

# Temporal Variations of Water Productivity in Irrigated Corn

An Analysis of Factors influencing Yield and Water Use across Central Nebraska

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**40%** population increase by  
2050, doubling the  
demand for food and feed

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**70%** of all freshwater withdrawals  
are for agriculture

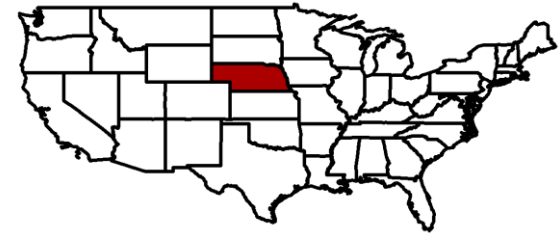


$$\text{Water Productivity} = \frac{\text{Crop [kg; \$]}}{\text{Water [m}^3\text{]}}$$



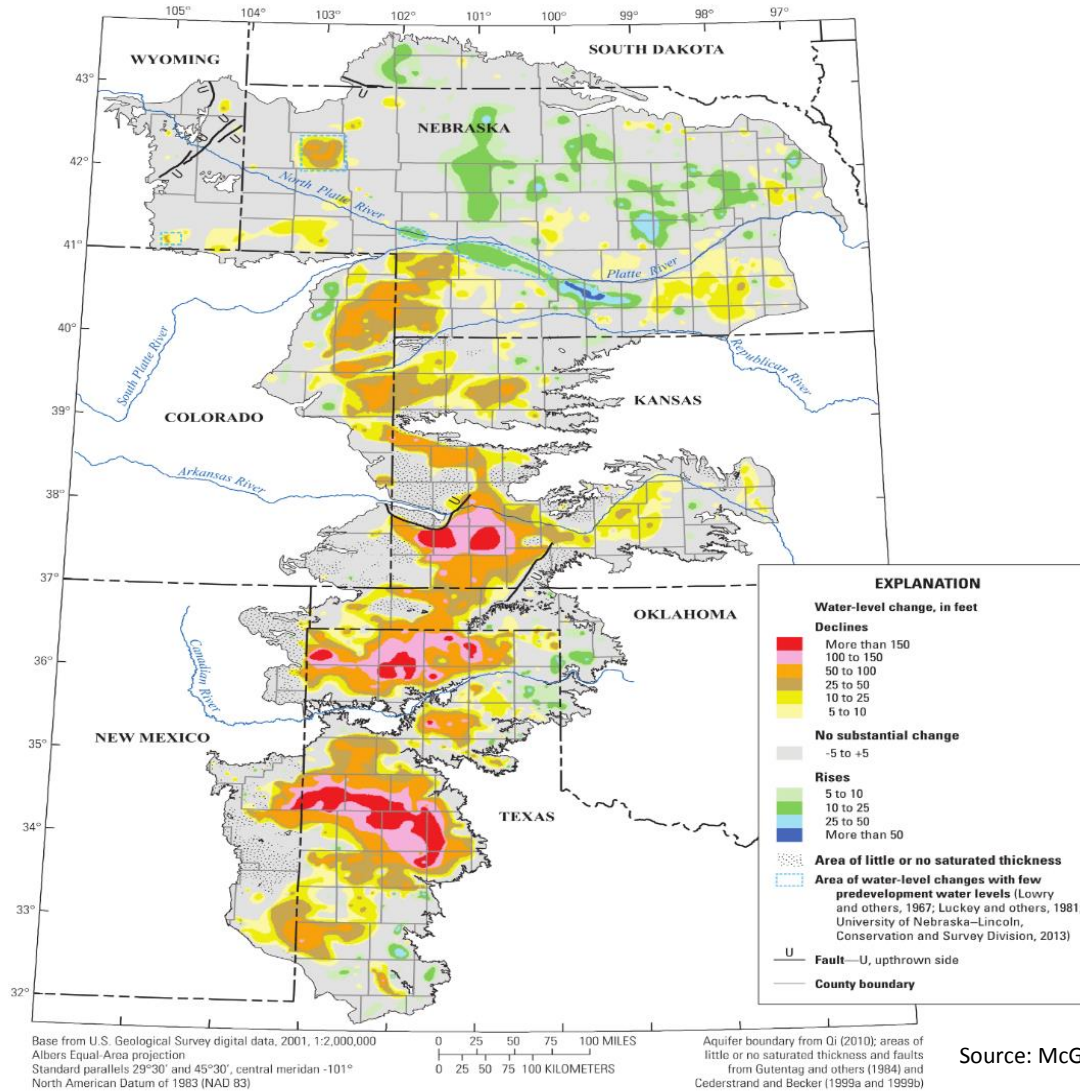
# Nebraska

- Third largest Corn producer in the USA
- Biggest irrigated area in the USA
- Mainly Groundwater for irrigation

