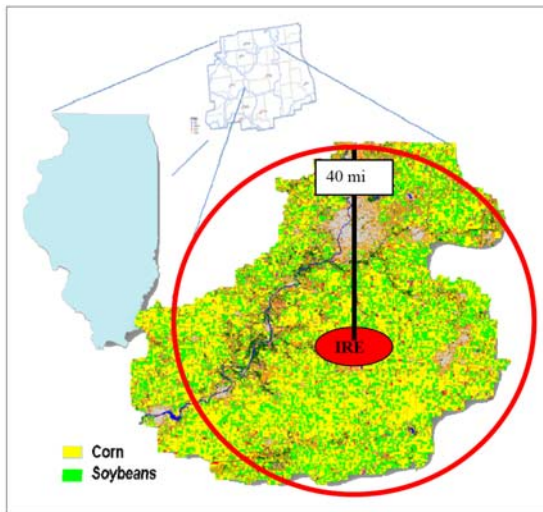


## Study Approach

This study sought to determine if corn extensification -- conversion of non agricultural land to corn -- and corn intensification -- conversion of non-corn crop acres to corn or increased yield in current corn acres -- occurred within the vicinity of an ethanol plant. And if so, whether the ethanol plant caused these effects. The study was conducted by the University of Illinois at Chicago Energy Resources Center and the Institute for Technology Development.

The study used data from a modern ethanol plant in Rochelle, Illinois with a current capacity of 58 million gallons per year (mgpy). The plant began operations in December, 2006. The time horizon for the land use study analysis was from one year prior to the plant startup in 2005 through two years of full plant production ending in 2007.

The study combined remote sensing (USDA NASS cropland data layer derived from AWiFS) with a survey of 29 farmers who supply corn to the ethanol plant. The present study determined corn-ethanol related land use changes from the "bottom-up": by carefully examining changes to each acre of land within a 40 mile radius (the surveyed corn draw area) of the ethanol plant.



## Findings

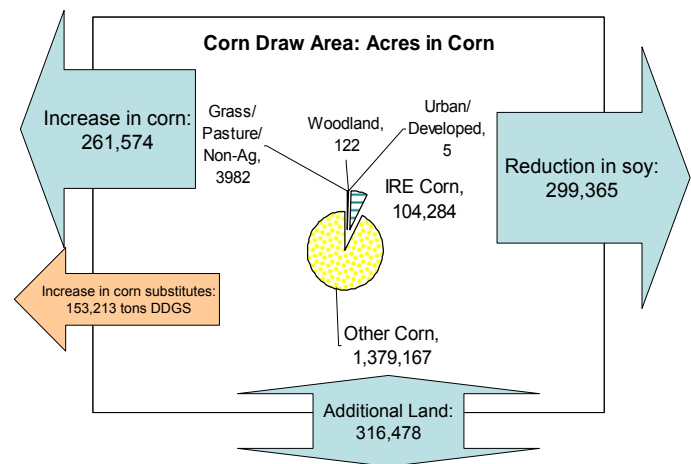
- ▶ In 2007 a total of 1.48 million acres of corn were grown within a 40 mile radius of the plant.
- ▶ In the 2007 growing season only 4,109 acres were converted from non agricultural use such as grass, pasture, or woodland to corn growing (0.28% of the 1.487 million acres in corn) versus the previous year.
- ▶ Conversion did not occur despite the fact that an additional 316,478 acres of land was available for conversion to agriculture within the corn draw area.
- ▶ It can be concluded that the start-up of the ethanol plant did not promote corn extensification -- the conversion of non-ag acres to corn -- as no meaningful

amount of available land within the ethanol draw area was converted

▶ At the time the study was conducted, the Rochelle, IL plant required 20,450,000 bushels of corn to produce 55 mgpy of corn ethanol on an annual basis. At the surveyed yield of 196.1 bu/acre, the 2007 land requirements to supply the Rochelle plant totaled 104,284 acres.

▶ Over the period of the study, corn production acres in the plant draw area increased by 261,574 acres while soy production decreased by 299,365 acres. This shift in planting is not explained by the ethanol plant's corn supply requirements which in full only accounts for 40% of the "new" corn acres.

▶ While the new ethanol plant accounts for some corn intensification, other variables such as economics and high export demand may drive corn intensification. Counting DDGS production as a corn co-product, annual yield increases were sufficient to meet the Rochelle plant's supply requirements. This indicates that a new ethanol plant's corn supply requirements may be met within a short period of time by normal yield increases.



In summary, the study concludes that the construction and operation of the Rochelle Illinois ethanol plant did not contribute to land use change. It follows that greenhouse gas emissions from IRE related land use change are insignificant. The life cycle global warming analysis for IRE produced corn ethanol (including farming, conversion, distribution, denaturing) totals 54.8 gCO<sub>2</sub>e/MJ. This assessment is consistent with the life cycle assessment requirements set by the Energy Independence and Security Act of 2007.

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