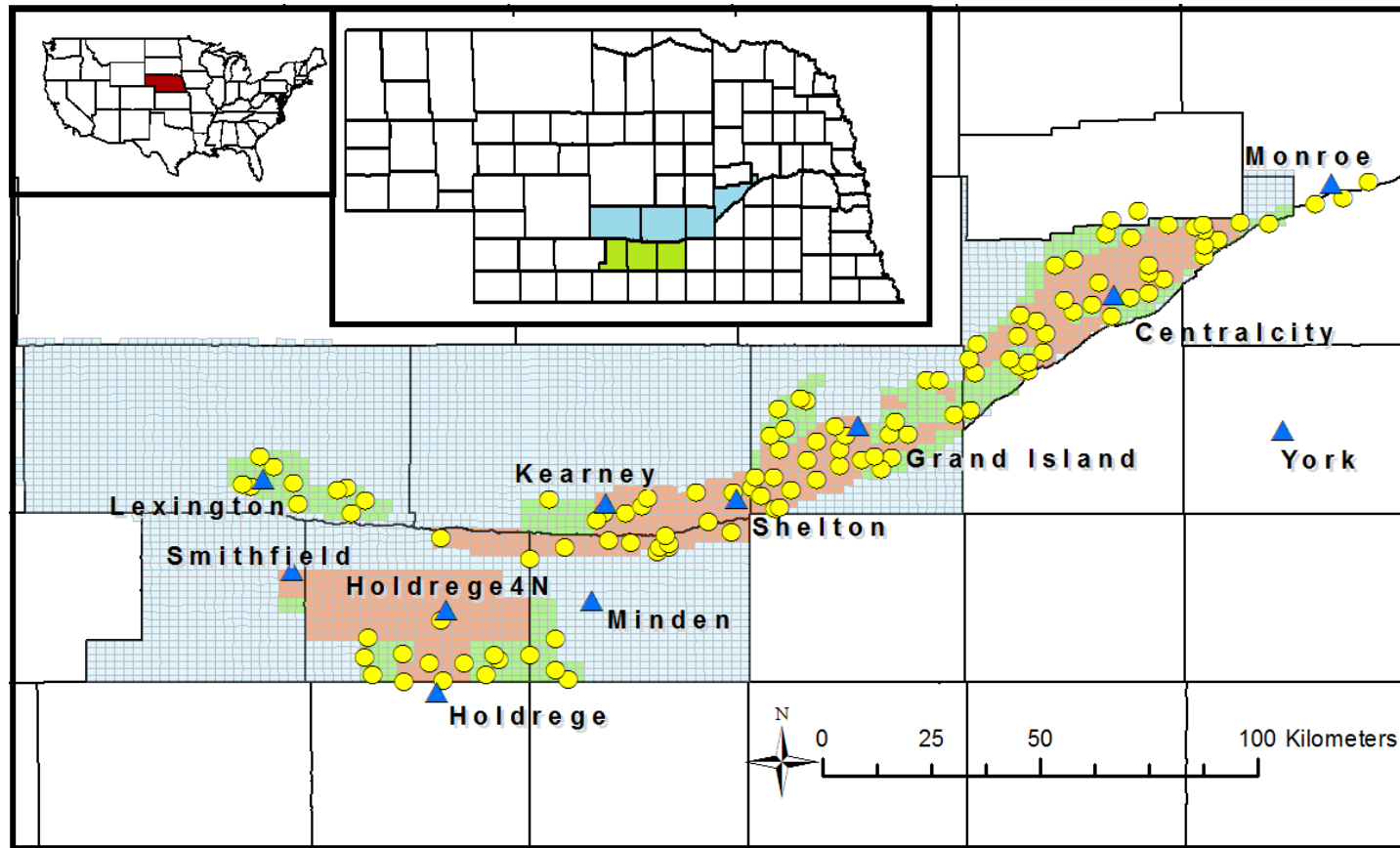


Source: University of Nebraska-Lincoln





# Study area



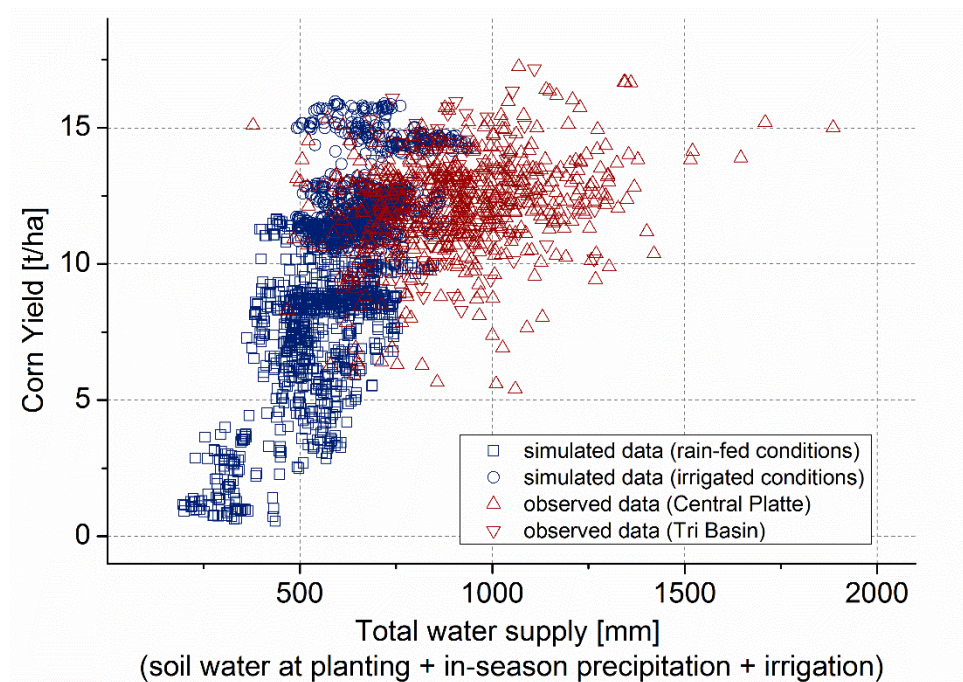
# Research Objectives

- Evaluation of Water Productivity in the study area
- Analysis of factors influencing Water Productivity
- Extension of Water Productivity analysis to interactions between grain production and water resources with ecological systems



# Results

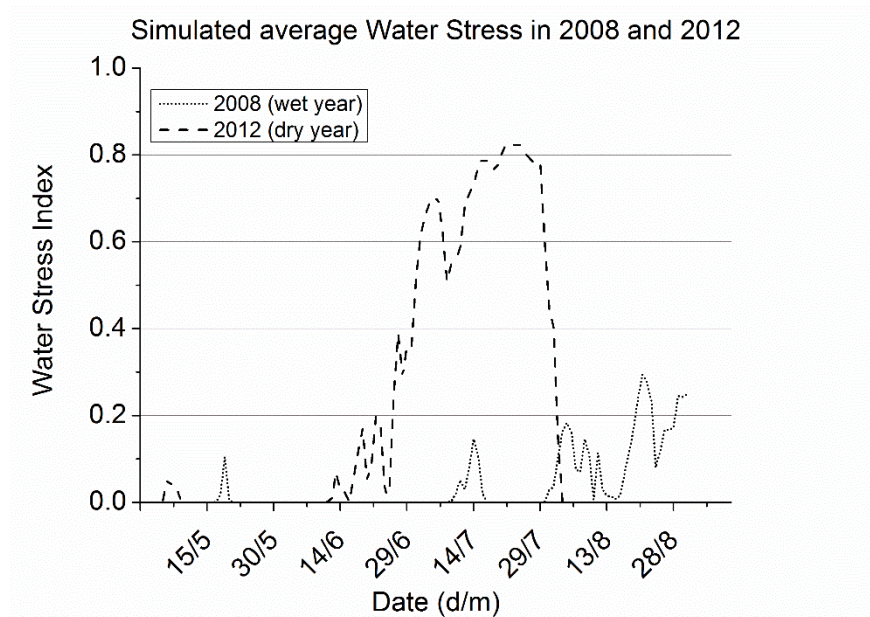
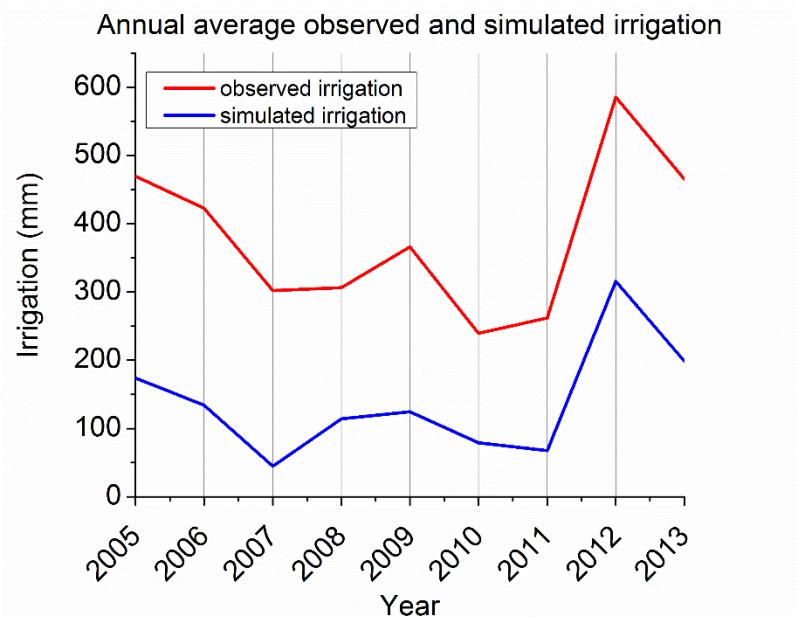
In the majority of cases more water is being added to the fields than needed for achieving optimum corn yields under ideal water, nutrient and pest management.





# Results

- Annual Water Productivity variations are mainly influenced by weather conditions
- Control over the amount and timing of water supply improves Water Productivity



# Conclusion

- Water Productivity can be improved in the study area
- Improving the quantification of crop water demand can help to increase Water Productivity
- Strategies towards sustainability of water resources should combine quantity with quality issues and consider the interactions of ecological systems

